PATHWORKS™ for Macintosh®

MacTerminal® User's Guide

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MacTerminal® User's Guide

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The Apple Publishing System

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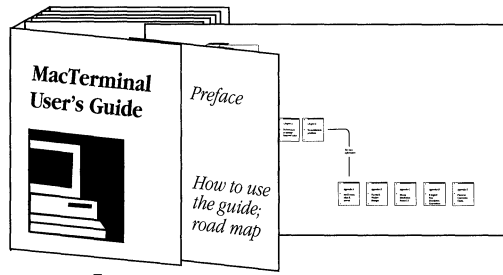
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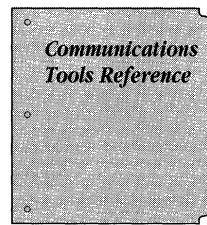
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Preface

This guide tells you how to use the MacTerminal® application. MacTerminal makes it possible for your Apple® Macintosh® computer to communicate with other computers down the hall or around the world. This Preface summarizes what you'll find in the *MacTerminal User's Guide* and helps you find the information you need. The Preface also presents a road map that shows how the different parts of the guide work together.

About this guide

The *PATHWORKS for Macintosh: MacTerminal User's Guide* is a special edition of the *MacTerminal User's Guide* distributed by Apple Computer. This special edition was created for the PATHWORKS™ for Macintosh product, and is an adaptation of the general version of the *MacTerminal User's Guide.*

The MacTerminal software provided with the PATHWORKS for Macintosh product is identical to the MacTerminal program sold by Apple Computer. PATHWORKS for Macintosh, however, includes additional communications tools and sample session documents for use with MacTerminal.

MacTerminal depends on *communications tools* to provide specialized communications capabilities. This guide includes the *Communications Tools Reference,* which is a set of reference modules for the communications tools included with MacTerminal. In the future, Apple Computer and other companies will offer new communications tools for use with MacTerminal. If you obtain some of these tools, you can insert their reference modules in the appropriate part of the *Communications Tools Reference.*

This guide also contains two quick reference cards that show how to simulate VT102™ and VT320™ keys from your Macintosh keyboard.

What you need to know

The *MacTerminal User's Guide* is intended for Macintosh users who may or may not be familiar with Digital computers. Because you can use MacTerminal to access terminal services on Digital networks, a basic understanding of computer networks will be helpful to you. If you need an overview of network terms and concepts, you may want to read Appendix A in the *Network Services User's Guide*.

To use this guide, you need to know basic Macintosh techniques and operations. If you have doubts about what *windows* are, what *select* means, or how to *click* and *drag* with the mouse, read the manuals that came with your Apple computer before you read this guide. It also helps to be familiar with at least one other Macintosh application, such as MacWrite®.

For information on installing MacTerminal and communications software for PATHWORKS for Macintosh, see the *Installation* part of the *Network Services User's Guide*.

How to use this guide

The degree of your experience with data communications software may influence the way in which you use this guide. The following list provides suggestions for where to start reading and summarizes the contents of the guide to help you decide how to continue your reading.

- If you have had little or no experience with data communications, read Chapter 1, "Introduction to MacTerminal," for an overview of the MacTerminal application and for definitions of some terms with which you need to be familiar when using your Macintosh to communicate with other computers.

- Read Chapter 2, "About Using MacTerminal," to acquaint yourself with how to use the MacTerminal program. This chapter tells you how to take full advantage of MacTerminal's features, so you should read it even if you have used earlier versions of MacTerminal or other communications software.

- When you are ready to start using MacTerminal to communicate with another computer, see Chapters 3, 4, and 5 for step-by-step instructions. Chapter 3 tells you how to set up a session document. Chapter 4 tells you how to communicate with another computer. Chapter 5 tells you how to handle session data.

- If you want detailed descriptions of the commands in the MacTerminal menus, turn to Chapter 6, "Commands Reference."

- For solving problems that you have while using MacTerminal, see Chapter 7, "Troubleshooting." For explanations of alert boxes that may appear while you're using MacTerminal, see Appendix A, "Alert Messages."

- If you want to know about on-line services, turn to Appendix B, "About On-line Services," for lists of mail services and on-line services, as well as for a list of recommended books about on-line services.

- If you are connecting special cables to the modem or printer ports on your Macintosh, you may want to reference Appendix C, "Pin Assignments."

- If you need to check the ASCII equivalents for characters, see Appendix D, "ASCII Character Chart."

- For definitions of terms used in this binder, see the Glossary.

Finding what you need

The following list tells you where to look for information on specific topics.

For	*See*
A basic overview of MacTerminal	Chapter 1, "Introduction to MacTerminal"
Installation instructions	*Installation* part of the *Network Services User's Guide*
An overview of using MacTerminal	Chapter 2, "About Using MacTerminal"
Step-by-step instructions for using MacTerminal	Chapter 3, "Setting Up a Session Document"; Chapter 4,"Communicating With Another Computer"; and Chapter 5, "Handling Data"
Command descriptions	Chapter 6, "Commands Reference"
Detailed descriptions of communications tools	*Communications Tools Reference*

Troubleshooting hints
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Visual conventions used in this guide

The `Courier` font is used to indicate computer commands and text that you type.

Terms that have a special meaning in relationship to Macintosh or Digital computers, or to networks, appear in **boldface** at first mention or when first defined in the text. These terms are defined in the glossary.

The ⌘ symbol is used throughout to indicate the Command key. This symbol means the same thing as the word *Command* in earlier Macintosh manuals.

The *MacTerminal User's Guide* includes special text elements to highlight important or supplemental information:

◆ **Note** Text set off in this manner presents additional information or interesting sidelights. ◆

△ **Important** Text set off in this manner—with *Important*—presents important information or instructions. △

Road map to the *MacTerminal User's Guide*

The road map that follows shows how the parts of *MacTerminal User's Guide* work together. The road map also shows that the instructions for installing MacTerminal are located in the companion guide, *PATHWORKS for Macintosh: Network Services User's Guide*.

1 Introduction to MacTerminal

This chapter introduces you to the MacTerminal® **application** and defines some terms that you need to know when working in a communications environment. The chapter lists the hardware and **software** requirements for using MacTerminal, and describes the different kinds of communications links you can establish. This chapter also explains how MacTerminal 3.0 differs from previous versions of MacTerminal.

What is MacTerminal?

MacTerminal is a communications and terminal emulation application that lets you establish **connections** between your Macintosh and other computers—personal computers, **minicomputers,** and **mainframe computers.** Your Macintosh and another computer may be locally linked by special cables or remotely linked by some kind of transmission facility, most likely telephone lines. These links between your Macintosh and other computers can provide valuable communications capabilities and give you access to useful information.

By using MacTerminal and appropriate communications equipment, you can

- **send** information to a coworker who is using another Macintosh or other type of personal computer

- communicate with a client by way of an electronic mail service such as MCI Mail, or a telex service such as Western Union EasyLink

- exchange information with your company's mainframe computer—for example, a Digital Equipment Corporation VAX™ 9000 computer

- get stock quotes and news from an information service such as Dow Jones News/Retrieval

- gain access to whole libraries of information through various commercial **databases** such as CompuServe and Dialog Information Service

- communicate with a wide range of Special Interest Groups (SIGs) and tap into all kinds of databases on low-cost local **Bulletin Board Systems (BBSs)**

MacTerminal works in conjunction with the **Macintosh Communications Toolbox.** The Communications Toolbox is an extension of the Macintosh system software and is responsible for managing communications tasks for Macintosh applications. The Communications Toolbox provides access to **communications tools,** the software that performs specific communications tasks such as terminal emulation. Your MacTerminal package includes a full set of communications tools, as described later in this chapter.

The communications tools fall into three categories:

Connection tools   Define the type of connection that is established between your Macintosh and the other computer

Terminal emulation tools   Determine the type of terminal that your Macintosh emulates (acts as) while communicating with another computer

File transfer tools   Let you send **files** from one computer to another

The following diagram shows the relationship between MacTerminal, the Communications Toolbox, the communications tools, and the Macintosh Operating System.
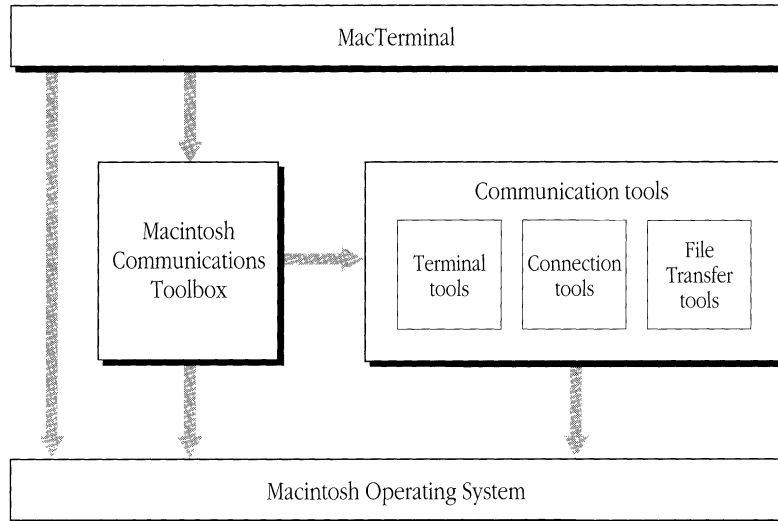
Terminal emulation

MacTerminal lets your Macintosh take on the characteristics of a terminal, while retaining its power as a computer. The basic job of a **computer terminal** is to send information to and receive information from another computer. A terminal has a keyboard that you use to enter information and a display screen to show what you're sending and receiving. Using a Macintosh as a terminal, you can exchange information with users of other Macintosh computers or types of other personal computers, and gain access to databases, applications, and the mass storage facilities on large computers.

The MacTerminal application is a terminal emulator because it can **emulate** (or imitate) other computer terminals. The terminals that MacTerminal can emulate depend on the terminal emulation tools that are installed on your Macintosh. Your MacTerminal package includes the following terminal emulation tools:

- TTY Terminal Emulation Tool
- VT102™ Terminal Emulation Tool
- VT320™ Terminal Emulation Tool

The other computer

The computer that you want to communicate with must have its own communications capabilities. For example, any other personal computer with which you communicate must be running communications software. Minicomputers and mainframe computers usually have specialized data communications software to manage the flow of information between themselves and many terminals. Computers with software like this are called **host computers.** You are usually required to enter valid user identification information (typically, a **user name** and a **password**) to access the host computer.

In order for two computers to communicate, they must "speak the same language." The communications tools that you use with MacTerminal have settings that allow you to match the settings of the other computer so the computers can talk to each other. For example, when you subscribe to Dow Jones News/Retrieval, you receive a manual that describes how to set up your Macintosh to communicate with the Dow Jones News/Retrieval computer system. These settings are called **communications parameters.**

While you are using MacTerminal, you work within a **session document,** which is a **document** similar to other Macintosh documents but designed for establishing a communications link between your Macintosh and another computer and for recording the communications between the two computers. By specifying an appropriate set of communications tools and choosing from a variety of **setup options** for these tools, you can set up your session document so that its communications parameters are compatible with those of the other computer. Your MacTerminal application includes sample session documents with communications parameters preset for communicating with:

- another Macintosh or other type of personal computer
- a **VAX computer** through a Local Area Transport (LAT) connection
- a VAX computer through a serial connection
- a DECnet™ host through a CTERM connection
- a commercial information service
- a BBS

The connection

In order to communicate with another computer, your Macintosh must connect to the other computer, either directly by special cable or indirectly through local **network** connections or other transmission channels, such as telephone lines. If you connect to the other computer by telephone lines, you'll attach your Macintosh to a device called a **modem.** The modem sends **data** from MacTerminal over telephone lines to a modem at the other end, which in turn sends the data to the other computer.

The following figure illustrates some of the connection possibilities when you are using MacTerminal.
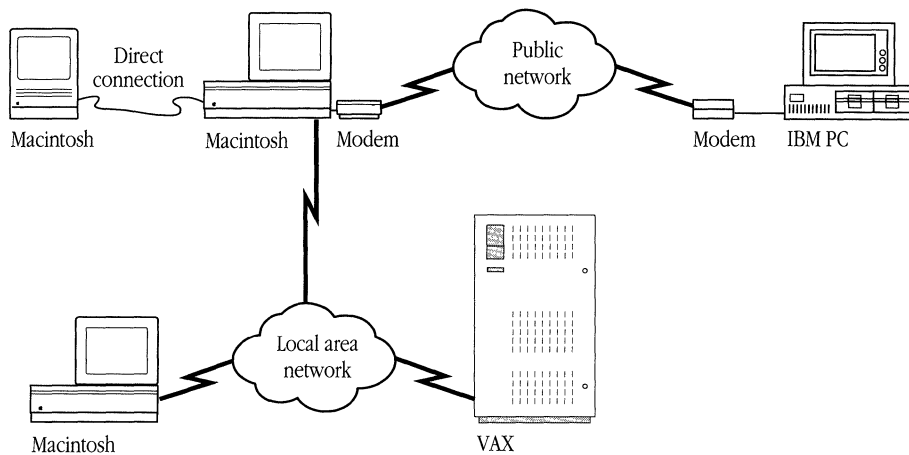
When you use MacTerminal to make contact with another computer, you start a **communications session.** During the **session,** your Macintosh and the other computer engage in an information exchange known as a **communications conversation.** The communications session lasts until you terminate the connection. The time that elapses between the contact and termination is called **connect time,** and is usually what you are billed for when you're using the services of a commercial host computer.

Before you start the communications session, you set up the session document for the type of connection tool you'll be using. Your MacTerminal package includes the following connection tools:

Apple Modem Connection Tool	For connecting with an Apple modem or other Hayes-compatible modem over telephone lines
AppleTalk ADSP Connection Tool	For connecting to services on the network that use the AppleTalk® Data Stream Protocol—for example, other workstations using MacTerminal

LAT Connection Tool	For connecting to VAX **terminal services** by means of the LAT protocol
Serial Connection Tool	Primarily used for connecting over local cables—for example, to connect your Macintosh directly to another Macintosh

File transfer

Besides using MacTerminal to set your terminal emulation and connection features, when you want to send or receive files, you use MacTerminal to **select** a **file transfer protocol.** This protocol defines the procedural rules that your Macintosh and the other computer follow when exchanging files. The **protocol** governs the format, timing, sequencing, and error control of any files **transferred** during the communications session.

For example, if you decide to send a file by using the XMODEM file transfer protocol, you set up your session document to use a file transfer tool that enables your Macintosh to follow the rules for this type of transfer. The receiving computer must also use the XMODEM protocol to receive the file.

Your MacTerminal package includes the following file transfer tools:

Text File Transfer Tool	For sending **ASCII** type **text** files; this tool does not provide error-checking
XMODEM File Transfer Tool	For sending and receiving files of all kinds, with error-checking to ensure that files are **transmitted** correctly; this tool supports several variations of the XMODEM protocol

Making sure you have what you need

You need the following items to use MacTerminal:

- a Macintosh Plus, a Macintosh Portable, or any computer in the Macintosh II or Macintosh SE family, with
  - □ at least 1 megabyte (MB) of **memory** (2 MB is recommended)
  - □ system software version 6.0.4 or a later version
  - □ Macintosh Communications Toolbox version 1.0 or a later version
  - □ communications tools (at a minimum, a terminal emulation tool and a connection tool)
  - □ MacTerminal version 3.0
- a **hard disk,** two 800K floppy **disk drives,** or one Apple SuperDrive™ floppy disk drive (the hard disk configuration is recommended)
- a network connection, a direct connection to another computer, or a modem
- access to a **remote computer** with communications capabilities

About network connections

If you're communicating over a network connection, you may need special communications hardware and software. For example, an **Ethernet card** and **EtherTalk®** 2.0 software must be installed in your Macintosh if you want to connect to an **Ethernet** environment.

You also need a network-based connection tool that supports the required network protocol. You may need to install additional software resources that allow you to use certain network-based connection tools. For complete details on the software and hardware requirements for a particular tool, see the documentation that accompanies the tool. For instructions on installing PATHWORKS™ for Macintosh, see the *Installation* part of the *Network Services User's Guide*.

About direct connections

If you're attaching your Macintosh computer directly to another computer, you need special cables designed for that purpose. For example, you can purchase special cables for a direct Macintosh-to-Macintosh or Macintosh-to-VAX hookup. Consult your authorized Apple dealer or a data communications specialist for help determining what cables you need. Appendix C shows the pin assignments for the Macintosh modem and printer **ports** to which the cables attach.

About modems

The modems that you can use with MacTerminal depend on the connection tool that you are using for the communications session. The Apple Modem Connection Tool included with MacTerminal is designed to work with all Apple and Hayes modems, as well as with most Hayes-compatible modems. Alternatively, you can use the Serial Connection Tool with just about any type of modem. (However, with other types of modems, you'll have to enter commands to the modem manually.)

What's different about your new MacTerminal application?

If you're already an experienced MacTerminal user, you may notice that the **menus, commands,** and **dialog boxes** in your new MacTerminal application are quite different from those in previous versions of MacTerminal. In fact, you won't be able to use MacTerminal 3.0 to **open** session documents created with earlier versions of MacTerminal. But, as you begin to use this new version of MacTerminal, you'll discover that you're able to accomplish most of the same things that you could with previous versions of MacTerminal—and you'll find that your new MacTerminal application offers some very beneficial additional features.

Expandable communications environment

MacTerminal now offers an expandable communications environment. Because MacTerminal uses the Macintosh Communications Toolbox, you'll be able to add new communications tools as they become available from Apple, Digital, and from other companies.

Contact Apple Computer's Developer Tools Express service to order additional communications tools from Apple and other companies. Call these numbers to place orders:

(800) 282-2731 (in U.S.A.)
(800) 637-0029 (in Canada)
(408) 562-3910 (International)

Previous versions of MacTerminal provided TTY, VT102, and IBM 3278 terminal emulation. Your new MacTerminal application offers VT320 terminal emulation in addition to TTY and VT102. However, this MacTerminal package does not include a communications tool specifically designed for IBM 3278 emulation; you should contact your authorized Apple dealer for products that enable your Macintosh to emulate IBM terminals.

Support of multiple connections

With your new MacTerminal application, you can open more than one session document at once, so you can establish multiple connections at the same time; for example, you can access information from a BBS over one connection while you are sending a file to a host computer over another connection.

The number of session documents that can be open at the same time is determined by the amount of memory available to MacTerminal and the communications tools, as well as by the memory requirements of the communications tools being used by the session documents. The number of connections you can establish at the same time depends on the connection tools that you are using and the hardware constraints of your system.

2 About Using MacTerminal

This chapter covers general information about how MacTerminal works. Even if you've used MacTerminal before, you may want to read through this chapter because some of the user interface elements are different in your new MacTerminal application (the **user interface** is the part of the MacTerminal program that you interact with: the commands, screens, dialog boxes, and so on).

This chapter begins by introducing you to the user interface for MacTerminal. It describes the session document and explains how to work within a session document. In addition, this section provides information about the MacTerminal command menus and explains how using MacTerminal affects the Macintosh keyboard.

This chapter concludes with an overview of the steps you follow during a MacTerminal communications session; the individual steps are covered in detail in Chapters 3, 4, and 5.

The MacTerminal user interface

This section explains some of the basics you need to be familiar with while using MacTerminal. If you have used other applications on your Macintosh computer, you will already be familiar with most of the elements in the MacTerminal user interface. The work surface on your screen is known as the desktop, and session documents are presented within **windows** on the **desktop.** You perform actions by moving objects on the screen, by choosing commands from the menus, or by manipulating controls, such as **check boxes** and **scroll bars.** While you are using MacTerminal, you may encounter dialog boxes that require you to respond by selecting a button. In addition, MacTerminal may display alert boxes to notify you of special situations. If you are unfamiliar with any of these user interface elements, you should refer to the manuals that came with your Macintosh computer.
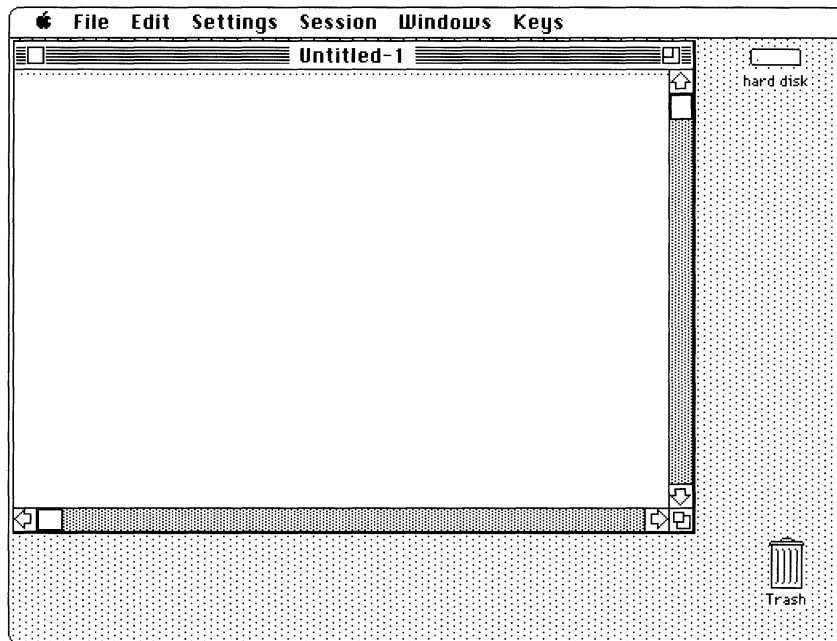
About the session document

While you're using MacTerminal, you work within a session document. A MacTerminal session document is like the documents of other Macintosh applications: you can open it, move it and resize it, name it, and **save** it on a disk. But a MacTerminal session document differs in a significant way; it lets you set up communications with another computer, in addition to providing a display area in which you see and work with incoming and outgoing data. Each session document accommodates one connection to another computer.

A session document has a set of communications tools associated with it: at a minimum, a connection tool and a terminal emulation tool; and generally, also a file transfer tool. After you open a session document, you may use the **default** communications tools and their settings or use the commands in the Settings menu to select and configure the tools to use during the session.

With MacTerminal, you can have more than one session document open at a time. The number of session documents that you can have open at the same time is limited only by the amount of memory available to MacTerminal and the tools used by the open session documents. See the modules in the *Communications Tools Reference* for estimates of the memory requirements for each of the tools included with MacTerminal. (Regardless of the number of session documents you are able to open at once, the actual number of simultaneous connections that you can establish depends on the connection tools you are using and the hardware constraints of your system.)

During the communications session, the data you are entering into the session document and any data arriving from the other computer appears in the **terminal region** of the session document window. As the terminal region fills up with data, the lines from past communications roll off the top of the screen. When the Save Lines Off Top command in the Session menu is activated, these lines are stored in the **scrollback cache region** of the window, as well as in a disk copy of the session document. To view the past communications, you use the vertical scroll bar; the terminal region appears below the dotted line and the scrollback cache region appears above, as shown in the following sample.

Key	Code (decimal)	Code (hex)	Abbreviation	Name
H	72	$48	Uppercase H	
I	73	$49	Uppercase I	
J	74	$4A	Uppercase J	
n	Table E-1	ASCII character chart (continued)		
Key	Code (decimal)	Code (hex)	Abbreviation	Name
K	75	$4B	Uppercase K	
L	76	$4C	Uppercase L	
M	77	$4D	Uppercase M	
N	78	$4E	Uppercase N	
O	79	$4F	Uppercase O	
P	80	$50	Uppercase P	
Q	81	$51	Uppercase Q	
R	82	$52	Uppercase R	
S	83	$53	Uppercase S	
T	84	$54	Uppercase T	
U	85	$55	Uppercase U	

Scrollback cache region

Terminal region

When you save the session document, its setup, including the settings chosen for the communications tools, is stored in a disk copy of the session document. If the Save Lines Off Top command was activated during the session, any communications that transpired while the command was activated are also saved in the session document on disk. If the Save Lines Off Top command was activated during the entire communications session, the saved session document can serve as a historical log of the interaction between your Macintosh and the other computer.

Terminal region

The terminal region, the part of the session document below the dotted line, is controlled by the terminal emulation tool that is being used for the session. The number of characters that can be displayed in the terminal region depends on the settings for the terminal emulation tool; 24 lines of 80 characters is a common setting. If the terminal emulation tool you are using supports graphics, graphics can be displayed in the terminal region.

When you **paste** text into the session document, the text is displayed in the terminal region as if you had typed it in. If you are communicating with a remote computer, the pasted text is sent to the other computer, just as if you had typed in the data from the keyboard.

Scrollback cache region

The scrollback cache region, the part of the window above the dotted line, contains lines of text that have scrolled off the top of the terminal region and are being stored in the disk copy of the session document. If the Save Lines Off Top command is activated, when you use the Clear Screen command from the Session Menu or when you close the session document, any data in the terminal region is moved into the scrollback cache and stored in the disk copy.

The number of lines in the scrollback cache region is limited by the amount of available disk space, as well as by the settings of the Saved Lines command in the Settings menu. You can specify that you want to save as much data in the scrollback cache as the disk containing the session document can accommodate or that you want to save a maximum amount of data, such as 100K.

Only text can be stored (and displayed) in the scrollback cache region; MacTerminal ignores anything **scrolling** off the top of the terminal region that is not text, such as graphics.

Selections

The MacTerminal session document supports the standard Macintosh functions of selecting, copying, and printing. As with other Macintosh applications, you can use your mouse and the keys on your keyboard to select portions of the data in the window to be copied to the **Clipboard** (or to be printed). You can select and copy (or print) data from both the terminal region and the scrollback cache region of the session document. You can also select data from both regions at once, by **dragging** the I-beam over the dotted line that separates the regions.

◆ **Note** When you are working in a session document, you can copy selections; however, you cannot **cut** or clear selections. Therefore, if you activate Save Lines Off Top when you open the session document and leave it activated until you close the document, the session document will serve as a log of the communications session. ◆

With MacTerminal, you can select data in the standard Macintosh manner, by **clicking** and dragging your mouse. To extend the selection in either direction, hold down the **Shift key** while clicking at the point to which you want to extend the selection. Standard selections are typically irregularly shaped, as shown in the following example.

```
┌─▤▤▤▤▤▤▤▤▤▤▤▤▤▤ UAX Connection ▤▤▤▤▤▤▤▤▤▤▤▤▤─┐
│ apple.com: xmodem                                  ⇧ │
│ XMODEM Version 3.2 -- UNIX-CP/M Remote File Transfer Facility │
│                                                      │
│ Usage:                                               │
│          xmodem -[rb!rt!sb!st][options] filename    │
│ Major Commands --                                    │
│          rb <-- Receive Binary                       │
│          rt <-- Receive Text                         │
│          sb <-- Send Binary                          │
│          st <-- Send Text                            │
│                                                      │
│                                                      │
│ Options --                                           │
│       Y   <-- Use YMODEM Batch Mode on transmit      │
│       B   <-- Use MODEM7 Batch Mode on transmit      │
│       K   <-- Use 1K packets on transmit             │
│       c   <-- Select CRC mode on receive             │
│       d   <-- Delete xmodem.log file before starting │
│       l   <-- (ell) Turn OFF Log File Entries        │
│       x   <-- Include copious debugging information in log file │
│ apple.com:                                           │
│                                                    ⇩ │
└─────────────────────────────────────────────────────┘
```

Click here ──

Drag to here ──

In addition to standard selection, with MacTerminal you can use a rectangular selection technique. One case where you might find rectangular selection useful is when you want to select only a part of a table, rather than the entire table, as shown in the following example. You make rectangular selections by holding down the **Command** (⌘) **key** while dragging your mouse.

Command-click here

Drag to here

Key	Code (decimal)	Code (hex)	Abbreviation	Name
Control-space	0	$00	NUL	Null
Control-a	1	$01	SOH	Start of header
Control-b	2	$02	STX	Start of text
Control-c	3	$03	ETX	End of text
Control-d	4	$04	EOT	End of transmission
Control-e	5	$05	ENQ	Enquiry
Control-f	6	$06	ACK	Acknowledgment
Control-g	7	$07	BELL	Bell
Control-h	8	$08	BS	Backspace
Control-i	9	$09	HT	Horizontal tab
Control-j	10	$0A	LF	Line feed
Control-k	11	$0B	VT	Vertical tab
Control-l	12	$0C	FF	Form feed
Control-m	13	$0D	CR	Carriage return
Control-n	14	$0E	SO	Shift out
Control-o	15	$0F	SI	Shift in
Control-p	16	$10	DLE	Data link escape

A selection is removed whenever you click the mouse outside of the selection, type a character, or paste something into the session document. The selection is also removed when text scrolls into the scrollback cache region or when you change to a different terminal emulation tool.

Resizing and arranging session document windows

As with other Macintosh documents, you can use the **zoom box** in the upper-right corner on the session document to resize the document window. With MacTerminal, the following zooming options are available:

While clicking the zoom box	*Result*
Don't press any keys	Zoom to the width of the terminal (as specified by the terminal emulation tool) and the height of the screen
Press the ⌘ key	Zoom to the size of the terminal (as specified by the terminal emulation tool)
Press the Option key	Zoom to the minimum window size
Press the ⌘ and Option keys	Zoom to the width specified for the scrollback cache region and the height of the monitor

MacTerminal gives you two choices for automatically arranging session documents on the desktop. The documents can be stacked on top of each other (in typical Macintosh fashion) or they can be laid out next to each other like tiles. See the descriptions of the Stack Windows and Tile Windows commands in Chapter 6, "Commands Reference," for more information about these options.

About the command menus

The MacTerminal **menu bar** contains the six menus shown in this sample.

```
  🍎  File   Edit   Settings   Session   Windows
```
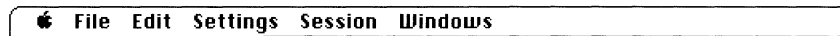
In some cases, the MacTerminal menu bar may also include menus that a particular communications tool supplies. For example, when you are using the VT102 Terminal Emulation Tool or the VT320 Terminal Emulation Tool, a **Keys menu** is added to the menu bar.

The File and Edit menus contain the standard commands for managing and editing documents that most Macintosh applications use. However, MacTerminal uses some of the standard commands in unique ways. For instance, since MacTerminal is designed so that you can keep a record of the communications conversation that occurs during the session, you can't cut data from a MacTerminal session document; therefore, the Cut command in the Edit menu is active only with **desk accessories** (like **Scrapbook**) that support cutting selections. The Settings and Session menus contain commands specific to MacTerminal. The Windows menu contains commands for arranging session documents on the desktop; in addition, the names of open session documents are added to the Windows menu, so you can use the menu to move quickly from one session document to another.

Any command that requires additional information from you appears with ellipses marks (...) after it. When you choose one of these commands, a dialog box appears with a message or with areas for you to enter information and select options. To confirm the command, you click a button, such as OK or Save, or press the Return key. Clicking the **Cancel button** retracts the command and leaves the options as they were when you chose the command.

Commands or their options are **dimmed** to show that they are unavailable whenever using them would be inappropriate. For example, the Close command is dimmed if no window is open on the desktop. Commands in the Settings and Session menus are only available when a session document is the top-most window; and when you choose a command from one of these menus, the command affects only the session document in the top-most window.

About the Macintosh keyboard

The effect of MacTerminal on your Macintosh keyboard varies slightly depending on the kind of keyboard you have. The type of Macintosh computer you are using determines the kind of keyboard you have. If you are using a Macintosh Plus, you have a **Macintosh Plus keyboard.** If you are using a Macintosh Portable or a computer in the Macintosh SE or Macintosh II families, you have one of the **Apple Desktop Bus™ (ADB) keyboards** (there are several varieties of these).

With an ADB keyboard, you can generate many of the commands on the MacTerminal menus by pressing the ⌘-key equivalents that appear to the right of the command names in the menus. For example, you can open an existing session document either by choosing Open from the File menu or by holding down the ⌘ key and pressing the O. However, since Macintosh Plus keyboards do not include a **Control key,** which is used during communications, its ⌘ key functions as a Control key and is not used to generate ⌘-key equivalents.

Special characters

Special **characters** and sequences of keystrokes are often used during communications to control various functions, for example, to break the connection or temporarily halt transmission (stop scrolling) and then to resume transmission.

You send a **control character** by holding down the Control key on ADB keyboards (or the ⌘ key on Macintosh Plus keyboards) while you press the other character. For example, if an information service requires that you use Control-C to log off, hold down the Control key (or the ⌘ key) and press the letter *C.* You send an **escape sequence** by pressing the **Escape key** and then pressing the other key. For example, Escape 1 means to press the Escape key, release it, and then press *1.* Appendix D lists the special characters and their ASCII equivalents.

Keyboard emulation

Some of the keys that appear on the keyboards for the terminals being emulated are not included on all Macintosh keyboards. For example, Function keys that are available on VT320 keyboards are not available on Macintosh Plus keyboards, so the Function keys must be emulated in some other manner. The terminal emulation tools included with MacTerminal provide equivalents for most terminal keys for which there are no corresponding keys on the Macintosh keyboards.

In some cases, the terminal emulation tools provide special graphics menus from which you can simulate keys that do not have physical counterparts on your Macintosh keyboard. With the VT102 Terminal Emulation Tool and the VT320 Terminal Emulation Tool, the graphics menu, known as a *screen keypad,* is accessible from a Keys menu that the tool adds to the MacTerminal menu bar.

In addition, some terminal emulation tools have mapped the keys on the Macintosh keyboard to those on the keyboards being emulated, so that by pressing a particular key or combination of keys on your Macintosh keyboard, you can simulate a particular key that is not available on the Macintosh keyboard. If you are using the VT102 Terminal Emulation Tool or the VT320 Terminal Emulation Tool, you should be aware of the following keyboard changes:

- On ADB keyboards
  □ The Shift-**Enter key** combination functions as a **Break key.**
  □ The function of the **Delete key** depends on how you set the tool's Swap Backspace and Delete option.

- On Macintosh Plus keyboards
  □ The ⌘ key functions as the Control key (and cannot be used to generate ⌘-key equivalents).
  □ The tilde/quotation mark (~/`) key functions as an Escape key. You can still generate the accent grave (`) by pressing the ⌘ key along with the tilde/quotation mark key and the tilde (~) by pressing the ⌘ and Shift keys with the tilde/quotation mark key.
  □ The Shift-Enter key combination functions as a Break key.
  □ The function of the **Backspace key** depends on how you set the tool's Swap Backspace and Delete option.

For additional information about how terminal keys are emulated with the VT102 Terminal Emulation Tool and the VT320 Terminal Emulation Tool, see the modules on these tools in the *Communications Tools Reference.* In addition, at the back of this binder, you'll find Quick Reference Cards that summarize keyboard emulation for both of these tools.

The communications session

Now that you are more familiar with the MacTerminal user interface, there are some things you should know about a MacTerminal communications session. The rest of this chapter provides an overview of a MacTerminal communications session. Here's a summary of the steps you'll follow during a communications session:

1. Open a session document and set its communications parameters to match those of the other computer. If you use one of the sample session documents provided on the PATHWORKS V1.0 **volume,** most of this step is taken care of for you.

2. Connect to the other computer.
   □ Open a connection; or, prepare your Macintosh to wait for an open-connection request from another computer.
   □ Log in (if you are communicating with a host computer).

3. Exchange information with the other computer.
   □ Send data to the other computer.
   □ Receive data from the other computer.
   □ Leave or pick up mail messages.
   □ Use the other computer's application.

4. Break the connection.

Opening and setting up a session document

When you open the MacTerminal 3.0 folder, you see the MacTerminal 3.0 application, Terminal Fonts folder, and MacTerminal Examples folder. The MacTerminal Examples folder contains six sample session documents, as shown in the following figure.
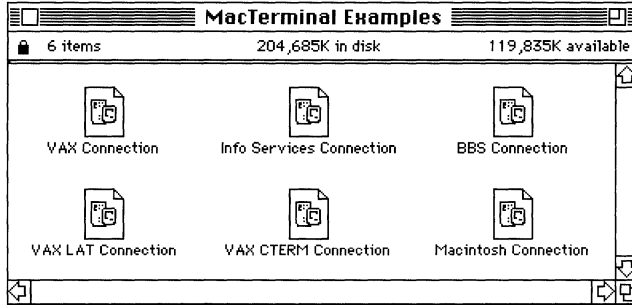
■ **To start MacTerminal, select the MacTerminal icon (or any of the MacTerminal sample session documents) and choose Open from the File menu (or double-click the icon). The new session document appears on your desktop.**

If you open the MacTerminal icon, the new untitled session document should use the Apple Modem Connection Tool, the VT102 Terminal Emulation Tool, and the XMODEM File Transfer Tool. If any of these tools are missing, MacTerminal will use another tool in the same category (see the New command in Chapter 6, "Commands Reference," for an explanation of how MacTerminal chooses another tool). If you open one of the sample session documents, they will be set up as follows:
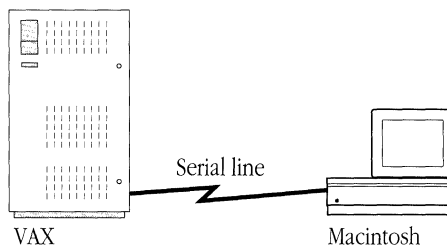
VAX Connection: This session document is preset to communicate with a VAX computer over a serial line It uses the default settings for the Serial Connection Tool (with the **XON/XOFF** option selected), the VT320 Terminal Emulation Tool, and the Text File Transfer Tool.

Host computer   Macintosh
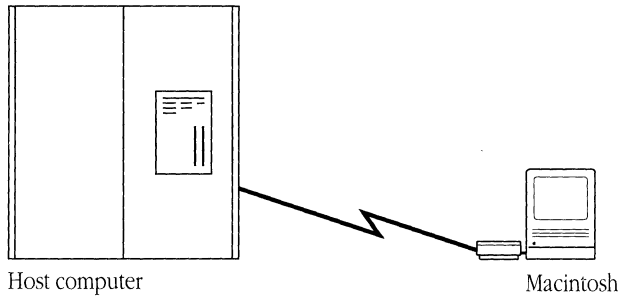
Info Services Connection: This session document is set up to communicate with most commercial **information services,** such as CompuServe and Dow Jones News/Retrieval. It uses the default settings for the Apple Modem Connection Tool, the VT102 Terminal Emulation Tool, and the XMODEM File Transfer Tool. You can contact many large national and international **on-line** information services using MacTerminal. The offerings of these services are powerful and diverse. By communicating with services like CompuServe, Dow Jones News/Retrieval, or Dialog Information Services, Inc., you can accomplish all kinds of things. You can research a topic in extensive databases; monitor your stock portfolio; track competitors, industries, and products; or shop for just about anything from clothes to cars without leaving your keyboard. Of course, these information services are not free. In most cases, you'll need to contact them directly to set up an account before you can begin to use their services; however, some services, GEnie and Delphi for example, offer on-line sign-up. If you're interested in what on-line information services provide, the time and money it takes to set up and use your accounts are well spent. Appendix B provides a list of on-line information services, as well as a list of recommended books about on-line services.

◆ **Note** Some information services, for example GEnie, require different settings from those set up for this session document. You can still access these services with MacTerminal; but first you need to find out the required settings and then use the commands in the Settings menu to change the configuration of your session document accordingly. ◆

BBS   Macintosh
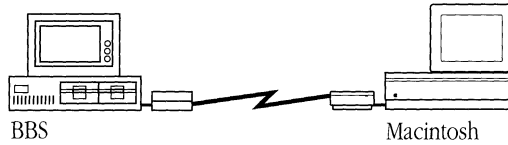
BBS Connection: This session document is set up to communicate with most Bulletin Board Systems (BBSs) using the default settings for the Apple Modem Connection Tool, the TTY Terminal Emulation Tool, and the XMODEM File Transfer Tool. A BBS is a computer that has been set up to act as a central connection point for computer owners who share similar interests or needs, both related and unrelated to computers. A sample of things you might find on local BBSs includes entertainment programs, **public domain software** that you can **download** (receive as a file) and use on your Macintosh, information databases, social bulletin boards where you can meet people with interests similar to yours, forums for ongoing discussions about current issues and events, and local computer user groups that you can contact for information on how to get the most out of your Macintosh computer. To find out how to get in touch with bulletin boards in your area, or to spread the word about a bulletin board that you are setting up, contact your local Apple user group. Ask your authorized Apple dealer for the name of the Apple user group nearest you or call (800) 538-9696. Lists of BBSs also appear in a variety of local and national computer-oriented publications.

VAX

Macintosh
on Ethernet
using LAT

Ethernet
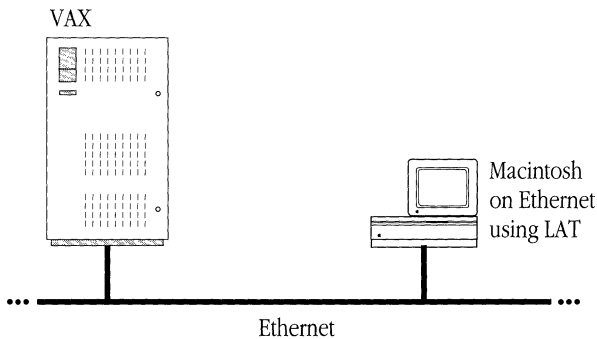
VAX LAT Connection: This session document is preset to communicate with a VAX computer using the LAT protocol. It uses the LAT Connection Tool, the VT320 Terminal Emulation Tool, and the Text File Transfer Tool. No service is selected for the LAT Connection Tool. In order to use this session document, you must specify a LAT service. The default settings are used for the VT320 Terminal Emulation Tool and the Text File Transfer Tool.

VAX — Macintosh on LocalTalk using CTERM — LocalTalk — Router — Ethernet
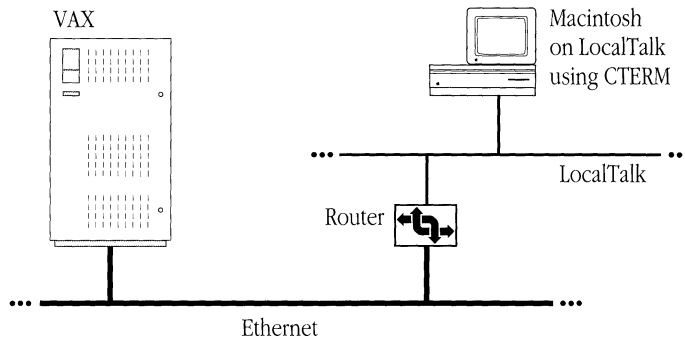
VAX CTERM Connection: This session document is preset to communicate with a VAX computer over DECnet. It uses the CTERM Connection Tool, the VT320 Terminal Emulation Tool, and the XMODEM File Transfer Tool. The CTERM Connection Tool is set to connect to a node named NODEXX. In order to use this session document, you must change the node name (NODEXX) to the name of the system to which you want to connect. The default settings are used for the VT320 Terminal Emulation Tool and the XMODEM File Transfer Tool.

Macintosh — Macintosh
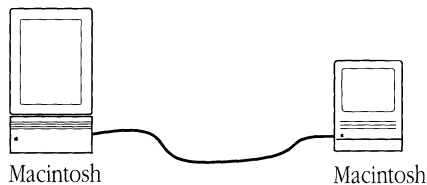
Macintosh Connection: This session document is preset to communicate with another Macintosh computer to which your Macintosh is directly connected. It uses the default settings for the Serial Connection Tool (with the **Baud Rate** option set to 19,200), the TTY Terminal Emulation Tool (with the **Local Echo, Auto Wrap,** and New Line on a Return options selected), and the XMODEM File Transfer Tool (with the Enable Auto Receive option selected). In addition to using this session document for communicating with other Macintosh computers, you may find that you can use it to communicate with another type of personal computer that is directly connected to your Macintosh, provided the other computer has compatible communications capabilities.

Changing settings

Once you've opened the session document, you use the commands in the Settings menu to set up the session document for the communications environment you need. Chapter 3, "Setting Up a Session Document," contains detailed instructions for changing settings.

It is important that your Macintosh and the other computer both use the same settings for the communications parameters. For example, if you want to send a file to a coworker who has an Apple IIe or to your company's VAX computer, you need to know the communications parameters for these computers so you can set up your session document accordingly. This information should be included in the documentation for any host or information service you are accessing. You may also be able to get the information from your system administrator or from the system administrator or customer service representative for the system you will be accessing. If you can't find out what the communications parameters are, use the preset ones for a new document and see what happens when you start communicating with the other computer. If you encounter problems, turn to Chapter 7, "Troubleshooting," and try the possible solutions.

When you choose the Connection, Terminal, or File Transfer commands from the Settings menu, a **settings dialog box** appears. The setup options within the dialog box vary depending on which communications tool is currently selected. In the example below, you see the settings dialog box for the Apple Modem Connection Tool.
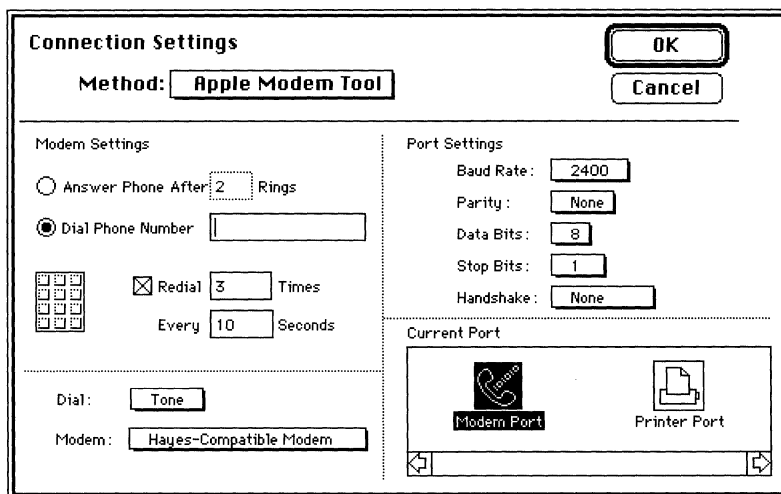
You don't need to know what each setup option means in order to set up your session document. But, if you have questions about specific options, you'll find detailed descriptions of each of the options in the tool modules in the *Communications Tools Reference.*

Using pop-up menus

Some of the settings dialog boxes include **pop-up menus.** A pop-up menu is a menu that isn't in the menu bar, but appears somewhere else on the screen (usually in a dialog box) when you click a particular place. You can usually identify a pop-up menu by the shadow box around the text. See the example below.

Pop-up menu ————

File Transfer Settings

Protocol: Text Tool

When Sending Text ...

Timing

Delay Per Character :
(60ths of Second)

Delay Per Line :
(60ths of Second)

OK

Cancel

Line Endings

CR
End Lines With :   ● LF
CR & LF

☐ Wrap Lines at Column : 80

0

0

Pop-up menu as
pointer is dragged
through it
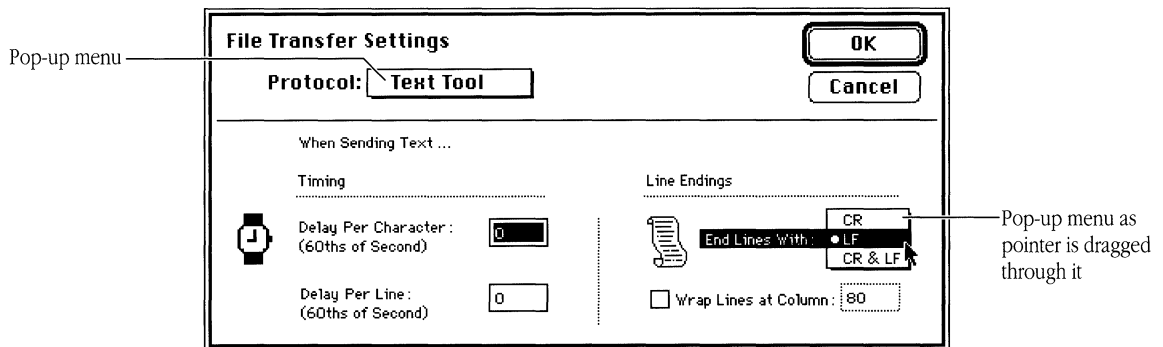
Pop-up menus are used for choosing from lists of related items. When you click the box for the pop-up menu, the menu appears, with the current value—bulleted, or checked, and highlighted—under the pointer. The pop-up menu acts like other menus: you can move around in it and choose another item, which then appears in the box, or you can move outside it to leave the current value active.

Saving the settings for the session document

Once you've set up your session document so you can communicate with a particular computer, you may want to name the document and save the settings. MacTerminal stores the saved document on the disk, and a session document appears in the **Finder**™. Each time you want to connect to the computer the session document was set up to access—for example, whenever you want to call the Dow Jones News/Retrieval service to find out how your stock is doing—you'll be able to open the document with the

proper settings and access number. Chapter 3, "Setting Up a Session Document," provides instructions for saving the session document.

Summary of steps for setting up a session document

Here's a summary of the steps to follow when setting up a new session document:

1. Open a new session document.
2. Use the commands in the Settings menu to configure your session document.
   □ Choose the Connection command to change the connection method.
   □ Choose the Terminal command to change the setup options for terminal emulation.
   □ When you will be sending or receiving files, choose the File Transfer command to change the file transfer protocol and choose the Folder for Received Files command to select the folder where you want to store incoming files.
   □ When you will be pasting the contents of the Clipboard into the session document, choose Paste Options if you need to set **transmission delays.**
   □ If you want MacTerminal to attempt to automatically establish a connection to the other computer whenever you open the session document, choose the Connect On Open command.
3. Determine whether you want to save incoming data. A new MacTerminal session document is preset to save incoming data; the Save Lines Off Top command in the Session menu is checked indicating that it is activated.
   □ If you don't want to save incoming data, choose the checked Save Lines Off Top command; this deactivates the command.
   □ If you want to save incoming data, leave the Save Lines Off Top command checked. Choose the Saved Lines command from the Settings menu to set the options for saving lines.
4. Save the settings before starting a communications session.
   □ Use Save or the Save As command from the File menu.

Connecting to the other computer

Once your session document is set up for the communications environment you will be using, you're ready to connect to the other computer and start a communications session. The next few sections discuss how to establish a connection with another computer. These sections provide an overview of the process; you'll find step-by-step instructions for using MacTerminal to establish a connection in Chapter 4, "Communicating With Another Computer." If you are connecting to a host computer, you may also need to refer to the documentation on the host computer or contact the system administrator or customer representative for connection instructions specific to the host system.

Opening a connection

If your Macintosh is directly connected to the other computer and is set to communicate with it, you can start sending and receiving information at any time by choosing the Open Connection command from the Session menu. When you are connecting over a local network, after you choose Open Connection, you may have to wait a few seconds for the connection to be established.

If you're using a modem, you start a session by turning on the modem and then choosing Open Connection. If you are using a modem connection tool, you may have entered an **access number**—the phone number of the computer to which you want to connect—when you set up the session document. If not, when you choose Open Connection, the modem connection tool you are using may prompt you to enter an access number. Once the access number is entered, the modem dials the other computer.

If you are connecting through a modem but are using a connection tool that is not specifically designed to work with modems (for example, the Serial Connection Tool), after turning on the modem and choosing Open Connection, you'll need to manually enter the commands that direct the modem to dial the access number of the other computer.

◆ **Note** The steps you take before and after you choose the Open Connection command may vary depending on the type of phone system in use within your company, so you may need to contact your company's **telecommunications** representative for specific instructions. ◆

With some connection tools, instead of opening the connection yourself, you can set up your Macintosh to wait for another computer to open the connection. If you are using the Apple Modem Connection Tool, when you are expecting to receive a call from another computer, use the Connection command on the Settings menu to make sure your connection settings match those of the other computer and to specify the number of times the modem should ring before the call is answered. Then, turn the modem on and choose the Wait for Connection command from the Session menu. When the call comes in, the modem answers the call, and MacTerminal confirms the connection. Usually, you'll type something to let the other computer know you're there and to indicate that you're ready to exchange information.

What happens after you open the connection?

Once the connection is open, your next steps depend on whether you're connected directly to another computer or are accessing the other computer through a phone or other network system, as well as on the computer to which you are connecting. What appears in the terminal region of your session document at this point also depends on these factors.
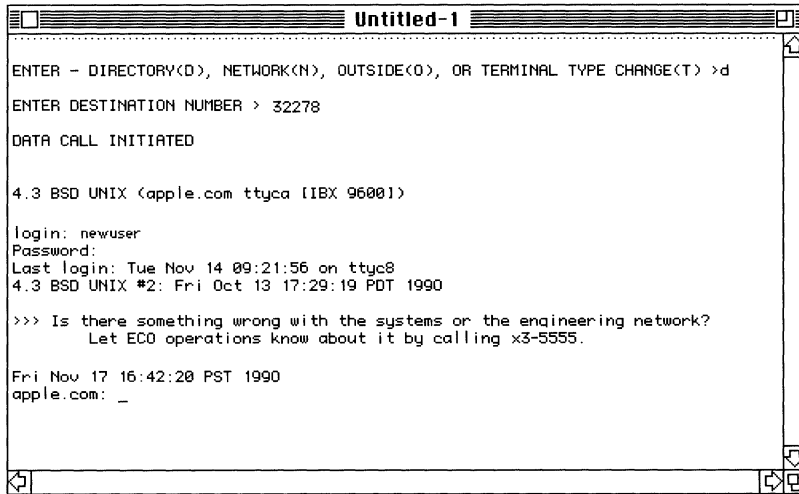
If you connected directly to another personal computer, once you choose the Open Connection command, you can immediately start exchanging information. In this case, you probably won't see any changes in the terminal region of your session document, but when you start typing, the characters you type will be sent to the other computer and anything entered by the person at the other computer will appear within the terminal region of your session document.

If you are connecting through a network (either a local hard-wired network, a local phone system, a public telephone network, or any combination of these), what appears in the terminal region of your session document after you choose Open Connection depends on the connection tool you are using and the network you are accessing. Most likely the network will ask you to enter additional information so that it can route you to the computer you want to communicate with. The queries are usually in the form of a **prompt**—an abbreviated question.

When you connect to a host computer, you have to complete a series of steps defined by the host computer to identify yourself—a procedure called **logging in**—before you can read data, work in an application, or send and receive files. Most host computers prompt you for your user name (or account number) and the password you received when you opened an account with the system. Some ask you to identify your terminal.

All the proper responses to these prompts should be in the host computer's user's manual. Except for the password, you see your responses on the screen; to protect the privacy of your account, the other computer usually doesn't **echo** back the password.

In the following sample, the *d* and the number *32278* are responses to the network prompts. The user name is *newuser* and, as you can see, the password is not displayed.

```
≣□≣═══════════════════ Untitled-1 ≣═══════════════════□≣
................................................................................
ENTER - DIRECTORY<D>, NETWORK<N>, OUTSIDE<O>, OR TERMINAL TYPE CHANGE<T> >d

ENTER DESTINATION NUMBER > 32278

DATA CALL INITIATED


4.3 BSD UNIX <apple.com ttyca [IBX 9600]>

login: newuser
Password:
Last login: Tue Nov 14 09:21:56 on ttyc8
4.3 BSD UNIX #2: Fri Oct 13 17:29:19 PDT 1990

>>> Is there something wrong with the systems or the engineering network?
      Let ECO operations know about it by calling x3-5555.

Fri Nov 17 16:42:20 PST 1990
apple.com: _
```

Log-in procedures may be very precise. In some cases, if you type a space where one is not indicated or use a lowercase letter when uppercase is called for, the host computer won't accept your entry. Instead, the host computer typically sends you a message telling you to try again or get help. When you have trouble logging in, contact the system administrator or customer service representative for the system you are trying to access.

Exchanging information with the other computer

You can start sending and receiving messages and files immediately when you're communicating with another personal computer. When you've successfully logged in, most host computers welcome you in some way and present you with a system prompt; you communicate with the host by entering commands that the host recognizes.

When you are communicating with a commercial information service, it's a little more complicated. Commercial information services typically display a main menu of options available on the system. When you choose an option by typing its number or command,

you often get another menu of choices within that main topic. This is a very common way for information services to guide you through available databases, applications, and communications networks. Using the service's on-line menus, you may look up some statistics, arrange an airline flight, check the facts on a new invention, or leave a message for a friend. Or, you may participate in a conference, respond to questions posted on an electronic bulletin board, or buy stock.

Using the other computer's application

In addition to databases, bulletin board services, and communications networks, many large systems have applications for you to use, for example, word processing or spreadsheet applications. If you choose to work in one of these applications, you'll probably want to use a terminal emulation tool that offers a variety of features, like the VT102 Terminal Emulation Tool or the VT320 Terminal Emulation Tool (these tools let the host application **highlight** text and enable you to position the **cursor** anywhere in the terminal region while you are using the host's application).

Some host computers have applications that use a full screen of data at a time. Text editors are the most common full-screen applications. If you're using a full-screen application, read "Saving Session Data" in Chapter 5, "Handling Session Data."

Sending data to the other computer

You can send data to the other computer by three means:

- Typing with your keyboard. Once you're connected, everything you type during the communications session is sent to the other computer.
- Pasting the contents of the Clipboard into the terminal region. The pasted text is sent to the other computer just as though it had been typed on the keyboard.
- Using the Send File command in the Session menu to send an entire file to the other computer.

When you are sending pasted text, you may need to set transmission delays (with the Paste Options command from the Settings menu) to ensure that the data is not transmitted faster than the other computer can receive it.

When you are sending a file to another computer, you usually have to prepare the other computer to receive the file by typing whatever command the computer recognizes

as telling it to prepare to receive the specified file. Then, you choose Send File from the Session menu and a dialog box appears that lets you select and send the file. Whenever you transfer a file, you should make sure that you and the other computer are both using the same file transfer protocol with compatible settings. If this file transfer is not successful, check that your file transfer settings are compatible (choose File Transfer from the Settings menu to confirm or change these settings).

◆ **Note** When you are sending files with the Text File Transfer Tool, you don't have to be concerned with matching protocol settings. Instead, you need to make sure that you are running a program on the host that can capture the text coming from the Macintosh; for example, you may need to be in insert mode in a text editing program. ◆

For detailed instructions on sending files or on sending text by pasting it into your session document, see Chapter 4, "Communicating With Another Computer."

Receiving data from the other computer

You can receive data from the other computer by two means:

■ The program or user controlling the other computer sends messages to you, usually as a response to something you have entered. For example, if you enter a command requesting that a list of available applications be displayed, the other computer sends a list of the applications to you.

■ You can download a file from the other computer.

If you are connected to another personal computer, someone will have to initiate the file transfer from the other computer; if you are connected to a host computer, you usually have to request that the host sends a file by typing whatever command the host recognizes as telling it to send the specified file. Then, depending on the file transfer protocol you are using, you may also need to choose Receive File from the Session menu before the file transfer will begin.

◆ **Note** The file transfer tool you use must support file receipt; some tools, the Text File Transfer Tool, for example, only support sending files. ◆

Whenever you transfer a file, you must make sure that you and the other computer are both using the same file transfer protocol with compatible settings. If file transfer is not successful, check that your file transfer settings are compatible (choose File Transfer from the Settings menu to confirm or change these settings).

For detailed instructions on receiving files, see Chapter 4, "Communicating With Another Computer."

Breaking the connection

You end a communications session by choosing the Close Connection command from the Session menu to break the connection with the other computer.

If you've been communicating with a host computer, you should terminate a communications session by typing the remote computer's **log-out** command. Then, choose the Close Connection command from the Session menu. Most commercial host computers terminate the connection after a few minutes if there is no activity on your end, but by logging out before closing the connection you are assured that you aren't being charged for an **open connection** because the other computer did not receive a log-off command. See Chapter 4, "Communicating With Another Computer," for step-by-step instructions on breaking the connection.

After you break a connection, you can establish another connection, either to the same computer or to another computer, provided you have not closed your session document.

To close the current session document, choose Close from the File menu or click in the **Close box** at the top left of the document window. When you are through using MacTerminal, choose Quit from the File menu.

Where to go from here

Now that you are familiar with how to use MacTerminal, you're ready to begin communicating with other computers. Refer to Chapter 3, "Setting Up a Session Document," for help setting up your own session documents; Chapter 4, "Communicating With Another Computer," for the instructions on the tasks you'll perform during a communications session; and Chapter 5, "Handling Session Data," for help working with the data contained in a session document. Refer to Chapter 6, "Commands Reference," for detailed command descriptions. And, refer to the *Communications Tools Reference* for details on the communications tools included with MacTerminal.

3 Setting Up a Session Document

This chapter provides instructions for the tasks you perform when setting up a MacTerminal session document. You don't have to read this chapter in any particular order; each task is independent of the others. The chapter covers the following tasks:

- Opening a new session document

- Changing the connection method

- Changing the setup options for terminal emulation

- Changing the file transfer protocol

- Specifying the folder for storing incoming files

- Changing the options for saving incoming data

- Setting transmission delays for pasted text

- Setting the session document to connect upon opening

- Undoing settings

- Saving the settings for a session document

The commands mentioned in this chapter are fully explained in Chapter 6, "Commands Reference."

Opening a new session document

The MacTerminal application comes with six sample session documents that are already set up for you:

- VAX Connection document, which is preset for communicating with a VAX computer over a serial connection
- Info Services Connection document, which is preset for communicating with most public information services
- BBS Connection document, which is preset for communicating with bulletin board systems
- VAX LAT Connection document, which is preset for communicating with a VAX computer over a LAT connection
- VAX CTERM Connection document, which is preset for communicating with a VAX computer over a DECnet connection
- Macintosh Connection document, which is preset for communicating with another Macintosh computer over a serial connection

You can open a sample session document simply by selecting the document and choosing Open from the File menu (or by double-clicking the document from the Finder).

When none of the sample session documents meet your needs, you will want to set up your own session document. Start by opening a new untitled session document.

- **Select the MacTerminal icon and choose Open from the File menu (or double-click the MacTerminal icon).**

A new MacTerminal session document appears.
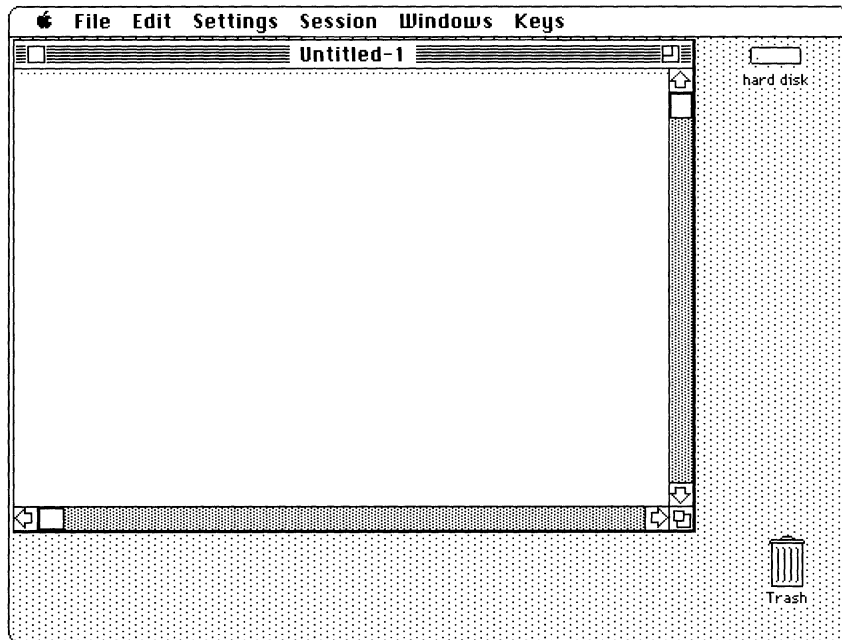
The new document is preset to communicate with most popular commercial information services using the following communications tools:

- Apple Modem Connection Tool
- VT102 Terminal Emulation Tool
- XMODEM File Transfer Tool

If any of these tools are not in the Communications Folder, MacTerminal uses another tool in the same category (see the New command in Chapter 6, "Commands Reference," for an explanation of how MacTerminal selects the alternate default tool).

With any session document, you can use the preset options or modify them. To change settings, choose the appropriate command from the Settings menu and select or deselect the options that appear in the dialog boxes presented by the command. Some features only have on and off options: click an unselected feature to turn it on; click a selected feature to turn it off. To confirm the settings in a dialog box, click the OK button (or to cancel, click the Cancel button).

Changing the connection method

To change the setup options for the type of connection that you will be establishing for the communications session, follow these steps:

1 Choose the Connection command from the Settings menu.

A Connection Settings dialog box appears.
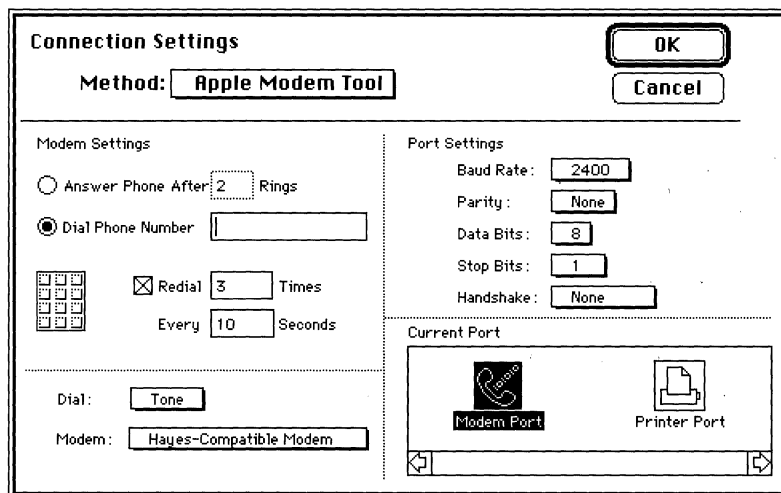
2 Change the options for the connection tool that is selected. Or, select a different connection tool from the Method pop-up menu and, if necessary, change the options for that tool.

For example:

■ If the tool you are using includes port settings, set these to match those of the computer with which you are communicating.

■ If you're using a modem and a connection tool that supports **automatic dialing** (like the Apple Modem Connection Tool), enter the access phone number and confirm that the other settings are compatible with the modem and phone system you are using.

- If you're using a connection tool that lets you access another computer through a local or wide area network, you'll probably enter a network identifier for the **destination computer** or pick the name of the computer from a list that is displayed by the connection tool.

If you need help determining how to set the options for the connection tool you will be using, refer to the documentation for that tool. The setup options for each of the connection tools included with MacTerminal are fully described in the *Communications Tools Reference.*

3 **Click OK when you are through changing the settings.**

Changing the setup options
for terminal emulation

To change the setup options for terminal emulation, follow these steps:

1 **Choose the Terminal command from the Settings menu.**

A Terminal Emulation Settings dialog box appears.
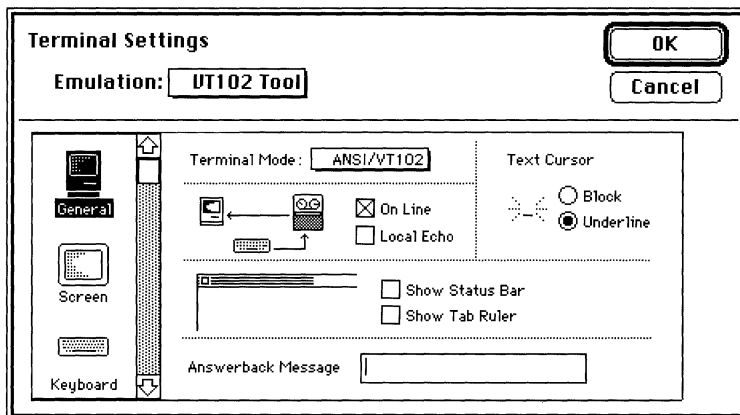
2 **Change the options for the terminal emulation tool that is selected. Or, select a different terminal emulation tool from the Emulation pop-up menu and then, if necessary, change the options for that tool.**

With some terminal emulation tools, for example, the VT102 Terminal Emulation Tool and VT320 Terminal Emulation Tool, you access various categories of setup options by selecting an icon from a scrolling list. For example, you select the keyboard icon to set keyboard-specific options. As shown in the following figure, a new group of setup options appears when you select the screen icon from the scrolling list in the VT102 settings dialog box.

```
┌─────────────────────────────────────────────────────────────────┐
│  Terminal Settings                              ┌──────────┐      │
│                                                 │    OK    │      │
│     Emulation: │ UT102 Tool│                    └──────────┘      │
│                                                 ┌──────────┐      │
│                                                 │  Cancel  │      │
│  ───────────────────────────────────────────────────────────     │
│   ┌─────┐ ⬆    Width : │ 80 Columns │       Scroll Text           │
│   │ ▦   │ ▓                                  ◉ Jump   ○ Smooth     │
│   │ ─── │ ▓    Size : │ 9 point │                                 │
│   General ▓                                                       │
│   ........ ▓    Characters              1 ─────────────── 80       │
│   ┌─────┐ ▓    ☐ Show Control Characters  This is a sample of UT  │
│   │▓▓▓▓▓│ ▓                                This is a sample of UT  │
│   │Screen ▓    ☐ Auto Wrap to Next Line    This is a sample of UT  │
│   └─────┘ ▓    ☐ Insert Characters         This is a sample of UT  │
│   ┌─────┐ ▓                                                       │
│   Keyboard ⬇  ☐ Origin at Scrolling Margin  ☐ Inverse Video       │
└─────────────────────────────────────────────────────────────────┘
```
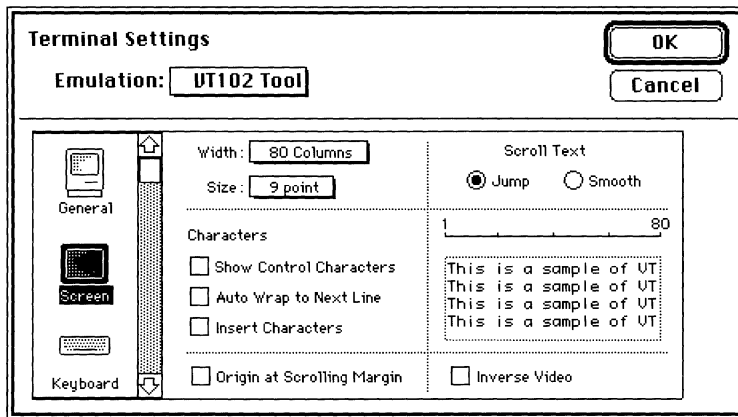
If you need help determining how to set up your terminal emulation tool for the communications environment that you are establishing, refer to the documentation for the host system that you are communicating with or contact the system administrator or customer service representative for the system you will be accessing. In addition, you can find detailed descriptions of the setup options for each of the tools included with MacTerminal in the *Communications Tools Reference*.

3 **Click OK when you are through changing the settings.**

Changing the file transfer protocol

A file transfer protocol represents an agreement between two computers about how they will exchange files of data. When you will be sending or receiving files during your communications session, you must use a file transfer protocol that is supported by the computer with which you are exchanging files.

To change the setup options for the file transfer tool, follow these steps:

1 **Choose the File Transfer command from the Settings menu.**

A File Transfer Settings dialog box appears.
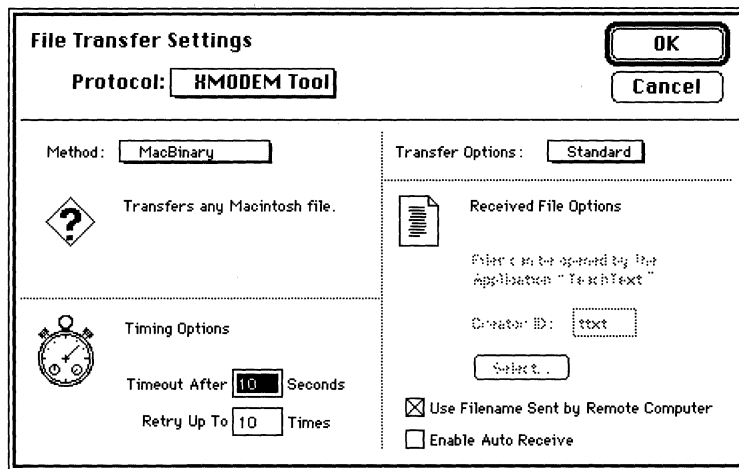
2 **Change the options for the file transfer tool that is selected. Or, select a different file transfer tool from the Protocol pop-up menu and then, if necessary, change the options for that tool.**

If you need help determining how to set the options for the type of file transfer that you will be performing, refer to the documentation for the tool you are using. The setup options for each of the tools included with MacTerminal are fully described in the *Communications Tools Reference.* The other computer must also support the file transfer protocol that you have chosen. Your system administrator or the system administrator or customer service representative for the host system you are communicating with may be able to help you determine what protocol and settings to use for file transfer. If you aren't able to determine in advance what setting to use, experiment with various settings until you are able to transfer files successfully.

3 **Click OK when you are through changing the settings.**

Specifying the folder
for storing incoming files

In addition to letting you choose a file transfer protocol and its associated settings, MacTerminal makes file receipt easier by letting you specify in advance the folder for storing incoming files.

Follow these steps to specify the folder where incoming files will be stored:

1 **Choose the Folder for Received Files command from the Settings menu.**

A dialog box appears that presents a list of the folders in the folder that was last specified with this command. If you have not previously specified a folder, you see a list of the folders in the folder that contains your session document.

```
┌─────────────────────────────────────────────────────┐
│  Select Default Folder for Received Files:           │
│       ┌─────────────────────────────┐                │
│       │   Select Current Folder     │                │
│       └─────────────────────────────┘                │
│          ┌─────────────────────┐                     │
│          │ 🖴 MacTerminal 3.0   │      ⊂⊃ hard disk   │
│          └─────────────────────┘                     │
│       ┌──────────────────────────┬─┐  ┌────────────┐ │
│       │ □ Connections           │⇧│  │   Eject    │ │
│       │ □ Incoming Files        │ │  └────────────┘ │
│       │ □ Memos                 │ │  ┌────────────┐ │
│       │ □ Outgoing Files        │ │  │   Drive    │ │
│       │                         │ │  └────────────┘ │
│       │                         │ │                 │
│       │                         │ │  ┌────────────┐ │
│       │                         │ │  │   Select   │ │
│       │                         │ │  └────────────┘ │
│       │                         │ │  ┌────────────┐ │
│       │                         │ │  │    Open    │ │
│       │                         │ │  └────────────┘ │
│       │                         │⇩│  ┌────────────┐ │
│       └──────────────────────────┴─┘  │   Cancel   │ │
│                                       └────────────┘ │
└─────────────────────────────────────────────────────┘
```
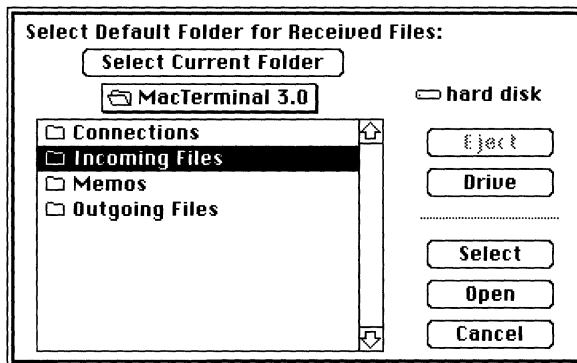
2 **If you want to direct incoming files to the folder whose contents are currently displayed, click the Select Current Folder button; otherwise, click the folder where you want to direct incoming files and then click the Select button.**

Use the Open button to locate a folder within a folder; use the Drive and Eject buttons to locate a folder on another disk.

Changing the options
for saving incoming data

A new MacTerminal session document is preset to save incoming data; if you look at the Save Lines Off Top command in the Session menu, you'll see a check mark next to the command name, indicating that the data-saving feature is active. (If you do not want to save incoming data, choose the Save Lines Off Top command; the check mark disappears, indicating that incoming data is no longer being saved.)

Follow these steps to set the options for saving data:

1   **Choose the Saved Lines command from the Settings menu.**

A dialog box appears that presents the options for saving data. MacTerminal is preset to save as much data as the disk containing your session document can store and to save screens before clearing them (in the case when the host computer sends one full screen of information, then clears the screen before sending the next full screen of information).

```
┌─────────────────────────────────────────────────────────┐
│  ┌─────────────────────────────────────────────────────┐ │
│  │ Saving Lines Off Top Settings...                    │ │
│  │                                                     │ │
│  │   When Saving Lines Off Top,                        │ │
│  │     ◉ Save As Much As Possible                      │ │
│  │     ○ Save a Maximum of  [ 100    ] K               │ │
│  │                                                     │ │
│  │   ☒ Save Screen Before Clearing                     │ │
│  │                                                     │ │
│  │                    [ Cancel ] ║    OK    ║          │ │
│  └─────────────────────────────────────────────────────┘ │
└─────────────────────────────────────────────────────────┘
```
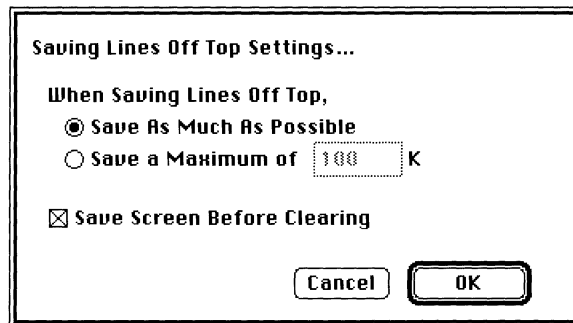
2   **If you want to specify a maximum amount of data to save, click the button next to this option and type a value for the maximum number of kilobytes to save.**

3   **If, for some reason, you don't want to save screens before they are cleared (when the host computer is sending full screens), deselect this option.**

4   **Click OK when you are through changing the settings.**

Setting transmission delays for pasted text

When you paste the contents of the Clipboard into your session document, the pasted text is sent to the other computer just as if you had typed it into the terminal region of your session document. If the other computer cannot process the pasted text as fast as your Macintosh is sending it, you may want to set transmission delays to slow down the rate at which the pasted text is sent. Follow these steps:

1 **Choose the Paste Options command from the Settings menu.**

A dialog box appears that presents the options for setting transmission delays.

```
┌─────────────────────────────────────────────────┐
│ ┌─────────────────────────────────────────────┐ │
│ │  Paste Options                              │ │
│ │     When Sending Text...                    │ │
│ │                                             │ │
│ │        Delay Per Character    ▐0      ▌     │ │
│ │        (60ths of a Second)    ▝▔▔▔▔▔▔▘     │ │
│ │                                             │ │
│ │        Delay Per Line         ┌0     ┐     │ │
│ │        (60ths of a Second)    └──────┘     │ │
│ │                      ( Cancel ) ╔═══════╗   │ │
│ │                                 ║  OK   ║   │ │
│ │                                 ╚═══════╝   │ │
│ └─────────────────────────────────────────────┘ │
└─────────────────────────────────────────────────┘
```
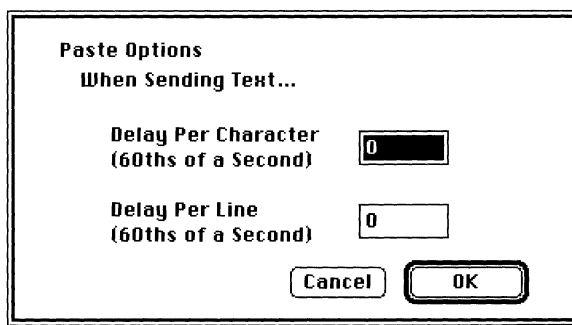
2 **Change the delay per character or the delay per line by typing the values in the boxes next to the options.**

Start by setting a delay between lines and, when you begin pasting selections, see if pasted selections arrive intact. If not, you may need to add a delay between characters.

3 **Click OK when you are through changing the settings.**

Setting the session document
to connect upon opening

You can set up your session document so that MacTerminal automatically attempts to establish a connection whenever you open the session document; that is, MacTerminal automatically invokes the Open Connection command.

To set up MacTerminal to do this, choose the Connect on Open command from the Settings menu; a check mark will appear next to the command name indicating the command is active. The next time you open the session document, MacTerminal automatically attempts to establish a connection for you.

```
Settings
 Connection...
 Terminal...
 File Transfer...
 ...............................................
 Folder for Received Files...
 Saved Lines...
 Paste Options...
✓Connect on Open
```
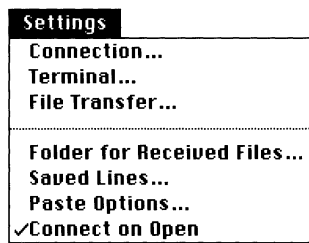
To deactivate the Connect on Open command, simply choose the command again from within the session document; the check mark disappears, indicating that the command is no longer active.

Undoing settings

You can choose the Undo command from the Edit menu to reverse the last changes you made with one of the commands in the Settings menu or with the Page Setup command.

```
┌─────────────────────────────────┐
│ Edit                            │
├─────────────────────────────────┤
│ Undo Terminal Change    ⌘Z      │
├─────────────────────────────────┤
│ Cut                     ⌘X      │
│ Copy                    ⌘C      │
│ Copy Table                      │
│ Paste                   ⌘V      │
│ Clear                   ⌘B      │
│ Select All              ⌘A      │
├─────────────────────────────────┤
│ Show Clipboard                  │
└─────────────────────────────────┘
```

The words that follow "Undo" change depending on which settings were last changed. For example, if the last settings you changed were with the Terminal command, the text of the Undo command reads "Undo Terminal Change"; if the last changes were with the Paste Options command, it reads "Undo Paste Options Change."

Saving the settings for a session document

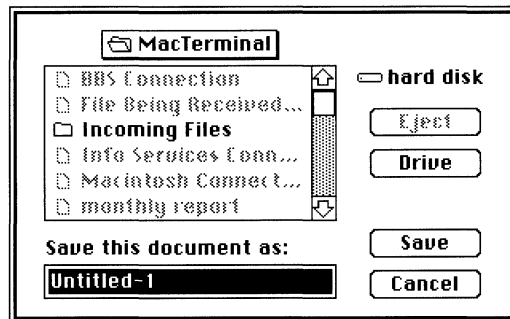When you change settings in a session document, the changes are not automatically saved. Unless you direct MacTerminal to save the changes, any settings changes are lost when you close the session document. MacTerminal has two commands for saving session documents and their settings on disk:

■ **Choose Save As from the File menu to save an untitled session document, to rename a document, or to save a document onto a different disk.**

A dialog box appears that lets you specify a name for the session document, as well as indicate where you want to store the document.

```
┌─────────────────────────────────────────┐
│     ┌──────────────────┐                 │
│     │ 🖾 MacTerminal │                    │
│     └──────────────────┘                 │
│   ┌──────────────────────┐               │
│   │ 🗋 BBS Connection  ⬆️│  ⬛ hard disk  │
│   │ 🗋 File Being Received...│            │
│   │ 🗀 Incoming Files    │ ┌──────────┐  │
│   │ 🗋 Info Services Conn...│ │  Eject  │ │
│   │ 🗋 Macintosh Connect...│ └──────────┘ │
│   │ 🗋 monthly report  ⬇️│ ┌──────────┐  │
│   └──────────────────────┘ │  Drive  │   │
│   Save this document as:   └──────────┘  │
│   ┌──────────────────────┐ ┌──────────┐  │
│   │ Untitled-1           │ │   Save   │  │
│   └──────────────────────┘ └──────────┘  │
│                            ┌──────────┐  │
│                            │  Cancel  │  │
│                            └──────────┘  │
└─────────────────────────────────────────┘
```

■ **Choose Save from the File menu to update the the disk copy of the document with the current changes.**

Unless you are saving an untitled document, no dialog box appears when you choose the Save command.

◆ **Note** The Save and Save As commands save the *settings* for the session document, not the *data* in the session document. If the Save Lines Off Top command in the Session menu is activated, session data is automatically saved into the scrollback cache region, as well as in a disk copy of the session document. ◆

For more information on the Save and Save As commands, see the descriptions of these commands in Chapter 6, "Commands Reference."

4 Communicating With Another Computer

This chapter provides instructions for using MacTerminal to communicate with other computers. You don't have to read this chapter in any particular order; the tasks are independent of each other. The following tasks are covered in this chapter:

- Opening a connection
- Preparing to receive a connection request
- Receiving a file
- Sending a file
- Sending pasted text
- Checking session status
- Closing the connection

The commands mentioned in this chapter are explained in detail in Chapter 6, "Commands Reference."

Opening a connection

You start a communications session by opening a connection to the other computer and, if you are communicating with a host system, then logging in to the host computer.

Here are the steps to follow:

1 **Open a MacTerminal session document and set it to communicate with the other computer.**

See Chapter 3, "Setting Up a Session Document," for help configuring your session document.

2 **If you're communicating by an external modem, turn on the modem.**

3 **Choose Open Connection from the Session menu.**

After you choose the Open Connection command, your next steps depend on whether you're connected directly to another computer or are accessing the other computer through a phone or other network system, as well as on the computer to which you are connecting. What appears in the terminal region of your session document at this point also depends on these factors. Here are some examples of what to expect:

- If you are directly connected to the other computer, you can start communicating immediately. In this case, you won't see any changes to the terminal region.
- If you are connecting over a network, you may have to wait a few seconds for the connection to be established. Once the connection is established, the network may prompt you to indicate the host to which you want to connect.
- If you're connecting through a modem, the tool will probably display a message informing you that the modem is being initialized (like the message generated by the Modem Connection Tool—see the following example). You may see the lights blinking on the modem and hear it dialing.

```
═══════ Modem Status ═══════
  ☎     Initializing modem...
→▣


                              [ Cancel ]
```
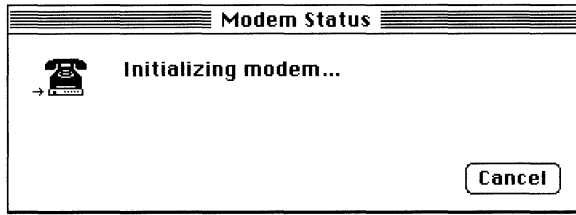
4 **Once connected, enter any characters required in order to log in to the other computer or just start typing if none are required.**

If you are connecting to a host computer, you may have to press a key or combination of keys (probably, you'll need to press the Return key once or twice) before the host displays a log-in prompt. Log-in prompts differ from one host to another; however, you'll almost always be asked for a user name or an account number and a password. In addition, some hosts may require a terminal identifier, found in the guide to the system or information service. And if you're connecting to the service through a phone network like Telenet or TYMNET, you'll be asked to identify which service you want.

If a prompt is repeated, it usually means that you made a typing mistake: you typed a space where you shouldn't have, used lowercase letters when only uppercase letters work, or pressed Return once when you were supposed to press it twice. The list of possible mistakes isn't endless, but it can be frustratingly long. Try again. If you continue to have trouble logging in, contact the administrator of the system for help.

Some hosts require that you type one or more control characters as part of the log-in sequence. The control characters are usually indicated by a caret: for example, ^C represents Control-C. To generate control characters, hold down the Control key (on ADB keyboards) or the ⌘ key (on Macintosh Plus keyboards) and type the letter. (For more information about how to generate log-in sequences, refer to the section titled "Special Characters" in Chapter 2, "About Using MacTerminal.")

Once you are logged in to the host computer, you are ready to start sending and receiving data.

If you're not connecting with a host computer, but with a computer that's communicating only with you—a coworker's Macintosh, for example—you can usually start sending and receiving information as soon as both computers have started their communications application and you have chosen the Open Connection command.

◆ **Note** If you've opened a connection, but can't see the characters you're typing, the other computer is probably not echoing back the characters you are entering. If you are communicating with a host that supports **full duplex,** you won't have this problem. But you probably will have this problem if the computer you are communicating with doesn't support full duplex, for example, if you are communicating with another Macintosh. In this case, choose the local echo option with your terminal emulation tool, and, as you type characters, they will appear on your screen. ◆

Preparing to receive a connection request

With some modem or network connection tools, instead of opening the connection yourself, you may be able to set up your Macintosh to wait for the other computer to request that a connection be opened. Refer to the documentation that accompanies the connection tool to determine whether it supports waiting for connection requests. The Serial Connection Tool included with MacTerminal does not support this feature, but the Apple Modem Connection Tool does.

Here are the steps to follow to prepare to receive a call:

1 **Open a MacTerminal document and set it to communicate with the other computer.**

If you are using a modem, specify the number of times that you want the line to ring before the modem answers the call. You won't need to specify an access number for another computer or a dialing method, but be sure you set the proper settings for the modem type and baud rate options. These options are set with the Connections command on the Settings menu. See Chapter 3, "Setting Up a Session Document," for help configuring your session document.

2 **If you're communicating through an external modem, turn on the modem.**

3 **Choose Wait for Connection from the Session menu.**

If you are connecting through a modem, the tool will probably display a message informing you that the modem is being initialized (like the message generated by the Apple Modem Connection Tool—see the following sample).
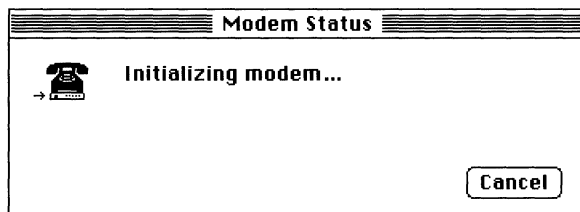
You may also see another message (like the one shown below) letting you know that the modem is waiting for a connection request.

```
╔════════════════ Modem Status ════════════════╗
║                                               ║
║    ☎    Waiting for call...                   ║
║  →▭                                           ║
║                                               ║
║                                  ( Cancel )    ║
║                                               ║
╚═══════════════════════════════════════════════╝
```
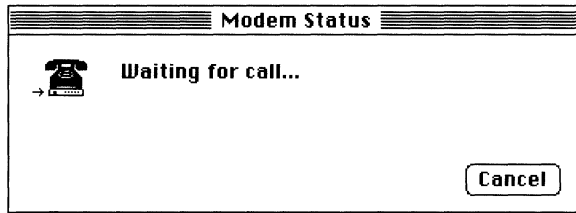
When a connection request comes in, the modem answers the call; then MacTerminal accepts the request and opens the connection.

Receiving a file

Using MacTerminal, you can receive files from another computer with which you have established a connection. For example, a coworker can send you a file from his Macintosh or other personal computer. Or, you can download a file from one of your company's mainframe computers, from an information service, or from a BBS.

In order for you to receive a file from another computer, your Macintosh and the other computer must both be using the same file transfer protocol with compatible settings. If your file transfer attempt is unsuccessful, you should check that your file transfer settings are compatible with those of the other computer. For details on the settings, refer to the module in the *Communications Tools Reference* on the file transfer tool that you are using.

In most cases, if you are communicating with a host computer, you usually have to request that the host send you the file by typing whatever command the host recognizes as telling it to send the specified file. You'll probably also have to indicate to the host what type of file transfer protocol you will be using. With some file transfer methods, the file transfer begins automatically. With other methods, once the host notifies you that it is ready to send the file, you'll start the file transfer by choosing Receive File from the Session menu.

If you are connected to another personal computer, someone will have to initiate the file transfer from the other computer, and you will have to choose Receive File before the file transfer will begin.

Here are the steps to follow to receive a file from the other computer:

1 **Open a session document.**

If necessary, set the appropriate terminal and connection options from the Settings menu. See Chapter 3, "Setting Up a Session Document."

2 **Choose File Transfer from the Settings menu and change the settings to accommodate your file transfer needs.**

A File Transfer Settings dialog box appears. The following figure is a sample of the initial XMODEM File Transfer Settings dialog box; the MacBinary method is selected.
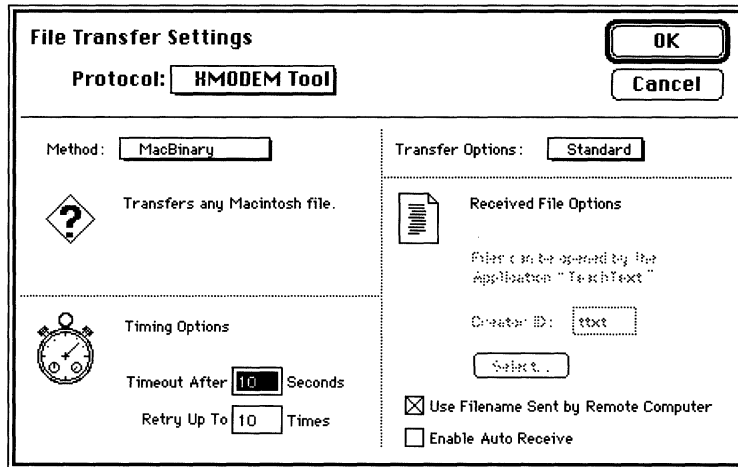
```
┌─────────────────────────────────────────────────────────────────┐
│  File Transfer Settings                        ╭──────────────╮   │
│        Protocol: │ HMODEM Tool │               │     OK       │   │
│                  └─────────────┘               ╰──────────────╯   │
│                                                ┌──────────────┐   │
│                                                │   Cancel     │   │
│                                                └──────────────┘   │
│  ─────────────────────────────────────────────────────────────   │
│  Method: │ MacBinary │          Transfer Options: │ Standard │     │
│                                                                   │
│    ◇      Transfers any Macintosh file.    ▤   Received File Options│
│   ⟨?⟩                                                              │
│                                               Files can be opened by the │
│                                               Application "TeachText"    │
│  ─────────────────────────────────────                            │
│                                            Creator ID: │ ttxt │     │
│    ⟨⊙⟩    Timing Options                                           │
│   ⟨◷⟩                                        ╭─────────╮           │
│           Timeout After │ 10 │ Seconds       │ Select. │           │
│                                              ╰─────────╯           │
│           Retry Up To │ 10 │ Times        ☒ Use Filename Sent by Remote Computer │
│                                           ☐ Enable Auto Receive     │
└─────────────────────────────────────────────────────────────────┘
```
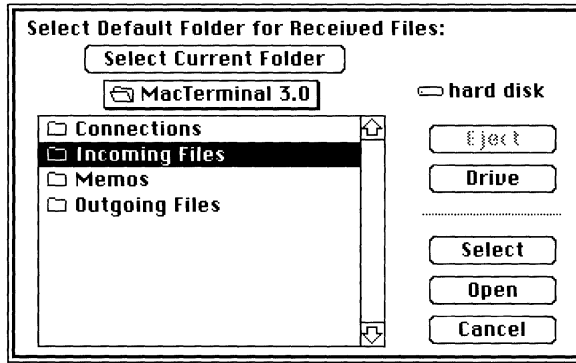
Use the Protocol menu to change to a different file transfer tool, for example, to the Text File Transfer Tool. If you aren't sure what file transfer protocol to use or how to set the options for the tool you have chosen, the file transfer tool modules in the *Communications Tools Reference* may help you. Otherwise, contact the system administrator for the computer from which you want to receive files (or try experimenting with the settings until file transfers are successful).

3　**If you want to direct the incoming files to a folder other than the one containing your session document, choose Folder For Received Files from the Settings menu; otherwise, skip to step 5.**

When you choose Folder for Received Files, a dialog box appears that presents a list of the folders in the folder that was last selected. (If you have not previously selected a folder, you'll see a list of the folders in the folder that contains your session document.)

```
┌─────────────────────────────────────────────────┐
│  Select Default Folder for Received Files:       │
│         [ Select Current Folder ]                │
│         [🗁 MacTerminal 3.0]      ⊂⊃ hard disk   │
│   ┌──────────────────────────┬─┐  ┌───────────┐  │
│   │ 🗀 Connections          │⇧│  [   Eject   ] │
│   │ 🗀 Incoming Files       │ │  ┌───────────┐  │
│   │ 🗀 Memos                │ │  [   Drive   ] │
│   │ 🗀 Outgoing Files       │ │  ···············│
│   │                         │ │  ┌───────────┐  │
│   │                         │ │  [  Select  ] │
│   │                         │ │  ┌───────────┐  │
│   │                         │ │  [   Open   ] │
│   │                         │⇩│  ┌───────────┐  │
│   └──────────────────────────┴─┘  [  Cancel  ] │
└─────────────────────────────────────────────────┘
```

If you specify a folder where incoming files should be directed, all incoming files are directed to that that folder; otherwise

■   if your session document is new and has never been saved on a disk, the received file is directed to the folder containing MacTerminal

■   if your session document is an existing document, the received file is directed to the folder where your session document was stored when you opened it

4   **Select a folder where you want to direct incoming files by selecting it and then clicking the Select button.**

Use the Select Current Folder button to select the folder whose contents are currently being displayed (in the example, *MacTerminal 3.0*); use the Open button to locate folders within folders and the Drive and Eject buttons to locate folders on other disks.
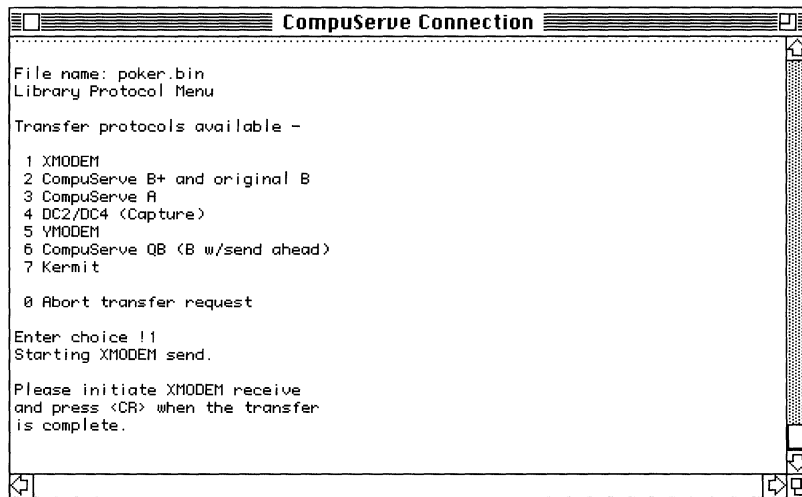
5   **Connect to the other computer by following the instructions given earlier in this chapter.**

6   **Locate the file you want to download and then enter the commands that direct the other computer to send you a file.**

The following example shows the commands you enter to download a file from a Mac Fun Forum library on a CompuServe host.

```
▓▓▓▓▓▓▓▓▓▓▓▓ CompuServe Connection ▓▓▓▓▓▓▓▓▓▓
MAUG(TM) Mac Fun Forum                    Library 4

Board/Card/Ed Games

  1 BROWSE thru files
  2 DIRECTORY of files

  3 UPLOAD a new file
  4 DOWNLOAD a file

  5 LIBRARIES







Enter choice !4_
```
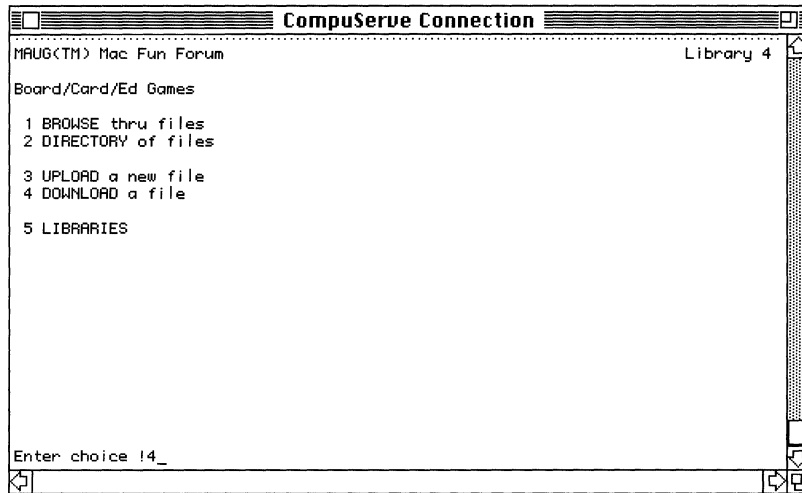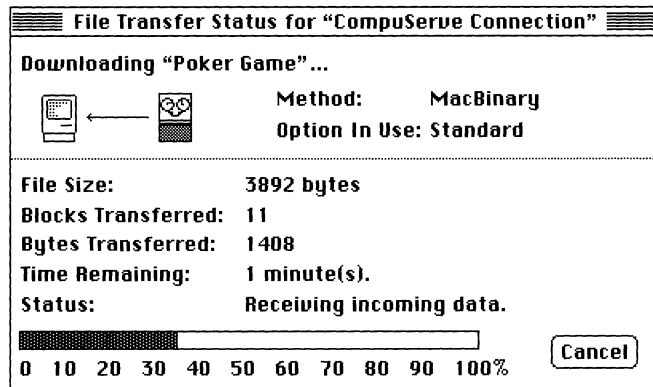
You type 4 to indicate that you want to download a file and then CompuServe prompts
you to enter the name of a file. After you enter the name of a file, CompuServe prompts
you to specify a file transfer protocol. In the example below, a 1 is entered to specify that
the XMODEM protocol should be used. When the message that begins with "Please
initiate" appears, CompuServe is ready to send you the file.

```
▓▓▓▓▓▓▓▓▓▓▓▓ CompuServe Connection ▓▓▓▓▓▓▓▓▓▓
File name: poker.bin
Library Protocol Menu

Transfer protocols available -

  1 XMODEM
  2 CompuServe B+ and original B
  3 CompuServe A
  4 DC2/DC4 (Capture)
  5 YMODEM
  6 CompuServe QB (B w/send ahead)
  7 Kermit

  0 Abort transfer request

Enter choice !1
Starting XMODEM send.

Please initiate XMODEM receive
and press <CR> when the transfer
is complete.
```

◆ **Note** Some file transfer methods, for example, the XMODEM MacTerminal 1.1 method, automatically invoke file receipt. If you are using one of these file transfer methods, when you finish entering the commands that tell the host to send a file, the host can immediately begin sending the file and your Macintosh will be ready to receive it. When the file transfer is completed, MacTerminal notifies you by sounding two beeps. In this case, you won't need to proceed to step 7. However, with most file transfer methods, you'll need to direct your Macintosh to receive the file as described in step 7. ◆

7 **Choose the Receive File command from the Session menu.**

The other computer begins sending the file. Most file transfer tools display a status dialog box (similar to the following example) to keep you informed of the progress.

```
▓▓▓ File Transfer Status for "CompuServe Connection" ▓▓▓
Downloading "Poker Game"...
    [🖥] ←—— [🖳]      Method:        MacBinary
                       Option In Use: Standard
......................................................................
File Size:            3892 bytes
Blocks Transferred:   11
Bytes Transferred:    1408
Time Remaining:       1 minute(s).
Status:               Receiving incoming data.

▓▓▓▓▓▓▓▓▓░░░░░░░░░░░░░░░░░░░   ( Cancel )
0  10  20  30  40  50  60  70  80  90  100%
```

To stop the file transfer before it finishes, click the Cancel button (if one appears in the status dialog box).

When the entire file has been received, a Save As dialog box (like the following example) usually appears, prompting you to name the file and giving you the opportunity to save the file in a different folder.
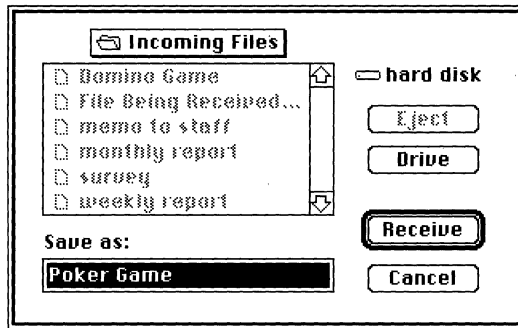
Whether or not the Save As dialog box appears depends on the design of the file transfer tool that you are using and on how the tool is configured. If your file transfer tool names the file itself (some of the XMODEM methods provide this feature), the Save As dialog box does not appear.

8   **If a Save As dialog box appears, type the name you want to save the file under, locate the folder within which you want to save the file, and then click the Receive button.**

After you click the Receive button, MacTerminal sounds two beeps to notify you that the file transfer process is complete.

Sending a file

Using MacTerminal, you can send files to another computer with which you have established a connection. You can send an existing file, for example, a word-processing or spreadsheet document, to the other computer; or you can compose what you want to send—a letter, a report, a table of figures, and so forth—in the appropriate Macintosh application and then send it to a coworker who is working on another Macintosh or other personal computer.

In order to send a file to another computer, your Macintosh and the other computer must both be using a similar file transfer protocol with compatible settings. If file transfer is not successful, you should check that your file transfer settings are compatible with those of the other computer. For details on the settings, refer to the module in the *Communications Tools Reference* on the file transfer tool that you are using.

In most cases, if you are communicating with a host computer, you'll need to prepare the host to receive a file from you by typing whatever command the host recognizes as telling it that you will be sending the specified file. You will probably also have to indicate to the host the type of file transfer protocol you will be using. Once the host notifies you that it is ready to receive a file, you'll start the file transfer by choosing Send File from the Session menu. If you are connected to another personal computer, you'll choose Send File, but unless the other computer is set up to receive files automatically, someone will also have to initiate the file receipt on the other computer before the file transfer will begin.

To send a file follow these steps:

1 **Open a session document.**

If necessary, set the appropriate terminal and connection options from the Settings menu. See Chapter 3, "Setting Up a Session Document."

2 **Choose File Transfer from the Settings menu and change the settings to accommodate your file transfer needs.**
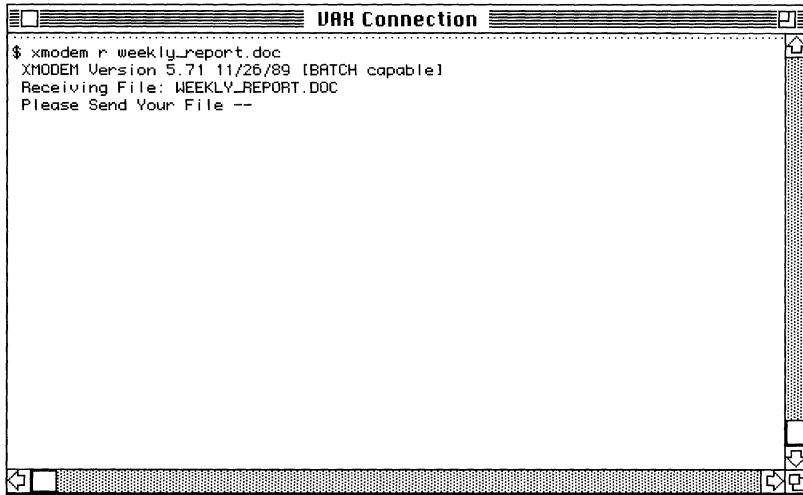
A File Transfer Settings dialog box appears. The following figure is a sample of the initial settings dialog box for XMODEM File Transfer Tool; the MacBinary method is selected.
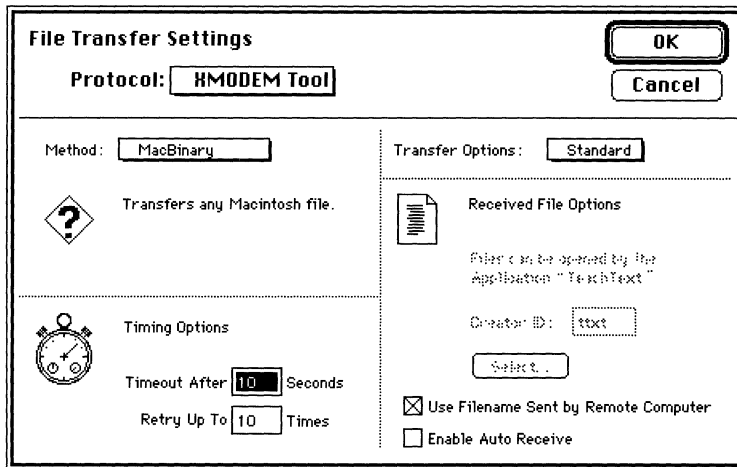
```
┌─────────────────────────────────────────────────────────────┐
│ File Transfer Settings                      ┌──────────┐     │
│       Protocol: │ HMODEM Tool │             │    OK    │     │
│                                             └──────────┘     │
│                                             ┌──────────┐     │
│                                             │  Cancel  │     │
│                                             └──────────┘     │
│ Method: │ MacBinary │        Transfer Options: │ Standard │  │
│                                                             │
│  ◇?◇   Transfers any Macintosh file.    ▤  Received File Options │
│                                                             │
│                                         Files can be opened by the │
│                                         Application "TeachText" │
│                                                             │
│  ⏱   Timing Options                     Creator ID: │ ttxt │ │
│                                                             │
│          Timeout After │10│ Seconds       │  Select.. │    │
│          Retry Up To │10│ Times        ☒ Use Filename Sent by Remote Computer │
│                                        ☐ Enable Auto Receive │
└─────────────────────────────────────────────────────────────┘
```

Use the Protocol menu to change to a different file transfer tool, for example, to the Text File Transfer Tool. If you aren't sure what file transfer protocol to use or how to set the options for the tool you have chosen, the file transfer tool modules in the *Communications Tools Reference* may help you. Otherwise, contact the system administrator for the computer that you want to send files to or try experimenting with the settings until file transfers are successful.

3 **Connect to the other computer by following the instructions given earlier in this chapter.**

4 **If necessary, prepare the other computer to receive a file by entering the commands that indicate you are about to send a file.**

The following example shows the command you enter to notify a VAX running a **VMS**™ **operating system** that you will be sending a file. Typically, when the host is ready to receive your file, it displays a message similar to the one shown on the facing page asking you to send the file.

```
                       VAX Connection
$ xmodem r weekly_report.doc
 XMODEM Version 5.71 11/26/89 [BATCH capable]
 Receiving File: WEEKLY_REPORT.DOC
 Please Send Your File --
```

5 **Choose the Send File command from the Session menu.**

A dialog box presents a list of all the files that can be transferred based on the current file transfer tool settings.

```
        ⌐ MacTerminal
     □ BBS Connection              ⌂ hard disk
     □ Commercial Services Co...
     □ Incoming Files               [  Eject  ]
     □ Macintosh Connection
     □ memo to staff                [  Drive  ]
     □ monthly report
     □ Outgoing Files
     □ VAX Connection               [  Send   ]
     □ weekly report                [ Cancel  ]
```
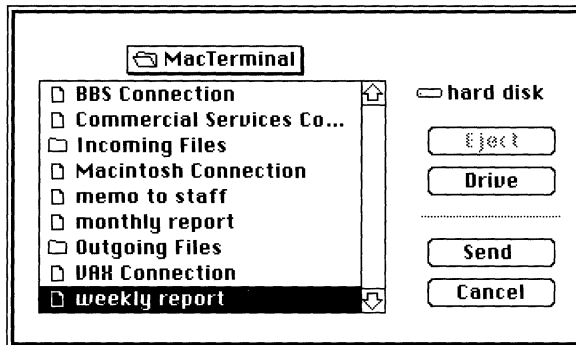
6 **Locate the file that you want to send. Use the Send button when you need to open folders in order to locate the file. Use the Drive and Eject buttons to locate a file on another disk.**

7 **Send the file by selecting it and clicking Send (or by double-clicking the file).**

MacTerminal begins sending the file. Most file transfer tools display a status dialog box (similar to the following example) to keep you informed of the progress.

```
═══════ File Transfer Status for "UAH Connection" ═══════
Uploading "weekly report"...

   ┌──┐          Method:        HMODEM Text
   │ ▪│ ──→ 🖳   Option In Use: Standard
   └──┘
..........................................................................
File Size:            23988 bytes
Blocks Transferred:   70
Bytes Transferred:    8960
Time Remaining:       Less than a minute.
Status:               Waiting for an acknowledge.

▓▓▓▓▓▓▓▓▓▓▓▓                              ┌─────────┐
0  10  20  30  40  50  60  70  80  90  100%  │ Cancel │
                                         └─────────┘
```
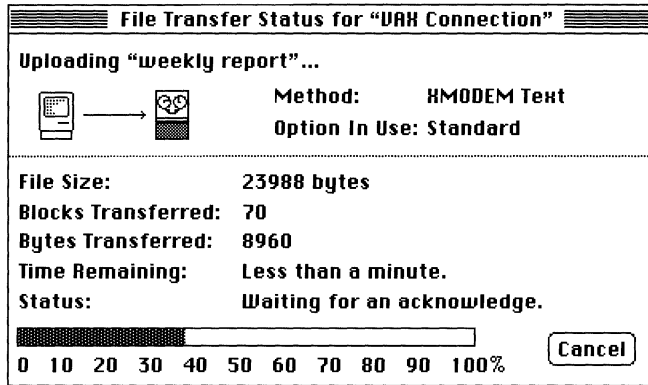
To stop the file transfer before it finishes, click the Cancel button (if one appears in the status dialog box).

When the file transfer is completed, MacTerminal notifies you by sounding two beeps.

Sending pasted text

You can send text to the computer to which your Macintosh is connected by cutting or copying the text to the Clipboard and then pasting it into the MacTerminal document. This is a quick way to send text you've composed in another application, such as a word-processing application or a desk accessory. You can also copy text from the scrollback cache region of your session document and send it to the other computer by pasting it in at the current **insertion point.** When you choose Paste, MacTerminal sends the text from the Clipboard to the remote computer just as if you'd typed the text into the terminal region.

Here are the steps to follow to send pasted text to another computer:

1 **If you are sending pasted text to another Macintosh or other personal computer, choose Terminal from the Settings menu to change your terminal emulation settings.**

   If you want the text that you are sending to be displayed, and properly formatted, on your screen, you will probably need to make the following settings changes:

   - Select the Local Echo option so that the characters are sent to your Macintosh screen as well as to the other computer. (It isn't necessary to select this option when you are communicating with a host computer that echoes the characters it receives back to your Macintosh screen.)

   - Select the option that allows you to automatically wrap characters to the next line when they extend beyond the right margin. With the TTY, VT102, and VT320 terminal emulation tools, use the Auto Wrap to Next Line option.

   - Select the option that causes a carriage-return/**line-feed** pair to be sent whenever a return character is encountered in the outgoing text. With the TTY, VT102, and VT320 terminal emulation tools, use the New Line on a Return option.

   For details on these options, see the module in the *Communications Tools Reference* on the terminal tool that you are using. For help setting the terminal emulation options, refer to Chapter 3, "Setting Up a Session Document."

2 **Choose Paste Options from the Settings menu if you need to set transmission delays for sending pasted text; change delays as needed; and then, click OK.**

If your connection lets you send data faster than the other computer can process it, you may need to set transmission delays to slow down the rate at which the pasted text is sent. You can set a delay between the lines sent, as well as between each character sent.

When you choose Paste Options, a dialog box appears that presents the options for setting transmission delays. Start by setting a small delay between lines and, when you begin pasting text, see if the pasted text arrives intact. If it doesn't, you may need to add a delay between characters.

```
Paste Options
   When Sending Text...

        Delay per character      ┌───────┐
        (60ths of a second)      │ 0     │
                                 └───────┘

        Delay per line           ┌───────┐
        (60ths of a second)      │ 0     │
                                 └───────┘
                        ( Cancel )  (   OK   )
```
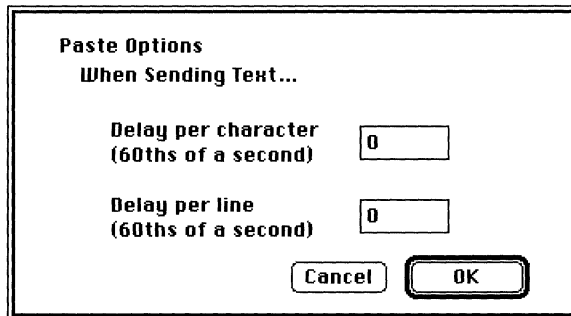
For more information on transmission delays, see the section titled "Setting Transmission Delays for Pasted Text" in Chapter 3, "Setting Up a Session Document," or refer to the description of the Paste Options command in Chapter 6, "Commands Reference."

3 **If a connection is not already open, open a connection to another computer by following the instructions given earlier in this chapter.**

4 **Select the text that you want to send and choose Cut or Copy from the Edit menu (remember, you can't cut text from a MacTerminal session document).**

The text appears in the Clipboard (choose Show Clipboard from the Edit menu if you want to confirm this). The contents of the Clipboard remain until the next cut or copy operation.

5 **Choose Paste from the Edit menu.**

MacTerminal sends the pasted text to the other computer.

Checking session status

You can check the status of communications sessions by choosing the About MacTerminal command from the Apple (⬛) menu to display a status window. The window lists the open session documents and the connection and terminal emulation tools associated with each of the sessions. You can keep this status window open to monitor the status of your session while you are using MacTerminal. It is continually updated to give you the latest status. To check the session status follow these steps:

1 **Choose About MacTerminal from the File menu.**

The status window appears on your desktop. It lists all open session documents and shows the connection and terminal emulation tools associated with each session document. The symbols to the left of the session document name indicate whether the connection for the session document is open or closed. Triangles that are not connected indicate that the session document does not have a connection open with another computer; triangles connected by the lightning bolt symbol (a symbol commonly used to represent connectivity) indicate that the specified session document has a connection open with another computer. For more information about the status window, see the description of the About MacTerminal command in Chapter 6, "Commands Reference."

```
▤☐▦▦▦▦▦ About MacTerminal 3.0... ▦▦▦▦▦
    MacTerminal® 3.0 © 1983-1990 Apple Computer, Inc.
       Macintosh® Communications Software

    Written by George Cowsar, Tom Dowdy, Jerry Godes,
       Byron Han, Don Loomis, and Chris Plummer


   This program was written with MacApp® © 1985-1990 Apple Computer, Inc.

       Session           Connection Type        Terminal Type
   ▷⚡◁  VAX Connection    Serial Tool            VT102 Tool         ⬆
   ▷  ◁  BBS Connection    Apple Modem Tool       TTY Tool

                                                                    ⬇
```
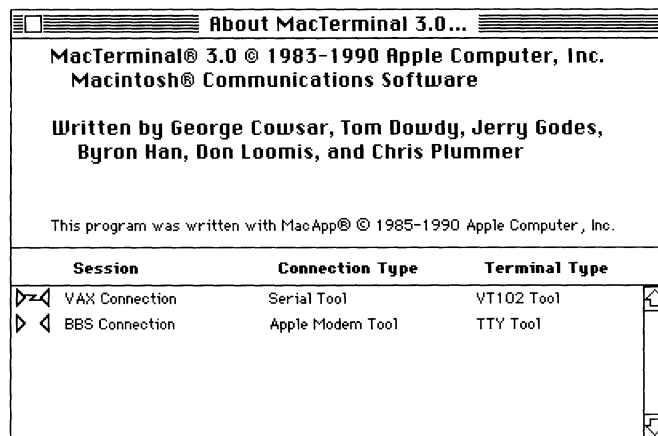
2 **To monitor the status of your sessions, leave the window open on your desktop and continue working within the session documents.**

3   **To close the status window, click the Close box in the top-left of the window or choose Close from the File menu while the status window is the top-most window.**

Closing the connection

When you are finished communicating with the other computer, you should end the communications session by closing the connection. The Close Connection command from the Session menu breaks the connection with the other computer, closing the communication session, although the session document remains open.

However, if you've been communicating with a host computer, usually you should terminate a communications session by typing the host's log-out command. Then, choose the Close Connection command from the Session menu. Most commercial hosts terminate the connection after a few minutes if there is no activity on your end. But, by logging out before closing the connection, you are assured that you aren't being charged for an open connection (because the other computer didn't receive a log-out command).

Follow these steps to close a connection:

1 **If you are communicating with a host computer, log out; otherwise, go to step 2.**

Log-out commands vary from host to host. If you aren't sure what the command is, try typing some of the logical choices: `quit, off, exit, logout, logoff,` or `bye.` One of them will probably work.

The sample below shows that by typing `off` you can log out of a CompuServe host.

```
CompuServe Connection
MAUG(TM) Mac Fun Forum                                        Library 4

Board/Card/Ed Games

 1 BROWSE thru files
 2 DIRECTORY of files

 3 UPLOAD a new file
 4 DOWNLOAD a file

 5 LIBRARIES




Enter choice !off_
```
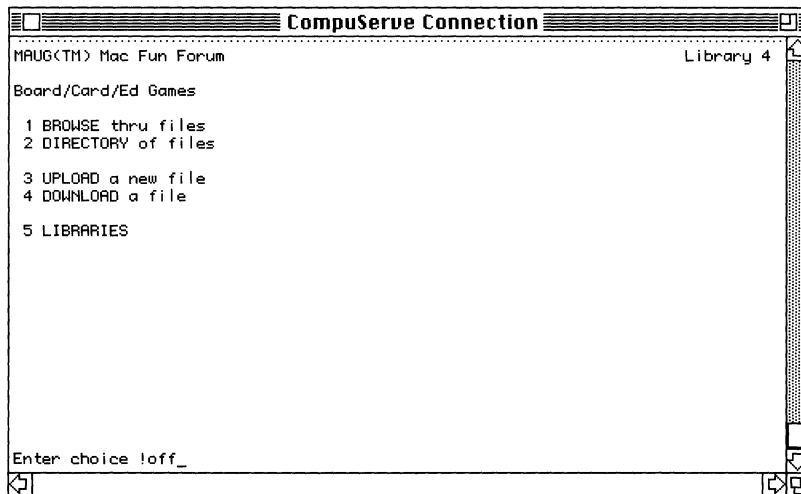
CompuServe logs you out and displays the "Host Name:" prompt. Sometimes, as in this CompuServe case, you can log right back in to the host without having to reopen the connection.

```
▤▢▤▤▤▤▤▤▤▤▤▤▤▤▤▤▤▤▤ CompuServe Connection ▤▤▤▤▤▤▤▤▤▤▤▤▤▤▤▤▤▤▤
  4 DOWNLOAD a file                                              ⇧
  5 LIBRARIES



















 Enter choice !off

 Thank you for using CompuServe!

 Off at 10:09 PST 15-Dec-89
 Connect time = 0:03

 Host Name:  _                                                  ⇩
```
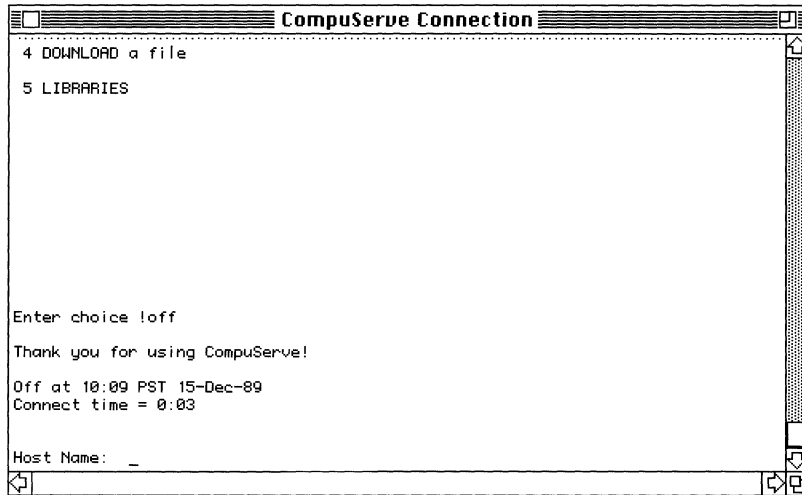
2 **Choose the Close Connection command from the Session menu to break the connection.**

MacTerminal closes the connection. At this time, you can either close the session document or continue to work within the same session document, changing settings or opening another connection.

5 Handling Session Data

This chapter provides instructions for most of the things you'll do with the data contained in session documents. You don't have to read the chapter in any particular order; each task is independent of the others. The following tasks are covered in this chapter:

- Saving session data

- Clearing session data

- Controlling the display of data

- Copying data from MacTerminal to another document

- Printing

The commands mentioned in this chapter are explained in detail in Chapter 6, "Commands Reference."

Saving session data

A new MacTerminal session document is preset to save session data; you will see a check mark next to the Save Lines Off Top command in the Session menu indicating that this command is activated. When this command is activated, data that overflows the terminal region is displayed in the scrollback cache region of the session document, as well as being stored in a disk copy of the document. You can use the vertical scroll bar to view the data that has been saved in the scrollback cache region. If the Save Lines Off Top command is activated when you close the session document, any data in the terminal region is also saved in the disk copy of the document. If you save the entire communications conversation that transpires during the session, the disk copy of the session document will serve as a historical record of the session.

- **If you don't want to save the incoming data, choose the checked Save Lines Off Top command. The check mark disappears and session data is no longer saved.**

- **If you have stopped saving the incoming data and want to start again, just choose the Save Lines Off Top command. The check mark reappears next to the command and MacTerminal resumes saving data as it scrolls out of the terminal region into the scrollback cache.**

◆ **Note** MacTerminal is preset to save as much data as possible and to save screens before clearing them (in the case when the host computer sends a full screen of information, then clears the screen before sending the next full screen of information). Using the Saved Lines command on the Settings menu, you can change options for how you want to save data. Refer to Chapter 3, "Setting Up a Session Document," for instructions on changing the options for saving data. ◆

Clearing session data

MacTerminal provides commands so you can quickly clear either the data in the terminal region of the session document window or the data in the scrollback cache region of the window. When the data is cleared from the scrollback cache region of the window, it is also erased from the disk copy of the session document.

■ **To clear the data in the terminal region of the session widow, choose the Clear Screen command from the Session menu.**

■ **To clear the data in the scrollback cache region, choose the Clear Saved Lines command from the Session menu.**

When you choose the Clear Saved Lines command, the dialog box shown below appears prompting you to confirm that you want to clear the data in the scrollback cache. (If you hold down the **Option key** while selecting the Clear Saved Lines command, the scrollback cache is cleared without this confirmation dialog box being displayed.)

```
┌─────────────────────────────────────────┐
│  ┌──────────────────────────────────┐   │
│  │  ⚠  Are you sure you want to clear the lines │
│  │      off top?                    │   │
│  │                                  │   │
│  │  ┌────────┐              ┌──────┐ │   │
│  │  │ Cancel │              │  OK  │ │   │
│  │  └────────┘              └──────┘ │   │
│  └──────────────────────────────────┘   │
└─────────────────────────────────────────┘
```
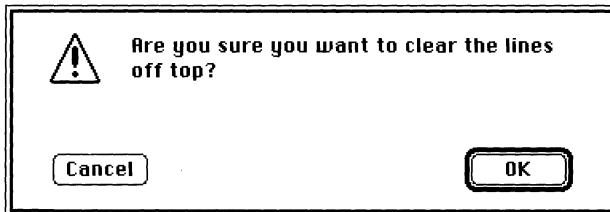
For more information about clearing data, see the descriptions of the Clear Screen command and the Clear Saved Lines command in Chapter 6, "Commands Reference."

Controlling the display of data

Usually, as soon as incoming data arrives from the other computer, the data is displayed in the terminal region of your session document. However, with some terminal emulation tools, you can use a "hold screen" command to keep data from being displayed until you enter a "release screen" command. With the VT102 Tool, you can use the No Scroll item on the Keys menu to control the display of incoming data; with the VT320 Tool, you can use the Hold Screen item, also on the Keys menu.

In addition, MacTerminal enables you to control the screen display regardless of the terminal emulation tool you are using:

■ **Hold down the mouse button to stop the display of incoming data; release the button to resume the display of incoming data.**

◆ **Note** When you stop the display of incoming data, you should be sure to select a **handshaking** option with your connection tool (XON/XOFF handshaking, for example). This is necessary because, although data is not being displayed, the incoming data is still being received by your Macintosh into an input buffer. When the input buffer fills up, your Macintosh needs a means of telling the other computer to stop sending data until room is available in the input buffer (that is, until some of the data in the input buffer is displayed); a handshaking protocol serves this purpose. If you don't use some sort of handshaking mechanism, the other computer may continue to send data even when your Macintosh can't receive it, and the data will be lost. ◆

Copying data from MacTerminal
to another document

You can select all or any part of the data in the MacTerminal session document and then copy it to a desk accessory or to the document of another Macintosh application. For example, if you've logged in to a database and received a table of statistics, you can put the table into a report you're working on in a Macintosh word-processing or spreadsheet application.

With MacTerminal, you can copy the data from the scrollback cache region as well as from the terminal region. You can also copy data from both regions at once, by dragging the I-beam over the dotted line in the session window.

△ **Important** The terminal emulation tools that accompanied your MacTerminal application use special monospaced fonts, which are included with the tools on the PATHWORKS V1.0 volume. Before copying data from a MacTerminal session document to another application's document, you should install these fonts in your **System file** so that spacing and character alignment can be maintained in the copied data. Use the Font/DA Mover to install the fonts (if you need help, refer to the manuals that accompanied your Macintosh). Then, after you copy data from MacTerminal into the other application's document, select the data, and choose the appropriate terminal-specific font. △

Follow these steps to copy data from a MacTerminal session document to another document:

1 **Select the data you want to copy.**

■ Choose Select All from the Edit menu to select all data in the document.

Or

■ Using your mouse, select a portion of the data.

2 **Choose Copy or Copy Table from the Edit menu.**

■ Choose Copy if you're copying paragraphs of text.

■ Choose Copy Table if you're copying columns of data to Microsoft Excel or to certain other spreadsheet applications.

The Copy Table command changes the spaces between columns to tabs so that a table appears in the correct **format** when you paste it into spreadsheet applications that require tabs between columns.

When you choose Copy or Copy Table, MacTerminal places a copy of the selection in the Clipboard. For more information about the Copy and Copy Table commands, see the descriptions of these commands in Chapter 6, "Commands Reference."

3 **Open the other application's document and paste the data where you want it.**

■ Open either a new or existing document for the application you want to use.

■ Choose Paste from the application's Edit menu.

Printing

With MacTerminal, you can print the entire session document, or you can print a selection. The selection can be from the terminal region or from the scrollback cache region of a session document. You can also print data selected from both regions at once, by dragging the I-beam over the dotted line when you make the selection.

If your Macintosh has access to more than one printer, you may need to choose the one you want to use before beginning to print; use the Chooser from the **Apple menu** to select a printer.

△ **Important** The terminal emulation tools that accompanied your MacTerminal application use special monospaced fonts, which are included with the tools on the PATHWORKS V1.0 volume. You should install these **fonts** in your System file to retain spacing and character alignment when you are printing to a LaserWriter using background printing or to an ImageWriter. Use the Font/DA Mover to install the fonts (if you need help, refer to the manuals that accompanied your Macintosh). △

Follow these steps to print the data in the session document:

1   **If you are printing from the Finder, select the document that you want to print.**

2   **If you are printing from within an open session document and you want to print only a portion of the data in the document, select the data that you want to print.**

3 **If you are printing from within an open session document and want to change the page setup for the document, choose Page Setup from the File menu. Change as necessary and click OK.**

A dialog box appears that presents the various page setup options. These settings are saved when you save the document.

```
LaserWriter Page Setup                        6.0    ┌──── OK ────┐
Paper: ◉ US Letter  ○ A4 Letter                      └────────────┘
       ○ US Legal   ○ B5 Letter  ○ │  Tabloid  │     ( Cancel )
       Reduce or [100] %    Printer Effects:         ( Options )
       Enlarge:             ⊠ Font Substitution?
       Orientation          ⊠ Text Smoothing?         ( Help )
       [icon][icon]         ⊠ Graphics Smoothing?
                            ⊠ Faster Bitmap Printing?
```
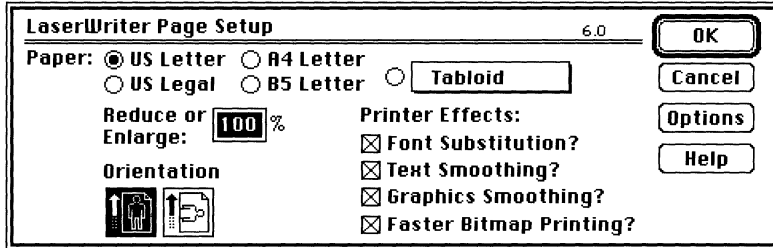
If you're printing data wider than 80 columns and want all of the columns to fit on a single page, you may want to use horizontal orientation and reduction. For example, to print a 132-column spreadsheet, choose horizontal orientation and reduce to 90%.

4 **Choose Print or Print Selection from the File menu.**

- Choose Print to print the entire session document.

- Choose Print Selection to print the selected portion of the data in the session document.

A dialog box appears that presents the options for printing. You can change the number of copies to be printed, specify a range of pages to be printed, or change other settings before beginning to print. For information about the settings, see the description of the Print command or Print Selection command in Chapter 6, "Commands Reference."

```
LaserWriter  "Glue and Baling Wire II Spooler"   6.0   ┌──── OK ────┐
Copies:[1]           Pages: ◉ All  ○ From:[  ] To:[  ]  └────────────┘
Cover Page:    ◉ No ○ First Page ○ Last Page            ( Cancel )
Paper Source: ◉ Paper Cassette  ○ Manual Feed           ( Help )
Print:         ◉ Color/Grayscale ○ Black & White
```
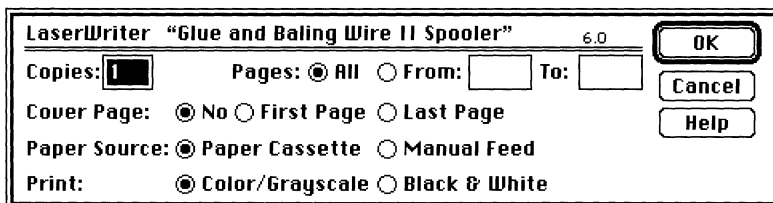
5   Click OK to begin printing the document.

During printing a status dialog box appears. You can stop printing at any time by clicking the Cancel button or by holding down the ⌘ key and pressing the period (.) key.

"Macintosh Connection" is now being printed.

Cancel
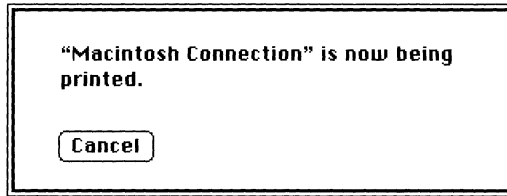
6 Commands Reference

This chapter provides details about the commands in the MacTerminal menus. The chapter is divided into sections that correspond to the basic set of MacTerminal menus:

- Apple (🍎) menu
- File menu
- Edit menu
- Settings menu
- Session menu
- Windows menu

In each section, the commands are described in the order they appear in the menu.

Some communications tools may add menus to the MacTerminal menu bar. For example, when you use the VT102 Terminal Emulation Tool or the VT320 Terminal Emulation Tool, a Keys menu is added. These menus are described in the applicable tool modules (see the *Communications Tools Reference*).

The Apple (⬤) menu

```
⬤
┌─────────────────────────┐
│ About MacTerminal 3.0...│
├·························│
│ Access Privileges       │
│ Alarm Clock             │
│ Calculator              │
│ Camera                  │
│ Chooser                 │
│ Control Panel           │
│ Find File               │
│ Key Caps                │
│ Scrapbook               │
├·························│
│ ▣ Finder                │
│ ◈ MacPaint              │
│ ✓▣ MacTerminal 3.0      │
├·························│
│ About MultiFinder...    │
└─────────────────────────┘
```
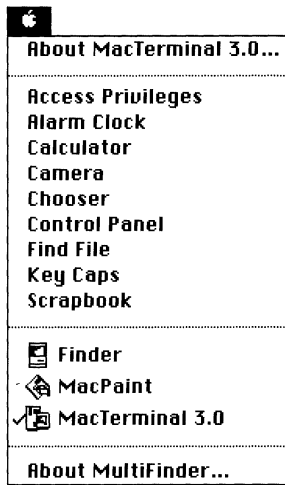
The Apple menu lets you display current information about your MacTerminal application, including the status of any active communication sessions. Additionally, the Apple menu lets you select desk accessories, which may be installed in your System file. In a **MultiFinder**® environment, you can also use the Apple menu to change from application to application.

About MacTerminal

This command opens the MacTerminal status window, which provides information about MacTerminal, as well as the status of the current communications sessions. The window lists the open session documents and shows the connection and terminal tools associated with each document, as shown in the following sample.

The symbols to the left of the session document name indicate whether the connection for the session document is currently open or closed. Triangles that are not connected indicate that the session document does not have a connection open with another computer; triangles connected by the lightning bolt symbol (a symbol commonly used to represent connectivity) indicate that the specified session document has a connection open with another computer.

```
┌─────────────────────────────────────────────────────────┐
│ ▣□▤▤▤▤▤▤▤▤▤▤▤▤ About MacTerminal 3.0... ▤▤▤▤▤▤▤▤▤▤▤▤ │
│         3.0, © Apple Computer, Inc. 1989, 1990          │
│         Macintosh® Communications Software             │
│                                                         │
│     Written by George Cowsar, Tom Dowdy, Jerry Godes,   │
│        Byron Han, Don Loomis, and Chris Plummer         │
│                                                         │
│     MacTerminal® 3.0 © 1983-1990 Apple Computer, Inc.   │
│   This program was written with MacApp® © 1985-1990 Apple Computer Inc. │
│─────────────────────────────────────────────────────────│
│     Session         Connection Type      Terminal Type  │
│  ▷⇄◁  VAX Connection    Serial Tool         VT102 Tool  │⇧│
│  ▷  ◁  BBS Connection   Apple Modem Tool     TTY Tool   │ │
│                                                         │ │
│                                                         │⇩│
└─────────────────────────────────────────────────────────┘
```

Open connection ────
Closed connection ────
Name of session ────
document

Connection tools   Terminal emulation
                    tools
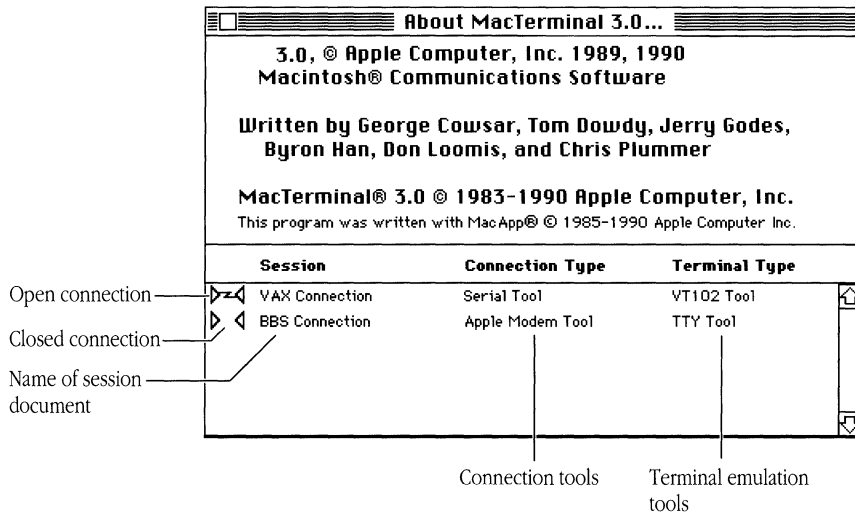
As long as the status window remains open, it is continually updated with the latest status. Therefore, you can monitor session status while you are working in MacTerminal by leaving the status window open on your desktop for reference.

To close the status window, click its close box or choose the Close command from the File menu while the status window is the top-most window.

Desk accessories

Choosing one of the desk accessories causes it to appear on the desktop. The desk accessory stays on the desktop as an active or inactive window until you close it, either with its close box or with the Close command from the File menu.

With some desk accessories, you can use the Edit menu to cut (or copy) information from the desk accessory and paste it into another desk accessory, into a document of another Macintosh application, or into a MacTerminal session document. During a communications session, when you paste data into a MacTerminal session document, the data is sent to the other computer, just as if you had typed it on the keyboard.

For instructions on using desk accessories, see the manuals that came with your Macintosh computer or the manuals that accompanied the desk accessories.

The File menu

```
File
New          ⌘N
Open...       ⌘O

Close        ⌘W
Save         ⌘S
Save As...
Revert To Saved

Page Setup...
Print Selection...
Print...      ⌘P

Quit         ⌘Q
```

The File menu contains commands for managing documents while you are using MacTerminal.

New

The New command creates a new, untitled MacTerminal session document. The Untitled-1 document shown on the next page is an example of the window that appears when you choose the New command.

Multiple MacTerminal session documents can be open on the desktop at the same time. The maximum number of new (or existing) session documents that can be open at once is determined by the amount of memory available to MacTerminal and the communications tools, as well as by the amount of memory required by the tools you are using. To check the memory requirements for the tools you are using, see the appropriate modules in the *Communications Tools Reference.*

The window created for the new session document is numbered. During each launch of the MacTerminal application, windows are numbered consecutively (beginning with 1) as they are created.
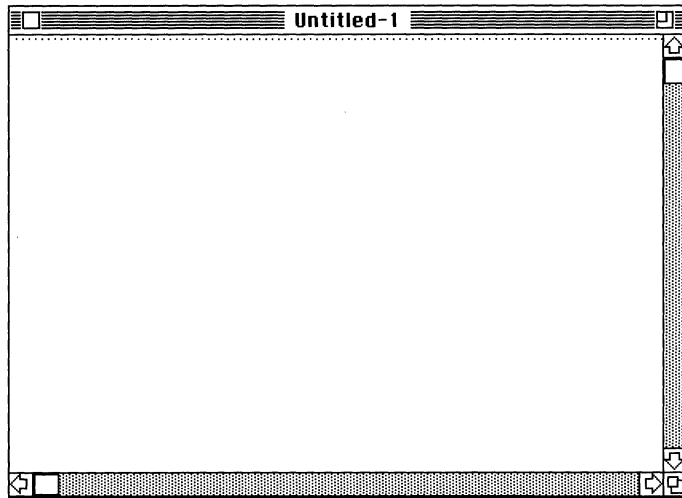
A new MacTerminal session document is automatically set up to use the following communications tools:

- Apple Modem Connection Tool
- VT102 Terminal Emulation Tool
- XMODEM File Transfer Tool

When one of the default tools is missing, MacTerminal looks for another tool in the same category and chooses the tool that comes first alphabetically. For example, if the VT102 Terminal Emulation Tool is missing, but the TTY Terminal Emulation Tool and the VT320 Terminal Emulation Tool are available, MacTerminal chooses the TTY Tool (because it comes first alphabetically). An alert box like the one below appears, notifying you which tool is being chosen.
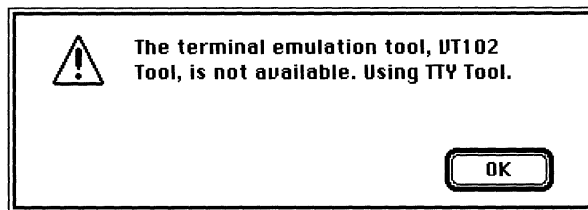
Both a connection tool and a terminal emulation tool must be available or you will be unable to create the new document. If you choose the New command and either no connection tool or no terminal emulation tool is available, the new session document will not open and an appropriate alert will appear (see the following example). In this case, you should install the required tool(s) and then choose New again. Refer to the *Installation* part of *Network Services User's Guide* for information on installing new communications tools.

```
┌─────────────────────────────────────────────┐
│  ┌──┐    No terminal emulation tools are      │
│  │░░│    available. The session document was  │
│  └──┘    not opened.                          │
│                                               │
│                           ┌──────────┐        │
│                           │    OK    │        │
│                           └──────────┘        │
└─────────────────────────────────────────────┘
```
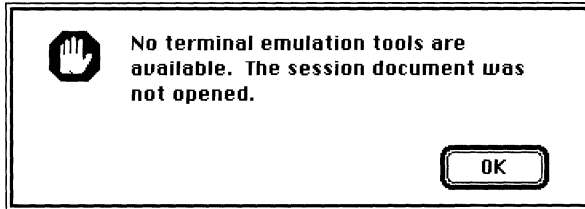
You will still be able to create a new session document when no file transfer tools are available; however, you won't be able to use the following menu commands associated with file transfer:

Settings Menu   File Transfer—although this command will not be dimmed, if you select it, you won't be able to access the settings dialog box. Instead, an **alert message** appears informing you that no file transfer tools are available.

Session Menu   Receive File, Send File—these commands will be dimmed and unavailable.

If you install a file transfer tool, these commands will again be available. See the *Installation* part of *Network Services User's Guide* for instructions on installing communications tools.

When you create a new session document, in addition to opening a window on the desktop, MacTerminal creates a corresponding disk file. MacTerminal requires both read and write access to a disk in order to maintain the disk file. If this access is unavailable, although MacTerminal allows you to create a new session document, the Save Lines Off Top command in the Session menu is dimmed, indicating that you cannot save the data in the session document on a disk file. If you switch to a disk that MacTerminal has write access to and save the document on that disk, the Save Lines Off Top command becomes available again.

Open

This command opens a MacTerminal session document stored on disk. Multiple session documents can be open on the desktop at the same time. The maximum number of session documents that can be open at once is determined by the amount of memory available to MacTerminal and the communications tools, as well as by the amount of memory required by the tools you are using. To check the memory requirements for the tools you are using, see the appropriate modules in the *Communications Tools Reference.*

Choosing the Open command brings up a dialog box that presents a list of the folders and session documents in the folder that contains your MacTerminal application (see the following example).

```
┌─────────────────────────────────────────────────────┐
│  ┌──────────────────────────────┐                    │
│  │ 🖰 MacTerminal Folder │                    │
│  │ ┌────────────────────────────┐            │
│  │ │ ▢ BBS Connection        ▲ │  ⊂⊃ hard disk  │
│  │ │ ▢ Incoming Files        │                │
│  │ │ ▢ Info Services Connection │  ┌──────────┐  │
│  │ │ ▢ Macintosh Connection  │  │  Eject   │  │
│  │ │ ▢ Outgoing Files        │  ┌──────────┐  │
│  │ │ ▢ URH Connection        │  │  Drive   │  │
│  │ │                         │                │
│  │ │                         ▼ │  ┌──────────┐  │
│  │ └────────────────────────────┘  │   Open   │  │
│  │                                  ┌──────────┐  │
│  │                                  │  Cancel  │  │
│  └──────────────────────────────────────────────┘  │
└─────────────────────────────────────────────────────┘
```
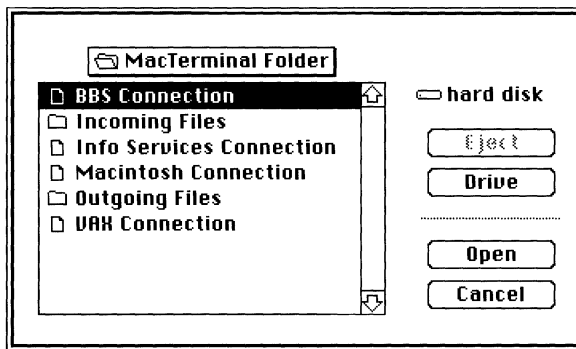
When you open a session document, if one of the communications tools associated with the document is not available, MacTerminal attempts to use a default tool in the same category and displays an alert box informing you of this (as shown in the example below). The default tools are

- Apple Modem Connection Tool
- VT102 Terminal Emulation Tool
- XMODEM File Transfer Tool

```
┌─────────────────────────────────────────────────────┐
│   ⚠   The terminal emulation tool, UT320        │
│       Tool, is not available. Using UT102 Tool.  │
│                                                  │
│                                                  │
│                                  ┌──────────┐    │
│                                  │    OK    │    │
│                                  └──────────┘    │
└─────────────────────────────────────────────────────┘
```
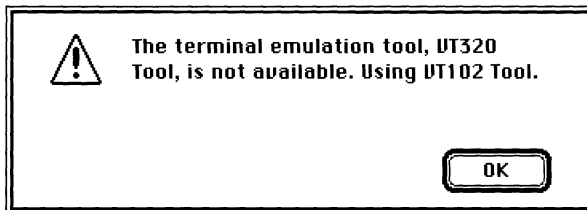
If a default tool is also missing, MacTerminal attempts to find another tool in the same category; if one is not available, you may be unable to open the session document. Refer to the New command for details on how MacTerminal responds when the default tools are unavailable.

MacTerminal requires exclusive read and write access to any session document that it opens (in order to maintain the disk file); if this is not available, MacTerminal displays an alert message informing you that you can't open the session document.

Close

This command closes the top-most window. The Close command is effective within MacTerminal session documents and status windows, as well as within most desk accessories.

When you close a session document, the following information is automatically saved on the disk copy of the session document:

- the settings for the size and placement of the session document window

- the setting for the Save Lines Off Top command in the Session menu (that is, whether or not the command is activated)

- any session data in the scrollback cache region; if the Save Lines Off Top command is activated when you choose the Close command, any data in the terminal region is also saved

If there are unsaved settings changes when you close a session document, the dialog box shown below appears. This dialog box also appears when you close an untitled session document that contains data in the scrollback cache.

```
┌─────────────────────────────────────┐
│  Save changes to "Untitled-1" before │
│  closing?                            │
│   ┌──────────────┐                   │
│   │     Yes      │                   │
│   └──────────────┘                   │
│   ┌──────────────┐  ┌──────────────┐ │
│   │      No      │  │    Cancel    │ │
│   └──────────────┘  └──────────────┘ │
└─────────────────────────────────────┘
```
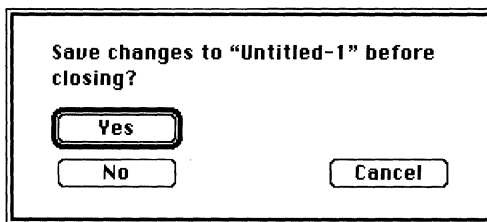
If you click Yes, the page setup settings and any settings made with commands in the Settings menu (except for those made with the Folder for Received Files command) are stored in the disk copy of the session document. If the session document is untitled, the Save As dialog box appears prompting you to name the document (see the explanation of this dialog box in the section which follows on the Save As command). If you click No, neither the settings changes nor the document (in the case of an untitled document) is saved. If you click Cancel, the session document reappears in the window and you may continue to work with it as before you chose the Close command.

◆ **Note** When you choose the Close command, MacTerminal may display various alert messages before closing the session document. For example, if a file transfer is in progress for the session document you are closing, you will be given the chance to return to the session document rather than closing it and interrupting the file transfer. ◆

Save

When you choose the Save command, all changes to settings made since the last time the session document was saved are written to the copy of the session document that is maintained on disk. These include

- changes made with the Page Setup command in the File menu
- changes made with any of the commands in the Settings menu (except for those made with the Folder for Received File command)

◆ **Note** The Save command saves the *settings* for the session document, not the *data* in the session document. If the Save Lines Off Top command in the Session menu is activated, session data is automatically saved into the scrollback cache region as well as on a disk copy of the session document. ◆

If the session document is untitled when you choose the Save command, the Save As dialog box appears prompting you to name the document. (See the explanation of this dialog box in the section which follows on the Save As command.)

◆ **Note** See the description of the Save As command for an explanation of how to name a document or save it on a different disk. ◆

Save As

Like the Save command, the Save As command lets you save the settings for an open session document on the disk copy of the document. In addition, the Save As command lets you specify the name that you want the session document saved under, as well as save the document on a different disk.

You should use the Save As command, instead of the Save command, when you want to accomplish any of the following:

- name an untitled document
- save the document that you are working on as a separate document and keep the old version on the disk
- save a document on another disk

◆ **Note** The Save As command saves the *settings* for the session document, not the *data* in the session document. If the Save Lines Off Top command in the Session menu is activated, session data is automatically saved into the scrollback cache region as well as on a disk copy of the session document. ◆

When you choose the Save As command, a dialog box (like the following one) appears with a place for you to type a name. After naming a document, you save it on the disk named in the dialog box by clicking the Save button. If the disk already contains a document with that name, you are asked to confirm that you want the document that you are saving to replace the existing one.
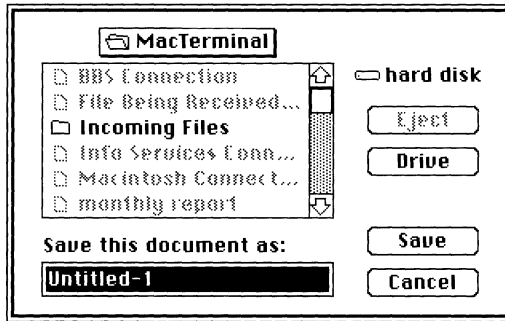
Revert To Saved

The Revert To Saved command causes the following settings of the active session document to revert to the settings used when the session document was last saved:

- settings changed with the Page Setup command in the File menu
- settings changed with any of the commands in the Settings menu—however, the Folder For Received File settings revert to the folder that contains the session document, rather than to the folder specified when the document was last saved
- settings for the Saved Lines Off Top command

When you choose the Revert To Saved command, a confirmation dialog box like the one below appears.
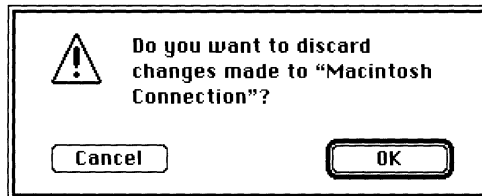
If you click Cancel, the settings remain as they were before you chose the Revert To Saved command; if you click OK, the settings revert to the last saved version. If a connection is open to another computer when you click OK, a dialog box appears informing you that the connection will be broken by the revert-to-saved operation. If a file transfer is in progress, a dialog box appears informing you that, in addition to the connection being broken, the file transfer will be terminated. These dialog boxes give you the opportunity to cancel the revert-to-saved operation if you don't want to interrupt the file transfer or break the connection.

Page Setup

The Page Setup command lets you specify the following page setup options:

- the size of paper on which you will be printing
- whether printing will be across the width of the paper or sideways across the length of the paper
- whether to reduce the size of the type
- what special printer effects to use

    A dialog box presents the various options as shown below.

```
┌─────────────────────────────────────────────────────────┐
│ LaserWriter Page Setup                        6.0    ┌──────────┐
│                                                      │    OK    │
│ Paper: ● US Letter  ○ A4 Letter                      └──────────┘
│        ○ US Legal   ○ B5 Letter  ○ │ Tabloid │       ┌──────────┐
│                                                      │  Cancel  │
│        Reduce or ┌───┐ %      Printer Effects:       └──────────┘
│        Enlarge:  │100│        ⊠ Font Substitution?   ┌──────────┐
│                  └───┘        ⊠ Text Smoothing?      │ Options  │
│        Orientation            ⊠ Graphics Smoothing?  └──────────┘
│        ┌──┐ ┌──┐              ⊠ Faster Bitmap Printing? │ Help │
│        │  │ │  │                                     └──────────┘
│        └──┘ └──┘
└─────────────────────────────────────────────────────────┘
```
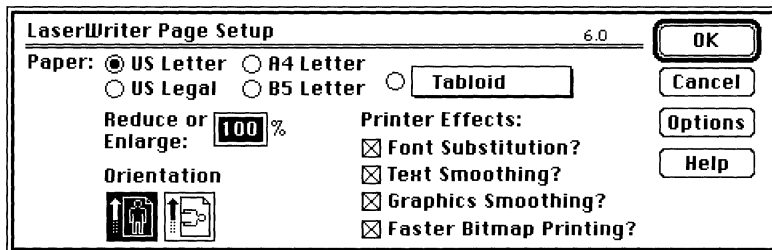
    If your font size is 9 point and your terminal width is 80 columns, you shouldn't have to change the preset options. But if you are using a larger font size or more columns, you may have to change some of the options; otherwise, some of the columns of data will overflow the first page and be printed on a second page (if there is no data in these columns, you'll get a blank page after each full page). To fit all the columns on a single printed page, you may need to use reduction (specify a percentage in the Reduce or

Enlarge box), choose horizontal orientation, or do both. For example, to print with a 9-point font and 132-column width, use horizontal orientation and reduce to 90%.

◆ **Note** The Page Setup command and is only available if printing is enabled; printing is disabled if there are no printer drivers in the **System Folder** of the **startup disk.** ◆

Print Selection/Print

The Print command prints all of the lines stored in the scrollback cache region, as well as the lines currently displayed in the terminal region of the session document window. The Print command can be chosen from the Finder, as well as from within a session document.

The Print Selection command prints what is selected in the open session document. With the Print Selection command, you can print a selection from either the current terminal region or from the scrollback cache region. You can also print data from both regions at once, by dragging the I-beam over the dotted line when you make the selection. When nothing is selected in the session document, the Print Selection command is dimmed and unavailable in the menu.

△ **Important** The terminal emulation tools that accompanied your MacTerminal application use special monospaced fonts, which are included with the tools on the PATHWORKS V1.0 volume. When you are printing to a LaserWriter using background printing or to an ImageWriter, you should install these fonts in your system file; otherwise, the printer will use another font (most likely one that is not a monospaced font) and printing will not be spaced properly. Use the Font/DA Mover to install the fonts on your System file (if you need help, refer to the manuals that accompanied your Macintosh).

If you don't want to install special fonts, you can still print properly to a LaserWriter by deactivating background printing (with the Chooser desk accessory on the Apple menu). However, you will not be able to print properly to an ImageWriter unless you install the appropriate fonts. △

When you choose either the Print command or the Print Selection command, a dialog box presents the various options (see the following example); you can print a single page or a range of pages, as well as print multiple copies.

```
┌─────────────────────────────────────────────────────────────┐
│ LaserWriter "Glue and Baling Wire II Spooler"    6.0   ┌──────────┐ │
│                                                        │    OK    │ │
│ Copies:[1]          Pages: ⦿ All  ○ From:[  ] To:[  ]  └──────────┘ │
│                                                        ┌──────────┐ │
│ Cover Page:    ⦿ No ○ First Page  ○ Last Page          │  Cancel  │ │
│                                                        └──────────┘ │
│ Paper Source: ⦿ Paper Cassette  ○ Manual Feed          ┌──────────┐ │
│                                                        │   Help   │ │
│ Print:         ⦿ Color/Grayscale ○ Black & White       └──────────┘ │
└─────────────────────────────────────────────────────────────┘
```
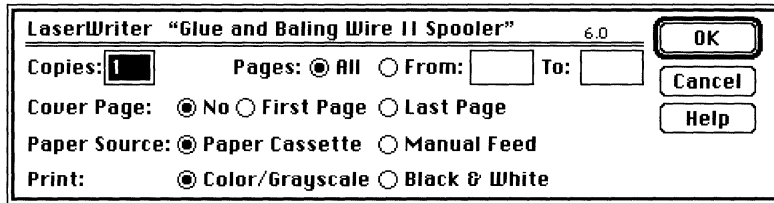
During printing, a dialog box appears. You can stop printing at any time by clicking the Cancel button or by holding down the ⌘ key and pressing the period (.) key.

```
┌───────────────────────────────────────┐
│                                       │
│   "Macintosh Connection" is now being │
│   printed.                            │
│                                       │
│   [ Cancel ]                          │
│                                       │
└───────────────────────────────────────┘
```
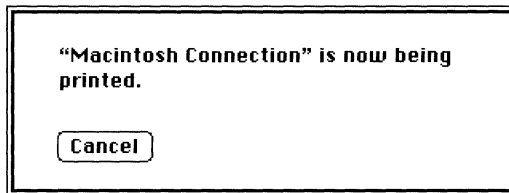
◆ **Note** The width of the data that is printed (80 or 132 columns) is determined by the width in your terminal settings. If you have data in your scrollback cache region that is 132 columns wide, and your terminal emulation tool is set to an 80-column width, you won't see data that extends past the 80th column. To print the entire width, set the terminal width to 132 columns before printing (use the Terminal command in the Settings menu). Also, if you are printing data that is larger than 9 points or that is more than 80 columns wide, it may not all fit on one printed page. When the columns of data don't fit onto the page, the columns that overflow are printed on a second page; you'll get one full page and a second page with the just the characters at the ends of lines (if there is no data in the columns that overflow, the second page will be blank). See the Page Setup command for help correcting this problem. ◆

Quit

The Quit command closes all active MacTerminal windows and returns you to the Finder (or if you launched MacTerminal from within another application, to that application). If session documents are open when you choose the Quit command, MacTerminal may display various alert boxes before closing the document (see the Close command earlier in this chapter for more information about the alert boxes that may appear).

The Edit menu

```
┌─────────────────────────────────────┐
│ Edit                                 │
├─────────────────────────────────────┤
│ Undo Connection Change          ⌘Z   │
│ ·································     │
│ Cut                             ⌘H   │
│ Copy                            ⌘C   │
│ Copy Table                           │
│ Paste                           ⌘U   │
│ Clear                           ⌘B   │
│ Select All                      ⌘A   │
│ ─────────────────────────────────── │
│ Show Clipboard                       │
└─────────────────────────────────────┘
```

The Edit menu contains the commands for editing while using MacTerminal. In addition, this menu includes the Undo/Redo command, which lets you reverse setup operations. The Cut and Clear commands are dimmed because they cannot be used in MacTerminal session documents.

Undo.../Redo...

This command reverses a previous setup operation. The setup operations that can be reversed are those made with the Page Setup command in the File menu or with any of the commands in the Settings menu.

The text that follows "Undo" or "Redo" changes to indicate the operation that is being undone or redone. For example, if the last reversible operation was a change made with the Connection command, the text of the Undo command reads "Undo Connection

Change." After you select Undo Connection Change, the text of the command changes to "Redo Connection Change," until the next reversible operation is performed.

When an operation cannot be undone, this command is dimmed and renamed "Can't Undo."

Cut

The Cut command can be used only with desk accessories. Cut removes a selection from a window and places the selection in the Clipboard, replacing the Clipboard's current contents. You may then paste the contents of the Clipboard into another spot in the same window or into another document.

Since MacTerminal does not permit you to remove data from a session document, you cannot use the Cut command in a session document. Therefore, the session document can serve as a historical record of the session. (Note that you can use the Copy command to copy a selection from a session document into the Clipboard.)

The Cut command is dimmed while you are in a session document or when nothing is selected in the top-most window.

Copy

The Copy command copies a selection from a MacTerminal session document or from a desk accessory and places it in the Clipboard, replacing anything already in the Clipboard. You may then paste the contents of the Clipboard into another spot in the same window or into another document.

You can use the Copy command within session documents, as well as within certain desk accessories. In a session document, you can copy data from either the current terminal region or the scrollback cache region. You can also copy data from both regions at once, by dragging the I-beam over the dotted line when you make the selection.

You can use the Copy command to copy any selected text; however, if you're copying columns of data for an application that expects tab delimiters, you should choose the Copy Table command instead.

The Copy command is dimmed when nothing is selected in the top-most window.

Copy Table

The Copy Table command copies a table selected from a MacTerminal session document and places the table in the Clipboard, replacing anything already in the Clipboard.

This command changes two or more spaces to tabs so that data remains in columns when you paste a table into certain spreadsheet applications that require tabs in order to set up columns. Some Macintosh spreadsheet applications, like Microsoft Excel, will paste a table in its proper format only if the table uses tab characters to separate the columns. If you are working with such an application, you should use the Copy Table command, instead of the Copy command, to copy tabular data.

The Copy Table command is dimmed when nothing is selected in the top-most window.

Paste

The Paste command copies the contents of the Clipboard into the open window at the current insertion point. If you are communicating with another computer, when you paste something into a session document, the pasted data is sent to the other computer. The other computer does not detect a difference between the data pasted in from the Clipboard and data typed in from the keyboard.

If the other computer can't receive data as fast as your Macintosh is sending it, you can use the Paste Options command in the Settings menu to control the character and line transmission delays for paste operations performed in session documents. Refer to the Paste Options command later in this chapter for additional information about how and when to set transmission delays between characters and between lines.

You can cancel a paste operation that is in progress by holding down the Command key and pressing the period (.) key.

If the Clipboard is empty, the Paste command is dimmed.

Clear

The Clear command can be used only with desk accessories. Clear removes a selection from a window without placing the selection in the Clipboard.

Since MacTerminal does not permit you to remove data from a session document, you cannot use the Clear command in a session document. Therefore, the session document can serve as a historical record of the session.

The Clear command is dimmed while you are in a session document or when nothing is selected in the top-most window.

Select All

The Select All command selects all of the data in the active window. If the active window is a session document, this command selects all the lines that are currently in the terminal region as well as all the lines in the scrollback cache region.

To turn off the selection, click anywhere within the window.

Show Clipboard

The Show Clipboard command displays a window that contains the current contents of the Clipboard, that is, whatever you last cut or copied.

You can leave the Clipboard open for reference on your desktop. When the Clipboard is open, the Show Clipboard command is renamed "Hide Clipboard." To close the Clipboard, choose Hide Clipboard, click the close box in the top-left corner of the window, or choose Close from the File menu.

The Settings menu

```
┌─────────────────────────────────┐
│ Settings                        │
├─────────────────────────────────┤
│ Connection...                   │
│ Terminal...                     │
│ File Transfer...                │
├─────────────────────────────────┤
│ Folder for Received Files...    │
│ Saved Lines...                  │
│ Paste Options...                │
│ Connect on Open                 │
└─────────────────────────────────┘
```
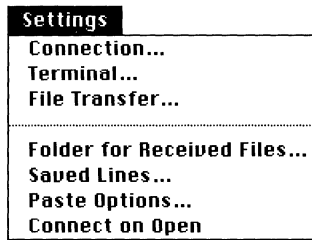
You'll use the Settings menu to set the various attributes of your MacTerminal communications environment. The Connection, Terminal, and File Transfer commands are used to define the type of communications session established between your Macintosh and another computer. The Folder for Received Files command lets you choose the folder to which incoming files should be directed. With the Saved Lines command, you specify how information is saved in the scrollback cache. You use Paste Options to specify the delay used between characters and lines when pasted text is being transmitted to another computer. With the Connect on Open command, you can set up MacTerminal to automatically attempt to establish a connection whenever you open the session document.

◆ **Note** The commands in the Settings menu are available only in session documents. When you choose a command from the Settings menu, it affects only the session document in the top-most window. ◆

Connection

You use the Connection command to choose the connection method for the communications session and to configure the communications parameters associated with the method. To send and receive data, your Macintosh and the other computer must use compatible connection methods with compatible communications parameters.

When you choose the Connection command, a settings dialog box like the sample below appears. You use the Method pop-up menu to specify the connection tool to be used for the session. The choices in this menu correspond to the connection tools that are installed in the Communications Folder in your System Folder. In the example, you can choose between the Apple Modem Tool and the Serial Tool, two of the connection tools included with your MacTerminal application. If you install additional connection tools, such as AppleTalk ADSP Tool, LAT Tool, or CTERM Tool, they will also be listed in the Method menu.
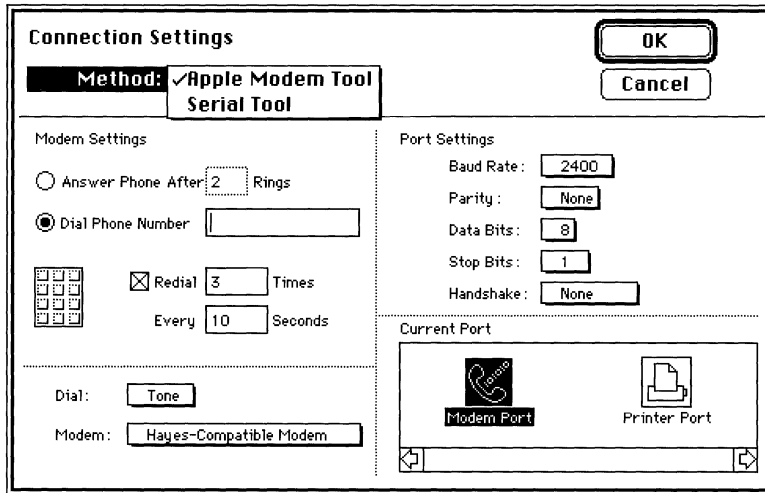
The setup options that appear in the lower part of the dialog box (below the solid horizontal line under the Method menu) depend on the connection method selected. When the method is changed via the pop-up menu, the lower part of the dialog box changes to show setup options for the communications parameters associated with the chosen connection tool.

Usually, the access instructions for the host that you are communicating with will tell you what settings to use for these setup options. See the modules on the Apple Modem, AppleTalk ADSP, LAT, and Serial tools (in the *Communications Tools Reference*) for detailed descriptions of the setup options for the connection tools included with MacTerminal.

Terminal

You use the Terminal command to designate the type of terminal that your Macintosh will emulate during the communications session, as well as to set up terminal-specific characteristics.

When you choose the Terminal command, a settings dialog box like the sample below appears. You use the Emulation pop-up menu to specify the type of terminal to emulate. The choices in the menu correspond to the terminal emulation tools that are installed in the Communications Folder in your System Folder. In the example, you can choose between the TTY Tool, VT102 Tool, and VT320 Tool, the three terminal emulation tools included with your MacTerminal application. If you install additional terminal emulation tools, they will also be listed in the Emulation menu.
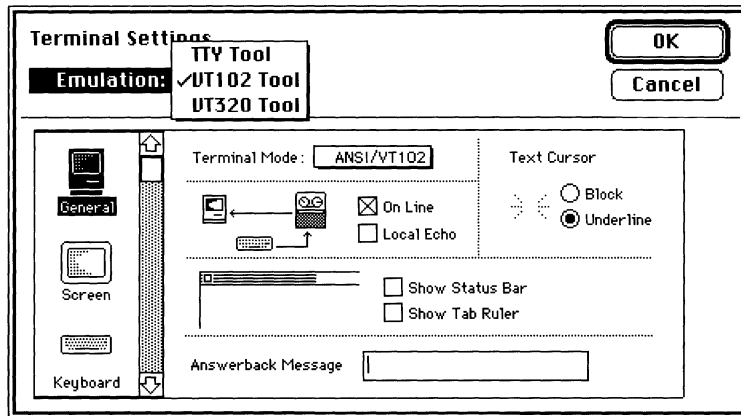
The setup options that appear in the lower part of the dialog box (below the solid horizontal line under the Emulation menu) depend on the terminal emulation selected. When the emulation is changed via the pop-up menu, the lower part of the dialog box changes to show the setup options for the chosen terminal emulation tool.

The settings you should use for your terminal emulation tool depend on the requirements of the computer with which you are communicating, as well as on the requirements of any application you might be using on the other computer. Turn to the modules on the TTY Tool, VT102 Tool, and VT320 Tool (in the *Communications Tools Reference*) for detailed descriptions of the setup options for the terminal emulation tools included with MacTerminal.

File Transfer

You use the File Transfer command to select a file transfer protocol and set protocol-specific features. A file transfer protocol defines the way MacTerminal sends and receives files; each file transfer protocol represents an agreement between two computers about how they will exchange files. For successful file transfers, both computers should use compatible protocols with any protocol-specific features defined compatibly.

When you choose the File Transfer command, a settings dialog box like the sample below appears. You use the Protocol pop-up menu to select a file transfer tool. The choices in this menu correspond to the file transfer tools that are installed in the Communications Folder in your System Folder. In the example, you can choose between the Text Tool and XMODEM Tool, the two file transfer tools included with your MacTerminal application. If you install additional file transfer tools, they will also be listed in the Protocol menu.
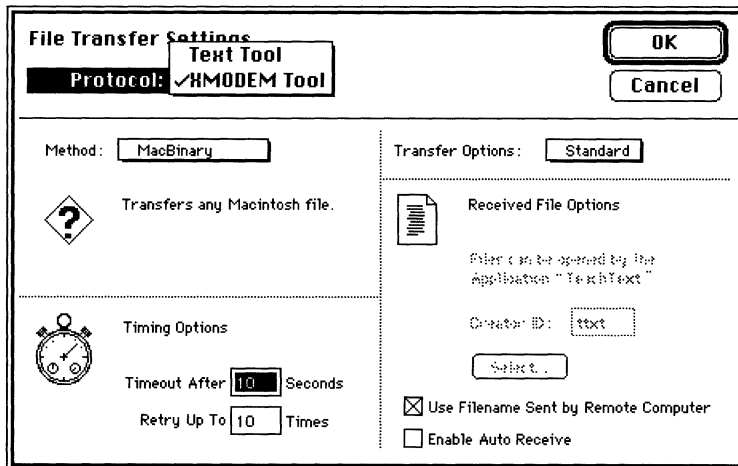
The setup options that appear in the lower part of the dialog box (below the solid horizontal line under the Protocol menu) depend on the file transfer protocol selected. When the protocol is changed via the pop-up menu, the lower part of the dialog box changes to show the setup options for the chosen file transfer tool.

Turn to the modules on the Text Tool and XMODEM Tool (in the *Communications Tools Reference*) for detailed descriptions of the setup options for the file transfer tools included with MacTerminal. If you aren't sure how to set up your file transfer tool, contact your system administrator or the administrator for the computer you are communicating with, or experiment with the setting yourself until you succeed in transferring files intact.

If no file transfer tools are present in the Communications Folder in your System Folder, when you choose the File Transfer command, you will be unable to access the settings dialog box and MacTerminal will display the following alert box.

```
┌─────────────────────────────────────────────┐
│  ⚠   No file transfer tools are available.   │
│                                              │
│                                              │
│                                              │
│                               ┌────────┐     │
│                               │   OK   │     │
│                               └────────┘     │
└─────────────────────────────────────────────┘
```
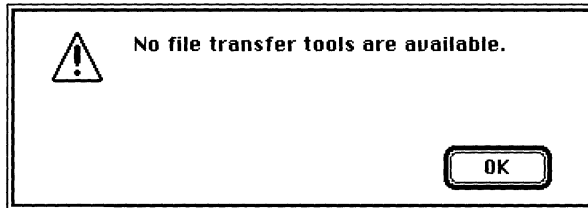
Folder for Received Files

This command lets you specify the folder that files should be stored in when they are received from another computer. When you choose Folder for Received Files, a dialog box appears that presents a list of the folders in the folder that was last selected (see the sample on the next page). If you have not previously selected a folder, you'll see a list of the folders in the folder that contains your session document.

You select a folder by highlighting it and then clicking the Select button. If the folder to which you want to direct files is within one of the folders on the list, open the folder by double-clicking it or by selecting it and clicking the Open button. If the folder to which you want to direct files is the one whose contents are being displayed (*MacTerminal 3.0* in the following example), choose the Select Current Folder button. Click the Drive and Eject buttons to direct files to a folder on a different disk.

```
┌─────────────────────────────────────────────────────────┐
│  Select Default Folder for Received Files:              │
│         ┌──────────────────────────┐                    │
│         │   Select Current Folder  │                    │
│         └──────────────────────────┘                    │
│            ┌─────────────────────┐    ⊂⊃ hard disk      │
│            │ 🗀 MacTerminal 3.0  │                       │
│            └─────────────────────┘    ┌──────────────┐  │
│   ┌──────────────────────────┬──┐     │    Eject     │  │
│   │ 🗀 Connections          │⬆ │     └──────────────┘  │
│   │ 🗀 Incoming Files       │  │     ┌──────────────┐  │
│   │ 🗀 Memos               │  │     │    Drive     │  │
│   │ 🗀 Outgoing Files      │  │     └──────────────┘  │
│   │                         │  │                        │
│   │                         │  │     ┌──────────────┐  │
│   │                         │  │     │    Select    │  │
│   │                         │  │     └──────────────┘  │
│   │                         │  │     ┌──────────────┐  │
│   │                         │  │     │    Open      │  │
│   │                         │⬇ │     └──────────────┘  │
│   └──────────────────────────┴──┘     ┌──────────────┐  │
│                                        │   Cancel     │  │
│                                        └──────────────┘  │
└─────────────────────────────────────────────────────────┘
```
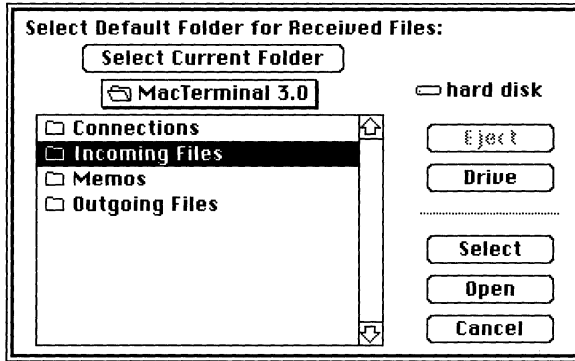
Saved Lines

When the Save Lines Off Top command in the Session menu is activated, the data in your MacTerminal session document is saved on a disk copy of the session document, as well as being displayed in the scrollback cache region of the session document window as it overflows the terminal region. You'll use the Saved Lines command to set the options for how you want to save this data. This command lets you specify how much data you want to save and whether or not you want to save full screens of data (when a remote application sends an entire screen of data and then clears the screen before sending the next full screen of data).

You can use the Saved Lines command at any time when a session document is the top-most window. When you choose Saved Lines, the following dialog box appears.

```
┌───────────────────────────────────────────────┐
│  Saving Lines Off Top Settings...             │
│                                               │
│  When Saving Lines Off Top,                   │
│    ⦿ Save As Much As Possible                 │
│    ○ Save a Maximum of  [ 100    ] K          │
│                                               │
│  ☒ Save Screen Before Clearing                │
│                                               │
│              ┌──────────┐  ┌───────────┐      │
│              │  Cancel  │  │    OK     │      │
│              └──────────┘  └───────────┘      │
└───────────────────────────────────────────────┘
```
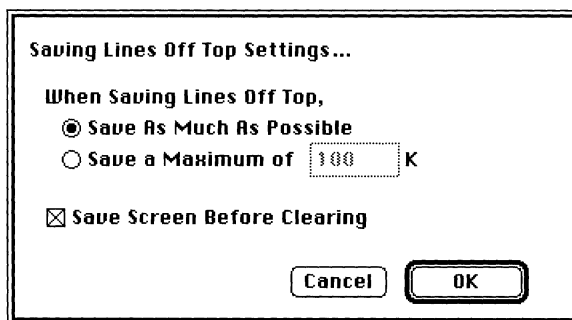
You may choose to save as much data as the disk containing your session document can handle or to specify a limit (in kilobytes).

You should use the Save Screen Before Clearing option when you are communicating with a host that sends a full screen of information, then clears the screen without scrolling. When Save Screen Before Clearing is selected, MacTerminal saves the contents of each full screen of information before clearing the screen; if this option is not selected, MacTerminal just clears the screen without saving its contents. (Remember, to save screens, you must also have chosen the Save Lines Off Top command from the Session menu.) The Save Screen Before Clearing option will be selected unless you deselect it.

When saving lines or saving screens, MacTerminal saves the data in the scrollback cache on the disk copy of the session document. During the communications session, if you reach the limit you have specified for the scrollback cache, MacTerminal

■ deactivates the Save Lines Off Top command

■ stops saving the incoming data on disk

■ displays the following alert box informing you that the limit has been reached

```
┌─────────────────────────────────────────┐
│  ⚠   The Saving Lines Off Top limit has been  │
│      reached.  Saving Lines Off Top is being  │
│      turned off.                              │
│                                               │
│                          ┌────────────┐       │
│                          │     OK     │       │
│                          └────────────┘       │
└─────────────────────────────────────────┘
```
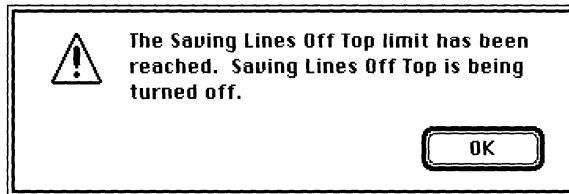
To save the rest of your session, you may need to increase the limit you specified for the scrollback cache. Or, if you specified to save as much data as possible, you'll need to free some space on the disk containing the session document or save the session document on another disk (using the Save As command from the File menu).

Paste Options

The Paste Options command controls the intercharacter and interline time delays for paste operations performed in session document windows.

If you are communicating with another computer, when you paste something into a session document, the pasted data is sent to the other computer. If the other computer can't process the data as fast as the Macintosh is sending it, you can slow down the rate at which data is sent by setting transmission delays between the characters sent or between the lines sent, thus preventing data loss.

When you choose the Paste Options command, the following dialog box appears.

```
┌────────────────────────────────────────────┐
│  Paste Options                             │
│    When Sending Text...                    │
│                                            │
│       Delay Per Character    ┌──────────┐  │
│       (60ths of a Second)    │ 0        │  │
│                              └──────────┘  │
│       Delay Per Line         ┌──────────┐  │
│       (60ths of a Second)    │ 0        │  │
│                              └──────────┘  │
│                     ┌────────┐ ┌────────┐  │
│                     │ Cancel │ │   OK   │  │
│                     └────────┘ └────────┘  │
└────────────────────────────────────────────┘
```
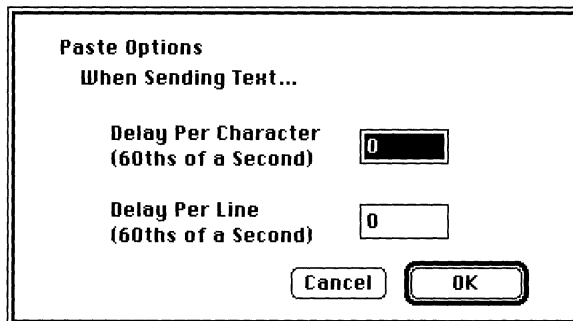
To slow down transmission, try experimenting with the delays until you find a setting that ensures the data is delivered intact. Start by setting the delay between lines and then try adjusting the delay between characters. Delays are specified in 60ths of a second and may range from 0 to 32767. The default for both delays is 0, no delay.

Connect on Open

When you select the Connect on Open command, the session document that you are in is set up to automatically attempt to establish a connection to another computer every time you open the document; that is, when you open the session document, MacTerminal automatically issues the Open Connection command.

When you open a new session document, the Connect on Open command is deactivated. To activate the command, you simply choose it; a check mark will appear next to the command name in the menu. To deactivate the Connect On Open command, simply choose the command again; the check mark disappears, indicating that the command is no longer active. The next time you open the session document, MacTerminal will not attempt to automatically open a connection.

The Session menu

```
Session
  Open Connection    ⌘I
  Close Connection   ⌘K
  Wait for Connection
  ┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈
  Receive File...    ⌘R
  Send File...       ⌘T
  ┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈
✓Save Lines Off Top  ⌘L
  Clear Saved Lines
  Clear Screen
  ┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈
  Reset Connection
  Reset Terminal
  Send Break         ⌘Y
```

The Session menu contains commands that affect the operation of MacTerminal during a communications session. You'll choose some of these commands as responses to situations created by the other computer with which you are communicating.

◆ **Note** The commands in the Session menu are available only in session documents. When you choose a command from the Session menu, it only affects the session document in the top-most window. ◆

Open Connection

The Open Connection command establishes (*opens*) a connection to another computer based on the settings specified with the commands in the Settings menu. You must open a connection before you can start exchanging information with another computer.

If your Macintosh is directly connected to another computer, you can issue the Open Connection command at any time. In this case, as soon as you issue the Open Connection command, you can begin to exchange data with the other computer.

If you are using a modem and a connection tool that supports automatic dialing, you start a communications session by turning on the modem and choosing the Open Connection command. If you haven't entered an access phone number in the settings dialog box for the connection tool being used, the tool may display a dialog box similar to the one shown below, prompting you to enter a phone number.

There is no phone number listed.
Please enter a temporary one below.

[Cancel]   [**Dial**]
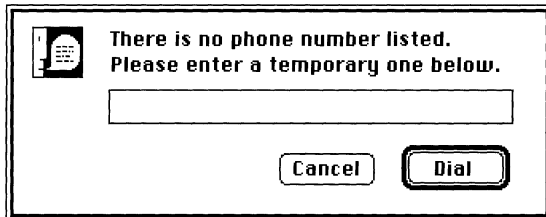
With some modems, you may hear connection noises as the modem is dialing and a brief high-pitched sound when the other computer answers. Depending on the connection tool you are using, various status messages may appear providing you with information about the connection attempt. For example, when you open a connection using the Apple Modem Connection Tool, the first message looks like this.

▤▤▤ Modem Status ▤▤▤

Initializing modem...

[Cancel]
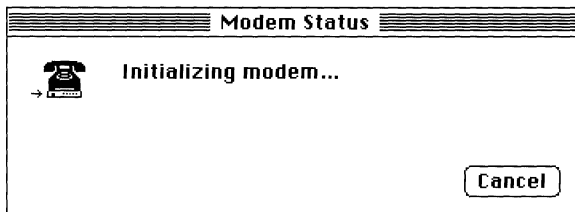
Next a dialing message may be displayed. The following status box is displayed by the Apple Modem Connection Tool while it is dialing.
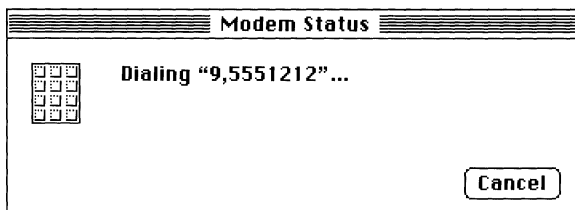
▤▤▤ Modem Status ▤▤▤

Dialing "9,5551212"...

[Cancel]

If the connection attempt succeeds, a connection message similar to the sample below is displayed. (The actual wording of the message depends on the modem being used.)

```
▤▤▤▤▤▤▤▤▤▤▤ Modem Status ▤▤▤▤▤▤▤▤▤▤▤

    ☎          The connection was established at 2400
               baud.


                                              [  OK  ]
```
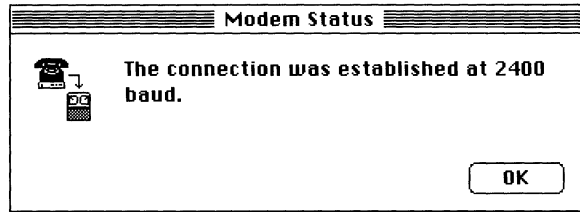
When a problem occurs during the connection attempt, a dialing status message is displayed. Refer to the documentation on the specific tool you are using for explanations of the status messages that may be displayed. The connection tools included with MacTerminal are described in the *Communications Tools Reference.*

If you have more than one MacTerminal connection open or are using other applications that access the serial port, when you attempt to establish a MacTerminal connection though the serial port, the dialog box shown below may appear. In this case, you need to close the document or application that is tying up access to the serial port before your connection attempts will succeed.

```
Sorry — The serial port selected is not
presently available.




                                   [  OK  ]
```
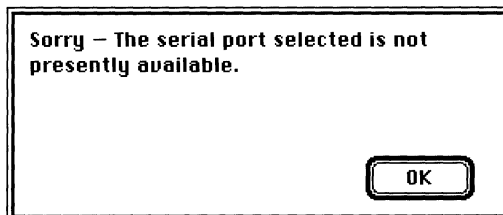
Close Connection

The Close Connection command breaks the connection for the active session document. You should also choose Close Connection when you have previously chosen the Wait for Connection command, but no longer want MacTerminal to respond to open connection requests from other computers.

Once you choose Close Connection, you will not be able to resume data exchanges until you choose the Open Connection command (or until you choose the Wait for Connection command and the other computer opens a connection).

When you choose the Close Connection command, depending on the connection tool being used, various status messages may appear indicating the status of the connection closing request. Refer to the documentation on the specific tool you are using for explanations of the status messages that may be displayed. The connection tools included with MacTerminal are described in the *Communications Tools Reference.*

The Close Connection command is dimmed and unavailable unless you have chosen either the Open Connection Command or the Wait for Connection command.

◆ **Note** If you suspect that the connection has been broken, but the Close Connection command is still highlighted while the Open Connection command remains dimmed, your connection tool may not have detected that the connection was dropped. In this case, choose Close Connection and the Open Connection command will be accessible again. ◆

Wait for Connection

The Wait for Connection command directs your Macintosh to wait for an open connection request from another computer, that is, to wait for an incoming call from another computer. Whether or not you can set up your Macintosh to wait for a connection request depends on the connection tool you are using. The Apple Modem Connection Tool supports this feature, but the Serial Connection Tool doesn't.

If you choose Wait for Connection and you are using a tool that does not support this feature, a dialog box appears informing you that you cannot set up your Macintosh to wait for a connection request.

If you are using a connection tool that supports this feature, when you choose Wait for Connection, MacTerminal attempts to open a connection whenever an open-connection request is received from another computer. With modem connection tools, when you choose the Wait For Connection command, the tool prepares the modem to respond to an open-connection request. In this case, the tool may display a modem initialization message and then another message (like the one shown below) letting you know that the modem tool is waiting for a connection request.

```
┌─────────────────────────────────────────────┐
│ ══════════ Modem Status ══════════          │
├─────────────────────────────────────────────┤
│                                             │
│    🕾     Waiting for call...                │
│  →▭                                         │
│                                             │
│                                             │
│                              ( Cancel )     │
│                                             │
└─────────────────────────────────────────────┘
```
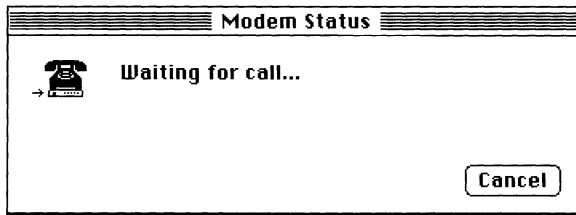
Some connection tools may not display a status message. In this case, the Open Connection command remains accessible even after you have chosen the Wait for Connection command, so you can still initiate a connection while your Macintosh is set up to wait for a connection.

When you no longer want MacTerminal to respond to open-connection requests, choose Close Connection from the Session menu.

◆ **Note** Some connection tools, for example, the Apple Modem Connection Tool, provide an answer mode. Setting the tool to answer mode and choosing Open Connection has the same effect as choosing the Wait for Connection command. ◆

Receive File

The Receive File command lets you receive a file from another computer. You use this command each time you receive an incoming file, unless you are using a file transfer method that supports automatic file reception. (For example, with the XMODEM MacTerminal 1.1 method, sending a file causes the receiving computer to automatically go into file reception mode).

◆ **Note** Before choosing the Receive File command, you may want to use the Folder for Received Files command in the Settings menu to specify where you want to store files that you receive. ◆

The Receive File command is dimmed in the menu and cannot be chosen until you establish your connection with the Open Connection command (or if you have chosen the Wait for Connection command, until the other computer sends an open connection request). In addition, before using the Receive File command, you may need to confirm that the file transfer protocol settings (set with the File Transfer command in the Settings menu) are correct for the type of file transfer that you are performing.

◆ **Note** The Receive File command is also dimmed when you are using a file transfer method that automatically invokes file receipt (for example, XMODEM MacTerminal 1.1) or one that does not support file receipt (for example, the Text File Transfer Tool). ◆

Depending on the file transfer tool that you are using, after you choose Receive File, a file transfer status dialog box (like the following example) may appear to inform you of the progress of the transmission. For information on how to read status dialog boxes, refer to the documentation on the specific file transfer tool you are using. The file transfer tools included with MacTerminal are described in the *Communications Tools Reference.*

```
╔═══ File Transfer Status for "CompuServe Connection" ═══╗
║ Downloading "Poker Game"...                            ║
║   ┌───┐      ┌───┐     Method:       MacBinary         ║
║   │▫▫▫│ ◄──  │▨▨▨│     Option In Use: Standard         ║
║   └───┘      └───┘                                     ║
║ ┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈  ║
║ File Size:           3892 bytes                        ║
║ Blocks Transferred:  11                                ║
║ Bytes Transferred:   1408                              ║
║ Time Remaining:      1 minute(s).                      ║
║ Status:              Receiving incoming data.          ║
║ ▨▨▨▨▨▨▨▨▨▨▨▨▨▨░░░░░░░░░░░░░░░░░░░░░░░   ┌────────┐      ║
║ 0  10  20  30  40  50  60  70  80  90  100%  │ Cancel │      ║
╚═══════════════════════════════════════└────────┘══════╝
```
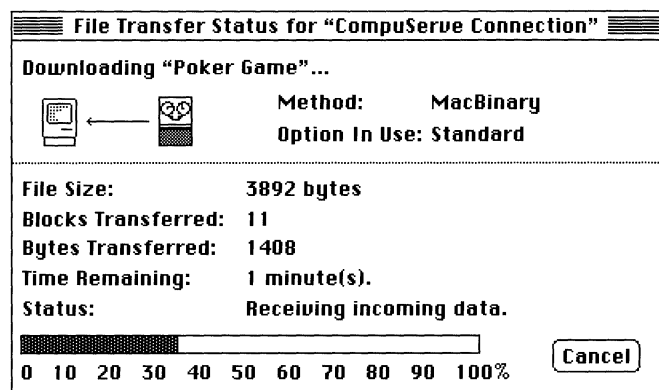
MacTerminal receives the file and sends it immediately to a disk. Depending on the file transfer tool you are using, you may be able to stop a transmission by clicking the Cancel button if one appears in the file transfer status dialog box.

In most cases, when the file transfer is complete, a Save As dialog box appears that you can use to name the file and to specify the folder where the file should be saved (see the following example). If, before you chose the Receive File command, you used the Folder For Received Files command to specify the folder where incoming files should be directed, the contents of that folder appear in the dialog box.
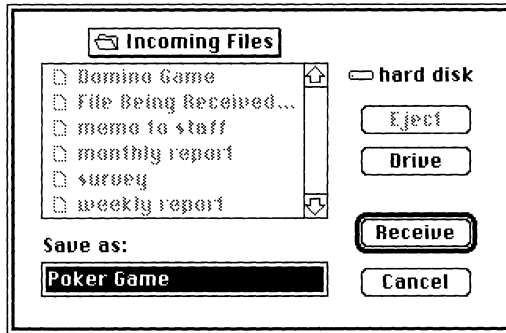
After you finish specifying how to save the file, you save it by clicking Receive or pressing the Return key. If a file already exists on this disk with the name you typed, you are asked to confirm that you want the new file to replace the existing one. If you decide not to save the file, you can click Cancel.

With some file transfer tools, the disk file is automatically given the same name as the incoming file. In these cases, when file transmission is complete, a Save As dialog box does not appear; however, you can tell that the file transfer is complete because your Macintosh will sound two beeps. The incoming file is automatically saved either in the folder that contains the session document you are using or, if one has been selected, in the folder indicated with the Folder for Received Files command.

◆ **Note** Once you start a file transfer, you may want to let the file transfer go on in the background while you are working in another session document, or even in another application. Remember, commands in the Settings and Session menus only affect the top-most window, so you have to move the session document to the foreground before choosing commands that will act on the session. ◆

Send File

The Send File command sends a file from a disk to another computer. You use this command each time you want to send a file.

The Send File command is dimmed and cannot be chosen until you establish your connection with the Open Connection command (or, if you have chosen the Wait for Connection command, until the other computer sends an open connection request). In addition, before using the Send File command, you should confirm that the file transfer protocol settings (set with the File Transfer command in the Settings menu) are correct for the type of file transfer you are performing.

When you choose Send File, a dialog box like the one shown below presents a list of the files that can be transferred based on the current file transfer protocol settings.

```
┌─────────────────────────────────────────────┐
│        ┌──────────────────┐                  │
│        │ 🖼 MacTerminal │                  │
│     ┌──────────────────────────┐             │
│     │ □ BBS Connection        ⬆ │  ⬛ hard disk │
│     │ □ Commercial Services Co...│             │
│     │ □ Incoming Files         │  ┌─────────┐  │
│     │ □ Macintosh Connection   │  │  Eject  │  │
│     │ □ memo to staff          │  ├─────────┤  │
│     │ □ monthly report         │  │  Drive  │  │
│     │ □ Outgoing Files         │  └─────────┘  │
│     │ □ UAH Connection         │  ┌─────────┐  │
│     │ ■ weekly report        ⬇ │  │  Send   │  │
│     └──────────────────────────┘  ├─────────┤  │
│                                   │ Cancel  │  │
│                                   └─────────┘  │
└─────────────────────────────────────────────┘
```
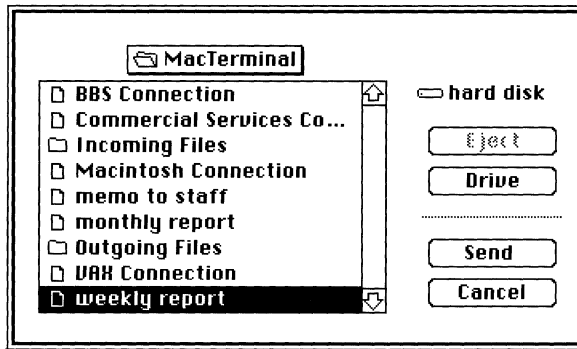
The types of files listed—documents, applications, text files, or system files—depend on the file transfer tool that you select with the File Transfer command in the Settings menu. For example, if you are using the Text File Transfer Tool or the XMODEM Text method with the XMODEM File Transfer Tool, only text files appear. (All MacTerminal session documents are saved as text files.) With the other XMODEM methods supported by the XMODEM File Transfer Tool, you see all the Macintosh files on the disk— documents, system files, and applications.

The Eject and Drive buttons in this dialog box let you send a file from another disk. If you decide you don't want to send a file, you can dismiss this dialog box by clicking the Cancel button.

◆ **Note** If the file that you want to transfer does not appear on the list (even after you've selected the appropriate disk), you may need to change the file transfer tool or its settings. ◆

When you select a file, then confirm the command by clicking Send or by pressing the Return key, MacTerminal sends the file to the other computer. With most file transfer tools, a File Transfer Status dialog box (see the example below) appears showing you the progress of the transmission; you will not see the actual text of the file on your screen. Refer to the documentation on the specific file transfer tool you are using for information on status dialog boxes. The file transfer tools included with MacTerminal are described in the *Communications Tools Reference.*

```
▬▬▬▬▬  File Transfer Status for "URH Connection"  ▬▬▬▬▬
Uploading "weekly report"...
   ┌──┐        ┌──┐     Method:         HMODEM Text
   │  │ ─────▶ │  │     Option In Use:  Standard
   └──┘        └──┘
⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯
File Size:              23988 bytes
Blocks Transferred:    70
Bytes Transferred:     8960
Time Remaining:        Less than a minute.
Status:                Waiting for an acknowledge.
▓▓▓▓▓▓▓▓▓▓▓▓▓░░░░░░░░░░░░░░░░░░   ┌────────┐
 0  10  20  30  40  50  60  70  80  90  100%  │ Cancel │
                                              └────────┘
```
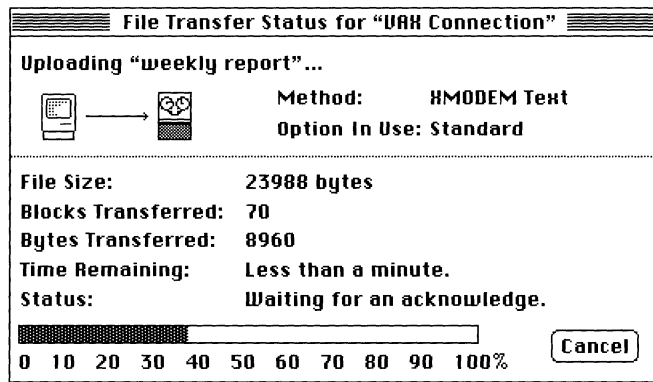
Depending on the file transfer tool you are using, you may be able to stop a transmission by holding down the ⌘ key and pressing the period (.) key, or by clicking the Cancel button if one appears in the file transfer status dialog box.

◆ **Note** Once you start a file transfer, you may want to let the file transfer go on in the background while you are working in another session document, or even in another application. Remember, Session menu commands only affect the top-most window, so you'll have to move the session document to the foreground before choosing commands that will act on the session. ◆

Save Lines Off Top

The Save Lines Off Top command determines whether or not data that scrolls out of the terminal region of the session document is saved. When this command is activated, as the terminal region of the session document window fills up, data overflows into the scrollback cache region; you can use the vertical scroll bar to view the past communications stored in the scrollback cache. In addition, the session data is stored on a disk copy of the document. If this command is activated when you close a session document, the data in the terminal region is also scrolled into the scrollback cache region and saved on the disk copy of the document.

If you haven't named and saved the session document, MacTerminal stores the session data in a temporary file until you save the session document. When you first create a new session document, the Save Lines Off Top command is activated and a check mark appears next to the command name in the menu indicating that the session data is being saved. If the Save Lines Off Top command remains activated throughout the entire communications session, the disk copy of the session document can serve as a historical record of the communications conversation between your Macintosh and the other computer.

To deactivate the Save Lines Off Top command, you choose the checked Save Lines Off Top command from the menu; the check mark is removed, data is no longer saved as it scrolls out of the terminal region, and session data is no longer saved on disk. However, deactivating the Save Lines Off Top command does not erase data that has already been saved on disk. If you want to start saving data again, simply choose the Save Lines Off Top command again; the check mark reappears indicating that the command is activated.

The Save Lines Off Top command can be used at any time while the active window is a session document, even while you are in the process of receiving a file. For example, you may decide to choose this command in the middle of a communications session in order to record only a particular part of the session.

To limit the quantity of data that is saved, you should use the Saved Lines command in the Settings menu. Using this command, you specify that either as much data as possible should be stored or that a specific number of kilobytes of data should be stored.

During a communications session, if the scrollback cache reaches the specified limit or if MacTerminal can no longer write to the disk (for example, if the disk becomes full), MacTerminal

■ deactivates the Save Lines Off Top command

■ stops saving the incoming data to disk

■ displays an appropriate alert box

To continue saving your communications conversation, depending on the message in the alert box, you may need to either increase the limit you have specified for the scrollback cache or free some space on a disk.

◆ **Note** You may want to save an entire screen at once if the host application you are using sends a full screen of information, clears it, and then sends the next screen. To save full screens, confirm that the Save Lines Off Top Command is activated and that the Save Screens Before Clearing option for the Save Lines command in the Settings menu is selected. ◆

Clear Saved Lines

The Clear Saved Lines command removes the lines that have scrolled out of the terminal region and into the scrollback cache region. When you choose this command, the confirmation dialog box shown below appears. If you click OK, the scrollback cache region of your screen is cleared and the corresponding data in the disk file is removed. If you hold down the Option key while choosing Clear Saved Lines, the scrollback cache is cleared without the confirmation dialog box being displayed.
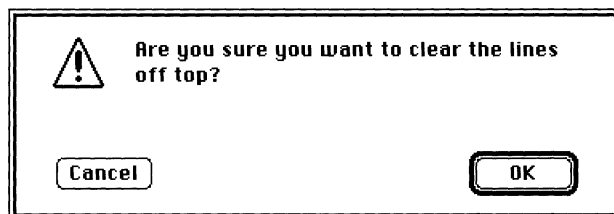
Clear Screen

This command clears the terminal region of the session document, moving the data to the scrollback cache region (if the Save Lines Off Top command is activated) and moving the cursor to the top-left corner of the terminal region. Since MacTerminal doesn't notify the other computer of any change in the terminal state, the data that arrives next may be positioned incorrectly because the other computer expected the text you cleared to still be in the terminal region.

Reset Terminal

The Reset Terminal command resets the setup options to the last saved settings for the terminal emulation tool. The Reset Terminal command can also have other effects, depending on the terminal emulation tool you are using. For specific details on the effects of this command, see the section on resetting the tool in the appropriate tool module (in the *Communications Tools Reference*).

You may want to use this command if you are using a host application that has changed the settings for your terminal emulation tool and has not reset them to their original settings. In most cases, when you quit from the host application, it automatically resets any terminal emulation settings that it has changed; however, if the host application is interrupted and is not able to quit in its normal fashion, the settings may not be changed back.

When you choose Reset Terminal, the following confirmation dialog box appears. If you click OK, the settings for the terminal emulation tool are reset. If the last saved settings were for a different terminal emulation tool, MacTerminal reverts to the default settings for the current tool, rather than changing to the other tool.

```
┌─────────────────────────────────────────────┐
│ ╔═════════════════════════════════════════╗ │
│ ║  ⚠   Are you sure you want to reset the  ║ │
│ ║      terminal?                            ║ │
│ ║                                           ║ │
│ ║  ┌──────────┐              ┌─────────┐   ║ │
│ ║  │ Cancel   │              │   OK    │   ║ │
│ ║  └──────────┘              └─────────┘   ║ │
│ ╚═════════════════════════════════════════╝ │
└─────────────────────────────────────────────┘
```
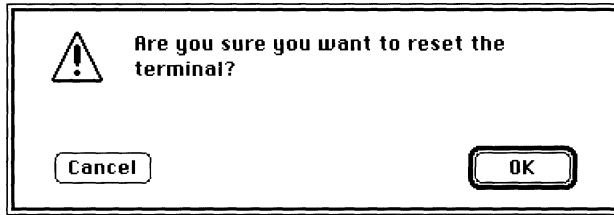
If you hold down the Option key while choosing Reset Terminal, the settings are reset without the confirmation dialog box being displayed.

Reset Connection

The Reset Connection command resets the setup options to the last saved settings for the connection tool. The Reset Connection command can also have other effects, depending on the connection tool you are using. For specific details on the effects of this command, see the section on resetting the tool in the appropriate tool module (in the *Communications Tools Reference*).

You may want to use this command if your connection is *hung*; that is, if you have been communicating over an established connection but are suddenly unable to communicate with the other computer. The session may be hung because the communications parameters for the connections are mismatched. For example, your Macintosh may be waiting for an XON acknowledgment before sending more data, but the host is not sending one. Although it depends on the connections tool, the chances are that resetting the connection will change the communications parameters to their original settings, usually releasing the hung connection without actually breaking the connection. When you reset the connection for the Serial Connection Tool or the Apple Modem Connection Tool, for example, the XON/XOFF parameter is reset to its original state, so your Macintosh behaves as if it has received an XON from the host and begins sending data again.

When you choose Reset Connection, the following confirmation dialog box appears. If you click OK, the connection tool settings revert to their last saved settings. If the last saved settings were for a different connection tool, MacTerminal reverts to the default settings for the current tool, rather than changing to the other tool.

```
┌─────────────────────────────────────────────────┐
│  ┌───────────────────────────────────────────┐  │
│  │  ⚠   Are you sure you want to reset the    │  │
│  │      connection?                           │  │
│  │                                            │  │
│  │  ┌────────┐              ┌──────────────┐  │  │
│  │  │ Cancel │              │      OK      │  │  │
│  │  └────────┘              └──────────────┘  │  │
│  └───────────────────────────────────────────┘  │
└─────────────────────────────────────────────────┘
```
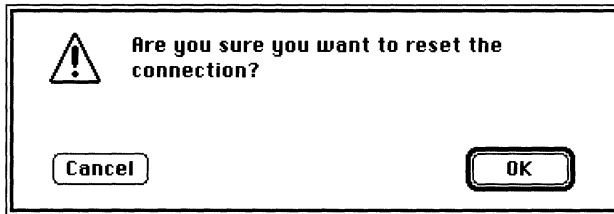
If you hold down the Option key while choosing Reset Connection, the settings are reset without the confirmation dialog box being displayed.

Send Break

This command sends a long break (3.5 seconds) across the open connection; it has the same effect as choosing the corresponding Break key from the keyboard. This effect is determined by the terminal emulation tool and connection tool you are using; see the applicable tool modules in the *Communications Tools Reference* (for the terminal tools in particular, see the description of Break key emulation).

You may want to use the Send Break command when you are communicating through a local phone system (a PBX system, for example) or over a **public network** (like TYMNET) in order to get back to the phone system or public network prompt.

When you choose Send Break, the confirmation following dialog box appears. If you click OK, the break is sent.

```
        ┌─────────────────────────────────────┐
        │  ⚠                                   │
        │                                     │
        │  Are you sure you want to send a break? │
        │  This may cause the connection to be │
        │  dropped.                           │
        │                                     │
        │            [ Cancel ]   [  OK  ]    │
        └─────────────────────────────────────┘
```
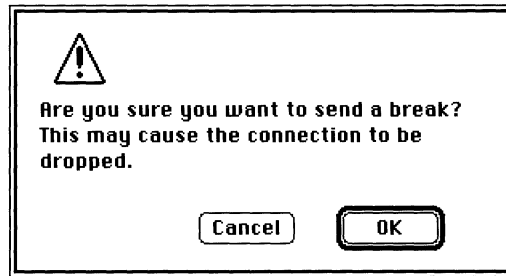
If you hold down the Option key while choosing Send Break, MacTerminal sends the break without displaying the confirmation dialog box.

The Windows menu

```
┌──────────────────────────┐
│ Windows                  │
├──────────────────────────┤
│ Tile Windows             │
│ Stack Windows            │
├──────────────────────────┤
│ UAH Connection           │
│ ✓Info Services Connection│
└──────────────────────────┘
```
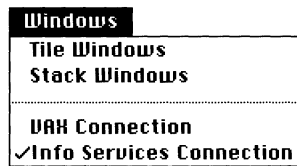
When you have more than one session document open on your desktop, you can use the Windows menu to arrange the session document windows so that they are either stacked (positioned one on top of the other) or tiled (positioned next to each other) on the desktop. In addition, you can use this menu to move from window to window; the windows for all open session documents, as well as any tool status windows (for example, file transfer status windows), appear in the menu so that you can choose them.

Tile Windows

This command lets you tile session document windows; that is, lay them out like tiles on your desktop, as shown in the following example. The sizes of the windows are reduced so that all open session documents can be displayed at once. When windows are tiled, you can move quickly to any window simply by clicking anywhere within a window.

```
  ⚫ File  Edit  Settings  Session  Windows  Keys
┌─────────────────────────────── Session doc #1 ───────────────────────────────┐
│ ............................................................................. │
│                                                                               │
│                                                                               │
│                                                                               │
├─────────────────────────────── Session doc #2 ───────────────────────────────┤
│ ............................................................................. │
│                                                                               │
│                                                                               │
│                                                                               │
├─────────────────────────────── Session doc#3 ────────────────────────────────┤
│ ............................................................................. │
│                                                                               │
│                                                                               │
│                                                                               │
├─────────────────────────────── Session doc #4 ───────────────────────────────┤
│ ─                                                                             │
│                                                                               │
│                                                                               │
└───────────────────────────────────────────────────────────────────────────┘
```
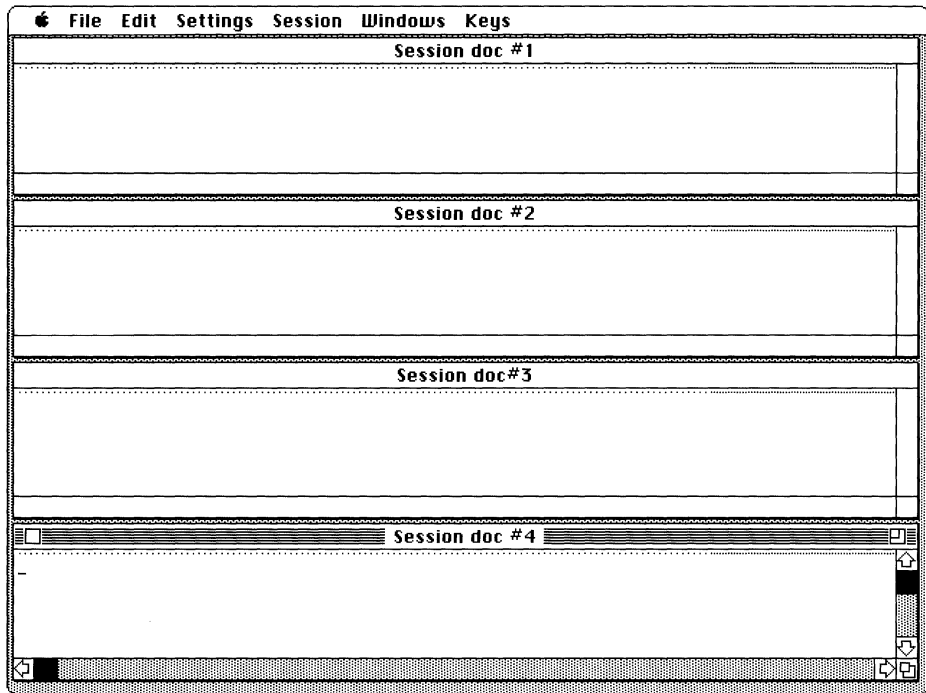
Stack Windows

This command lets you stack the open session document windows one on top of the other, with the active window on the top of the stack and only the **title bar** displayed for the other windows, as shown on the facing page. To change session documents, click the title bar of the appropriate window or choose the session document from the Windows menu.
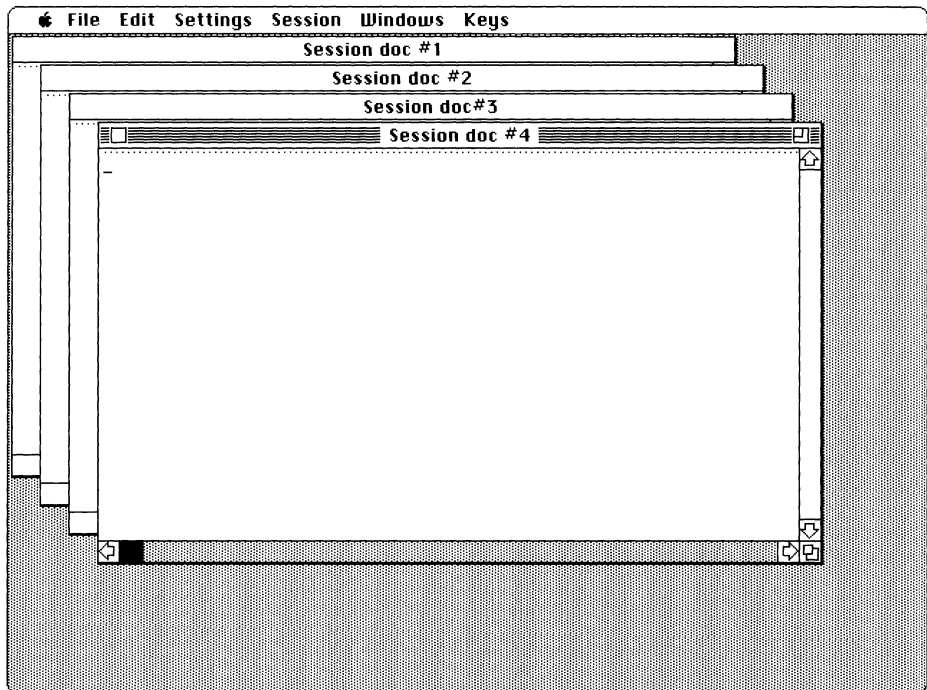
If you hold down the Option key while choosing Stack Windows, the windows will be sized as small as possible; otherwise the size of the window is determined by the setup of your terminal emulation tool and the size of your monitor. For example, with the VT102 Tool, the height of the terminal window is 24 lines and the width is either 80 or 132 columns, depending on what you specify (note that if there isn't enough room on your monitor to display the entire 132 columns, the window will be resized accordingly).

On ADB keyboards, you can move the top-most window to the back of the stack by holding down the ⌘ key while pressing the Tab key. By holding down the ⌘ and Shift keys while pressing Tab, you can move the bottom-most window to the foreground. (Note that these scrolling options are not available on Macintosh Plus keyboards.)

7 Troubleshooting

This chapter contains information that will help you solve problems that might occur while you are using MacTerminal.

If your problem is associated with a connection, terminal emulation, or file transfer tool, you should refer to "Communications Problems" in the first part of this chapter. After presenting general troubleshooting strategies, this section discusses more specific solutions. For more detailed information on tool-related problems, see the "Troubleshooting Hints" sections in the appropriate tool reference modules in the *Communications Tools Reference.*

This chapter also suggests solutions to problems that result from lack of sufficient memory. In addition, this chapter discusses problems that can occur when you are trying to print session data or copy it to another application, but have not installed the fonts required by the terminal emulation tools included with MacTerminal.

Communication problems

First, the obvious. Make sure that your connection is open. If the Open Connection command on the Session menu is not dimmed, your connection is not open; you need to choose Open Connection.

One of the more common problems you may encounter when trying to get two computers to communicate is establishing the connection between the modems, particularly between different brands of modems. You and the person handling the remote computer must be sure you both have the correct cables, that the cables and the telephone lines are properly plugged in, and that the modem switches are set correctly. When you are communicating with a host system, chances are any problems will be on your end, rather than at the host end.

If data is not being sent and received correctly, compare the settings for the communications parameters; keep in mind that the problems can be caused by mismatched settings for the connection, terminal, or the file-transfer tool being used for the session. When you will be exchanging files, make sure that the remote computer supports the file transfer protocol settings you are using.

If you don't find the solution you need in this chapter, see the "Troubleshooting Hints" sections in the reference modules in the *Communications Tools Reference.*

Connection problems

Here are some ideas for solving connection-related problems:

Nothing happens when you try to communicate.

Make sure that your cables are hooked up properly. Check that your connection tool is properly configured for the computer you are trying to access and the communications media you are using for connecting. Connections between two Macintosh computers or between a Macintosh and another type of personal computer may require a null modem cable or adapter.

Make sure your connection is open. If the Open Connection command in the Session menu is not dimmed, your connection is not open; you need to choose Open Connection. If you are are using a modem with status lights, you can watch the lights to verify whether or not data is going in and out of the modem.

Verify that a cable is firmly attached to the port through which you are transmitting. If you are transmitting locally, by a direct cable connection rather than by modem, verify that the cable is properly connected to the ports on both devices. If your cable is properly connected, verify that the baud rates are the same on both machines. With the Serial Connection Tool and the Apple Modem Connection Tool, the Open Connection command establishes contact with the port on your Macintosh; it does not guarantee a connection with the other end. If the baud rates don't match, the other device may simply refuse to respond. However, if the baud rates *do* match, make sure the On Line option is selected for the terminal emulation tool you are using. Use the Terminal command in the Settings menu.

Incoming data is garbled.

Check that your **parity** and baud rate settings match those of the other computer. If you see rectagular boxes or international characters scattered throughout the data, your parity setting might be wrong. In this case, the Macintosh interprets the eighth bit as data, so that characters acquire an ASCII value greater than 128. In the Macintosh extended ASCII **character set,** some of the characters above 128 decimal (80 hex) appear as rectangular boxes because they are undefined.

Unexpected characters appear on the screen when you are receiving data.

"Noise" or static on the telephone lines can cause unexpected characters to be displayed. If you think that there is too much noise on the line, try disconnecting and reinitiating the connection in hopes of establishing a better connection. (You may also see unexpected characters when the character set selections made with your terminal emulation tool are incorrect.)

Characters are lost during transmission, despite identical communications settings.

Try reducing the baud rate or changing the handshaking method. Choose Connection from the Settings menu and experiment with different settings. (Remember, the settings for the remote computer will need to be adjusted accordingly.)

"Noise" or static on the telephone lines can cause causes characters to be dropped during transmission. If you think that there is too much noise on the line, try disconnecting and reinitiating the connection in hopes of establishing a better connection.

If you lose data while sending pasted text or while transferring files with the Text File Transfer Tool, try selecting longer character and line delays. To set transmission delays, use the commands on the Settings menu: use the Paste Options command to set delays for pasted text, and use the File Transfer command to set the delays for the Text File Transfer Tool.

Terminal emulation problems

In general, make sure you have configured your terminal emulation tool properly. Use the Terminal command in the Settings menu to change the options when necessary. Also, keep in mind that the problem could be with the connection tool settings.

◆ **Note** If things are working fine and you suddenly start to experience any of these problems, you may want to choose the Reset Terminal command from the Session menu to reset the options for your terminal emulation tool to their last saved settings. ◆

Here are some suggestions for correcting terminal emulation problems:

No data is sent or received.

Make sure that your cables are hooked up properly and that your connection is properly configured. Check that your connection is open by pulling down the Session menu. If your connection is open, the Open Connection menu item will be dimmed. Also, make sure that the On Line option is checked.

Nothing appears on the screen when you send data.

First, make sure that your connection is open. If it is, try selecting the Local Echo option. The remote computer may not be echoing the keys you are pressing.

The data appears as double characters.

Deselect the Local Echo option. The remote computer may echo the keys you press; therefore, selecting Local Echo generates double characters. Most host computers echo keystrokes.

The data sent from the host doesn't appear on your screen.

Check the setting in the Keys menu for the No Scroll menu item (if you are using the VT102 Tool) or the Hold Screen menu item (if you are using the VT320 Tool). If the menu item is checked, choose it and it will change to unchecked, allowing incoming data to appear on the screen. With either terminal emulation tool, you can also try pressing Control-Q. If the No Scroll or Hold Screen menu item is unavailable, or if Control-Q does not work, make sure that the XON/XOFF handshaking protocol is selected in the connection tool being used for the session.

Incoming data writes over the last character on the first line.

Select the Auto Wrap to Next Line option.

Lines of incoming data are double-spaced.

Deselect the New Line on a Return option. If this option is already unchecked, the incoming data is probably supposed to be double-spaced.

Incoming data writes over the same line.

Select the New Line on a Return option.

The cursor is not visible on the screen.

The cursor may have been scrolled out of the visible screen. Click the active scroll bar, or resize the window, to scroll the cursor back into the visible screen. You can also type a character to bring the cursor into view.

The terminal is displaying unexpected characters (for example, graphics characters or characters from a non-US ASCII character set).

Check the setting on the Character Set screen; make sure that the active character set is G0 and that US ASCII is designated as the G0 character set. (You may also see unexpected characters when you are communicating over a noisy phone line.)

The terminal is displaying unrecognizable characters.

The terminal type or mode may be wrong, so the communications from the host are not making sense. This situation can arise when your log-in string authorizes you for a terminal type other than the one you have selected; for example, if, in the host's user-authorization database, your user name is authorized to log in using a VT102 terminal, but you are using the TTY Tool. In this case, you would need to use the Terminal command in the Settings menu to change to the VT102 Tool (or, you could change your user name authorization to allow you to log in using a TTY terminal; contact the host computer's system administrator if you don't know how to do this).

With the VT320 Tool, you may also need to check the setting for the **Terminal Mode** option in the General Setup dialog box. The VT320 mode should be selected in an 8-bit environment; the ANSI/VT100 mode should be selected in a 7-bit environment. You should also confirm that the Show Controls option is selected and that you are using the correct character set. If the problem continues, try a different terminal emulation tool: the VT102 Tool is suitable for 7-bit environments; TTY Tool does not support many character sequences.

(Note that unrecognizable characters may also appear when you are communicating over a noisy phone line.)

Data transfer problems

If you are using a file transfer protocol, make sure that the other computer is using a compatible protocol. Also, keep in mind that mismatched connection tool settings could be the problem.

Here are some suggestions for dealing with data transfer problems:

Text that you are pasting into the session document is not being received intact by the other computer.

The other computer may be unable to process the incoming data at the rate at which your Macintosh is sending it. Try setting transmission delays with the Paste Options command in the Settings menu.

You are having trouble sending or receiving files.

Check that the remote computer supports the protocol method you have specified. For example, if you are using the XMODEM File Transfer Tool, examine the Transfer Options settings by choosing File Transfer from the Settings menu.

Data is lost during file transfers with the Text File Transfer Tool.

Try slowing down the rate of transmission by increasing the delay per line or the delay per character. You can also try using handshaking if the host with which you are communicating supports it.

Memory problems

If there is not enough memory available to MacTerminal, you may be unable to perform certain operations. For example, you may be unable to use the commands on the Settings menu to set up your session document. The number of session documents that you can open at the same time is determined by the amount of memory available to MacTerminal, the amount of memory required by MacTerminal, and the amount required by the communications tools being used by the open session documents. When there is not enough memory to open a document, an alert box like the following one appears.

```
┌─────────────────────────────────────┐
│  ▥   Could not create a new         │
│      document because there is       │
│      not enough memory.              │
│                                      │
│                                      │
│                        ╔═══════════╗ │
│                        ║    OK     ║ │
│                        ╚═══════════╝ │
└─────────────────────────────────────┘
```
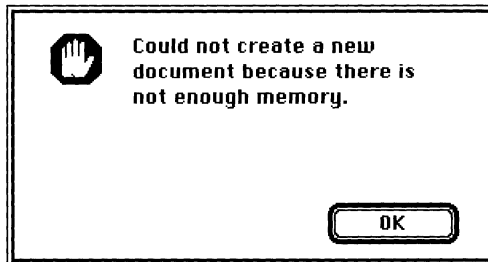
If you are having problems due to memory shortages when using MacTerminal on a Macintosh with only 1 megabyte of memory, try freeing up some memory by making one or more of the following changes:

- Use the Finder rather than MultiFinder.
- Remove INITs.
- Reduce the size of the RAM cache (on the **Control Panel**).
- Don't include 32-bit QuickDraw™.

When you are running under MultiFinder, MacTerminal is allocated a partition size that provides enough memory for about two session documents (depending on the memory requirements of the particular communications tools used with the session document). You may want to adjust the partition size—to decrease the size when you only need to open one session document at a time, or to increase the size when you want to want to open several session documents at once or when you are using tools that require more memory. To change the partition size, select the MacTerminal application and the Get Info command from the File menu, then type a new value for the application memory size. Since there are many variables in setting this size, you may need to experiment with the size to find the minimal size that meets your requirements. The following variables affect memory requirements:

- The number of open session documents. Each session document requires an overhead of memory.

- The tools needed. Some tools require more memory than others. In addition, a tool may require more memory depending on how it is used. For example, a terminal emulation tool needs more memory when it is set for 132-column width than when set for 80-column width. The reference modules in the *Communications Tools Reference* provide estimates of the amount of memory required for each of the tools included with MacTerminal. Note that session documents using the same tool will share a copy of the tool, so they will require less memory than session documents using different tools.

- The size of the Clipboard. The contents of the Clipboard are stored in MacTerminal's memory partition—if there is not enough memory available, you will be unable to show or paste the contents of the Clipboard.

Printing and copying problems

The terminal emulation tools that come with your MacTerminal application use special monospaced fonts. If you are having problems with character alignment and line spacing when you print session data or copy it into another application, the appropriate fonts may not be installed in your System file. These fonts are included on the PATHWORKS V1.0 volume and can be installed with the Font/DA Mover. (If you need help using the Font DA/Mover, refer to the manuals that come with your Macintosh.)

The special fonts should be installed in order to retain spacing when you plan to

- use background printing to print to a LaserWriter
- print to an ImageWriter
- copy portions of the data in your MacTerminal session document into another application and you want the copied data to look exactly as it does in the session document

If you don't want to install special fonts, you can still print properly to a LaserWriter by deactivating background printing (with the Chooser desk accessory on the Apple menu). However, you will not be able to print properly to an ImageWriter unless you install the appropriate fonts.

Network-related problems

If one of the scenarios in the following list describes a problem that you're having, the problem could be related to the network hardware or software that you're using.

The Control Panel is missing.

The Control Panel is present on all startup disks unless you have removed it with the Font/DA Mover. If you're using more than one startup disk, your Macintosh may switch to a disk that does not have the Control Panel installed. The icon of the current startup disk is in the upper-right corner of the desktop.

Use the Installer application from the *System Tools* disk (version 6.0.4 or a later version) to update your System file; it automatically reinstalls the Control Panel.

The Network icon is missing from the Control Panel.

One of the following problems exists:

- You don't have the EtherTalk 2.0 software installed correctly on your startup disk. See the documentation for the Ethernet card that you are using.
- The Network icon has been moved from your System Folder. You must reinstall the EtherTalk 2.0 software. See the documentation for the Ethernet card that you are using.
- Your startup disk has the wrong version of the Control Panel. You must use version 3.1 or a later version. (The version number appears in the lower-left corner of the Control Panel). Use the Installer application from the *System Tools* disk (version 6.0.4 or a later version) to update your System file. The Installer automatically reinstalls the Control Panel.

You can't select the Network icon in the Control Panel. You get a message advising you that the network package has not been installed correctly.

The EtherTalk 2.0 software has not been installed properly on your startup disk. See the documentation for the Ethernet card that you are using.

The EtherTalk icon doesn't appear in the Control Panel after you click the Network icon.

One of the following problems exists:

- You don't have the EtherTalk 2.0 software installed correctly on your startup disk. See the documentation for the Ethernet card that you are using.

- The EtherTalk icon has been moved from your System Folder. You must reinstall the EtherTalk 2.0 software. See the documentation for the Ethernet card that you are using.

- There is no Ethernet card in your Macintosh, or the card is not working properly. If a card is installed, see its documentation.

Two or more EtherTalk icons appear in the Control Panel when you click the Network icon.

One of the following conditions exists:

- You have multiple Ethernet cards installed. The number in parentheses next to each icon's name identifies the slot containing the card.

- Earlier versions of EtherTalk software exist on your startup disk. Earlier versions are identified by single-arrow icons; icons for version 2.0 (or later versions) are identified by double arrows. PATHWORKS for Macintosh requires that you use EtherTalk version 2.0. See the documentation for the Ethernet card that you are using.

    If you want to remove the previous version of EtherTalk, find its icon in the System Folder and drag it to the Trash.

You can't select the EtherTalk icon in the Control Panel. You get a message advising you that an error occurred while trying to install EtherTalk.

You did not start your Macintosh with an EtherTalk startup disk, or the disk that you used has become damaged. Try reinstalling the EtherTalk 2.0 software. See the documentation for the Ethernet card that you are using.

You are unable to select an EtherTalk icon in the Control Panel to switch the network connection. You get a message that the connection cannot be changed now, or that doing so will disrupt a critical service that your computer provides (such as an AppleShare file server or a router).

If you can't switch the network connection, quit all applications and try switching the network connection again. If you still can't switch network connections, and you don't mind disrupting services that your computer provides or is using, shut down your Macintosh. Then restart your computer, using a startup disk that permits network connection changes. Finally, try switching the network connection again.

Your Macintosh computer *hangs* (does not respond to the mouse and keyboard actions).

Your Macintosh may hang for a minute or so when you select an EtherTalk icon or when you start up your computer. The computer can hang if it is not correctly connected to the Ethernet cable, or the Ethernet card is not configured correctly. See the documentation for the Ethernet card that you are using.

The Connection Settings dialog box does not list any network services, or does not list the service that you want.

■ If no network services appear, check the physical connection between your Macintosh and the network. See the suggestions later in this section for checking your network.

■ If a particular service does not appear, the service may be in a different zone, malfunctioning, switched off, or disconnected from the network. There may also be trouble in the network cables between your Macintosh and the missing service. See the suggestions later in this section for checking your network. You can also contact your system administrator to see if there are known problems with the network.

■ If you switched the network connection in the Control Panel (as described earlier in this chapter) while the Connection Settings dialog box was open, the services listed in the dialog box may not have been updated. Close the Connection Settings dialog box and reopen it to see the services on the newly selected network.

You can't select devices connected to the printer port of your Macintosh.

If the Chooser does not let you select an ImageWriter printer or other device connected to the printer port while the EtherTalk network connection is selected, you probably have an old version of the Chooser on your Macintosh. You must have Chooser version 3.4 (or a later version) to select a device on the printer port. Use the Installer application from *System Tools* disk (version 6.0.4 or a later version) to update your System file. The Installer automatically updates the Chooser.

Here's a checklist to consult whenever you're having trouble with the Ethernet:

- Are all cables secure?

    Make sure that the network cable to your Ethernet card is secure at all connections. Also check the network cable to the service that you're trying to use. Contact your system administrator if you are uncertain about cable configuration.

- Is the problem really related to the network?

    Sometimes a problem that seems to be related to the network is actually related to the device or application program that you're using. The manual for the device or application may be helpful.

- Is your Ethernet card installed and set correctly?

    Shut down your Macintosh and make sure that the Ethernet card is firmly seated in its slot. Also, make sure that any jumpers and switches are set properly. See the documentation for your Ethernet card.

- Is the application that you want to use available on your network?

    You may have more than one network to which you can connect. Use the Control Panel to select the proper network connection. See "Selecting a Network" in Chapter 4 of the *Network Services User's Guide* for instructions.

Appendixes

Appendix A: Alert Messages

This appendix describes the alert messages you might encounter while using MacTerminal. The messages are listed alphabetically, according to the text of each message.

In addition to the alert messages displayed by MacTerminal, the communications tools you are using with MacTerminal may also display alert messages. For the communications tools included with MacTerminal, you can identify these messages by the tool icon that appears in the bottom-left corner of the alert box. In the sample below, the icon indicates that the alert message was generated by a file transfer tool.

> **The File Transfer did not complete.**
>
> **Could not recover from an unknown problem after several tries. You could try again using a higher Retry value.**
>
> **OK**
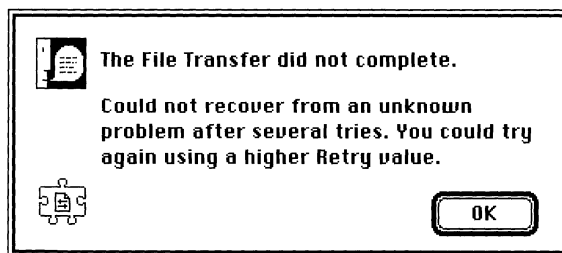
Tool-specific alert messages are explained in the respective tool modules in the *Communications Tools Reference*.

Are you sure you want to clear the lines off top?

This message is warning you that if you click Yes, you will lose all the data that was saved in the scrollback cache region. Click No if you don't want to lose this data.

Are you sure you want to reset the connection?

This message is double-checking to be sure you want to reset your connection. Different connection tools handle resetting differently; see the module in the *Communications Tools Reference* on the connection tool that you are using to determine what happens when you reset the tool.

Are you sure you want to reset the terminal?

This message is double-checking to be sure you want to reset your terminal. Different terminal emulation tools handle resetting differently; see the module in the *Communications Tools Reference* on the terminal emulation tool that you are using to determine what happens when you reset the tool.

Are you sure you want to send a break? This may cause the connection to be dropped.

This message is double-checking to be sure you want to send a break. Since different connection tools handle breaks differently, you may want to check the documentation on the connection tool you are using to find out what happens when a break is sent. Click Cancel if you don't want to send a break.

Changing the connection tool failed. Reverting to the original connection tool.

Although a number of unusual circumstances can cause this alert to appear, in most cases, this alert appears because the tool you tried switching to required more memory than was available. Regardless of the cause, MacTerminal tries to recover by using the connection tool you were using prior to changing connection tools.

If you suspect that MacTerminal is unable to change connection tools because there is not enough memory available for the tool you are changing to, try increasing the memory as described in Chapter 7, "Troubleshooting," and then see if you are able to change to the tool.

Changing the file transfer tool failed. Reverting to the original file transfer tool.

Although a number of unusual circumstances can cause this alert to appear, in most cases, this alert appears because the tool you tried switching to required more memory than was available. Regardless of the cause, MacTerminal tries to recover by using the file transfer tool you were using prior to changing file transfer tools.

If you suspect that MacTerminal is unable to change file transfer tools because there is not enough memory available for the tool you are changing to, try increasing the memory as described in Chapter 7, "Troubleshooting," and then see if you are able to change to the tool.

Changing the terminal emulation tool failed. Reverting to the original terminal emulation tool.

Although a number of unusual circumstances can cause this alert to appear, in most cases, this alert appears because the tool you tried switching to required more memory than was available. Regardless of the cause, MacTerminal tries to recover by using the terminal emulation tool you were using prior to changing terminal emulation tools.

If you suspect that MacTerminal is unable to change terminal emulation tools because there is not enough memory available for the tool you are changing to, try increasing the memory as described in Chapter 7, "Troubleshooting," and then see if you are able to change to the tool.

Could not access the Clipboard because there is not enough memory.

This message appears when you are unable to show or paste the contents of the Clipboard because there is not enough memory available to MacTerminal.

Could not initialize the Communications Toolbox. See the MacTerminal documentation for instructions.

This message appears when you are unable to use MacTerminal because the Communications Toolbox failed to initialize when you attempted to open the MacTerminal application. You may be able to solve this problem by restarting your Macintosh. However, if this doesn't work, you may need to reinstall the Communications Toolbox, or possibly even your Macintosh Operating System.

Do you want to discard changes made to [session document name]?

This message appears when you select the Revert to Saved command from the File menu. It is warning you that if you click OK, MacTerminal will discard any settings changes made since you last saved the session document. If you want to save these changes, click Cancel, and then choose Save from the File menu.

◆ **Note** Clicking OK in response to this alert message will *not* cause data stored in the scrollback cache to be discarded. ◆

Memory space is low. Some commands may be disabled.

This message appears when MacTerminal has disabled the New and Open commands to conserve memory in response to a low memory condition. When more memory becomes available, MacTerminal re-enables these commands. Refer to Chapter 7, "Troubleshooting," for help freeing up memory space.

No connection tools are available. The session document was not opened.

This message appears when you create a new document or open a saved document, but have no connection tools in your Communications Folder. You need to install connection tools into your Communications Folder in order to use MacTerminal.

No file transfer tools are available.

This message appears when you create a new session document, open an existing session document, or choose File Transfer from the Settings menu, but have no file transfer tools in your Communications Folder. You need file transfer tools in order to perform file transfers or to change file transfer tool settings.

No terminal emulation tools are available. The session document was not opened.

This message appears when you create a new document or open a saved document, but have no terminal tools in your Communications Folder. You need to install terminal tools into your Communications Folder in order to use MacTerminal.

Reverting will cause the connection to be dropped and the file transfer in progress to be stopped. Are you sure you want to do this?

MacTerminal displays this message to inform you that it will drop your connection and stop your file transfer when it reverts. If you don't want to interrupt the file transfer or drop the connection, click the Cancel button, which cancels the revert operation.

Reverting will cause the connection to be dropped. Are you sure you want to do this?

MacTerminal displays this message to inform you that it will drop your connection when it reverts. Click Cancel to avoid dropping your connection.

Save Lines Off Top has been turned off because the disk is full.

This message is telling you that MacTerminal can no longer save data in the scrollback cache region because the disk to which data is being written has no more free space. As data scrolls out of the terminal region, it will be lost.

   If you want to save more data in your scrollback cache region, free some disk space on the current disk or choose the Save As command from the File menu to save on another disk. Then choose Save Lines Off Top from the Session menu to reactivate saving of data as it scrolls out of the terminal region.

Save Lines Off Top has been turned off because the limit has been reached.

This message is telling you that MacTerminal can no longer save data in the scrollback cache region because it has reached the limit specified with the Saved Lines command in the Settings menu. As data scrolls out of the terminal region, it will be lost.

If you want to save more data in your scrollback cache region, try raising the limit by choosing Saved Lines from the Settings menu, changing the limit, and then choosing Save Lines Off Top from the Session menu.

The connection tool, [tool name], has changed. Using the default configuration with it.

This message appears when MacTerminal tries to use a session document that specifies a version of connection tool that is not in your Communications Folder. After you click OK, MacTerminal opens the document using the version of connection tool in your Communications Folder and configures it with the default configuration.

The most common situation that causes this message to appear occurs when you install a new connection tool and MacTerminal tries to open a session document that was saved using the older version of the tool. You also see this message when you try to undo or revert to a version of tool that is no longer in your Communications Folder.

The connection tool, [tool name], is not available. Using [tool name].

This message appears when MacTerminal tries to use a connection tool that is not in your Communications Folder. After you click OK, MacTerminal opens the document using the specified connection tool.

This situation arises when you try to create a new document, open a document you have saved, or revert to a copy of a document you have saved, but the connection tool specified in the document is not in your Communications Folder. MacTerminal also displays this message when you change connection tools, rename or remove the tool you had been using, and then select the Undo command or the Revert to Saved command.

The file transfer in progress for session [session document name] will need to be canceled in order to complete the requested operation.

With some commands, MacTerminal must first stop any current file transfers before it can perform the requested operation (for example, when you try to reconfigure the file transfer tool or close a connection while a file transfer is in progress). If you want the file transfer to be completed successfully, click Cancel, wait for the file transfer to finish, and then try the command again. Click OK if it's all right for MacTerminal to stop the file transfer in order to perform the requested operation.

The file transfer tool, [tool name], has changed. Using the default configuration with it.

This message appears when MacTerminal tries to use a session document that specifies a version of file transfer tool that is not in your Communications Folder. After you click OK, MacTerminal opens the document using the version of file transfer tool in your Communications Folder and configures it with the default configuration.

The most common situation that causes this message to appear occurs when you install a new file transfer tool and MacTerminal tries to open a session document that was saved using the older version of the tool. You also see this message when you try to undo or revert to a version of tool that is no longer in your Communications Folder.

The file transfer tool, [tool name], is not available. Using [tool name].

This message appears when MacTerminal tries to use a file transfer tool that is not in your Communications Folder. After you click OK, MacTerminal opens the document using the specified file transfer tool.

This situation arises when you try to create a new document, open a document you have saved, or revert to a copy of a document you have saved, but the file transfer tool specified in the document is not in your Communications Folder. MacTerminal also displays this message when you change file transfer tools, rename or remove the tool you had been using, and then select the Undo or the Revert to Saved command.

There is not enough memory to initialize the file transfer tool, [tool name].

This message is telling you that there wasn't enough memory to open a file transfer tool with the session document. To open the document with a file transfer tool, you need to free some memory available to MacTerminal (refer to Chapter 7, "Troubleshooting," for help).

The terminal emulation tool, [tool name], has changed. Using the default configuration with it.

This message appears when MacTerminal tries to use a session document that specifies a version of terminal emulation tool that is not in your Communications Folder. After you click OK, MacTerminal opens the document using the version of terminal tool in your Communications Folder and configures it with the default configuration.

The most common situation that causes this message to appear occurs when you install a new terminal tool and MacTerminal tries to open a session document that was saved using the older version of the tool. You also see this message when you try to undo or revert to a version of tool that is no longer in your Communications Folder.

The terminal emulation tool, [tool name], is not available. Using [tool name].

This message appears when MacTerminal tries to use a terminal emulation tool that is not in your Communications Folder. After you click OK, MacTerminal opens the document using the specified terminal emulation tool.

This situation arises when you try to create a new document, open a document you have saved, or revert to a copy of a document you have saved, but the terminal tool specified in the document is not in your Communications Folder. It also arises when you change terminal tools, rename or remove the tool you had been using, and then select Undo or Revert to Saved.

Warning! If connection tool changes cause the connection to be dropped, the file transfer in progress will be stopped.

This message appears when you choose the Connection command from the Settings menu while MacTerminal is transferring a file. Although you can change some settings without dropping your connection, changing certain settings (for example, changing the port setting or changing to a different connection tool) will cause your connection to be dropped. If you want to be sure the file transfer is completed successfully, click OK but don't change the connection settings until the file transfer is completed.

You must install the Communications Toolbox and restart your Macintosh before running MacTerminal.

To use MacTerminal, you must have the Communications Toolbox installed on your Macintosh. Use the PATHWORKS V1.0 volume. For instructions, turn to the *Installation* part of the *Network Services User's Guide.*

Your computer lacks the required hardware or System Software to run this application.

You need system software version 6.0.4 or later and a Macintosh Plus or later model Macintosh computer to run MacTerminal.

Appendix B: About On-Line Services

You can reach all sorts of on-line services with MacTerminal, including national bulletin boards, electronic mail services, information services that let you transfer files from a variety of computers, financial data services (for example, to do home banking or to obtain stock quotations), services that let you shop directly with shopkeepers, and more.

The lists in this appendix provide you with the names of some popular services available to the public, as well as the names of some books that are recommended as good references for accessing and using these services.

Mail services

Some of the popular mail services include

EasyLink
Western Union Corporation
One Lake Street
Upper Saddle River, NJ 07458
(800) 779-1111

ITT Dialcom
BT Tymnet, a wholly owned subsidiary
of British Telecommunications
2560 North First Street
P.O. Box 49019
San Jose, CA 95161-9019
(800) 872-7654

MCI Mail
1150 17th Street, NW
Suite 800
Washington, DC 20001
(800) 444-6245
in Washington: (202) 833-8484

Quick-Comm
General Electric Company
401 North Washington Street
Rockville, MD 20850
(301) 340-4000

SprintMail
Sprint International
12490 Sunrise Valley Drive
Reston, VA 22096
(800) 336-0437
(703) 689-8316

Popular on-line services

Other on-line information services provide you with libraries of information that can be accessed directly from your Macintosh. Some of the popular on-line services include

Bibliographic Retrieval Services (BRS)
8000 West Park Drive
McLean, VA 22102
(800) 468-0908

CompuServe
5000 Arlington Centre Boulevard
P.O. Box 20212
Columbus, OH 43220
(800) 848-8199
In Ohio: (614) 457-0802

Delphi
General Videotex Corporation
3 Blackstone Street
Cambridge, MA 02139
(800) 544-4005
In Massachusetts: (617) 491-3393
On-line registration: (800)365-4636
Modem settings: 1200 baud, no parity,
8 data bits, 1 stop bit, no handshaking
password: signup

Dialog Information Services
Marketing Department
3460 Hillview Avenue
Palo Alto, CA 94304
(800) 3-DIALOG

Dow Jones News/Retrieval Service
P.O. Box 300
Princeton, NJ 08543-0300
(800) 522-3567

GEnie
General Electric Company
401 North Washington Street
Rockville, MD 20850
(800) 638-9636
On-line registration: (800)638-8369
Modem settings: 1200 baud, no parity,
8 data bits, 1 stop bit
Terminal settings: TTY, local echo
Password: genie

NewsNet
945 Haverford Road
Bryn Mawr, PA 19010
(800) 345-1301
In Pennsylvania: (215) 527-8030

Nexis/Lexis
Mead Data Central
P.O. Box 933
Dayton, OH 45401
(800) 227-4908
In Ohio: (513) 865-6800

Whole Earth Lectronic Link (the WELL)
27 Gate Five Road
Sausalito, CA 94965
Business office: (415) 332-4335
On-line registration: (415) 332-6106
Modem settings: 1200 baud, no parity,
8 data bits, 1 stop bit, no handshaking

Recommended books about on-line services and products

The following books are recommended references for finding out about the latest available on-line services and utilities and for learning about communications products:

The Computer Phone Book
by Mike Cane
New American Library
1633 Broadway
New York, NY 10019

Dvorak's Guide to PC Telecommunications
by John C. Dvorak and Nick Anis
Osborne/McGraw-Hill
Division of McGraw-Hill
2600 Tenth Street
Berkeley, CA 94710

Directory of Online Databases
Cuadra Associates, Inc.
2001 Wilshire Boulevard, Suite 305
Santa Monica, CA 90403

Hooking In: The Underground Computer Bulletin Board Workbook and Guide
by Tom Beeston and Tom Tucker
Computerfood Press
P.O. Box 608
Oracle, AZ 85623

How to Look It Up Online
by Alfred Glossbrenner
St. Martin's Press
175 Fifth Avenue
New York, NY 10010

MacAccess: Information in Motion
by Dean Gengle and Steven Smith
Hayden Books
4300 West 62nd Street
Indianapolis, IN 46268

The Well-Connected Macintosh
by Tony Bove and Cheryl Rhodes
Harcourt Brace Jovanovich, Publishers
124 Mt. Auburn Street
Cambridge, MA 02138

Appendix C: Pin Assignments

This appendix shows you the pin assignments and signal descriptions for the modem and printer ports on the back panel of your Macintosh. Both types of ports use 8-pin minicircular connectors.
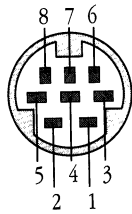
Pin number	Signal name	Signal description
1	HSKo	handshake out (DTR)
2	HSKi	handshake in/external clock (CTS)
3	TXD-	transmit data -
4	GND	signal ground
5	RXD-	receive data -
6	TXD+	transmit data +
7	GPi	general purpose input*
8	RXD+	receive data +

*Modem port only: Can be set in software to be a second external clock.

Appendix D: ASCII Character Chart

This appendix contains an ASCII character chart. ASCII is an acronym for *American Standard Code for Information Interchange.* ASCII is a code in which the numbers from 0–127 stand for text charcters, including letters of the alphabet, the digits 0–9, punctuation marks, special characters, and control characters. ASCII is used for representing text inside of the computer and for transmitting text between computers. The Text and XMODEM protocols transfer files that consist only of ASCII characters; such files are also known as Text files.

ASCII character chart

Key	Code (decimal)	Code (hex)	Abbreviation	Name
Control-space	0	$00	NUL	Null
Control-a	1	$01	SOH	Start of header
Control-b	2	$02	STX	Start of text
Control-c	3	$03	ETX	End of text
Control-d	4	$04	EOT	End of transmission
Control-e	5	$05	ENQ	Enquiry
Control-f	6	$06	ACK	Acknowledgment
Control-g	7	$07	BELL	Bell
Control-h	8	$08	BS	Backspace
Control-i	9	$09	HT	Horizontal tab
Control-j	10	$0A	LF	Line feed
Control-k	11	$0B	VT	Vertical tab
Control-l	12	$0C	FF	Form feed
Control-m	13	$0D	CR	Carriage return
Control-n	14	$0E	SO	Shift out
Control-o	15	$0F	SI	Shift in
Control-p	16	$10	DLE	Data link escape
Control-q	17	$11	DC1 (XON)	Device control 1
Control-r	18	$12	DC2	Device control 2
Control-s	19	$13	DC3 (XOFF)	Device control 3
Control-t	20	$14	DC4	Device control 4
Control-u	21	$15	NAK	Negative acknowledgment
Control-v	22	$16	SYN	Synchronization character
Control-w	23	$17	ETB	End-of-transmission block
Control-x	24	$18	CAN	Cancel
Control-y	25	$19	EM	End of message
Control-z	26	$1A	SUB	Substitute

ASCII character chart *(continued)*

Key	Code (decimal)	Code (hex)	Abbreviation	Name
Control-[	27	$1B	ESC	Escape
Control-\	28	$1C	FS	Forms separator
Control-]	29	$1D	GS	Group separator
Control-6	30	$1E	RS	Record separator
Control-/	31	$1F	US	Unit separator
space	32	$20		Space
!	33	$21		Exclamation point
"	34	$22		Quotation mark
#	35	$23		Number sign
$	36	$24		Dollar sign
%	37	$25		Percent sign
&	38	$26		Ampersand
'	39	$27		Apostrophe, right single quotation mark, acute accent
(	40	$28		Left parenthesis
)	41	$29		Right parenthesis
*	42	$2A		Asterisk
+	43	$2B		Plus sign
,	44	$2C		Comma
-	45	$2D		Hyphen, minus sign
.	46	$2E		Period, decimal point (full stop)
/	47	$2F		Slant (solidus)
0	48	$30		Digit zero
1	49	$31		Digit one
2	50	$32		Digit two
3	51	$33		Digit three
4	52	$34		Digit four
5	53	$35		Digit five

(continued)➡

ASCII character chart *(continued)*

Key	Code (decimal)	Code (hex)	Abbreviation	Name
6	54	$36		Digit six
7	55	$37		Digit seven
8	56	$38		Digit eight
9	57	$39		Digit nine
:	58	$3A		Colon
;	59	$3B		Semicolon
<	60	$3C		Less than sign
=	61	$3D		Equal sign
>	62	$3E		Greater than sign
?	63	$3F		Question mark
@	64	$40		Commercial at
A	65	$41		Uppercase A
B	66	$42		Uppercase B
C	67	$43		Uppercase C
D	68	$44		Uppercase D
E	69	$45		Uppercase E
F	70	$46		Uppercase F
G	71	$47		Uppercase G
H	72	$48		Uppercase H
I	73	$49		Uppercase I
J	74	$4A		Uppercase J
K	75	$4B		Uppercase K
L	76	$4C		Uppercase L
M	77	$4D		Uppercase M
N	78	$4E		Uppercase N
O	79	$4F		Uppercase O
P	80	$50		Uppercase P
Q	81	$51		Uppercase Q
R	82	$52		Uppercase R
S	83	$53		Uppercase S

ASCII character chart *(continued)*

Key	Code (decimal)	Code (hex)	Abbreviation	Name
T	84	$54		Uppercase T
U	85	$55		Uppercase U
V	86	$56		Uppercase V
W	87	$57		Uppercase W
X	88	$58		Uppercase X
Y	89	$59		Uppercase Y
Z	90	$5A		Uppercase Z
[	91	$5B		Left bracket (left square bracket)
\	92	$5C		Reverse slant (reverse solidus)
]	93	$5D		Right bracket (right square bracket)
^	94	$5E		Circumflex accent
_	95	$5F		Underline (lowline)
`	96	$60		Left single quotation mark, grave accent
a	97	$61		Lowercase a
b	98	$62		Lowercase b
c	99	$63		Lowercase c
d	100	$64		Lowercase d
e	101	$65		Lowercase e
f	102	$66		Lowercase f
g	103	$67		Lowercase g
h	104	$68		Lowercase h
i	105	$69		Lowercase i
j	106	$6A		Lowercase j
k	107	$6B		Lowercase k
l	108	$6C		Lowercase l
m	109	$6D		Lowercase m
n	110	$6E		Lowercase n

(continued)➡

ASCII character chart *(continued)*

Key	Code (decimal)	Code (hex)	Abbreviation	Name
o	111	$6F		Lowercase o
p	112	$70		Lowercase p
q	113	$71		Lowercase q
r	114	$72		Lowercase r
s	115	$73		Lowercase s
t	116	$74		Lowercase t
u	117	$75		Lowercase u
v	118	$76		Lowercase v
w	119	$77		Lowercase w
x	120	$78		Lowercase x
y	121	$79		Lowercase y
z	122	$7A		Lowercase z
{	123	$7B		Left brace (left curly bracket)
|	124	$7C		Vertical line
}	125	$7D		Right brace
~	126	$7E		Tilde (overline)
Delete	127	$7F	DEL	Delete

Glossary

access number   The telephone number of the remote computer with which you want to communicate.

ADSP   See **AppleTalk Data Stream Protocol.**

ADSP driver   A system file that provides the AppleTalk Data Stream Protocol on your Macintosh.

alert message   A message from MacTerminal (or from a communications tool) indicating that a function, command, or entry cannot be performed or accepted. Alert messages are often accompanied by a beep.

Apple Desktop Bus (ADB) keyboards   The keyboards used with computers in the Macintosh SE and Macintosh II families, as well as with Macintosh Portable computers.

Apple (🍎) menu   The menu on the far left in the menu bar, from which you choose desk accessories and display the MacTerminal status window.

Apple Modem Connection Tool   A communications tool used for connecting through an Apple modem or other Hayes-compatible modem.

AppleShare   Software that runs on Macintosh computers to provide file and print services on an AppleTalk network. See **AppleShare file server, AppleShare print server.**

AppleShare client   The combination of your Macintosh computer and the AppleShare workstation software, which allows you to access an AppleShare or VAXshare file server. See also **AppleShare file server, AppleShare workstation software.**

AppleShare file server   On an AppleTalk network system, a combination of software, one or more hard disks, and a Macintosh computer that stores documents, folders, and applications. If you have the AppleShare workstation software installed on your computer, you can access the stored files and can also store your own files on the server and share them with other users. See also **AppleShare client, AppleShare workstation software.**

AppleShare print server   On an AppleTalk network system, a combination of software and a Macintosh computer that captures documents sent to it and manages the printing of those documents on network printers. If you have the AppleShare workstation software installed on your computer, you can submit a job to the print server and then use your Macintosh for other tasks while the print server controls the printing of your files. Compare **VAXshare print server.**

AppleShare workstation software   A set of resources that acts as an extension of the system software. These resources provide information that your computer needs in order to let you access AppleShare or VAXshare file servers. You install the resources as a part of the System file in your System Folder on your Macintosh. See also **AppleShare client, resource.**

AppleTalk A comprehensive network system designed and developed by Apple Computer, Inc. It consists of many different kinds of computer systems and servers and a variety of cabling and connectivity products.

AppleTalk Data Stream Protocol (ADSP) An AppleTalk communications protocol that lets you establish connections between applications on a network. ADSP allows full-duplex, byte-stream connections. Data flow on an ADSP connection is reliable; ADSP guarantees that data bytes are delivered in the same order as that in which they were sent and that they are free of duplicates.

application A computer program that puts the resources of the computer to use for a specific purpose, such as word processing or telecommunications.

ASCII Acronym for American *Standard Code for Information Interchange* (pronounced *ASK-ee*). A code in which the numbers 0–127 stand for text characters, including letters of the alphabet, the digits 0 through 9, punctuation marks, special characters, and control characters. Used for representing text inside the computer and for transmitting text between computers.

asynchronous, asynchronous communications In telecommunications, the exchange of signals without regard to any internal or external timing system. The interval between successive signals can be of arbitrary duration. Information is sent in blocks marked by a start signal and a stop signal. Also known as "start-stop communication," asynchronous communication is most commonly used between microcomputers.

automatic dialing A method used by communications software to direct a modem to dial the number for the remote computer, so you don't have to manually enter the commands that direct the modem to dial.

auto wraparound A terminal setup option that determines how to handle text that overflows the current line. This option is set with the Terminal command in the Settings menu. If auto wraparound is being used, when text reaches the last column in a line, it spills over to the

next line. Otherwise, the cursor stops at the last column, and every new character overwrites the last character.

Backspace key A key on the Macintosh Plus keyboard that moves the cursor back one space. With the TTY, VT102, and VT320 Tools, you can choose whether pressing the Backspace key just moves the cursor back or also deletes the character. Use the Terminal command on the Settings menu to change the setting for how the Backspace key functions.

baud rate The speed at which your data is being transmitted. The baud rate is equal to the number of discrete signals per second.

Break key With the TTY, VT102, and VT320 Tools, the Shift-Enter key combination functions as the Break key.

bulletin board system (BBS) A personal computer set up to act as a telecommunications connection point for computer owners with similar interests or needs.

bundle A collection of LAT terminal services. System administrators create a bundle of services by defining a range of group codes. Those services whose group codes fall within the range of group codes are part of the bundle.

Cancel button A button that appears in dialog boxes. Clicking this button cancels the current operation.

character Any symbol that has a widely understood meaning. Some characters, such as letters, numbers, and punctuation, can be displayed on the screen and printed on a printer. Others are used to control various functions of the computer. See also **control character.**

character set The entire collection of characters that can be shown on the screen or used to code computer instructions. The VT102 and VT320 Tools offer several character sets from which to choose an active character set—the one that is usually displayed—and an alternative set.

check box The small box associated with an option in a dialog box that, when clicked, adds or removes the option.

click To position the pointer on something, and then press and quickly release the mouse button.

Clipboard The holding place for what you last cut or copied.

close box The small white box on the left side in the title bar of an active window. Clicking the close box closes the window and removes the window from the desktop.

command A word or phrase, usually in a menu, describing an action for the Macintosh to perform. Choosing a command causes the action to take place.

Command key (⌘) On ADB keyboards, the ⌘ key is used in combination with other keys to generate equivalents to the commands on the MacTerminal menus. However, since the Macintosh Plus keyboard does not contain a Control key (which is used frequently when communicating with other computers), with the TTY, VT102, and TTY Tools, the ⌘ key on this keyboard functions as a Control key and cannot be used to generate ⌘-key equivalents.

communications conversation The messages exchanged between your Macintosh and the other computer during a communications session. These message appear in the terminal region of your session document. When the Save Lines Off Top command in the Session menu is activated, the messages exchanged during the communications conversation are stored in the scrollback cache region of the session document as well as in a disk copy of the document.

Communications Folder A folder created within your System Folder during installation of the Macintosh Communications Toolbox. It is used for storing the communications tools.

communications parameters Settings used to establish compatibility between computers so that the communications can communicate with each other. With MacTerminal, communications parameters are specified with the setup options for the communications tools. Use the Terminal, Connection, and File Transfer commands in the Settings menu to change setup options.

communications session The activity during the time your Macintosh is connected to another computer and accessible by the other computer.

Communications Toolbox See **Macintosh Communications Toolbox**.

communications tools Software components that supply the communications functions your Macintosh needs in order to communicate with another computer. Communications tools fall into three categories: connection tools, file transfer tools, and terminal emulation tools. Each type of tool manages a different aspect of the communication process. See also **connection tools, file transfer tools, terminal emulation tools.**

computer terminal A device that lets you communicate with a host computer through a keyboard and display or printer.

connection A link between your Macintosh and another computer. In order to communicate, your Macintosh and the other computer must first have some kind of physical link; you can connect to the other computer through local cables or through modems and telephone networks. Next, you must establish a communications link using software like MacTerminal. When MacTerminal has made contact with the other computer, a connection is established and your Macintosh and the other computer can exchange information over the open connection.

connection tools One of the three types of communications tools. A connection tool determines the type of connection that is established between your Macintosh and the other computer. Examples: Apple Modem Tool, Serial Tool. See also **communications tools.**

connect time   The elapsed time between the moment MacTerminal makes contact with another computer, starting a communications session, and the moment when you terminate the connection.

control character   An ASCII character used as a command to a computer, terminal, or printer. See **Control key.**

Control key   A key that when pressed in conjunction another key issues a command. For example, when you type *S*, the computer considers it just another letter in the alphabet, but when you press Control-S the computer considers it a command. ADB keyboards contain a Control key, but the Macintosh Plus keyboard does not. When you are using the TTY, VT102, or VT320 Tool, you can use the ⌘ key on the Macintosh Plus keyboard as a Control key (however, you won't be able to generate ⌘-key equivalents on this keyboard while using MacTerminal).

Control Panel   A desk accessory that lets you change the speaker volume, the keyboard repeat speed, and other preferences.

cursor   A blinking underline (or solid rectangle) that marks the position of the next incoming or outgoing character shown in the terminal region of the session document.

cut   To remove something from a desk accessory by selecting it and choosing Cut from the Edit menu, which places the selection on the Clipboard. Data in a MacTerminal session document can be copied but not cut.

data   Information, especially information used or operated on by a program. Characters that convey meaningful text or graphics. Distinguished from arrangement (for instance, characters that announce that the information is about to start, or has just stopped) or error-checking (for instance, characters that are put in to help make sure that there have been no mistakes in transmission).

database   A collection of interrelated data records that are cross-referenced and indexed so that complex queries based on these relationships can be readily answered. The database structure minimizes repetition of data and supports applications using different retrieval and processing methods.

default   A preset selection. The default is automatically used by MacTerminal if you don't supply a different response. For example, when you open a session document, MacTerminal automatically uses certain communications tool and the preset settings for these tools.

delay   See **transmission delay.**

Delete key   A key on ADB keyboards that moves the cursor back one space. With the TTY, VT102, and VT320 Tools, you can choose whether pressing the Delete key just moves the cursor back or also deletes the character. Use the Terminal command on the Settings menu to change the setting for how the Delete key functions.

desk accessories   "Mini-applications" that are available from the Apple menu regardless of which application you're using. Examples are the Calculator, Control Panel, Alarm Clock, and Scrapbook.

desktop   Macintosh's working environment—the menu bar and gray area on the screen.

destination computer   The remote computer that you are communicating with over a network connection.

dialog box   A box that contains a message requesting more information from you. A dialog box has places to enter information and choose options.

dimmed command   A command that appears lighter and grayer than other commands in the menu. When a command is dimmed, it cannot be chosen.

dimmed icon   An icon that represents a disk—or a document, folder, or application on a disk—that has been ejected. Any dimmed icon can be selected. Dimmed disks and folders can be opened; dimmed documents and applications can't be.

disk The magnetic medium on which a Macintosh stores information.

disk drive The mechanism that holds the disk, retrieves information from it, and saves information on it. A Macintosh has an internal disk drive, and you can add an external one, or a hard disk.

document Whatever you create with Macintosh applications—information you enter, modify, view, or save. In MacTerminal, you work within a special document, known as a session document, that provides options for setting up a communications session and the display area to view incoming and outgoing data. Also see **session document**.

double-click To position the pointer to where you want an action to take place, and then to press and release the mouse button twice in quick succession without moving the mouse.

download To receive and store data from a remote computer.

drag To position the pointer on something, press and hold the mouse button, move the mouse, and release the mouse button. When you release the mouse button, you either confirm a selection or move an object to a new location.

echo Retransmission by a host computer of every character it receives back to the terminal that sent it. The echoed characters appear in the terminal region of your session document.

emulate To imitate or behave in an identical way. The terminal emulation tools included with MacTerminal make it possible for your Macintosh to emulate various computer terminals.

Enter key A key that confirms or terminates an entry or sometimes a command.

Escape character The character used to start an escape sequence. Its ASCII value is 1B.

Escape key A key frequently used to start an escape sequence. Since the Macintosh Plus keyboard doesn't contain an Escape key, with the TTY, VT102, and VT320

Tools, the tilde/quotation mark key on this keyboard functions as the Escape key.

escape sequence A sequence of keystrokes beginning with the Escape key, often used for positioning the cursor and controlling the display of text on the screen.

Ethernet A high-speed local area network system that uses a variety of cables, such as thick-wire, thin-wire, broadband, twisted pair, and so on. The Ethernet specification was developed by Digital Equipment Corporation, Intel Corporation, and Xerox Corporation.

Ethernet card A printed circuit board or interface card that connects a computer, such as a Macintosh or VAX, to Ethernet and serves as the communications controller between the computer and other devices in the Ethernet environment. A number of Ethernet cards are available for Digital, Apple, and other types of computers. Apple provides an Ethernet card called the *EtherTalk NB Card*. See also **Ethernet, EtherTalk.**

EtherTalk A high-performance AppleTalk connection. EtherTalk consists of an Ethernet interface card, AppleTalk software, and Ethernet cabling. EtherTalk enables you to use Ethernet cabling in an AppleTalk environment. See also **AppleTalk, Ethernet.**

EtherTalk NB Card An Ethernet card provided by Apple Computer, Inc. See also **Ethernet, Ethernet card, EtherTalk.**

file A collection of information stored on a disk; usually a document. Macintosh files include applications, documents, system files, and text files.

file transfer To send a file from one computer to another.

file transfer protocol A protocol that establishes the way a computer will send and receive a file.

file transfer tools One of the three types of communications tools. A file transfer tool ensures that files are transferred intact between computers. Examples: Text Tool, XMODEM Tool. See also **communications tools.**

Finder An application that you use to manage documents and applications and to gain access to the contents of disks.

font A collection of letters, numbers, punctuation marks, and other typographical symbols with a consistent appearance.

format The arrangement of text as determined by margins, tabs, line spacing, and text alignment.

full duplex A communications link capable of simultaneous two-way transmission; allows the other computer to echo received characters back to the terminal region of the session document.

group code A number assigned to a LAT service on a network. More than one service may have the same number; those services with the same code belong to a group. See **bundle.**

half duplex A communications link between the host computer and MacTerminal in which only one device can transmit at a time, as with walkie-talkies. With half-duplex, the host computer does not echo what you send, so your need to select the local echo option with your terminal emulation tool. (Use the Terminal command on the Settings menu to change this option).

handshaking The exchange of predetermined signals between two computers in order to establish a connection and to maintain the connection by controlling the data flow.

hard disk drive A device that holds a hard disk, retrieves information from it, and saves information to it. A hard disk can store much more information than a floppy disk.

highlight To make something visually distinct from its background. An item is usually highlighted to show that it has been selected or chosen.

host computer A computer that manages information for many terminals. A host computer may be a mainframe, a minicomputer, or another microcomputer. (The microcomputer might be running an electronic bulletin board, for example.)

icon A graphic representation of an object, a concept, or a message.

information service A company that offers the public access to sources of information like national databases, current news, and business information. This information is stored on large computer, which subscribers can access through dial-up connections.

insertion point The spot where something will be added. An insertion point is selected by clicking and is represented by a blinking vertical bar. In MacTerminal, insertion points appear only in dialog boxes where you are asked to type information.

installation The process of adding or changing information on a Macintosh computer. For example, the Installer application provided with PATHWORKS for Macintosh installs software and updates the System file. The Installer uses Installer script documents that define the software to be installed.

Keys menu A menu that is added to the MacTerminal menu bar by certain terminal emulation tools; among other things, it provides you with the on-screen equivalent of the Macintosh numeric keypad, imitating the function and cursor keys of the terminal. You can "press" a key by choosing it from the open menu. The VT102 and VT320 Tools supply Keys menus.

LAT Connection Tool A communications tool that you install on your Macintosh. The LAT Tool lets you access LAT services on Digital computers. See also **connection tools, LAT, terminal service.**

LAT protocol See **Local Area Transport protocol.**

line feed An ASCII character (decimal 10) that ordinarily causes the cursor to drop down to the next line—in the same column it was before. The interpretation of this key can be redefined by the communications tools that you are using.

local area network (LAN) A group of computers and shared devices connected to the same transmission cables and located within a limited area, usually a single building.

Local Area Transport (LAT) protocol A communications protocol developed by Digital to support high-speed terminal services. See also **communications protocol.**

local echo A method of communication in which MacTerminal displays data "locally" in the terminal display area as you send it, without relying on the host computer to echo the characters back. Typically, your terminal emulation tool lets you choose whether or not you want to use a local echo option.

LocalTalk A system of cables, cable extenders, and connector boxes used to connect computers and other devices in a network.

log in To enter a series of responses to prompts by the host computer at the beginning of a communications session, to identify yourself, your account number, sometimes your terminal, and so forth.

log out To type a command to the host computer that terminates the communications session.

Macintosh Communications Toolbox A set of extensions to the Macintosh system software that provides Macintosh applications with standard communications services and a consistent interface for using those services.

Macintosh Plus keyboard The keyboard that comes with the Macintosh Plus computer.

mainframe computer A large computer whose speed and storage capacity allow it to handle huge amounts of data and work with many terminals.

memory The place in the Macintosh that stores information while you are working on it. The amount of memory available to MacTerminal and the communications tools, and the amount of memory required by the tools you are using, determines how many session documents you can open at once.

menu A list of commands that appears when you point to and press the menu title in the menu bar. Dragging through the menu and releasing the mouse button while a menu item is highlighted chooses that item.

menu bar The horizontal strip at the top of the screen that contains menu titles.

minicomputers An intermediate-size computer that can perform the same kinds of functions as a mainframe computer, but that has less storage capacity, processing power, and speed.

modem A peripheral device that enables a computer or terminal to transmit and receive over telephone lines by modulating, or converting, data from a digital to analog form. When receiving data, the modem converts an analog signal to a digital signal; when sending data, the modem converts the digital signal into an analog signal.

MultiFinder System software that enables your Macintosh to run more than one application at the same time. In addition, MultiFinder makes it possible for you to run certain applications in the background while you continue working on other applications.

network A collection of interconnected, individually controlled computers, the hardware and software used to connect them, and the communications protocols that govern the exchange of information between the computers and other devices. A network allows users to share data and peripheral devices such as printers and storage media, to exchange electronic mail, and so on.

network identifier An address, or number, used to identify a computer or other unit of equipment in a network.

numeric keypad A set of keys arranged as on a calculator, for rapid entry of numbers. There is a physical keypad on your keyboard. In addition, the VT102 and VT320 Tools supply an equivalent graphics keypad in the Keys menu. With the VT100 and VT320 terminal types, the keys on the numeric keypad take on special functions defined by the applications running on the remote computer.

off line Not connected to a host computer. When MacTerminal is off line, it can use local echo to display what is typed, but it is not communicating with another computer.

on line Currently connected to and under the control of the host computer. When MacTerminal is on line to the host computer, the host computer defines much of what you can do.

open To activate an application, document, folder, or disk. The action that occurs depends on the type of object that is opened.

open connection An established communications link to another computer over which the two computers can exchange information.

operating system Software that controls the basic operations of a computer.

Option key A key used like the Shift key to give an alternate interpretation to another key you type.

parity A method of detecting errors in data transmission. The computer that sends a piece of data adds a bit, and the receiving computer looks at that bit to make sure it maintains a sameness (or parity) of level or count. If not, the assumption is that an error has been made somewhere along the line. There are several kinds of parity, and when you find out what the other computer expects, you should set up your connection tool to use that type of parity. (Use the Connection command in the Settings menu.)

password A unique string of characters that a user (or program) must supply to gain access to a network or host computer. For security, passwords usually are not displayed on the screen as they are entered.

paste To place the contents of the Clipboard—whatever was last cut or copied—into a document, text file, or desk accessory. Pasting into a session document during a communications session sends the data to the remote computer.

pop-up menu A menu that appears within a dialog box and is used for setting values or for choosing from lists of related items.

ports The connection sockets on the back of your Macintosh through which data is transmitted.

prompt A query or advisory message from a host computer to the terminal user, such as a request to type a password or choose a command.

protocol A set of rules for sending and receiving data on a communications line.

public domain software Programs that are available to the public without copy restrictions.

public network A telecommunications network that leases circuit services to the public. TYMNET and Telenet are examples of public networks.

remote computer A computer other than your own but in communication with yours through communication links. A remote computer can be any distance from your computer, from right beside it to thousands of miles away.

resource A software module containing data used by the Macintosh Operating System or by Macintosh applications. Resources are stored in the resource fork of a Macintosh file. For example, a resource might provide a menu, font, or icon for an application.

router A device that links two or more separate networks. For example, a router can link and allow data to cross between a LocalTalk network and an Ethernet.

save To transfer information from your Macintosh to a disk for storage.

Scrapbook A desk accessory in which you save frequently used pictures or passages of text.

scroll To move information within a window so that a different part of it is visible.

scrollback cache region The area above the dotted line in a session document, which is used to store the communications conversation as it overflows the terminal region of the session document. Data will be saved into the scrollback cache region whenever the Save Lines Off Top is activated. The data in the scrollback cache region can be viewed, copied, and printed. In addition, it is saved in the disk copy of the session document.

scroll bar A rectangular bar that may be along the right or bottom of a window. Clicking or dragging in the scroll bar causes the view of the document to move vertically or horizontally.

select To designate where the next action will take place. To select, you click, double-click, or drag across information. In MacTerminal, you can select data to copy it to another application. The selection is usually highlighted.

send To transfer information. Once you have started a communications session, you can paste information into your document; that information will be sent automatically to the other computer. To send a whole file, choose Send File from the Session menu.

Serial Connection Tool A communicated tool used primarily for connecting to another computer over local cables. You can also connect through a modem with the Serial Tool; however, you will have to enter the commands to the modem manually.

session See **communications session.**

session document The document you work in while using MacTerminal. It provides options for setting up a communications session and enables you to view incoming and outgoing data.

settings dialog box A dialog box displayed by a communications tool; it contains the setup options used to specify communications parameters.

setup options Settings used to define the communications parameters for the session document. With MacTerminal setup options are tool-specific and can be changed with the Terminal, Connection, and File Transfer commands in the Settings menu.

Shift-click A technique that allows you to extend or shrink a selection by holding down the Shift key while you revise your selection.

software Programs, or instructions, for the Macintosh to carry out. The Macintosh reads these instructions from disks inserted into the disk drive.

startup disk A disk with all the files you need to use the Finder and possibly one or more applications.

System file A file that Macintosh computers use to start up the operating system.

System Folder The folder that contains the resources needed by your Macintosh Operating System. Among other things, it contains the Communications Folder (which is used to store communications tools) and the System file.

telecommunications The science and technology of communication by electronic means.

terminal See **computer terminal.**

terminal emulation tools One of the three types of communications tools. The terminal emulation tool that you use determines the type of terminal that your Macintosh will emulate during the communications session. Examples: TTY Tool, VT102 Tool, VT320 Tool. See also **communications tools.**

terminal mode With the VT102 and VT320 Tools, an option that defines the specific Digital terminal type. You set the mode with the Terminal command in the Settings menu.

terminal region The part of the session document where the communications conversation between you and the other computer is displayed. If the Save Lines Off Top command is selected, when the terminal region is full, messages overflow into the scrollback cache region (the region above the dotted line in the session document).

terminal service A LAT service on a host computer, such as a VAX, that users can access from terminals connected to the host. Often refers to a specific host computer. Users can log in to an account on this host to interact with the operating system. Other terminal services might include word processing or accounting applications. You can access terminal services from your Macintosh computer by using communications software such as MacTerminal, together with a connection and a terminal emulation tool.

terminal service application An application that you can use from a computer terminal without first having to log in to the computer on which the application runs.

text Information in the form of characters readable by human beings. A text file is encoded using the ASCII format. You can create text files in most applications; for instance, from MacWrite. You can transfer a text file with the text or XMODEM Text protocols.

Text File Transfer Tool A communications tool that is used for performing the simplest form of file transfer by simply sending the text to the other computer without performing any error-checking.

title bar The horizontal bar at the top of a window that shows the name of the window's contents and lets you move the window.

transfer To send or receive information between computers.

transmission delay A deliberate slowing down, as when you add a time interval between characters or between lines when you send them. Sometimes the other computer cannot process information as fast as MacTerminal sends it. To set transmission delays, use the Paste Options command (for pasted text) or the File Transfer command (for files) in the Settings menu.

transmit To send information to another computer.

TTY Terminal Emulation Tool A communications tool that lets your Macintosh emulate a TTY, which is a basic fixed-function terminal.

user interface The part of a software application with which the user interacts: the commands, screens, dialog boxes, and so on.

user name A string of characters that uniquely identifies a user for log-in purposes; you usually must enter a user name before you can gain access to a network system or to a host computer.

VAX computer A Digital Equipment Corporation minicomputer.

VMS An interactive operating system that runs all of Digital's VAX computers. While you are logged in to the computer, you and the system conduct a dialog of command and response. You use the Digital Command Language (DCL) to communicate with VMS. VMS stands for Virtual Memory System.

volume A piece of storage medium formatted to contain files; usually a disk or part of a disk.

VT102 Terminal Emulation Tool A communications tool that lets your Macintosh emulate a VT102, which is a Digital Equipment Corporation text-only terminal.

VT320 Terminal Emulation Tool A communications tool that lets your Macintosh emulate a VT320, which is a Digital Equipment Corporation text-only terminal that offers a wide variety of functions, including support for 8-bit characters.

window The area that displays information on a desktop. You view documents through windows. You can open or close windows, change their size, edit their contents, scroll through them, and move them around the desktop.

XMODEM File Transfer Tool A communications tool for sending and receiving files that performs error-checking and correction. Several transfer methods are available with the XMODEM Tool—MacBinary, MacTerminal 1.1, Straight XMODEM, and XMODEM Text.

XON/XOFF A handshake protocol (transmit-On/transmit Off) used by computers and intelligent terminals to control the flow of data between the systems.

zoom box The small box on the right side of the title bar of some windows. Clicking the zoom box expands a window to its maximum size. Clicking it again returns the window to its original size.

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MacTerminal User Update

This update for the *MacTerminal® User's Guide* contains information on the following topic:

■ DECnet™ for Macintosh® software

DECnet for Macintosh

DECnet for Macintosh is a software package included with PATHWORKS for Macintosh that lets you establish DECnet connections to VAX™ computers from your Macintosh computer. The DECnet for Macintosh software includes the following components:

- CTERM Tool—connection tool for terminal ("SET HOST") connections
- DECnet Control—Control Panel device
- DECnet Tool—connection tool for DECnet task-to-task connections
- DECnet/Mac—communications driver
- NCP—DECnet configuration application
- NetCopy—DECnet file-transfer application

You can use the CTERM Tool to access terminal services over a DECnet connection. (The DECnet Tool also works with MacX™ to let you access DECwindows™ applications over a DECnet connection.)

See the *DECnet for Macintosh User's Guide,* published by Digital Equipment Corporation, for information on installing and using DECnet for Macintosh software.

Communications Tools Reference

Preface

This is your reference guide to the communications tools included with your MacTerminal® application. This document explains what the communications tools are and the setup options associated with each of the tools. The instructions for using the tools are provided in the user's guide.

The *Communications Tools Reference* is divided into three parts:

- Connection Tools
- Terminal Emulation Tools
- File Transfer Tools

Within each part are modules on the communications tools for that category. Each tool module is an independent unit. If you aren't using a particular tool, you might want to remove the module on this tool and store it somewhere else. In addition, because Apple Computer (and other companies) will continue to release new tools that you can use with MacTerminal, you can insert any new tool modules that you obtain in the appropriate section of this binder.

At the back of this binder, you'll find quick reference cards (keyboard conversion charts for some of the terminal emulation tools) that you can tear out and refer to as needed.

About the communications tools

The communications tools for the Macintosh® Communications Toolbox enable applications like MacTerminal to provide connection, terminal emulation, and file transfer capabilities to users. Each communications tool provides the application with a specific communications function; for example, the VT102™ Terminal Emulation Tool provides applications with VT102 terminal emulation capabilities. The communications tools work in conjunction with the Macintosh® Communications Toolbox, which is system software that provides Macintosh applications with access to communications functions. The tools fall into three categories:

Connection tools   Define the type of connection that is established between your Macintosh computer and the remote computer

Terminal emulation tools   Determine the type of terminal that your Macintosh emulates during the communications session

File transfer tools   Implement the protocols that make it possible for your Macintosh to exchange files of information with other computers

For each communications session, you need a terminal emulation tool and a connection tool; frequently, you will also use a file-transfer tool. For example, if you are establishing a communications session to transfer files between your Macintosh and a VAX™ computer, you might use the VT320™ Terminal Emulation Tool (so that your Macintosh emulates this Digital Equipment Corporation terminal) and the Modem Connection Tool (to establish a compatible link between the two computers), as well as the XMODEM File Transfer Tool (to ensure that the files you transfer arrive without errors).

You can set up each tool to meet your particular communications needs by using MacTerminal to change the communications parameters (the setup options) for the tool. For example, when you are using a terminal emulation tool, you can usually set the column width and type size, among other features, and when you are using a connection tool, you might specify such features as baud rate, parity, and handshake method.

The communications tools included with MacTerminal

PATHWORKS™ for Macintosh includes a basic set of communications tools for use with MacTerminal. After you install the tools, they reside in a folder named Communications Folder in your System Folder. If you install all the communications tools included with MacTerminal, the contents of the Communications Folder will look like the following example.
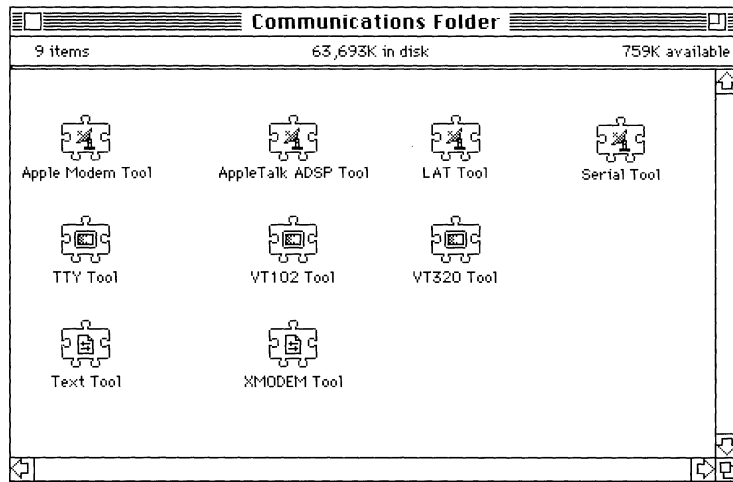
These tools fall into three categories:

 connection tools: Apple Modem, AppleTalk ADSP, LAT, Serial

 terminal emulation tools: TTY, VT102, VT320

 file transfer tools: Text, XMODEM

You use the Settings menu in your MacTerminal application to select and configure tools. If you do not change any of the settings, MacTerminal automatically uses the following three tools:

- Modem Connection Tool
- VT102 Terminal Emulation Tool
- XMODEM File Transfer Tool

The setup options for all the communications tools included with your MacTerminal application are preset to the most common settings. In many cases, you won't need to change these settings. However, sometimes you may want to reconfigure the tools to better accommodate the type of communications environment that you are establishing. The tool modules in the rest of this document define the setup options associated with each of the tools included with your MacTerminal application. Using the Settings menu, it's easy to change the settings; you can experiment with various settings until you find the ones that work best for your environment. When you close a session document, you can save the settings for that document. Then, the next time you open the session document, it will already be set up for you.

In addition to the tools included in your MacTerminal package, you can install new communications tools (as they become available from Apple computer and other companies) into your System Folder and use them with MacTerminal.

About installing communications tools

Before using MacTerminal, you need to install MacTerminal, the Macintosh Communications Toolbox, and a set of communications tools. In fact, MacTerminal won't run unless the Communications Toolbox and both a terminal emulation tool and a connection tool are available (a file transfer tool is *not* required). The *Installation* part of the *Network Services User's Guide* provides complete installation instructions.

This part of your binder contains reference modules describing the connection tools that accompany your MacTerminal® application. A connection tool is software that allows one computer to establish a connection with another computer.

The modules in this section describe how to set up your Apple® Macintosh® computer to connect to another device using the following connection tools included with MacTerminal:

Apple Modem Connection Tool	For connecting with remote systems via an Apple modem or other Hayes-compatible modem
AppleTalk ADSP Connection Tool	For connecting to services on the network that use the AppleTalk® Data Stream Protocol
LAT Connection Tool	For connecting to VAX™ terminal services using the Local Area Transport (LAT) protocol
Serial Connection Tool	For connecting directly to another computer (or other device, for example, a modem) through the serial port on the Macintosh

The discussions for each of the connection tools provide the following information:

- an overview of the tool and, where appropriate, a description of the special hardware and software needed to use the tool
- descriptions of the configuration options used to set up your Macintosh to communicate using the specified type of connection
- alert and status message definitions
- troubleshooting hints

Apple® Modem Connection Tool

The Apple Publishing System

Contents

The Apple® Modem Connection Tool lets you establish a connection with a remote computer through a modem attached to your Macintosh® computer. The Apple Modem Tool provides a connection through either of the two serial ports built into the Macintosh and automatically recognizes an attached Apple, Hayes, or other Hayes-compatible modem. Besides using the built-in serial ports, the Apple Modem Tool can establish connections through serial or modem cards installed in your Macintosh.

◆ **Note** Serial and modem cards must have software that registers them with the Communications Toolbox. See the section, "Current Port," in this module for more information. ◆

The Apple Modem Tool enables your modem to answer an incoming call or make an outgoing call. When Answer Phone (answer mode) is selected, you can specify the number of rings the modem should wait before answering. When Dial Phone (dial mode) is selected, you can enter the destination phone number, the redial count, the redial interval, and the dialing method. The modem automatically dials for you.

Other Apple Modem Tool options let you select the type of modem being used, as well as set data transmission parameters such as baud rate, parity, number of data bits and stop bits per character, and handshake method. To type commands directly to a modem, establish a connection using Apple's Serial Connection Tool (or a tool with similar capabilities from another manufacturer) and start typing. The MacTerminal® session document you opened will record your commands and the modem's responses.

Modem connection settings

You choose the Connection command in the Settings menu (shown below) to access a dialog box that lets you set connection attributes.
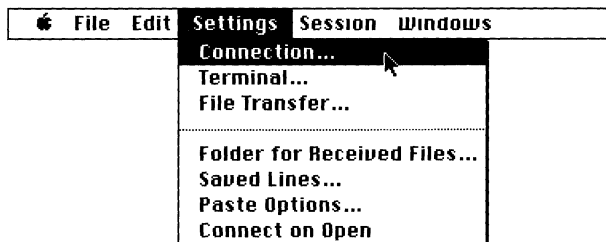
When you choose Apple Modem Tool from the Method pop-up menu in the Connection Settings dialog box, the dialog box displays the setup options for configuring your Macintosh to communicate over a modem connection (see below).
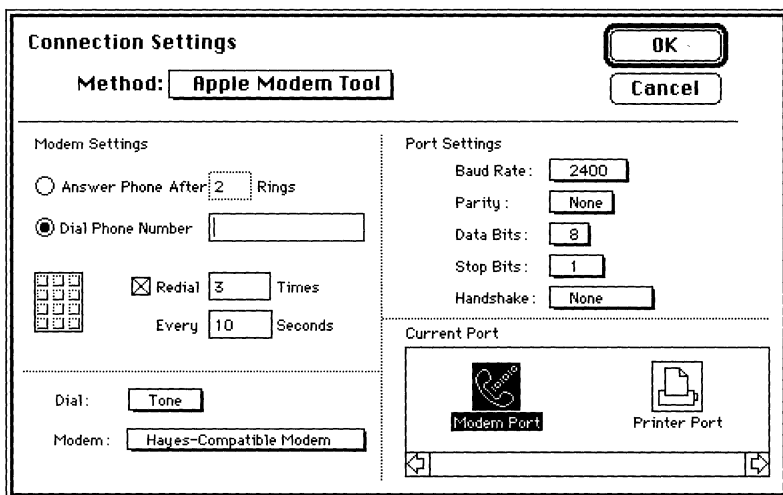
Setup options

For each option in the Apple Modem Connection Settings dialog box, the most commonly used setting is preset as the default. However, you may need to change some of these settings depending on the type of modem you are using, the type of information being transmitted, or the communication requirements of the remote computer. In these cases, you should refer to the documentation for your modem or the remote computer, or contact your system administrator for information on how the various options should be set for the communications session you are establishing.

The following subsections describe the connection setup options available in the Apple Modem Connection Settings dialog box. The options are presented in the order they appear in the dialog box (reading from top to bottom and from left to right).

Modem Settings

Use the options in this group to specify whether the modem will dial a number or answer an incoming call and to set related features. If the modem is in answer mode, you can specify the number of rings before a call is answered. If the modem is in dial mode, you can specify the access phone number and the dialing conventions. The default setting for this option is dial mode (Dial Phone Number).

Dial mode. The access phone number of the remote computer that you want to call goes in the text field for this option. The field accepts up to 200 characters. If you have already entered a number, it appears selected (highlighted), and you can change it by typing another number.

With most Hayes-compatible modems, a comma after a number causes the modem to pause before dialing the remaining numbers. Use a comma when entering a number used to get an outside line, or whenever you dial a number and then wait for a dial tone. An "at" sign (@) in the phone number causes the modem to detect a silence (no noise) on the line before dialing. Refer to your modem manual for further information on giving instructions to your modem.

The other options in this group (those used for specifying the dialing conventions) become available when you select this mode.

○ Answer Phone After ⌷2   ⌷ Rings

Answer mode. This option specifies the number of times the phone rings before the modem answers the call, thus establishing the connection. You can specify any number of rings 1–255. The default setting is 2 rings.

   If you specify a number less than 1 or greater than 255, the Apple Modem Tool beeps and sets the number of rings to 2. If you keep trying to enter a number that is out of this range, the tool displays an alert box explaining the problem.

Redial ... Times, Every ... Seconds This option is available only when dial mode is chosen; you can use it to specify the number of times to redial the phone number for the remote computer and the duration between redials. The default setting for this option is 3 attempts to redial at 10-second intervals.

⊠   When this option is checked and an attempt to establish phone connection with a remote computer is unsuccessful (such as when the line is busy), the modem redials the phone number the specified number of times, allowing the specified duration (in seconds) between each redial.

☐   When this option is unchecked and an attempt to establish phone connection with a remote computer is unsuccessful, the modem does not redial the phone number.

Dial This pop-up menu is only available when dial mode is chosen; it lets you choose the dialing method used for the connection. Tone and Pulse are dialing methods used by telephone companies. Mixed is a combination of both methods. As you change dialing methods, the icon representing the method changes. The default setting for this option is the Tone dialing method.

Tone is the most common transmission signal in use today; it is used with most push-button telephones.

Pulse is used with many rotary-dial telephones and is still found in parts of the United States.

Mixed dialing (a combination of both tone and pulse) is used when part of the telephone number is in pulse and part of the number is in tone.

One case that requires mixed dialing is calling an electronic banking service from a rotary telephone. Although you can probably access the service by pulse dialing, you must then enter an extension in tone numbers. In this case, you would type a P before entering the pulse number for the service and a T before the tone extension, for example, P4155551212,T1678 (the comma indicates a delay).

Mixed dialing is also used where a tone system exists within a building, but the region still uses a pulse system. In this case, the part of the number that gets you an outside line (9, for instance) is in tone and the rest of the number is in pulse. When you type the phone number, you would type an uppercase T before the tone numbers and an uppercase P before the pulse numbers, for example, T9,P4155551212 (the comma indicates a delay).

Modem

This pop-up menu lists the type of modem being used for the connection. The modem you use must be compatible with a Hayes modem. The default setting for this option is Hayes-Compatible Modem.

```
Apple 300
Apple 1200
Apple Personal Modem
Apple Data Modem 2400
Macintosh Portable Data Modem 2400
..............................................................
Hayes Smartmodem
US Robotics Courier
Microcom AX
Telebit Trailblazer
..............................................................
● Hayes-Compatible Modem
```
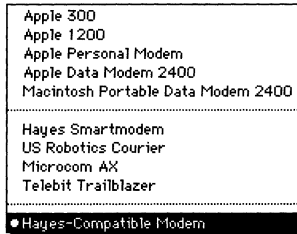
Choose the modem you want from this list. For each modem, the Apple Modem Tool uses a preset string of commands to set up the modem and automatically dial the telephone number you enter.

Port Settings

The pop-up menus in this group allow you to set the baud rate, parity, number of data bits per character, number of stop bits per character, and handshake method used by the serial port.

Baud Rate You use this option to regulate the speed at which data is transmitted between your Macintosh and the modem. The baud rate is usually the number of bits sent per second; however, more precisely, the baud rate is the number of times per second that a transmission signal varies (sometimes this may be somewhat different from the number of bits sent per second). Both your Macintosh and the device it is communicating with must transmit data at the same baud rate (unless you are using a modem that adjusts the sending baud rate to match the requirements of the remote modem, for example, the Apple Data Modem 2400, in which case the baud rate for the Macintosh may be any rate that the local modem can handle).

The Baud Rate pop-up menu offers a variety of rates, 110–57,600 (56K) baud. The capabilities of your modem and the modem at the receiving end determine the baud rate you choose. The default baud rate is 2400.

◆ **Hint** If incoming data is garbled (or missing), your baud rate setting may not match that of the other computer, or the phone lines may be noisy. ◆

Parity This menu lets you choose the method used by your Macintosh and the other computer for checking that data isn't garbled during transmission. The Apple Modem Tool enables you to use even or odd parity checking or to specify none, indicating that no parity checking will be performed.

You may choose any of the three parity settings, as long as the other computer is also set up to use the same parity. If you are connecting to an information service or to a remote computer, their setup instructions should indicate what parity to use. If you aren't sure what parity to use, contact the appropriate system administrator. The default setting for parity checking is None. (Most on-line services use no parity.)

◆ **Note** Some older computer systems require mark or space parity; however, the Apple Modem Tool does not support these settings. If the host or on-line service you are trying to contact specifies mark or space parity, ask the system administrator whether you can substitute a different parity setting. ◆

Data Bits This menu lets you specify the number of bits that make up a character. With the Apple Modem Tool, your Macintosh can send and receive 5-, 6-, 7-, or 8-bit characters, whichever the other computer requires. The default setting for this option is 8-bit characters.

◆ **Note** Some file transfer tools require a certain bit-character setting. For example, the XMODEM File Transfer Tool requires 8 data bits per character. ◆

Stop Bits Use this menu to specify the number of stop bits used to mark the end of a transmitted character. The Apple Modem Tool supports 1, 1.5, or 2 stop bits. Typically, a stop bit is 1-bit long; this is the default setting for this option.

Handshake This menu lists the methods available for regulating the flow of data transmitted between your Macintosh and the computer at the other end of the connection. For handshaking to work, both computers must have the same handshake method in effect. Numerous factors determine when it's best to use handshaking, but here are some important considerations:

How busy your Macintosh is

If your Macintosh is performing comprehensive background tasks, such as spooling a file to the printer or making complex spreadsheet calculations, its ability to quickly process incoming data diminishes.

How fast the other computer is sending data

Processing a continuous inflow of data at high baud rates is more exacting than dealing with sporadic transmissions at slower rates.

How powerful your Macintosh is

A Macintosh IIfx computer can process incoming data faster than a Macintosh Plus, for instance.

Whether the other device or service requires handshaking

Some commercial services, such as MCI Mail, require XON/XOFF for controlling data flow.

Whether the file transfer protocol you're using (if any) requires handshaking

Some file transfer protocols, like XMODEM, are not compatible with XON/XOFF handshaking.

The Apple Modem Tool offers the following handshake options; the default setting is None:

None

The Apple Modem Tool disregards any XON or XOFF characters sent by the other computer. The tool doesn't regulate the flow of data from the other computer, nor does it respond to the other computer's attempts to regulate the flow of data from your Macintosh.

If the other computer sends information faster than your Macintosh can receive it, some incoming characters will be lost. In this case, try specifying XON/XOFF handshaking or a slower baud rate. If the host or device you're connected to doesn't support these options, you can also try deactivating the Save Lines Off Top command from the Session menu. Turning off this feature helps your Macintosh process incoming data faster because it doesn't have to save overflow lines to the scrollback cache at the same time. (However, this command does not affect data flow rates during file transfer.)

XON/XOFF

The Apple Modem Tool regulates the flow of data between your Macintosh and the other computer. Using XON/XOFF prevents the loss of data when either computer sends characters faster than the other computer can receive them. On the Macintosh, the serial drivers control the XON/XOFF procedure. Each serial port on a Macintosh is controlled by a driver. The driver monitors a buffer that stores incoming data. When the buffer fills to a certain point, the driver sends a Control-S to temporarily stop transmission. After the buffer empties a certain amount, the driver issues a Control-Q to signal the sending device to resume transmitting data.

Note that XON/XOFF handshaking is incompatible with the XMODEM File Transfer Tool.

Current Port

Choose one of the port icons displayed in the Current Port scrolling list to specify the port on the back of your Macintosh that connects to the modem. In a minimum configuration—meaning you haven't installed an add-on serial or modem card—two port icons appear in the scrolling list. These icons are identical to those identifying the ports on the back of the Macintosh, as shown in the example below (note that the placement of the ports on the back panel varies from one model of Macintosh to another).

Modem Port

Modem port

Printer Port

Printer port

You can use either port when establishing a connection. However, if you are using LocalTalk®, the printer port is unavailable since the LocalTalk connection is established through the printer port.

If additional serial ports are available on your Macintosh, icons for these ports should also appear in the Current Port scrolling list. For example, if your Macintosh contains a Creative Solutions card, the corresponding port icon appears in the scrolling region provided the card has registered itself with the Communications Toolbox. The program that performs this registration usually takes the form of an init or cdev that you drag into your System Folder.

◆ **Note** If you install a serial card in your Macintosh, be sure to ask the manufacturer for the software that registers the card with the Communications Toolbox. When you buy a card, check to see if this program is included; in some cases it won't be. ◆

Resetting the Apple Modem Tool

You can reset the Apple Modem Tool by choosing the Reset Connection command from the Session menu. Choosing this command resets all of the setup options for the connection tool (that is, all the options you can set in the Connection Settings dialog box) to the settings last saved.

In addition, when you reset the Apple Modem Tool, the tool's input and output buffers are cleared. As a result, you may lose data in transit (if the data is temporarily being stored in either the input or output buffer).

Resetting the Apple Modem Tool also resets the handshaking status for the tool to XON. So, if your Macintosh was waiting to send data until it received an XON from the other computer, it doesn't have to wait any longer but can resume sending data. (If the other computer isn't ready to start receiving data again, this could result in data loss.)

Dialing status messages

After you use the Open Connection command, the Apple Modem Tool displays a status box that provides you with information about the connection attempt. The first message looks like the one shown below.
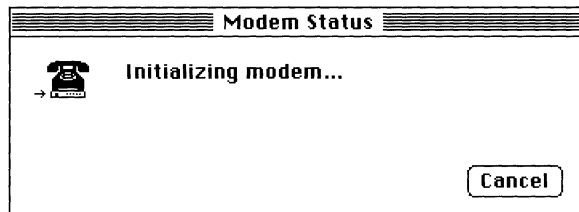
If you haven't entered a phone number in the Connection Settings dialog box and the tool is set to dial mode, the following alert appears first and prompts you to enter one. After you enter a phone number and click Dial, the Initializing Modem status message, shown on the previous page, appears.

There is no phone number in the connection settings. Please enter a phone number for this call.

Cancel   Dial
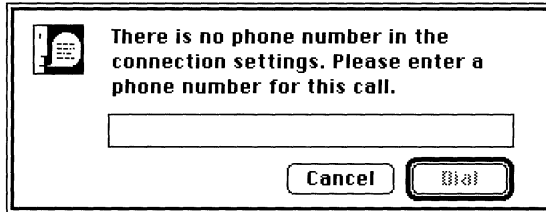
Next, a dialing message is displayed.
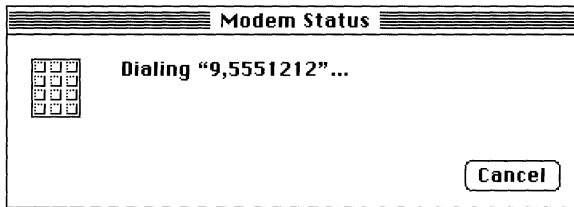
Modem Status

Dialing "9,5551212"...

Cancel

If the connection attempt succeeds, a connection message similar to the sample below is displayed (the actual wording depends on the modem being used).

Modem Status

The connection was established at 2400 baud.

OK

If a problem occurs during the connection attempt, a dialing status message appears. The possible dialing status messages follow; they are listed alphabetically.

An error occurred while dialing.

The modem is accepting the initialization commands, but rejecting the dialing command. Reset the modem and try again.

No dial tone was detected.

The modem cannot detect a dial tone. Make sure your phone isn't off the hook and that the phone line is plugged securely into the modem. Then try your call again.

No silence was detected.

You have entered a phone number that includes an "at" sign (@), which means that the modem needs to detect a silence (a period of no noise) on the line before continuing to dial. The modem is not detecting this silence, so the connection attempt is terminating. The lines to the remote system may be busy; try again later.

The initialization command was rejected by the modem, please check the modem type.

Make sure you have chosen the proper type of modem from the Modem pop-up menu. If the name of your modem does not appear, choose Hayes-Compatible Modem.

The line was busy.

You can't establish a connection because the remote system's telephone line is busy. Try again later or try another phone number if one is available.

The modem is not responding; please check that your cables are plugged in, that your modem is turned on, and that the correct speed has been selected.

The modem is not responding to communication from the Apple Modem Tool. Besides checking your modem and cables, make sure the modem is hooked up to the same port you selected in the Connection Settings dialog box to establish this connection.

The modem will not wait for incoming calls.

The modem cannot accept the "wait for call" command sent by the Apple Modem Tool; confirm that the kind of modem you are using is supported by the Apple Modem Tool. All Apple modems and most other Hayes-compatible modems will work with the Apple Modem Tool.

The phone line appears to have been dropped.

Your modem has lost the carrier signal and has advised the Apple Modem Tool of this situation. After displaying this message, the Apple Modem Tool closes the connection. Try your call again or check whether the remote computer is temporarily out of service.

The remote system did not answer.

The remote system is failing to answer. Possibly the remote modem is not in answer mode or is not turned on, or perhaps you have the wrong phone number. If the remote system is a host computer, it may be temporarily out of service (down). Try your call again later.

Waiting for an incoming call.

The modem is waiting for another computer to dial your Macintosh and request a connection.

◆ **Hint** While waiting for the incoming call, you can switch to another session or application (if you're using MultiFinder®) or choose a desk accessory and work on something else if you need to. ◆

Troubleshooting hints

Most problems you may encounter while using the Apple Modem Tool are caused by mismatched communications parameters; the settings you chose do not match the settings of the computer with which you are attempting to communicate. If you cannot establish a connection when you choose the Open Connection command from the Session menu or if you send or receive garbled data, compare your connection settings with those of the other computer. Keep in mind that terminal emulation tool settings that conflict with what the remote computer expects could also cause problems.

Sometimes you may have difficulty getting the connection started at all. Here's some advice to help you work through some common problems:

Establishing a connection between modems.

If you're having trouble establishing a connection between the modems, such as between an Apple modem and another type of modem, the first step is to check your equipment. You and the person using the remote computer must be sure you both have the correct cables, the cables and the telephone lines are properly plugged in, and the modem switches are set correctly. If nothing you do seems to work, try using the Serial Connection Tool and manually entering the commands to the modem.

Note that differences in baud rates and modulation schemes may create problems with modem-to-modem communication. Modems of the same baud rate may not be compatible with each other. This problem is common among 1200-baud modems. At 1200 baud, there are two common standards: V.22, used by Apple, Hayes, and most other Hayes-compatible modems, and the Bell 212A standard. Modems using the V.22 standard cannot communicate with those using the Bell 212A standard. There are also several 9600-baud modem standards, including V.29 and V.32. Most 9600-baud modems should be V.32 compatible. You need to be sure that your modem and the modem you are communicating with use the same standard.

Noise, or static, on the telephone lines.

Noise can cause garbled data or any number of other problems. If you think there is too much noise on the line, try hanging up and redialing to establish a better connection.

The modem takes too long to dial or hang up.

Some modems have switches for such things as the parameter RAM, that set the modem's default mode of operation. When certain switch settings don't match Apple Modem Tool settings, the modem sometimes takes a long time to resolve the discrepancies and its performance drops. If your modem is behaving sluggishly, try changing the switch settings. Consult your modem manual for instructions.

Regardless of whether your modem has switches, you should also verify that the baud rate for the Apple Modem Tool is the same as your modem's *default* baud rate so that you can reduce the instances when your modem has to spend time identifying and adjusting to the tool's baud rate. If you have a modem with an autobaud feature and you're not sure what its current baud rate is, consider switching the power on and off to reset the default baud rate before making a new call.

Here are some additional tips for solving communications problems:

Incoming data is garbled.

Check that your parity and baud rate settings match those of the other computer. If you see rectangular boxes or international characters scattered throughout the data, your parity setting might be wrong. In this case, the Macintosh interprets the eighth bit as data, so that characters acquire an ASCII value greater than 128. In the Macintosh extended ASCII character set, many of the characters above 128 decimal (80 hex) are rectangular boxes.

No data appears.

Verify that a cable is firmly attached to the port through which you are transmitting. If your cable is properly connected, verify that the baud rates match on both machines. With the Apple Modem Tool, the Open Connection command establishes contact with the port on your Macintosh; it does not guarantee a connection with the other end. If the baud rates don't match, the other device may simply refuse to respond. However, if the baud rates *do* match, make sure the On Line option is selected for the terminal emulation tool you are using. You will find this option in the Terminal Settings dialog box.

As soon as you connect, a status window appears indicating the connection was dropped.

If your RS-232 cable is improperly wired so that the voltage to the Clear To Send (CTS) pin for your Macintosh is always low, your modem informs the Apple Modem Tool that it has lost the carrier signal and the tool closes the connection. To temporarily avoid this problem, select Hayes-Compatible Modem from the Modem pop-up menu as Hayes-compatible modems don't check for low CTS. To permanently solve this problem, however, buy a new cable.

Sending a break produces unexpected results.

Make sure you are sending the type of break you need. With the Apple Modem Tool, sending a short break holds the line low for .233 seconds, which may interrupt the data flow but usually won't break your connection. Sending a long break holds the line low for 3.5 seconds. If you are accessing a host through intermediary communications equipment like a PBX system, sending a long break may break the connection between the intermediary and the host.

Alert messages

In addition to the dialing status messages you may see while using the Apple Modem Tool, the following alert messages may appear:

Changing the connection tool will close the current connection. Are you sure you want to do this?

You can't switch from one connection tool to another without closing the current connection. For example, if you're using the Apple Modem Tool and you choose the Serial Tool from the Connection Settings dialog box and click OK, you will get this message.

Changing the port will close the current connection.

You can't switch from the port in use to a different port without closing the current connection. For example, if you're using the modem port and you click the serial port icon in the Connection Settings dialog box, you will get this message.

Sorry—The serial port selected is in use and is not available.

Choose another serial port or close the current connection. This message may appear when the serial port chosen is already being used by LocalTalk.

Sorry—The serial port selected is not available.

Choose another port or close the current connection. This message appears when the serial port chosen is already open and in use by another session or application.

◆ **Note** Some applications don't close a port when they're finished using it. If you know that the port you've selected is not in use, you can override this condition. Hold down the Option key so that the OK button in the alert changes to an Override button. Then click Override; the Apple Modem Tool opens the selected port. You should use this override option with some degree of caution because if you override a port when another application is using it, the data stream splits between the two applications. In this case, both applications receive different parts of any incoming data and both applications' outgoing data gets sent to the device at the other end. (If you're not sure whether an application has left a port open or is using it, a safer approach would be to quit from your applications and restart your Macintosh. Restarting closes any ports that were left open.) ◆

The baud rate selected is larger than this serial port can support. Baud rate is now set to [*rate*].

The maximum baud rate on your modem card is less than the rate currently selected for the Apple Modem Tool. The tool has set the baud rate to the maximum your modem card allows.

Memory requirements

The number of MacTerminal session documents that you can have open at once depends on the amount of memory required by the communications tools used with the open session documents. If you are having trouble opening as many session documents as you want, it may be helpful to look at the amount of memory required for the tools you are using. The Apple Modem Tool requires approximately 35K–60K (kilobytes) of space in memory (depending on the functions that the tool is performing and the number of open session documents that are using it). To check the memory requirements for the other tools you are using, turn to the "Troubleshooting Hints" sections in the modules for those tools.

If you are using MultiFinder, you can choose About the Finder™ from the File menu to check how much memory is available to MacTerminal. If there isn't enough memory available, you can increase the partition size allocated for the MacTerminal application (use the Get Info command in the File menu).

AppleTalk® ADSP Connection Tool

Apple Computer, Inc.

The Apple Publishing System

Contents

The AppleTalk® ADSP Connection Tool lets you establish connections with services on your network that communicate by means of the AppleTalk Data Stream Protrocol (ADSP). The services to which you connect may be either applications or devices. The AppleTalk ADSP Connection Tool works on both Ethernet and LocalTalk® networks.

ADSP is one of the AppleTalk family of communications protocols, which are the protocols most commonly used by Apple networks. ADSP provides full-duplex, byte-stream communications. Data flow on an ADSP connection is reliable; ADSP guarantees that data bytes are delivered in the same order as that in which they were sent, and that they are not duplicated. In addition to supporting the usual data channel, the AppleTalk ADSP Tool also supports the *attention channel*. The attention channel allows the connected services to exchange messages (such as a message that the data stream is about to end) at the same time that data is being sent.

This module explains how to configure the Connection Settings dialog box for the AppleTalk ADSP Tool. You can configure the AppleTalk ADSP Tool for initiating connections to other services and to wait for connections initiated by other services. At the end of this module, you'll find a troubleshooting section that lists problems that you might encounter and suggests possible solutions. The troubleshooting section includes explanations of the alert messages that may appear while you are using the AppleTalk ADSP Tool, and a list of things to check if you suspect that there is a problem with the physical network.

What you need

This section lists the software components that must be installed on your Macintosh® computer before you use the AppleTalk ADSP Connection Tool. This section also tells you how to select a network if your Macintosh computer is connected to more than one network.

Software requirements

You must have the following software components installed on your Macintosh in order to use the AppleTalk ADSP Tool:

- Macintosh Communications Toolbox—installed in the System file
- AppleTalk ADSP Tool—installed in the Communications Folder
- ADSP driver version 1.0.2 or a later version—installed in the System Folder

The *Installation* part of the *Network Services User's Guide* provides installation procedures for the PATHWORKS™ for Macintosh software and describes all the components, including those related to the AppleTalk ADSP Tool. Together, the AppleTalk ADSP Tool and ADSP driver take up about 56K bytes on your disk drive. The AppleTalk ADSP Tool also requires about 44K bytes of random-access memory (RAM) while you are using a MacTerminal® session document configured with that tool, plus 10K bytes for each connection that you open.

If you are connecting to a VAX computer through an Ethernet card installed in your Macintosh, you must also have support for AppleTalk Phase 2. If you are using the Apple EtherTalk® NB Card, this means you must install EtherTalk 2.0 software. If you are using some other Ethernet card, you must install the equivalent AppleTalk Phase 2 software. See the documentation accompanying your Ethernet card for instructions.

Selecting a network connection

Your Macintosh computer may be connected to more than one network, or you may
have two or more connections to the same network. For example, your computer may be
connected to a LocalTalk network and also contain an Ethernet card that connects it to an
Ethernet environment. Or it may contain multiple Ethernet cards, each card connecting it
to a different Ethernet environment. If you have multiple network connections, you must
specify which connection you want to use.

To select a network connection:

1 **Choose Control Panel from the Apple (⚫) menu.**

The Control Panel window appears.
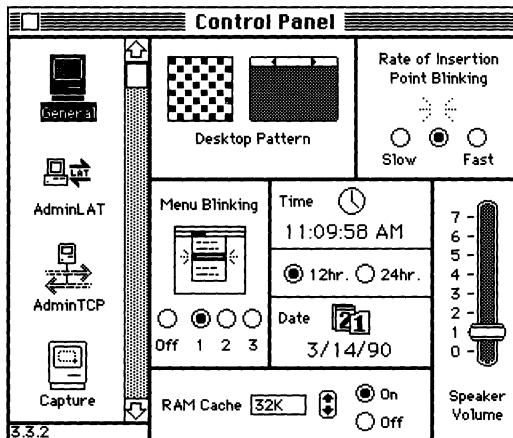
2   **Select the Network icon from the group of icons on the left side of the Control Panel window.**

You may have to scroll through the list to find the Network icon.
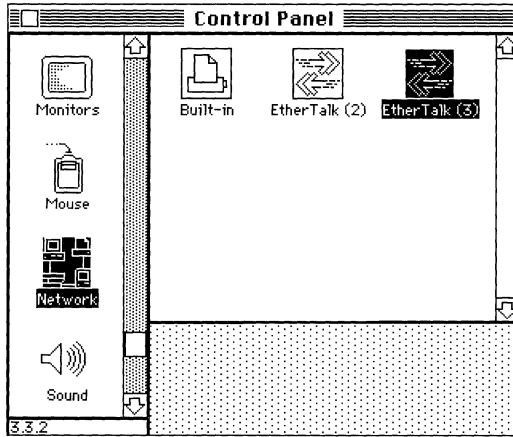
3   **Select the icon for the network connection that you want to use.**

The Control Panel displays a separate icon for each network to which your Macintosh is connected.

A connection to a LocalTalk network is usually made through the printer port. The icon for this type of connection, labeled Built-in, is shown in the preceding figure.

A connection to an Ethernet environment is represented by an icon labeled EtherTalk. If your Macintosh is connected to more than one Ethernet environment, each EtherTalk icon is also labeled with a number in parentheses, indicating the slot containing the Ethernet card for that connection.

AppleTalk ADSP Tool connection settings

The Connection Settings dialog box in MacTerminal lets you

- choose the connection method that you want to use
- specify the service to which you want to connect
- enter a name that will identify your computer on the network (so that other services can initiate the connection)

You open the Connection Settings dialog box from MacTerminal by choosing the Connections command from the Settings menu, as shown in the following figure.

```
 File   Edit   Settings   Session   Windows
               Connection...
               Terminal...
               File Transfer...

               Folder for Received Files...
               Saved Lines...
               Paste Options...
               Connect on Open
```
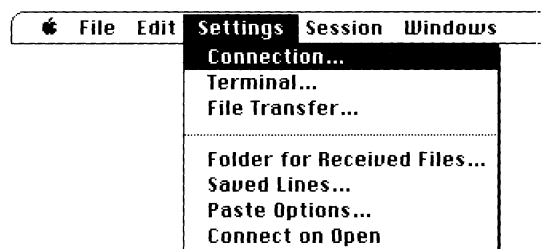
When the Connection Settings dialog box appears, you need to choose the AppleTalk ADSP Tool as your connection method, so that the dialog box displays the appropriate connection settings. You choose AppleTalk ADSP Tool from the Method pop-up menu, near the top of the dialog box.

```
Connection Settings                          ( OK )

    Method:  ✓Apple Modem Tool               ( Cancel )
             AppleTalk ADSP Tool
             AppleTalk-DECnet Tool
             LAT Tool
             Serial Tool
```
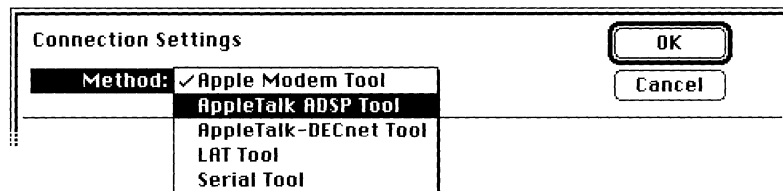
When you choose the AppleTalk ADSP Tool, the Connection Settings dialog box displays three groups of settings:

- *Connection Type setting.* This part of the dialog box contains only one field, Connection Type, in which you specify a connection type.

- *Remote settings.* This part of the dialog box identifies the service to which you want to connect. There are two fields and two lists:
  - □ *Zone,* which lets you specify the AppleTalk zone in which the computer to which you want to connect resides. Below this setting is a list of available zones, from which you can select the one you want.
  - □ *Name,* which lets you identify the service to which you want to connect. Below this setting is a list of available services, from which you can select.

- *Local settings.* This part of the dialog box identifies your zone and your computer's name. There are two fields:
  - □ *Local Zone,* which the AppleTalk ADSP Tool fills in with the name of your zone.
  - □ *Local Name,* which the AppleTalk ADSP Tool fills in with either the user name from the Chooser window (if you entered one) or with *Local User* (if you haven't entered a user name in the Chooser window). You do not have to accept these automatic entries; you can replace the AppleTalk ADSP Tool's entry with whatever name you like.

```
┌─────────────────────────────────────────────────────────────┐
│  Connection Settings                      ┌──────────────┐   │
│      Method: │ AppleTalk ADSP Tool │      │     OK       │   │
│                                           └──────────────┘   │
│                                           ┌──────────────┐   │
│                                           │    Cancel    │   │
│                                           └──────────────┘   │
│  ┌─────┐           Connection Type: │ ADSP          │ ┌────┐ │
│                                                              │
│  Zone: │ Stevens Creek 1 │        Name: │ Remote User │      │
│  ┌─────────────────────┐  Remote   ┌──────────────────────┐ │
│  │ Stevens Creek 1      ↑│          │                    ↑│ │
│  │ Test Eng. 1          │           │                     │ │
│  │ Test Eng. 2          │           │                     │ │
│  │ Test Eng. 3          │           │                     │ │
│  │ Test Eng. 4          │           │                     │ │
│  │ The End Zone        ↓│          │                    ↓│ │
│  └─────────────────────┘           └──────────────────────┘ │
│                                                              │
│  Local Zone: Stevens Creek 1    Local Name: │ John Doe │     │
└─────────────────────────────────────────────────────────────┘
```
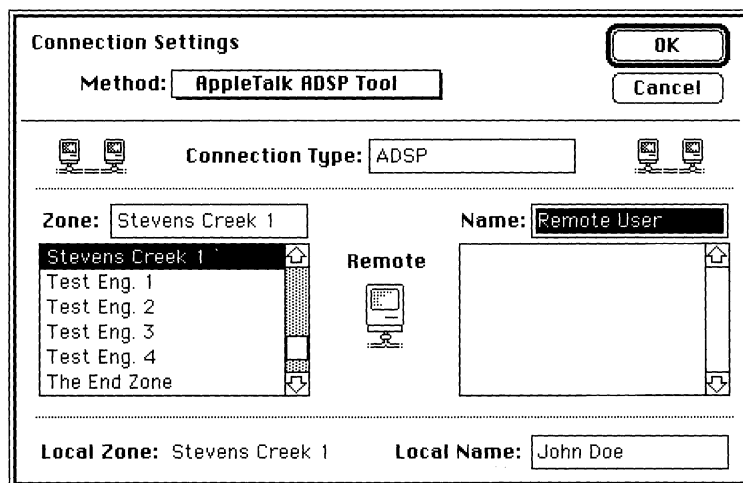
The sections that follow describe each of these settings in more detail.

Connection type

Services that support AppleTalk ADSP connections are assigned different *types*. The Connection Type field in the Connection Settings dialog box identifies the type of AppleTalk ADSP connection you want to make, and thus the services that you can access.

◆ **Connection method vs. connection type** Don't confuse the connection *type* with the connection *method*. The *method*, which you select from the pop-up menu at the top of the dialog box, determines the connection tool that you are using—in this case, the AppleTalk ADSP Tool. The *type* is a setting for the AppleTalk ADSP Tool, which defines the type of AppleTalk ADSP connection that you will make with the tool. ◆

You can connect only to services on the network that are of the connection type you specify here. These services will be listed in the remote settings section of the dialog box.

For example, suppose that you want to establish a connection between a MacTerminal session running on your Macintosh and a MacTerminal session running on a coworker's Macintosh. You can make that connection if both you and your coworker choose the AppleTalk ADSP Tool and both specify the same connection type. The following figure shows a code that you might use: *PATHWORKS*. After you enter the connection type, any other services on the network with the same type—in this example, *PATHWORKS*—appear in the right-hand list in the Remote section of the dialog box.

```
┌─────────────────────────────────────────────────────────┐
│  Connection Settings                    ┌────  OK  ────┐  │
│       Method: │  AppleTalk ADSP Tool  │   │   Cancel   │  │
│                                                           │
│    ▦ ▦        Connection Type: │PATHWORKS      │  ▦ ▦     │
│                                                           │
│  Zone: │Stevens Creek 1        │      Name: │The Doctor Is In│
│  ┌─────────────────────────┐          ┌─────────────────────┐
│  │ ROMuLAN              ⇧  │ Remote   │ Joe's Terminal   ⇧ │
│  │ SC1/Electric Ladyland   │          │ The Doctor Is In    │
│  │ SC1/Neptune             │   ▦      │                     │
│  │ SC1/Snake Pit           │   🖳     │                     │
│  │ SC1/Uranus              │          │                     │
│  │ Stevens Creek 1      ⇩  │          │                  ⇩ │
│  └─────────────────────────┘          └─────────────────────┘
│                                                           │
│  Local Zone: Stevens Creek 1     Local Name: │Smith       │
└─────────────────────────────────────────────────────────┘
```
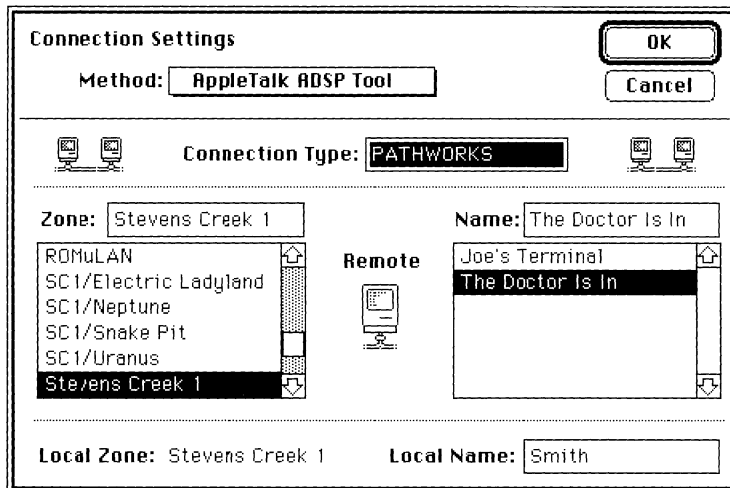
In the Connection Type field, you can enter any 32-character string that does not contain an asterisk (*), colon (:), equal sign (=), or approximately equal sign (≈). If you want to connect to a service that runs on a VAX, you should enter that service's entity type. Ask your system administrator if you don't know what the entity type is. If you are connecting to another communications application such as MacTerminal running on another Macintosh on the network, then the entity type that you specify needs to match the entity type being used by the other application.

Remote settings

The fields in the Remote section of the Connection Settings dialog box identify the service to which you want to connect.

◆ **Note** You need to fill in the Remote settings only if you are going to *initiate* a connection (by choosing Connect from the Session menu). If you are going to *wait* for a connection (by choosing Wait for Connection from the Session menu), you do not need to fill in the Remote part of the dialog box. Skip to "Local Settings." ◆

Remote zone

The Zone field identifies the zone containing the service that you want to use. A list of available zones appears in the list below the field. You can type the zone name directly in the Zone field, or you can select a zone from the list. (When you select a name, it appears automatically in the Zone field.)

If there are no zones on the network, the AppleTalk ADSP Tool displays an asterisk in the Zone field. Do not delete the asterisk—it is required when your network has no zones.

Remote name

The Name field identifies the service to which you want to connect. The list below the field contains the names of network services that communicate by means of the ADSP protocol and that use the connection type code that you specified. (See "Connection Type," earlier in this reference module.) You can type the service name directly in the Name field, or you can select a name from the list. (When you select a name, it appears automatically in the Name field.)

◆ **Impostors** It is possible that network devices to which you cannot actually connect may be listed as services in the list below the Name field. The devices are listed because they communicate by using AppleTalk ADSP, but they do not support connections from communications applications. For example, if you enter *LaserWriter* in the Connection Type field, the names of the LaserWriter® printers on your network appear in the list. If you try to open a connection to a LaserWriter from a MacTerminal session document, the attempt will fail. Because the LaserWriter does not respond to MacTerminal's requests, MacTerminal will eventually time out and quit trying to open the connection. ◆

Local settings

The local settings, at the bottom of the Connection Settings dialog box, identify the zone in which your computer resides and your computer's name.

Local zone

The local zone name appears automatically in the Local Zone field. You cannot edit this field. If there are no zones on the network, the AppleTalk ADSP Tool displays an asterisk here.

Local name

The AppleTalk ADSP Tool automatically fills in the Local Name field with your Chooser User Name, if you've entered one. Otherwise, the AppleTalk ADSP Tool puts *Local User* in the Local Name field. Either way, you can enter a different name if you prefer. If you want to establish more than one connection (by opening multiple session documents), you should enter a different name for each connection. Services trying to connect to your session documents will not be able to distinguish between them if they have the same name.

Troubleshooting hints

This section lists problems that you may encounter and messages that you may see when you use the AppleTalk ADSP Connection Tool. It suggests possible solutions for many of the problems.

Many problems result from having the wrong version of the system or communications software installed on your startup volume. To make sure that you have the proper software installed, see the *Installation* part of the *Network Services User's Guide.*

If the problem that you're having isn't described here, it may be related to MacTerminal or to the network service that you're trying to access. See Chapter 7, "Troubleshooting," or see the documentation for the service that you're trying to access.

Can't establish communications with a coworker's Macintosh.

1. Make sure that both of you are running MacTerminal and using session documents configured with the AppleTalk ADSP Tool. Make sure that you've both specified the same AppleTalk ADSP connection type. (See "Connection Type," earlier in this module.)
2. On one Macintosh, choose Wait for Connection from the Session menu. On the other Macintosh, choose Open Connection from the Session menu. (To initiate communications, one side must be waiting for a connection, while the other opens the connection.)

Remote service stops responding while you're connected.

The service may have become unavailable because of one of the following conditions: an interruption in the service itself; a problem with the device on which the service is running; a problem with the physical network. Open the Connection Settings dialog box and choose another service.

   If you suspect a problem with the physical network, see "Network-Related Problems," later in this section.

The service's name appears in the Remote section of the Connection Settings dialog box, but the service doesn't respond when you try to open a connection.

The service may have become unavailable between the time at which you specified it in the Connection Settings dialog box and the time at which you tried to open the connection. One of the following conditions may have occurred: an interruption in the service itself; a problem with the device on which the service is running; a problem with the physical network. Open the Connection Settings dialog box and choose another service.

◆ **Note** Services appear to be available for two minutes after they cease to be available. Therefore, the service name may appear in the Connection Settings dialog box even though it is unavailable. ◆

   If you suspect that there is a problem with the physical network, see "Network-Related Problems" later in this section.

The name of the service that you want doesn't appear in the Connection Settings dialog box.

- The service you want to use must be "listening." This means that the service must have registered its availability on the network. In MacTerminal, the way to register a MacTerminal session as available on the network is to choose the Wait for Connection command from the Session menu.
- The service that you want may be using a different connection type than the one you specified. See "Connection Type" earlier in this module.

The AppleTalk ADSP Tool is not listed in the Method pop-up menu.

1. Make sure that you installed the software properly. See the *Installation* part of the *Network Services User's Guide*.

2. If you configured the session document and then, from the desktop, changed the name of the connection tool file, MacTerminal will not be able to locate the tool. Open the Connection Settings dialog box and choose the tool again by its new name. See Chapter 3, "Setting Up a Session Document."

Alert messages

An alert box may appear, warning of an error, when you click OK in the Connection Settings dialog box or when you open a preconfigured session document. If an alert box appears, it probably means that you have forgotten to turn on AppleTalk, or that you have not installed the AppleTalk ADSP Tool or ADSP driver correctly.

Error initializing AppleTalk. Check to see if AppleTalk is turned on in the Chooser.

Every Macintosh computer comes with the AppleTalk network protocols installed, but not necessarily activated. If you receive this message, open the Chooser and make sure that the Active button is selected in the Chooser window. The Active button is next to the word *AppleTalk,* near the bottom of the Chooser window.
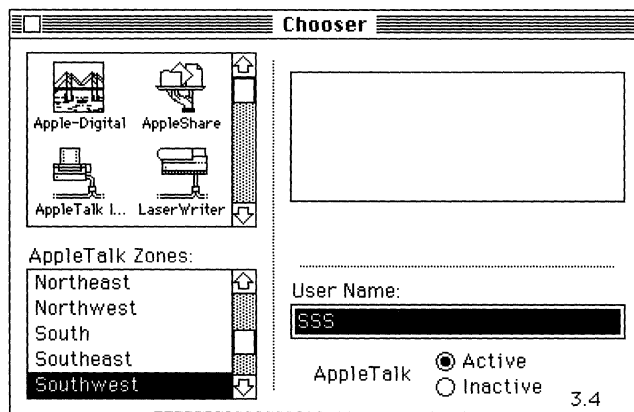
Click Active if it isn't selected. An alert box appears, asking you to confirm that you are connected to an AppleTalk network.

Error initializing the ADSP protocol. Check to see if the ADSP file is in your System Folder.

This message tells you that the ADSP software has been improperly installed on your Macintosh. Make sure that your System Folder contains the ADSP driver and that the AppleTalk ADSP Tool is in the Communications Folder in your System Folder. Be sure to restart your Macintosh after installing the ADSP driver. (For more information on installation, see the *Installation* part of the *Network Services User's Guide*.)

Network-related problems

If one of the scenarios in the following list describes a problem that you're having, the problem could be related to the network hardware or software that you're using.

The Control Panel is missing.

The Control Panel is present on all startup disks unless you have removed it with the Font/DA Mover. If you're using more than one startup disk, your Macintosh may switch to a disk that does not have the Control Panel installed. The icon of the current startup disk is in the upper-right corner of the desktop.

Use the Installer application from the *System Tools* disk (version 6.0.4 or a later version) to update your System file. The Installer automatically reinstalls the Control Panel.

The Network icon is missing from the Control Panel.

One of the following problems exists:

- You don't have the EtherTalk 2.0 software installed correctly on your startup disk. See the documentation for the Ethernet card that you are using.
- The Network icon has been moved from your System Folder. You must reinstall the EtherTalk 2.0 software. See the documentation for the Ethernet card that you are using.
- Your startup disk has the wrong version of the Control Panel. You must use version 3.1 or a later version. (The version number appears in the lower-left corner of the Control Panel). Use the Installer application from the *System Tools* disk (version 6.0.4 or a later version) to update your System file. The Installer automatically reinstalls the Control Panel.

You can't select the Network icon in the Control Panel. You get a message advising you that the network package has not been installed correctly.

The EtherTalk 2.0 software has not been installed properly on your startup disk. See the documentation for the Ethernet card that you are using.

The EtherTalk icon doesn't appear in the Control Panel after you click the Network icon.

One of the following problems exists:

- You don't have the EtherTalk 2.0 software installed correctly on your startup disk. See the documentation for the Ethernet card that you are using.
- The EtherTalk icon has been moved from your System Folder. You must reinstall the EtherTalk 2.0 software. See the documentation for the Ethernet card that you are using.
- There is no Ethernet card in your Macintosh, or the card is not working properly. If a card is installed, see its documentation.

Two or more EtherTalk icons appear in the Control Panel when you click the Network icon.

One of the following conditions exists:

■ You have multiple Ethernet cards installed. The number in parentheses next to each icon's name identifies the slot containing the card.

■ Earlier versions of EtherTalk software exist on your startup disk. Earlier versions are identified by single-arrow icons; icons for version 2.0 (or later versions) are identified by double arrows. PATHWORKS for Macintosh requires that you use EtherTalk version 2.0. See the documentation for the Ethernet card that you are using.

  If you want to remove the previous version of EtherTalk, find its icon in the System Folder and drag it to the Trash.

You can't select the EtherTalk icon in the Control Panel. You get a message advising you that an error occurred while trying to install EtherTalk.

You did not start your Macintosh with an EtherTalk startup disk, or the disk that you used has become damaged. Try reinstalling the EtherTalk 2.0 software. See the documentation for the Ethernet card that you are using.

You are unable to select an EtherTalk icon in the Control Panel to switch the network connection. You get a message that the connection cannot be changed now, or that doing so will disrupt a critical service that your computer provides (such as an AppleShare file server or a router).

If you can't switch the network connection, quit all applications and try switching the network connection again. If you still can't switch network connections, and you don't mind disrupting services that your computer provides or is using, shut down your Macintosh. Then restart your computer, using a startup disk that permits network connection changes. Finally, try switching the network connection again.

Your Macintosh computer *hangs* (does not respond to the mouse and keyboard actions).

Your Macintosh may hang for a minute or so when you select an EtherTalk icon or when you start up your computer. The computer can hang if it is not correctly connected to the Ethernet cable, or the Ethernet card is not configured correctly. See the documentation for the Ethernet card that you are using.

The Connection Settings dialog box does not list any network services, or does not list the service that you want.

- If no network services appear, check the physical connection between your Macintosh and the network. See the suggestions later in this section for checking your network.

- If a particular service does not appear, the service may be in a different zone, malfunctioning, switched off, or disconnected from the network. There may also be trouble in the network cables between your Macintosh and the missing service. See the suggestions later in this section for checking your network. You can also contact your system administrator to see if there are known problems with the network.

- If you switched the network connection in the Control Panel (as described earlier in this chapter) while the Connection Settings dialog box was open, the services listed in the dialog box may not have been updated. Close the Connection Settings dialog box and reopen it to see the services on the newly selected network.

You can't select devices connected to the printer port of your Macintosh.

If the Chooser does not let you select an ImageWriter® printer or other device connected to the printer port while the EtherTalk network connection is selected, you probably have an old version of the Chooser on your Macintosh. You must have Chooser version 3.4 (or a later version) to select a device on the printer port. Use the Installer application from *System Tools* disk (version 6.0.4 or a later version) to update your System file. The Installer automatically updates the Chooser.

Here's a checklist to consult whenever you're having trouble with the Ethernet:

- Are all cables secure?

  Make sure that the network cable to your Ethernet card is secure at all connections. Also check the network cable to the service that you're trying to use. Contact your system administrator if you are uncertain about cable configuration.

- Is the problem really related to the network?

  Sometimes a problem that seems to be related to the network is actually related to the device or application program that you're using. The manual for the device or application may be helpful.

- Is your Ethernet card installed and set correctly?

  Shut down your Macintosh and make sure that the Ethernet card is firmly seated in its slot. Also, make sure that any jumpers and switches are set properly. See the documentation for your Ethernet card.

- Is the application that you want to use available on your network?

  You may have more than one network to which you can connect. Use the Control Panel to select the proper network connection. See "Selecting a Network" earlier in this module for instructions.

LAT Connection Tool

Apple Computer, Inc.

The Apple Publishing System

LAT Connection Tool was written, edited, and composed on a desktop publishing system using Apple Macintosh® computers, an AppleTalk® network system, and Microsoft® Word. Proof pages were created on the Apple LaserWriter® printers; final pages were printed on a Linotronic® 300. Line art and chapter openers were created with Adobe Illustrator™. PostScript®, the LaserWriter page-description language, was developed by Adobe Systems Incorporated.

Text type and display type are Apple's corporate font, a condensed version of ITC Garamond®. Bullets are ITC Zapf Dingbats®.

Contents

The Local Area Transport (LAT) communications protocol, developed by Digital Equipment Corporation, supports high-speed asynchronous communications for terminals and other devices connected to Ethernet local area networks (LAN). The LAT protocol provides an efficient connection between terminals and services on a network, and minimizes the VAX™ computer processing resources required to provide the services. In cases where more than one VAX on a network offers identical services, LAT also provides "load balancing" by evenly distributing the demands for those services between the VAX computers offering them.

The LAT software lets you establish LAT connections between your Macintosh® computer and VAX computers on an Ethernet LAN. You use the LAT Connection Tool in conjunction with a communications application such as MacTerminal and a terminal emulation tool. This allows your Macintosh to emulate a Digital terminal and gives you access to services on VAX computers. Services accessed by terminals or terminal emulators are called *terminal services.*

The set of terminal services available to you depends on the particular Ethernet environment. Services announce or "advertise" their availability by periodically sending brief messages over the network. The LAT software on your Macintosh "listens" for these announcements and keeps a list of them. If a new service starts advertising itself, or an existing service ceases to announce its availability, then the LAT updates the list of services accordingly. When you configure a session document and choose the LAT, the list of available terminal services is displayed.

What you need

This section describes the software and hardware requirements for using the LAT Connection Tool. This section also tells you how to select a network if your Macintosh contains more than one Ethernet card.

Software requirements

Several software and hardware components must be installed on your computer before you can use the LAT Connection Tool:

- Macintosh Communications Toolbox
- LAT Tool
- LAT control panel device
- LAT Prep file
- Ethernet card and EtherTalk® 2.0 (AppleTalk® Phase 2) software

The *Installation* part of the *Network Services User's Guide* provides installation procedures for the PATHWORKS™ for Macintosh software and describes all the components, including those related to the LAT Connection Tool.

The LAT Connection Tool does not work over a modem or across a router. Therefore, your Macintosh computer must be connected directly to Ethernet cabling through an Ethernet card. See the *Software Product Description* (SPD 31-53.xx) for information on which Ethernet cards work with PATHWORKS for Macintosh.

PATHWORKS for Macintosh also requires support for AppleTalk Phase 2 for connecting through an Ethernet card. If you are using the Apple EtherTalk NB Card, you must install EtherTalk 2.0 software. If you are using some other Ethernet card, you must install the equivalent AppleTalk Phase 2 software. See the documentation accompanying your Ethernet card for instructions.

Selecting a network connection

You can install more than one Ethernet card in your Macintosh computer. Each card lets you connect to a different Ethernet environment. If you have multiple Ethernet cards installed, the LAT software automatically selects one of the cards based on the following rules:

1. If you have previously selected a card, the LAT uses that card.
2. If you have not selected a card, the LAT Tool uses the card in the lowest-numbered slot.

If you remove the currently selected Ethernet card or move it to another slot, the LAT software automatically selects the card in the lowest-numbered slot. You can override the automatic selection and thereby connect to a different network by manually selecting a card.

To select a different Ethernet card:

1 **Choose Control Panel from the Apple () menu.**

The Control Panel dialog box appears.
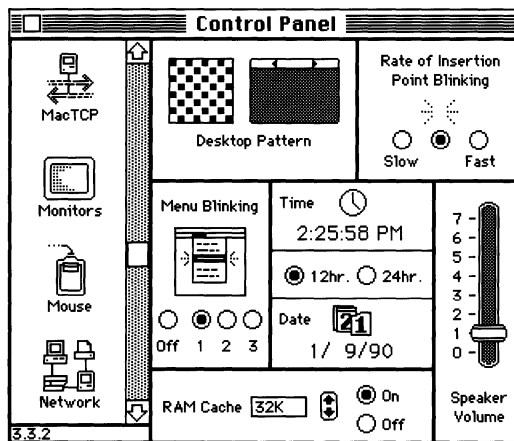
2   **Select the LAT icon from the group of icons on the left side of the Control Panel dialog box.**

You may have to scroll through the list to find the LAT icon.
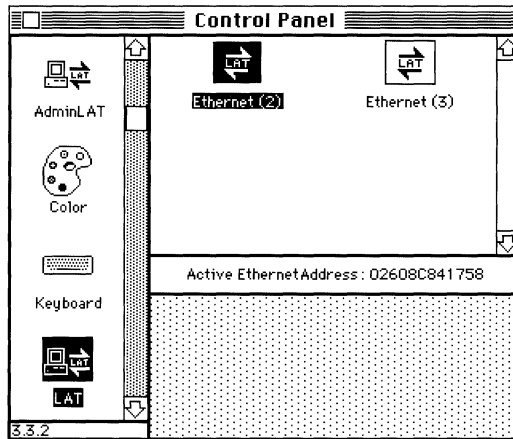
3   **Select the icon for the network connection that you want to use.**

The Control Panel displays a separate icon for each network to which your Macintosh is connected. A connection to an Ethernet environment is represented by an icon labeled *EtherTalk*. If your Macintosh is connected to more than one Ethernet environment, each EtherTalk icon is also labeled with a number in parentheses, indicating the slot containing the Ethernet card for that connection.

4   **Close the Control Panel dialog box.**

LAT Tool connection settings

The Connection Settings dialog box in MacTerminal lets you

- choose the connection method that you want to use
- specify the service to which you want to connect

You open the Connection Settings dialog box from MacTerminal by choosing the Connections command from the Settings menu, as shown in the following figure.

```
 File   Edit   Settings   Session   Windows
               Connection...
               Terminal...
               File Transfer...

               Folder for Received Files...
               Saved Lines...
               Paste Options...
               Connect on Open
```
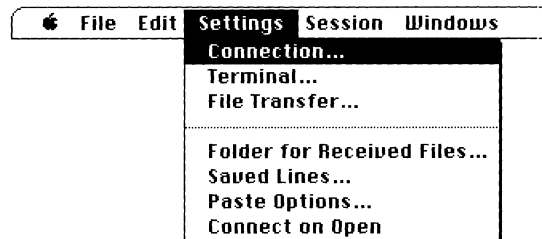
When the Connection Settings dialog box appears, you need to choose the LAT Tool as your connection method so that the dialog box displays the appropriate connection settings. You choose LAT Tool from the Method pop-up menu near the top of the dialog box.

```
Connection Settings                              ( OK )

        Method: ✓ Apple Modem Tool              ( Cancel )
                  AppleTalk ADSP Tool
                  AppleTalk-DECnet Tool
                  LAT Tool
                  MacTCP Tool
                  Serial Tool
```
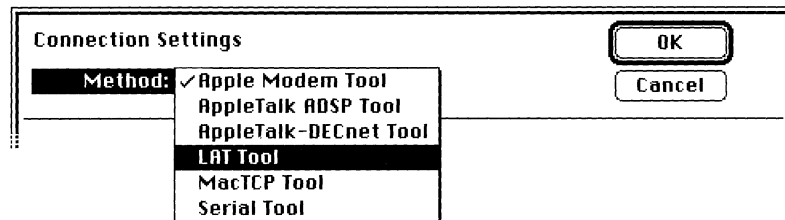
When you choose LAT Tool from the Method pop-up menu in the Connection
Settings dialog box, the dialog box displays a list of the available terminal services.

```
┌─────────────────────────────────────────────────────────────┐
│  Connection Settings                          ┌───────────┐  │
│                                               │    OK     │  │
│         Method:┌──────────────────┐           └───────────┘  │
│                │   LAT Tool       │           ┌───────────┐  │
│                └──────────────────┘           │  Cancel   │  │
│  ──────────────────────────────────────────── └───────────┘  │
│          Select a LAT Service:                               │
│                                                              │
│                  ┌────────────────────────┐                  │
│                  │MAYTAG                  │                  │
│                  └────────────────────────┘                  │
│                  ┌─────────────────────┬──┐                  │
│                  │ ◇  MAYTAG           │⇧ │                  │
│                  │ ◇  SOUP             ├──┤                  │
│                  │                     │  │                  │
│                  │                     │  │                  │
│                  │                     │  │                  │
│                  │                     ├──┤                  │
│                  │                     │⇩ │                  │
│                  └─────────────────────┴──┘                  │
└─────────────────────────────────────────────────────────────┘
```
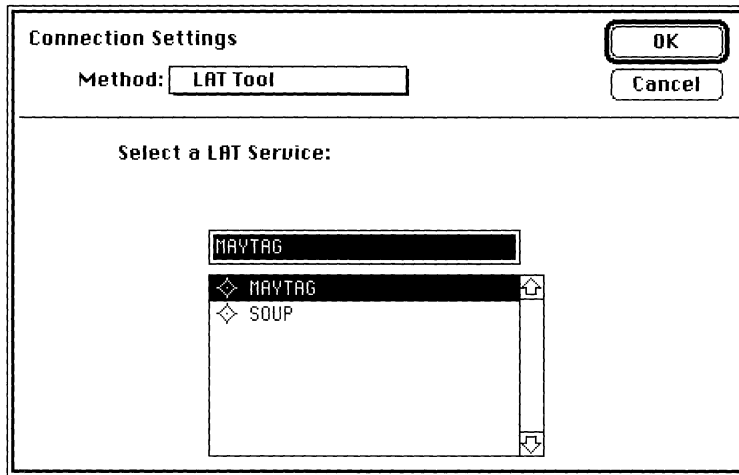
The LAT software is preset to give you access only to terminal services with a group
code of 0 (zero). This is the default code assigned to services by the LAT protocol. On
some networks, however, the system administrator may have assigned different group
codes to certain services. To use these services, your LAT software must be specially
modified by the system administrator by using a configuration utility provided as part of
the PATHWORKS for Macintosh product.

If your LAT software has been configured to provide access to additional services, the
Connection Settings dialog box will include a pop-up menu above the list of services.
The pop-up menu lets you choose among different groups of services, called *bundles,*
which the system administrator has made available to you.
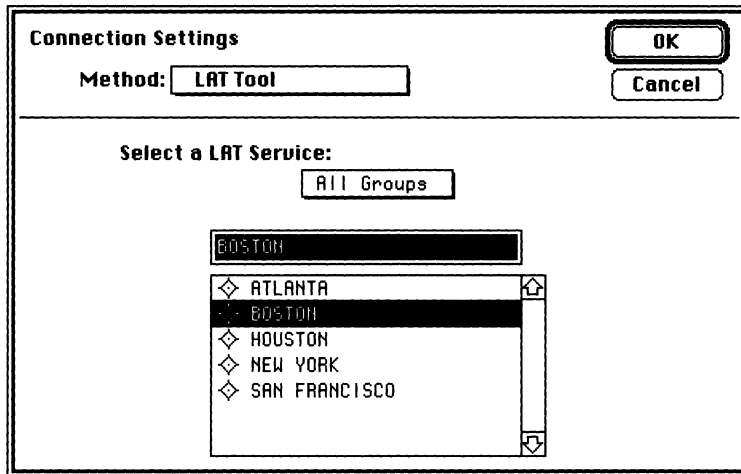
You can select the service you want to use either by highlighting the service's name in the list or by typing the name in the text field above the list. If you type the service name in the text field, the name must match exactly one of the names in the list. Otherwise, no service is selected. (When you've typed a valid service, the LAT Tool automatically highlights the matching name in the list.)

Once you specify a service, you'll be connected to that service when you establish a LAT connection from your application. In MacTerminal, you accomplish this by choosing Open Connection from the Session menu.

Troubleshooting hints

When you first choose the LAT Connection Tool, the following alert message may appear:

The LAT driver doesn't seem to be installed. Check to see if the LAT file is in tl correct folder.

Before you can select and configure the LAT Connection Tool, your Macintosh computer must have a properly installed Ethernet card that is connected to an Ethernet environment.

The LAT file must also be installed in the System Folder on your hard disk. If it is not, reinstall the LAT Tool.

After you choose the LAT Tool, it takes a minute or so for the LAT software to compile a list of services. This is because services only announce their availability from time to time. Note also that as new services become available, or existing services are removed from the network, the list of services may change.

Here are some possible problems that might occur at this time, and things to do that might solve the problem:

No services appear in the Connection Settings dialog box.

If this is the first time you've chosen the LAT Tool, wait a minute or two for your LAT software to listen for available services.

Otherwise, check to make sure you've connected to the right network. First verify that your Macintosh contains a properly installed Ethernet card. If your Macintosh contains more than one Ethernet card, open the Control Panel and select the LAT icon to see which Ethernet card is selected. Choose the network that has the service you want to use.

A service that you expected to be available does not appear in the Connection Settings dialog box.

Wait a minute or two. The LAT software updates the list of services from time to time as services announce their availability on the network. If the service still does not appear, check to make sure you've connected to the right network. Open the Control Panel and select the LAT icon to see which Ethernet card is selected.

Because the Connection Settings dialog box can only list 100 services, it is possible that no more services can be listed. Otherwise, your system administrator may have removed the service.

A connection to the selected service could not be established.

Check to make sure you've connected to the right network. First verify that your Macintosh contains a properly installed Ethernet card. If your Macintosh contains more than one Ethernet card, open the Control Panel and select the LAT icon to see which Ethernet card is selected. Choose the network that has the service you want to use.

Otherwise, the service you've selected may no longer be available. Open the Connection Settings dialog box and select an alternative service.

◆ **Note** In some Ethernet environments, identical services may be offered by more than one VAX. The LAT Tool software does not let you specify a service on a particular VAX. The load-balancing feature of the LAT protocol chooses the service to which you'll be connected depending on the demands for the resources of the VAXes on which the services reside. ◆

Alert messages

While you are using the LAT Connection Tool, the following alert may appear:

Unable to open connection.

The service you've selected may no longer be available. Open the Connection Settings dialog box and select an alternative service.

Network-related problems

If one of the scenarios in the following list describes a problem that you're having, the problem could be related to the network hardware or software that you're using.

The Control Panel is missing.

The Control Panel is present on all startup disks unless you have removed it with the Font/DA Mover. If you're using more than one startup disk, your Macintosh may switch to a disk that does not have the Control Panel installed. The icon of the current startup disk is in the upper-right corner of the desktop.

Use the Installer application from the *System Tools* disk (version 6.0.4 or a later version) to update your System file. The Installer automatically reinstalls the Control Panel.

The LAT icon is missing from the Control Panel.

One of the following problems exists:

- You don't have the EtherTalk 2.0 software installed correctly on your startup disk. See the documentation for the Ethernet card that you are using.
- The LAT files have been removed from your System Folder. You must reinstall the LAT software. See the *Installation* part of the *Network Services User's Guide.*
- Your startup disk has the wrong version of the Control Panel. You must use version 3.1 or a later version. (The version number appears in the lower-left corner of the Control Panel). Use the Installer application from the *System Tools* disk (version 6.0.4 or a later version) to update your System file. The Installer automatically reinstalls the Control Panel.

You can't select the LAT icon in the Control Panel. You get a message advising you that the network package has not been installed correctly.

The EtherTalk 2.0 software has not been installed properly on your startup disk. See the documentation for the Ethernet card that you are using.

The Ethernet icon doesn't appear in the Control Panel after you click the LAT icon.

One of the following problems exists:

- You don't have the EtherTalk 2.0 software installed correctly on your startup disk. See the documentation for the Ethernet card that you are using.

- The EtherTalk file has been removed from your System Folder. You must reinstall the EtherTalk 2.0 software. See the documentation for the Ethernet card that you are using.

- There is no Ethernet card in your Macintosh, or the card is not working properly. If a card is installed, see its documentation.

Two or more Ethernet icons appear in the Control Panel when you click the LAT icon.

One of the following conditions exists:

- You have multiple Ethernet cards installed. The number in parentheses next to each icon's name identifies the slot containing the card.

- Earlier versions of EtherTalk software exist on your startup disk. Earlier versions are identified by single-arrow icons; icons for version 2.0 (or later versions) are identified by double arrows. PATHWORKS for Macintosh requires that you use EtherTalk version 2.0. See the documentation for the Ethernet card that you are using.

  If you want to remove the previous version of EtherTalk, find its icon in the System Folder and drag it to the Trash.

You can't select the Ethernet icon in the Control Panel. You get a message advising you that an error occurred while trying to install EtherTalk.

You did not start your Macintosh with an EtherTalk startup disk, or the disk that you used has become damaged. Try reinstalling the EtherTalk 2.0 software. See the documentation for the Ethernet card that you are using.

You are unable to select an Ethernet icon in the Control Panel to switch the network connection. You get a message that the connection cannot be changed now, or that doing so will disrupt a critical service that your computer provides (such as an AppleShare® file server or a router).

If you can't switch the network connection, quit all applications and try switching the network connection again. If you still can't switch network connections, and you don't mind disrupting services that your computer provides or is using, shut down your Macintosh. Then restart your computer, using a startup disk that permits network connection changes. Finally, try switching the network connection again.

Your Macintosh computer *hangs* (does not respond to the mouse and keyboard actions).

Your Macintosh may hang for a minute or so when you select an Ethernet icon or when you start up your computer. The computer can hang if it is not correctly connected to the Ethernet cable, or the Ethernet card is not configured correctly. See the documentation for the Ethernet card that you are using.

The Connection Settings dialog box does not list any network services, or does not list the service that you want.

- If no network services appear, check the physical connection between your Macintosh and the network. See the suggestions later in this section for checking your network.

- If a particular service does not appear, the service may be in a different zone, malfunctioning, switched off, or disconnected from the network. There may also be trouble in the network cables between your Macintosh and the missing service. See the suggestions later in this section for checking your network. You can also contact your system administrator to see if there are known problems with the network.

- If you switched the network connection in the Control Panel (as described earlier in this chapter) while the Connection Settings dialog box was open, the services listed in the dialog box may not have been updated. Close the Connection Settings dialog box and reopen it to see the services on the newly selected network.

You can't select devices connected to the printer port of your Macintosh.

If the Chooser does not let you select an ImageWriter® printer or other device connected to the printer port while the EtherTalk network connection is selected, you probably have an old version of the Chooser on your Macintosh. You must have Chooser version 3.4 (or a later version) to select a device on the printer port. Use the Installer application from *System Tools* disk (version 6.0.4 or a later version) to update your System file. The Installer automatically updates the Chooser.

Here's a checklist to consult whenever you're having trouble with the Ethernet:

■ Are all cables secure?

Make sure that the network cable to your Ethernet card is secure at all connections. Also check the network cable to the service that you're trying to use. Contact your system administrator if you are uncertain about cable configuration.

■ Is the problem really related to the network?

Sometimes a problem that seems to be related to the network is actually related to the device or application program that you're using. The manual for the device or application may be helpful.

■ Is your Ethernet card installed and set correctly?

Shut down your Macintosh and make sure that the Ethernet card is firmly seated in its slot. Also, make sure that any jumpers and switches are set properly. See the documentation for your Ethernet card.

■ Is the application that you want to use available on your network?

You may have more than one network to which you can connect. Use the Control Panel to select the proper network connection. See "Selecting a Network" earlier in this module for instructions.

Serial Connection Tool

Apple Computer, Inc.

The Apple Publishing System

Serial Connection Tool was written, edited, and composed on a desktop publishing system using Apple® Macintosh® computers, an AppleTalk® network system, and Microsoft® Word. Proof pages were created on the Apple LaserWriter® printers; final pages were printed on a Linotronic® 300. Line art and chapter openers were created with Adobe Illustrator™. PostScript®, the LaserWriter page-description language, was developed by Adobe Systems Incorporated.

Text type and display type are Apple's corporate font, a condensed version of ITC Garamond®. Bullets are ITC Zapf Dingbats®. Some elements, such as program listings, are set in Apple Courier, a fixed-width font.

Contents

The Serial Connection Tool allows you to transmit data in serial format; that is, one bit after another over a single wire. Compared to the Apple® Modem Connection Tool, which requires a modem to establish a connection, the Serial Tool accommodates other methods for setting up connections and offers a wider range of baud rates. For example, you can use the Serial Tool to establish a direct connection between your Macintosh® computer and another computer, modem, or device (such as a piece of laboratory equipment) by connecting a cable to the serial port on each machine. The Serial Tool can also be used to establish a connection through a modem, but rather than dialing and executing other modem commands automatically, the Serial Tool requires that you make a call manually by typing commands to the modem. Use the Apple Modem Connection Tool when you want to take advantage of automatic dialing features.

In addition to establishing connections through the two serial ports built into the Macintosh computer, the Serial Tool establishes connections through serial cards installed in your Macintosh. However, not all cards on the market support the range of baud rates provided by the Serial Tool.

The Serial Tool offers a range of choices for setting data transmission parameters, such as baud rate (at speeds 50–57,600 baud), parity, number of data bits and stop bits per character, and handshake method. One option keeps a serial connection open after you close the session document in which you opened that connection. This option is especially handy when you aren't running MultiFinder®. See the section titled "When Closing Document" in this module for an explanation of this feature.

Serial connection settings

You choose the Connection command from the Settings menu (shown below) to access a dialog box that lets you set connection attributes.

```
  ✿  File  Edit  Settings  Session  Windows
                 Connection...
                 Terminal...
                 File Transfer...
                 ............................
                 Folder for Received Files...
                 Saved Lines...
                 Paste Options...
                 Connect on Open
```
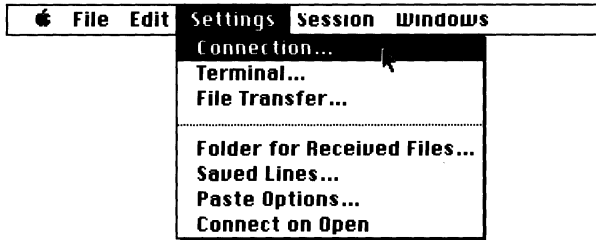
When you choose Serial Tool from the Method pop-up menu in the Connection Settings dialog box, the dialog box displays the setup options for configuring your Macintosh to communicate over a serial connection (see below).

```
Connection Settings                          (   OK   )
       Method: [ Serial Tool ]               ( Cancel )

  Port Settings              Current Port

   Baud Rate: [ 9600 ]        [  [Modem Port]      [Printer Port]  ]
   Parity:    [ None ]
   Data Bits: [ 8 ]
   Stop Bits: [ 1 ]
   Handshake: [ None ]
                             When Closing Document
                              ☐ Hold Connection
                              ☐ Permit to Disconnect
```
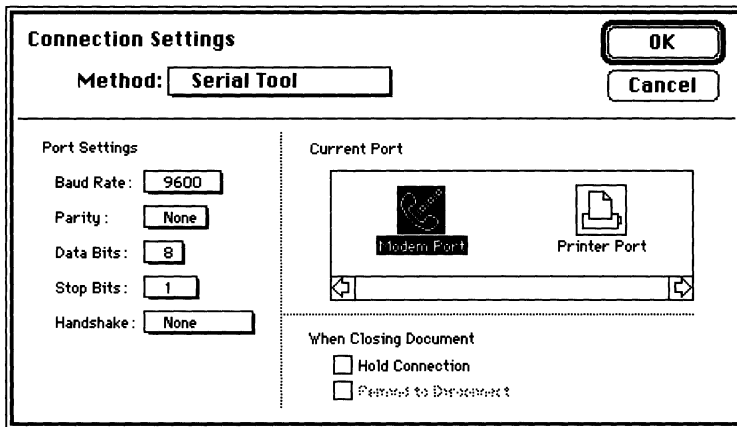
Setup options

For each option in the Serial Connection Settings dialog box, the most commonly used setting is preset as the default. However, you may need to change some of these settings depending on the type of information being transmitted or the communication requirements of the device you are connecting to. In these cases, you should refer to the documentation for the other device or contact your system administrator for information on how the various options should be set for the communications session you are establishing.

The following subsections describe the connection setup options available in the Serial Connection Settings dialog box. The options are presented in the order they appear in the dialog box (reading from top to bottom and from left to right).

Port Settings

The pop-up menus in this group allow you to set port-specific features, including baud rate, parity, number of data bits per character, number of stop bits per character, and handshake protocol.

Baud Rate You use this option to regulate the speed at which data is transmitted between your Macintosh and another computer. The baud rate is usually the number of bits sent per second; however, more precisely, the baud rate is the number of times per second that a transmission signal varies (sometimes this may be somewhat different from the number of bits sent per second). Both your Macintosh and the device it is communicating with must transmit data at the same baud rate.

The baud rate pop-up menu lets you choose from a variety of rates, 50–57,600 (56K). The Macintosh serial ports support all these baud rates. Consult the user manuals for the other devices you are connecting to in order to find out what baud rates these devices support. If you are connecting to a local computer system, such as a VAX™, you can contact the system administrator for information on baud rates. If you are connecting through a modem, the baud rate is limited by the capabilities of the modem and the host computer.

The default baud rate is 9600. However, computers directly attached to each other can communicate at much higher baud rates. If devices are transmitting at more than 9600 baud, use hardware or software handshaking to regulate the data flow and prevent data loss.

◆ **Hint** If incoming data is garbled or missing, verify that your baud rate and parity settings match those of the other computer. You can also try reestablishing your connection in case noise or interference on the line is causing the problem. (Also, make sure that the character set used by both sender and receiver is the same—character set selection is usually carefully controlled by the host application, but can also be adjusted with the setup options for the VT102™ Terminal Emulation Tool or the VT320™ Terminal Emulation Tool.) ◆

Parity This menu lets you choose the method used by your Macintosh and the other computer for checking that data isn't garbled during transmission. The Serial Connection Tool allows you to use even or odd parity checking, or to specify none, indicating that no parity checking will be performed.

You may choose any of the three parity settings, as long as the other computer or device (including another Macintosh) is also set up to use the same parity. If you are connecting to an information service or to a remote computer, their setup instructions should indicate what parity to use. If you aren't sure what parity to use, contact the appropriate system administrator. The default setting for parity checking is None.

◆ **Note** Some older computer systems require mark or space parity; however, the Serial Tool does not support these settings. If the host or on-line service you are trying to contact requires mark or space parity, ask the system administrator whether you can substitute a different parity setting. ◆

Data Bits This menu lets you specify the number of bits that make up a character. With the Serial Tool, your Macintosh can send and receive 5-, 6-, 7-, or 8-bit characters, whichever the other computer requires. The default setting for this option is 8-bit characters.

◆ **Note** Some file transfer tools require a certain bit-character setting. For example, the XMODEM File Transfer Tool requires 8 data bits per character. ◆

Stop Bits You use this menu to specify the number of stop bits used to mark the end of a transmitted character. The Serial Tool supports 1, 1.5, or 2 stop bits. Typically, a stop bit is 1-bit long; this is the default setting for this option.

Handshake This menu lists the methods available for regulating the flow of data transmitted between your Macintosh and the computer or device at the other end of the connection. For handshaking to work, both computers must have the same handshake method in effect. Numerous factors determine when it's best to use handshaking, but here are some important considerations:

How busy your Macintosh is
If your Macintosh is performing comprehensive background tasks, such as spooling a file to the printer or making complex spreadsheet calculations, its ability to quickly process incoming data diminishes.

How fast the other computer is sending data
Processing a continuous inflow of data at high baud rates is more exacting than dealing with sporadic transmissions at slower rates.

How powerful your Macintosh is
A Macintosh IIfx computer can process incoming data faster than a Macintosh Plus, for instance.

Whether the other device or service requires handshaking
Some commercial services, such as MCI Mail, require XON/XOFF for controlling data flow.

Whether the file transfer protocol you're using (if any) requires handshaking
Some file transfer protocols, like XMODEM, are not compatible XON/XOFF handshaking.

The Serial Connection Tool offers the following handshake options; the default setting is None:

| None |

The Serial Tool disregards any XON or XOFF characters sent by the other computer. The tool doesn't regulate the flow of data from the other computer, nor does it respond to the other computer's attempts to regulate the flow of data from your Macintosh.

If the other computer sends information faster than your Macintosh can receive it, some incoming characters will be lost. In this case, try specifying XON/XOFF handshaking or a slower baud rate. If the host or device you're connected to doesn't support these options, you can also try deactivating the Save Lines Off Top command from the Session menu. Turning off this feature helps your Macintosh process incoming data faster because it doesn't have to save overflow lines to the scrollback cache at the same time. (However, this command does not affect data flow rates during file transfer.)

| XON/XOFF |

The Serial Tool regulates the flow of data between your Macintosh and the other computer. Using XON/XOFF prevents the loss of data when either computer sends characters faster than the other computer can receive them. On the Macintosh, the serial drivers control the XON/XOFF procedure. Each serial port on a Macintosh is controlled by a driver. The driver monitors a buffer that stores incoming data. When the buffer fills to a certain point, the driver sends a Control-S to temporarily stop transmission. After the buffer empties a certain amount, the driver issues a Control-Q to signal the sending device to resume transmitting data.

Note that XON/XOFF handshaking is incompatible with the XMODEM File Transfer Tool.

The following hardware-based handshaking options apply only to devices directly connected by an RS-232 cable that supports handshaking. In this configuration, the DTR (Data Terminal Ready) pin on one connector is connected by a wire to the CTS (Clear To Send) pin on the other connector and vice versa. This arrangement ensures that when one device drops the voltage on its DTR pin the other device senses that the signal on its CTS line has dropped. Without a Clear To Send indication, the other device stops sending data. When the receiving device is ready to accept data again it raises its DTR signal, causing the sending device to receive a Clear To Send.

◆ **Note** These DTR and CTS handshaking methods won't work unless the corresponding pins in the RS-232 cable connecting your Macintosh to another device are wired together. When you buy an RS-232 cable be sure to verify that the handshaking pins are connected. You can also have a technician check the pins with an ohmmeter. ◆

| DTR & CTS | Accommodates connections where both devices support flow control using DTR and CTS hardware handshake methods. |

| DTR Only | Accommodates connections where the DTR hardware handshake method is the only means of flow control. This method only affects data being received by your Macintosh. When your Macintosh drops DTR, the other device temporarily stops sending data. However, your Macintosh will not respond when the other device drops its DTR signal. As a result, the other device cannot control the flow of data sent to it. |

| CTS Only | Accommodates connections where the CTS hardware handshake method is the only means of flow control. This method only affects data being sent by your Macintosh. When the other device drops DTR, your Macintosh will stop sending data. However, your Macintosh cannot control the flow of data sent to it. |

Current Port

Choose one of the port icons displayed in the Current Port scrolling list to specify the port through which your Macintosh will communicate with other devices. Be sure an RS-232-C cable connects that port to either a modem (for remote communications) or to the actual device with which you want to communicate (for local communications). If you haven't installed an add-on serial card, the modem and printer port icons appear in the scrolling list. These icons are identical to those that identify the ports on the back of the Macintosh, as shown in the example below (note that the placement of the ports on the back panel varies from one model of Macintosh to another).

Modem Port — Modem port

Printer Port — Printer port

You can use either port when establishing a connection. However, if you are using LocalTalk®, the printer port is unavailable since the LocalTalk connection is established through the printer port.

If additional serial ports are available on your Macintosh, icons for these ports should also appear in the Current Port scrolling list. For example, if your Macintosh contains a Creative Solutions card, the corresponding port icon appears in the scrolling region provided the card has registered itself with the Communications Toolbox. The program that performs this registration usually takes the form of an init or cdev that you drag into your System Folder.

◆ **Note** If you install a serial card in your Macintosh, be sure to ask the manufacturer for the software that registers the card with the Communications Toolbox. When you buy a card, check to see if this program is included; in some cases it won't be. ◆

When Closing Document

The two options in this group allow you to specify whether you want the remote computer to keep your connection open, even after you have closed the current session document.

Hold Connection The settings for this option determine whether the remote computer holds your connection open after you close the session document. The default setting for this option is unchecked.

☐ When this option is unchecked, closing the session document closes the connection.

☒ When this option is checked, the remote computer holds the connection open after the session document closes. You can then open another application (to get the information you want to send, for example) and then reopen the same or another session document to regain access to the open connection. This option is especially useful if you aren't using MultiFinder.

To break a connection that has been held open, choose Close Connection from the Session menu. Since this command is only available after you issue the Open Connection command, you must reopen the session document in which you opened the connection and choose Close Connection. Alternatively, you can open a new session document, click the appropriate port icon in the Serial Connection Settings dialog box and click OK. Then choose Open Connection from the Session menu to activate the Close Connection command.

Selecting the Hold Connection option also makes the Remind to Disconnect option available. This option, described next, gives you a way to close an open connection after you close the session document.

Remind to Disconnect The settings for this option determine whether an alert box notifies you that the connection is remaining open even though you are closing the current session document. This alert box gives you the opportunity to close the connection. (The Remind to Disconnect option is dimmed and unavailable when the Hold Connection option is unchecked.) The default setting for this option is unchecked.

☐ When this option is unchecked, you are not notified after you close the session document that the connection is still open.

☒ When this option is checked, an alert box (shown below) appears when you close the session document. The alert message reminds you that the connection is still open and gives you the chance to close it.
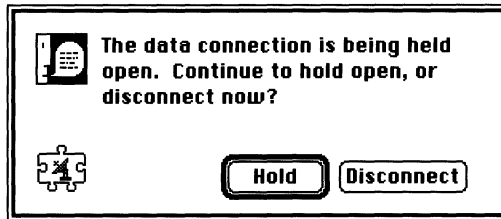
Resetting the Serial Tool

You can reset the Serial Tool by choosing the Reset Connection command from the Session menu. Choosing this command resets all the setup options for the connection tool (that is, all the options you can set in the Connection Settings dialog box) to the settings last saved.

In addition, when you reset the Serial Tool, the tool's input and output buffers are cleared. As a result, you may lose data in transit (if the data is temporarily being stored in either the input or output buffer).

Resetting the Serial Tool also resets the handshaking status for the tool to XON. So, if your Macintosh was waiting to send data until it received an XON from the other computer, it doesn't have to wait any longer but can resume sending data. (If the other computer isn't ready to start receiving data again, this could result is some data loss.)

Troubleshooting hints

Most problems you may encounter while using the Serial Tool are caused by mismatched communications parameters; the settings you chose do not match the settings of the computer or modem with which you are attempting to communicate. If you cannot establish a connection when you choose the Open Connection command from the Session menu or if you send or receive garbled data, compare your connection settings with those of the remote computer or device. Keep in mind that terminal emulation tool settings that conflict with what the remote computer expects could also cause problems.

Since the Serial Tool is generally used between computers that are directly connected, if you can't establish a connection, it is also a good idea to make sure all cables are properly attached. Connections between two Macintosh computers or between a Macintosh and another personal computer may require a null modem cable or adapter.

Incoming data is garbled.

Check that your parity and baud rate settings match those of the other device. If you see rectangular boxes or international characters scattered throughout the data, your parity setting might be wrong. In this case, the Macintosh interprets the eighth bit as data, so that characters acquire an ASCII value greater than 128. In the Macintosh extended ASCII character set, some of the characters above 128 decimal (80 hex) appear as rectangular boxes because they are undefined.

Data is lost.

If characters are missing from incoming data, choosing one of the handshaking options might solve the problem. First, verify that the other computer or device supports the type of handshaking you select. After making this check, if you're using a hardware-handshaking method and are still losing characters, make sure the handshaking pins in your RS-232 cable are connected (have a technician check the pins with an ohmmeter) or, if possible, use XON/XOFF.

If you lose data while transferring files using the Text File Transfer Tool, try selecting longer character and line delays in the File Transfer Settings dialog box.

No data appears.

Verify that a cable is firmly attached to the port through which you are transmitting. If you are transmitting locally, by a direct cable connection rather than by modem, verify that the cable is properly connected to the ports on both devices. If your cable is properly connected, verify that the baud rates match on both machines. With the Serial Tool, the Open Connection command establishes contact with your serial port; it does not guarantee a connection with the other end. If your baud rate doesn't match, the other device may simply refuse to respond. However, if the baud rates *do* match, make sure the On Line option is selected for the terminal emulation tool you are using. You will find this option in the Terminal Settings dialog box.

Sending a break produces unexpected results.

Make sure you are sending the type of break you need. With the Serial Tool, sending a short break holds the line low for .233 second, which may interrupt the data flow but usually won't break your connection. Sending a long break holds the line low for 3.5 seconds. If you are accessing a host through intermediary communications equipment like a PBX system, sending a long break may break the connection between the intermediary and the host.

Alert messages

While you are using the Serial Tool, the following alert messages may appear:

Changing the connection tool will close the current connection. Are you sure you want to do this?

You can't switch from one connection tool to another without closing the current connection. For example, if you're using the Serial Tool and you choose the Apple Modem Connection Tool from the Connection Settings dialog box and click OK, you will get this message.

Changing the port will close the current connection.

You can't switch from the port in use to a different port without closing the current connection. For example, if you're using the modem port and you click the serial port icon in the Connection Settings dialog box, you will get this message.

Sorry—The serial port selected is in use and is not available.

Choose another serial port or close the current connection. This message may appear when the serial port chosen is already being used by LocalTalk.

Sorry—The serial port selected is not available.

Choose another serial port or close the current connection. This message appears when the serial port chosen is already open and in use by another session or application.

◆ **Note** Some applications don't close a port when they're finished using it. If you know that the port you've selected is not in use, you can override this condition. Hold down the Option key so that the OK button in the alert changes to an Override button. Then click Override; the Serial Tool opens the selected port. However, you should use this override option with some degree of caution, because if you override a port when another application is using it, the data stream splits between the two applications. In this case, both applications receive different parts of any incoming data and both applications' outgoing data gets sent to the device at the other end. (If you're not sure whether an application has left a port open or is using it, a safer approach would be to quit from your applications and restart your Macintosh. Restarting closes any ports that were left open.) ◆

The baud rate selected is larger than this serial port can support. Baud rate is now set to [*rate*].

The maximum baud rate on your serial card is less than the rate currently selected for the Serial Tool. The tool has set the baud rate to the maximum your serial card allows.

Memory requirements

The number of MacTerminal® session documents that you can have open at once
depends on the amount of memory required by the communications tools used with the
open session documents. If you are having trouble opening as many session documents
as you want, it may be helpful to look at the amount of memory required for the tools
you are using. The Serial Tool requires approximately 15K–25K (kilobytes) of space in
memory (depending on the functions that the tool is performing and the number of open
session documents that are using it). To check the memory requirements for the other
tools you are using, turn to the "Troubleshooting Hints" sections in the modules for those
tools.

If you are using MultiFinder, you can choose About the Finder™ from the File menu
to check how much memory is available to MacTerminal. If there isn't enough memory
available, you can increase the partition size allocated for the MacTerminal application
(use the Get Info command in the File menu).

This part of your binder contains reference modules describing the terminal emulation tools that accompany your MacTerminal® application. Terminal emulation software allows one type of computer to imitate, or *emulate,* another type of computer terminal. The terminal emulation tools included with MacTerminal allow your Apple® Macintosh® computer to emulate the following terminals:

TTY (Teletype)   Basic fixed-function terminals

VT102™   Digital Equipment Corporation text-only terminals

VT320™   Digital text-only terminals that offer a wide variety of functions, including support for 8-bit characters

You can also use MacTerminal with other terminal emulation tools that are designed to work with the Macintosh Communications Toolbox.

The modules for each of the terminal emulation tools provide the following information:

- an overview of the tool
- descriptions of the configuration options used to set up your Macintosh as the emulator
- information about keyboard mapping and special keys
- troubleshooting hints

In addition, the modules include any special considerations pertaining to the individual terminal emulation tools.

TTY Terminal Emulation Tool

Apple Computer, Inc.

The Apple Publishing System

TTY Terminal Emulation Tool was written, edited, and composed on a desktop publishing system using Apple® Macintosh® computers, an AppleTalk® network system, and Microsoft® Word. Proof pages were created on the Apple LaserWriter® printers; final pages were printed on a Linotronic® 300. Line art and chapter openers were created with Adobe Illustrator™. PostScript®, the LaserWriter page-description language, was developed by Adobe Systems Incorporated.

Text type and display type are Apple's corporate font, a condensed version of ITC Garamond®. Bullets are ITC Zapf Dingbats®.

Contents

The TTY (Teletype) terminal is a basic, line-oriented terminal. It supports typing, receipt of an incoming data stream, and on-screen data display. TTY emulation can be used to access timesharing or information services that don't require a specific terminal. To provide additional functionality, the TTY Terminal Emulation Tool offers a few extensions to the minimal features of a typical TTY. These functions are provided:

- 80-character or 132-character screen widths
- 24-row screen length
- automatic repeat of noncontrol keys
- automatic repeat of control keys
- local echo mode
- automatic wrap mode
- smooth scroll mode
- display control characters (controls appear as special characters)
- new line mode
- backspace and delete character swapping

◆ **Installation note** In addition to installing the TTY Tool (see *Installation* part of the *Network Services User's Guide* for instructions), you install the TTY Font into your System file. You need this font for performing background printing to a LaserWriter® printer, printing to an ImageWriter® printer, or copying portions of your MacTerminal® session document to another application. Use the Font/DA Mover to install the TTY Font included on the PATHWORKS™ V1.0 volume (if you need help using the Font/DA Mover, refer to the manuals that accompanied your Macintosh® computer). ◆

TTY terminal settings

You choose the Terminal command from the Settings menu (shown here) to access a
dialog box that lets you set the terminal emulation attributes for your Macintosh.

```
  ┌──────────────────────────────────────────────┐
  │ ┆ File  Edit │Settings│ Session  Windows      │
  └─────────────┌────────────────────────────┐───┘
                │ Connection...              │
                │ Terminal...              ▶ │
                │ File Transfer...           │
                │····························│
                │ Folder for Received Files...│
                │ Saved Lines...             │
                │ Paste Options...           │
                │ Connect on Open            │
                └────────────────────────────┘
```
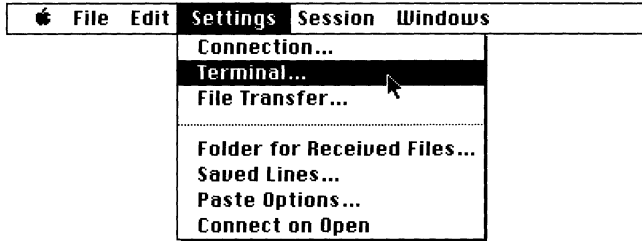
When you choose TTY Tool from the Emulation pop-up menu in the Terminal
Settings dialog box, the dialog box displays the options for configuring your Macintosh to
emulate a TTY (see below).

```
┌────────────────────────────────────────────────────────────────┐
│  Terminal Settings                          ┌──────────────┐    │
│                                             │     OK       │    │
│    Emulation: │  TTY Tool  │                └──────────────┘    │
│                                             ┌──────────────┐    │
│                                             │   Cancel     │    │
│                                             └──────────────┘    │
│  ┌─┐     ┌──┐                       Text Cursor                 │
│  └─┘ ←── └──┘  ⊠ On Line                   ○ Block              │
│     ▭──↑        □ Local Echo               ◉ Underline          │
│ ············································                      │
│  Width: │ 80 Columns │           Scroll Text                    │
│  Size :  │ 9 point  │            ◉ Jump     ○ Smooth            │
│ ············································                      │
│  Characters                     1                          80   │
│   □ Show Control Characters                                     │
│   □ Auto Wrap to Next Line       This is a sample of T          │
│ ············································  This is a sample of T│
│  Holding Down Keys Will          This is a sample of T          │
│   ⊠ Auto Repeat Keys             □ Swap 'Backspace' and 'Delete'│
│   □ Repeat Control Keys          □ New Line on a Return         │
└────────────────────────────────────────────────────────────────┘
```

Option preview area

The Terminal Settings dialog box includes an option preview area that provides information about the settings you choose. When you change the settings for the Width, Size, Show Control Characters, Auto Wrap to Next Line, or Scroll Text options, you'll notice corresponding changes in the option preview area. The sample Terminal Settings dialog box below shows you how the option preview area looks when you are using the default settings for these options. Refer to the explanation of the individual options for information on how the option preview area changes when you change specific options.

Option preview area
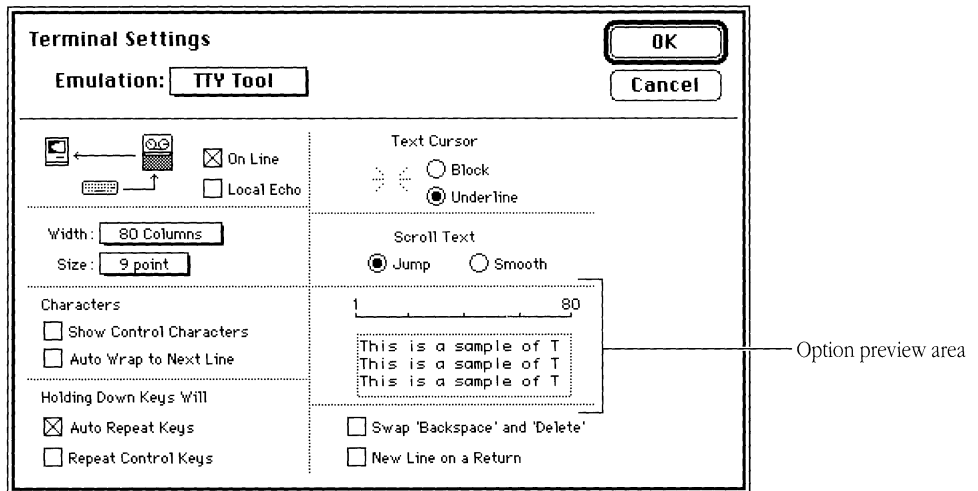
Setup options

For each setup option, the most commonly used setting is preset as the default. However, you may need to change the settings for some options depending on the type of information being transmitted or the communication requirements of the remote computer. In these cases, you should refer to the documentation for the remote computer or contact your system administrator for information on how the various options should be set for the communications session you are establishing.

The following subsections describe the setup options available in the Terminal Settings dialog box. The options are presented in the order they appear in the dialog box (reading from top to bottom and from left to right).

On Line

The settings for this option determine whether your Macintosh is on line or off line. The default setting for the On Line option is checked.

When this option is checked, your Macintosh is *on line*, meaning it is able to communicate with another computer. In this case, as long as you have an established connection to another computer, the characters you type are sent to the remote computer, and incoming data from the remote computer is displayed on your Macintosh screen.

When your Macintosh is on line, you may need to select the Local Echo option to cause characters to be sent to your Macintosh screen as they are sent to the remote computer. The Local Echo option is available only when the On Line option is checked.

When this option is unchecked, your Macintosh stops sending data to the remote computer and ignores incoming data without terminating the connection (a condition called *off line*).

Click the On Line option to resume communication with the remote computer.

When you are working off line, the characters you type are automatically displayed on the Macintosh screen. Therefore, the Local Echo option is dimmed and unavailable when the On Line option is unchecked.

Local Echo

This option is available only when the On Line option is checked. The settings for the Local Echo option determine whether characters you type on the keyboard or numeric keypad are sent to your Macintosh screen (as well as to the remote computer with which your Macintosh is communicating). Since most host systems echo keystrokes, the default setting for Local Echo is unchecked.

☐ Local Echo

When this option is unchecked, as you press keys, characters are sent only to the remote computer, not to your Macintosh screen. The characters that appear on your screen are sent by the remote computer.

☒ Local Echo

When this option is checked, as you press keys, characters are sent to your Macintosh screen as well as to the remote computer.

Select this option when your Macintosh is communicating with a host that does not echo keystrokes.

Width

This pop-up menu lets you set the number of display columns for TTY emulation. Two widths are supported: 80 columns per line and 132 columns per line. When you change the setting for the Width option, the scale in the option preview area of the dialog box changes accordingly. The default width is 80 columns per line.

| 80 Columns |

1   80

| 132 Columns |

1   132

△ **Important** When the Width option is changed, the terminal region in your session document is cleared and the cursor is returned to the top left of the screen. To save the data in the terminal region, before changing the width, be sure that the Save Screen Before Clearing option is selected in the dialog box for the Saved Lines command in the Settings menu and that the Save Lines Off Top command in the Session menu is checked. △

Size

This pop-up menu lets you set the font size of the characters displayed on the screen during TTY emulation. Two sizes are supported: 9 point and 12 point. When you change the setting for the Size option, the sample in the option preview area of the dialog box changes accordingly. The default size is 9 point.

| 9 point | This is a sample of T
This is a sample of T
This is a sample of T |

| 12 point | This is a sample o
This is a sample o |
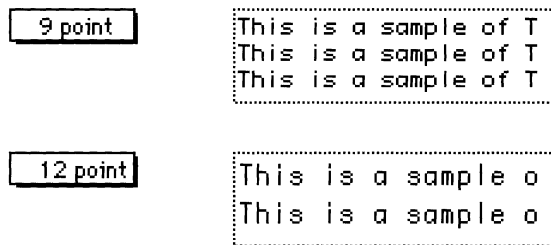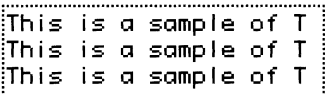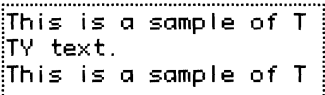
Characters

The options in this group let you specify certain attributes of how characters are handled while your Macintosh is emulating a TTY terminal.

Show Control Characters The settings for this option determine whether control characters are displayed as readable characters. The default setting for this option is unchecked. The chances are that you will never change this option. Sometimes mainframe application programmers use it to help them debug code.

```
☐  This is a sample of T
   TY text.
   This is a sample of T
```

When this option is unchecked, control characters have their normal effect. For example, when a line feed is encountered, the cursor moves to the following line.

```
☒  This is a sample of T
   TY text.Cʀ
   This is a sample of T
```

When this option is checked, control characters are displayed on the screen as they are encountered in the incoming data stream (and, when the Local Echo option is also checked, as they are entered from the keyboard). For example, when a carriage return character is encountered, the Cʀ symbol appears on the screen, but the cursor does not move to the next line.

Selecting this option also causes characters that otherwise would have extended beyond the right margin to wrap to a new line. Therefore, when you select this option, the Auto Wrap to Next Line option becomes dimmed.

Auto Wrap to Next Line The settings for this option determine whether characters that extend beyond the right margin wrap to the beginning of the next line. When you change the settings for this option, the sample in the option preview area of the dialog box changes accordingly. The default setting for this option is unchecked.

```
☐  This is a sample of T
   This is a sample of T
   This is a sample of T
```

When this option is unchecked, the cursor stops when it reaches the last column of a row. Incoming characters write over the last character on the line until a carriage return character occurs in the incoming data stream.

```
☒  This is a sample of T
   TY text.
   This is a sample of T
```

When this option is checked, the cursor moves to the first column of the next line when it reaches the last column of a row.

Holding Down Keys Will

The options under this heading control key repetition.

Auto Repeat Keys The settings for this option determine whether the Tab, Return, Backspace, Enter, and Escape keys, as well as all noncontrol keys, repeat when held down. The default setting for Auto Repeat Keys is checked.

⊠   When this option is checked, a key repeats when you hold it down.

☐   When this option is unchecked, a key doesn't repeat when you hold it down.

    You can use the keyboard control panel device (which is accessed through the Macintosh Control Panel item on the Apple menu) to specify the key repeat rate and the delay time before a key begins to repeat.

◆ **Note** To cause characters generated with Control key combinations (for example, the bell character and the line-feed character) to repeat, the Repeat Control Keys option must be checked. ◆

Repeat Control Keys The settings for this option determine whether keys used to generate control characters repeat when held down. Control characters are generated by simultaneously pressing both the Control key and another key on an Apple Desktop Bus™ (ADB) keyboard. On a Macintosh Plus keyboard, you can generate control characters by simultaneously pressing both the ⌘ (Command) key and another key. The default setting for Repeat Control Keys is unchecked.

☐   When this option is unchecked, the keys used to generate control characters don't repeat when you hold them down.

⊠   When this option is checked, the keys used to generate control characters repeat when you hold them down.

You can use the keyboard control panel device (which is accessed through the Macintosh Control Panel item on the Apple menu) to specify the key repeat rate and the delay time before a key begins to repeat.

◆ **Note** To cause Tab, Backspace, Return, Enter, Escape, and noncontrol keys to repeat, the Auto Repeat Keys option must be checked. ◆

Text Cursor

The settings for this option determine whether the cursor is a solid block or an underline, depending on the button chosen. The Underline is the default setting for the Text Cursor option.

○ Block
◉ Underline

```
┌─────────────────────────────── Unti
│□▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓
│The cursor looks like this: _
```

◉ Block
○ Underline

```
┌─────────────────────────────── Unti
│□▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓
│The cursor looks like this: █
```
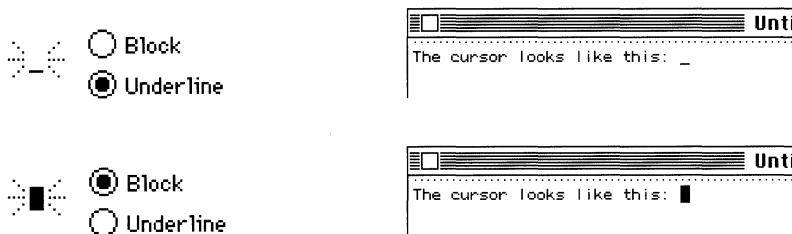
Scroll Text

When the remote computer is sending data into the terminal region, but the region is already filled with data, the TTY Tool automatically scrolls the data in the terminal region. The Scroll Text option lets you specify how the data scrolls. Smooth scrolling usually slows down the rate at which the incoming data is displayed, but makes it easier to read rapidly scrolling lines. When you change these settings, the sample text in the option preview area scrolls accordingly to demonstrate the effects of the change you are making. The default setting for Scroll Text is Jump.

◉ Jump   Scrolling is said to *jump* because data is displayed one line at a time. When you select this option, the text in the option preview area demonstrates how incoming text is displayed.

◉ Smooth
Scrolling takes place smoothly because data is displayed one pixel at a time. When you select this option, the text in the option preview area scrolls smoothly out of the area, demonstrating how incoming text is displayed. When you select the smooth scroll option, you should probably also select the XON/XOFF handshaking option (or another handshaking option) with your connection tool in order to control the flow of data to your Macintosh.

Swap Backspace and Delete

The settings for this option determine which character is sent when the Backspace key (on Macintosh Plus keyboards) or the Delete key (on ADB keyboards) is pressed. The default setting for this option is unchecked.

☐
On ADB keyboards:
- Pressing the Delete key sends a backspace character (ASCII 08).
- Pressing the Delete key while holding down the Option key sends a delete character (ASCII 127).

On Macintosh Plus keyboards:
- Pressing the Backspace key sends a backspace character (ASCII 08).
- Pressing the Backspace key while holding down the Option key sends a delete character (ASCII 127).

☒
On ADB keyboards:
- Pressing the Delete key sends a delete character (ASCII 127).
- Pressing the Delete key while holding down the Option key sends a backspace character (ASCII 08).

On Macintosh Plus keyboards:
- Pressing the Backspace key sends a delete character (ASCII 127).
- Pressing the Backspace key while holding down the Option key sends a backspace character (ASCII 08).

New Line on a Return

The settings for this option determine whether line-feed characters in incoming data are interpreted as carriage return/line-feed pairs or as line feeds only. In addition, this option determines what characters are sent when you press the Return key. The default setting for this option is unchecked.

☐ When this option is unchecked, a line feed is interpreted as only a line feed (not as a carriage return/line-feed pair). When a line-feed character is received from the remote computer, the cursor moves down one line, but stays in the same column, rather than moving to the beginning of the next line.

Pressing the Return key sends a carriage return character.

☒ When this option is checked, a line feed is interpreted as a carriage return/line-feed pair. When a line-feed character is received from the remote computer, the cursor moves to the first position on the next line. Use this option when incoming data does not move down to the beginning of the next line.

Pressing the Return key sends both a carriage return character and a line-feed character.

Resetting the TTY Tool

You can reset the TTY Tool by choosing the Reset Terminal command from the Session menu. Choosing this command resets all of the setup options for the TTY Tool (that is, all the options you can set in the Terminal Settings dialog box) to the last saved settings. In addition, when you reset the TTY Tool, all the data in the terminal region of your session document window is cleared (if the Save Lines Off Top command is checked, the cleared data will be saved in the scrollback cache).

TTY keys emulation

With the TTY Tool, Macintosh Plus keyboards function as follows:

- The ⌘ key acts as a Control key, meaning you cannot use ⌘-key equivalents.
- The tilde/quotation mark (~/`) key generates an escape character.
- The ⌘-tilde/quotation mark key combination generates a left single quotation mark, grave accent (`).
- The ⌘-Shift-tilde/quotation mark key combination generates a tilde (~).

ADB keyboards function as follows:

- A Control key is available for creating control characters, so the ⌘ key can be used to create ⌘-key equivalents.
- An Escape key is available for generating an escape character, so the tilde/quotation mark key generates a left single quotation mark, grave accent (`) and the Shift-tilde/quotation mark key combination generates a tilde (~).

However, since the TTY Tool does not perform any other special keyboard remapping, cursor keys and function keys are not available; the numeric keypad simply generates numbers and numeric operators.

◆ **Note** TTY terminals cannot generate some of the characters available on the Macintosh keyboards. More specifically, the TTY Tool only understands 7-bit characters, while the Macintosh can generate 8-bit characters (you do this by using the Option key in conjunction with other keys). If you try to enter an 8-bit character, your Macintosh beeps to let you know you can't enter the character. When you paste an 8-bit character into a TTY terminal window, the TTY Tool substitutes one or more 7-bit characters, which appear similar to the 8-bit character. For example, you generate the pi symbol (π) by pressing Option-p on your Macintosh keyboard. If you try this, your Macintosh will beep. However, if you paste the pi symbol into your session document from the clipboard, the TTY Tool sends the word *pi* instead of the pi symbol. ◆

Special characters

Since a TTY is a basic terminal, it does not support any special editing functions (such as inserting or deleting lines) or character display functions (such as boldfacing and underlining). However, the TTY Tool responds to the following ASCII special characters:

Backspace (ASCII 08)   Moves the cursor back one character

Bell (ASCII 07)   Sounds a bell

Carriage return (ASCII 0D)   Moves the cursor to the start of the line

Form feed (ASCII 0C)   Moves the cursor to the next line

Horizontal tab (ASCII 09)   Moves the cursor to the next tab location (tabs are every eight spaces)

Line feed (ASCII 0A)   Moves the cursor to the next line

Vertical tab (ASCII 0B)   Moves the cursor to the next line

Troubleshooting hints

Most problems you may encounter while using the TTY Tool are caused by mismatched communications parameters; the settings you chose are not compatible with the settings for the computer with which you are communicating. If data is not being sent and received correctly, compare the settings for the communications parameters; keep in mind that the problems could also be caused by mismatched settings for the connection tool being used for the session. Check with your system administrator to make sure you're using the correct settings.

Here are some suggestions for how to correct some of the problems you could encounter when the setup options are not set correctly:

Nothing is sent or received.

Check that your connection is open by pulling down the Session menu. If your connection is open, the Open Connection menu item will be dimmed.

Also, make sure that the On Line option is checked.

If you are unable to send or receive data, you may also need to check the physical connections and/or the setup options for the connection tool being used for the session.

Nothing appears on the screen when you send data.

Select the Local Echo option. The remote computer may not be echoing the keys you are pressing.

The data you send appears as double characters.

Deselect the Local Echo option. The remote computer may echo the keys you press; therefore, selecting Local Echo generates double characters. Most host computers echo keystrokes.

Incoming data writes over the last character on the first line.

Select the Auto Wrap to Next Line option.

Lines of incoming data are double-spaced.

Deselect the New Line on a Return option.

Incoming data writes over the same line.

Select the New Line on a Return option.

The cursor is not visible on the screen.

The cursor may have been scrolled out of the visible screen. Click the active scroll bar, or resize the window, to scroll the cursor back into the visible screen. You can also type a character to bring the cursor into view.

Memory requirements

The number of MacTerminal session documents you can have open at once depends on the amount of memory required by the communications tools used with the open session documents. If you are having trouble opening as many session documents as you want, it may be helpful to look at the amount of memory required for the tools you are using. The TTY Tool requires approximately 50K–65K (kilobytes) of space in memory (depending on the functions that the tool is performing and the number of open session documents that are using it). To check the memory requirements for the other tools that you are using, turn to the "Troubleshooting Hints" sections in the modules for those tools.

If you are using MultiFinder®, you can choose About the Finder™ from the File menu to check how much memory is available to MacTerminal. If there isn't enough memory available, you can increase the partition size allocated for the MacTerminal application (use the Get Info command in the File menu).

VT102™ Terminal Emulation Tool

Apple Computer, Inc.

The Apple Publishing System

VT102 Terminal Emulation Tool was written, edited, and composed on a desktop publishing system using Apple® Macintosh® computers, an AppleTalk® network system, and Microsoft® Word. Proof pages were created on the Apple LaserWriter® printers; final pages were printed on a Linotronic® 300. Line art and chapter openers were created with Adobe Illustrator™. PostScript®, the LaserWriter page-description language, was developed by Adobe Systems Incorporated.

Text type and display type are Apple's corporate font, a condensed version of ITC Garamond®. Bullets are ITC Zapf Dingbats®.

Contents

The Digital Equipment Corporation VT102™ terminal is a video terminal used as an input and output device for remote computers. The VT102 Terminal Emulation Tool allows you to set general, screen, keyboard, and character set attributes for your Apple® Macintosh® computer so that it can perform like a VT102 terminal. The VT102 Tool follows the Digital VT102 model very closely, with the following exceptions:

- The default screen on the Macintosh is dark text on a light background. (On the VT102, the default screen is light text on a dark background.)

- With the VT102 Tool, there is no relationship between the Cursor Key mode and the Keypad mode. (On the VT102, the Cursor Key mode can be set only if the Keypad mode is set to Application.)

- The VT102 Tool ignores printing sequences that would control a locally attached printer.

- The VT102 Tool ignores hardware testing sequences specific to the VT102.

- The VT102 Tool allows you to swap the functions of the Backspace and Delete keys.

- The VT102 Tool does not reset the DTR (Data Terminal Ready) signal during a break.

◆ **Installation note** In addition to installing the VT102 Tool (see the *Installation* part of the *Network Services User's Guide* for instructions), you should also install the VT102 Font into your System file. You need this font for performing background printing to a LaserWriter® printer, printing to an ImageWriter® printer, or copying portions of your MacTerminal® session document to another application. Use the Font/DA Mover to install the VT102 Font included on the PATHWORKS™ V1.0 volume (if you need help using the Font/DA Mover, refer to the manuals that accompanied your Macintosh). ◆

VT102 terminal settings

You choose the Terminal command from the Settings menu (shown here) to access a dialog box that lets you set the terminal emulation attributes for your Macintosh computer.

```
  File   Edit   Settings   Session   Windows
               Connection...
               Terminal...
               File Transfer...

               Folder for Received Files...
               Saved Lines...
               Paste Options...
               Connect on Open
```
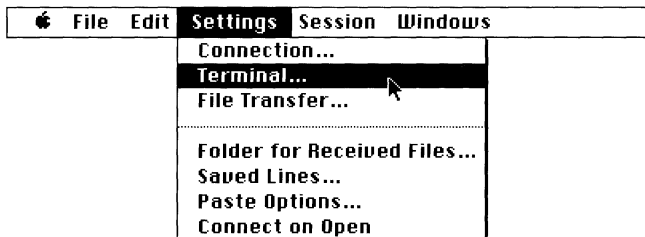
To set the attributes for VT102 emulation, you choose VT102 Tool from the Emulation pop-up menu in the Terminal Settings dialog box. A list of setup icons and a group of setup options appear. The setup options displayed within the dialog box vary depending on which of the four setup icons (General, Screen, Keyboard, or Character Set) is selected. When you first select VT102 Tool from the pop-up menu, the General icon becomes selected and the options that fall into the General category are displayed, as shown below.

```
Terminal Settings                              [   OK   ]

    Emulation: [  VT102 Tool ]                  [ Cancel ]
    _____

    General    Terminal Mode: [ ANSI/VT102 ]    Text Cursor

                                ☒ On Line        ○ Block
                                □ Local Echo     ● Underline

    Screen
                                        □ Show Status Bar
                                        □ Show Tab Ruler

    Keyboard   Answerback Message [                    ]
```
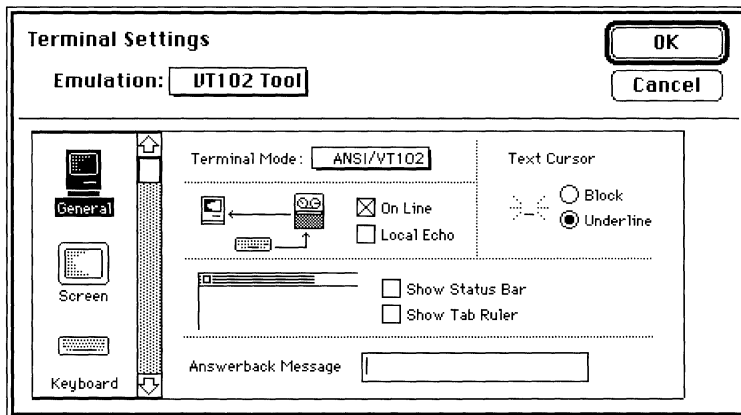
For each option, the most commonly used setting is preset as the default. You may need to change the setting for some options depending on the type of connection being used, the type of information being transmitted, or the communication requirements of the remote computer. In these cases, you should refer to the documentation for the remote computer or contact your system administrator for information on how the various options should be set for the communications session you are establishing.

◆ **Note** During a communications session, you may notice that some settings change based on communication from the host. This happens because the VT102 responds to special character sequences the remote computer sends. If for some reason the host leaves your terminal in an undesired state, you can restore the last saved settings by choosing Reset Terminal from the Session menu. ◆

The following sections describe the setup options available with each of the four VT102 setup icons (General, Screen, Keyboard, and Character Set). Within each of these four sections, the individual options are described in the order they appear in the dialog box (reading from top to bottom and from left to right).

General setup options

When you select the General icon in the VT102 Settings dialog box, the setup options shown below are displayed.
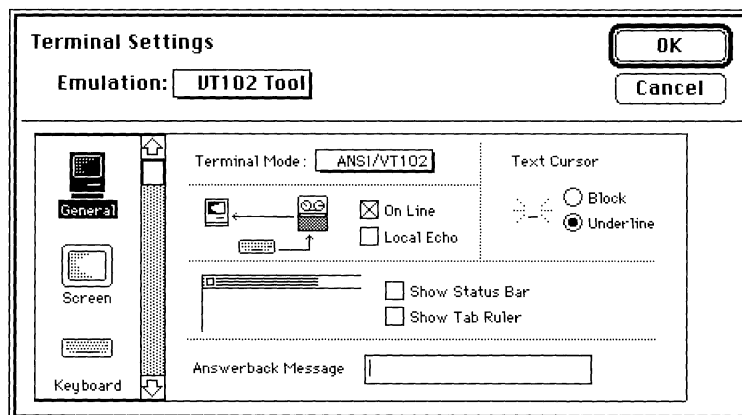
Terminal Mode

You use this pop-up menu to specify which VT102 mode your Macintosh should be in. The default setting for the terminal mode option is ANSI/VT102.

[ANSI/VT102] This is the typical mode for VT102 emulation.

[VT52] This is the mode used to emulate a Digital VT52™ terminal. When this mode is chosen, the Character Set Settings dialog box is disabled because VT52 terminals do not support character set options.

On Line

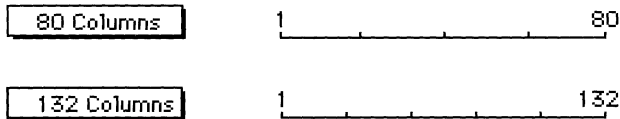The settings for this option determine whether your Macintosh is on line or off line. The default setting for the On Line option is checked.

☒ On Line

When this option is checked, your Macintosh is *on line*, meaning it is able to communicate with another computer. In this case, as long as you have an established connection to another computer, the characters you type are sent to the remote computer, and incoming data from the remote computer is displayed on your Macintosh screen.

When your Macintosh is on line, you may need to select the Local Echo option to cause characters to be sent to your Macintosh screen as they are sent to the remote computer. The Local Echo option is available only when the On Line option is checked.

□ On Line

When this option is unchecked, your Macintosh stops sending data to the remote computer and ignores incoming data without terminating the connection (a condition called *off line*).

Click the On Line option to resume communication with the remote computer.

When you are working off line, the characters you type are automatically displayed on the Macintosh screen. Therefore, the Local Echo option is dimmed and unavailable when the On Line option is unchecked.

Local Echo

This option is available only when the On Line option is checked. The settings for the Local Echo option determine whether characters you type on the keyboard or numeric keypad (or select from the Keys menu) are sent to your Macintosh screen (as well as to the remote computer with which your Macintosh is communicating). Since most host systems echo keystrokes, the default setting for Local Echo is unchecked.

□ Local Echo

When this option is unchecked, as you press keys, characters are sent only to the remote computer, not to your Macintosh screen. The characters that appear on your screen are sent by the remote computer.

☒ Local Echo

When this option is checked, as you press keys, characters are sent to your Macintosh screen as well as to the remote computer. Select this option when your Macintosh is communicating with a host that does not echo keystrokes.

Show Status Bar

The settings for this option determine whether a status bar (similar to the status lights on a VT102 terminal) appears at the top of the VT102 terminal emulation screen (above any tab ruler). An example of the status bar is shown below. The default setting for Show Status Bar is unchecked; no status bar appears.

Shows whether On Line and Local Echo are off or on

Shows whether the keyboard is locked

The remote computer's application controls the meaning of these indicators
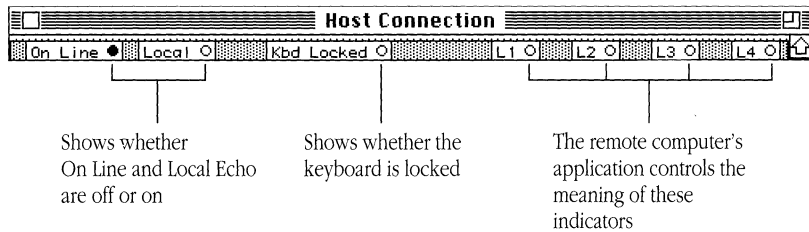
When the light next to a label is on, the option is selected. Clicking these labels does not change their state. You can change the settings of the On Line and Local Echo options in the Terminal Settings dialog box. The remote computer turns on Kbd Locked (keyboard is locked) when it can't accept input, usually because it already has as much data as it can handle. The remote computer will turn Kbd Locked off when it is able to accept more input.
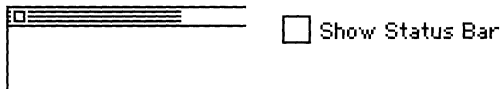
☐ Show Status Bar

When this option is unchecked, no status bar is displayed.

☒ Show Status Bar

When this option is checked, the status bar is displayed.

Show Tab Ruler

The settings for this option determine whether a tab ruler appears at the top of the VT102 terminal screen, below the status bar (if the status bar is also being displayed). An example of the tab ruler is shown below. The default setting for Show Tab Ruler is unchecked; no tab ruler appears.

Set new tabs
Clear all tabs
Reset default tabs

Host Connection

☐ Show Tab Ruler
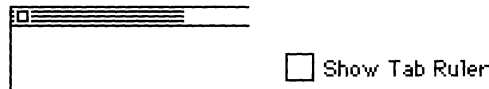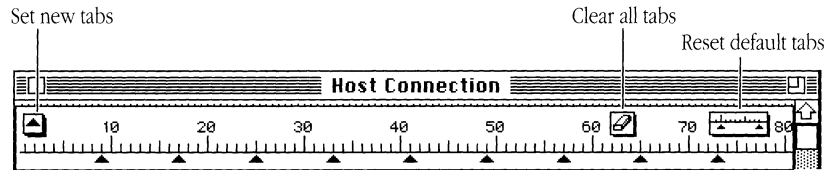
When this option is unchecked, the tab ruler is not displayed.
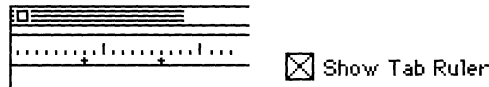
☒ Show Tab Ruler

When this option is checked, the tab ruler is displayed.

You can set or clear tabs using the Tab Ruler. By default, tabs are set every 8 spaces. You can set new tabs by dragging the tab markers from the new-tabs icon on the left side of the ruler. To move existing tabs, click the tab to select it, and then drag it where you want it to go. The buttons on the right side of the ruler clear all set tabs and reset the default tabs to every 8 spaces. You can also clear a tab by selecting it and then dragging it below the ruler.

Answerback Message

This option lets you enter the character string that is returned to the remote computer when an enquire character is detected in the incoming data stream. The answerback string provides an identification response to the remote computer. You do not need to provide an answerback string unless the remote computer specifies it. Most public information services don't require an answerback string. However, you may need to send an answerback message when you're communicating with certain types of private computer systems. The system administrator for the remote system can tell you if an answerback string is required.

The answerback string can contain 1–20 characters. Some answerback messages require that you type a control character to generate the appropriate answerback message; for example, typing Control-M to generate the carriage return character (₨) in the answerback message area.

When communicating with another computer system, the VT102 Tool sends the answerback string you've specified when the other computer requests it. Or, you can manually control transmission of the answerback string using the following methods:

- Control-Enter sends the answerback string. Hold down the Control key on an ADB (Apple Desktop Bus™) keyboard, or the ⌘ (Command) key on a Macintosh Plus keyboard, and press Enter. The VT102 Tool sends the answerback string, which is equivalent to pressing the Control-Break on a VT102 terminal.

- Control-E asks for the answerback string. Hold down the Control key, or the ⌘ key on a Macintosh Plus keyboard, and press E. The computer at the other end automatically sends its answerback message if it is configured to do so.

Text Cursor

The settings for this option determine whether the cursor is a solid block or an underline, depending on the button chosen. The Underline is the default setting for the Text Cursor option.

○ Block
● Underline

```
▤□▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓ Unti
The cursor looks like this: _
```

● Block
○ Underline

```
▤□▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓ Unti
The cursor looks like this: █
```

Screen setup options

When you select the Screen icon in the VT102 Settings dialog box, the setup options
shown below are displayed.

```
┌────────────────────────────────────────────────────────────────┐
│  Terminal Settings                          ( ▐   OK   ▌ )      │
│     Emulation:  [ VT102 Tool]               (   Cancel   )      │
│  ┌──────────────────────────────────────────────────────────┐  │
│  │  ▢ ▲  Width: [ 80 Columns ]        Scroll Text           │  │
│  │  □     Size:  [ 9 point ]        ● Jump   ○ Smooth       │  │
│  │ General                                                  │  │
│  │        Characters              1 ․․․․․․․․․․․․․․ 80        │  │
│  │ ▓▓▓    □ Show Control Characters   This is a sample of VT│  │
│  │ Screen □ Auto Wrap to Next Line    This is a sample of VT│  │
│  │                                    This is a sample of VT│  │
│  │        □ Insert Characters         This is a sample of VT│  │
│  │ ▤▤▤                                                      │  │
│  │ Keyboard ▼ □ Origin at Scrolling Margin  □ Inverse Video │  │
│  └──────────────────────────────────────────────────────────┘  │
└────────────────────────────────────────────────────────────────┘
```
— Option preview area
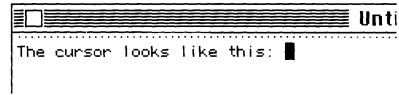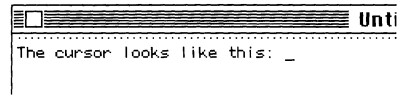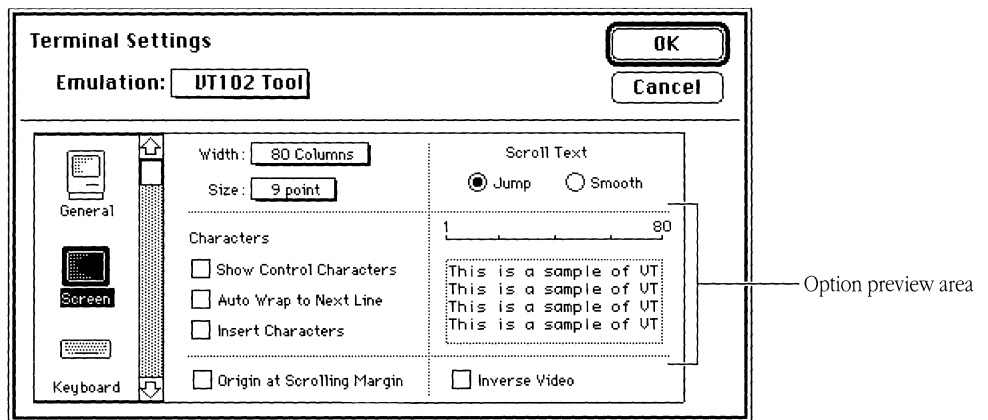
Option preview area

The option preview area provides you with information about the settings you choose.
When you change the settings in the Width, Size, Show Control Characters, Auto Wrap to
Next Line, Scroll Text, or Inverse Video options, you'll notice corresponding changes in
the option preview area. Refer to the explanation of the individual options for
information on how the area changes when you change the settings for specific options.

Width

This pop-up menu lets you set the number of display columns for VT102 emulation. Two widths are supported: 80 columns per line and 132 columns per line. When you change the setting for the Width option, the scale in the option preview area of the dialog box changes accordingly. The default width is 80 columns per line.

| 80 Columns | 1 _____ 80

| 132 Columns | 1 _____ 132

△ **Important** When the Width option is changed, the terminal region in your session document is cleared and the cursor is returned to the top left of the screen. To save the data in the terminal region, before changing the width, be sure that the Save Screen Before Clearing option is selected in the dialog box for the Saved Lines command in the Settings menu and that the Save Lines Off Top command in the Session menu is checked. △

Size

This pop-up menu lets you set the font size of the characters displayed on the screen during VT102 emulation. Two sizes are supported: 9 point and 12 point. When you change the setting for the Size option, the sample in the option preview area of the dialog box changes accordingly. The default setting is 9 point.
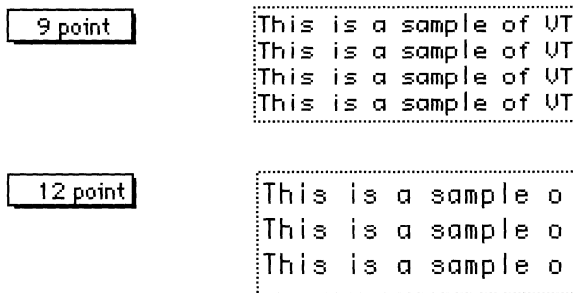
| 9 point |
```
This is a sample of VT
This is a sample of VT
This is a sample of VT
This is a sample of VT
```

| 12 point |
```
This is a sample o
This is a sample o
This is a sample o
```
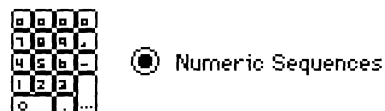
Characters

The options in this group let you specify certain attributes of how characters are handled while your Macintosh is emulating a VT102 terminal.

Show Control Characters The settings for this option determine whether control characters are displayed as readable characters. The default setting for this option is unchecked. The chances are that you will never change this option. Sometimes mainframe application programmers use it to help them debug code.

☐
```
This is a sample of VT
102 text.
This is a sample of VT
102 text.
```
When this option is unchecked, control characters have their normal effect. For example, when a line feed is encountered, the cursor moves to the following line.

☒
```
This is a sample of VT
102 text.ₑᵣ
This is a sample of VT
102 text.ₑᵣ
```
When this option is checked, control characters are displayed on the screen as they are encountered in the incoming data stream (and, when the Local Echo option is also checked, as they are entered from the keyboard). In addition, the control characters have their normal effect. For example, when a carriage return character is encountered, the ₑ symbol appears on the screen and the cursor moves to the beginning of the line.

Selecting this option also causes characters that otherwise would have extended beyond the right margin to wrap to a new line. Therefore, when you select this option, the Auto Wrap to Next Line option becomes dimmed.

Auto Wrap to Next Line The settings for this option determine whether characters that extend beyond the right margin wrap to the beginning of the next line. When you change the settings for this option, the sample in the option preview area of the dialog box changes accordingly.

The default setting for this option is unchecked. This option becomes dimmed when the Show Control Characters option is selected.

□
```
This is a sample of VT
This is a sample of VT
This is a sample of VT
This is a sample of VT
```
When this option is unchecked, the cursor stops when it reaches the last column of a row. Incoming characters write over the last character on the line until a carriage return character occurs in the incoming data stream.

☒
```
This is a sample of VT
102 text.
This is a sample of VT
102 text.
```
When the option is checked, the cursor moves to the first column of the next line when it reaches the last column of a row.

Insert Characters The settings for this option determine whether characters are inserted between existing text or write over existing text. The default setting for this option is unchecked (under most circumstances, you should not change this setting).

□
When this option is unchecked, characters are inserted at the cursor location, writing over any existing text. The cursor moves to the right as new characters are inserted.

☒
When this option is checked, characters are inserted at the cursor location, pushing any existing text to the right. The cursor moves to the right as new character are inserted. Characters moving past the right margin are lost.

Origin at Scrolling Margin

The settings for this option determine whether the cursor can move outside the scrolling region (the area between the top and bottom margins). In addition, this option determines whether screen addressing is in absolute or relative coordinates. Usually, the remote computer determines the appropriate setting for this option. The chances are that you will never change this option. Sometimes mainframe application programmers use this option to help them debug code. The default setting for this option is unchecked.

☐　　　　When this option is unchecked, the cursor can be positioned beyond the boundaries of the scrolling region. In this case, screen addressing is based on absolute coordinates, where line 1, column 1, is in the top-left corner of the screen, rather than within the scrolling region.

☒　　　　When this option is checked, the cursor cannot be positioned beyond the boundaries of the scrolling region. In this case, screen addressing is based on relative coordinates, where line 1, column 1, is in the top-left corner of the scrolling region.

Scroll Text
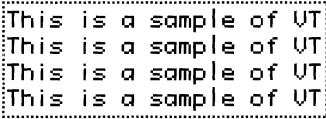
When the remote computer is sending data into the terminal region, but the region is already filled with text, the VT102 Tool automatically scrolls the data in the terminal region. The Scroll Text option lets you specify how the data scrolls. Smooth scrolling usually slows the rate at which the incoming data is displayed, but makes it easier to read rapidly scrolling lines. When you change these settings, the sample text in the option preview area scrolls accordingly to demonstrate the effects of the change you are making. The default setting for Scroll Text is Jump.

◉ Jump   Scrolling is said to *jump* because data is displayed one line at a time. When you select this option, the text in the option preview area demonstrates how incoming text is displayed.

◉ Smooth   Scrolling takes place smoothly because data is displayed one pixel at a time. When you select this option, the text in the option preview area scrolls smoothly out of the area, demonstrating how incoming text is displayed. When you select the smooth scroll option, you should probably also select the XON/XOFF handshaking option (or another handshaking option) with your connection tool in order to control the flow of data to your Macintosh.

Inverse Video

The settings for this option determine whether the Macintosh displays white text on a black background or black text on a white background. Normally, the Macintosh displays black text on a white background. When you activate Inverse Video, white text appears on a black background. When you change the setting for this option, the background and text in the option preview area of the dialog box change accordingly. The default setting for this option is unchecked.

☐   This is a sample of VT
       This is a sample of VT
       This is a sample of VT
       This is a sample of VT

☒   This is a sample of VT
       This is a sample of VT
       This is a sample of VT
       This is a sample of VT

Keyboard setup options

When you select the Keyboard icon in the VT102 Settings dialog box, the setup options shown below are displayed.
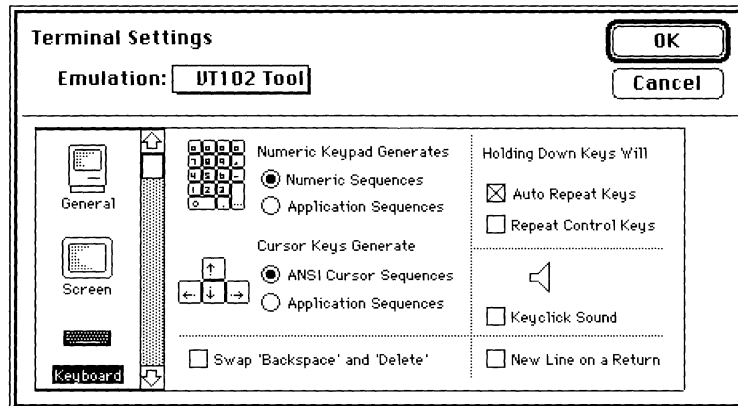
```
┌──────────────────────────────────────────────────────────────────┐
│  Terminal Settings                            ┌──────────────┐     │
│                                               │     OK       │     │
│     Emulation:  [ VT102 Tool ]                └──────────────┘     │
│                                               ┌──────────────┐     │
│                                               │   Cancel     │     │
│                                               └──────────────┘     │
│  ──────────────────────────────────────────────────────────────   │
│   ┌──────┐ ⇧  ▓▓▓▓  Numeric Keypad Generates │ Holding Down Keys Will │
│   │      │    ▓▓▓▓  ⦿ Numeric Sequences       │                     │
│   │      │    ▓▓▓▓  ○ Application Sequences    │ ⊠ Auto Repeat Keys  │
│   General                                     │ □ Repeat Control Keys│
│                       Cursor Keys Generate    │                     │
│   ┌──────┐      ┌↑┐   ⦿ ANSI Cursor Sequences │ ◁                   │
│   │      │   ┌←┐└↓┘┌→┐ ○ Application Sequences │                     │
│   Screen                                      │ □ Keyclick Sound    │
│                                               │                     │
│   ▓▓▓▓▓▓     □ Swap 'Backspace' and 'Delete'  │ □ New Line on a Return│
│   [Keyboard] ⇩                                │                     │
└──────────────────────────────────────────────────────────────────┘
```

Numeric Keypad Generates

The settings for this option determine whether the keys on the keypad generate numeric characters or escape sequences, depending on the button selected. The default setting for this option is Numeric Sequences.

⦿ Numeric Sequences

The keys on the keypad generate characters that match the typical numeric, comma, period, and minus sign keys on the VT102-type keyboard (in accordance with ANSI specifications).

⦿ Application Sequences

The keys on the keypad generate special escape sequences (specified by Digital).

Cursor Keys Generate

The settings for this option determine the characters transmitted when the Cursor (arrow) keys are pressed. The default setting for this option is ANSI Cursor Sequences, which you will not need to change under most circumstances. Usually, the remote computer sets the option appropriately.

● ANSI Cursor Sequences

When Cursor keys are pressed, ANSI cursor-control sequences are transmitted to the remote computer.

● Application Sequences

When Cursor keys are pressed, cursor-control functions (specified by Digital) are transmitted to the remote computer.

If pressing Cursor keys or choosing them from the Keys menu generates unexpected characters in your terminal emulation window but does not move the cursor, the application on the remote computer may not accept input from Cursor keys. (This can also happen if the Cursor key setting does not match what the remote application expects.)

Swap Backspace and Delete

The settings for this option determine which character is sent when the Backspace key (on Macintosh Plus keyboards) or the Delete key (on ADB keyboards) is pressed. The default setting for this option is unchecked.

☐

On ADB keyboards:

- Pressing the Delete key sends a backspace character (ASCII 08).
- Pressing the Delete key while holding down the Option key sends a delete character (ASCII 127).

On Macintosh Plus keyboards:

- Pressing the Backspace key sends a backspace character (ASCII 08).
- Pressing the Backspace key while holding down the Option key sends a delete character (ASCII 127).

☒

On ADB keyboards:

- Pressing the Delete key sends a delete character (ASCII 127).
- Pressing the Delete key while holding down the Option key sends a backspace character (ASCII 08).

On Macintosh Plus keyboards:

- Pressing the Backspace key sends a delete character (ASCII 127).
- Pressing the Backspace key while holding down the Option key sends a backspace character (ASCII 08).

Holding Down Keys Will

The options under this heading control key repetition.

Auto Repeat Keys The settings for this option determine whether Tab, Return, Backspace, Enter, Escape, and noncontrol keys repeat when held down. The default setting for Auto Repeat Keys is checked.

☒   When this option is checked, a key repeats when you hold it down.

☐   When this option is unchecked, a key doesn't repeat when you hold it down.

You can use the keyboard control panel device (which is accessed through the Macintosh Control Panel item on the Apple menu) to specify the key repeat rate and the delay time before a key begins to repeat.

◆ **Note** To cause characters generated with Control key combinations (for example, the bell character and the line-feed character) to repeat, the Repeat Control Keys option must be selected. ◆

Repeat Control Keys The settings for this option determine whether keys used to generate control characters repeat when held down. Control characters are generated by simultaneously pressing both the Control key and another key on an ADB keyboard. On a Macintosh Plus keyboard, you can generate control characters by pressing both the ⌘ key and another key. The default setting for Repeat Control Keys is unchecked.

☐   When this option is unchecked, the keys used to generate control characters don't repeat when you hold them down.

☒   When this option is checked, keys used to generate control characters repeat when you hold them down.

You can use the keyboard control panel device (which is accessed through the Macintosh Control Panel item on the Apple menu) to specify the key repeat rate and the delay time before a key begins to repeat.

◆ **Note** To cause Tab, Backspace, Enter, Escape, Return, and noncontrol keys to repeat, the Auto Repeat Keys option must be selected. ◆

Keyclick Sound

The settings for this option determine whether an audible clicking sound is made when a key is pressed. You can change the volume level from the General or Sound Control Panel device available from the Macintosh Control Panel item in the Apple menu. The default setting for Keyclick is unchecked.

☐ Keyclick Sound

When this option is unchecked, clicks are not sounded when keys are pressed.

☒ Keyclick Sound

When this option is checked, a click is sounded each time you press a key. (If the keyboard is locked, you will hear a beep instead of a keyclick.)

New Line on a Return

The settings for this option determine whether line-feed characters in incoming data are interpreted as carriage return/line-feed pairs or as line feeds. In addition, this option determines what characters are sent when you press the Return key. The default setting for this option is unchecked.

☐

When this option is unchecked, a line feed is interpreted as only a line feed (not as a carriage return/line-feed pair). When a line-feed character is received from the remote computer, the cursor moves down one line, but stays in the same column, rather than moving to the beginning of the next line.

Pressing the Return key sends a carriage return character.

⊠   When this option is checked, a line feed is interpreted as a carriage return/line-feed pair. When a line-feed character is received from the remote computer, the cursor moves to the first position on the next line. Use this option when incoming data does not move down to the beginning of the next line.

Pressing the Return key sends both a carriage return character and a line-feed character.

Character Set setup options

When you select the Character Set icon in the VT102 Settings dialog box, you have access to pop-up menus that allow you to specify the character sets for display on your Macintosh screen. A character set is equivalent to a Macintosh font; it is a collection of characters that can be shown on a screen or used to code computer instructions. US ASCII and French are examples of character sets.

◆ **Note** If you selected VT52 mode in the General Settings dialog box, the options in this dialog box are dimmed because they do not apply to the VT52 terminal type. ◆
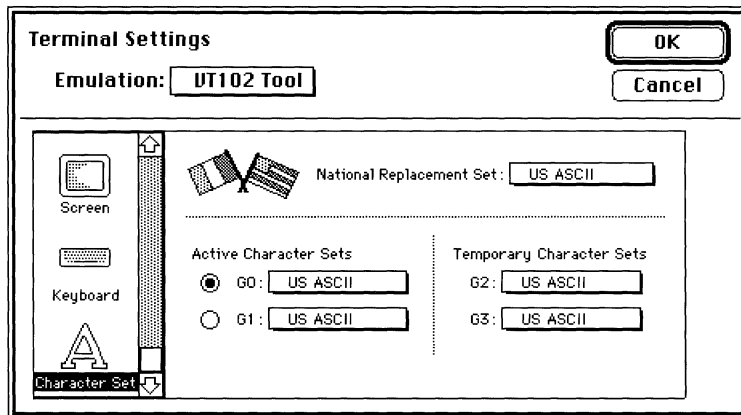
The VT102 Tool supports 13 different international character sets and a graphics character set (each of which contains 128 characters). The VT102 Tool is preset to use only the US ASCII character set (as you can see from the example on the previous page). In almost every circumstance, you won't need to change anything in this dialog box because host applications take care of setting these options. Usually, the host resets the options to your original settings. However, in the rare case that a host application changes a character set setting but doesn't change it back, you will need to reset the setting yourself. In addition, you may want to change the character set options, if, for example, you need a Graphics character set to generate on-screen graphics or a foreign character set to communicate with a multilingual host computer.

You use the National Replacement Set menu to select a different international character set. The G0-G3 menus contain identical lists, which allow you to choose either the US ASCII character set, a Graphics character set, or, if one is specified, the international character set. You use the G0 and G1 menus to specify the choices for the active character set, the one currently used to display characters on the screen. At any given time, only one character set may be active. The G2 and G3 menus let you specify temporary character sets—the host can switch to a temporary character set to generate one character, and then the VT102 Tool switches back to the last active character set (either G0 or G1).

◆ **Note** VT102 terminals using the US ASCII character set cannot generate some of the characters available on the Macintosh. More specifically, the VT102 Tool only understands 7-bit characters, while the Macintosh can generate 8-bit characters (you do this by using the Option key in conjunction with other keys). If you try to enter an 8-bit character, your Macintosh beeps to let you know you can't enter the character. When you paste an 8-bit character into a VT102 terminal window, the VT102 Tool substitutes one or more 7-bit characters, which appear similar to the 8-bit character. For example, you generate the pi symbol (π) by pressing Option-p on your Macintosh keyboard. If you try this, your Macintosh will beep. However, if you paste the pi symbol into your session document from the clipboard, the VT102 Tool sends the word *pi* instead of the pi symbol. ◆

National Replacement Set

Click the National Replacement set pop-up menu to select a national replacement set.
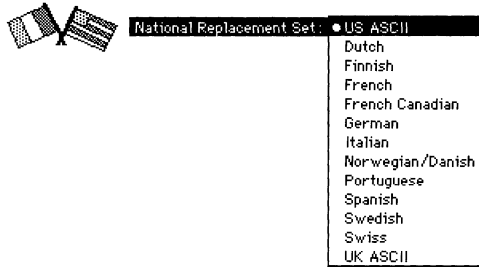
US ASCII is the standard set of letters, numbers, and symbols used in North American English computers. This is the default character set on this menu.

UK ASCII is the same as US ASCII but with the pound sterling symbol (£) instead of the number sign (#). Dutch, Finnish, French, French Canadian, German, Italian, Norwegian/Danish, Portuguese, Spanish, Swedish, and Swiss are various character sets with accented characters. See the *VT320 Programmer Reference Manual* for additional details on these character sets. You can obtain this guide directly from Digital by dialing 800-344-4825.

When you specify anything other than US ASCII, the International option becomes available when you pop up any of the G0-G3 menus, as shown in the menu below. For instance, when you select French as the National Replacement set, French also appears when you pop up any of the G0-G3 menus.
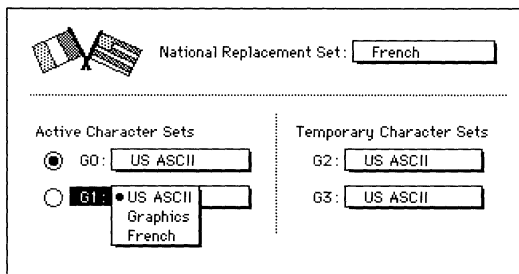
Active Character Sets

You use these pop-up menus (G0 and G1) to specify the active character set and an alternate. Both menus contain the same list of character sets, and US ASCII is the default for both menus. The G0 menu is the default for the active character set.

You can change the selection on either of these menus by pulling down the menu and clicking a different character set; you can change the active character set by clicking the other button.

Temporary Character Sets

These menus (G2 and G3) specify the two temporary character sets. Both menus contain the same list of character sets, and US ASCII is the default for both menus. You can change the selection on either of these menus by pulling down the menu and clicking a different character set.

The character sets specified in the G2 or G3 menus can be swapped for only one character at a time (that is, either G2 or G3 temporarily becomes the active character set, one character is generated, and then the VT102 Tool switches back to either G0 or G1, whichever was the last active character set).

Resetting the VT102 Tool

The VT102 Tool can be reset in two ways. Occasionally, the remote computer you are connected to will reset one or more settings. The other way is by choosing the Reset Terminal command from the Session menu.

Choosing this command resets all the setup options for the VT102 Tool (that is, all the options you can set in the Terminal Settings dialog box) to the last saved settings. In addition, when you reset the VT102 Tool, all the data in the terminal region of your session document window is cleared (if the Save Lines Off Top command is checked, the cleared data will be saved in the scrollback cache).

VT102 keys emulation

Some keys on VT102 keyboards do not exist on the Macintosh keyboards; the VT102 Tool enables the Macintosh to emulate these keys.

In some cases, the VT102 Tool maps the VT102 keys to certain key combinations on Macintosh keyboards. In other cases, you can choose from a Keys menu. Frequently, you can emulate the VT102 keys either by using the Keys menu or with key combinations.
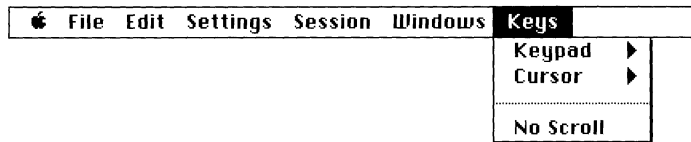
The Keys menu

There are two submenus on the VT102 Tool Keys menu:

The numeric keypad

The Cursor keys (arrows)
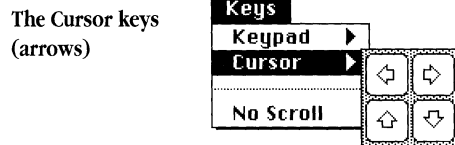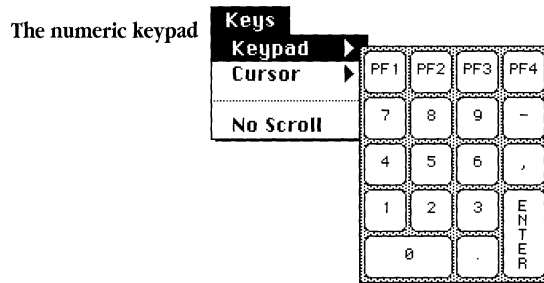
When you select a key cell from the Keypad or Cursor menu, it produces the same result as if you had pressed the key on a VT102 keyboard.

The third item on the Keys menu, No Scroll, is available only when the connection tool being used for the session is set up to use XON/XOFF handshaking; otherwise, this item is dimmed and unavailable. The No Scroll item lets you freeze the screen while data is coming in, so you can read the current contents of the screen before it scrolls off. Choose No Scroll again to release the screen and continue displaying incoming data. (Equivalent control keys are Control-S for stop scrolling and Control-Q for continue scrolling.) When the screen is frozen (that is, when the screen does not scroll), a check mark appears next to the No Scroll item on the menu.

Keyboard mapping

The keys highlighted on the sample VT102 keyboard below do not have equivalent keys on all Macintosh keyboards and so have been mapped to the Keys menu, to keyboard combinations on the Macintosh keyboards, or to both. In some cases, keyboard equivalents are supplied by the MacTerminal Settings or Session menus.
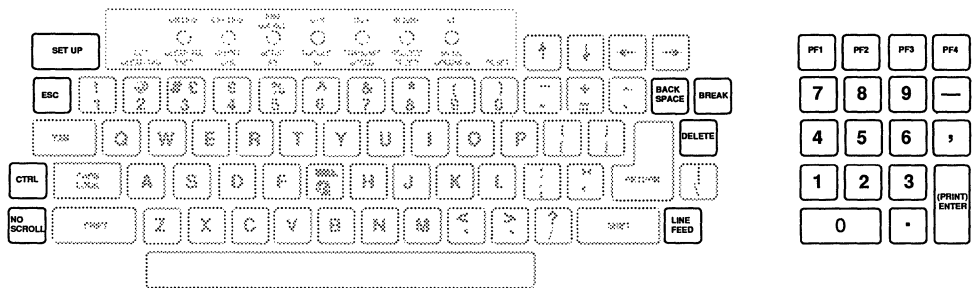
The following table shows you how to generate the missing VT102 keys. There is a Quick Reference Card for these key mappings at the back of this binder.

To emulate these VT102 keys	On Macintosh Plus keyboards use	On Apple ADB keyboards* use
Cursor (arrow) keys	Cursor (arrow) keys or Keys menu	Cursor (arrow) keys or Keys menu
Backspace	Backspace	Delete
Delete	Option-Backspace	Option-Delete
Short break (Break)	Option-Enter	Option-Enter
Long break (Shift-Break)	Shift-Enter or Session menu	Shift-Enter or Session menu
Answerback (Control-Break)	⌘-Enter	Control-Enter
Control	⌘	Control
Escape	Tilde/quotation mark (~/ˆ)	Escape
Left single quotation mark, grave accent (ˋ)	⌘–Tilde/quotation mark (~/ˆ)	Tilde/quotation mark (~/ˆ)
Tilde (~)	⌘–Shift-tilde/quotation mark (~/ˆ)	Shift–tilde/quotation mark (~/ˆ)
Keypad	Keypad or Keys menu	Keypad or Keys menu
Line Feed	⌘-J	Control–J
No Scroll	⌘-Q/⌘-S or Keys menu	Control–Q/Control–S or Keys menu
PF1; PF2; PF3; PF4	Keypad or Keys menu	Keypad or Keys menu
Set Up	Settings menu	Settings menu

*The key combinations apply to all ADB keyboards: Apple, Apple Extended, Apple Extended II, and Macintosh Portable (with a keypad).

◆ **Note** VT102 terminals using the US ASCII character set cannot generate some of the characters available on the Macintosh. More specifically, the VT102 Tool only understands 7-bit characters, while the Macintosh can generate 8-bit characters (you do this by using the Option key in conjunction with other keys). If you try to enter an 8-bit character, your Macintosh beeps to let you know you can't enter the character. When you paste an 8-bit character into a VT102 terminal window, the VT102 Tool substitutes one or more 7-bit characters, which appear similar to the 8-bit character. For example, you generate the pi symbol (π) by pressing Option-p on your Macintosh keyboard. If you try this, your Macintosh will beep. However, if you paste the pi symbol into your session document from the clipboard, the VT102 Tool sends the word *pi* instead of the pi symbol. ◆

The following subsections provide additional details about how the VT102 Tool handles keyboard mapping.

Backspace/Delete keys

For information on how the VT102 Tool handles the Backspace and Delete keys, see "Keyboard Setup Options" earlier in this module.

Break key

On the VT102 keyboard, the Break key, alone and in combination with other keys, performs three different functions:

- Pressing the Break key alone generates a short break (.233 second), which interrupts the flow of data.
- Shift-Break generates a long break (3.5 seconds). With the VT102 Tool, a long break may also drop the connection to the host, depending on the connection tool you are using. For example, if you are using the Serial Connection Tool or Apple Modem Connection Tool, the communications equipment (such as a PBX) between you and the host may drop the connection in response to a long break.
- Control-Break generates the answerback message.

Refer to the preceding table to determine which menu to use or keys to press on your Macintosh keyboard in order to emulate these VT102 keys.

Control key

On ADB keyboards, there is a Control key. On Macintosh Plus keyboards, the ⌘ key serves as the Control key (this means you can't use the ⌘ key on Macintosh Plus keyboards for keyboard shortcuts).

Cursor keys

Cursor keys (arrows) exist on both Macintosh Plus keyboards and ADB keyboards. In addition, they are also emulated in the Keys menu.

Escape key

On ADB keyboards, there is an Escape key. On Macintosh Plus keyboards, the top-left key, the tilde/quotation mark (~/`) key, is used for the Escape key. To generate a tilde (~) on the Macintosh Plus keyboard, use ⌘-Shift-tilde/quotation mark; to generate a left single quotation mark, grave accent (`), use ⌘-tilde/quotation mark.

Keypad keys

The VT102 keypad physically maps one-to-one to the keypad on Macintosh Plus keyboards and ADB keyboards. In addition, the VT102 keypad keys are emulated in the Keys menu.

Setup key

Instead of providing a keyboard equivalent to the VT102 Setup key, the VT102 Tool lets you use the Settings dialog boxes for setup operations.

Troubleshooting hints

Most problems you encounter while using the VT102 Tool are caused by mismatched communications parameters; the settings you chose for the tool are incompatible with the settings for the computer with which you are communicating. If data is not being sent and received correctly, compare the settings for the communications parameters; keep in mind that the problems could also be caused by mismatched settings for the connection tool being used for the session. Check with your system administrator to determine if your settings are correct.

Make sure the settings for the VT102 Tool setup options match the requirements of the remote computer. Here are some suggestions for how to correct some of the problems you could encounter when the setup options are not set correctly:

Nothing is sent or received.

Check that your connection is open by pulling down the Session menu. If your connection is open, the Open Connection menu item will be dimmed.

Also, make sure that the On Line option is checked.

If you are unable to send or receive data, you may also need to check the physical connections and/or the setup options for the connection tool being used for the session.

Nothing appears on the screen when you send data.

Select the Local Echo option. The remote computer may not be echoing the keys you are pressing.

The data you send appears as double characters.

Deselect the Local Echo option. The remote computer may echo the keys you press; therefore, selecting Local Echo generates double characters. Most host computers echo keystrokes.

Incoming data writes over the last character on the first line.

Select the Auto Wrap to Next Line option.

Lines of incoming data are double-spaced.

Deselect the New Line on a Return option.

The cursor is not visible on the screen.

The cursor may have been scrolled out of the visible screen. Click the active scroll bar, or resize the window, to scroll the cursor back into the visible screen. You can also type a character to bring the cursor into view.

The terminal is displaying unexpected characters (for example, graphics characters or accented characters).

Check the setting on the character set screen; make sure the active character set is G0 and that US ASCII is designated as the G0 character set. You may also see unexpected characters when you are communicating over a noisy phone line.

Memory requirements

The number of MacTerminal session documents you can have open at once depends on the amount of memory required by the communications tools used with the open session documents. If you are having trouble opening as many session documents as you want, it may be helpful to look at the amount of memory required for the tools you are using. The VT102 Tool requires approximately 70K–95K (kilobytes) of space in memory (depending on the functions that the tool is performing and the number of open session documents that are using it). To check the memory requirements for the other tools you are using, turn to the "Troubleshooting Hints" sections in the modules for those tools.

If you are using MultiFinder®, you can choose About the Finder™ from the File menu to check how much memory is available to MacTerminal. If there isn't enough memory available, you can increase the partition size allocated for the MacTerminal application (use the Get Info command in the File menu).

VT320™ Terminal Emulation Tool

Apple Computer, Inc.

The Apple Publishing System

VT320 Terminal Emulation Tool was written, edited, and composed on a desktop publishing system using Apple® Macintosh® computers, an AppleTalk® network system, and Microsoft® Word. Proof pages were created on the Apple LaserWriter® printers; final pages were printed on a Linotronic® 300. Line art and chapter openers were created with Adobe Illustrator™. PostScript®, the LaserWriter page-description language, was developed by Adobe Systems Incorporated.

Text type and display type are Apple's corporate font, a condensed version of ITC Garamond®. Bullets are ITC Zapf Dingbats®.

Contents

The VT320™ terminal is an enhanced Digital Equipment Corporation text-only terminal that accommodates international environments through support of 8-bit character sets. The VT320 Terminal Emulation Tool lets you set general, screen, keyboard, and character set attributes for your Apple® Macintosh® computer so that it can perform like a VT320 terminal. The VT320 Tool follows the Digital VT320 model very closely, with the following exceptions:

■ The default screen on the Macintosh is dark text on a light background. (On the VT320, the default screen is light text on a dark background.)

■ The VT320 Tool ignores printing sequences that would control a locally attached printer.

■ The VT320 Tool ignores escape sequences used by VT320 terminals for testing, controlling local printing, and controlling screen alignment.

■ The VT320 Tool displays downloadable fonts in 9 or 12 point size only.

◆ **Installation note** It is recommended that, in addition to installing the VT320 Tool (see the *Installation* part of the *Network Services User's Guide* for instructions), you also install the VT320 Font into your System file. You need this font for performing background printing to a LaserWriter® printer, printing to an ImageWriter® printer, or copying portions of your MacTerminal® session document to another application. Use the Font/DA Mover to install the VT320 Font included on the PATHWORKS™ V1.0 volume (if you need help using the Font/DA Mover, refer to the manuals that accompanied your Macintosh). ◆

VT320 terminal settings

You choose the Terminal command from the Settings menu (shown below) to access a dialog box that lets you set the terminal emulation attributes for your Macintosh.

```
  File   Edit  Settings  Session   Windows
              Connection...
              Terminal...         ▶
              File Transfer...
              ─────────────────
              Folder for Received Files...
              Saved Lines...
              Paste Options...
              Connect on Open
```
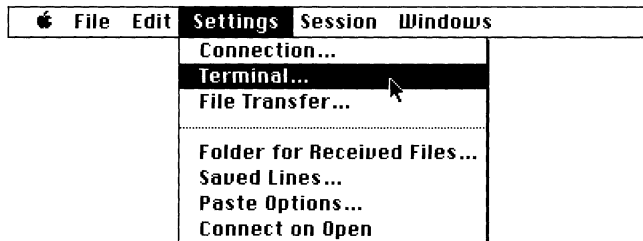
To set the attributes for VT320 emulation, you choose VT320 Tool from the Emulation pop-up menu in the Terminal Settings dialog box. A list of setup icons and a group of setup options appear. The setup options that appear within the dialog box vary depending on which of the four setup icons (General, Screen, Keyboard, or Character Set) is selected. When you first select VT320 Tool from the pop-up menu, the General icon is selected and the options that fall into the General category are displayed, as shown below.

```
┌──────────────────────────────────────────────────────────┐
│  Terminal Settings                          ( ═ OK ═ )    │
│     Emulation: [ UT320 Tool]                ( Cancel )    │
│  ────────────────────────────────────────────────────     │
│  ┌──────┐  Terminal Mode: [ VT300 (7-bit) ]  Terminal ID: [ VT320 ID ]│
│  │      │                                                  │
│  │General│   ▢◀  ▢   ☒ On Line    Text Cursor             │
│  │      │        ▢   ▢ Local Echo    ○ Block              │
│  │      │                            ● Underline           │
│  │Screen│  ┌───────────┐  ▢ Show Status Bar  Lock Changes to│
│  │      │  │           │  ▢ Show Tab Ruler   ▢ User Features│
│  │Keyboard│ Answerback Message [      ]      ▢ Defined Keys │
│  └──────┘                                                  │
└──────────────────────────────────────────────────────────┘
```
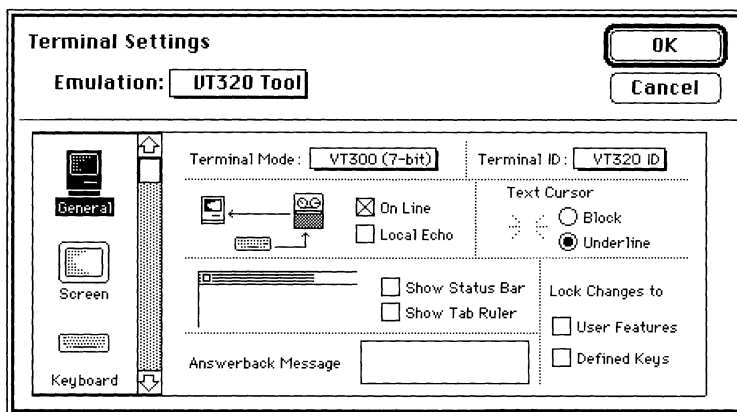
For each option, the most commonly used setting is preset as the default. You may need to change the settings for some options depending on the type of connection you're using, the type of information being transmitted, or the communication requirements of the remote computer. If so, you should refer to the documentation for the remote computer or contact your system administrator for information on how the various options should be set for the communications session you are establishing.

◆ **Note** During a communications session, you may notice that some settings change based on communication from the host. This happens because the VT320 responds to special character sequences that the remote computer sends. If for some reason the host leaves your terminal in an undesired state, you can restore the last saved settings by choosing Reset Terminal from the Session menu. ◆

The following sections describe the setup options available with each of the four VT320 setup icons (General, Screen, Keyboard, and Character Set). Within each of these four sections, the individual options are described in the order they appear in the dialog box (reading from top to bottom and from left to right).

General setup options

When you select the General icon in the VT320 Settings dialog box, the setup options shown below are displayed.
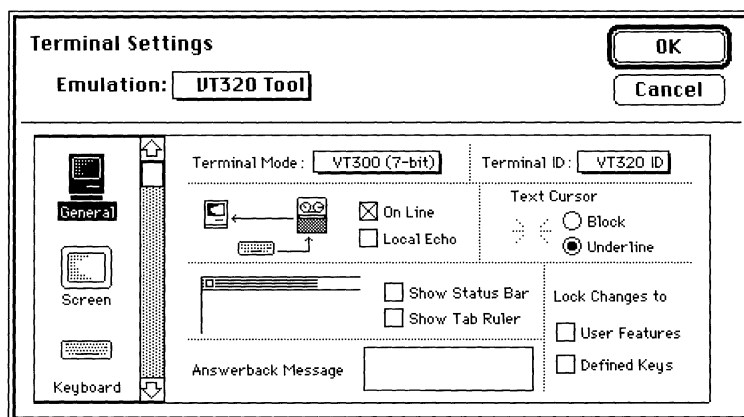
Terminal Mode

You use this pop-up menu to specify which VT320 mode your Macintosh should be in. The default setting for the terminal mode option is VT300™ (7-bit).

| VT300 (7-bit) | The terminal can use all VT320 features. It supports 8-bit graphic display characters and 7-bit control characters. Use this setting for all VT220™ applications. |

| VT300 (8-bit) | The terminal uses all VT320 features available in an 8-bit environment with 8-bit control characters. Use this setting for VT320 applications that support 8-bit control characters. Although this mode offers the most efficiency, it is not supported by some applications. |

| ANSI/VT100 | The terminal can run applications that require VT100™ or VT102™ compatibility. |

| VT52 | The terminal can run applications designed for VT52™ terminals. When this mode is chosen, the Character Set Settings dialog box is disabled because VT52 terminals do not support character set options. |

Terminal ID

You use this pop-up menu to select the terminal ID. Some host applications require a terminal ID in order to identify specific attributes of the terminal. This menu lets you choose between the following terminal IDs:

- VT320
- VT100
- VT101™
- VT102
- VT220

The default setting for the Terminal ID option is VT320 ID. Check with your system administrator if you're not sure which Terminal ID setting to use.

On Line

The settings for this option determine whether your Macintosh is on line or off line. The default setting for the On Line option is checked.

☒ On Line

When this option is checked, your Macintosh is *on line*, meaning it is able to communicate with another computer. In this case, as long as you have an established connection to another computer, the characters you type are sent to the remote computer, and incoming data from the remote computer is displayed on your Macintosh screen.

When your Macintosh is on line, you may need to select the Local Echo option to cause characters to be sent to your Macintosh screen as they are sent to the remote computer. The Local Echo option is available only when the On Line option is checked.

☐ On Line

When this option is unchecked, your Macintosh stops sending data to the remote computer and ignores incoming data without terminating the connection (a condition called *off line*).

Click the On Line option to resume communication with the remote computer.

When you are working off line, the characters you type are automatically displayed on the Macintosh screen. Therefore, the Local Echo option is dimmed and unavailable when the On Line option is unchecked.

Local Echo

This option is available only when the On Line option is checked. The settings for the Local Echo option determine whether characters you type on the keyboard or numeric keypad (or select from the Keys menu) are sent to your Macintosh screen (as well as to the remote computer with which your Macintosh is communicating). Since most host systems echo keystrokes, the default setting for Local Echo is unchecked.

☐ Local Echo   When this option is unchecked, as you press keys, characters are sent only to the remote computer, not to your Macintosh screen. The characters that appear on your screen are sent by the remote computer.

☒ Local Echo   When this option is checked, as you press keys, characters are sent to your Macintosh screen as well as to the remote computer. Select this option when your Macintosh is communicating with a host that does not echo keystrokes.

Show Status Bar

The settings for this option determine whether a status bar (similar to the status lights on a VT320 terminal) appears at the top of the VT320 terminal emulation screen (above any tab ruler). An example of the status bar is shown below. The default setting for Show Status Bar is unchecked; no status bar appears.

Shows whether
On Line and Local Echo
are off or on

Shows whether the
keyboard is locked

When the light next to a label is on, the option is checked. Clicking these labels does not change their state. You can change the settings of the On Line and Local Echo options in the Terminal Settings dialog box. The remote computer turns on Kbd Locked

(keyboard is locked) when it can't accept input, usually because it already has as much data as it can handle. The remote computer will turn Kbd Locked off when it can accept more input.
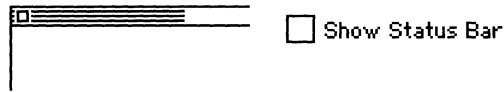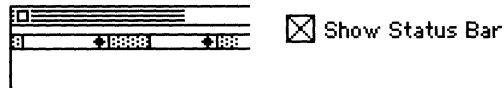
☐ Show Status Bar

When this option is unchecked, no status bar is displayed.

☒ Show Status Bar

When this option is checked, the status bar is displayed.

Show Tab Ruler

The settings for this option determine whether a tab ruler appears at the top of the VT320 terminal screen. The tab ruler appears below the status bar (if the status bar is also being displayed). An example of the tab ruler is shown below. The default setting for Show Tab Ruler is unchecked; no tab ruler appears.

Set new tabs   Clear all tabs   Reset default tabs

Host Connection

10   20   30   40   50   60   70   80

☐ Show Tab Ruler

When this option is unchecked, the tab ruler is not displayed.

☒ Show Tab Ruler
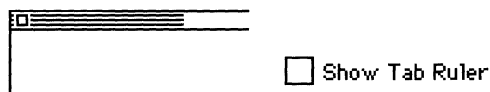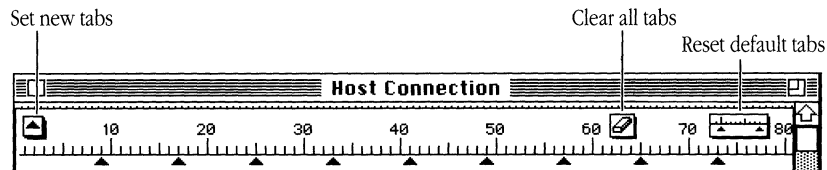
When this option is checked, the tab ruler is displayed.

You can set or clear tabs using the Tab Ruler. By default, tabs are set every 8 spaces (for compatibility with typical VT320 terminal screens). You can set new tabs by dragging the tab markers from the new-tabs icon on the left side of the ruler. To move existing tabs, click the tab to select it, and then drag it where you want it to go. The buttons on the right side of the ruler clear all set tabs and reset the default tabs to every 8 spaces. You can also clear a tab by selecting it and then dragging it below the ruler.

Answerback Message

This option lets you enter the character string that is returned to the remote computer when an enquire character is detected in the incoming data stream. The answerback string provides an identification response to the remote computer. You do not need to provide an answerback string unless the remote computer specifies it. Most public information services don't require an answerback string. However, you may need to send an answerback message when you're communicating with certain types of private computer systems. The system administrator for the remote system can tell you if an answerback string is required.

The answerback string can contain 1–30 characters. Some answerback messages require that you type a control character to generate the appropriate answerback message; for example, typing Control-M to generate the carriage return character (ℝ) in the answerback message area.

When communicating with another computer system, the VT320 Tool sends the answerback string you've specified when the other computer requests it. Or, you can manually control transmission of the answerback string, using the following methods:

- Control-Enter sends the answerback string. Hold down the Control key on an ADB keyboard or the ⌘ (Command) key on a Macintosh Plus keyboard and press Enter. The VT320 Tool sends the answerback string, which is equivalent to pressing the Control-Break on a VT320 terminal.

- Control-E asks for the answerback string. Hold down the Control key on an ADB keyboard or the ⌘ key on a Macintosh Plus keyboard and press E. The computer at the other end automatically sends its answerback message if it is configured to do so.

Text Cursor

The settings for this option determine whether the cursor is a solid block or an underline, depending on the button chosen. The Underline is the default setting for the Text Cursor option.

○ Block ⦿ Underline	▤☐▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨ **Unti** The cursor looks like this: _
⦿ Block ○ Underline	▤☐▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨ **Unti** The cursor looks like this: ▊
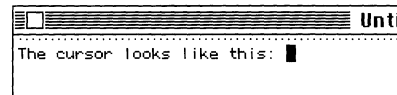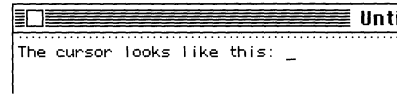
Lock Changes to

The two options in this group let you specify whether the host system can control certain emulation settings.

User Features The settings for this option determine whether the host system can make changes to the settings for the following features: Auto Repeat, Keyboard Lock, Inverse Video, Smooth Scroll, and Tab stops. The default setting for this option is unchecked.

☐   When this option is unchecked, the host can change the settings for these features.

☒   When this option is checked, the host cannot alter the settings for these features.

Defined Keys The settings for this option determine whether the host system can change user-defined key definitions. (With the VT320 Tool, the user can define the functions of certain function keys by using programming sequences.) The default setting for this option is unchecked.

☐   When this option is unchecked, the host can redefine the user-defined keys.

☒   When this option is checked, the host cannot redefine the user-defined keys.

Screen setup options

When you select the Screen icon in the VT320 Settings dialog box, the setup options shown below are displayed.

Option preview area
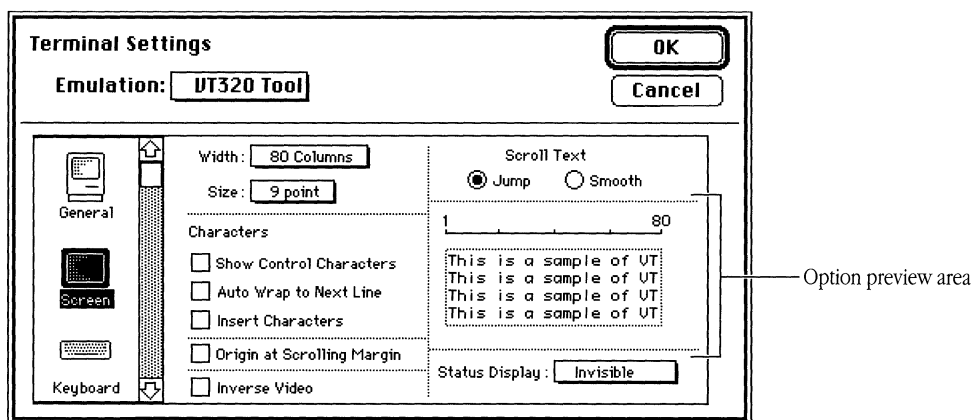
Option preview area

The option preview area provides information about the settings you choose. When you change the settings in the Width, Size, Show Control Characters, Auto Wrap to Next Line, Scroll Text, or Inverse Video options, you'll notice corresponding changes in the option preview area. Refer to the explanation of the individual options for information on how the area changes when you change the settings for specific options.

Width

This pop-up menu lets you set the number of display columns for VT320 emulation. Two widths are supported: 80 columns per line and 132 columns per line. When you change the setting for the Width option, the scale in the option preview area of the dialog box changes accordingly. The default width is 80 columns per line.

| 80 Columns | 1 _____ 80 |

| 132 Columns | 1 _____ 132 |

△ **Important** When the Width option is changed, the terminal region in your session document is cleared and the cursor is returned to the top left of the screen. To save the data in the terminal region, before changing the width, be sure that the Save Screen Before Clearing option is selected in the dialog box for the Saved Lines command in the Settings menu and that the Save Lines Off Top command in the Session menu is checked. △

Size

This pop-up menu lets you set the font size of the characters that appear on the screen during VT320 emulation. Two sizes are supported: 9 point and 12 point. When you change the setting for the Size option, the sample in the option preview area of the dialog box changes accordingly. The default size is 9 point.

| 9 point | This is a sample of VT
This is a sample of VT
This is a sample of VT
This is a sample of VT |

| 12 point | This is a sample o
This is a sample o
This is a sample o |
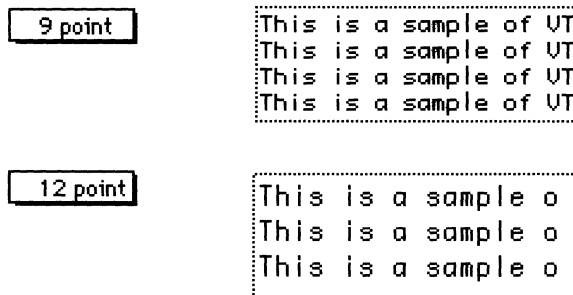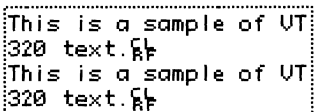
Characters

The options in this group let you specify certain attributes of how characters are handled while your Macintosh is emulating a VT320 terminal.

Show Control Characters The settings for this option determine whether control characters are displayed as readable characters. The default setting for this option is unchecked. The chances are that you will never change this option. Sometimes mainframe application programmers use it to help them debug code.

☐   This is a sample of VT
320 text
This is a sample of VT
320 text

When this option is unchecked, control characters have their normal effect. For example, when a line feed is encountered, the cursor moves to the following line.

☒   This is a sample of VT
320 text.ₐᵣ
This is a sample of VT
320 text.ₐᵣ

When this option is checked, control characters are displayed on the screen as they are encountered in the incoming data stream (and, when the Local Echo option is also checked, as they are entered from the keyboard). In addition, the control characters have their normal effect. For example, when a carriage return character is encountered, the ℟ symbol appears on the screen and the cursor moves to the beginning of the line.

   Selecting this option also causes characters that otherwise would have extended beyond the right margin to wrap to a new line. Therefore, when you select this option, the Auto Wrap to Next Line option becomes dimmed.

Auto Wrap to Next Line The settings for this option determine whether characters that extend beyond the right margin wrap to the beginning of the next line. When you change the settings for this option, the sample in the option preview area of the dialog box changes accordingly. The default setting for this option is unchecked. This option becomes dimmed when the Show Control Characters option is checked.

☐ `This is a sample of VT`
`This is a sample of VT`
`This is a sample of VT`
`This is a sample of VT`

When this option is unchecked, the cursor stops when it reaches the last column of a row. Incoming characters write over the last character on the line until a carriage return character occurs in the incoming data stream.

☒ `This is a sample of VT`
`320 text`
`This is a sample of VT`
`320 text`

When this option is checked, the cursor moves to the first column of the next line when it reaches the last column of a row.

Insert Characters The settings for this option determine whether characters are inserted between existing text or written over existing text. The default setting for this option is unchecked (under most circumstances, you should not change this setting).

☐ When this option is unchecked, characters are inserted at the cursor location, writing over any existing text. The cursor moves to the right as new characters are inserted.

☒ When this option is checked, characters are inserted at the cursor location, pushing any existing text to the right. The cursor moves to the right as new characters are inserted. Characters moving past the right margin are lost.
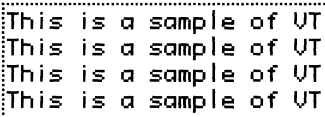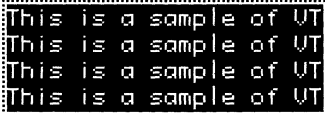
Origin at Scrolling Margin

The settings for this option determine whether the cursor can move outside of the scrolling region (the area between the top and bottom margins). In addition, this option determines whether screen addressing is in absolute or relative coordinates. Usually, the remote computer determines the appropriate setting for this option. The chances are that you will never change this option. Sometimes mainframe application programmers use this option to help them debug code. The default setting for this option is unchecked.

☐   When this option is unchecked, the cursor can be positioned beyond the boundaries of the scrolling region. In this case, screen addressing is based on absolute coordinates, where line 1, column 1, is in the top-left corner of the screen, rather than within the scrolling region.

☒   When this option is checked, the cursor cannot be positioned beyond the boundaries of the scrolling region. In this case, screen addressing is based on relative coordinates, where line 1, column 1, is in the top-left corner of the scrolling region.

Inverse Video

The settings for this option determine whether the Macintosh displays white text on a black background or black text on a white background. Normally, the Macintosh displays black text on a white background. When you activate Inverse Video, white text appears on a black background. When you change the setting for this option, the background and text in the option preview area of the dialog box change accordingly. The default setting for this option is unchecked.

☐
```
This is a sample of VT
This is a sample of VT
This is a sample of VT
This is a sample of VT
```

☒
```
This is a sample of VT
This is a sample of VT
This is a sample of VT
This is a sample of VT
```

Scroll Text

When the remote computer is sending data into the terminal region, but the region is already filled with data, the VT320 Tool automatically scrolls the data in the terminal region. The Scroll Text option lets you specify how the data scrolls. Smooth scrolling usually slows down the rate at which the incoming data is displayed, but makes it easier to read rapidly scrolling lines. When you change these settings, the sample text in the option preview area scrolls accordingly to demonstrate the effects of the change you are making. The default setting for Scroll Text is Jump.

⦿ Jump

Scrolling is said to *jump* because data is displayed one line at a time. When you select this option, the text in the option preview area demonstrates how incoming text is displayed.

⦿ Smooth

Scrolling takes place smoothly because data is displayed one pixel at a time. When you select this option, the text in the option preview area scrolls smoothly out of the area, demonstrating how incoming text is displayed. When you select the smooth scroll option, you should probably also select the XON/XOFF handshaking option (or another handshaking option) with your connection tool in order to control the flow of data to your Macintosh.

Status Display

The Status Display pop-up menu controls the appearance and content of the status line. When visible, the status line appears in inverse video on line 25, the bottom line of the terminal region in the session document. The default is to make the status display invisible.

| Invisible | A status line does not appear.

| Visible | A status line showing the row and column position of the cursor appears at the bottom of the terminal region.

| Host Writable | The status line displays a message from the host computer, if the host has a message to display.

Keyboard setup options

When you select the Keyboard icon in the VT320 Settings dialog box, the setup options shown below are displayed.

Numeric Keypad Generates

The settings for this option determine whether the keys on the keypad generate numeric characters or escape sequences, depending on the button selected. The default setting for this option is Numeric Sequences.

 ⦿ ANSI Numeric Sequences

The keys on the keypad generate characters that match the typical numeric, comma, period, and minus sign keys on the VT320-type keyboard (in accordance with ANSI specifications).

◉ Application Sequences

The keys on the keypad generate special escape sequences (specified by Digital).

Cursor Keys Generate

The settings for this option determine the characters transmitted when the Cursor (arrow) keys are pressed. The default setting for this option is ANSI Cursor Sequences, which you will not need to change under most circumstances. Usually, the remote computer sets the option appropriately.

◉ ANSI Cursor Sequences

When Cursor keys are pressed, ANSI cursor-control sequences are transmitted to the remote computer.

◉ Application Sequences

When Cursor keys are pressed, cursor-control functions (specified by Digital) are transmitted to the remote computer.

If pressing Cursor keys or choosing them from the Keys menu generates unexpected characters in your terminal emulation window but does not move the cursor, the application on the remote computer may not accept input from Cursor keys. (This can also happen if the Cursor key setting does not match what the remote application expects.)

Swap Backspace and Delete

The settings for this option determine which character is sent when the Backspace key (on Macintosh Plus keyboards) or the Delete key (on Apple Desktop Bus™ [ADB] keyboards) is pressed. The default setting for this option is checked.

☒   *On ADB keyboards:*

- Pressing the Delete key sends a delete character (ASCII 127).
- Pressing the Delete key while holding down the Option key sends a backspace character (ASCII 08).

On Macintosh Plus keyboards:

- Pressing the Backspace key sends a delete character (ASCII 127).
- Pressing the Backspace key while holding down the Option key sends a backspace character (ASCII 08).

☐   *On ADB keyboards:*

- Pressing the Delete key sends a backspace character (ASCII 08).
- Pressing the Delete key while holding down the Option key sends a delete character (ASCII 127).

On Macintosh Plus keyboards:

- Pressing the Backspace key sends a backspace character (ASCII 08).
- Pressing the Backspace key while holding down the Option key sends a delete character (ASCII 127).

Holding Down Keys Will

The options under this heading control key repetition.

Auto Repeat Keys The settings for this option determine whether the Tab, Return, Backspace, Enter, Escape, and noncontrol keys repeat when held down. The default setting for Auto Repeat Keys is checked.

☒   When this option is checked, a key repeats when you hold it down.

☐   When this option is unchecked, a key doesn't repeat when you hold it down.

You can use the keyboard control panel device (which is accessed through the Macintosh Control Panel item on the Apple menu) to specify the key repeat rate and the delay time before a key begins to repeat.

◆ **Note** To cause characters generated with Control key combinations (for example, the bell character and the line-feed character) to repeat, the Repeat Control Keys option must be selected. ◆

Repeat Control Keys The settings for this option determine whether keys used to generate control characters repeat when held down. Control characters are generated by simultaneously pressing both the Control key and another key on an ADB keyboard. On a Macintosh Plus keyboard, you can generate control characters by pressing both the ⌘ key and another key. The default setting for Repeat Control Keys is unchecked.

☐   When this option is unchecked, the keys used to generate control characters don't repeat when you hold them down.

☒   When this option is checked, keys used to generate control characters repeat when you hold them down.

You can use the keyboard control panel device (which is accessed through the Macintosh Control Panel item on the Apple menu) to specify the key repeat rate and the delay time before a key begins to repeat.

◆ **Note** To cause Tab, Backspace, Enter, Escape, Return, and noncontrol keys to repeat, the Auto Repeat Keys option must be selected. ◆

Keyclick Sound

The settings for this option determine whether an audible clicking sound is made when a key is pressed. You can change the volume level from the General or Sound Control Panel device available from the Macintosh Control Panel item in the Apple menu. The default setting for Keyclick is unchecked.

◁

☐ Keyclick Sound

When this option is unchecked, clicks are not sounded when keys are pressed.

◁))

☒ Keyclick Sound

When this option is checked, a click is sounded each time you press a key. (If the keyboard is locked, you will hear a beep instead of a keyclick.)

New Line on a Return

The settings for this option determine whether line-feed characters in incoming data are interpreted as carriage return/line-feed pairs or as line feeds. In addition, this option determines what characters are sent when you press the Return key. The default setting for this option is unchecked.

☐

When this option is unchecked, a line feed is interpreted as only a line feed (not as a carriage return/line-feed pair). When a line-feed character is received from the remote computer, the cursor moves down one line, but stays in the same column, rather than moving to the beginning of the next line.

Pressing the Return key sends a carriage return character.

☒

When this option is checked, line feed is interpreted as a carriage return/line-feed pair. When a line-feed character is received from the remote computer, the cursor moves to the first position on the next line. Use this option when incoming data does not move down to the beginning of the next line.

Pressing the Return key sends both a carriage return character and a line-feed character.

Character Set setup options

When you select the Character Set icon in the VT320 Settings dialog box, you have access to pop-up menus that allow you to specify the character sets for display on your Macintosh screen. A character set is equivalent to a Macintosh font; it is a collection of characters that can be shown on a screen or used to code computer instructions. US ASCII and French are examples of character sets.

◆ **Note** If you select VT52 mode in the General Settings dialog box, the options in this dialog box are dimmed because they do not apply to a VT52 terminal type. ◆

```
┌─────────────────────────────────────────────────────────────┐
│  Terminal Settings                          (    OK    )     │
│      Emulation:[ VT320 Tool]                ( Cancel )       │
│  ┌───────────────────────────────────────────────────────┐  │
│  │  ┌──┐↑                                                 │  │
│  │  │▢▢│   ▨▨▨   National Replacement Set:[ US ASCII ]    │  │
│  │  └──┘                                                  │  │
│  │  Screen  Active Character Sets                         │  │
│  │  ┌──┐    ◉  —   G0:[ US ASCII ]                        │  │
│  │  │░░│                              User Preferred Set   │  │
│  │  Keyboard ○  ○  G1:[ US ASCII ]                        │  │
│  │           ○  ◉  G2:[ User Preferred ] ◉ DEC Supplemental│ │
│  │  ┌──┐                                 ○ ISO Latin      │  │
│  │  │△│    ○  ○  G3:[ User Preferred ]                   │  │
│  │ Character Set↓                                         │  │
│  └───────────────────────────────────────────────────────┘  │
└─────────────────────────────────────────────────────────────┘
```
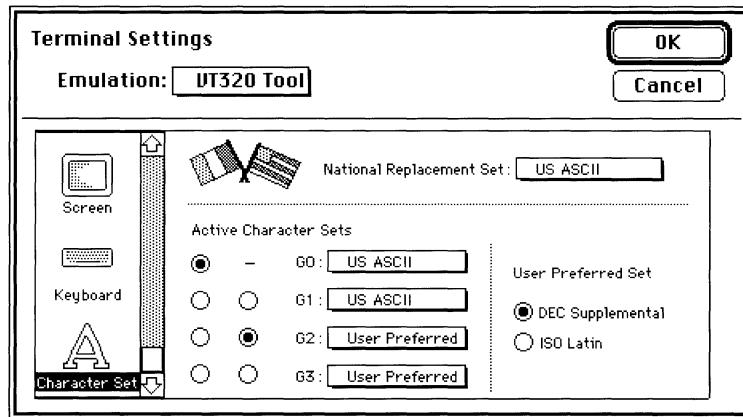
The VT320 Tool supports 17 different character sets (each of which contains 128 characters). The VT320 Tool is preset to use the US ASCII and DEC™ Supplemental character sets. In almost every circumstance, you won't need to change anything in this dialog box because host applications take care of setting these options. Usually, the host resets the options to your original settings. However, in the rare case that a host application changes a character set setting, but doesn't change it back, you will need to reset the setting yourself. In addition, you may want to change the character set options, if, for example, you need a Graphics character set to generate on-screen graphics or a foreign character set to communicate with a multilingual host computer.

You use the National Replacement Set menu to select a different international character set. You use the G0–G3 menus to specify the choices for the active character sets, the ones currently used to display characters on the screen. At any given time, two character sets may be active: a GL set and a GR set. The button under the User Preferred option lets you specify the supplemental character set that you use most often.

The following is a summary of the character sets available on the VT320 character set menus:

US ASCII
The standard set of letters, numbers, and symbols used in North American English computers. When you specify US ASCII as the active GL set character set, the characters generated by Macintosh key combinations that include the Option key are available.

Graphics
The set of graphics characters used to create line drawings on a VT320 terminal.

International
UK ASCII—the same as US ASCII but with the pound sterling symbol (£) instead of the number sign (#). Dutch, Finnish, French, French Canadian, German, Italian, Norwegian/Danish, Portuguese, Spanish, Swedish, and Swiss are various character sets with accented characters. Only one international character set at a time can be designated as active.

ISO Latin
ISO Latin-1—a multinational character set. Generally, this character set should be assigned as the GR set option, rather than the GL set option.

DEC Supplemental
DEC supplemental graphics character set. Generally, this character set should be assigned as the GR set option, rather than the GL set option.

User Preferred   A supplemental character set designated as a special standby set. You use the button under User Preferred Set to designate either DEC Supplemental or ISO Latin as this special standby set.

Soft   A character set required by the host application, which the host supplies to the Macintosh. The Macintosh stores this character set as *soft* and uses it when needed by the host application.

◆ **Note** See the *VT320 Programmer Reference Manual* for additional details on these character sets. You can obtain this guide directly from Digital Equipment Corporation by dialing 800-344-4825. ◆

Active Character Sets

At any one time, a VT320 terminal maintains four potentially active character sets, identified in the G0-G3 menus. All the menus contain the same list of character sets, as shown below. When an international character set is specified with the National Replacement Set menu, the dimmed international item is replaced with the chosen character set.
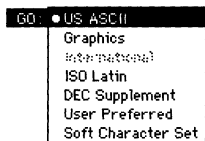
US ASCII is the default for the G0 and G1 menus; the User Preferred character set (either DEC Supplemental or ISO Latin) is the default for the G2 and G3 menus.

Of the four potentially active character sets, the VT320 Tool can display only two sets at a time; these are called GL and GR. The GL set contains characters with ASCII values from 0–127; the GR set contains characters with ASCII values from 128–255. GL and GR enable the VT320 terminal to display the characters and shapes the host sends to it. However, there are times when the host requires the terminal to display something that is in neither GL nor GR, so it switches GL or GR to one of the other potentially active character sets.

In the Character Set Settings dialog box, there are two columns of buttons under the heading Active Character Sets. Of the four potentially active character sets, those with a highlighted button next to them are active.

Active Character Sets

⦿	–	G0: [US ASCII]
○	○	G1: [US ASCII]
○	⦿	G2: [User Preferred]
○	○	G3: [User Preferred]
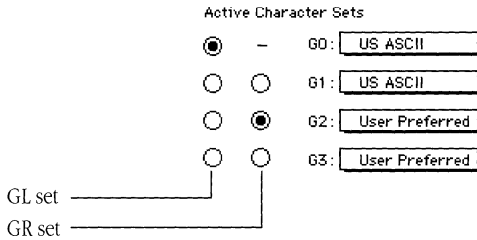
GL set ————————┘ │
GR set ——————————┘

The column of buttons on the left denotes which of the active character sets, G0-G3, is being used for GL. The column on the right is for GR. The default GL set is US ASCII and the default GR set is the User Preferred set (which is preset to the DEC™ Supplemental character set but can be changed to ISO Latin). You can use the buttons to change GL and GR. Use the pop-up menus to change to another character set.

The character set specified in the G0 menu may be mapped only to GL (so no button appears in the right-hand column next to this menu); the character sets from the other menus may be mapped to either GL or GR. However, the DEC Supplemental character set and the ISO Latin character set are usually assigned as the GR set; if you assign either of these character sets as the GL set, they take on unexpected values.

National Replacement Set

Click the National Replacement set pop-up menu to select a national replacement set.

National Replacement Set:
● US ASCII
  Dutch
  Finnish
  French
  French Canadian
  German
  Italian
  Norwegian/Danish
  Portuguese
  Spanish
  Swedish
  Swiss
  UK ASCII
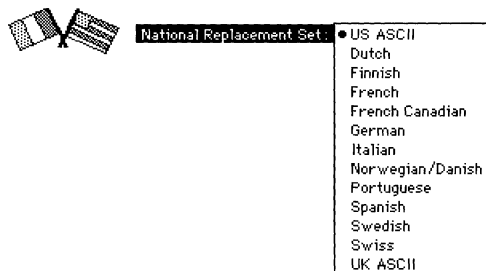
When you specify anything other than US ASCII, the value you specify becomes available when you pop up any of the G0-G3 menus. For instance, when you select French as the National Replacement set, French also appears when you pop up the G0 menu.
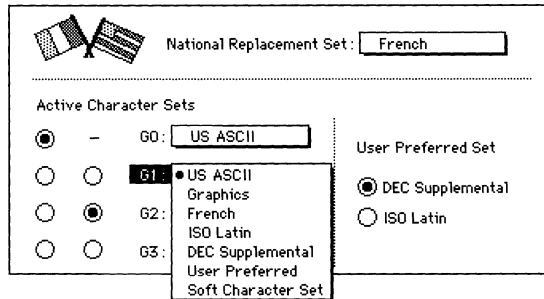
User Preferred Set

This option lets you designate the supplemental character set you use most often (either DEC Supplemental or ISO Latin) as a special standby set. Designating a User Preferred supplemental set provides applications with an easy way to access the supplemental set. The host does not have to confirm that you are using either the DEC Supplemental character set or the ISO Latin character set; it just sends the characters and lets the terminal determine which set to use for receiving the characters. DEC Supplemental is the default User Preferred character set.

⦿ DEC Supplemental   The DEC Supplemental character set is the User Preferred character set.

⦿ ISO Latin   ISO Latin-1 is the User Preferred character set.

Resetting the VT320 Tool

The VT320 Tool can be reset in two ways. Occasionally, the remote computer you are connected to will reset one or more settings. The other way is by choosing the Reset Terminal command from the Session menu.

Choosing this command resets all the setup options for the VT320 Tool (that is, all the options you can set in the Terminal Settings dialog box) to the last saved settings. In addition, when you reset the VT320 Tool, all the data in the terminal region of your session document window is cleared (if the Save Lines Off Top command is checked, the cleared data will be saved in the scrollback cache).

VT320 keys emulation

Some keys on VT320 keyboards do not exist on Macintosh keyboards; the VT320 Tool enables the Macintosh to emulate the keys. In some cases, the VT320 Tool maps the VT320 keys to certain key combinations on the Macintosh keyboards. In other cases, you can choose from a Keys menu. Frequently, you can emulate the VT320 keys either by using the Keys menu or with key combinations.

The Keys menu

	File	Edit	Settings	Session	Windows	Keys
						Keypad ▶
						Editing Keys ▶
						Function Keys ▶
						Hold Screen
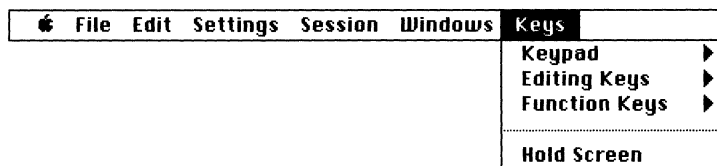
There are three submenus in the VT320 Tool Keys menu, and they are shown on the facing page.

**The numeric
keypad**
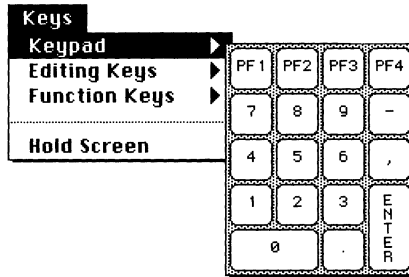
The Editing keys
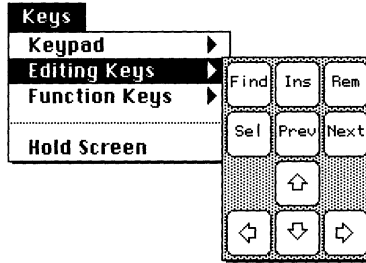
The Function keys
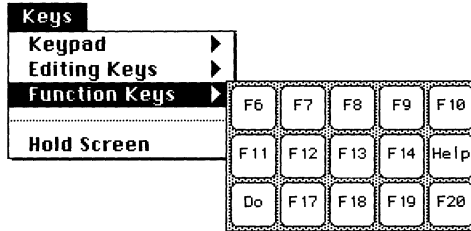
The user-defined function keys (U6–U20) appear when you hold down the Shift key and pop up the Function Keys menu.
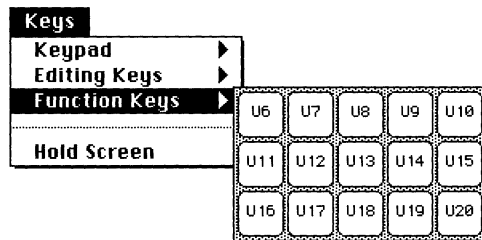
When you select a key cell from one of these menus, it produces the same result as when you press the corresponding physical key on the VT320 keyboard.

The fourth item on the Keys menu, Hold Screen, is available only when the connection tool being used for the session is set up to use XON/XOFF handshaking; otherwise, this item is dimmed and unavailable. The Hold Screen item lets you freeze the screen while data is coming in, so you can read the current contents of the screen before it scrolls off. Choose Hold Screen again to release the screen and continue displaying incoming data. (Equivalent control keys are Control-S for stop scrolling and and Control-Q for continue scrolling.) When the screen is held (that is, when the screen does not scroll), a check mark appears next to the Hold Screen item on the menu.

Keyboard mapping

The keys highlighted on the sample VT320 keyboard below do not have equivalent keys on all Macintosh keyboards and so have been mapped to the Keys menu, to keyboard combinations on the Macintosh keyboards, or to both. In some cases, keyboard equivalents are supplied by the MacTerminal File, Settings, or Session menus.
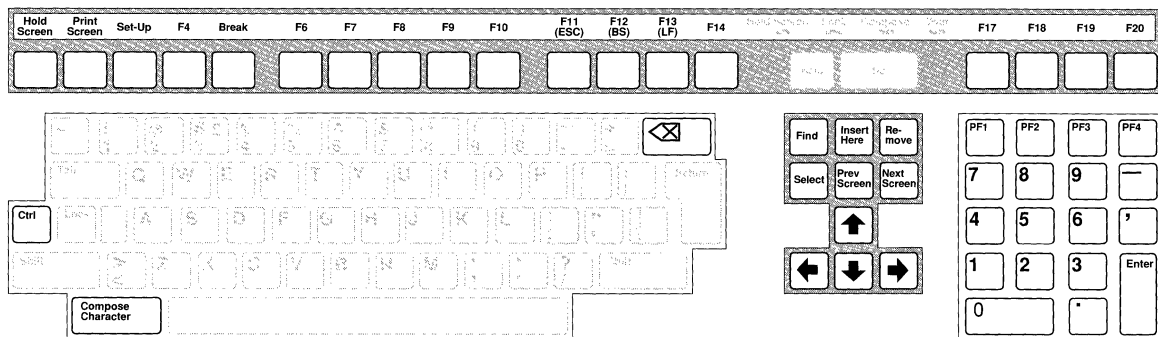
The following tables show you how to generate the missing VT320 keys. In addition, at the back of this binder, you'll find a Quick Reference Card for the commonly used keyboard equivalents.

In these tables, *Macintosh Plus keyboards* refers only to the keyboards that come with Macintosh Plus computers; *Apple ADB keyboards* refers to all Apple ADB Keyboards: Apple, Apple Extended, Apple Extended II, and Macintosh Portable (with a keypad). Since Function and Editing keys are available on ADB Extended keyboards, the Option-key combination equivalents for these keys (shown in these tables) are not provided for either of the ADB Extended keyboards.

The table below shows you how to generate VT320 keys that can be generated from your Macintosh keyboard, but not from the VT320 Keys menu.

To emulate these VT320 keys	On Macintosh Plus keyboards use	On Apple ADB keyboards use
Backspace	Option-Backspace	Option-Delete
Delete	Backspace	Delete
Short break (Break)	Option-Enter	Option-Enter
Long break (Shift-Break)	Shift-Enter or Session menu	Shift-Enter or Session menu
Answerback (Control-Break)	⌘-Enter	Control-Enter
Control	⌘	Control
Escape	Tilde/quotation mark (~/`)	Escape
Left single quotation mark, grave accent (`)	⌘–Tilde/quotation mark (~/`)	Tilde/quotation mark (~/`)
Tilde (~)	⌘–Shift–tilde/quotation mark (~/`)	Shift–tilde/quotation mark (~/`)
Compose character	Option-(key)	Option-(key)
Line Feed	⌘-J	Control-J
Print Screen	File menu	File menu
Set Up	Settings menu	Settings menu

The keys in the following table can be generated from the Keys menu as well as with the key combinations shown.

To emulate these VT102 keys	On Macintosh Plus keyboards, use the Keys menu or press	On Apple ADB keyboards, use the Keys menu or press
Hold Screen	⌘-Q/⌘-S	Control–Q/Control–S
Keypad	Keypad	Keypad
Cursor (arrow) keys	Cursor (arrow) keys	Cursor (arrow) keys
Find	Option–Keypad zero (0)	Option–Keypad zero (0)
Select	Option–Keypad period (.)	Option–Keypad period (.)
Insert	Option–Left Arrow	Option–Left Arrow
Remove	Option–Right Arrow	Option–Right Arrow
Previous Screen	Option–Up Arrow	Option–Up Arrow
Next Screen	Option–Down Arrow	Option–Down Arrow
F6	Option–Keypad clear	Option–Keypad clear
F7	Option–Keypad equals (=)	Option–Keypad equals (=)
F8	Option–Keypad slash (/)	Option–Keypad slash (/)
F9	Option–Keypad asterisk (*)	Option–Keypad asterisk (*)
F10	Option–Keypad 7	Option–Keypad 7
F11	Option–Keypad 8	Option–Keypad 8
F12	Option–Keypad 9	Option–Keypad 9
F13	Option–Keypad minus (-)	Option–Keypad minus (-)
F14	Option–Keypad 4	Option–Keypad 4
F15	Option–Keypad 5	Option–Keypad 5
F16	Option–Keypad 6	Option–Keypad 6
F17	Option–Keypad plus (+)	Option–Keypad plus (+)
F18	Option–Keypad 1	Option–Keypad 1
F19	Option–Keypad 2	Option–Keypad 2
F20	Option–Keypad 3	Option–Keypad 3
U6–U20*	Shift–Option–Keypad key	Shift–Option–Keypad key

*The key combinations for U6–U20 are identical to the key combinations for F6–F20, respectively, except you also press the Shift key. You can also generate U6–U20 by holding down the Shift key while using the Function Keys menu; or, if you are using an Apple Extended ADB keyboard, by holding down the Shift key while pressing the appropriate Function key.

The following table shows you how to generate additional keys that are available when you are using the ISO Latin character set as your GR character set. See the section titled "Character Set Setup Options" earlier in this chapter for additional information about using this character set.

To emulate these VT320 keys	On Macintosh Plus keyboards press	On Apple ADB keyboards press
Broken vertical (¦)	Option-b	Option-b
Cedilla (¸)	Option-8	Option-8
Currency sign (¤)	Shift-Option-2	Shift-Option-2
Macron (‾)	Option-Dash (-)	Option-Dash (-)
Middle dot (·)	Shift-Option-9	Shift-Option-9
Multiplication sign (×)	Option-5	Option-5
One quarter (¼)	Option-x	Option-x
One half (½)	Option-v	Option-v
Three quarters (¾)	Option-j	Option-j
Superscript 1 (^{1})	Option-d	Option-d
Superscript 2 (^{2})	Option-w	Option-w
Superscript 3 (^{3})	Shift-Option-p	Shift-Option-p
Lowercase Icelandic eth (ð)	Shift-Option-4	Shift-Option-4
Uppercase Icelandic eth (Ð)	Shift-Option-3	Shift-Option-3
Lowercase Icelandic thorn (þ)	Shift-Option-5	Shift-Option-5
Uppercase Icelandic thorn (Þ)	Shift-Option-6	Shift-Option-6

The table below shows you how to generate additional keys that are available when you are using the DEC Supplemental character set as your GR character set. See the section titled "Character Set Setup Options" earlier in this module for additional information about using this character set.

To emulate these VT320 keys	On Macintosh Plus keyboards press	On Apple ADB keyboards press
Currency sign (✖)	Shift-Option-2	Shift-Option-2
Middle dot (·)	Shift-Option-9	Shift-Option-9
One quarter (¼)	Option-x	Option-x
One half (½)	Option-v	Option-v
Superscript 1 (^{1})	Option-d	Option-d
Superscript 2 (^{2})	Option-w	Option-w
Superscript 3 (^{3})	Shift-Option-p	Shift-Option-p

The subsections that follow provide additional details about how the VT320 Tool handles keyboard mapping.

Backspace/Delete keys

For information on how the VT320 Tool handles the Backspace and Delete keys, see "Keyboard Setup Options" earlier in this module.

Break key

On the VT320 keyboard, the Break key, alone and in combination with other keys, performs three different functions:

- Pressing the Break key alone generates a short break (.233 second), which interrupts the flow of data.

- Shift-Break generates a long break (3.5 seconds). With the VT320 Tool, a long break may also drop the connection to the host, depending on the connection tool you are using. For example, if you are using the Serial Connection Tool or the Apple Modem Connection Tool, the communications equipment (such as a PBX) between you and the host may drop the connection in response to a long break.

- Control-Break generates the answerback message.

Refer to the preceding table to determine which keys to press on your Macintosh keyboard in order to emulate these VT320 keys.

Compose Character key

The Compose Character key on the VT320 keyboard lets you generate characters that don't appear on the VT320 keyboard. On the VT320 keyboard, you press the Compose Character key and then a sequence of three other keys.

On Macintosh keyboards, you use Option–key combinations to generate characters that don't appear on the keyboard. If the character generated by the Option–key combination is not a valid VT320 character, it is ignored.

Control keys

On ADB keyboards, there is a Control key. On Macintosh Plus keyboards, the ⌘ key serves as the Control key (this means you can't use the ⌘ key for keyboard shortcuts).

Cursor keys

Cursor keys (arrows) exist on both Macintosh Plus keyboards and ADB keyboards. They are also emulated in the Keys menu.

Editing keys

There are three ways to emulate the functions provided by the editing keys on the VT320 keyboard. Regardless of the keyboard you have, the Keys menu provides selections that function identically to VT320 editing keys. You can also use the key combinations described in the previous table. A third way is available if you have an Extended ADB keyboard. You can use the Cursor keys and the six keys above them to function as VT320 editing keys, as shown below.
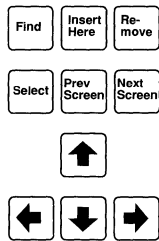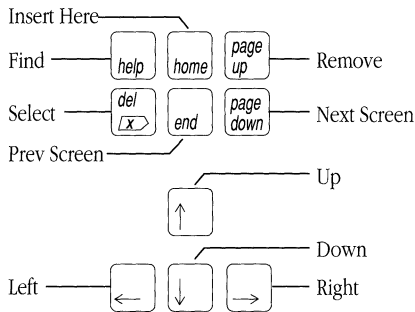
Escape key

On ADB keyboards, there is an Escape key. On Macintosh Plus keyboards, the top-left key, the tilde/quotation mark (~/`) key, is used for the Escape key. To generate a tilde (~) on the Macintosh Plus keyboard, use ⌘-Shift-tilde/quotation mark; to generate a left single quotation mark, grave accent (`), use ⌘-tilde/quotation mark.

Function keys

There are three ways to emulate the functions provided by the function keys on the VT320 keyboard. Regardless of the keyboard you have, the Keys menu provides selections that function identically to VT320 function keys. In addition, the Extended ADB keyboard contains Function keys that can be used to emulate the VT320 function keys. However, the Extended ADB keyboard contains Function keys F1 through F15, while the VT320 keyboard contains Function keys F6 through F20. The discrepancy is resolved by mapping Fx on the Extended ADB keyboard to F(x+5) on the VT320—for example, to generate a VT320 F6, use F1 on the Extended ADB keyboard.

You can also generate Function keys on Macintosh keyboards by using the Keypad keys in combination with the Option key as shown below.
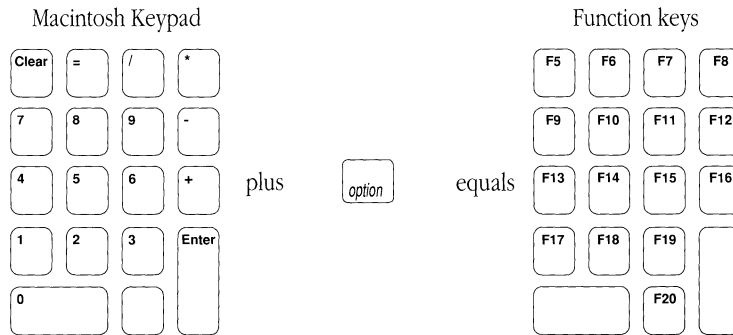
◆ **Note** To generate user-defined VT320 function keys, hold down the Shift key and the Option key, while pressing the appropriate keypad key. ◆

Keypad keys

The VT320 keypad physically maps one-to-one to the Macintosh keypad on the Macintosh Plus keyboards and ADB keyboards. In addition, the VT320 keypad keys are emulated in the Keys menu.

Print Screen key

To print the screen, use the Print command in the MacTerminal File menu.

Setup key

Instead of providing a keyboard equivalent to the VT320 Setup key, the VT320 Tool lets you use the Settings dialog boxes for setup operations.

Troubleshooting hints

Most problems you encounter while using the VT320 Tool are caused by mismatched communications parameters; the settings you chose are incompatible with the settings for the computer with which you are communicating. If data is not being sent and received correctly, compare the settings for the communications parameters; keep in mind that the problems could also be caused by mismatched settings for the connection tool or the file transfer tool being used for the session. Check with your system administrator to determine if your settings are correct.

Make sure the settings for the VT320 Tool setup options match the requirements of the remote computer. Here are some suggestions for how to correct some of the problems you could encounter when the setup options are not set correctly:

Nothing is sent or received.

Check that your connection is open by pulling down the Session menu. If your connection is open, the Open Connection menu item will be dimmed.

Also, make sure that the On Line option is checked.

If you are unable to send or receive data, you may also need to check the physical connections and/or the setup options for the connection tool being used for the session.

Nothing appears on the screen when you send data.

Select the Local Echo option. The remote computer may not be echoing the keys you are pressing.

The data you send appears as double characters.

Deselect the Local Echo option. The remote computer may echo the keys you press; therefore, selecting Local Echo generates double characters. Most host computers echo keystrokes.

Incoming data writes over the last character on the first line.

Select the Auto Wrap to Next Line option.

Lines of incoming data are double-spaced.

Deselect the New Line on a Return option.

Incoming data writes over the same line.

Select the New Line on a Return option.

The cursor is not visible on the screen.

The cursor may have been scrolled out of the visible screen. Click the active scroll bar, or resize the window, to scroll the cursor back into the visible screen. You can also type a character to bring the cursor into view.

The terminal is displaying unexpected characters (for example, graphics characters or accented characters).

Check the setting on the Character Set setup screen; make sure the active character set is G0 and that US ASCII is designated as the G0 character set.

The terminal is echoing unrecognizable characters.

The terminal may be in the wrong mode—check the setting for the Terminal Mode option in the General Settings dialog box. The VT320 mode should be selected in an 8-bit environment; the ANSI/VT100 mode should be selected in a 7-bit environment. You may also see unexpected characters when you are communicating over a noisy phone line.

Memory requirements

The number of MacTerminal session documents you can have open at once depends on the amount of memory required by the communications tools used with the open session documents. If you are having trouble opening as many session documents as you want, it may be helpful to look at the amount of memory required for the tools you are using. The VT320 Tool requires approximately 95K–120K (kilobytes) of space in memory (depending on the functions that the tool is performing and the number of open session documents that are using it). To check the memory requirements for the other tools you are using, turn to the "Troubleshooting Hints" sections in the modules for those tools.

　　If you are using MultiFinder®, you can choose About the Finder™ from the File menu to check how much memory is available to MacTerminal. If there isn't enough memory available, you can increase the partition size allocated for the MacTerminal application (use the Get Info command in the File menu).

This part of your binder contains reference modules describing the file transfer tools that accompany your MacTerminal® application. A file transfer tool lets you implement the protocol for sending data to and receiving data from a remote system, such as a mainframe computer or an information service. A file transfer protocol represents an agreement between two computers about how they will exchange data.

The modules in this section describe how to set up your Apple® Macintosh® computer to communicate using the following file transfer protocols included with MacTerminal:

Text   The simplest form of file transfer; it does not offer error-checking.

XMODEM   A file transfer method for sending and receiving files that includes error-checking and correction. Several variants are available with the XMODEM tool—MacBinary, MacTerminal 1.1, Straight XMODEM, and XMODEM Text.

You can also use MacTerminal with other file transfer tools that are designed to work with the Macintosh Communications Toolbox.

The discussions for each of the file transfer tools provide the following information:

- an overview of the file transfer protocol
- descriptions of the configuration options used to set up your Macintosh to transfer data using the file transfer protocol
- sample status boxes
- troubleshooting hints

Text File Transfer Tool

Apple Computer, Inc.

The Apple Publishing System

Text File Transfer Tool was written, edited, and composed on a desktop publishing system using Apple® Macintosh® computers, an AppleTalk® network system, and Microsoft® Word. Proof pages were created on the Apple LaserWriter® printers; final pages were printed on a Linotronic® 300. Line art and chapter openers were created with Adobe Illustrator™. PostScript®, the LaserWriter page-description language, was developed by Adobe Systems Incorporated.

Text type and display type are Apple's corporate font, a condensed version of ITC Garamond®. Bullets are ITC Zapf Dingbats®.

Contents

The Text File Transfer Tool is used for the simplest form of file transfer. It is used to send files that contain only text, a sequence of ASCII characters without any information about format or font. The Text Tool does not include an error-checking mechanism, so transmission errors won't be detected or corrected during file transfers.

Text file transfer serves as the lowest common denominator of file transfer protocols. Some application's documents are automatically saved as Text files, for example, MPW® (Macintosh Programmer's Workshop) documents or TeachText files. In addition, many Apple® Macintosh® computer applications give you the option of saving a document as a Text file, for example, MacWrite® has a Text Only button in its Save As command. You can use the Text Tool when transmitting to a remote computer that can receive only ASCII files and that does not support any of the other protocols.

◆ **Note** The Text Tool can be used only to *send* a Text file to a remote computer. However, you can receive Text files using other file transfer tools; for example, you can use the Straight XMODEM or the XMODEM Text methods provided by the XMODEM File Transfer Tool. If you're receiving a Macintosh file, you can use the XMODEM Tool's MacBinary method. Also, remember that you can receive the contents of a Text file directly into your session document and then save the received file as part of the session document. To do this, when you request that the other computer send the contents of the file, make sure that the Save Lines Off Top command is selected so that incoming data is saved in the scrollback cache; later, you can copy the saved file into another application. ◆

Text file transfer settings

You choose the File Transfer command from the Settings menu (shown below) to access a dialog box that lets you set the file transfer protocol attributes.

```
  ¢  File  Edit  Settings  Session  Windows
                 Connection...
                 Terminal...
                 File Transfer...        ▶
                 ─────────────────────────
                 Folder for Received Files...
                 Saved Lines...
                 Paste Options...
                 Connect on Open
```
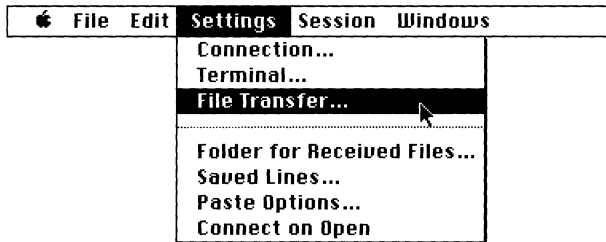
When you choose Text Tool from the Protocol pop-up menu in the File Transfer Settings dialog box, the dialog box displays the setup options for configuring your Macintosh to send a file using the Text File Transfer protocol (see below).

```
┌─────────────────────────────────────────────────────────────────┐
│  File Transfer Settings                          (    OK    )     │
│        Protocol: [  Text Tool     ]              ( Cancel  )      │
│  ─────────────────────────────────────────────────────────────   │
│           When Sending Text ...                                   │
│                                                                   │
│           Timing                        Line Endings              │
│                                                                   │
│    ⌚   Delay Per Character:  [ 0 ]   ▤  End Lines With: [ CR ]    │
│         (60ths of Second)                                         │
│                                                                   │
│         Delay Per Line:      [ 0 ]      ☐ Wrap Lines at Column: 80│
│         (60ths of Second)                                         │
└─────────────────────────────────────────────────────────────────┘
```
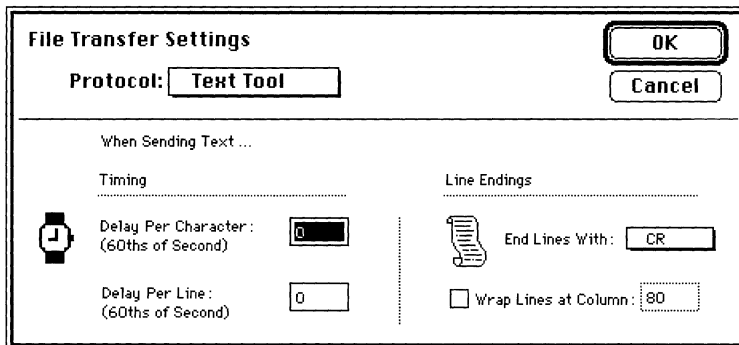
Setup options

For each option in the Text File Transfer Settings dialog box, the most commonly used setting is preset as the default. However, you may need to change some of these settings, depending on the type of file being transmitted or how the application on the receiving computer will use the file. In these cases, refer to documentation for the receiving application or contact your system administrator for information on how the various options should be set for the type of file transmission you are performing.

The following subsections describe the Text File Transfer setup options. The options are presented in the order they appear in the dialog box (reading from top to bottom and from left to right).

When Sending Text...

This phrase serves as a reminder that the Text Tool is designed for *sending* files only. To receive files in ASCII form use the Straight XMODEM or XMODEM Text options of the XMODEM File Transfer Tool; or, receive the contents of the Text file directly into a session document (for which the Saved Lines Off Top command is activated so that incoming data is saved in the scrollback cache).

Timing

The two options in this group let you specify transmission delays between characters and between lines. Use these options when you are communicating with a computer that can't receive data as fast as the Macintosh is sending it. If you can't adjust the baud rate being used (either because you don't have direct access to the remote computer or because the other computer does not support that baud rate), setting transmission delays provides another way to decrease the rate at which data is sent and prevent data loss.

Try experimenting with the delay between characters and the delay between lines until you find a setting that ensures the data is delivered intact. Start by setting a small delay between lines and then, if you are still losing characters, try adjusting the delay between characters.

Delay Per Character This option lets you specify a delay period between characters. Specify delays in whole numbers 0–32767. The value entered indicates the number of increments in 60ths of a second. For example, a delay of 2 indicates $2/60$ or $1/30$ second. The default setting for this option is no delay (0).

Delay Per Line This option lets you specify a delay period between lines. Specify delays in whole numbers 0–32767. The value entered indicates the number of increments in 60ths of a second. For example, a delay of 2 indicates $2/60$ or $1/30$ second. The default setting for this option is no delay (0).

Line Endings

The options in this group let you specify the end-of-line character transmitted during file transfer.

End Lines With Use this pop-up menu to specify which character or characters the Text Tool sends to indicate the end of a text line. When transmitting a file, the Text Tool replaces each carriage return it finds in the text with the end-of-line character you select here. Since Macintosh files use a carriage return character (ASCII 13) to indicate the end of a line, leave this option set to CR when transmitting to another Macintosh. Some remote systems use a line-feed character (ASCII 10) or a carriage return/line-feed pair to indicate an end of line. To set this option correctly, find out how the receiving application interprets end-of-line characters. The default setting for this option is a carriage return.

| CR | The Text Tool sends a carriage return character to indicate the end of a line. |

| LF | The Text Tool sends a line-feed character to indicate the end of a line. |

| CR & LF | Both a carriage return character and a line-feed character are sent to indicate the end of a line. |

Wrap Lines at Column This option lets you specify the column at which lines in the outgoing file end. You should specify this option when the receiving application has a line limit that is less than the line length in the file you are sending, or when sending text to a system that does not wrap text automatically. The Text Tool inserts a carriage return character at the column specified unless doing so would divide a word, in which case the tool inserts the carriage return character in front of that word. When filtering lines of text, the tool ignores lines that are shorter than the line length you specify in this option, which means that short lines of text are not concatenated. The default setting for this option is to leave line lengths unchanged.

☐   When this option is unchecked, the line lengths are unchanged during file transmission.

☒   When this option is checked, the Text Tool inserts a carriage return at the column specified and wraps any words beyond that point to the beginning of the next line. Lines break between words rather than between characters. (A word is any group of characters separated from other characters by at least one space, tab, or carriage return.) Unless you specify otherwise, lines will wrap at the 80th column.

Status box

During file transfer, a status box (such as the one shown below) indicates how the transfer is progressing. Click the Cancel button if you need to stop transferring a file.

◆ **Note** During the file transfer process, you can switch to another MacTerminal® session document as well as to another application or to a desk accessory, moving this status box to the background. When you want to check the progress of your file transfer, just move the status box back to the foreground by clicking it or by selecting it from the Windows menu. ◆

Troubleshooting hints

If you are unable to send a file, confirm the following:

- Your connection is open. Check the Session menu. If the Receive File command is dimmed and the Open Connection command is not dimmed, your connection is not open, so you need to choose the Open Connection command.

- All the cables are properly connected.

When a file is not being received intact, check that the connection setup options you chose match the requirements of the computer receiving the file. Keep in mind that mismatched connection tool settings could also cause problems, although symptoms of such problems usually occur while you're establishing the connection or logging in to a remote host.

If your settings match those of the other computer, but characters are still lost during transmission, try increasing the delay per line or the delay per character values. Another possible solution is to send your file again at a slower baud rate. If you are directly connected to the other computer through the serial port, try setting a handshaking option or selecting a different handshaking option with your connection tool. (Remember, the setting for the other computer must be adjusted accordingly.)

Memory requirements

The number of MacTerminal session documents you can have open at once depends on the amount of memory required by the communications tools used with the open session documents. If you are having trouble opening as many session documents as you want, it may be helpful to look at the amount of memory required for the tools you are using. The Text Tool requires approximately 15K–25K (kilobytes) of space in memory (depending on the functions that the tool is performing and the number of open session documents that are using it). To check the memory requirements for the other tools that you are using, turn to the "Troubleshooting Hints" sections in the modules for those tools.

If you are using MultiFinder®, you can choose About the Finder™ from the File menu to check how much memory is available to MacTerminal. If there isn't enough memory available, you can increase the partition size allocated for the MacTerminal application (use the Get Info command in the File menu).

XMODEM File Transfer Tool

The Apple Publishing System

XMODEM File Transfer Tool was written, edited, and composed on a desktop publishing system using Apple® Macintosh® computers, an AppleTalk® network system, and Microsoft® Word. Proof pages were created on the Apple LaserWriter® printers; final pages were printed on a Linotronic® 300. Line art and chapter openers were created with Adobe Illustrator™. PostScript®, the LaserWriter page-description language, was developed by Adobe Systems Incorporated.

Text type and display type are Apple's corporate font, a condensed version of ITC Garamond®. Bullets are ITC Zapf Dingbats®.

Contents

The XMODEM File Transfer Tool provides a method of transferring data between two computers that includes error-checking and correction. Developed by Ward Christensen, XMODEM protocol is an agreement to send and resend data until it arrives intact and error free (or until the specified retry time period or count is exceeded).

The XMODEM Tool supports the following variations of the XMODEM file transfer protocol:

- MacBinary
- MacTerminal® 1.1
- Straight XMODEM
- XMODEM Text

The first section in this module describes these four XMODEM methods. The rest of the module provides details about the setup options used with XMODEM file transfer.

Choosing a file transfer method

This section describes the four XMODEM file transfer methods and when to use them. After deciding what method to use, see the "Setup Options" section for information on setting that file transfer options. If you are already familiar with these file transfer methods, go directly to "Setup Options."

About Macintosh files

Unlike files on other computers, Macintosh® computer files have two sections: a data fork and a resource fork. The data fork is an unstructured storage area for data; the resource fork is structured to enable programmers to create, manage, and manipulate resources. Resources can be segments of program code and graphic images, such as menus, fonts, dialog boxes, and icons. Most of the information in application and system files is stored in the resource fork, while the text in a document file is stored in the data fork. The document's formatting information, if any, is saved in the resource fork.

When transferring a file, it's important to choose a file transfer format that can properly process your Macintosh file. Some of the file transfer formats supported by the XMODEM Tool transfer only the contents of the data fork (which can cause problems if you need the information in the resource fork). A brief explanation of the XMODEM Tool file transfer methods follows. Use this information to identify the transfer method that best suits your case.

MacBinary

MacBinary transfers any type of Macintosh file to or from a Macintosh or other computer that supports binary XMODEM protocol. MacBinary was designed to transfer the data fork, the resource fork, and the Finder™ information block intact in one file. This capability makes MacBinary preferable to its predecessor, MacTerminal 1.1, which transmits the three parts of a Macintosh file as three separate files.

The XMODEM Tool supports the MacBinary I and MacBinary II formats. When you use the MacBinary method, the XMODEM Tool always sends files in MacBinary II format; when receiving files, the XMODEM Tool detects the format of the incoming file and decides whether to use MacBinary I or MacBinary II to receive the file.

When to use MacBinary

Use MacBinary to transfer any Macintosh file, especially application files, system files, and Text files for which you want to retain the information in the resource fork.

Use MacBinary to transfer (upload) files from a Macintosh to an information service, such as CompuServe, where another Macintosh computer using MacBinary can access the file.

Some tips on transferring files

To send a file, use the Send File command from the Session menu. If you're sending the file to a mainframe or other non-Macintosh host, you have to log in and set it up to receive the file first, that is, locate the file, issue the appropriate commands, and so forth. If you're sending a file to a Macintosh or another personal computer, you have to coordinate the transfer with the person receiving the file.

To receive files, choose the Receive File command from the Session menu or check the Enable Auto Receive option in the File Transfer Settings dialog box so that files are received automatically. If you check Enable Auto Receive, the incoming data stream is monitored for a receive signal from the sending host. Remember to verify that the sending host supports the auto-receive feature. If it doesn't, you have to issue the Receive File command yourself.

If you're receiving a file from a mainframe or other non-Macintosh host, you have to log in and set it up to send the file first, that is, locate the file, issue the appropriate commands, and so forth. If you're receiving a file from a Macintosh or another personal computer, you have to coordinate the transfer with the person sending the file.

MacTerminal 1.1

MacTerminal 1.1 is the predecessor of MacBinary. The main difference between the two methods is that MacTerminal 1.1 transfers the three parts of a Macintosh file in separate units: one for the data fork, one for the resource fork, and one for the Finder information block. The receiving computer either combines the three units into one file or saves them as three individual files.

When to use MacTerminal 1.1

Use this format to transfer a Macintosh file to or from a remote host that supports MacTerminal 1.1 instead of MacBinary. (Many UNIX® systems have local applications, such as *macput* and *macget,* that support the MacTerminal 1.1 method.)

Some tips on transferring files

As with the other XMODEM methods, use the Send File command in the Session menu to send a file. However, with MacTerminal 1.1, incoming files are received automatically because all file transfers are initiated by the sender. So, you don't have to use the Receive File command to receive files unless the sending computer does not support this auto-receive feature. If the sender does not initiate file receipt, use the appropriate commands to prepare the host to send the file, then choose the Receive File command from the Session menu.

When sending a file to a remote host, be sure to issue the appropriate commands to prepare the host to receive the file first. For example, if you're sending a file to a UNIX host, type `macget` at the system prompt before sending the file from your Macintosh.

When receiving a file from a remote host, prepare the host to send the file. For example, if you are receiving a file from a UNIX host, type `macput` and the filename and the host will begin sending the file. The *macput* program has options that you can use to specify whether the file is a 3-part file or just a data fork.

Straight XMODEM

Straight XMODEM is the original version of XMODEM protocol. Unlike MacBinary and MacTerminal 1.1, it transmits just the data fork of a Macintosh file. It also doesn't convert end-of-line indicators to match those used by the receiving application, so before using this method to transfer a file, verify that both your Macintosh and the remote host use the same indicator. Otherwise, the application receiving your file won't have the correct end-of-line indicators. If you need the end-of-line indicators converted during file transfer, you should use the XMODEM Text method: you can use this method even when the other computer is using the Straight XMODEM method.

◆ **Note** Remember that you may also be able to edit the file after it is received in order to fix the end-of-line indicators. ◆

When to use Straight XMODEM

Use Straight XMODEM to transfer the data fork of a Macintosh file to a non-Macintosh computer or to receive a non-Macintosh file. When your Macintosh receives a file, Straight XMODEM creates a Macintosh file and copies the incoming data into the data fork.

Avoid using this method to send any Macintosh file that has data in the resource fork, namely application files and system files. However, if you have no alternative, see the transferring tips in the next section for some suggestions.

Some tips on transferring files

As with the other XMODEM methods, use the Send File or Receive File commands in the Session menu to send or receive a file, respectively. To send to or receive from a remote host, be sure to log in and issue the appropriate commands to set up the host first.

When you must use Straight XMODEM to transfer Macintosh application or system files, use a file conversion utility, such as BinHex, first. This utility converts the entire file, including the resource fork, into text. The person receiving the file must have the means to convert the file back to a binary format.

To send document files, such as MacWrite® files, with formatting information in the resource fork, open the file and save it as text first. Often the Save As command in your word processor's File menu contains such an option.

XMODEM Text

The XMODEM Text method transfers Text files only. In addition, when sending files, it converts the carriage return end-of-line indicators used in Macintosh files into the carriage return/line-feed indicators used by many other types of computers, thus preserving the spacing between lines and paragraphs in files that use either of these two indicators. When receiving a file, XMODEM Text converts the carriage return/line-feed indicators to carriage returns.

When to use XMODEM Text

Use XMODEM Text to exchange Text files between a Macintosh and a system that uses the carriage return/line-feed end-of-line indicator. You won't be able to send any Macintosh file that uses the resource fork (such as application or system files) with this method.

Don't use this method to transfer Text files to another Macintosh; use MacBinary instead.

Some tips on transferring files

As with the other XMODEM methods, use the Send File or Receive File commands in the Session menu to send or receive a file, respectively. To send to or receive from a remote host, be sure to log in and issue the appropriate commands to set up the host first.

XMODEM file transfer settings

You choose the File Transfer command from the Settings menu (shown below) to access a dialog box that lets you set the file transfer protocol attributes.
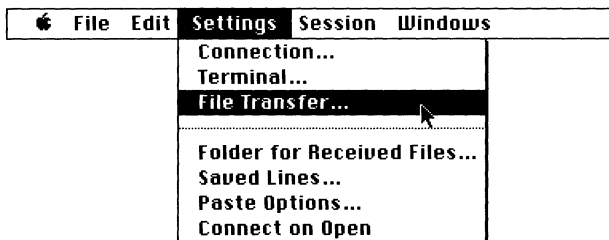
When you choose XMODEM Tool from the Protocol pop-up menu in the File Transfer Settings dialog box, the dialog box displays the setup options for configuring your Macintosh to send or receive a file using one of four XMODEM protocol variations. The dialog box includes a Method pop-up menu from which you can choose a specific XMODEM method (see below).
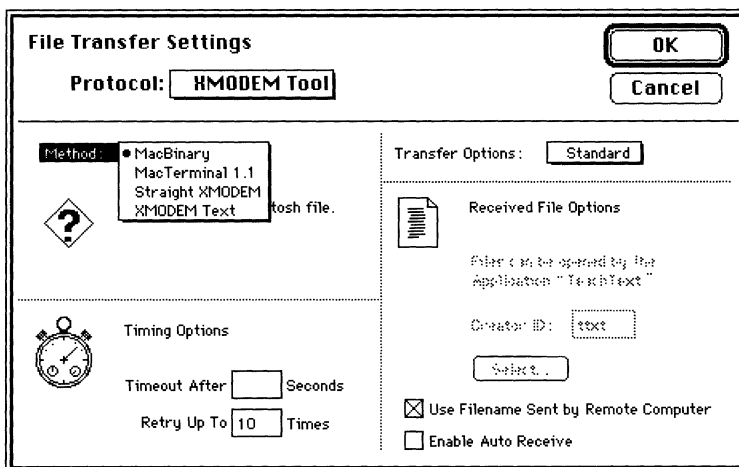
Setup options

When you select one of the XMODEM variations from the Method pop-up menu, the File Transfer Settings dialog box displays the setup options for configuring your Macintosh to transfer and receive files using that method. The most commonly used setting for each option is preset as the default. However, you may need to change some of these settings, depending on the type of file being transmitted or the way the application on the receiving computer uses the file. In these cases, refer to the documentation for the receiving application or contact your system administrator for information about how to set the various options for the type of file you are transmitting.

The following subsections describe the XMODEM file transfer setup options. The options are presented in the order they appear in the dialog box (reading from top to bottom and from left to right). Some options apply to one XMODEM method but not to another; these cases are noted in the descriptions.

Method

Use this pop-up menu to choose the variation of XMODEM that you want to use for file transfer. The options available in the dialog box change according to the methods you select. The help message below the Method menu also changes, briefly summarizing an important aspect of the XMODEM method you chose. The question mark icon identifies the help message. See "Choosing a File Transfer Method" at the beginning of this module for a full explanation of each method. The default method is MacBinary.

Method:　| MacBinary |

◆?◆　　Transfers any Macintosh file.

The MacBinary method transfers any Macintosh file (a document, an application, or a system file) to or from a Macintosh or any computer that supports binary XMODEM protocol.

Method: | MacTerminal 1.1 |

Transfers any Macintosh file,
with automatic file reception.

The MacTerminal 1.1 method transfers Macintosh files to a Macintosh or another make of computer that supports MacTerminal 1.1. If the sender supports auto-receive, it signals the receiver to automatically receive the file, doing away with the need to manually enter a Receive File command.

Method: | Straight XMODEM |

Transfers the data fork of the
file, without converting line
endings.

The Straight XMODEM method just transfers the data fork of files. Use this format if the file is going to be used on a non-Macintosh computer.

Method: | XMODEM Text |

Transfers a text file,
converting line endings between
computers.

The XMODEM Text method transfers Text files only. It transfers solely the contents of the data fork, converting outgoing carriage return characters to carriage return/line-feed pairs, and incoming carriage return/line-feed pairs to carriage returns. Choose this format when the remote system ends lines with carriage return/line-feed characters.

Timing Options

The two options in this group regulate retransmission attempts.

Timeout After ... Seconds This option determines the length of time (in seconds) that the receiving computer waits between blocks of data for an appropriate response from the other computer. Enter a whole number 0–32767; the default is 10 seconds. When using information services that may be slow to respond, you may need to increase the timeout value.

Retry Up To ... Times This option determines the number of times the sending computer attempts to retransmit a block of data that the receiving computer has either received with errors or not acknowledged. Enter a whole number 0–32767; the default is 10 times. For large files, you may need to increase this number. The XMODEM Tool automatically reattempts to send the first block up to 15 times.

Transfer Options

This pop-up menu lets you define the size of the blocks transmitted and the type of error-checking performed. It also includes a CleanLink selection, which provides enhanced throughput because error recovery is disabled. The default setting for this option is Standard.

◆ **Transfer negotiations** The XMODEM Tool can change the transfer option you select if the remote computer requests an alternative. Essentially, the receiver initiates the negotiation of transfer parameters and the sender adjusts its settings to the capabilities of the receiver. Should this negotiation take place, the File Transfer Status box indicates the transfer option substituted for your original selection. ◆

In general, XMODEM error-checking can be accomplished in one of two ways: that is, by using a checksum or through Cyclic Redundancy Checking (CRC). A checksum is an extra byte added to each block of data by the sender. The receiving computer uses this byte to calculate whether the block was transmitted accurately. If the calculations match, the receiving computer sends an acknowledgment (ACK) to the transmitting computer, which responds by sending the next block of data. If the calculations do not match, the

receiving computer sends a negative acknowledgment (NAK) to the transmitter to request that the block be retransmitted. With the CRC method, the acknowledgment procedure is the same, but the sender adds a 2-byte CRC to the block, which is used by the receiver to verify the accuracy of each block. The CRC algorithm is statistically much more reliable as an error-detecting mechanism than is a simple checksum.

| Standard | Data is transmitted in 128-byte blocks with simple checksums; no CRC checking is performed. Choose this option if the remote system doesn't support any of the other options listed here. |

| CRC-16 | Data is transmitted in 128-byte blocks using the CRC-16 algorithm to detect errors. This option provides more reliable error-checking than does the Standard option. |

| 1K Blocks | Data is transmitted in 1K blocks (1,024-byte blocks) rather than 128-byte blocks; thus, choosing this option results in faster data transfer than the Standard and CRC-16 options allow. The CRC-16 algorithm is used for error-checking. |

| CleanLink | Data is transmitted in 1K blocks using the CRC-16 error-checking and the *CleankLink* technique. With CleanLink, no acknowledgment is required between sender and receiver; data transfer is faster with this technique because the sender does not wait for a block to be acknowledged before sending the next block. However, if the receiving computer detects an error, it cancels the transmission and stops the file transfer. Avoid choosing this option if your connection allows transmission errors, since any error that occurs while the file is being transmitted cancels the entire file transfer. Consider using CleanLink if you have an error-free connection, such as with |

- a connection established using error-correcting modems, such as the Digital DF242™ modem. Remember that the other end of the connection must have an error-correcting modem for the connection to be error-free.

- an error-checking and recovery protocol, such as AppleTalk® Data Stream Protocol (ADSP).

Received File Options

The options in this group allow you to define certain attributes of received files. Depending on which of the XMODEM methods you are using, one or the other of these options becomes available.

Creator ID Choosing either the Straight XMODEM or XMODEM Text method activates the Creator ID option. This option lets you specify the application that should be launched when the Text file (received via either of these XMODEM methods) is opened from the Finder. The Creator ID is a 4-character code that identifies an application.

To specify the Creator ID, click the Select button to display a dialog box listing the applications on your disk. Double-click the name of the application you want and the code for that application appears in the Creator ID field. When incoming files are received they are stored as the specified type of file.

The default Creator ID is *ttxt,* for TeachText. If you don't change this setting, you can still open up a TeachText document with any application that can open Text files. Simply start up the preferred application, choose Open from the File menu, and double-click the name of the TeachText file.

◆ **Hint** You can type an application's Creator ID code directly into the Creator ID field if you happen to know it. But, if you're not sure of the code, use the Select button. ◆

Use Filename Sent by Remote Computer The settings for this option determine whether the XMODEM Tool automatically saves the received file with the original filename used on the sending computer. This option is available only with the MacBinary and MacTerminal 1.1. methods. The default setting for this option is checked.

⊠   If this option is checked, when file transmission is complete, the XMODEM Tool automatically saves the file with the original name and does not prompt you to name the file.

Should another file on your disk happen to have the same name as the file just received, the XMODEM Tool appends a number to the name of the received file. For example, if the received file was named Read Me, the tool would change it to Read Me#1.

☐   If this option is unchecked, when file transmission is complete, you are prompted to name the file and then save it by choosing the Receive button in the dialog box.

Enable Auto Receive   Enable Auto Receive is a MacBinary option. When selected, you can automatically receive files under certain conditions. The default setting for this option is unchecked.

☐   When this option is unchecked, the MacBinary method does not provide automatic file receipt.

☒   When this option is checked, file receipt is automatic with the MacBinary method as long as the sending computer supports this feature. MacTerminal monitors the incoming data for a receive request from the sending computer and, when one is detected, notifies the XMODEM Tool to receive the file. If the remote computer does not send the receive request, you can still choose the Receive File command in the Session menu to receive the file.

Status box

During file transfer, a status box (such as the one shown below) indicates how the transfer is progressing. Click the Cancel button if you need to stop transferring a file.
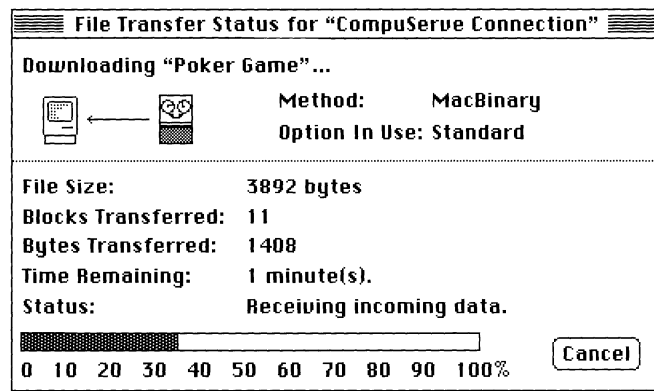
The Option In Use field may show a different option from the one you selected because requests from the remote computer can change this setting.

◆ **Note** During the file transfer process, you can switch to another MacTerminal session document, as well as to another application or to a desk accessory, moving this status box to the background. When you want to check the progress of your file transfer, just move the status box back to the foreground by clicking it or by selecting it from the Windows menu. ◆

Troubleshooting hints

If you are unable to send or receive a file, confirm that the following conditions are true:

- Your Macintosh and the remote computer are both using the XMODEM file transfer protocol and all the options (method, timing, transfer, and so forth) correlate.
- The remote computer supports the XMODEM method you are using.
- The remote computer supports the error-checking method you selected from the Transfer Options pop-up menu.
- If the connection tool you are using has a data-bit option, it is set to 8-bit characters for compatibility with the XMODEM protocol.
- Neither the remote computer nor the connection tool you are using specifies XON/XOFF handshaking, as the XMODEM protocol does not prevent XON/XOFF characters from being acted on. As a result, the computer receiving the file interrupts the transfer if it encounters a Control-S (XOFF) in the file, the checksum, or the CRC characters.
- All the cables are properly connected.

Here are some additional suggestions:

- If you are sending files over a noisy line, you may need to increase the number of retries (the number of times the XMODEM Tool tries to retransmit a block of data). See the Retry Up To...Times option for details.

- When using information services that may be slow to respond, increase the timeout value.

- If you have trouble receiving a file using the MacBinary method, verify that MacBinary was used to send it. MacBinary files have a 128-byte header. If the file you are trying to receive does not have this header, the XMODEM Tool tries to interpret the first 128 bytes it receives as header information anyway. This attempt may produce such effects as a "disk full" error message, an incorrect filename, or an unopenable file (wrong Creator ID). If you do receive a file you can open, the first 128 bytes will be missing.

- Sometimes mismatched connection tool settings can also cause problems, although symptoms of such problems usually occur while you're establishing the connection or logging in to a remote host.

Alert messages

While you are using the XMODEM Tool, the following alert messages may appear:

A bad packet was received from the remote computer.

This message appears when the XMODEM protocol receives an information packet that it was not expecting. For example, when you are using CleankLink, this message is displayed if a NAK is received (since NAKs are not supposed to be transmitted with the CleanLink technique).

Could not recover from an unknown problem after several tries. You could try again using a higher Retry value.

Something is interfering with the file transfer. Try increasing the number of retrys. However, if you continue to receive this message, there may be problems at the receiving end of the connection; try again later, but if the problem persists, you may need to contact the remote computer's system administrator for help.

The incoming file is not in the MacBinary format.

This message is notifying you that although you are set up to use the MacBinary method, the incoming file cannot be received because it is not being recognized as a MacBinary file. The file transfer will be canceled.

There is not enough disk space on this volume for the incoming file.

The file transfer is stopping because there is not enough space on the disk to which the incoming file is being directed. Switch to another disk or free up some space on the current disk before trying to transfer the file again.

The remote computer canceled the file transfer.

If you see this message, more than likely the person handling the remote computer has canceled the file transfer.

The remote computer did not respond in time. You could try again using a higher Timeout value.

The file transfer attempt is failing because the remote computer is not responding in the allotted time. Try increasing the timeout value. If you continue to be timed out, there may be problems at the receiving end of the connection; try again later, but if the problem persists, you may need to contact the remote computer's system administrator for help.
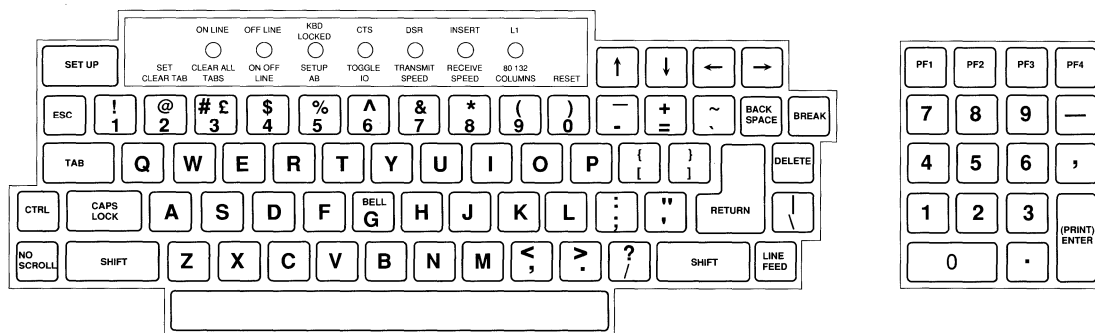
Memory requirements

The number of MacTerminal session documents you can have open at once depends on the amount of memory required by the communications tools used with the open session documents. If you are having trouble opening as many session documents as you want, it may be helpful to look at the amount of memory required for the tools you are using. The XMODEM Tool requires approximately 40K–55K (kilobytes) of space in memory (depending on the functions that the tool is performing and the number of open session documents that are using it). To check the memory requirements for the other tools you are using, turn to the "Troubleshooting Hints" sections in the modules for those tools.

If you are using MultiFinder®, you can choose About the Finder from the File menu to check how much memory is available to MacTerminal. If there isn't enough memory available, you can increase the partition size allocated for MacTerminal (use the Get Info command in the File menu).

VT102™ Keyboard Emulation
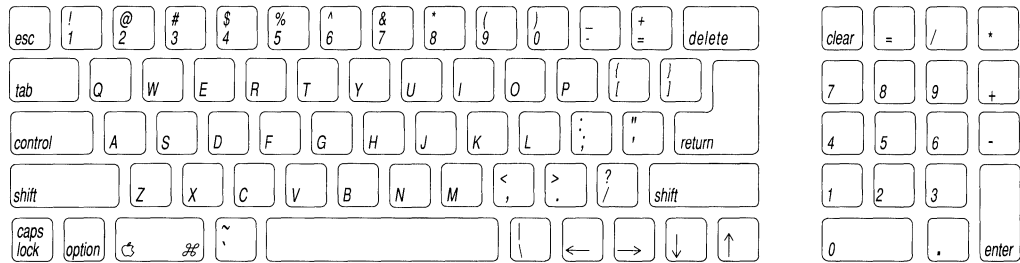
Quick Reference Card

VT102 keyboard

To emulate these VT102 keys	On Apple® Classic keyboards* use	On Apple ADB keyboards† use
Cursor (arrow) keys	Cursor (arrow) keys or Keys menu	Cursor (arrow) keys or Keys menu
Backspace	Backspace	Delete
Delete	Option-Backspace	Option-Delete
Short break (Break)	Option-Enter	Option-Enter
Long break (Shift-Break)	Shift-Enter or Session menu	Shift-Enter or Session menu
Answerback (Control-Break)	⌘-Enter	Control-Enter
Control	⌘	Control
Escape	Tilde/quotation mark (~/`)	Escape
Left single quotation mark, grave accent (`)	⌘ –Tilde/quotation mark (~/`)	Tilde/quotation mark (~/`)
Tilde (~)	⌘ –Shift–Tilde/quotation mark (~/`)	Shift–Tilde/quotation mark (~/`)

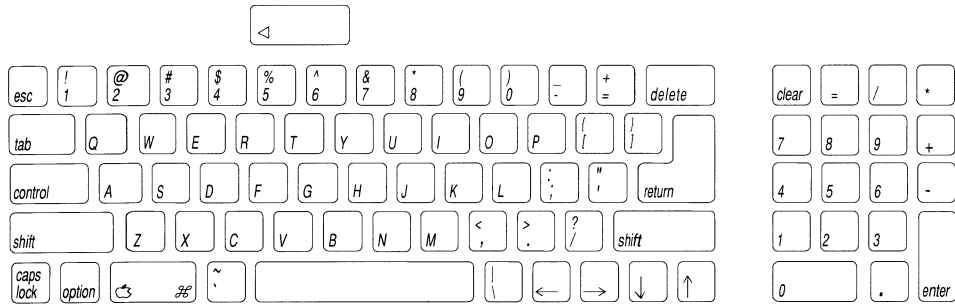Apple ADB Extended and ADB Extended II keyboards
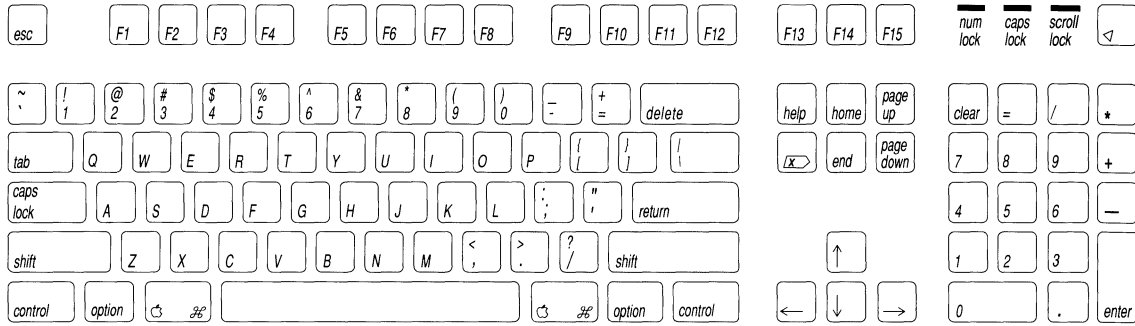
Apple ADB Macintosh Portable keyboard (with a keypad)

Apple Classic Extended (Macintosh Plus) keyboard
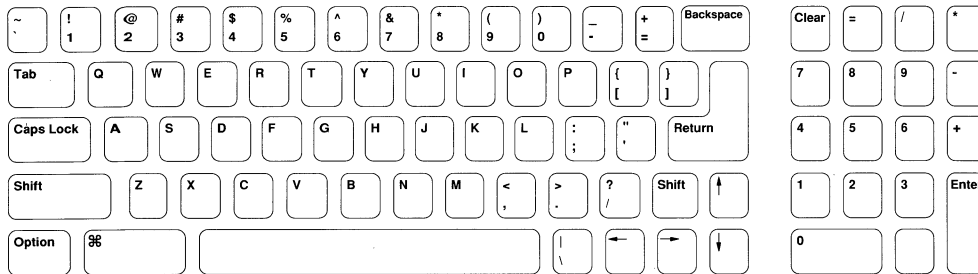
Apple ADB keyboard

To emulate these VT102 keys	On Apple Classic keyboards use	On Apple ADB keyboards use
Keypad	Keypad or Keys menu	Keypad or Keys menu
Line Feed	⌘-J	Control-J
No Scroll	⌘-Q/⌘-S or Keys menu	Control-Q/Control-S or Keys menu
PF1; PF2; PF3; PF4	Keypad	Keypad
Set Up	Settings menu	Settings menu

*Applies only to the Apple Classic Extended keyboard that came with the Macintosh® Plus computer.

†Applies to all ADB (Apple Desktop Bus™) keyboards: Apple, Apple Extended, Apple Extended II, and Macintosh Portable (with a keypad).
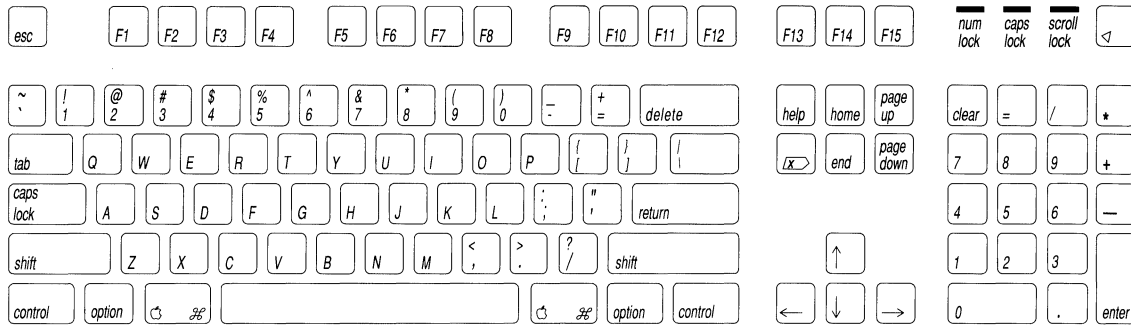
VT320™ Keyboard Emulation

Quick Reference Card

VT320 keyboard

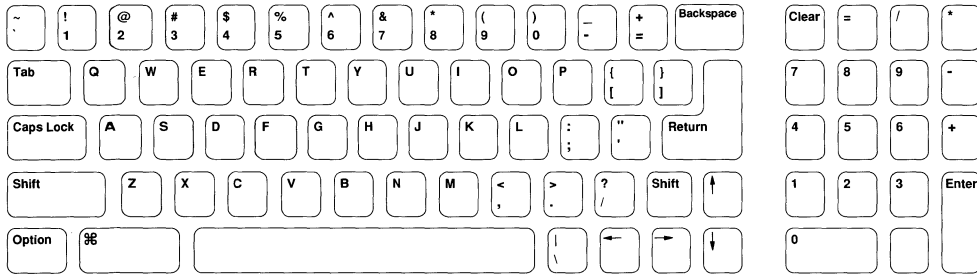| To emulate these VT320 keys	On Apple® Classic keyboards* use	On Apple ADB keyboards† use
Backspace	Option-Backspace	Option-Delete
Delete	Backspace	Delete
Short break (Break)	Option-Enter	Option-Enter
Long break (Shift-Break)	Shift-Enter or Session menu	Shift-Enter or Session menu
Answerback (Control-Break)	⌘-Enter	Control-Enter
Control	⌘	Control
Escape	Tilde/quotation mark (~/`)	Escape
Left single quotation mark, grave accent (`)	⌘ – Tilde/quotation mark (~/`)	Tilde/quotation mark (~/`)
Tilde (~)	⌘ –Shift–tilde/quotation mark (~/`)	Shift–tilde/quotation mark (~/`)
Compose character	Option-(key)	Option-(key)
Line Feed	Command-J	Control-J
Print Screen	File menu	File menu
Set Up	Settings menu	Settings menu
Hold Screen	⌘-Q/⌘-S or keys menu	Control-Q/Control-S or keys menu

Apple ADB Extended and ADB Extended II keyboards
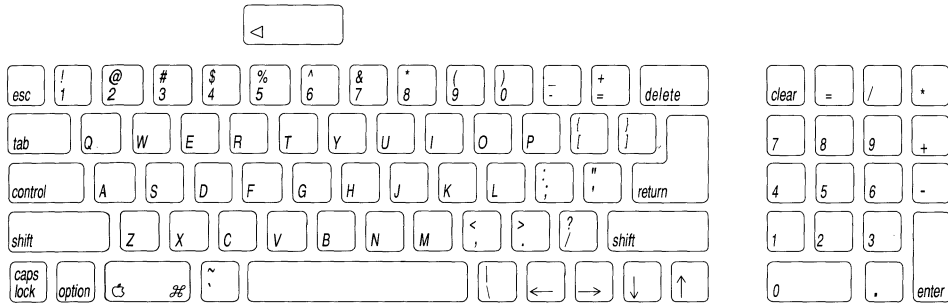

Apple ADB Macintosh Portable keyboard (with a keypad)
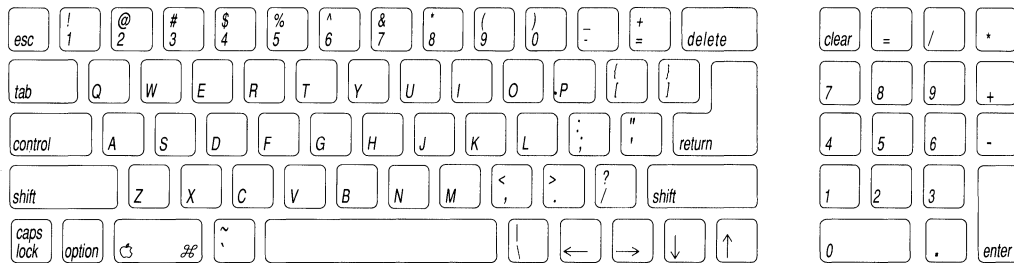
Apple Classic Extended (Macintosh Plus) keyboard

Apple ADB keyboard

To emulate these VT320 keys	On Apple Classic keyboards, use the Keys menu or press	On Apple ADB keyboards, use the Keys menu or press
Keypad	Keypad	Keypad
Cursor (arrow) keys	Cursor (arrow) keys	Cursor (arrow) keys
Find	Option–Keypad zero (0)	Option–Keypad zero (0)
Select	Option–Keypad period (.)	Option–Keypad period (.)
Insert	Option–Left Arrow	Option–Left Arrow
Remove	Option–Right Arrow	Option–Right Arrow
Previous Screen	Option–Up Arrow	Option–Up Arrow
Next Screen	Option–Down Arrow	Option–Down Arrow
F6	Option–Keypad clear	Option–Keypad clear
F7	Option–Keypad equals (=)	Option–Keypad equals (=)
F8	Option–Keypad slash (/)	Option–Keypad slash (/)
F9	Option–Keypad asterisk (*)	Option–Keypad asterisk (*)
F10	Option–Keypad 7	Option–Keypad 7
F11	Option–Keypad 8	Option–Keypad 8
F12	Option–Keypad 9	Option–Keypad 9
F13	Option–Keypad minus (-)	Option–Keypad minus (-)
F14	Option–Keypad 4	Option–Keypad 4
F15	Option–Keypad 5	Option–Keypad 5
F16	Option–Keypad 6	Option–Keypad 6
F17	Option–Keypad plus (+)	Option–Keypad plus (+)
F18	Option–Keypad 1	Option–Keypad 1
F19	Option–Keypad 2	Option–Keypad 2
F20	Option–Keypad 3	Option–Keypad 3
U6–U20§	Shift–Option–Keypad key	Shift–Option–Keypad key

*Applies only to the Apple Classic Extended keyboard that came with the Macintosh® Plus computer.

†Applies to all Apple ADB (Apple Desktop Bus™) keyboards: Apple, Apple Extended, Apple Extended II, and Macintosh Portable (with a keypad). However, since ADB Extended keyboards contain Function and Editing keys, you must use those keys instead of the Option-key combinations shown.

§The key combinations for U6–U20 are identical to the key combinations for F6–F20, respectively, except you also press the Shift key. You can also generate U6–U20 by holding down the Shift key while using the Function Keys menu, or if you are using an ADB Extended keyboard, by holding down the Shift key while pressing the appropriate Function key.

Refer to the *Communications Tools Reference* for additional characters you can generate using the DEC™ Supplemental or ISO Latin Character sets.