TinyTERM Plus

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How to Use This Guide

The *TinyTERM Plus* User's Guide provides an in-depth look into how to use *TinyTERM Plus* to satisfy network needs. This guide is intended for users and administrators of *TinyTERM Plus*.

To fully utilize *TinyTERM Plus* it is beneficial to be familiar with the Windows operating system. This guide assumes basic Windows knowledge, and uses Windows-specific terminology. For help with Windows, see the Windows documentation.

Conventions Used in This Guide

Different type faces are used to provide visual clues to screen output, keys and commands typed. The conventions used are:

Table P-1. Keyboard and Text/Data Input Conventions

Convention	Description
HELVETICA	Represents a key to be pressed. For example, F1. It also represents screen output, such as system prompts.
KEY + KEY	Represents a key combination such as ALT+F1. This indicates you should hold the ALT key and then press the F1 key.
italics	Represent pathnames, file names, and command references within the text.
0	Is a zero.
O	Is an uppercase letter "oh".
\E	Represents the escape code.
Boldface	Represents commands or options you should type exactly. A sample command prompt with a command appears below:
	a:setup
↵	Represents the RETURN or ENTER key when located on a command line such as:
	a:setup↵
Select item | item | item	A menu selection hierarchy, where each item is different and available after making the previous selections.

Table P-2. Mouse Conventions

Convention	Description
Point	Move the screen pointer by using the mouse.
Click	Press the left mouse button.
Double-Click	Press the left mouse button twice in quick succession.
Drag	Press the left mouse button, and hold it while moving the mouse.
Right-Click	Press the right mouse button.

Table P-3. General Conventions

Convention	Description
Choose	Use the mouse or the keyboard to move the highlight bar or focus.
Select	Use the mouse click or RETURN key to activate the chosen selection.
Press	Refers to on screen buttons. Pressing involves selecting the button and then "pushing" it. The keyboard involves TABbing and pressing RETURN. The mouse involves pointing and pressing the left mouse button.
To Cancel	Press ESCAPE, double click the window menu box (upper left corner), or press the cancel button.
	Tips are provided throughout the setup and operation instructions for further assistance.
Glossary	A basic definition of the word or phrase has been provided in a footnote on the page, as well as in the glossary in the back of this manual.

Register the Product!

Please fill out the registration card and mail it within 10 days of purchase to ensure prompt service. Registration provides a number of services including:

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- Product announcements
- Upgrade announcements
- Special promotions
- *Point to Point*, Century's informative newsletter

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If Assistance Is Required

Century Software is committed to providing the highest quality support available. This commitment extends to every dealer, reseller, and end-user who purchases a Century product.

If problems are encountered when installing, configuring, or using *TinyTERM Plus*, try these troubleshooting steps before calling the support number:

1. Verify that all the requirements for installing and running *TinyTERM Plus* are met. Refer to the section *Prior to Installation* in this guide.
2. Verify that the computer, modem, software, and cables are installed, configured, and connected properly.
3. Review the appropriate section(s) of the *TinyTERM Plus* manual.

If help is required, please contact Century Software:

By mail: Century Software, Inc.
ATTENTION: Technical Support
5284 South Commerce Drive, Suite C-134
Salt Lake City, UT 84107

By phone: (801) 268-3088

By fax: (801) 268-0642
ATTENTION: Technical Support

By E-mail tech@censoft.com

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(800) 329-2384

Century Software's FACTS by FAX line offers answers to some of Technical Support's frequently asked questions.

Century Software is committed to quality in technical support. To ensure this, a Technical Support Representative will respond to requests for assistance within 24 hours of the initial call.

Or by 24-hour BBS: (801) 266-0330

Baud:	300 to 14,400 V.32 bis
WordLen:	8
Stop Bits:	1
Parity:	NONE
Emulation:	SCOANSI

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  - Sample scripts written by support personnel and end-users
  - Technical support documents, including technical help papers
- Upload services:
  - Questions for technical support

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New Year's Day	Memorial Day
Independence Day	Labor Day
Thanksgiving Day	Day After Thanksgiving
Christmas Eve	Christmas Day

Support line procedures

To assist the Technical Support staff in answering questions and resolving problems quickly, please follow these support line procedures:

1. Be prepared to provide specific details concerning the computer system's hardware and software configuration. In addition, the Serial Number and Version Number of *TinyTERM Plus* should be noted prior to contacting Technical Support.
   Because Century Software's products run on a wide variety of systems, this information is important to the Technical Support representatives to provide correct answers quickly.
2. Call from a phone which allows access to the computer system while speaking with a Technical Support Representative.
3. Have any applicable documentation readily available. Read and note any applicable sections or release notes.
4. If possible, be prepared to re-create the problem with the Technical Support Representative. Otherwise be prepared to give a step-by-step description of how the problem occurred.
5. Do not request a specific representative for new questions or problems; this may cause delays in responding to calls.

What Century Software will do

A Technical Support Representative will discuss any questions or problems which are usually resolved during the initial contact. If a representative is not available on the initial call, one will respond to the call in the order it was received. If the caller is unavailable on a call back, the representative will leave a message and wait for a response.

Century Software is committed to resolving all problems within 24 hours. However, some resolutions require a longer period of time. If the situation requires more time, a representative will provide updates on the progress of the problem resolution.

Installing TinyTERM Plus

In This Section:

Prior to Install

Requirements

Hardware

- A personal computer with 386 or higher processor.
  - For *network connections*[1], previously installed network hardware including an NDIS or ODI compliant *network interface card.*[2]

    OR
  - For *asynchronous*[3] (serial) connections a serial port or *Hayes compatible modem*[4] and an *RS-232C cable*[5] to connect the serial port to the host or external modem.

---

[1] The term "network connection" is used to describe all aspects of the connection between the PC and the network server. This includes cabling and communication parameters set on the server and the PC.

[2] The board that allows the PC to "talk to" the network.

[3] This is a common transmission method between computers and modems or dumb terminals. The information is transmitted a single character at a time rather than strings of characters.

[4] "Hayes compatible modems" are an industry standard similar to IBM compatible PC's. Commands used to tell the modem what to do, as well as the "protocol" used (the way the modem communicates with the PC or other modem) are standardized.

[5] A cable that connects the PC to the modem or main network computer (server).

To determine the type of hardware used, refer to "Collecting Installation Information" in this section. Also, it may be helpful to review the *Example Configurations* section. This will provide the necessary assistance to determine the type of hardware to be used, as well as helpful hints on the set up of the hardware.

- One 1.44MB 3..5" floppy disk drive.
- One fixed hard drive with at least 4MB of available space.

Software

- MS-DOS or PC-DOS, version 3.1 or later.
- MS Windows version 3.1 or higher.
- NDIS driver or ODI driver if using a network interface card.

Collecting Installation Information

The *Setup* program requires information about the network connection to properly install *TinyTERM Plus*. Before proceeding with the setup, collect the system and network information described in this section. If not familiar with the details of the network, check with the System Administrator to gather the information.

Begin collecting the required information by locating the serial number on the Warranty card that came with *TinyTERM Plus*.

Product Serial Number: _____

Product Activation Key: _____

To determine other necessary information for installation on Windows 3.1, identify the communication method used by the network:

Serial or Modem
If *serial or modem communications*[6] are required, the *LAN*[7] information may be skipped.

Network Interface Card
If a Network Interface Card will be used, complete the LAN Information on the next page.

Both
If both a serial interface and a network interface will be used, complete the LAN Worksheet on the next page.

[6] A serial or modem connection is one where the PC or modem is connected to a multi-user system.

[7] LAN: Local Area Network; the PC communicates with the main network computer (server) through a network interface card (NIC) installed on the PC.

Local Area Network (LAN) Worksheet

The following information will be required to complete the setup of TinyTERM Plus TinyTERM Plus. Enter the information specific to the computer on the blanks provided. It may be necessary to consult with the System Administrator for this information. Examples are shown in parentheses:

For Network Connections:

PC Internet Address (156.27.1.51):_____
PC Name (pc_10): _____

The Internet Address should be available from the System Administrator or from the Internet Provider.

For PC's that Communicate via Network Interface Cards (NIC):

NIC Vendor Name (3COM): _____
NIC Type (3C503): _____

[8]*Interrupt Level* (5): _____

[9]*I/O* Base Address (0x300): _____

This information should be available in the network interface card documentation if there is not a System Administrator.

[8] In order for the computer to receive one task at a time from the different devices (PC's, printers, modems, etc.), each device is assigned a number. This must be a unique number for each device. Check the NIC (network interface card) for the number assigned to the card.

[9] Input and Output; information going into or out of a computer or computer device.

Installing TinyTERM Plus

1. Start Windows (if using Windows 3.1, start in enhanced mode).

2. Insert the *TinyTERM Plus* diskette into a diskette drive (the examples given in this manual use drive A).

3. Select Program Manager | File | Run for Windows 3.1/Windows for Workgroups or select Run from the Windows 95 startup menu.

4. In the Command Line text box, type

   a: setup

   Click OK.

Begin Install

The initial *Setup* screen will then be displayed. The options are given to click NEXT to continue with Setup, click HELP to print the installation worksheet or click CANCEL to end the installation.

The installation worksheet can also be found in the Local Area Network (LAN) Worksheet on page 4. The information requested on this worksheet must be entered correctly to ensure that *TinyTERM Plus* will function properly. The following additional user information is required:

Table 1 Installation Information

Option	Description
Name:	User name.
Company:	Company Name.
Serial Number:	The serial number located on the Warranty card that came with the TinyTERM Plus software.
Activation Key:	Type the Activation Key as shown on the Warranty card that came with the Simply [NFS] software.

Specifying Installation Parameters

Directory

The directory that will be used when installing the software will then be displayed. Type the desired directory for the software, or press RETURN to accept the default directory of c:\century. If unsure of the correct directory to be used, simply accept the default. A Century program group will be setup automatically.

Components

Select the *TinyTERM Plus]* components to install:

- Terminal Emulator
  Provides terminal emulation for a variety of terminals.
- [10] *TCP/IP* Network Applications
  Provides options to install Network Shared Services and Network Printing.
- TCP/IP Network Stack
  The install program will determine the type of operating system running on the PC. If Windows 95 is detected, this option will not be available, as the TCP/IP Network Stack used with *TinyTERM Plus* is the Microsoft TCP/IP Network Stack in Windows 95. Options include TCP/IP for Local Networks, SERIAL Networks as well as the Internet Dialer software.

After specifying which of the components will be installed, click NEXT to continue with the installation.

By default, all the components will be installed. Unless you are sure a component should not be installed, accept the default.

[10] TCP/IP: Transmission Control Protocol/Internet Protocol (network protocol) that provides communication across interconnected networks that may use different hardware platforms (i.e. Windows to UNIX systems).

Completing Setup

Follow the instructions for the operating system in use. After completing the instructions in this section, refer to the section Installing the Software on page 10.

Windows 95

The *TinyTERM Plus* data entry is then complete. The Summarize and Finish screen will be displayed showing the information selected for the install. Click on the BACK button to make any desired changes. Verify that the installation parameters contain the correct information.
Click on the CANCEL button to abort the installation or click on the FINISH button to proceed. Selecting the FINISH button starts the installation of the actual components to the hard drive.

Windows 3.1/Windows for Workgroups

Choose the method the network uses to find configuration information:

- Use user defined settings
  Configuration information exists on this PC. Choose this option when *DHCP and BOOTP*[11] are not available. If this option is selected, the following information will be required (this is the same information as the LAN Worksheet described earlier in this section):

[11] DHCP and BOOTP are configuration utilities that automatically send the PC configuration when requested. Ask the System Administrator if either of these options is available.

Table 2 Local Configuration

Option	Description
PC Name:	The network name for the PC. This name identifies the PC on the network (PC_10).
PC IP Address:	The IP address for the PC. This address identifies the PC on the network. For example, 192.42.45.133.
[12]***Gateway*** (optional):	(Optional) The gateway used when the IP address entered above is not on the local network. **Note** Complete this option only if the network has a gateway.
Advanced-(Optional) :	The Subnet Mask and Broadcast Address for this PC. **Note** Change these options only if the network is divided into subnets.

- Use DHCP
  Configuration information exists on a DHCP server. This method requires that the System Administrator set up a machine to run the DHCP server. Once set up, the DHCP server provides configuration information to the TCP stack.

- Use BOOTP
  Configuration information is matched with IP addresses on a BOOTP server. This method requires that the System Administrator set up a machine to run the BOOTP server. Once set up, the BOOTP server provides configuration information to the TCP Stack

Select the method to be used by the TCP Stack to *resolve machine names*[13]:

[12] A connection between one network and another, usually networks of different types.

[13] Machines running TCP/IP are known by an IP (Internet Protocol) address (192.43.45.133) and a machine name (PC_10). Machine names are easy for people to remember, but the network needs to know the IP address. The two ways of making this association is with DNS (Domain Name Server) or HOSTS files.

- Try DNS first, then HOSTS
  TinyTERM Plus instructs the[14] *DNS* server to resolve the machine name. If not found, *TinyTERM Plus* then searches a[15] *HOSTS* file for the name.

- Try HOSTS first, then DNS
  TinyTERM Plus searches a HOSTS file for the machine name. If not found, *TinyTERM Plus* instructs the DNS server to resolve the name.

- Try only DNS
  TinyTERM Plus instructs the DNS server to resolve the name.

- Try only HOSTS
  TinyTERM Plus searches a HOSTS file on the PC for the name.

Enter the name resolution information as requested. *Setup* may request one or more of these items:

- The PC's domain name and the DNS server's IP address. For example, a name of pcx.cen.com may be entered with an address of 192.90.34.2.

- The directory path of a HOSTS file. If the directory is known for the HOSTS file, enter that directory. If the directory is not known, click the Browse button to search for a directory or leave the directory blank to have *Setup* create a HOSTS file.

[14] Domain Name Server; generally used by UNIX systems. This must be set up by the System Administrator to be used.

[15] HOSTS file; this is set up by the System Administrator and must have the host name and the I/P address for each computer with which you will communicate.

1. If the Setup program finds an *ODI device*[16] driver installed on the PC, the directory where the *net.cfg* file is located will be requested. Type the directory or click Browse to locate the file.

   If the setup program determines that Windows for Workgroups is running, it will find the network card setup from Control Panel | Network. If the network card has not been configured, the install will proceed to the network configuration dialog where the network card may be configured.

   If the setup program does not find network drivers running and Windows 3.1 is used, a list of network cards that the install has available will be provided. The configuration of the network card will follow.

2. The *TinyTERM Plus* setup is then complete. The Summarize and Finish screen will be displayed showing the information selected for the install. The option is given to click on the BACK button to make any desired changes. Verify that the installation parameters contain the correct information.

   Click on the CANCEL button if the installation should be ended or click on the FINISH button if the information displayed is correct. Selecting the FINISH button starts the installation of the actual components to the hard drive.

Installing the Software

Click Install when satisfied with the installation settings. *Setup* installs the *TinyTERM Plus* programs and files, prompting diskette changes as needed. If one of the following conditions exist, setup prompts the restart of Windows after the first disk is installed. When Windows is restarted, *TinyTERM Plus* installation continues.

[16] ODI: Open Datalink Interface

- A previous version of *TinyTERM Plus* exists
- *TinyTERM Plus* replaced a Windows for Workgroups network

  After installing *TinyTERM Plus*, setup lists the files modified during installation and the names of backup files created for each modified file. For more information about modified files, see the section *Example NDIS and ODI Configurations* in this manual.
  TinyTERM Plus is now installed. Before running:
- Reboot the PC.
- Configure the Dialer if serial port/modem connections will be used. For more information, see the *Setting up the Dialer* in this manual

Installing TinyTERM Plus to a network file server

Login as Supervisor and run TinyTERM Plus's installation program. After the installation is complete, users may be set up by running *isetup.exe* from File Manager for Windows 3.1 or Windows for Workgroups. For Windows 95, *isetup.exe* can be run from File Manager if it is installed, or from the Run option in the main Windows 95 menu.
A separate subdirectory will be created for each user. The user should have all access rights to the directory. TinyTERM Plus must be run from the user directory, not the main TinyTERM Plus directory.
When installing to a network file server the subdirectory \SER is created under the main TinyTERM Plus directory. All users must have read and write permission to this directory. Any users with insufficient rights will get an error message and be returned to the operating system.

The TinyTERM Emulator

In This Section:

The TinyTERM Window

When TinyTERM is started, the following will be displayed:

Figure 1TinyTERM Main Screen

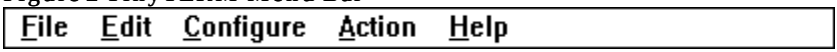
The TinyTERM window has the following components:

- Menu Bar
- Ribbon Bar
- Session Bar
- Control Menu
- Title Bar
- Iconify (Minimize) Button
- Maximize Button

Menu Bar

TinyTERM's Menu Bar offers easy access to most features. The Menu Bar is located at the top of the window and looks like this:

Figure 2 TinyTERM Menu Bar



File

- Open ICONect
  Displays a standard open file dialog with a list of configuration files. Options include:
  - OK
    Loads the configuration file into memory, but makes no connection. This option is useful for changing parameters in the configuration without making a connection. Click on the Connect button on the Ribbon Bar to establish a connection.
  - Cancel
    Exits without making any changes to the current configuration.
- Save ICONect
  Saves the current configuration information as described later in this section.
- Save ICONect As
  Displays a file save dialog. This allows the user to save the configuration to a different configuration file.
- ICONect Summary
  The Summary button brings up a dialog which allows entry of detailed information about the TAP file. Items include author, date, subject, version, e-mail and description.
- Print Screen
  Prints the current emulation screen to the printer. The emulation screen is actually text, so a graphics printer is unnecessary.
- File Transfer
  Displays the File Transfer dialog box.
- Open URL
  Allows the setup of a shortcut for transferring and manipulating FTP and HTTP files, as well as accessing TELNET sessions.

- Edit Text File
  Displays an edit file dialog. This allows the user to edit a text file using the defined editor.
- Change Directory
  Displays a change directory dialog. This allows the user to change the current directory.
- Erase File
  Displays an erase file dialog. This allows the user to delete a file.
- Install Language
  Displays an Install New Languages dialog. This allows the user to install additional language versions.
- Exit
  Exits from TinyTERM to the Program Manager.

Edit

- Copy
  Copies the selected emulator screen text to the Windows clipboard.
- Paste
  Copies the text in the Windows clipboard to the currently active connection.
- Paste Link
  If text in the Windows clipboard is in Windows LINK format, copies it to the currently active connection.
- Clear Screen
  Clears the emulator screen.

Configure

The Configure options are discussed in detail later in this section. This listing serves as a short description for reference.

- Communications
  Change the communications settings of a configuration.
- Emulation
  Change the emulation settings of a configuration.
- Data Capture/Printer
  Change TinyTERM's printer options.
- Modem
  Change the modem settings of a configuration.

- DDE
  Change TinyTERM's default DDE settings.
- Keyboard
  Change the keyboard settings used by TinyTERM.
- Color
  Change TinyTERM's default color settings.
- Fonts
  Change the font TinyTERM uses for the emulation window.
- Login
  Change the automatic login settings of a configuration.
- Code Page
  Change the selected code page.
- Server
  Change the server settings of a configuration.
- General
  Change the general settings of a configuration.
- Ribbon Bar
  Customize the default TinyTERM ribbon bar settings.

Action

- Script Command
  Displays an edit dialog, allowing the user to enter any single script command for immediate execution.
- Command File
  Displays an execute command file dialog, allowing the user to select a script command file to run.
- Capture
  Toggles current capture mode status.
- Macro Bar
  Toggles current macro bar display status.
- Server Mode
  Initiates TinyTERM server mode.
- Connect
  Connects using the settings of the current configuration. If already connected, the connection will be dropped and then a new connection will be made.

- Disconnect
  Disconnects the current connection.

Help

- Contents
  Calls Window's Help system with the TinyTERM Help file. It opens the file to the contents screen.
- Search for Help on
  Displays an entry dialog. Enter keywords in the entry field. TinyTERM then displays Windows Help on the keywords from the entry dialog.
- ToolTips
  Controls ToolTips (balloon help) display status. When this item is checked, ToolTips are displayed. When unchecked, ToolTips are not displayed.
- About ICONect
  Displays the current TAP file dialog, which includes icon and description information.
- About TinyTERM
  Displays the TinyTERM copyright dialog, which includes version information.
- Auto Register TinyTERM
  TinyTERM may be registered electronically by filling the requested information with the Auto Register function.

Ribbon Bar

From the main menu, you control all of TinyTERM's functions. In addition, many of TinyTERM's important features are available quickly from the default Ribbon Bar.

Figure 3 TinyTERM's Ribbon Bar

The following list explains the buttons on the default Ribbon Bar (listed from left to right):

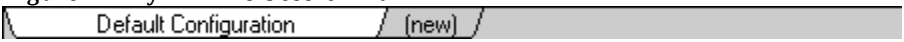
- Connect
  Connects using the settings of the current configuration. If already connected, the connection will be dropped and then a new connection will be made.
- Disconnect
  Disconnects the current connection.
- Open
  Open a configuration file.

- Save
  Save current configuration into the configuration and system files.
- Transfer
  Brings up the Transfer File dialog box.
- Communications Setup
  Configure the communications settings of a configuration.
- Emulation Setup
  Configure the emulation settings of a configuration.
- Printer
  Configure the printer settings.
- Key
  Configure the keyboard settings.
- Color
  Configure the color settings.
- Help
  Access the on-line Help system.
- Exit
  Exit TinyTERM to the Program Manager.

Session Bar

The Session Barcontrols and displays information on all TinyTERM sessions:

Figure 4 TinyTERM's Session Bar



The current connection's description is shown inside a large tab. Background sessions and the new session option are shown within small tabs. Click on any tab to change to that session, or click on (new) to establish another concurrent session.

Control Menu

The Control Menuis a pull-down menu that appears in the upper left hand corner of the TinyTERM window and controls moving, resizing, maximizing, iconifying, and closing the TinyTERM window.
Click on the Control Menubutton in the upper left hand corner or press ALT+SPACEBARto open this pull-down menu.

You can access the selections on the Control Menu three ways: click on the selection, use the ALT keys if available, or type the underlined letter. ALT key combinations allow you to access the Control Menu options without opening the window first:

Table 3 Control Menu Options

Item	Function
Restore	Restores an icon to an active window or resize a window to its original size.
Move	Moves the window to a new location. Once selected, the cursor becomes a crosshair. Move the cursor until the window is in the desired position and click.
Size	Enlarges or reduces the window. The cursor becomes a crosshair. While keeping the mouse button down, move the cursor until the window outline is the desired size and release the mouse button.
Minimize	Reduces your window to an icon. Double-click on the TinyTERM icon to open and activate the window.
Maximize	Enlarges your window to the size of the screen.
Close or ALT+F4	Exits TinyTERM.
Switch To... or Ctrl+ESC	Opens the Task List dialog box so you can switch to another running Windows application. You can also use ALT+TAB to cycle through your applications.

Title Bar

The Title Bar displays the title of the TinyTERM window. If you place the mouse pointer on the title bar and press the mouse button once without releasing, you can move your window to a new position on the screen. Release the button when the window outline is in the desired position.

Iconify (Minimize) Button

Clicking on the Iconify Button iconifies (minimizes) your window and is useful for eliminating screen clutter. Remote applications are not affected when you iconify TinyTERM.

To re-activate TinyTERM, double-click on the TinyTERM icon.

Maximize Button

Clicking on the Maximize Button enlarges your window to the size of your screen. When maximized, this button changes to a double arrow. Click again to reduce the window to its original size.

Using the Help System

If you are familiar with the Windows Help system, you already know how to use TinyTERM's Help.

If you ever forget how to use any section of TinyTERM, there is an on-line Help system that explains what to do. The Help option of the menu runs a separate program under Windows. You may leave Help running concurrently while you are working in TinyTERM.

To access Help

- Select Main Menu | Help | Contents, Main Menu | Help | Search for Help On..., or press the Help button on the Ribbon Bar

To exit Help

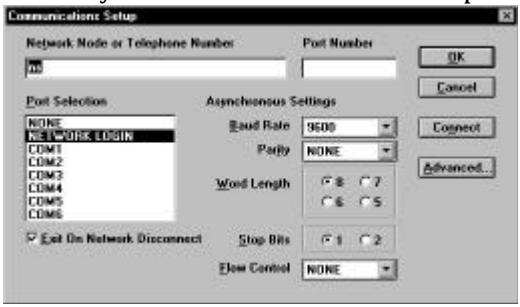
- Double-click the system menu (located in the upper left corner of the Help window).
- Select close from the Help window system menu.

Changing Your Settings

Changing your communications settings

1. Select Main Menu | Configure | Communication or click on the Communications Setup Button on the default Ribbon Bar. The Communications Setup dialog box appears:

Figure 5 TinyTERM Communications Setup Dialog Box



2. In the Network Node or Telephone Number edit field, type one of three items, depending on your Port Selection:
   - Phone number. This is valid with any COM port selection.
   - Network node name or Internet address. This is valid with the NETWORK LOGIN port selection.
3. In the Port Number edit field, type the network port number to connect to. This is valid only with the NETWORK LOGIN port selection.
4. In the Port Selection list box click on:
   - NONE to connect to neither asynchronous nor network communications links.
   - NETWORK LOGIN to connect to a network. You must also define a network service and connection type under the Advanced settings.
   - COMn to connect to a serial port.
5. Click the checkbox to change the Exit On Disconnect setting. When checked, TinyTERM will automatically exit when a network connection closes. This option is only valid for network connections.
6. In the Asynchronous Settings group change:
   - Baud Rate
     The baud rate is the speed of the serial connection, roughly equivalent to bits per second. Click the Baud Rate down arrow to display the list of possible values. Click on the desired Baud Rate.
     For a direct connection the speed should probably be 9600 or 19200; for a modem connection, it depends on the speed of your modem and the speed of the modem used by the system you are communicating with. TinyTERM will set the speed you specify when it opens the port.

- Parity
  Click on the down arrow for the list of values. Parity is a primitive form of error checking used before the development of more sophisticated communications protocols. While it is less frequently used for error checking, both systems must use the same value in order to communicate. The possible values for parity are NONE, EVEN, ODD, MARK, and SPACE. You should specify NONE unless you are planning to communicate with another system that you are sure uses one of the other options.
- Word Length
  Click on the word length needed within the group box. If parity must be even or odd, word length must be 7. Otherwise, connections with no parity must have a length of 8.
- Stop Bits
  Click on the number of stop bits needed within the group box. The only time two stop bits are used is at a low speed like 110 baud, so you should rarely need to change this value.
- Flow Control
  The optimum flow control method to be used. If you are unsure, use XON/XOFF. Choices are:

NONE	No flow control will be used.
XON/XOFF	Software flow control utilizing XON (^S) and XOFF (^Q) characters will be used.
HARDWARE	Hardware flow control between the modems and serial ports will be used.
ETX/ACK	Software flow control utilizing ETX (^C) and ACK (^F) characters will be used.

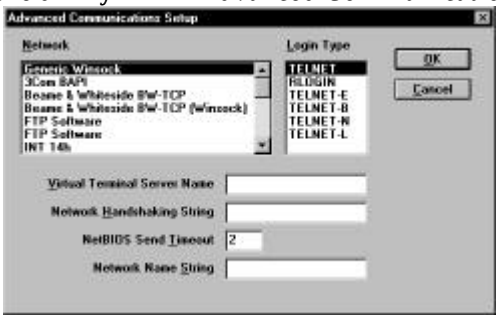
7. To accept the new settings without connecting, press ENTER.
   Or click on the OK Button.
   To accept the new settings and establish a connection, click on the Connect Button.
   To reject the new settings, press ESC.
   Or click on the Cancel Button.

Changing your advanced communications settings

If you have chosen NETWORK LOGIN as your Port Selection, you must define your advanced settings.

1. From the Communications Setup dialog box click on the Advanced button. The Advanced Communications Setup dialog box appears:

Figure 6 TinyTERM Advanced Communications Setup Dialog Box



2. In the Network list box, click on the name of the network you are using.
3. In the Login Type list box, click on the login type for network connections. The Login Types are:

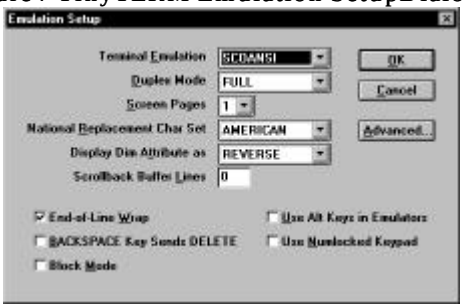
TELNET	Standard TELNET access.
RLOGIN	Standard RLOGIN access.
TELNET-E	TELNET access - echo enabled.
TELNET-B	TELNET access - binary mode.
TELNET-N	TELNET access - send EOL None.
TELNET-L	TELNET access - Send EOL Linefeed

4. In the NetBIOS/MSNET group, enter the values for the following entry fields (These options are only used if the selected Network is NetBIOS, MSNET, or LAN Manager):
   - Virtual Terminal Server Name
   - Network Handshaking String
   - NetBIOS Send Timeout
   - Network Name String
5. To accept the new settings, press ENTER.
   Or click on the OK Button.
   To reject the new settings, press ESC.
   Or click on the Cancel Button.

Changing your emulation settings

1. Select Main Menu | Configure | Emulation or click on the Emulation Setup Button on the default Ribbon Bar
   The Emulation Setupdialog box appears:

Figure 7 TinyTERM Emulation SetupDialog Box



2. The options which can be set are as follows:
   - Terminal Emulation
     Terminal Emulation is a pop up field. Click the down arrow to display the list of available terminal emulations:

ADM1	ADM1 terminal emulation.
ANSI	ANSI 3.64. Generic ANSI emulation.
AT386	AT&T UNIX System V/386 Color Console. This is a full-screen, 25 line emulation of the console on AT&T and Interactive UNIX System V/386 systems and System V.4.
IBM3101	IBM 3101 terminal. Supports block and line mode.
IBM3151	IBM 3151 terminal. Defaults to a 24 line emulation.
IBM3151-25	IBM 3151 terminal. Defaults to a 25 line emulation.
PCTERM	WYSE WY-60 scancode mode emulation. Automatically selected if Wyse60 is selected and the application requests it.
SCOANSI	SCO UNIX Color Console. This is a full-screen, 25 line emulation of the console on SCO UNIX and XENIX systems. Scancode mode is also supported in this emulation.
TTY	Pass-through or "teletype" mode. All characters received are displayed on the screen and no special escape processing is performed.
TV912	TeleVideo 912 terminal emulation.

TV925	TeleVideo 925 terminal emulation.
TV950	TeleVideo 950 terminal emulation.
VT320	DEC VT320 terminal emulation. Includes support for Multinational Character Sets, compose characters, label line, transparent printing, double-high/double-wide characters, numeric keypad, and more.
VT320-7	DEC VT320 terminal emulation with National Replacement Character Set support, which allows foreign character display over 7-bit connections.
VT220	DEC VT220 terminal emulation with Multinational Character Set support.
VT220-7	DEC VT220 terminal emulation with National Replacement Character Set support.
VT100	DEC VT100 terminal emulation.
VT52	DEC VT52 terminal emulation.
WYSE60	WYSE WY-60 24 line terminal emulation. Includes support for 132 columns, label line and 25-line mode.
WYSE60-25	WYSE WY-60 terminal emulation 25-line mode. Automatically selects 25-line mode.
WYSE50	WYSE WY-50 terminal emulation.

- Duplex Mode
  Click on the down arrow to display available options. Click on the duplex mode desired.

  FULL In full-duplex mode, characters typed on the local keyboard are echoed to the screen by the remote system, not by the terminal itself. Full-duplex mode is the default.

  HALF Characters typed are immediately displayed on the screen before being sent over the communications line. This is sometimes called “local echo.”

- Screen Pages
  Click the down arrow to display possible values. Each terminal emulation supports multiple screen memory pages for use with programs like Mscreenand DigiScreen, which provide multiple sessions over a single connection. Screen pages are allocated upon opening a

configuration; changing screen pages on an open configuration requires reopening the configuration.

- National Replacement Char Set
  Click on the down arrow to display possible values. The DEC VT320 and VT220 terminals support an alternate character set when used over a 7-bit data connection. This allows displaying of special foreign characters which are usually available over 8-bit connections. This option effects only the VT320-7 or VT220-7 emulation selections.
- Display Dim Attributes as
  Click on the down arrow to display possible values. This option affects only the WYSE50 and WYSE60 emulations. It controls how TinyTERM should display characters with the dim attribute. Your choices are:

  NORMAL Dim characters will be displayed in the same color as normal characters.

  REVERSE Dim characters will be displayed in the reverse color.

  DIM Dim characters will be displayed in the low intensity color of the normal color and normal characters will be displayed in their high intensity colors.

- Scrollback Buffer Lines
  This is an edit field which defines the number of previously viewed lines to be saved in terminal mode. This allows you to scroll backward and forward to see data which has already scrolled by your screen. The maximum number of lines which can be defined is 200. If you change the number of lines, the changes are not in effect until you save and reload your configuration.
- End-of-Line Wrap
  Controls whether the selected emulation automatically linefeeds when a character is typed in the last column. Checked causes the cursor to move to the first column of the next line. Unchecked causes the cursor to remain in the last column until a carriage return is received.
- BACKSPACE Key Sends DELETE
  Selects what the BACKSPACE key sends to the remote system: the ASCII value for a backspace or the ASCII value for a delete. VMS systems expect the DEC VT terminals' BACKSPACE to send the delete value. When checked, the BACKSPACE key sends the ASCII value for delete (octal 177).
- Block Mode
  Controls block mode operation of the WYSE 50, IBM3101 and TeleVideo 912, 925 and 950 emulations. Checked uses block mode. Unchecked uses line mode (default).

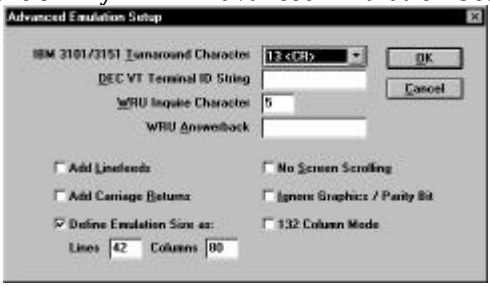
- Use Alt Keys in Emulators
  Controls usage of ALT key combinations within TinyTERM. If checked, all ALT key combinations will be processed by TinyTERM and not by Windows. For example, ALT+F4 would not close TinyTERM. If unchecked, all ALT key combinations are first processed by Windows (default).
- Use Numlocked Keypad
  Controls allowable toggling of the NumLock key within TinyTERM. If checked, the NumLock key will be on at all times. If unchecked, the NumLock key functions normally (default).

3. To accept the new settings, press ENTER.
   Or click on the OK Button.
   To reject the new settings, press ESC.
   Or click on the Cancel Button.

Changing your advanced emulation settings

1. From the Emulation Setup dialog box, click on the Advanced button
   The Advanced Emulation Setup dialog box appears:

Figure 8 TinyTERM Advanced Emulation Setup Dialog Box



- IBM 3101/3151 Turnaround Character
  This is an edit field which defines the line-turnaround character for the IBM 3101 and IBM 3151 emulations. It is also the end-of-page for the IBM 3101, IBM 3151, and WYSE 50 emulations. There are four possible characters.
- DEC VT Terminal ID String
  This edit field defines the response to report requests from remote systems. The DEC VT series of terminals respond to requests for information such as what type of terminal, video capabilities and printing capabilities. Normally TinyTERM responds only with the terminal type, but some applications require more. This field allows you to customize the response.

- WRU Inquire Character
  This is an edit field which defines the WRU request character. This is an edit field of 3 digits. Enter the ASCII number for the character that is the WRU Inquiry from the host. Valid numbers are from 1 to 255.
- WRU Answerback
  This edit field allows you to set an answerback string for connection to systems which require it.
- Add Linefeeds
  This selects whether to add linefeeds to data sent and received. Although usually unchecked, some remote systems require it.
- Add Carriage Returns
  This selects whether to add carriage returns to data sent and received. Although usually unchecked, some remote systems require it.
- Define Emulation Size As
  This defines the size of the emulation screen. If ToolTips are activated, the tip for lines and columns will indicate the maximum value allowed for the current font selected. Please note that selecting this option will uncheck the 'Scale to a TERM Font' option in the Font Setup dialog box, as these options are mutually exclusive.
- No Screen Scrolling
  This selects whether the screen scrolls when a character is typed in the last column of the last line, or a linefeed code is received on the last line. If unchecked, all lines scroll up one line and the cursor appears at the beginning of the last line. If checked, the cursor moves to the beginning of the first line.
- Ignore Graphics / Parity Bit
  This enables (checked) and disables (unchecked) masking of the parity (8th) bit for incoming and outgoing data during terminal emulations and data captures. This option is ignored in 8-bit emulations including AT386, SCO ANSI, WYSE 60, PCTERM and VT220/VT320.
- 132 Column Mode
  This controls the number of columns available in the current emulation. If checked, the current emulation will be switched into 132 column mode. By default, this is unchecked, providing 80 columns.

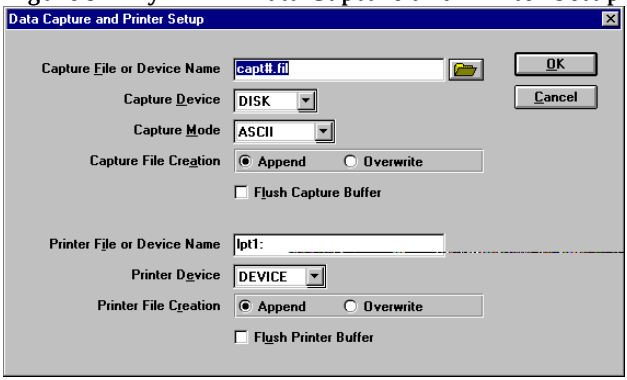
2. To accept the new settings, press ENTER.
   Or click on the OK Button.
   To reject the new settings, press ESC.
   Or click on the Cancel Button.

Changing your data capture and printer settings

1. Select Main Menu | Configure | Data Capture/Printer or click on the Printer Setup Button on the default Ribbon Bar

   The Data Capture and Printer Setup dialog box appears:

Figure 9 TinyTERM Data Capture and Printer Setup Dialog Box



2. In the Capture group, you can change the following options:
   - Capture File or Device Name
     This edit field specifies where data captured goes while data capture is turned on. Valid device names include LPT1:, LPT2:, and COM1: through COM4:.
     If you specify a filename and include a number sign (#), TinyTERM substitutes a two-digit number from 00 to 99 to ensure that each data capture file has a unique name. The numbers are incremented each time you open the capture file (i.e., at the start of a TinyTERM session, not each time you toggle capture on and off). They start over when you reach 99 or when you assign a new filename that includes a number sign.
     The capture file is placed in the current directory unless you specify a full pathname. The default filename is capt#.fil.
   - Capture Device
     Click on the down arrow to display options. This pop-up field defines whether the File or Device Name field is a DEVICE (such as a printer), a DISK file, a SPOOL utility, or PrintMgr (the Windows Print Manager). If NONE is selected, all data capture requests will be ignored.

- Capture Mode
  Click on the down arrow to display options. This pop-up field specifies whether data is captured as an ASCII file, a BINARY file or a MNEMONIC dump file.
- Capture File Creation
  This group of 2 radial buttons determines how an existing capture file should be treated. If APPEND is selected, captured data is appended to the end of the existing file. If OVERWRITE is selected, the existing file is overwritten with new captured data. This field does not affect data which is sent to a device or spooler.
- Flush Capture Buffer
  This checkbox controls if TinyTERM flushes out the output buffer immediately upon receiving a capture off request. This ensures that all capture data is written to the file or printed. If checked the output buffer will be flushed.

3. In the Printer group, you can change the following options
   - Printer File or Device Name
     This edit field specifies where the data should go when printing is turned on. Valid device names include LPT1:, LPT2:, and COM1: through COM4:.
     If you specify a filename and include a number sign (#), TinyTERM substitutes a two-digit number from 00 to 99 to ensure that each print file has a unique name. The numbers are incremented each time you open the print file (i.e., at the start of a TinyTERM session, not each time you toggle print on). They start over when you reach 99 or when you assign a new filename that includes a number sign.
     The print file is placed in the current directory unless you specify a full pathname. The default filename is pr#.fil.
   - Printer Device
     Click on the down arrow to display options. This pop-up field defines whether the File or Device Name field is a DEVICE (such as a printer), a DISK file or a SPOOL utility, or PrintMgr (the Windows Print Manager). If CAPTURE is selected, all print requests will be routed through the data capture system. If NONE is selected, all print requests will be ignored.
   - Printer File Creation
     This group of 2 radial buttons determines how an existing print file should be treated. If APPEND is selected, print data is appended to the end of the existing file. If OVERWRITE is selected, the existing file is overwritten with new print data. This field does not affect data which is sent to a device or spooler.

- Flush Printer Buffer
  This checkbox controls if TinyTERM flushes out the output buffer immediately upon receiving a capture off request. This ensures that all capture data is written to the file or printed. If checked the output buffer will be flushed.

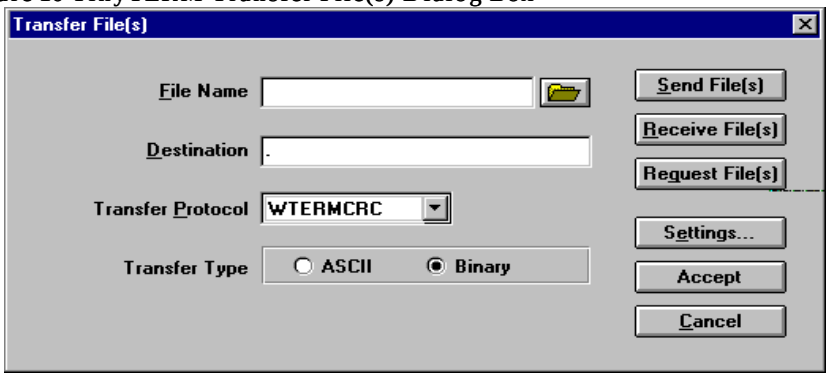
4. To accept the new settings, press ENTER.
   Or click on the OK Button.
   To reject the new settings, press ESC.
   Or click on the Cancel Button.

File Transfers

Transfer Files

1. Select Main Menu |File | File Transfer or click on the Transfer Button on the Ribbon Bar.
   The Transfer File dialog box is displayed

Figure 10 TinyTERM Transfer File(s) Dialog Box



2. Options available include:
   - File Name
     This edit field contains the file to be transferred. Wildcards may be used to transfer more than one file.
   - Destination
     This edit field contains the destination directory for the file(s) being transferred. This defaults to the current directory, represented by a period (".").

- Transfer Protocol
  This list box determines the protocol to use for the file(s) being transferred. If FTP is selected, the FTP Host... button is enabled, allowing configuration of the FTP hostname, username, and password.
- Transfer Type
  This group of 2 radio buttons determines how transferred files should be treated. If ASCII is selected, text file conversion will be attempted. It is the responsibility of the system receiving the file(s) to perform text file conversion. If Binary is selected, the file(s) will be transferred with no modifications.

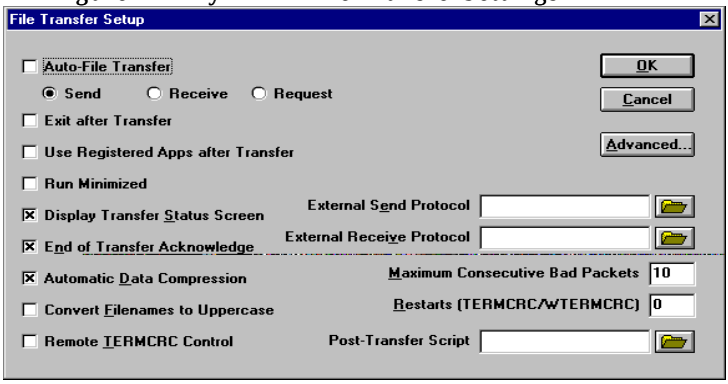
3. Click on the Browse button to select a specific file on the local system.
   Or press ENTER.
   To transfer the file(s) in the File Name field to a remote system, click on the Send File(s) Button. The remote system should be ready to receive files before this button is selected.
   To receive the file(s) in the File Name field from a remote system, click on the Receive File(s) Button. This button should be used only if the remote system has begun sending the file(s).
   To request the file(s) in the File Name field from a remote system, click on the Request File(s) Button. This button should be used only if the remote system is in server mode.
   To exit file transfer, press ESC.
   Or click on the Cancel Button.

Changing File TransferSettings

To change the settings to be used when transferring files, select the Settings button in the file transfer screen.

The following screen will then be displayed:

Figure 11 TinyTERM File TransferSettings



Settings

- Auto-File Transfer

  If this box is checked, the file transfer will begin sending, receiving or

  requesting file information whenever TinyTERM is initiated.
- Exit After Transfer

  This option will exit TinyTERM after the transfer is complete
- Use Registered Apps After Transfer

  When receiving files that have a registered extension (i.e. ".doc" for Word), this option when checked, will instruct Windows to launch the appropriate application software. The extensions and the associated application programs are set up within Windows.
- Run Minimized

  By checking this box, the transfer function screen will be minimized during the actual transfer. This allows other functions to be performed while the transfer is taking place.
- Display Transfer Status Screen

  This checkbox selects whether to display the file transfer status screen. During file transfers, a status screen is displayed to keep you updated on the condition of the transfer. If you do not want to display this status screen, uncheck this field and TinyTERM will display a series of periods on the emulator window as the transfer occurs (i.e. ". . . . . .").

- End of Transfer Acknowledge
  This checkbox selects whether TinyTERM's file transfer status screen requires acknowledgment at the conclusion of a file transfer command. This option is checked by default, which requires you to close the file transfer status screen manually. If unchecked, the file transfer status screen will display all information as normal, but will close automatically at the conclusion of the file transfer command.
- Automatic Data Compression
  This checkbox selects whether TERMCRC and WTERMCRC perform automatic data compression to decrease the amount of time required to transfer files. Uncheck to turn compression OFF.
- Convert Filenames to Uppercase
  This checkbox selects whether filenames are sent in all caps. If checked, TinyTERM will create files with uppercase names on UNIX systems when those files come from DOS systems.
- Remote TERMCRC Control
  This checkbox selects control mode for file transfer. In control mode, TinyTERM acts as a server, waiting for REMOTE and file requests from a remote computer also running TinyTERM.

3. The External Protocol group:
   - Send
     This edit field defines the DOS command line necessary for sending files with the external protocol.
   - Receive
     This edit field defines the DOS command line necessary for receiving files with the external protocol.
   - Maximum Consecutive Bad Packets
     This is an edit field. Use this field to set the maximum number of consecutive bad packets that may be received before TinyTERM aborts a file transfer. The default value is 10. Set the value lower if you want TinyTERM to abort sooner during transfers across noisy communications lines.
     If the phone line is very noisy, even TinyTERM's error-checking protocols may not be able to transfer a file. A bad packet (one that doesn't arrive intact) is retransmitted. However, if packets are consistently bad, it may be better to abort the transfer and try again later. (Retransmitting packets takes time, and thus increases the time of a file transfer.)

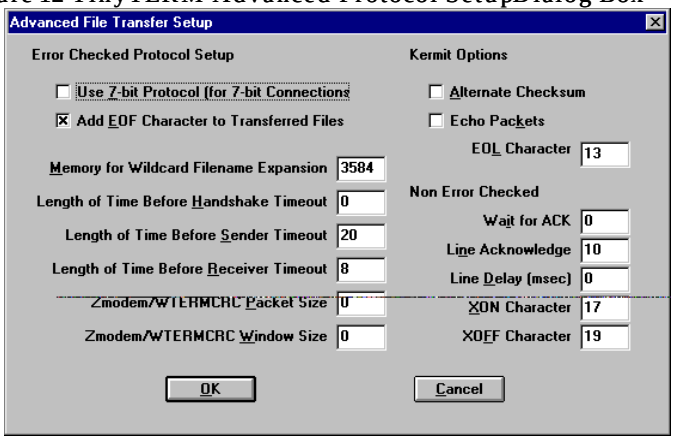
- Restarts (TERMCRC/WTERMCRC)
  This edit field turns on or off the restartable file transfer feature. If this field is set at 0, restarts are not attempted. If the field is set at 1 or more, TinyTERMattempts*n* times to restart a file transfer after interruption. Restartable file transfers are only attempted if the file transfer protocol is TERMCRC or WTERMCRC.
- Post-Transfer Script
  If a custom script should be executed after the transfer is complete, the appropriate directory and file name may be entered for this option. Either type the information or press the Browse button to determine the correct directory and file to be entered for this item, if any.

4. To accept the new settings, press ENTER.
   Or click on the OK Button.
   To reject the new settings, press ESC.
   Or click on the Cancel Button.

Changing your advanced file transfer settings

1. The advanced file transfer settings may be changed using the Protocol Setup functions.From the Protocol Setup dialog box click on the Advanced Button. The Advanced Protocol Setup dialog box appears:

Figure 12 TinyTERM Advanced Protocol SetupDialog Box



2. The Error Checked Protocols group:
   - Use 7-bit Protocol (for 7-bit Connections)
     This checkbox selects whether to strictly use 7-bit characters during file transfers. If checked, file transfers over 7-bit links use only characters between hex 20-7e and ^X, which are printable characters. This field should be unchecked for all 8-bit connections, but checked for most networks.
   - Add EOF Character to Transferred Files
     This checkbox controls the addition of an End Of File character to the end of a transferred file.
   - Memory for Wildcard Filename Expansion
     This edit field specifies the number of bytes to allocate for filename expansions. The default memory allocated for filename expansions is 3584 (13 x 275) bytes, sufficient for 275 filenames, one byte per character in the filename. TinyTERM's filename expansion routine uses only the number of bytes in the filename plus one for memory storage. This field can be used either to specify a smaller amount of memory if memory conservation is important, or to specify a larger memory allocation so that more filenames may be selected by the wildcard.
   - Length of Time Before Handshake Timeout
     This edit field specifies the number of seconds TinyTERM should wait at the beginning of a transfer before timing out due to a lack of response. When set to zero, TinyTERM will never time out.
   - Length of Time Before Sender Timeout
     This edit field specifies the number of seconds for packet sender timeout. When set to zero, TinyTERM will never time out.
   - Length of Time Before Receiver Timeout
     This edit field specifies the number of seconds for packet receiver timeout. When set to zero, TinyTERM will never time out.
   - Zmodem/WTERMCRC Packet Size
     This edit field allows you to override the Zmodem and WTERMCRC packet sizes. The packet size is in bytes. A zero entry sets this field to the default.
   - Zmodem/WTERMCRC Window Size
     This edit field allows you to adjust the Zmodem and WTERMCRC maximum sliding window size. This is preset by the baud rate, but you can override it. It is used to change the window size so that the time required to transmit a packet matches the ACK transmission delay time. A zero entry sets this field to the default.

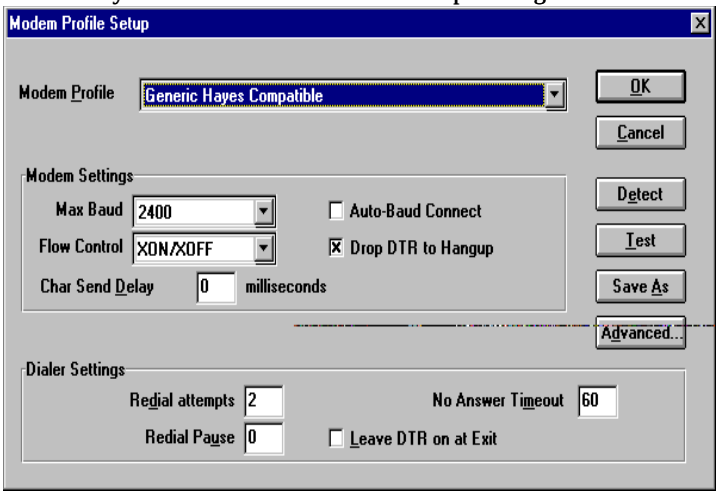
3. The KERMIT Options group:
   - Alternate Checksum
     This checkbox selects the new (unchecked) or the old (checked) version of KERMIT checksum generation. Older versions of KERMIT use a different error-checking method. If you are communicating with an older version, you may need this checked.
   - Echo Packets
     This checkbox selects whether to echo received packets to the screen. Check this box to display all packets to the screen as they are received.
   - EOL Character
     This is an edit field for the numeric ASCII value of the End Of Line Character. It defaults to 13 which is the Carriage Return
4. The Non-Error Checked group:
   - Wait for ACK
     This edit field sets the number of seconds TinyTERM waits for an XON or ACK during ASCII and Line transfers. TinyTERM will timeout if an XON or ACK is not received within the specified period of time. Default of zero means TinyTERM will not timeout.
   - Line Acknowledge
     This edit field defines the acknowledge character during Line sends. The acknowledge character signals readiness to send another line out the communications line. The default character is the linefeed character (\n).
   - Line Delay (msec)
     This edit field sets the amount of time TinyTERM should delay after each linefeed character is sent down the communications line. The default value is 0, which means "no delay." If you are communicating with a system that cannot handle input at the full baud rate speed, set this value higher.
   - XON Character
     This edit field will accept the numeric ASCII value for the software flow control character XON. The default value XON=(17Q) is usual and normal for asynchronous communications.
   - XOFF Character
     This edit field will accept the numeric ASCII value for the software flow control character XOFF. The default value XOFF=(19Q) is usual and normal for asynchronous communications.

5. To accept the new settings, press ENTER.
   Or click on the OK Button.
   To reject the new settings, press ESC.
   Or click on the Cancel Button.

Changing your modem settings

Select Main Menu | Configure | Modem.
The Modem Profile Setup dialog box appears:

Figure 13 TinyTERM Modem Profile Setup Dialog Box



In the Modem Profile pop-up field, select the modem name which matches the modem you are using.
If no modem name in the list matches your modem type, select one that most closely matches your modem. Generic Hayes Compatible will work for most Hayes compatible modems.

Modem Settings group change:

- Max Baud
  The maximum baud rate (bps) supported by your modem.

- Flow Control
  The optimum flow control method used by your modem. If you are unsure, use XON/XOFF. Choices are:

NONE	No flow control will be used.
XON/XOFF	Software flow control utilizing XON (^S) and XOFF (^Q) characters will be used.
HARDWARE	Hardware flow control between the modems and serial ports will be used.
ETX/ACK	Software flow control utilizing ETX (^C) and ACK (^F) characters will be used.

- Char Send Delay
  The number of milliseconds between character sends (for slower modems.)
- Auto-Baud Connect
  Check if your modem requires auto baud rate detection.
- Drop DTR to Hang-up
  Check if your modem supports hang-up using DTR signal.

Dialer Settings

- Redial Attempts
  The number of times TinyTERM should redial when a call does not go through (e.g., when the remote system does not answer.)
- Redial Pause
  The number of seconds to pause between redial attempts.
- No Answer Timeout
  The number of seconds TinyTERM should wait for a carrier signal before it hangs up and redials. Any number may be entered in this field, but it is recommended that you do not set this value to less than 30 seconds in order to allow time for TinyTERM to dial and for the modems to negotiate a connection.
- Leave DTR on at Exit
  If checked, the modem connection will remain active when you exit TinyTERM.

Detect

To assist in setting up the modems correctly for TinyTERM, this option will automatically search the hardware configuration and display available modem ports and the maximum baud rate for each port.

Test

To test your modem, click the Test Button.

This will send the initialization sequence to your modem and verify that the settings that you have specified are working correctly.

Saving the Settings

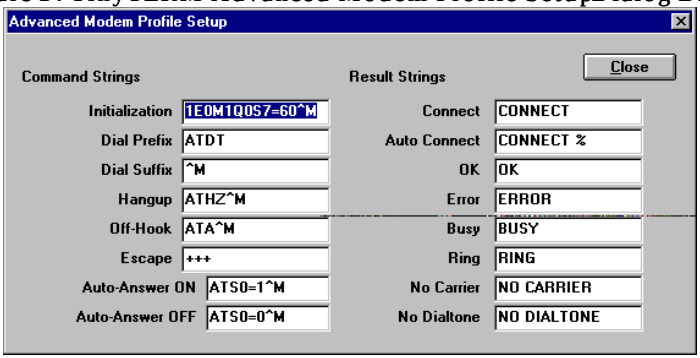
- To accept the new settings, press ENTER, or click the OK button.
  To reject the new settings, press ESC, or click the Cancel button.
- To save your modem settings under a name of your choice, click the Save As button.
  You will be prompted for a modem configuration profile name. Enter the name that you wish to use and press ENTER or click the OK button. Your modem profile will be added to TinyTERM's modem database, and will appear as an entry in the Modem Profile pop-up field.
  Press ESC or click the Cancel button to exit without saving your modem profile.

Changing your advanced modem settings

From the Modem Profile Setup dialog box, click on the Advanced Button.

The Advanced Modem Profile Setup dialog box will be displayed:

Figure 14 TinyTERM Advanced Modem Profile Setup Dialog Box



All of the Command Strings and Result Strings can be customized to fit the requirements of your modem.

Command Strings:

- Initialization
  The string of modem commands sent to the modem before the connect attempt.
- Dial Prefix
  The string sent to the modem before the phone number to be dialed. For Hayes modems, the string is "ATDT".
- Dial Suffix
  The string to be sent immediately following the phone number. For Hayes modems, it is a carriage return.
- Hang-up
  The string required to hang up your modem. For Hayes modems, it is "ATHZ".
- Off-Hook
  The string required to force the modem to go "off-hook". For Hayes modems, it is "ATA" followed by a carriage return.
- Escape
  The string required to place the modem into command mode. For Hayes modems, it is "+++".
- Auto-Answer ON
  The string required to set the modem to automatically answer incoming calls. For Hayes modems, it is "ATS0=1" followed by a carriage return.
- Auto-Answer OFF
  The string to disable the modem from automatically answering incoming calls. For Hayes modems, it is "ATS0=0" followed by a carriage return.

Result Strings

- Connect
  The string response received from the modem when a connection is established. For Hayes modems, it is "CONNECT".
- Auto Connect
  The string received from the modem when a connection is established at % baud.
- OK
  The string received from the modem when a valid command has been received and acknowledged. For Hayes modems, it is "OK".
- Error
  The string received from the modem when a command is rejected.

- Busy
  The string received from the modem when a busy signal is encountered while attempting a call.
- Ring
  The string received from the modem when it is ringing. For Hayes modems, it is "RING" followed by a carriage return.
- No Carrier
  The string received from the modem when a call was not completed due to a carrier signal not being detected from the remote modem.
- No Dialtone
  The string received from the modem when a call is attempted and a dial tone is not detected on the telephone line.

3. Press ENTER, or click the Close button to return to the Modem Profile Setup dialog box.

Changing your DDE settings

1. Select Main Menu | Configure | DDE.
   The Dynamic Data Exchange Setup dialog box appears:

Figure 15 TinyTERM Dynamic Data Exchange Setup Dialog Box

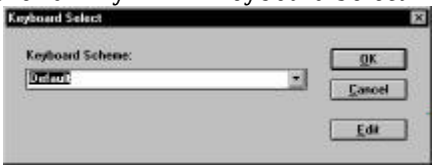
2. The following DDE settings may be changed:
   - Enable Dynamic Data Exchange
     This checkbox controls whether TinyTERM accepts requests for DDE conversations.
   - TinyTERM server name
     This edit field changes the name used by a DDE client to request a DDE conversation with TinyTERM.
   - Request timeout
     This edit field sets the number of seconds TinyTERM waits for a Request reply before it times out and displays an error.

3. To accept the new settings, press ENTER.
   Or click on the OK Button.
   To reject the new settings, press ESC.
   Or click on the Cancel Button.

Modifying your keyboard mappings

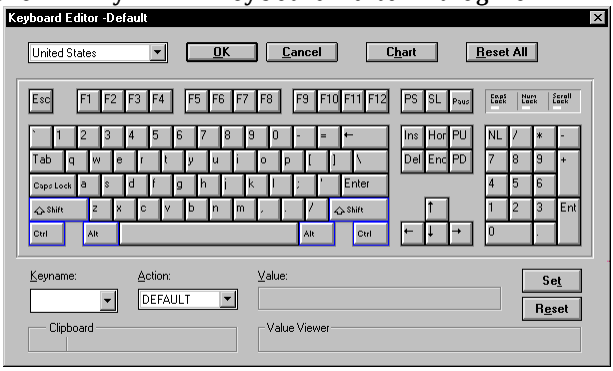
1. Select Main Menu | Configure | Keyboard or click on the Keyboard Setup Button on the default Ribbon Bar.
   The Keyboard Select dialog box appears:

Figure 16 TinyTERM Keyboard Select Dialog Box



2. Select the keyboard scheme that you wish to edit or load.
   To load the keyboard scheme and have the key mappings take effect, click the OK button.
   To close the Keyboard Select dialog without selecting a keyboard, click the Cancel button.
   To edit an existing keyboard scheme, click the Edit button. If you wish to create a new keyboard scheme, type a description in the Keyboard Scheme edit field and click the Edit button.
   The Keyboard Editor dialog box appears:

Figure 17 TinyTERM Keyboard Editor Dialog Box

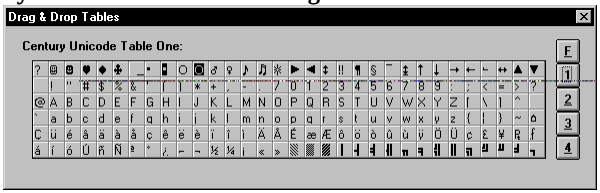


3. The keyboard editor controls and buttons are as follows:
   - The Keyboard pop-up list box
     This field selects the default keyboard that you wish to remap. The displayed keyboard will change to match the selected keyboard type.
   - The OK button
     Click this button to exit the keyboard mapper.

     If keyboard settings have been changed, you will be asked if you would like to save your new settings. Click Yes to save settings, No to discard settings, or Cancel to return to the editor.

     If keyboard settings have been changed, you will be asked if you want your new settings to take effect immediately. Click the Yes button to have the settings take effect immediately, No to maintain the current keyboard settings, or Cancel to return to the editor.
   - The Cancel button
     Click this button to exit the keyboard editor and discard all changes.
   - The Chart button
     Clicking this button opens the TCS chart.

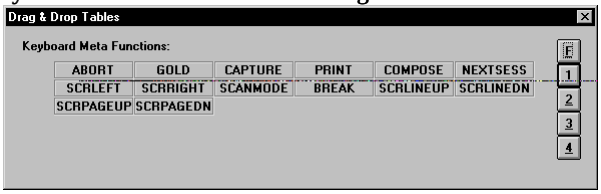
Figure 18 TinyTERM TCS ChartDialog Box



Characters from the chart can be dragged to the keyboard editor and dropped on a key to remap the key value. Each 'page' of the TCS chart can be viewed by clicking the buttons labeled 1, 2, 3, and 4 on the right side of the chart.

The TinyTERM Functions chart can be displayed by clicking the "F" button. TinyTERM functions can be dragged from this chart to any key in the keyboard editor:

Figure 19 TinyTERM Function ChartDialog Box



- The Reset All button
  Clicking this button resets all key values to the TinyTERM default setting.
- The Keyboard
  All 'keys' on the keyboard accept several actions:

  Any key can be 'dragged' and 'dropped' on any other key to change the destination key to send the sequence of the source key. The label on the destination key will change to the new value and the font will be bold to show that the key has been changed.

  Any character from the chart can be dropped on any key to remap the destination key to the chart value. The label on the destination key will change to the new value and the font will be bold to show that the key has been changed.

  Any key can be clicked on and the keyname will appear in the Keyname list box for manual editing.

  If the ALT, SHIFT, or CTRL keys are clicked, the keyboard will redraw to display the keys modified by the ALT, SHIFT, or CTRL keys. Combinations of SHIFT and CTRL can be used. Keys that do not display a value do not have default key mappings.
- The Keyname pop-up list box
  This field allows selection of a keyname to be mapped.
- The Action pup-up list box
  This field lists the action associated with the selected key.

  RESET indicates that the selected key is set to the default value.

  MACRO indicates that the key is mapped to send a string, is mapped to a different TinyTERM Character Set value, or set to a TinyTERM function. The value is displayed in the Value edit box.
- The Value Edit box
  This edit box displays the value of a current key mapping. The contents of the box can be changed to the desired value for the selected key.
- The Set button
  Sets the value in the Value Edit box to the selected key.
- The Reset button
  Clicking this button resets the selected key to the default value.

- The Clipboard

  The clipboard is a temporary holding area for keys and values. Use the clipboard to drag keys and values from modified keys (ALT, SHIFT, CTRL) to unmodified keys and vice versa.

  Values or keys can be dragged to the clipboard, then dragged to any other key or value.

  Keys can be dragged to and from the left section of the clipboard, mappings and values can be dragged to and from the right section of the clipboard.
- The Value Viewer text box

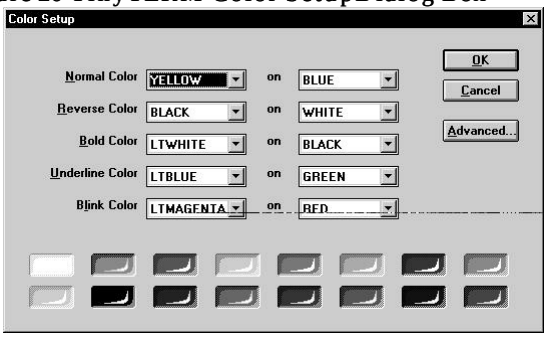
  Keys and Values dropped in the Value Viewer text box will be appended to the value in the Value edit box. This is useful for building long strings and values.

Changing your color settings

1. Select Main Menu | Configure | Color or click on the Color Setup button on the default Ribbon Bar.

   The Color Setup dialog box appears:

Figure 20 TinyTERM Color Setup Dialog Box



2. From this screen, colors for the 5 basic attributes can be customized. Each option allows you to define one of 16 foreground colors and one of 8 background colors. The attributes which can be set are:
   - Normal Color
   - Reverse Color

     If DEFAULT is selected, reverse characters are displayed in the reverse colors of the Normal Color.

- Bold Color
  If DEFAULT is selected, bold characters are displayed in the high intensity color of the foreground Normal Color.
- Underline Color
  If DEFAULT is selected, underline characters are displayed underlined.
- Blink Color

To assign colors to these attributes:

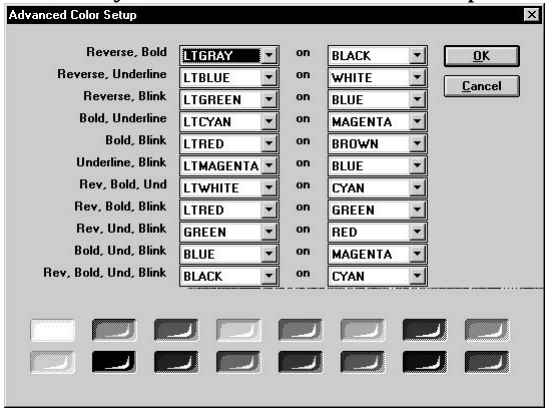
- Click on the down arrow next to the listbox containing the color you want changed. A list of valid color choices will be displayed. Select the desired color;
  or
- Drag a color from one of the paint pots into the listbox containing the color you want changed. All sixteen colors are valid for a foreground color. Only the bottom row of paint pots, the dark hues, are valid choices for a background color.

3. To accept the new settings, press ENTER.
   Or click on the OK Button.
   To reject the new settings, press ESC.
   Or click on the Cancel Button.

Changing your advanced color settings

1. From the Color Setup dialog box, click the Advanced button.
   The Advanced Color Setup dialog box appears:

Figure 21 TinyTERM Advanced Color Setup Dialog Box

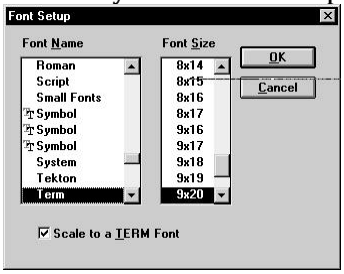


2. Colors for 11 permutations of attribute handling schemes are available. To assign colors to these attributes:
   - Click on the down arrow next to the listbox containing the color you want changed. A list of valid color choices will be displayed. Select the desired color;
     or
   - Drag a color from one of the paint pots into the listbox containing the color you want changed. All sixteen colors are valid for a foreground color. Only the bottom row of paint pots, the dark hues, are valid choices for a background color.
3. To accept the new settings, press ENTER.
   Or click on the OK Button.
   To reject the new settings, press ESC.
   Or click on the Cancel Button.

Modifying your font settings

1. Select Main Menu | Configure | Fonts.
   The Font Setup dialog box appears:

Figure 22 TinyTERM Font Setup Dialog Box



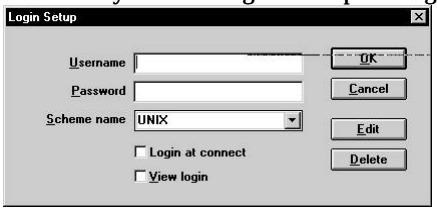
2. The Font Name box lists the Windows fonts available on your computer. Click on an item to make a selection.
3. The Font Size box lists the sizes supported by the font listed in the Font Name box. Click on an item to make a selection.
4. If the "Scale to a TinyTERM" Font is selected, TinyTERM automatically scales the current font to display a standard 80x24 or 80x25 character screen in the current window size. If a 132 column mode sequence is received, the font will adjust to the size of the Window.

5. To accept the new settings, press ENTER.
   Or click on the OK Button.
   To reject the new settings, press ESC.
   Or click on the Cancel Button.

Changing your login settings

1. Select Main Menu | Configure | Login .
   The Login Setupdialog box appears:

Figure 23 TinyTERM Login SetupDialog Box



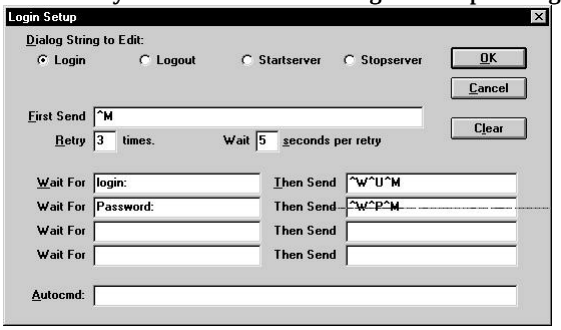
2. Options available include:
   - Username
     This field should contain the response required by your remote system's "login" prompt.
   - Password
     This field should contain the response required by your remote system's "password" prompt. The contents of this field are automatically encrypted.
   - Scheme name
     Click on the down arrow to display options. This pop up field determines which scheme name is executed.
   - Login at connect
     This checkbox controls whether TinyTERM performs an auto-login or simply loads the username and password information. If checked, the login information will be used every time a connection is made. If unchecked, the username, password, and login type information is stored in memory.
   - View login
     This checkbox controls whether TinyTERM displays the login sequences to the screen. If checked, all login dialog information will be displayed in the emulator window. If unchecked, TinyTERM will perform a silent login.
   - Delete button
     Removes the currently selected login scheme from the login type database.

3. To accept the new settings, press ENTER.
   Or click on the OK Button.
   To reject the new settings, press ESC.
   Or click on the Cancel Button.

Changing your advanced login settings

1. From the Login Setup dialog box, click the Edit button.
   The Advanced Login Setup dialog box appears:

Figure 24 TinyTERM Advanced Login Setup Dialog Box



2. Options available include:
   - Dialog String to Edit
     These radio buttons determine which string within the chosen scheme to edit.
   - First Send
     This is a connection initialization string. Some systems may require a carriage return or break sequence before they respond with a login. Place any preliminary transmissions in this field.
   - Retry *n* times
     "*n*" is the number of times TinyTERM attempts to log in before reporting a login failure.
   - Wait *n* seconds per retry
     This is the number of seconds to wait for each "Wait For" string before timing out and beginning the next retry.

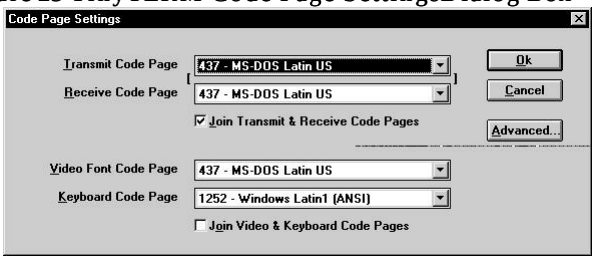
- Wait For/Then Send
  These are paired fields that conduct a dialogue with a remote system during auto login. Generally the user must wait for the login string from the remote system and reply with the username, and repeat the same sequence of waiting and answering for the password. TinyTERM will automate this process by using a dialog string created here. TinyTERM will sequentially "Wait For" and "Then Send" the strings entered in these fields.
- Autocmd
  This edit field contains the filename of a script command file to automatically execute after logging in.
- Clear button
  Clears all values from the fields.

3. To accept the new settings, press ENTER.
   Or click on the OK Button.
   To reject the new settings, press ESC.
   Or click on the Cancel Button.

Modifying your code page settings

1. Select Main Menu | Configure | Code Page.
   The Code Page Settings dialog box appears:

Figure 25 TinyTERM Code Page Settings Dialog Box



2. There are four code page fields that can be changed:
   - Transmit Code Page
     This field contains the code page setting for all communications sent from TinyTERM to the remote host. This field should correspond with the code page of the application on the remote host.
   - Receive Code Page
     This field contains the code page setting for all communications received from a remote host. This field should correspond with the code page of the application on the remote host.

- Join Transmit & Receive Code Pages
  If checked, both transmit and receive code pages will be set to the value of Transmit Code Page. If Transmit Code Page is changed, both fields will change.

- Video Font Code Page
  This field contains the code page used in the video font being used by TinyTERM. If this field is changed, you most likely will need to change the font used by TinyTERM to a font based on the selected code page.
- Keyboard Code Page
  This field contains the code page used by the keyboard. If a keyboard driver is being used, set this field to match the code page used by the driver.

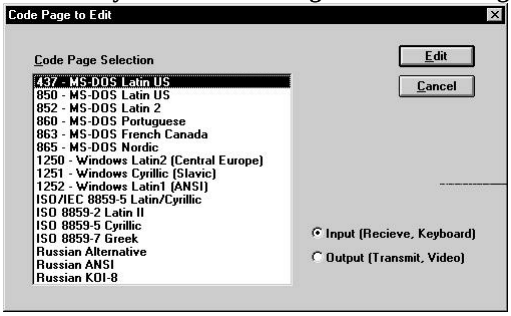
  - Join Video & Keyboard Code Pages
    If Checked, both Video and Keyboard code pages will be set to the value of Video Font Code Page. If Video Font Code Page is changed, both fields will change.

3. To accept and save the new settings, press ENTER.
   Or click on the Save Button.
   To reject the new settings, press ESC.
   Or click on the Cancel Button.

Changing your advanced code page settings

1. From the Code Page Settings dialog box, click the Advanced button.
   The Code Page to Edit dialog box appears:

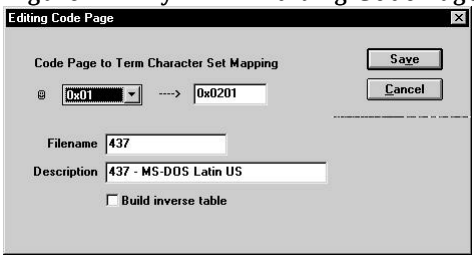
Figure 26 TinyTERM Code Page to Edit Dialog Box



2. In the Code Page Selection list box, select the code page that you wish to edit.
   Input (Receive and Keyboard) code pages may be selected by clicking the Input Radio button.
   Output (Transmit and Video) code pages may be selected by clicking the Output radial button.
3. To Edit the code page, press ENTER, or click the Edit button.
   To return to the Code Page Setting Dialog without editing, press ESC or click the Cancel button.

If Edit is selected from the Code Page to Edit dialog box, the Editing Code Page dialog box appears:

Figure 27 TinyTERM Editing Code Page Dialog Box



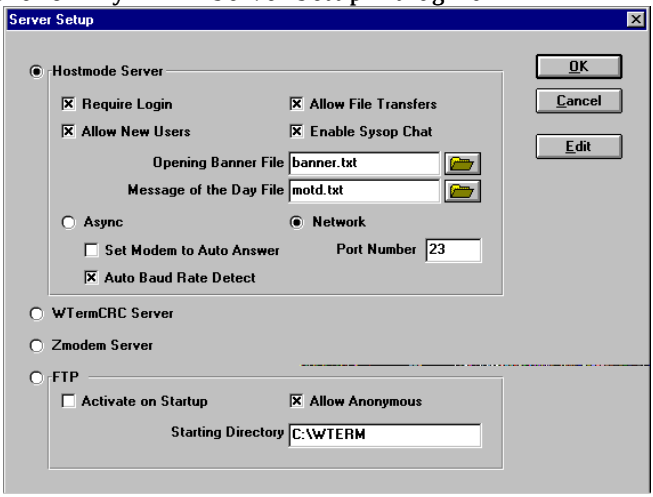
1. To change a character within a code page file, select the value to edit in the pop-up list box.
   If Input code page was selected in the Code Page to Edit dialog, the pop-up list box will display the Hexadecimal values of the input code page values (0x01 through 0xFF);
   or
   If Output code page was selected in the Code Page to Edit dialog, the pop-up list box will display the TERM Character Set (TCS) values.
   The character corresponding to the pop-up list box value is displayed to the left of the pop-up list box.
2. In the Edit field, change the character value to your desired value.
   The Edit field will display the Hexadecimal value of the TCS character if editing input codes pages, or the output code page value if editing output code pages.
   The edit field corresponds to the character mapping in the output code page or the character to be displayed from the TERM Character Set. A complete listing of TCS values and glyphs is available from Century Software, Inc.

3. Enter the new filename to save your character mappings in the Filename edit box.
   This new file name will appear in the Code Page settings dialog box as a choice in the Code Page settings fields.
4. Enter a description of your code page mappings in the Description edit field.
5. If the Build inverse table check box is checked, an inverse code page mapping will be created for input code pages if output pages were edited, or for output code pages if input pages were edited.
6. To accept and save the new settings, press ENTER.
   Or click on the Save Button.
   To reject the new settings, press ESC.
   Or click on the Cancel Button.

Changing your server settings

Select Main Menu | Configure Server.
The Server Setup dialog box appears:

Figure 28 TinyTERM Server Setup Dialog Box



Options available include:

- HostmodeServer
  Selecting this button enables TinyTERM to function as a host machine, similar in many ways to a BBS. Options which affect hostmode are:

  Require Login
  This checkbox determines if a login requirement exists. If checked, a username MUST be provided in order to login. If unchecked, connection does not require any sort of login.

  Allow New Users
  This checkbox determines whether unrecognized login names are accepted or rejected. If checked, any login name entered that does not exist in the hostmode user list will be added as a new user. If unchecked, only the names within the hostmode user list will be valid login names.

  Allow File Transfers
  This checkbox determines if file transfers can be performed. If checked, file transfers are permitted. If unchecked, no file transfers can occur.

  Enable Sysop Chat
  This checkbox determines whether the Sysop is available to be paged for chat. If checked, the Sysop chat function is available. If unchecked, the Sysop chat function is disabled.

  Opening Banner File
  This edit field provides the name of a text file to display when a successful connection is made. Either type the file name if the pathname is known, or press the Browse button to determine the correct name.

  Message of the Day File
  This edit field provides the name of a text file to use for the message of the day. Either type the file name if the pathname is known, or press the Browse button to determine the correct name.

  Async
  Select this radial button to place hostmode in asynchronous ready mode.

  Network
  Select this radial button to place hostmode in network ready mode.

- WTERMCRC Server
  Selecting this button enables TinyTERM to accept remote commands from another WTERMCRC capable product.
- Zmodem Server
  Selecting this button enables TinyTERM to accept remote commands from another Zmodem capable product.

- FTP

  Selecting this server option allows the use of the FTP options as described in the *Transfer Files* option described on page 32. There are several options available when this selection is marked:

  Activate on Startup-This option allows FTP to execute automatically when TinyTERM is started.

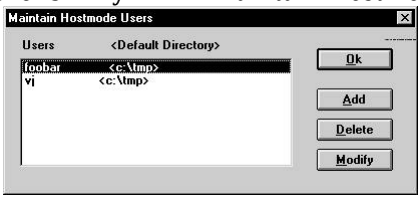
  Allow Anonymous Login allows clients to enter the server without a password.

  Starting Directory-type the directory that should be accessed when the connection is made either manually or automatically.

To edit the hostmode users list, select Hostmode Server and then click Edit.

The Maintain Hostmode Users dialog box appears:

Figure 29 TinyTERM Maintain Hostmode Users Dialog Box



To accept the user list, press ENTER.

Or click on the OK Button.

To delete the currently selected name, click on the Delete Button.

To add a new user, click on the Add Button.

To modify the currently selected user, click on the Modify Button.

To accept the new settings, press ENTER.

Or click on the OK Button.

To reject the new settings, press ESC.

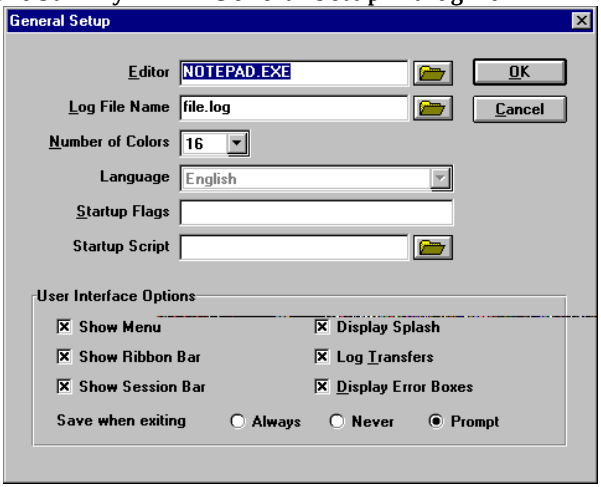
Or click on the Cancel Button.

Changing your general settings

Select Main Menu | Configure | General.

The General Setup dialog box appears:

Figure 30 TinyTERM General Setup Dialog Box



In the General Settings group, the following options can be changed:

- Editor
  This edit field defines how to execute the editor used for editing files. Provide a full pathname, if it is not in the Windows directory. Default is NOTEPAD.EXE.
- Logfile Name
  This edit field contains the name of the default logfile used by the LOG command.
- Number of Colors
  Click the down arrow to display the options for the number of allowable colors to display. For example, if your monitor can only support eight colors, 8 should be selected. Allowable values are 2, 8 and 16 colors. 2 colors gives black and white display.
- Language
  This option will determine how the keyboard entries will be displayed, as well as the language in which TinyTERM will be displayed.
- Startup Flags
  This edit field allows the user to set a number of values using options specified on the command line. This option allows you to set default options that are automatically used whenever TinyTERM is invoked.

A command option is a letter preceded by a dash (-). Multiple options can be concatenated following a single dash. For example, to omit the startup banner whenever you run TinyTERM without any other options, you would enter:

-u

The Startup Flags specified in your configuration are ignored if any startup flags are specified on the command line when starting TinyTERM.

- Startup Script
  If TinyTERM should be connected then run a specific script after connection, the pathname for the script will need to be entered in this space. If the pathname is not known for the desired script, press the Browse button to determine the correct name.
- Show Menu
  This checkbox selects whether to display the menu bar. Checked will show the menu bar. Unchecked hides the menu bar.
- Show Ribbon Bar
  This checkbox selects whether to display the ribbon bar. Checked will show the ribbon bar. Unchecked hides the ribbon bar
- Show Session Bar
  This checkbox selects whether to display the session bar. Checked will show the session bar. Unchecked hides the session bar
- Display Splash
  This checkbox selects whether to display the splash screen on startup. Checked willshow the splash screen. Unchecked suppresses the splash screen.
- Log Transfers
  This checkbox selects whether to automatically log the results of all file transfers. Checked will automatically log file transfers as they are performed.
- Display Error Boxes
  Selects whether to display error boxes when errors occur. If checked, error boxes will display for user interaction. If unchecked, errors will be reported on the terminal screen.

- Save When Exiting

  If the settings should be saved without a prompt when exiting, click the “Always” radio button. If the settings should never be saved when exiting TinyTERM, click the “Never” radial button. If the option should be given when exiting TinyTERM to save the entered settings, click the “Prompt” radial button.

To accept the new settings, press ENTER.

Or click on the OK Button.

To reject the new settings, press ESC.

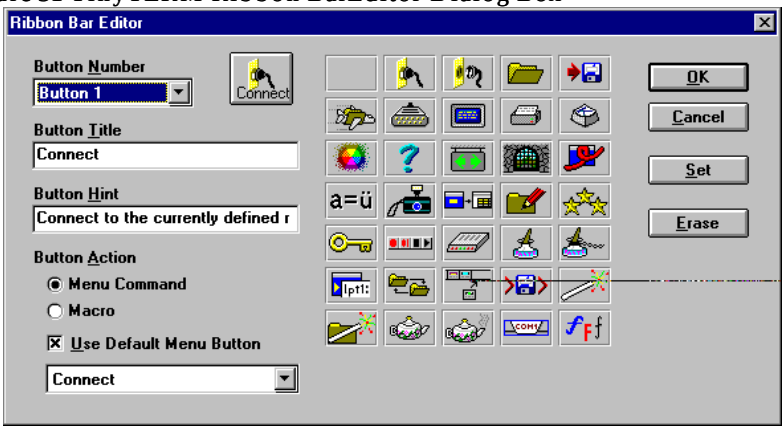
Or click on the Cancel Button.

Customizing your ribbon bar

Select Main Menu | Configure Ribbon Bar

The Ribbon Bar Editor dialog box appears:

Figure 31 TinyTERM Ribbon Bar Editor Dialog Box



Options available include:

- Button Number

  This field determines which number button is being edited. To change the associated picture, click on any of the bitmaps to the right of this field.
- Button Title

  This edit field contains the name of the button to display on the ribbon bar.
- Button Hint

  This edit field contains the ToolTip to be associated with this button.

- Button Action
  These radio buttons determine what function is assigned to this button. The options are:
  - Menu Command
    Selecting this option places a list of valid TinyTERM commands into the list box. If the Use Default Menu Button is checked, the bitmap that corresponds to this command will be selected for you.
  - Macro
    Selecting this option places a list of macro files within the current directory into the list box.
- Set button
  Click this button to assign current settings to the selected button number.
- Erase button
  Click this button to delete this button from the menu bar.

To accept the new settings, press ENTER.
Or click on the OK Button.
To reject the new settings, press ESC.
Or click on the Cancel Button.

Saving Your New Settings

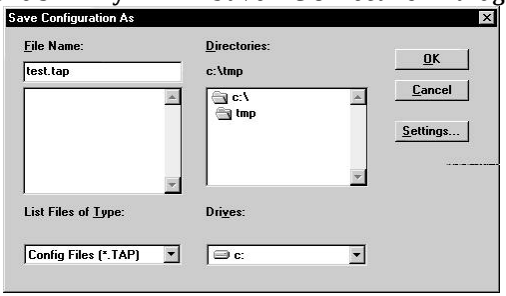
Changes made during a session are only in effect for the duration of that session unless you save them. Saving the session configuration will allow all of TinyTERM's settings to be used again. These settings will be placed in a TERM Application Profile.

To save a new configuration

Select Main Menu | File | Save ICONect As

The Save ICONect As dialog box appears:

Figure 32 TinyTERM Save ICONect As Dialog Box



Select the appropriate drive and directory.

Choose the appropriate filename.

- In filename, type the name of the file you want to save. TinyTERM will automatically add the .TAP extension.

  Or
- Select the appropriate filename appearing in the listbox.

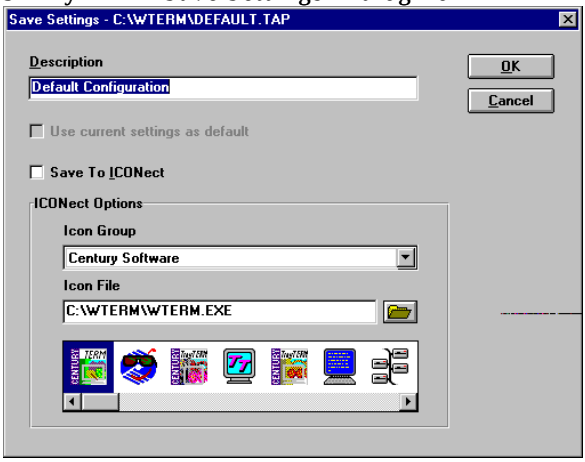
To accept the filename and save, press ENTER.

Or click the OK button.

To change current file settings, click on the Settings button.

The Save Settings dialog box appears:

Figure 33 TinyTERM Save Settings Dialog Box



The Description edit field contains the description of the file to be saved. This also determines the name of the icon created, if any.

The Use current settings as default checkbox determines whether the default.tap file should be affected by this file. If checked, the current settings will be saved in both the selected configuration file and the default.tap file. If unchecked, only the selected configuration file will be saved.

The Save to ICONect checkbox determines whether a new icon should be created for this configuration file. If checked, an icon will be created for this configuration file. If unchecked, the file will be saved, but no icon will be created.

The Icon Group list box sets the Program Manager group in which to place the newly created icon.

The Icon File is the filename containing the icon to assign. Click the Browse button to bring up a standard file dialog with which to select the file. All icons located within the chosen file are arranged within the icon browser.

The Summary button brings up a dialog which allows entry of detailed information about the TAP file. Items include author, date, subject, version, e-mail, and description.

To accept the settings, press ENTER.
Or click the OK button.
To reject the settings, press ESC.
Or click the Cancel button.
To exit without saving, press ESC.
Or click the Cancel button.

To save a defined configuration

1. Select Main Menu | Save ICONeor click the Save button on the default Ribbon Bar
   The current configuration file will be saved with current settings.

To exit TinyTERM

1. Select Main Menu | File | Exit or click on the Exit Button on the default Ribbon Bar
   - If changes were made to the configuration the “Save Settings on Exit” dialog box may be displayed. If the option is not given to save the changes in the configuration, check the “Save When Exiting” radio buttons in the General Settings. Detailed instructions can be found beginning on page 58.
     Press Y, or click on the Yes Button to save current settings. The system configuration file will be updated. Press N, or click on the No button to discard any changes. Press C, or click the Cancel button to return to TinyTERM.
   - If you have not made any changes to your configuration, the Exit dialog box will appear.
     Press Y, or click on the Yes Button to quit to the Windows Program Manager. Press N, or click on the No Button to return to TinyTERM.

Advanced Configuration

In This Section:

TinyTERM System Files

TinyTERM distributes its system setup, startup, connection, and exit functions into two files, located in the TinyTERM install directory. This division of labor allows for very flexible system and connection configurations. TinyTERM's startup files include the following files:

DEFAULT.TAP

This file contains TinyTERM's system configuration and session default settings. The *default.tap* file is created and changed by options under the Configure menu, and should not be modified directly. This file is an ASCII text file containing TinyTERM script commands.

WTERM.EX/WTERM32.EX

This file contains custom shutdown commands. This file can be created by the user. This file is an ASCII text file containing TinyTERM script commands.

TinyTERM uses the following startup outline:

1. Load *default.tap*.
2. Load *.tap* file from command line.
3. Load dash options from the command line.
4. Execute the Script file from the command line if specified.

5. Establish a connection from the *.tap* file and dash options information.
6. Execute the AUTOCMD script from the *.tap* file, if one exists.

TinyTERM uses the following shutdown outline:

1. Execute the *WTERM.EX/WTERM32.EX* file, if one exists.
2. Close sessions and user interface.
3. Close capture and print files.
4. Exit to the Program Manager.

Quoted strings

Most of TinyTERM's edit fields support special characters. A string may contain any alphanumeric character (a..z and/or 0..9) as well as the following special macro values:

\r	carriage return (\x0D)
\n	line feed (\x0A)
\t	horizontal tab (\x09)
\v	vertical tab (\x0B)
\f	form feed (\x0C)
\b	backspace (\x08)
\e	escape (\x1B)
\^	carat (\x5E)
\\	backslash (\x5C)
\"	double quote (\x22)
\'	single quote (\x27)
\-	dash (\x2D)
\x	hex value follows
\0..\7	octal value follows

TinyTERM Environment Variables

Environment variables can be used to modify the operation of TinyTERM and are defined using the DOS SET command. For example,

```
C:>\ SET HOME=C:\MYDIR
```

defines the HOME variable. For a list of current environment variables, type SET without any options.

HOME

If this variable is set, it will override the default search path when checking for the **.tap* file.

TERMRC

This variable is the full pathname of TinyTERM's user runtime command startup file, which is always executed after the **.tap* file. This file is normally named *WTERM.RC/WTERM32.RC*.

USER

This variable determines what login name is used in an rlogin network connection. If this variable is not set, TinyTERM uses root as the login name.

Serial and Modem Connections

In This Section:

Direct Connections

TinyTERM can be used to directly connect the PC to a multi-user system (usually UNIX). A direct connection requires a properly made cable to connect the serial port on the PC to a serial port on a multi-user host system. This cable is known as an RS-232 or serial cable. See *The RS-232 Standard* later in this section.

Modem Connections

TinyTERM now provides automatic Hayes modem access. This means that TinyTERM can be allowed to provide the default Hayes-compatible modem command codes to perform functions such as dialing and hanging up. Common Hayes commands (also called the AT command set) are listed on the next page. These commands allow the manual entry of initialization strings to enhance speed and performance when dialing out and connecting to a remote computer via modem.

Establishing Modem Connections Manually

In order to communicate with a remote host computer through a modem, first communication must be established with the modem and command it to dial. If using a 100% Hayes compatible modem, the procedure for connecting will look like this:

1. Start *TinyTERM* and enter terminal mode by pressing .
2. Type AT↵. If the modem is connected properly, "OK" or "0" will be displayed (depending on the setting of the V command for the modem). A response from the modem verifies that the connection between the terminal and the modem is correct.

If there is no response from the modem, make sure the modem is communicating by typing ATQ0↵. If there is still no response, check the cabling and port.

3. Type ATDT1-800-555-1212↵ to dial the phone. If near the modem, listen for a dial tone and dialing (depending on the setting of the M command on the modem).
4. Upon connection to the remote computer, the message "CONNECT" will be displayed. At this point, connection is made and communication with the remote host should be established.
5. To disconnect from the remote host, type +++. This will get the modem's attention and allow a hangup command.
6. Type ATH0↵. This causes the modem to disconnect the phone line.

The above is a basic example. The specific connection may require additional commands. See the modem documentation for more specific details.

Modem switch settings

While the Hayes dialer protocol has become the de-facto industry standard, the way to set default "switch settings" vary greatly. External modems generally have a set of switches that control various modem defaults. Internal modems will either have these switches physically on the card or programmable from the operating system. Whichever way the modem is configured, the following table lists the required settings for correct operation with *TinyTERM*.

Table 4 Modem Switch Settings

Switch	Setting
Verbose	verbose replies
Quiet	send resultcodes
Echo	no character echo
DCD	respond to DCD
Line	RJ11 single line
CmdRec	the modem should listen to commands
AT Set	use Hayes command set

Common modem commands

The following table is provided as a convenience. For a complete list of commands compatible with the modem, please refer to the modem manual.

Table 5 Common Hayes Modem Commands

Prefix	Function
AT	Attention code. This must precede all commands except A/ and +++.

Command	Function
A	Force answer mode command. The modem will answer the phone even if it has not received a call.
A/	Re-execute command. This executes the last command sent to the modem. This does not require the AT prefix.
D	Dial command. This command places the modem in originate mode and then dials the dialing string that follows.
H0	Hang up command. This disconnects from the phone line.
M	Speaker status. M0 turns the speaker off. M1 turns the speaker on until a connection is established.
P	Pulse dialing command. This command causes the modem to use pulse dialing.
Q	Result-code display command. Q0 causes the modem to display the results of the commands sent to it. For example, OK = Command executed, RING = Ring signal detected. For further result codes, see the modem documentation. Q1 causes your modem not to display the results.
S0	Auto-answer command. This commands sets the number of rings to wait before answering the phone. S0=0 will cause the modem not to answer the phone. S0=1 will cause the modem to answer the phone on the first ring.

T	Tone dialing command. This command causes the modem to use touch-tone dialing.

Table 6 Common Hayes Modem Commands (continued)

Command	Function
V	Result-code form command. V0 causes results to be displayed numerically. For example, 0 = OK, 2 = RING. V1 causes the results to be displayed in verbal (English) form.
Z	Resets the modem and restores all default values.
+++	Escape command. This command sets the modem off-line so commands can be issued to it. This command does not require the AT prefix.
&F	Factory reset command. This command restores the modem to its initial factory settings.
&W	Write configuration. If the modem supports nonvolatile RAM, this command will save the current configuration.

The RS-232 Standard

The type of cables required for directly connecting two computers or connecting a computer and a modem are defined by the Electrical Institute of America's RS-232 standard. Just about every computer has one or more RS-232 connectors (usually referred to as serial ports). However, the RS-232 standard is very broad, so these ports are not configured identically on all systems.

RS-232 was originally designed for communications between terminals and modems. These two types of equipment are referred to in the standard as data terminal equipment (DTE) and data communications equipment (DCE). Most (but not all) computers are DTE. Terminals are always DTE. Modems are always DCE. Usually, a serial port on a DTE uses a 25-pin male connector, while a serial port on a DCE uses a 25-pin female connector.

Most of the wires in the cable are defined as control lines. Only two of the wires (those connected to pins 2 and 3) are actually used for data transmission. DTE sends out data on pin 2, and DCE expects to receive it there. DCE sends out data on pin 3, and DTE expects to receive it there.

If making a connection directly between DTE and DCE, as expected by the RS-232 standard, then use a *straight-through* RS-232 cable. However, to establish a direct connection between two computers with DTE ports, then a *null modem* cable must be used, in which the wires connecting pins 2 and 3 are crossed. This

type of cable forces the two DTE connections into accepting one as a DCE connection.

Both straight-through and null modem cables are widely available. These cables should be available from the system manufacturer or at most computer or electronics stores.

There are several complications: most computer manufacturers configure the serial ports on their computers as DTE ports; however some configure them as DCE. Furthermore, some manufacturers use female connectors for DTE ports, or male connectors for DCE. In addition, to save space on crowded boards, many manufacturers have adopted a more compact 9-pin connector in place of the standard 25-pin connector.

As a general rule, if the system manufacturer provides standard modem cables for use with the system, *TinyTERM* will run correctly with them.

RS-232 cables consist of up to 25 wires, each with a specific function, and each intended to carry a different signal. Only two of the wires are commonly used for data transmission; the rest are used for various kinds of control signals.

A piece of equipment (a computer or a modem) sends a signal across the cable by applying a small positive or negative voltage to a specific pin in the cable's end connector. The signal is carried through the wires in the cable to the corresponding pin at the other end, where it is detected by another piece of equipment. The voltage may either be held high (positive) as a go-ahead signal, or may pulse quickly to convey data, with the sequence of negative and positive voltages being interpreted as binary codes.

Unfortunately, as it has now come to be applied, the RS-232 standard is rather broad, and leaves a lot up to the equipment manufacturer. All that is standard is the function of each of the 25 pins found in the connectors on each end of a serial cable. All 25 pins are rarely used. Instead, different pieces of equipment require different signals to operate. To make things even more complicated, connectors with only 9 pins are becoming increasingly common.

In this section, an assumption is made of using a standard 25-pin connector. The pinouts for the 9-pin connector used on the IBM PC/AT are listed later in the section.

If all of the equipment is purchased from a single manufacturer, the exact cables needed to connect the various pieces should also be available from this source. If the hardware is mix and match, the cables will probably have to be built internally.

For more authoritative treatments of RS-232 and serial communications in general, we recommend *Technical Aspects of Data Communications* by John McNamara (Digital Press, 1982), and *C Programmer's Guide to Data Communications* by Joe Campbell (Sams, 1987).

RS-232 signals

Many of the signals defined by the RS-232 standard are rarely used. The following table lists the signals that are important for the present purposes.

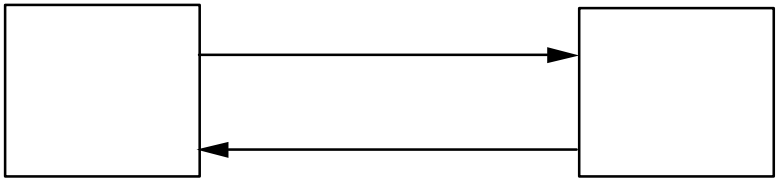
Table 7 RS-232 Signals

Pin #	Function	Direction DTE/DCE
1	Frame Ground	⇔
2	Transmit Data (TxD)	⇒
3	Receive Data (RxD)	⇐
4	Request to Send (RTS)	⇒
5	Clear to Send (CTS)	⇐
6	Data Set Ready (DSR)	⇐
7	Signal Ground (GND)	⇔
8	Data Carrier Detect (DCD)	⇐
20	Data Terminal Ready (DTR)	⇒
22	Ring Indicator (RI)	⇐

Data transmission

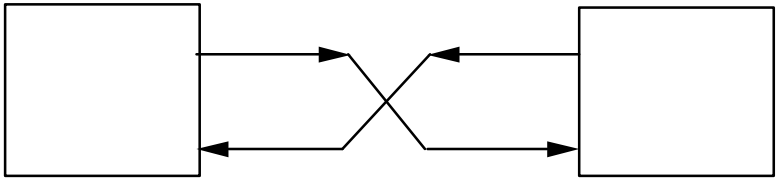
Only two of the 25 pins are used for data transmission. The standard also calls for secondary transmit and receive lines, but they are rarely implemented. Pin 2 is defined as Transmit Data and pin 3 is defined as Receive Data.
Since DTE uses pin 2 to transmit data and pin 3 to receive it, and DCE does the reverse, connecting a terminal or computer to a modem or printer (DTE to DCE) requires a straight-through connection, as shown here.

Figure 34 DTE to DCE Connection



To make a connection between two computers (DTE to DTE), a cable is required with lines 2 and 3 crossed; this is called a null modem or modem eliminator cable.

Figure 35 DTE to DTE Connection



Pin 1 is a safety ground, and should be connected at one end (the host end of a computer-modem connection, or either end of a direct link between two computers) and left unconnected at the opposite end of the cable. In a proper RS-232 implementation, pin 1 of the port is connected internally to the frame ground of the system.

Pin 7 is the signal ground. It provides the reference voltage against which other signals are measured. It should be connected straight through.

A pin is said to be asserted when a voltage greater than ± 3 volts (relative to signal ground) is present on the pin. On the data lines, a voltage more negative than -3 volts is considered a binary 1, and a voltage more positive than +3 volts is considered a binary 0. (Serial drivers usually assert voltages of ± 5 volts to allow 2 volts of noise margin.)

On the control lines, a positive voltage is considered the on state, and a negative voltage is considered off. This is the direct opposite of the case for the data lines. If it is not known whether a device is DTE or DCE, measure the voltage on pins 2 and 3. The transmitter should always have a negative voltage, even when idle. If pin 2 is negative, the device is DTE. If pin 3 is negative, the device is DCE.

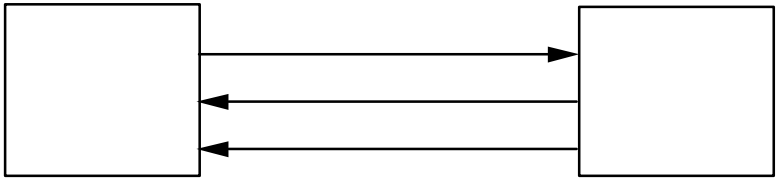
Hardware handshaking

The remainder of the RS-232 lines are control lines. Some types of equipment (including modems) aren't happy just to receive a stream of data. They need to feel more in control through a process called handshaking. In handshaking, some preliminary communication between the two pieces of equipment must take place before data can be sent.

Let's consider what type of handshaking might be necessary between a computer and a modem in order to dial up another computer system. First of all, on an outgoing call, the computer needs to know that the modem is available to make the call. Then the modem needs to tell the computer that it has made a connection.

A computer (DTE) asserts pin 20 (Data Terminal Ready or DTR) to show that it is ready. A modem (DCE) asserts pin 6 (Data Set Ready or DSR). When the modem makes a connection with another modem on the other end, it asserts pin 8 (Data Carrier Detect or DCD) to let the computer know that a connection has been established. These voltages usually remain high during the entire transmission.

Figure 36 Usage of DTR, DSR and DCD



If the voltage on pin 20 drops, it tells the modem that the computer is unable to continue transmission, perhaps because it is down. The modem will hang up the phone if a call is in progress. If the voltage on pin 8 drops, it tells the computer that the modem no longer has a connection. In both cases, these pins give a simple yes/no report on the state of the transmission. This form of handshaking is sometimes referred to as modem control.

There is a further level of handshaking that is used to control the rate of data transmission. When transmitting large amounts of data at high speed, it is possible that one end of a link may try to send data faster than the other can receive it. To keep this from happening, there is a flow-control handshake that allows either end to prevent the other from sending any more data until it gets the go-ahead.

When a DTE device is ready to send data, it asserts pin 4 (Request to Send or RTS). If the DCE is ready to receive it, it gives the go ahead by asserting pin 5 (Clear to Send or CTS). Data transmission then begins. If the voltage on CTS drops at any time, this tells the sending system that the receiver isn't ready for more data. Since this flow control handshake is implemented in the serial port hardware, it is considerably more efficient and reliable than the CTRL S/CTRL Q (XON/XOFF) handshake that can be performed in software.

If both types of handshaking are used, the entire conversation between computer and modem might look like this (where a plus sign signifies raising the voltage on the line, and a minus sign signifies dropping the voltage):

Table 8 Conversation Between Computer and Modem

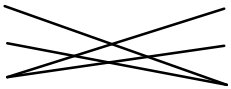
Device	Signal	Meaning
Computer	DTR+	I want to call another system. Are you ready?
Modem	DSR+	Yes, I'm ready. Go ahead and dial.
Modem	DCD+	I've got your party, sir.
Computer	RTS+	Can I send data now?
Modem	CTS+	Sure. Go ahead.
Computer	TxD...	Data sent out.
Modem	...RxD	Data Received. Previous four steps may be repeated, with either device in the sending role.
Computer	DTR-	I'm done. Please hang up.
Modem	DCD-	Whatever you say.

All of the above sounds good in theory, but in practice it will not always work. Connecting a computer to a modem is generally easy, since a DTE to DCE connection is what RS-232 was made for. A straight-through cable connecting pins 1 through 8 and 20 (or all 25 pins) will usually do the trick.

Things can get quite a bit more complicated for a direct connection between two computers. Just as the function of pins 2 and 3 is asymmetrical between DTE and DCE devices, so too is the function of pins 6, 8 and 20. A DTE device (a computer or terminal) asserts DTR (pin 20) and expects to receive DSR (pin 6) and DCD (Data Carrier Detect). A DCE device (a modem) asserts DSR and DCD and expects to receive DTR. If two DTE devices are connected with a straight-through cable, no handshaking can occur.

To get around the handshaking problem, a null modem cable can cross some of the control lines as well as the data lines.

Figure 37 Basic DTE Null Modem Handshaking

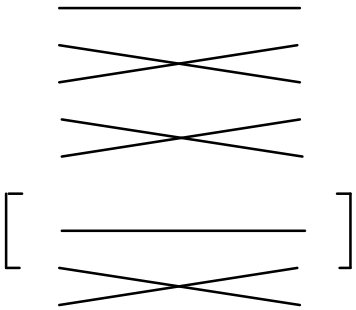


This allows DTR (pin 20) on each DTE interface to drive both DSR (pin 6) and pin 8 (DCD) on the other. Whenever either side asserts DTR, the other side thinks it's getting DSR and DCD.

Some publications suggest that pins 4 and 5 can be "faked out"by tying them together at each end of the cable. As a result, whenever the computer looks for a go-ahead signal, it gets it—from itself. This is really a poor practice. It will generally work if simply connecting terminals, since people can't type fast enough to ever overload the computer.

For direct connections with dependable flow control, always connect pins 4 and 5, crossed so that the two DTE interfaces will converse correctly (unless, of course, one of the two computers has a DCE interface, in which case the cable should be straight through). Here's the pinning for a full null modem cable.

Figure 38 25-Pin Null Modem Cable



This should only be done for a null modem cable, since a modem really does require the DTR/DCD handshaking signals. If using a cable like this with a modem, it will not know to hang up when the computer closes the port and drops (de-asserts) DTR.

Like all generalities, the advice given above may be insufficient. Finding the right cable can be simple and straightforward. Or it can be a seemingly hopeless task for which no one has the right advice. Be sure to read the documentation for the devices to connect. It may be difficult to translate the raw description given for each device into the information necessary to connect them to one another, but perseverence will bring success.

The use of a device called a breakout box can be invaluable when trying to build a cable. One can usually be picked up at any electronics supply store. A good breakout box is expensive, but worth the investment if building numerous cables. The breakout box allows the relatively easy rearrangement of the wires in a cable for testing purposes, and includes LEDs that display which signals are actually active at any point.

9-pin connectors

9-pin connectors are becoming increasingly common on many computers. The pins on these connectors have the same function as those on the 25-pin connector, but of course they fall in different positions. Table 5 shows the pinouts for the 9-pin connector on the IBM PC/AT. This is a DTE connector.

Table 9 9-Pin DTE Connector

Pin #	Function
1	Data Carrier Detect (DCD)
2	Receive Data (RD)
3	Transmit Data (TD)
4	Data Terminal Ready (DTR)
5	Signal Ground (GND)
6	Data Set Ready (DSR)
7	Request to Send (RTS)
8	Clear to Send (CTS)
9	Ring Indicator (RI)

Distance limits for RS-232 cables

Although the RS-232 standard imposes an official limit of 50 feet on RS-232 cables, in practice, they can be much longer. The maximum workable length is dependent on baud rate. According to McNamara (*Technical Aspects of Data Communications*, Digital Press, 1982), the following distances have been determined, as shown in Table 6:

Table 10 RS-232 Cable Distance Limits

Baud Rate	Shielded Cable	Unshielded Cable
110	5000 ft.	
	3000 ft	
300	5000 ft.	3000 ft
1200	3000 ft.	3000 ft
2400	1000 ft.	500 ft
4800	1000 ft.	250 ft
9600	250 ft.	250 ft

Network Connections

In This Section:

TinyTERM provides direct network support for:

- Beame and Whiteside BW-TCP
- FTP Software PC/TCP
- Novell LAN WorkPlace for DOS
- Microsoft LAN Manager
- Microsoft Networks
- Sun PC-NFS
- Wollongong Pathway

In addition to direct support, *TinyTERM* supports three standard network application interfaces:

- INT14h
- NetBIOS
- Windows Socket API

By supporting these standard interfaces, *TinyTERM* can be used with many other networks including:

- NetManage ChameleonNFS
- Racal Interlan
- Wollongong WIN/TCP

The following sections contain information that may be helpful in running *TinyTERM* over the network.

BAPI (Bridge Application Program Interface)

TinyTERM can connect to networks which support this type of interface. Networks which support BAPI include:

- 3Com TCP v1.2
- Hewlett Packard Arpa Services for DOS v2.0 or higher

TinyTERM uses the *bapidll.exe* executable to communicate with the network's BAPI driver. To activate *bapidll.exe*, add the following line to the [windows] section of *win.ini*:

```
[windows]
load=bapidll.exe
```

Once the *win.ini* file is changed, restart Windows to have the changes to take effect.

BIOS Interrupt 14h (INT14h) Interfaces

TinyTERM's INT14h driver can be used with any network software package which supports third party emulation programs that access the BIOS Interrupt 14h interface. Examples of network software packages supporting other emulators include:

- Eicon X.25
- Racal Interlan
- InterConnections TES
- Wollongong WIN/TCP for DOS

Using emulation software packages with INT14h networks usually involve running an INT14h redirect program before running the emulation. *TinyTERM*'s INT14h driver has been tested with the networks previously listed. However, *TinyTERM* should work with any standard BIOS Interrupt 14h interface. See network documentation for further information on using INT14h.

NetBIOS and MSNET Interfaces

NetBIOS

NetBIOS is the Network Basic Input Output System considered to be a standard interface on IBM PC and compatible systems. Select NetBIOS or LAN Manager in the Port Selection field. LAN Manager is NetBIOS with a different virtual circuits configuration. See *Virtual Circuits Configuration* for more information.

MSNET

MSNet is Microsoft's network interface. Select MS Networks, OpenNET A or OpenNET B in the Port Selection field. OpenNET A and OpenNET B are MSNet interfaces with different virtual circuit configurations. See *Virtual Circuits Configuration* for more information.

Virtual Circuits Configuration

Under Windows the following settings can be changed from Configure | Communications | Advanced.

In order to maintain maximum compatibility with NetBIOS and MSNet based networks, *TinyTERM* supports the ability to change the network port number, the virtual terminal name and the handshaking required for the VT server to grant a virtual terminal line.

While *TinyTERM* provides transports for the most common NetBIOS and MSNet networks, the network in use may require changes to the virtual circuits configuration.

The NETPORT command

The NETPORT command sets the 16th character of the NetBIOS/MSNet name. This is required in order to be granted a terminal server line.

The NETPORT command is used as follows:

NETPORT*number*

number This is the numeric digit equal to the ASCII value of the requested port number.

The NETVTNAME command

The NETVTNAME command controls the creation of the virtual terminal server name from the name passed to *TinyTERM*. This is required in order to be granted a terminal server line.

The NETVTNAME command is used as follows:

NETVTNAME *"string"*

string This is the coded virtual terminal name. %s is used to match the user specified name. For example, "%s.VT" means take the user specified node name and follow it with a ".VT" to create the virtual terminal server name for the MSNet/NetBIOS call command.

The NETDIALOG command

The NETDIALOG command controls the handshaking required after the MSNet/NetBIOS call command completes in order for the VT server to grant a virtual terminal line.

The NETDIALOG command is used as follows:

NETDIALOG *"string"*

string This is the handshaking string which determines what is sent and what is expected to be received. This string supports the following:

^B	Send a break character.
^F	Clear the receive character buffer before proceeding.
^K	Send the next character as a Control character. For example to send a Control B instead of a break character, use "^KB".
^S	*TinyTERM* waits for the characters between each ^S before continuing with the string.
^W	Wait one second before processing the rest of the string.
^Z	Send a null character.

The NETNAME command

The NETNAME command sets the local LAN adapter name for MSNET/NetBIOS. The default value is TN followed by *TinyTERM*'s 6 digit serial number. For example if the *TinyTERM Plus* serial number were WTN012345TT, the local LAN adapter name would be TN012345. This does not usually need adjusting.

The NETNAME command is used as follows:

NETNAME "*string*"

string Is the coded virtual terminal name, handshaking string or local LAN adapter name.

The NETSTIME command

This command is used to set the NetBIOS/MSNET send timeout value. If the connection drops during high network traffic, increasing or setting this value to 0 may solve the problem.

The NETSTIME command is used as follows:

NETSTIME*n*

n number of 1/2 second intervals to wait for network response before timing out.

2 is the default value (wait 1 second for a response before timing out).

0 is the value for never time out.

Using NETPORT, NETVTNAME and NETDIALOG

The virtual circuit configuration for the OpenNET transport is as follows:

```
NETPORT 76
NETVTNAME “%s.VT”
NETDIALOG “^SiVTS^S^Fipc1^Z”
```

OpenNET networks uses the character “v” as the 16th character in it’s MSNet name. The ASCII value of “v” is 76.

OpenNET networks require that the virtual terminal server name is equal to the user specified node name with “.VT” appended to it.

In order to get a virtual terminal line with an OpenNET network, the following handshaking occurs:

^SiVTS^S Search for the string “iVTS”
^F Flush further input
iPC1^Z Send the string “iPC1” followed by a null character.

Table 1. Default Virtual Circuits Configurations

Network	Interrupt Vector	Port	VT Name	Handshake
NetBIOS	5c	0	User nodename	None
SCO XENIX-NET	5c	‘s’	User nodename	Send: ‘vtp’ Rcv: ‘\006’
LAN Manager	5c	‘s’	User nodename	Send: ‘vtp’ Rcv: ‘\006’
MSNET	2a	0	User nodename	None
OpenNET A	2a	‘v’	User nodename + ‘.VT’	Rcv: ‘iVTS’ Send: ‘iPC1’ Send: NUL

Novell NetWare for UNIX or SCO IPX/SPX

Novell NetWare for UNIX or SCO IPX/SPX networks require IPX software to be installed on a UNIX server. Only Novell NetWare needs to be installed on the PC. Once the software is installed, *TinyTERM* will access the network if NOVELL NVT has been selected in the Port Selection field.

In addition to running NetWare, it is necessary to have the file *vipxspx.dll* installed in the Windows directory, the file *vipx.386* in the Windows SYSTEM directory, and the following entry in the *system.ini* file:

```
[386 Enh]
network = vipx.386
```

Windows Sockets

TinyTERM for Windows supports connecting to a network through the standard Windows Sockets API (Winsock API or Winsock). Use of Winsock requires that the *winsock.dll* of the target network be installed. This usually includes modification of the PATH statement in the *autoexec.bat* file, or installing the *winsock.dll* in the Windows or Windows SYSTEM directory. The install program of the Winsock compatible package should handle this.

Connect to the network from *TinyTERM* by selecting Winsock from the Port Selection field.

Character Sets

In This Section:

DEC Multinational Character Set

The data bits per character (or word length) setting of a connection plays a part in determining the allowable data which can come across that connection. More characters are displayable over an 8-bit connection than a 7-bit connection. In fact, a 1-bit difference doubles the number of allowable characters.
The increased number of allowable characters is ideal for displaying graphic characters, accents, and diacritical marks at the same time. This allows the display of multinational characters. In addition, special symbols such as a pound sign and superscripts can be displayed.

Serial communication occurs as a serial stream of bits sent from one system to another. In order for the stream to be synchronized at both ends of the link, it is divided into frame. These frames are marked by a start bit (always 0) and a stopbit (always 1). The data is what falls in between. In most cases, data is transmitted one byte (8 bits) at a time. However, a 7-bit word length is sometimes used for transmitting text-only files.

The DEC VT320 and DEC VT220 emulations support the DEC Multinational Character Set which is composed of the ASCII Character Set and the DEC Supplemental Graphic set.
In Table1, all characters below hex 80 make up the ASCII Character Set and all characters at and above hex 80 compose the DEC Supplemental Graphic set.

Table 11 DEC Multinational Character Set

HEX	-0	-1	-2	-3	-4	-5	-6	-7	-8	-9	-A	-B	-C	-D	-E	-F
0-	NUL	SOH	STX	ETX	EOT	ENQ	ACK	BEL	BS	HT	LF	VT	FF	CR	SO	SI
1-	DLE	DC1	DC2	DC3	DC4	NAK	SYN	ETB	CAN	EM	SUB	ESC	FS	GS	RS	US
2-	SP	!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
3-	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4-	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5-	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
6-	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7-	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	DEL
8-					IND	NEL	SSA	ESA	HTS	HTJ	VTS	PLD	PLU	RI	SS2	SS3
9-	DCS	PU1	PU2	STS	CCH	MW	SPA	EPA				CSI	ST	OSC	PM	APC
A-		¡	¢	£		¥		§	¤	©	ª	«				
B-	°	±	²	³		µ	¶	·		¹	º	»	¼	½		¿
C-	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï
D-		Ñ	Ò	Ó	Ô	Õ	Ö	Œ	Ø	Ù	Ú	Û	Ü	Ÿ		ß
E-	à	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	î	ï
F-		ñ	ò	ó	ô	õ	ö	œ	ø	ù	ú	û	ü	ÿ		

National Replacement Character Set

While 8-bit connections allow the display of multinational characters and special symbols, 7-bit connections cannot because there are fewer characters to display. To allow multinational characters over a 7-bit connection, use the National Replacement Character (NRC) sets. This applies to the DEC VT320-7 and DEC VT220-7 emulations.

An NRC set replaces specific characters from the ASCII table with needed characters for a specific language. TinyTERM supports 14 NRC sets.

American	German
British	Italian
Canadian	Norwegian
Danish	Portuguese
Dutch	Spanish
Finnish	Swedish
French	Swiss

As an example of how the NRC set works, assume British is selected as the character set. The only difference between the American character set and the British character set is the hex value 23. The American character set uses a cross-hatch (#) and the British character set uses a pound sign (£).
Look at the IBM PC Character Set chart. A "#" is displayed in the hex 23 location. If the British character set is selected, this would be changed to "£." Therefore, whenever a hex 23 is sent or received, a pound sign is displayed. See Table 2.

Table 12 National Replacement Character Set

Character Set	23	40	5B	5C	5D	5E	5F	60	7B	7C	7D	7E
AMERICAN	#	@	[	\	]	^	_	`	{	|	}	~
BRITISH	£	@	[	\	]	^	_	`	{	|	}	~
CANADIAN	#	à	â	ç	ê	î	_	ô	é	ù	è	û
DANISH	#	@	Æ	Ø	Å	^	_	`	¨	*ƒ*	¼	'
FINNISH	#	@	Ä	Ö	Å	Ü	_	é	ä	ö	å	ü
FRENCH	£	à	°	ç	§	^	_	`	é	ù	è	¨
GERMAN	#	§	Ä	Ö	Ü	^	_	`	ä	ö	ü	ß
ITALIAN	£	§	°	ç	é	^	_	ù	à	ò	è	ì
NORWEGIAN	#	@	Æ	Ø	Å	^	_	`	æ	ø	å	~
PORTUGUESE	#	@	Ã	Ç	Õ	^	_	`	ã	ç	õ	~
SPANISH	£	§	¡	Ñ	¿	^	_	`	`	°	ñ	ç
SWEDISH	#	É	Ä	Ö	Å	Ü	_	é	ä	ö	å	ü
SWISS	ù	à	é	ç	ê	î	è	ô	ä	ö	ü	û

IBM PC Character Set

Table 13 IBM PC Character Set

HEX	-0	-1	-2	-3	-4	-5	-6	-7	-8	-9	-A	-B	-C	-D	-E	-F
0-	0 NUL ^@	1 SOH ☺ ^A	2 STX ☻ ^B	3 ETX ♥ ^C	4 EOT ♦ ^D	5 ENQ ♣ ^E	6 ACK ♠ ^F	7 BEL • ^G	8 BS ◘ ^H	9 HT ○ ^I	10 LF ◙ ^J	11 VT ♂ ^K	12 FF ♀ ^L	13 CR ♪ ^M	14 SO ♫ ^N	15 SI ☼ ^O
1-	16 DLE ► ^P	17 DC1 ◄ ^Q	18 DC2 ↕ ^R	19 DC3 ‼ ^S	20 DC4 ¶ ^T	21 NAK § ^U	22 SYN ▬ ^V	23 ETB ↨ ^W	24 CAN ↑ ^X	25 EM ↓ ^Y	26 SUB → ^Z	27 ESC ← ^[	28 FS ∟ ^\	29 GS ↔ ^]	30 RS ▲ ^^	31 US ▼ ^_
2-	32	33 !	34 "	35 #	36 $	37 %	38 &	39 '	40 (	41)	42 *	43 +	44 ,	45 -	46 .	47 /
3-	48 0	49 1	50 2	51 3	52 4	53 5	54 6	55 7	56 8	57 9	58 :	59 ;	60 <	61 =	62 >	63 ?
4-	64 @	65 A	66 B	67 C	68 D	69 E	70 F	71 G	72 H	73 I	74 J	75 K	76 L	77 M	78 N	79 O
5-	80 P	81 Q	82 R	83 S	84 T	85 U	86 V	87 W	88 X	89 Y	90 Z	91 [	92 \	93]	94 ^	95 _
6-	96 `	97 a	98 b	99 c	100 d	101 e	102 f	103 g	104 h	105 i	106 j	107 k	108 l	109 m	110 n	111 o
7-	112 p	113 q	114 r	115 s	116 t	117 u	118 v	119 w	120 x	121 y	122 z	123 {	124 |	125 }	126 ~	127 ⌂
8-	128 Ç	129 ü	130 é	131 â	132 ä	133 à	134 á	135 ç	136 ê	137 ë	138 è	139 ï	140 î	141 ì	142 Ä	143 Å
9-	144 É	145 æ	146 Æ	147 ô	148 ö	149 ò	150 û	151 ù	152 ÿ	153 Ö	154 Ü	155 ¢	156 £	157 ¥	158 ₧	159 ƒ
A-	160 á	161 í	162 ó	163 ú	164 ñ	165 Ñ	166 ª	167 º	168 ¿	169 ⌐	170 ¬	171 ½	172 ¼	173 ¡	174 «	175 »
B-	176 ░	177 ▒	178 ▓	179 │	180 ┤	181 ╡	182 ╢	183 ╖	184 ╕	185 ╣	186 ║	187 ╗	188 ╝	189 ╜	190 ╛	191 ┐
C-	192 └	193 ┴	194 ┬	195 ├	196 ─	197 ┼	198 ╞	199 ╟	200 ╚	201 ╔	202 ╩	203 ╦	204 ╠	205 ═	206 ╬	207 ╧
D-	208 ╨	209 ╤	210 ╥	211 ╙	212 ╘	213 ╒	214 ╓	215 ╫	216 ╪	217 ┘	218 ┌	219 █	220 ▄	221 ▌	222 ▐	223 ▀
E-	224 α	225 ß	226 Γ	227 π	228 Σ	229 σ	230 µ	231 τ	232 Φ	233 Θ	234 Ω	235 δ	236 ∞	237 φ	238 ε	239 ∩
F-	240 ≡	241 ±	242 ≥	243 ≤	244 ⌠	245 ⌡	246 ÷	247 ≈	248 °	249 ·	250 ·	251 √	252 ⁿ	253 ²	254 ■	255

Terminal Emulation Reference

In This Section:

This section lists the keyboard mappings and local print sequences for the various emulations supported by *TinyTERM.*

For the following tables:

\E	=	Escape
^	=	Control
\x##	=	hex string

AT386 Console Emulation

Description

The AT386 Console emulation is a full-screen, 25 line color emulation of the console on AT&T and Interactive UNIX System V/386 and System V.4.

Keyboard Layout

Table-14 AT386 Console Keyboard Layout

AT386	IBM PC AT386 Keyboard	Keyboard Byte Sequence
F1..F10	F1..F10	\EOP..\EOY
F11..F12	F11..F12 (*)	\EOZ..\EOA
Shift+F1..Shift+F10	Shift+F1..Shift+F10	\EOp..\EOy
Shift+F11..Shift+F12	Shift+F11..Shift+F12 (*)	\EOz..\EOa
↑	↑	\E[A
↓	↓	\E[B
→	→	\E[C
←	←	\E[D
Home	Home	\E[H
Page Up	Page Up	\E[V
End	End	\E[Y
Page Down	Page Down	\E[U
Ctrl+Keypad 5	Ctrl+Keypad 5	\E[G
Insert	Insert	\E[@
Ctrl+Delete	Ctrl+Delete	\127
Tab	Tab	\x09
Ctrl+Tab	Ctrl+Tab	\x09
Esc	Esc	\E
Ctrl+Esc	Ctrl+Esc	\E

Table 14. AT386 Console Keyboard Layout (Continued)

AT386	IBM PC AT386 Keyboard	Keyboard Byte Sequence
Enter	Enter	\x0D
Ctrl+Enter	Ctrl+Enter	\x81
Ctrl+Backspace	Ctrl+Backspace	\x84
Keypad 0..Keypad 9	Keypad 0..Keypad 9	0..9
Keypad -	Keypad -	-
Keypad +	Keypad +	+
Keypad *	Keypad *	*
Keypad ,	Keypad ,	,
Keypad .	Keypad .	.
Keypad Enter	Keypad Enter	^M
Ctrl+Keypad -	Ctrl+Keypad - (**)	-
Ctrl+Keypad +	Ctrl+Keypad + (**)	+
Ctrl+↑	Ctrl+↑	\E[A
Ctrl+↓	Ctrl+↓	\E[B
Backspace	Backspace	^H

* Requires KEYBOARD EXTBIOS or INT9 under DOS

** Requires KEYBOARDINT9 under DOS

Local Print Sequences

Although the actual AT386 Console doesn't support local printing, *TinyTERM*'s emulation does through the following sequences:

On	\E[5i
Off	\E[4i

DEC VT52 Emulation

Description

The DEC VT52 emulation is the VT52 subset of the VT100 terminal emulation. All VT52 escape sequences are processed, including graphics characters, transparent print, and numeric keypad support.

Keyboard Layout

Table 15 DEC VT52 Keyboard Layout

VT52	IBM PC VT52 Keyboard	Keyboard Byte Sequence
PF1..PF4	F1..F4	\EP..\ES
Keypad 0..Keypad 9	Keypad 0..Keypad 9	0..9
↑	↑	\EA
↓	↓	\EB
→	→	\EC
←	←	\ED

Application Mode

Keypad 0..Keypad 9	Keypad 0..Keypad 9	\E?p..\E?y
Keypad -	Keypad -	\E?m
Keypad ,	Keypad *	\E?l
Keypad .	Keypad .	\E?n
Keypad Enter	Keypad Enter	\E?M

Local Print Sequences

The DEC VT52 uses the following sequences:

On	\EW
Off	\EX

DEC VT100 Emulation

Description

The DEC VT100 emulation is a full featured DEC-compatible VT102/VT100 terminal emulation. All VT102 escape sequences are processed, including graphics characters and transparent print.

Keyboard Layout

Table 16 DEC VT100 Keyboard Layout

VT100 Keyboard	IBM PC VT100 Keyboard	Byte Sequence
PF1..PF4	F1..F4	\EOP..\EOS
Keypad 0..Keypad 9	Keypad 0..Keypad 9	0..9
↑	↑	\EA
↓	↓	\EB
→	→	\EC
←	←	\ED

Application Mode

Keypad 0..Keypad 9	Keypad 0..Keypad 9	\EOp..\EOy
Keypad -	Keypad -	\EOm
Keypad ,	Keypad *	\EOl
Keypad .	Keypad .	\EOn
Keypad Enter	Keypad Enter	\EOM

Local Print Sequences

The DEC VT100 uses the following sequences:

On	\E[5i
Off	\E[4i

DEC VT320/VT220 Emulations

Description

The DEC VT320 and DEC VT220 emulations are full-featured DEC-compatible emulations with Multinational Character Set support. All VT320 and VT220 escape sequences are processed, including graphics characters, transparent print, and numeric keypad support.

Each emulation has a -7 emulation option as well. This selects the appropriate terminal emulation with National Replacement Character Set support. The NRCS is determined by the Character Set field in the emulation setup screen. This option should be used over 7 data bit connections.

Keyboard Layout

The following keys perform specific hardware functions and cannot be emulated:

- Hold Screen (use Ctrl+S/Ctrl+Q)
- Print Screen (use the Print key)
- Set-Up
- Data/Talk
- Break (use the Break key)

Table 17 DEC VT320/VT220 Keyboard Layout

VT320/VT220 Keyboard	IBM PC VT320/VT220 Keyboard	Byte Sequence
PF1..PF4	F1..F4	\EOP..\EOS
F6..F10	F6..F10	\E[17~..\E[21~
F11	F11 (*) or Ctrl+F1	\E[23~
F12	F12 (*) or Ctrl+F2	\E[24~
F13..F14	Ctrl+F3..Ctrl+F4	\E[25~..\E[26~
Help	Ctrl+F5	\E[28~
Do	Ctrl+F6	\E[29~
F17..F20	Ctrl+F7..Ctrl+F10	\E[31~..\E[34~
↑	↑	\E[A
↓	↓	\E[B
→	→	\E[C
←	←	\E[D
Find	Home	\E[1~
Insert Here	Insert	\E[2~
Remove	Delete	\E[3~
Select	End	\E[4~
Prev Screen	Page Up	\E[5~
Next Screen	Page Down	\E[6~
Keypad 0.. Keypad 9	Keypad 0.. Keypad 9	0..9
Backspace	Backspace	\177

Application Mode

↑	↑ \EOA
↓	↓ \EOB
→	→ \EOC
←	← \EOD
Keypad 0..Keypad 9	Keypad 0.Keypad 9 \EOp..\EOy
Keypad -	Keypad - \EOm
Keypad ,	Keypad * \EOl
Keypad .	Keypad . \EOn
Keypad Enter	Keypad Enter \EOM

* Requires KEYBOARD EXTBIOS or INT9 under DOS

DEC Compose Key

The Compose key is used with the VT220/VT220-7 and VT320/VT320-7 emulations to create multinational characters that do not exist on the keyboard. By pressing the Compose key and a two-stroke key sequence, characters can be created such as a British pound sign (£) or an a-umlaut (Ä).

Press the Compose key before the two-character sequence; the order of the two-character sequence is irrelevant.

When a valid two-stroke sequence is sent after the Compose key, the Compose sequence is turned off, and the special character is sent to the computer. If an improper sequence is sent, the Compose sequence aborts, a warning bell sounds, and no characters are sent to the computer.

The following table lists the keystrokes required to create nonstandard characters. The first column describes the desired character. The second column describes the necessary keystrokes.

Table 18 DEC Compose Key Sequences

Composite Character	Key Sequence
“	(quotation mark) “ (space)
#	(number sign) ++
’	(apostrophe) ’ (space)
@	(commercial at) aa or AA
[	(opening bracket) ((
\	(backslash) // or /<
]	(closing bracket)))
^	(circumflex accent) ^ (space)
’	(single quote) ’ (space)
{	(opening brace) (-
|	(vertical line) /^
}	(closing brace))-
~	(tilde) ~ (space)
¡	(inverted !) !!
¢	(cent sign) c/ or C/ or c| or C|
£	(pound sign) l- or L- or l= or L=
¥	(yen sign) y- or Y- or y= or Y=
§	(section sign) so or SO or s! or S!
¤ (\x0F)	(currency sign) xo or XO or x0 or X0
© (\xE8)	(copyright sign) co or CO or c0 or C0
ª	(feminine ordinal indicator) a- or A-
«	(angle quotation mark left) <<

Table 18 DEC Compose Key Sequences **(Continued)**

Composite Character	Key Sequence
°	(degree sign) 0^
±	(plus/minus sign) +-
µ (\x75)	(micro sign) /u or /U
¶	(paragraph sign) p! or P!
·	(middle dot) .^
º	(masculine ordinal indicator) o- or O-
»	(angle quotation mark right) >>
¿	(inverted ?)??
À (\x85)	(A grave) A`
Â (\x83)	(A circumflex) A^
Ã (\x41)	(A tilde) A~
Ä	(A umlaut) "A
Å	(A ring) A*
Æ	(A E ligature) AE
Ç	(C cedilla) C,
È (\x8A)	(E grave) E`
É	(E acute) E'
Ê (\x88)	(E circumflex) E^
Ë (\x89)	(E umlaut) E"
Ì (\x8D)	(I grave) I`
Í (\xA1)	(I acute) I'
Î (\x8C)	(I circumflex) I^
Ï (\x8B)	(I umlaut) I"
Ñ	(N tilde) N~
Ò (\x95)	(O grave) O`
Ó (\xA2)	(O acute) O'

Table 18 DEC Compose Key Sequences **(Continued)**

Composite Character	Key Sequence
Ô (\x93)	(O circumflex) O^
Õ (\x4F)	(O tilde) O~
Ö	(O umlaut) O”
Œ (\x4F)	(O E ligature) OE
Ù (\x97)	(U grave) U`
Ú (\xA3)	(U acute) U’
Û (\x96)	(U circumflex) U^
Ÿ (\x9B)	(Y umlaut) Y”
ß	(German small sharp s) ss
à	(a grave) a`
á	(a acute) a’
â	(a circumflex) a^
ã (\x61)	(a tilde) a~
ä	(a umlaut) a”
å	(a ring) a*
æ	(a e ligature) ae
ç	(c cedilla) c,
è	(e grave) e`
é	(e acute) e’
ê	(e circumflex) e^
ë	(e umlaut) e”
ì	(i grave) i`
í	(i acute) i’
î	(i circumflex) i^
ï	(i umlaut) i”
ñ	(n tilde) n~

Table 18 DEC Compose Key Sequences **(Continued)**

Composite Character	Key Sequence
ò (o grave)	o`
ó (o acute)	c’
ô (o circumflex)	o^
õ (\x6F) (o tilde)	o~
ö (o umlaut)	o”
œ (\x6F) (o e ligature)	oe
ø (\x9B) (o slash)	o/
ù (u grave)	u`
ú (u acute)	u’
û (u circumflex)	u^
ü (u umlaut)	u”
ÿ (y umlaut)	y”

Local Print Sequences

The DEC VT320/220 emulations use the following sequences:

On	\E[5i
Off	\E[4i

SCO Console Emulation

Description

The SCO Console emulation is a full-screen, 25 line color emulation of the console for SCO UNIX/XENIX systems.

Keyboard Layout

Table 19 SCO Console Keyboard Layout

SCO Console Keyboard	IBM PC SCO Console Keyboard	Byte Sequence
F1..F12	F1..F12 (*)	\E[M..\E[X
Shift+F1..Shift+F12	Shift+F1..Shift+F12 (*)	\E[Y..\E[j
Ctrl+F1..Ctrl+F12	Ctrl+F1..Ctrl+F12 (*)	\E[k..\E[v
Ctrl+Shift+F1.. Ctrl+Shift+F12	Ctrl+Shift+F1.. Ctrl+Shift+F12 (*)	\E[w..\E[{
↑	↑	\E[A
↓	↓	\E[B
→	→	\E[C
←	←	\E[D
Keypad 0..Keypad 9	Keypad 0..Keypad 9	0..9
Home	Home	\E[H
Page Up	Page Up	\E[I
End	End	\E[F
Page Down	Page Down	\E[G
Insert	Insert	\E[L
Delete	Delete	\x7F
Shift+Tab	Shift+Tab	\E[Z

Table 19. SCO Console Keyboard Layout **(Continued)**

SCO Console	IBM PC SCO Console Keyboard	Keyboard Byte Sequence
Ctrl+Esc	Ctrl+Esc	\x80
Ctrl+Enter	Ctrl+Enter	\x81
Ctrl+Home	Ctrl+Home	\x82
Ctrl+Page Up	Ctrl+Page Up	\x83
Ctrl+Backspace	Ctrl+Backspace	\x84
Ctrl+End	Ctrl+End	\x85
Ctrl+Page Down	Ctrl+Page Down	\x86
Ctrl+Keypad -	Ctrl+Keypad - (**)	\x87
Ctrl+Keypad +	Ctrl+Keypad + (**)	\x88
Ctrl+←	Ctrl+←	\x89
Ctrl+→	Ctrl+→	\x8A

* F11 and F12 Require KEYBOARD EXTBIOS or INT9 under DOS
** Requires KEYBOARDINT9 under DOS

Local Print Sequences

Although the actual SCO Console doesn't support local print, TinyTERM's emulation does through the following sequences:

On	\E[5i
Off	\E[4i

WYSE WY-50 Emulation

Description

The WYSE WY-50 is a full featured Wyse 50 emulation. This emulation supports most sequences, with the exception of protected mode on/off processing.

Keyboard Layout

Table 20 WYSE WY-50 Keyboard Layout

Wyse50	IBM PC Keyboard	Wyse50 Keyboard	Byte Sequence
F1	F1		^A@\r
F2..F10	F2..F10		^AA\r..^AI\r
F11	F11 (*)or Ctrl+F1		^AJ\r
F12	F12 (*) or Ctrl+F2		^AK\r
F13..F16	Ctrl+F3..Ctrl+F6		^AL\r-^AO\r
Shift+F1	Shift+F1		^A`\r
Shift+F2..Shift+F10	Shift+F2..Shift+F10		^Aa\r..^Ai\r
Shift+F11	Shift+F11 (*) or Ctrl+Shift+F1		^Aj\r
Shift+F12	Shift+F12 (*) or Ctrl+Shift+F2		^Ak\r
Shift+F13..Shift+F16	Ctrl+Shift+F3.. Ctrl+Shift+F6		^Aj\r-^Ao\r
↑	↑		^K
↓	↓		^J
→	→		^L
←	←		^H
Home	Home		^^ (\x1E)
Shift+Home	Ctrl+Home		\E{
PAGE Next	Page Down		\EK

Table 20. WYSE WY-50 Keyboard Layout **(Continued)**

Wyse50	IBM PC Keyboard	Wyse50 Keyboard Byte Sequence
PAGE Prev	Page Up	\EJ
Tab	Tab	^I
Shift+Tab	Shift+Tab	\EI
Back Space	Backspace	^H
Ins	Insert	\Eq
Del	Delete	\177
Repl	End	\Er
INS Char	Ctrl+Page Down	\EQ
INS Line	Ctrl+→	\EE
DEL Char	Ctrl+Page Up	\EW
DEL Line	Ctrl+←	\ER
Send	Ctrl+Enter	\E7
Keypad Enter	Keypad Enter	^M

* Requires KEYBOARD EXTBIOS or INT9 under DOS

Local Print Sequences

The WYSE WY-50 uses the following sequences:

On	^X
Off	^T

WYSE WY-60 Emulation

Description

The WYSE WY-60 is a full-featured native-mode Wyse 60 emulation. This emulation supports scan code mode on/off sequences and extended keyboard support.

Keyboard Layout

Table 21 WYSE WY-60 Keyboard Layout

Wyse60	IBM PC Keyboard	Wyse60 Keyboard Byte Sequence
F1	F1	^A@\r
F2..F10	F2..F10	^AA\r..^AI\r
F11	F11 (*)or Ctrl+F1	^AJ\r
F12	F12 (*) or Ctrl+F2	^AK\r
F13..F16	Ctrl+F3..Ctrl+F6	^AL\r-^AO\r
Shift+F1	Shift+F1	^A`\r
Shift+F2..Shift+F10	Shift+F2..Shift+F10	^Aa\r..^Ai\r
Shift+F11	Shift+F11 (*) or Ctrl+Shift+F1	^Aj\r
Shift+F12	Shift+F12 (*) or Ctrl+Shift+F2	^Ak\r
Shift+F13..Shift+F16	Ctrl+Shift+F3.. Ctrl+Shift+F6	^Aj\r-^Ao\r
↑	↑	^K
↓	↓	^J
→	→	^L
←	←	^H
Home	Home	^^ (\x1E)
Shift+Home	Ctrl+Home	\E{
PAGE Next	Page Down	\EK

Table 21. WYSE WY-60 Keyboard Layout (Continued)

Wyse60	IBM PC Keyboard	Wyse60 Keyboard Byte Sequence
PAGE Prev	Page Up	\EJ
Tab	Tab	^I
Shift+Tab	Shift+Tab	\EI
Back Space	Backspace	^H
Ins	Insert	\Eq
Del	Delete	\177
Repl	End	\Er
INS Char	Ctrl+Page Down	\EQ
INS Line	Ctrl+→	\EE
DEL Char	Ctrl+Page Up	\EW
DEL Line	Ctrl+←	\ER
Send	Ctrl+Enter	\E7
Keypad Enter	Keypad Enter	^M
Esc	Esc	\E
Print	Print Screen	\EP

* Requires KEYBOARD EXTBIOS or INT9 under DOS

Local Print Sequences

The WYSE WY-60 uses the following sequences:

On	\Ed#
Off	^T

IBM 3151 Emulation

Description

The IBM 3151 emulation is a full-screen, 24 or 25 line emulation of the IBM 3151 terminal. All IBM 3151 control sequences are processed, including transparent print. An extended keyboard is required to access the following IBM 3151 function keys: F11, F12, F23, F24, F35, F36.

Keyboard Layout

The IBM 3151 uses a Line Turnaround Character in many of its control sequences. This is represented in the following table through the use of <LTA>. This character is chosen within the emulation setup dialog.

Table 22 IBM 3151 Keyboard Layout

IBM 3151	IBM PC Keyboard	IBM 3151 Keyboard	Byte Sequence
F1..F12	F1..F12		\Ea<LTA>..\El<LTA>
F13..F24	Shift+F1..Shift+F12		\E!a<LTA>.. \E!l<LTA>
F25..F36	Ctrl+Shift+F1.. Ctrl+Shift+F12		\E"a<LTA>.. \E"l<LTA>
↑	↑		\EA
↓	↓		\EB
→	→		\EC
←	←		\ED
Home	Home		\EH
Clear	Ctrl+Home		\EL<LTA>
Erase Input	Ctrl+Page Up		\EK
Erase EOF	Page Down		\EI
Erase EOP	Ctrl+Page Down		\EJ
Insert Character	Insert		\EP
Insert Line	Ctrl+Insert		\EN

Table 22. IBM 3151 Keyboard Layout **(Continued)**

IBM 3151	IBM PC Keyboard	IBM 3151 Keyboard	Byte Sequence
Delete Character	Delete		\EQ
Delete Line	Ctrl+←		\EO
DEL	Ctrl+Delete		\xFF
Tab	Tab		\x09
Backtab	Shift+Tab		\E2
Esc	Esc		\E
Return	Enter		\x0D
LF	Ctrl+Enter		\x0A
Enter	Keypad Enter		
Backspace	Backspace		\x08
Break	Ctrl+B	Break	
Keypad 0..Keypad 9	Keypad 0..Keypad 9		0..9
Keypad -	Keypad -	-	
Keypad +	Keypad +	+	
Keypad *	Keypad *	*	
Keypad ,	Keypad ,	,	
Keypad .	Keypad .	.	

Local Print Sequences

The IBM 3151 emulation uses the following sequences:

On	^P^R
Off	^P^T

Network Connections

In This Section:

Getting Started

During installation, *Century TCP* was configured to communicate either via a network interface card or a serial port/modem.

This chapter explains how to:

- Change Local Area Network (LAN) configurations.
- Check the LAN or serial connection.
- View LAN or serial installation and status information.

If *TinyTERM Plus* was installed with LAN and serial port/modem support, see *Switching Between LAN and Serial Communication Methods* on page 147 for information about switching between LAN and serial interfaces.

Running The Network Configuration Utility

When installing *TinyTERM Plus*, an icon is created in the Century program group that can be used to configure the *Century TCP* LAN and view information about the LAN and serial connections. Look for the Century network icon in the Century program group.

To run the *Century TCP* network configuration utility, double-click on the Century TCP icon. The TCP/IP main window will be displayed.

From the main window, LAN configurations may be changed, the network may be checked and network statistics may be viewed. The following provides an overview of the TCP/IP window:

File Menu

Refresh Statistics	Describes events that have occurred within transfers.
Save Changes:	Saves network configuration changes.
Enable SNMP.	If checked, *Century TCP* provides SNMP MIB-II information. The default state is unchecked (off).
Update Status:	Sets the update rate for the Statistics tabs.
Always on Top:	If checked, the *Century TCP* configuration utility window is always on top of other windows on the desktop.
Minimized at Startup:	If checked, the *Century TCP* configuration utility starts with a minimized window (icon).
Exit:	Prompts to save any configuration changes and then terminates the *Century TCP* configuration utility.

Help Menu

Provides on-line help and describes the *Century TCP* network configuration utility.

View Tab

Displays hardware and interface information and network transmission statistics.

Configure Tab

Allows the configuration of the Network Card, PC Name, IP Addresses, Gateways, DNS and Hosts File.

Ping Tab

Tests the network.

Status Line

Displays quick explanations for items pointed to with the cursor.

Network/Serial Status Line

States whether or not the network is working.

Modifying Network Configurations

The Century TCP configuration utility allows the modification of how Century TCP is configured. If the entries in this section are not understood, contact the System Administrator for further information. Modifying one of these parameters incorrectly can cause the Century network to cease functioning.

LAN Connections

If using a LAN connection:

- Configure network card and interface parameters.
- Configure Domain Name Service (DNS) parameters.
- Configure gateway machines.
- Add, change, delete and locate Hosts file entries.

Serial Connections

If using a serial connection, the only active tab in the *Configure* menu is the *Hosts File* tab. With it, Hosts file entries may be added, changed, deleted or located. All other tabs in *Configure* will be inactive; they are only used with PCs configured for LAN connections.

Configuring Network Card Parameters

Existing Network Drivers

If *Century TCP* inherited the existing network environment and network drivers, the network card settings cannot be changed through Configure | Network Card.

Century TCP *Installed Network Drivers*

If *Century TCP* installed the network card drivers, select Configure | Network Card to modify the parameters for the specific network card that will be used. Several different configuration parameters will be given depending on the network card that is displayed. For example, if the PC currently uses the 3Com 3C503 EtherLink II network, hardware information that may be changed for that card is displayed; Hardware interrupt, I/O address and Transceiver type.

For each entry, the current setting is highlighted. Select the setting that matches the network card configuration.

Changing the Network Card Driver

If a different network card driver should be installed and *Century TCP* installed the existing driver, rerun the *Plus[NFS]* installation program. See the section *Installing TinyTERM Plus* for further information.

Configuring Interface Parameters

Configuring Local Interface Parameters

Before configuring the interface parameters, the following configuration names and addresses must be available:

- PC name
- PC Internet address
- [1]*Subnet mask* identifier
- Broadcast address

Contact the System Administrator for the information necessary to complete this screen.

To configure the local interface parameters:

1. After double clicking on the Century TCP icon, select Configure | Interface
2. Enter the name of the PC on which *Century TCP* is installed in the *PC Name* box.
3. Enter the Internet address of the PC on which *Century TCP* is installed in the *PC IP Address* box.
4. Enter the subnet mask identifier in the Subnet Mask box.

[1] A subnet mask is used to identify subnet partitions on the network. This is a way of dividing up the network to designate specific PC addresses to each subnet.

The subnet mask identifies machines on the network and subnet. Network addresses are 32-bit numbers. A portion of the 32-bits identifies the network/subnet and the remaining bits specify machines within the network/subnet. Subnet masks have bits set to 1 in the network and 0 in the machine portion of the address. Refer to *Appendix C-Subnets and Subnet Masks*.

5. Enter a broadcast address that is an address common to all nodes on the network in the Broadcast Address box. Refer to the *Broadcast Addresses* section in this manual for more information.

A datagram sent to the broadcast address is received by all hosts on a network and processed as if the datagram was sent directly to each host.

6. Select File | Save Changes.

Using BOOTP or DHCP

BOOTP and DHCP are alternative methods for configuring the PC name, PC IP address, subnet mask and broadcast address for the PC. BOOTP and DHCP request this information dynamically from a BOOTP or DHCP server on the network when the PC starts.

After confirming with the System Administrator that BOOTP or DHCP is available on the network:

1. After double clicking on the Century TCP icon, select Configure | Interface.
2. Select Enable Remote Configuration. The PC Name, PC IP Address, Subnet Mask and Broadcast Address fields become unselectable.
3. Select one of the following:

Use BOOTP.	Provides TCP/IP configuration parameters to the PC via a BOOTP server on the network.
Use DHCP.	Provides TCP/IP configuration parameters to the PC via a DHCP server on the network.

4. Select File | Save Changes.

Configuring Gateway Machines

Gateway machines let one subnet talk to another subnet within a network. Communication is usually limited to the systems directly connected to the network. Contact the System Administrator for the gateway addresses that may be used. Up to four gateways may be entered. Gateway 1 is the default; Gateways 2, 3 and 4 are alternate routes when machines can't be reached through the previous gateway.

To configure the local network gateway machines:

1. After double clicking on the Century TCP icon, select Configure | Gateways.
2. Enter up to four gateways (gateway 1 is the default).
3. Select File | Save Changes.

Configuring DNS Parameters

Century TCP must be configured to use a Domain Name Server (DNS) or a Hosts file (see Configuring Hosts Files) to resolve machine names into Internet addresses. If using both, *Century TCP* determines who goes first by looking at what was defined during installation (see the Installation section of this manual).

To configure the local domain's name and name servers:

1. After double clicking on the Century TCP icon, select Configure | DNS.
2. Enter the local domain name given to the local network in the Domain Name box.
3. Enter up to four name servers in the four boxes provided.

A name server is the IP Address of the server that stores resource records about hosts and is accessed to resolve host names into IP Addresses. If Name Server 1 cannot resolve the name, Name Server 2 is tried and so on.

4. Select File | Save Changes.

Configuring Hosts Files

Century TCP requires either a Domain Name Server (DNS) described previously or a Hosts file. If both are used, *Century TCP* determines which will be used first by referring to entries made during installation (see the Installation section in this manual).

When *Century TCP* was installed, an existing HOSTS file was searched for and created if one was not found. The title bar for the *Century TCP* configuration utility designates the hosts file location when the Configure | Hosts File tab is selected.

The Configure | Hosts File tab allows the addition of host names, as well as the changing, deletion or sorting of host file entries. Clicking Undo cancels any changes made to the Hosts file since the changes were last saved.

Adding a Hosts File

To create a Hosts file or add entries to the existing file:

1. After double clicking on the Century TCP icon, select Configure | Hosts File.
2. Enter a host TCP/IP address in the Host IP Address box.
3. Enter the primary host name for the machine in the Host Name box.
4. Enter an alias name for the host in the Alias box (optional).
5. Enter a description of the host in the Comment box (optional).
6. Click Add. The file information is added to the *Host File Entries* listbox.
7. Repeat steps 2-6 to add additional hosts.
8. Select File | Save Changes.

To use an existing Hosts file with *Century TCP* that was not selected during installation, copy or move the HOSTS file to the directory specified in the *Century TCP* configuration utility title bar. By default, this directory is C:\CENTURY\ETC.

Changing a Hosts File

To change existing information about a host:

1. After double clicking on the Century TCP icon, select Configure | Hosts File.
2. Select the desired file from the *Host File Entries* listbox.
3. Enter the changes to the existing entry.
4. Click Change.

5. **Select** File | Save Changes.

Deleting a Hosts File Entry

To delete a hosts file:

1. After double clicking on the Century icon, select Configure | Hosts File.
2. Select the file to delete in the Host File Entries listbox.
3. Click Delete. The information is deleted from the Host File Entries listbox.
4. Select File | Save Changes.

Finding a Hosts File Entry

To search for Host File Entries quickly, perform the following steps:

1. Click Find.
2. Enter a complete IP address, host name or alias name in the *Find Hosts File Entry* dialog.
3. Click Search. The system highlights the entry in the *Hosts File Entries* listbox.

Sorting Host File Entries

To sort *Host File Entries* by either IP address or hostname, choose IP Address or Hostname.

Checking the Network

The *ping* utility was designed as a tool to check network communications and name resolution. This is helpful to find out if the PC can communicate with a particular host. Using *ping*, the PC sends a signal to the host to verify that communication is possible. *Ping* is only useful when the Network Status Line states LAN:UP. If the Network Status field says LAN:DN or the status window does not show a successful outcome after pinging the host, verify that the IP addresses were used. To use the *ping* utility, perform the following steps:

1. Select Ping.
2. Enter the host's name or IP address in the *Host Name* or *IP Address* box.
3. Click Start. The response displays in the *Status* window.

Click Stop if the ping attempt should be terminated.

Viewing Installation and Status Information

The View | Installation and View | Status tabs show the current network configuration and network activity.

Viewing Installation Specifications

To view the choices made during installation, select View | Installation.

The following describes each field that is displayed:

Hardware

Network Card:	The name of the network card in use.
Physical Address:	The Ethernet Address that identifies the network card. If the physical address is zeros, the network card, NDIS or ODI drivers are improperly configured.
Interrupt:	The hardware interrupt number used by the network card. If grayed out, this typically means that the interrupt number is configured automatically by the software on the network card. Refer to the network card documentation for more information.
I/O Port:	An input/output address used by many network cards to pass data. If grayed out, this typically means the I/O port is either not used or is configured automatically by the software on the network card. Refer to the network card documentation for further information.
DMA Channel:	Direct Memory Access (DMA) channel of the network card. If grayed out, this typically means the DMA channel is either not used or is configured automatically by the software on the network card. Refer to the network card documentation for further information.

Memory Address:	The base address of the memory buffer used for network data transfer, if required.
Interface	
PC Name:	The name of the PC on which Century TCP/IP is installed.
PC IP Address:	The IP address of the PC on which *Century TCP* is installed.
Subnet Mask:	The subnet mask identifies machines on the network and subnet.
Domain Name:	The name of a group of machines on the network. A domain name consists of a sequence of names separated by periods; for example, pcx.ncd.com.
Default DNS Server:	The Default Domain Name Server (DNS) is the address of the Domain Name Server used to maintain and resolve IP addresses.
Default Gateway:	The Default Gateway specifies which router should receive communication destined for addresses in another subnet or network.

Viewing TCP Activity

To display the Transmission Control Protocol (TCP) activity for the current *Century TCP* session, select View | Statistics | TCP.

The following describes each field that is displayed:

Connections:	Logs the currently active TCP connections, total TCP connections, accepted connections by the host and connections that have been closed during this *Century TCP* session.
Packets:	TCP network communication is carried on in the form of packets. Packets are bundles of information regulated by TCP so that communication between two network nodes can take place. Displays the total number of packets sent and received, along with a duplicate packet count and a count of retransmitted packets.

Bytes:	Packets are composed of bytes of information. Displays the total number of bytes sent and received that are kept along with a duplicate byte count and a count of retransmitted bytes. The period information is the total number of bytes sent and received, the duplicate byte count and a count of the bytes that were retransmitted for this period. The time frame for the period to display is defined in File | Update Status.

Viewing UDP Activity

To display the User Datagram Protocol (UDP) activity for the current *Century TCP* session, select View | Statistics | UDP. The total number of Datagrams sent and received along with the errors during the *Century TCP* session will be displayed. The same information displays for the period as defined in File | Update Status.

Viewing IP Activity

To display the Internet Protocol (IP) activity for the current *Century TCP* session, select View | Statistics | IP. The total number of Datagrams sent and received along with the errors during the *Century TCP* session will be displayed. The same information displays for the period as defined in File | Update Status.

Viewing Network Interface Activity

To display network card activity for the current *Century TCP* session, select View | Statistics | Network Interface. The following provides a detailed description of the information displayed:

Packets:	Network communication occurs in the form of packets. Packets are bundles of network information. This option displays the total number of packets sent and received on the network card. The number of packets sent and received on the network card for the period of time defined in File | Update Status also displays.

Bytes:	Packets are composed of information bytes. This option displays the total number of bytes sent and received in packets. The number of bytes displayed is determined by the period defined in File | Update Status.

Updating the Displayed Statistics

Manual Update

To update the current statistics displayed for TCP, UDP, IP or Network Interface in the View | Statistics tab, select File | Refresh Statistics. To turn off the automatic update feature, select File | Update Status | Never. Before either of these option can be used, select View | Statistics so that the Refresh Statistics screen will be active.

Automatic Update

To set the *Century TCP* configuration utility to automatically update the statistics for TCP, UDP, IP or Network Interface, select File | Update Status. The default update period is every one-half second.

Switching Between LAN and Serial Communication Methods

Overview

If Century TCP was installed for Lcoal Area Network (LAN) and serial port/modem connections, the option is given to switch between the two communication methods.

If Century TCP was installed for serial port/modem connections only, only serial communications will be allowed and this chapter does not apply. If LAN connections are desired and only serial connections were installed, reinstall *TinyTERM Plus* and select the LAN interface. See the *Specifying Installation Parameters* section in this manual.

Communication Method

Determining the Communication Method

The Century program group contains a Network Switcher icon that states which communication method is currently used. The icon will be switched to the communication method currently selected.

1. Double-click the Network Switcher icon. A dialog displays showing the current network communication method and asking if the configuration should be switched.
2. Click YES to change the communication method. A dialog displays stating that the change will take effect after Windows is restarted.
3. Choose one of the following selections:

   Click YES to restart Windows immediately.
   Click NO if other applications need to be closed prior to restarting Windows. Any open applications should be closed, then Windows should be terminated and restarted.

The first time the communication switch is changed to serial port/modem, the *Century TCP* dialer will also need to be configured (does not apply to Windows 95 users). See the *Setting up the Dialer* in section in this manual.

Troubleshooting Network Connections

If a problem is encountered while connecting to the network, always check the Network Status Line at the bottom right of the screen to see if the network is active (UP) or inactive (DN).

This section describes some common problems and presents some suggestions for troubleshooting. Find the description below that best matches the problem and try the corresponding solutions.

LAN:DN

If the network is down, carefully examine the network installation, referring to the *Network Addresses* section of this manual if necessary. If running Windows 3.x or Windows for Workgroups without the Windows for Workgroups network, also check the network driver messages as the PC starts.

Select the Ping tab to test the following:

PC's IP Address:	This ping test should always succeed if the network card is properly configured. No data will actually be sent to the network, ping will simply verify a response between the PC and the network connection.
A Host IP Address on the Network:	This test will simply verify that a host IP address has been setup on the network. Try to select a host that is not across a gateway for this test.
A Host IP Address across a Gateway:	This verifies that the specified gateway is correct.
Name Resolution:	For the three tests described above, perform the same operation using the names rather than the IP address. This validates the name resolution. (DNS, HOSTS).

Hostname Lookup Failed

The DNS Server or Hosts file does not recognize the name entered in the Host Name or IP Address field in the Ping tab. Try another host name or enter the host's IP address instead.

Host not responding

The host cannot be reached. Check the network configuration by selecting Configure | Interface. The network card should also be checked by selecting Configure | Network Card.

Setting up the Dialer

In This Section:

Getting Started

The Dialerfunctions described in this section will only apply to systems running on Windows3.1 or Windows for Workgroups. For those systems using Windows 95, the dialer functions provided with Windows 95 should be used. Refer to the Windows 95 documentation for details on running these functions.

The Century Dialerapplication provides the ability to:

- Connect the PC to a remote host by using a modem and a telephone line or by using a direct serial line.
- Write a[2]*script* to automate connection and disconnection.
- View the status of the connection.

Prior to Setting up the Dialer

Before using the Dialer,check the following:

- Be sure that the PC is connected to a modem or to a dedicated serial line.
- If using an external modem, be sure the modem is powered on.
- If using a modem, have the modem documentation available.

[2] A list of commands that can be run to automate tasks such as connections, logins and disconnects.

Information to Set up the Dialer

When a connection is made to the host via a dedicated serial line or a modem the following information is necessary. This information can be obtained from the System Administrator or the Internet provider:

- Modem type
- Modem initialization string (optional if defining a new modem).
- Modem speed (also called baud rate)
- Phone number of the remote network access server, including any dialing prefix and dialing suffix.
- Serial port where the dedicated line or the modem is attached to the PC.
- Serial port speed (baud rate)

For the next four items, it may be helpful to refer to the LAN Worksheet completed in the Getting Started section of this manual.

- Network protocol
- Domain name service data (optional)
- Static IP or PC address (optional)
- Remote IP or Gateway address (optional).

Starting the Dialer

The Dialer is installed when the *Century TCP* network is installed. Look for the Internet Dialer icon in the Century program group. To run the Dialer, double-click on the Internet Dialer icon.

The first time the Dialer is run, the *Main Dialer* window will be displayed as well as the first dialog presented by the *Initial Setup Assistant*

Prior to using the Dialer to establish a connection between the PC and the remote host, the configuration parameters will need to be specified for the PC to host connection. The easiest way to specify these parameters is to first fill out the dialogs presented by the Initial Setup Assistant and then to fill out the dialogs presented by the *New Connection Assistant* The assistants automate the tabs in the *Main Dialer* window.

Using the Initial Setup Assistant

The *Initial Setup Assistant* goes through the process of setting up the dialer in a step-by-step manner. Setting up the Dialer includes defining the *COM*[3] port settings, modem settings and dialing parameters.

The *Initial Setup Assistant* will be displayed the first time the Dialer is accessed. To use this function at any time, select Tools | Initial Setup Assistant from the main Dialer window. The *Specify Parameters Now or Later* dialog will be displayed. To set up the Dialer parameters, click on the *Specify Parameters Now* option. If the *Specify Parameters Later* option is selected, the *Initial Setup Assistant* dialog will be closed.

Using the New Connection Assistant

The *New Connection Assistant* provides step by step assistance to define a connection to the Dialer. Defining a connection includes defining the connection type, defining the appropriate network settings, defining all host to PC addresses, defining the host's phone number and defining the login type and parameters.

[3] COM is an abbreviation for Communication Port. This is the port that is used to connect the computer to a serial or modem connection.

To start the *New Connection Assistant* at the end of using the *Initial Setup Assistant*, click Specify New Connection Now in the *Specify New Connection Now or Later* dialog. To run this option at anytime, select Tools | New Connection Assistant from the main Dialer window.

Main Dialer Window

When the *Initial Setup Assistant* is closed, the main Dialer window will be displayed. From this window, databases of frequently used phone numbers, modem types and login scripts may be created. These database entries are then available when building or modifying connections.

Making a Connection

Before a connection can be initiated, the Dialer and at least one connection must be defined. The simplest way to accomplish this is to use the *Initial Setup Assistant* to configure the Dialer, then use the *New Connection Assistant* to define the first connection. If these options were not used to setup the Dialer and the connection, follow the instructions in Adding a New Connection and Changing the Dialer Settings on page 156 to set up the Dialer and define the first connection.

Initiating a Connection

1. From the top of the main Dialer window, select the name of the desired connection from the Connection list.
2. Click Connect.

The Dialer initiates a connection based on the definition of the selected connection. If using a modem for the connection, the lights at the bottom of the main Dialer window show the status of the connection at any time. In left to right order, these lights are:

- TD Transmitted Data
- RD Received Data
- TR Data Terminal Ready (DTR)
- RS Ready to Send (RTS)

- CS Clear to Send (CTS)
- SR Data Set Ready (DSR)
- RI Ring Indicator
- CD Data Carrier Detect (DCD)
- FE Framing Error
- OE Overflow Error
- PE Parity Error

When a connection is active and the main Dialer window is minimized, the four modem lights on the bottom of the Dialer icon show the current status of the connection. In left to right order, these lights are:

- TD Transmitted Data
- RD Received Data
- CD Data Carrier Detect (DCD)
- GE General Error Indicator (lights whenever any error is detected).

For detailed explanations on each of the modem lights, refer to the documentation provided with the modem in use.

Adding a New Connection

To add a new connection:

1. Click Add in the main Dialer window. The *Adding A New Connection* dialog box displays.
2. Enter the name of the connection in the *New Name* box.
3. Select a connection to base the new connection on from the *Based Upon* list.
4. Click OK.

5. Modify any appropriate settings on the *Connection* tab, *Modem* tab, *COM Port* tab or *Phone book* tab as described in *Changing the Dialer Settings* next.

6. Select File | Save Changes to save any changes made.

Changing the Dialer Settings

The configuration and connection settings used by the Dialer can be easily set or changed through the tabs of the *Main Dialer* window. This section lists the settings that may be changed with each tab.

To change an existing connection, first select the name of the connection to change from the drop down list of the *Connection* box above the tabs of the *Main Dialer* window.

Settings on the Connection Tab

The option is provided to define the connection type, set the default connection, specify an authorization model including username and password, as well as setting up the network. Each of the options is described in detail:

- Connection Type
  Click on this option to select either a Serial connection or Network connection. A serial connection is provided for applications that do not use TCP/IP. The serial connection is currently not used by any *Century TCP* applications. The following are the options available after selecting the Network connection:

  PPP (Point to Point Protocol)
  Allows hosts to link via TCP/IP over an asynchronous RS-232C port. PPP offers a more complete set of options than SLIP

  SLIP (Serial Line Internet Protocol)
  Allows hosts to link via TCP/IP over an asynchronous RS-232C port.

  CSLIP (Compressed header SLIP)
  This option is a variant of SLIP that compresses the 40 bytes of TCP/IP headers that are transmitted with each data packet down to approximately 5 or 6 bytes.

- Default Connection
  This is the connection that will be used when Auto Dialing is enabled (on the *Options* menu) and a *Century TCP* application is invoked. Select this setting when the name of the desired connection is displayed in the *Connection* box of the Dialer window. Only one network connection may be selected as the default at a time.

- Authorization
  This item specifies the *authentication*[4] model for logging into the remote host. Select the model appropriate for the host system. If the settings are not known, contact the System Administrator or Internet provider. Click to display the *Authorization Settings* dialog where one of the following may be selected:

  Use PAP Authorization Model
  This protocol sends an identifying name and an associated password. Login scripts are disabled when this is selected. This setting is unavailable if SLIP, CSLIP or Serial connection type are selected.

  Use CHAP Authorization Model
  Login scripts are disabled when this is selected. This setting is unavailable if SLIP, CSLIP or Serial connection types are selected.

  Use [5]*Standard Login*
  This is the default setting and requires no special authorization. Login scripts may be used or manual interaction may be used to log in.

[4] When connecting to a server, or when a computer is acting as a server, the computer will verify that the connecting machine has the right to connect and access it.

[5] This type of login is the most common. Usually when a connection is made, the user must type their user id (name) and the correct password to gain access to the system.

Set Login Parameters
Click this option to set the username and password that is appropriate for the host or Internet system.

- Network Settings
  These settings are only available if a network connection type is selected. If the proper response to these settings is not known, contact the System Administrator or the Internet Provider.

- Domain Name
  Domain Name Server's Host IP Address. Enter the domain name consisting of a sequence of names separated by periods. For example, pcx.cen.com.

- Domain Name Server IP Address
  Enter the DNS Host IP Address. For example, 192.99.77.160.

- Local IP Address
  IP address for the local machine. Click Use Static Local then enter the IP address if the address provided is static (never changing).

Settings on the Modem Tab

The Modem tab allows the selection or definition of the modem type, initialization strings, the specification of a direct serial connection without a modem, as well as specification of a PCMCIA modem. Each option is described in detail:

- Modem Type
  Click to select a modem type from the drop down list. If unsure of the type of modem in use, check the modem documentation. If the documentation is unavailable, select generic (Hayes compatible). To define a modem not displayed on the list, click Add to display the *Adding a Modem* dialog.

- Modem Control Strings
  Standard modem command strings that the Dialer automatically sends as part of the serial connection process. Enter the appropriate command strings for the modem.

- Initialize
  A string of commands controlling such modem functions as data compression, data rate and flow control. Enter the initialization string from the modem manual. If the correct initialization string is not known, use the default settings that establish these conditions:
  - Compression: On
  - Error Correction: On
    This is important if the modem speed is 9600 baud or greater.
  - Data Rate: Fixed
  - Hardware Flow Control: On
  - Software Flow Control: Off

  Dial
  Standard modem dial command. Enter the dial command from the modem manual. This is typically ATDT.

  Hang-up
  Standard modem hang-up command. Enter the hang-up command from the modem manual. This is typically ~~~+++~~~ATH.

These standard commands are valid for Hayes compatible modems. If the modem used is not Hayes compatible, the commands will need to be verified in the documentation for the modem used.

- Direct Serial Connection Without Attached Modem
  Indicates a direct line to the host. When the connection is initiated, no dialing occurs.
- PCMCIA Modem
  Indicates that the modem is installed in a *PCMCIA*[6] slot of the PC.

[6] This is a Plug and Play compliant device. The device is plugged into the PC and is automatically configured when the PC is started.

Settings On The COM Port Tab

The COM Port tab allows the specification of the COM Port, the modem speed (baud rate), flow control, data bits, stop bits, parity, auto disconnect timeout, dialing timeout and the Dialer retry count.

The items included in the COM Port Tab basically control how the communication will happen. This includes how quickly the communication or conversation will occur and the basic rules of the conversation. If a System Administrator is not available, it may be necessary to refer to the documentation for the computers and other devices used for the conversation to determine details on these items.

Each of these options is described below:

- Port
  The COM ports in the computer are where the cables and internal devices such as modems are connected so that the computer can communicate with the outside world. Most personal computers have between two and four COM ports. Select the COM port used for this connection: COM1, COM2, COM3 or COM4.

- Modem Speed
  Indicates the rate at which the computer exchanges data. Typical modem speed settings include 2400, 9600 and 19200. The modem documentation describes the maximum speed (also called baud rate) at which the modem can operate. Select the appropriate speed from the list. The default is 19200. If the modem's speed is not given on the list, select the next fastest speed, then set the Flow Control to RTS/CTS.

- Flow Control
  Indicates how to coordinate sending and receiving data between the PC and the host. Select the appropriate setting; XON/XOFF or RTS/CTS. The default is RTS/CTS. Use Flow Control when the speed of the modem and the PC are different.

- Data Bits
  The number of bits transmitted at a time. Click the appropriate button, 7 or 8. The default is 8 (if unsure of what this setting should be, use 8).

- Stop Bits
  Mark the end of a character in asynchronous communications. Click the appropriate button, 1 or 2. The default is 1 (use 1 if not sure what the setting should be).

- Parity
  Adds a bit to each transmitted character. When using even parity, the bit's value is either 0 or 1 to make the total number ones in the character even. When using odd parity, the bit's value is either 0 or 1 to make the total number of ones in the character odd. Click the appropriate button, Even, Odd, Mark, Space or None. The default is None (use None if not sure what this setting should be).

- Auto disconnect timeout
  Specifies the time in seconds during which no data has been sent or received after which the Dialer hangs up. Enter the desired waiting time, in seconds. The default is 900 seconds. Zero (0) means never disconnect. This prevents accidentally keeping a long distance connection if the user is distracted.

- Dialing Timeout
  Specifies the number of seconds that the modem waits after dialing for a connection to be established. If the modem doesn't connect in that number of seconds, the Dialer hangs up and re-dials according to the setting of the *Dialer retry count*. Enter the desired waiting time, in seconds. The default is 45 seconds. Zero (0) means never disconnect.

- Dialer retry count
  Specifies the number of times the Dialer re-dials a number that is not responding. Enter the desired number of retries. The default is 10 tries.

Settings on the Phone book Tab

The Phone book tab allows the selection, specification or modification of a destination for the connection, the setting of the phone number for the connection, setting a dialing prefix and suffix, as well as selecting, creating or modifying a login script. In effect, this works like a "Phone Book", where frequently called numbers can be entered and the connection to the number can be automated. Each of these options is described in detail:

- Destination
  The description to associate with a given phone number. For example, the location the phone number reaches. Select an existing destination from the list or click Add to create a new destination.

- Number
  The phone number, including area code. Select an existing number to be used for the connection, or type a new phone number for the connection. Numbers must conform to the characters and formats supported by the modem.

- Dialing Prefix
  Information to be added to the beginning of the phone number. Enter any prefix characters required for the telephone system used.

- Dialing Suffix
  Information to be appended to the phone number. Enter any suffix characters required for the telephone system used.

- Login Script
  Use of a login script allows the automation of the login procedure. Login scripts may be added or changed as necessary. For details on the maintenance of these scripts, refer to the section Login Scripts on page 165.

  File Name
  List of currently available login scripts. Select the desired login script. To login manually, select Manual Connect. When Manual Connect is used, click Continue after logging in to the host. This action informs the Dialer that the login is completed and that the PPP/SLIP/CSLIP (serial) connection process is to continue.

  First Line
  This item shows the first line of the currently selected login script. If Manual Connect is selected, nothing displays.

Add Button
Click to display the *Adding a Script* dialog where a new script may be created.

Change Button
Click to have Notepad open the currently selected login script for editing.

Settings on the Statistics Tab

The Statistics tab allows the viewing of the history and connection summaries of the Dialersession.

Connection History

The Connection History tracks the connections made. Click *This Connection* to change the information in the window to pertain only to the current connection. The Connection history allows the display of when the connection was made, the tracking of errors, displaying the history of all connections as well as the option to delete all or portions of the Connection History by selecting Edit | Delete.

History Summary

This screen summarizes how many attempts to connect were made verses how many times a connection was made. The summary also displays how long the current connection has lasted.

Current Connection

Click This Connection when a connection is active to view the summary of all sessions for the current connection. This includes the start time, duration and local IP address and host name provided by this connection.

Using the Dialer Menus

The menu bar of the main Dialer window provides the following options:

- File
- Edit
- Options
- Tools
- Help

Each of the options is explained in detail:

- File

  Save Changes
  Allows the saving of changes made in the Dialer since the last File | Save Changes or last File | Discard Changes.

  Discard Changes
  Allows the deletion of changes made in the Dialer since the last File | Save Changes or File | Discard Changes.

  Exit
  Exits the Dialer

- Edit

  Cut
  Removes text selected within Dialer edit boxes and puts it on the Clipboard. This command is available only when there is selected text. The text remains on the Clipboard until replaced with new text.

  Copy
  Copies text from the Dialer edit boxes and places it onto to the Clipboard. This command is available only when there has been text selected. The text remains on the Clipboard until replaced with new text.

  Paste
  Inserts a copy of the contents of the Clipboard at the insertion point, replacing the selected text (if any) with text from the Clipboard. This command is not available if the Clipboard is empty.

Delete
Deletes the selected item. Depending on which tab and control are selected, this menu may change. For example, when accessing the Modem tab with Modem Type selected to delete, this menu item becomes Delete Modem.

- Options

  Always On Top
  Keeps the Dialerwindow or icon above any other application.

  Minimized At Startup
  Minimizes the Dialerwindow when the Dialer starts.

  Auto Dialing
  When checked, enables auto dialing capability. When another application capable of invoking auto dialing does so, the Dialer automatically starts and dials.

- Tools

  Initial Setup Assistant
  Starts a series of dialogs that go through step by step the initial set up of the Dialerparameters. See Using the Initial Setup Assistant on page 153.

  New Connection Assistant
  Starts a series of dialogs that provide step by step assistance when setting up the connection. This feature may be used each time to define a new connection. See Using the New Connection Assistant on page 153.

Login Scripts

A login script is a file consisting of a set of special commands, arranged to perform the tasks to be performed each time a host is logged into. A new script file may be created, a script file may be deleted or edited using Microsoft WindowsNotepad.

This section explains how to create login scripts and gives descriptions for each of the login scripting commands available in *Century TCP*. It also provides some examples of login scripts using these commands. Login scripts are not available for PAP and CHAP authorization models.

Adding and Changing Scripts

Century TCP provides two sample login scripts that may be reviewed by selecting the Phonebook | File Name . A list of script file names will be displayed. Simply select the desired file. The name will be displayed in the *File Name* list box, and the first line of the script will be displayed in the *First Line* box. This allows easy identification of the script selected.

To add a new script:

1. Select Phonebook.
2. Click Add at the end of the *File Name* list box. The *Adding a New Script* dialog box is displayed.
3. Enter a name for the new login script in the *New Name* box.
4. Select a name of an existing script to base the new script on in the *Based Upon* box.
5. Click OK. A new script file, which is a copy of the based-on script, is created. The file name extension .xsc is automatically appended.
6. Select File | Save Changes to save the new script.
7. Change the login script as desired using the new procedure.

To modify a login script:

1. Select Phonebook.
2. From the *File Name* list box, select a file name.
3. Click Change. *Notepad* displays the selected script.

4. Make the changes to the script, then select Notepad's File | Save.
5. Exit Notepad

To change login scripts or connect manually, simply select the *File Name* list box and select a script by name, or select Manual Connect. The next time a connection is made, *Dialer* will use the new setting.

Login Script Commands

Be aware of case sensitivity when specifying text string arguments with the following login scripting commands. The wait for *string* must exactly match the string, including case, sent by the host. All other commands that have text string arguments send their strings to the host machine. For these commands, case sensitivity depends on the host machine. Typically, host machines running UNIX operating systems are case sensitive, whereas machines running VMS operating systems are not.

The following table provides the commands available with a brief description for each one:

Table 1Command Listing

Command	Description
alarm	Sounds the alert tone on the PC. This command might be used to indicate when a connection has been established between the PC and the host.
break	Sends a break signal to the host. Some computers use the break signal as an attention character on a serial line. The break signal has limited use in scripts for network connections.
command *string*	Sends the specified string. This command is designed for modem control. Thus, the string specified must be a command recognized by a modem. This command accommodates the modem requirement for pauses between characters in commands sent to it. For faster communications to devices other than modems, use the *transmit* command. Even though the PC is communicating with a host through a modem, once the connection is established, the transmit command may then be used for sending commands to the host itself.
pause *number*	Makes the PC wait the specified number of seconds before executing the next command. Some actions require a pause. For example, if sending commands that take the host several seconds to execute, use the *pause* command to make the PC wait for the host to catch up.
prompt *string, flag*	Displays a dialog box with the specified string as a prompt, then transmits the input the user enters at the prompt in the format specified by *flag*: If *flag*=0 or non-existent, the password characters are displayed as asterisks. If *flag*=1, the text is displayed in readable format. If no *flag* is specified, *flag*=1 is assumed.
slipaddr *int1 int2*	Interprets an IP address for SLIP connections. The *int1* value determines the type of IP address being interpreted. If *int1* = -1, the IP address is ignored. If *int1* = 1, the IP address, if valid, is assigned as the local host's IP address. If *int1* = 2, the IP address, if valid, is assigned as the remote host's IP address.

Table 1 Command Listing (continued)	
	Int2 specifies a time in seconds in which the IP address must be interpreted. If the address is not interpreted during this time, the connection fails.
sound "<*WAV file*	Plays the specified Windows *.wav file. The file name must be enclosed *pathname>* in double quotes and can optionally include the full path. If a path is not specified, the following directories are searched, in order: Current directory Windows directory Windows System directory directories specified in the *PATH* statement When specifying a path, be sure to use double backslashes to indicate a single change in directory level. For example: sound "C:\\WINDOWS\\TADA.WAV" If the specified file is not found, the default sound specified by the SystemDefault entry in the [sounds] section of the *win.ini* file is played. If no default sound is specified, no sound is played.
transmit *string*	Sends the specified string as fast as possible, that is, with no pauses between characters. This command does not work well for sending commands to modems. For modem commands, use *command.*
waitfor *sting int*	Makes the PC wait for the specified interval (in seconds) for the specified string to be sent from the host. If after waiting the specified interval, this string is not received, the PC times out (the login script is aborted), and the *TinyTERM Plus*View | Log window displays the following error message: Script Reader: Waitfor timeout. The specified string is searched for using a case-sensitive comparison.
waitfori *string int*	Same as the above *waitfor* command except that the specified string is searched for using a case insensitive comparison.

Login Script File Examples

The following examples are script files that provide a sample of how a script can be created. If these examples are used as a base for the script, be sure to modify all areas that will differ in the specific environment. This includes such as items as login and password prompts, host names and user names.

Login Example

The following script logs into a host machine.

```
waitfor “login: “ 60                ;Wait for login banner.
transmit “bob\r”                    ;Login as bob.
waitfor “word:” 60                  ;Wait for password prompt
prompt “Hood Password”              ;Prompt user for password
```

This script has the PC wait up to 60 seconds for the host “hood” to transmit a login prompt back to the PC. When the PC receives the login prompt, it sends the user name “bob” to the host and waits for hood to send a password prompt. When it does, the PC displays a dialog box with the prompt “Hood Password”. The user types the appropriate password and the login will complete.

The \r is a standard character designating a carriage return. Comments in the file (shown in these examples on the right sides of the lines) are preceded with semicolons.

Terminal Server Login Example

In this example, the script directs the PC to login to a host over telephone lines through a terminal server. The modem initialization and dialing is defined in the connection and is performed automatically.

```
pause 2
waitfor “word:’” 60                 ;Wait for password prompt
prompt “Cisco Password”             ;Send a Cisco password
pause 1
transmit “hood\r”                   ;Connect to host “hood”
waitfor “login:” 60
transmit “bob\r”                    ;Login as bob
waitfor “word:” 60
prompt “Hood Password”              ;Prompt for password
```

The PC waits 2 seconds for modem dialing to complete. The login script waits up to 60 seconds for the terminal server to provide a password prompt. When the terminal server sends the password prompt, the PC displays a dialog box with the prompt Cisco Password. The user then types in the terminal server password and login to the terminal server completes as in the Direct Dial-In example.

Require a Callback Example

In this example, the login script requires the host to call back and given permissions to login. The modem initialization and dialing is defined in the connection and performed automatically.

```
pause 1
waitfor “username:” 20
transmit “hood\r”                ;Send user name response.
waitfor “word:” 20
prompt “Group Password”          ;Prompt for group password
pause 2
command “ath\r”                  ;Hangup
pause 1
waitfor “RING” 60                ;Host calling back. Modem sends tone
                                 signal to PC.
command “ata\r”                  ;Answer the phone.
waitfor “name:” 20
transmit “bob\r”                 ;Send user name
waitfor “word:” 20
prompt “Login Password”          ;Prompt for password
```

Restrictions on Login Scripts

Note the following rules and restrictions when building login scripts:

Table 2 Login Rules

Feature	Rule
Max. line length	160 characters.
Max. string length	160 characters. This restriction can be surmounted by continuing a single statement on multiple lines with consecutive *transmit* commands. For example: transmit “xemacs -I display bobs_pc:0” transmit “-fg white -bg black” transmit “-font 6x13 &\r”
Max. commands per file	No limit.
“command” statement	Send characters at the rate of one character per 155 ms.
Sending nonprintable	Use either:
characters to host	The numeric decimal code for the character, preceded with a backslash (\). An escape character (described in the next table).

To send non-printable characters, use the standard C escape characters listed in the Alpha Code or Numeric Code column in the following table. For other non-printable characters, use a backslash (\) followed by the decimal value of the character.

Table 3 Escape Code Listing

Alpha Code	Meaning	Numeric Code
\b	back space	\8
\f	form feed	\12
\n	line feed	\10
\p	password	See following paragraph.
\r	carriage return	\13
\t	tab	\9
\u	username	See following paragraph.
\v	vertical tab	\11

\p and \u produce special character sequences that are interpreted by the Dialer as a macro. This macro emits an array of characters that corresponds to a password and username. The password and username correspond to the password and username entered in the Dialer's *Standard Login Authorization Parameters* dialog. Access this dialog by selecting Connection | Authorization | Set Login Parameters.

Troubleshooting the Dialer

This section describes common problems and presents some suggestions for troubleshooting. Find the description below that best matches the problem and try the suggestions listed for the problem.

Can't connect to the remote host when using a modem

- Is the modem powered on?
- Is the correct COM port setting being used? If unsure of the correct COM port for the modem, try each one in sequence, starting with COM1. After changing the COM port setting, click Connect in the main Dialer window with a known good Connection selected.
- If an internal modem is used, be sure that the modem's COM port is not being used by other devices in the computer.
- If using a PCMCIA type modem, be sure PCMCIA Modem is selected in the Modem tab, then try the connection again.
- If unsure of the modem type in use, select Generic (Hayes compatible). Also try selecting PCMCIA Modem in the Modem tab.

The modem isn't calling

- Is the modem powered on?
- Is the modem securely connected to the correct COM port in the computer and the modem jack labeled LINE connected to an active telephone jack?
- If the telephone line uses tone dialing, does the Dialing string in Phonebook contain a T or a P if the telephone uses pulse dialing?

- If the modem is properly connected, the "Hayes Compatible" modem may not be 100% compatible. Change the Initialize string in Modem | Modem Control Strings dialog to values that are correct for the modem as defined in the modem documentation.

The modem disconnects immediately after it makes a connection and begins to redial

The modem is timing out and aborting the dial. Increase the modem wait for timeout. Refer to the modem documentation for specific instructions on timeouts.

The modem connection was successful, but communication is very slow

Transmission errors may be occurring due to a noisy phone line. When this happens, the modem must continually resend data, which slows the actual throughput. To solve this problem, try hanging up and reconnecting. If communication is still very slow, try increasing the modem baud rate in the *COM Port* tab. Next, try selecting PCMCIA Modem in the *Modem* tab.

The modem connection was successful, but the modem suddenly disconnects

Does the telephone line have "call waiting"? If so, another call may have come in during the *Century TCP* connection. Use a telephone line that does not have the call waiting function or contact the telephone company to find out how to disable call waiting.

IRQ Conflict

The modem and another device in the computer have the same Interrupt Request Line (IRQ). Look at the Windows COM port settings in the *Control Panel*. If there are two COM ports with the same IRQ, one must be changed.

To change the IRQ on one of the active ports:

1. Open the Windows *Control Panel* and select the port to be tested.
2. Click Settings.
3. Click Advanced.
4. Change the IRQ field to resolve the conflict.

Using Multiple Network Protocols

In This Section:

Introduction

Although *Century TCP* uses the TCP/IP network protocol, it can also coexist simultaneously with other non-TCP/IP network protocols. This section discusses some of the popular network protocols and how they can work together with *Century TCP*.

The examples show *Century TCP* and the example network in a Windows 3.1 or Windows for Workgroups environment when the Windows for Workgroups network is not active. For information concerning TCP/IP on Windows 95, refer to the Windows documentation.

Artisoft LANtastic and *Century TCP*

Century TCP and LANtastic can work simultaneously on the PC network adapter via NDIS network card drivers. Only certain versions of LANtastic, however, support NDIS drivers. If the PC is running LANtastic version 4.1 or below, the current LANtastic version must be installed.

In order to run LANtastic over NDIS, Artisoft's AI-NDIS.EXE NDIS compatible protocol driver must be used. This file is available on the Artisoft bulletin board in the AINDIS.EXE self-extracting file. This file is included in the LANtastic version 6.0 and above.

Banyan VINES and *Century TCP*

Century TCP and Banyan VINES can work simultaneously on the PC network adapter via NDIS network card drivers. Only certain versions of Banyan support NDIS drivers. Banyan VINES version 5.5 or higher must be used.

The following instructions assume that Banyan is configured to use NDIS drivers. Refer to *PCCONFIG* and *Managing VINES Workstations* in the Banyan documentation for NDIS configuration information. After configuring Banyan for NDIS, perform the following steps:

1. Install *Century TCP*. *Century TCP* detects the current NDIS configuration. While making no changes to the NDIS configuration, items are added to the *config.sys, autoexec.bat* and the *protocol.ini* files.

2. Edit the *config.sys* file. The following line should be included in this file:

   DEVICE=C:\BAN\PROTMAN.DOS /I:C:\BAN

   The "/I" parameter provides the name of the directory that contains the *protocol.ini* file. There are several other drivers loaded from the BAN directory, one of which is the NDIS driver for the network board. Typically the filename extension for the NDIS driver is .dos.

   Below the protman.dos device name, verify that the following line is included:

   DEVICE=C:\CENTURY\MAR_NDIS.DOS

   If there are any other drivers loaded from the Century directory, comment them out by adding REM at the front of the line.

3. Edit the *autoexec.bat* file. *Century TCP* adds the following command line to the file:

   C:\CENTURY\NETBIND.COM

   This line is redundant to the ban command in the *autoexec.bat* file placed there by Banyan VINES. Delete the NETBIND.COM command from *autoexec.bat*.

4. Edit the *protocol.ini* file. The location of this file is determined by the "/I" parameter to PROTMAN.DOS in the *config.sys* file. In this example, the parameter in question is \LAN (see step 2).

   Ensure the following four lines are in the *protocol.ini* file:

   ```
   [MAR_NDIS]
      DRIVERNAME=MAR_NDIS$
      BINDINGS=NETWORK_CARD
      PCXNET_INT=0x60
   ```

   Change the BINDINGS= line in the [MAR_NDIS] section to match the BINDINGS= line in the [VINES_XIF] section.

IBM LAN Support with *Century TCP*

The IBM LAN Support program allows IEEE 802.2 and NetBIOS programs to operate over a single LAN. IBM LAN Support includes a collation of drivers that provide this capability. The IBM LAN Support DXMA0MOD.SYS interrupt arbitrator driver is always used. It is combined with the other IBM LAN Support drivers, depending upon the types of application programs accessed by LAN Support.

For diagrams and explanations of the IBM LAN Support driver combinations, see *Appendix B* in the *IBM LAN Support Program Version 1.35 User's Guide.*

The following table lists the included IBM LAN Support drivers:

Table 1 IBM LAN Support Drivers

Driver Name	Description
DXMA0MOD.SYS	Interrupt arbitrator (required driver)
DXMC0MOD.SYS	Token-Ring adapter types I, II, /A, 16/4 & 16/4/A
DXMC1MOD.SYS	3270 Workstation support
DXMEMOD.SYS	Ethernet NDIS IEEE 802.2 support
DXMG0MOD.SYS	PC Network & Baseband adapter support
DXMG1MOD.SYS	3270 Workstation support
DXMG2MOD.SYS	Original PC Network adapter support
DXMT0MOD.SYS	NetBIOS driver E O=N CF=Y (required command line options)
DXMJ0MOD.SYS	NETBEIU NDIS Driver (no IEEE 802.2)

The DXME0MOD.SYS/DXMT0MOD.SYS combination and DXMJ0MOD.SYS are mutually exclusive. DXMT0MOD.SYS and DXMJ0MOD.SYS both provide NETBEIU support.

When the IBM LAN Support is used with the NDIS network card drivers, certain parameters are mandatory on the IBM LAN Support DXM driver lines. The following entries are sample *config.sys, autoexec.bat* and *protocol.ini* entries for *Century TCP* and IBM LAN Support.

Century TCP (NDIS) and IBM LAN Support (NetBIOS)

CONFIG.SYS

```
DEVICE=C:\CENTURY\PROTMAN.DOS /:C:\CENTURY
DEVICE=C:\NDIX_DRIVER.DOS
DEVICE=C:\LSP\DXMA0MOD.SYS 001
DEVICE=C:\LSP\DXMJ0MOD.SYS
DEVICE=C:\CENTURY\MAR_NDIS.DOS
```

The 001 DXMA0MOD.SYS parameter defines US English as the language for load-time messages. The *NDIS_DRIVER.DOS* is replaced with the network card driver.

AUTOEXEC.BAT

```
C:\CENTURY\NETBIND.COM
PATH=C:\CENTURY;%PATH%
```

PROTOCOL.INI

```
[PROTMAN_MOD]
  DRIVERNAME = PROTMAN$
[DXMAIDXCFG]
 DXMJ0MOD_NIF = NETBEIU$
 BINDINGS = NETWORK_CARD
 ETHERAND_TYPE = D
 CHAINX5C = 1
[NETWORK_CARD]
 DRIVERNAME = DRIVER$
[MAR_NDIS]
 DRIVERNAME=MAR_NDI$
 BINDINGS=NETWORK_CARD
 PCXNET_INT=0x60
```

NETWORK_CARD is replaced with the network card driver name.

Century TCP (NDIS) and IBM LAN Support (IEEE 802.2 & NetBIOS)

CONFIG.SYS

```
DEVICE=C:\CENTURY\PROTMAN.DOS /I:C:\CENTURY
DEVICE=C:\NDIS_DRIVER.DOS
DEVICE=C:\LSP\DXMA0MOD.SYS 001
DEVICE=C:\LSP\DXME0MOD.SYS_,12,1
DEVICE=C:\LSP\DXMT0MOD.SYS E O=N CF=Y
DEVICE=C:\CENTURY\MAR_NDIS.DOS
```

Table 2IBM LAN Parameter Reference

Driver	Parameter	Purpose
DXMA0MOD.SYS	001	Defines US English as the language for load-time messages.
DXME0MOD.SYS	12	Gives a 12KB work space for the network card adapter.
	1	Transmits Ethernet DIX Version 2.0 frames with swapping address bits.
DXMT0MOD.SYS	E	Enables the network adapter for simultaneous use with an asynchronous adapter.
	O=N	Delays the NetBIOS network adapter open until NETBIND is run in AUTOEXEC.BAT.
	CF=Y	Prevents an application program from intercepting the interrupt issued by the NetBIOS driver.

NDIS_DRIVER.DOS is replaced with the network card driver name.

AUTOEXEC.BAT

```
C;\CENTURY\NETBIND.COM
PATH=C:\CENTURY,%PATH%
```

PROTOCOL.INI

```
[PROTMAN_MOD]
DRIVERNAME = PROTMAN$

[DXMAIDXCFG]
DXME0_NIF = DXME0.NIF

[DXME0_NIF]
DRIVERNAME = DXME0$
BINDINGS = NETWORK_CARD

[NETWORK_CARD]
DRIVERNAME = DRIVER$

[MAR_NDIS]
DRIVERNAME=MAR_NDI$
BINDINGS=NETWORK_CARD
PCXNET_INT=0x60
```

NETWORK_CARD is replaced with the network card driver name.

Century TCP (NDIS) and IBM LAN Support (IEEE 802.2)

CONFIG.SYS

```
DEVICE=C:\CENTURY\PROTMAN.DOS /:C:\CENTURY
DEVICE=C:\NDIS_DRIVER.DOS
DEVICE=C:\LSP\DXMA0MOD.SYS 001
DEVICE=C:\LSP\DXME0MOD.SYS_,12,1
DEVICE=C:\CENTURY\MAR_NDIS.DOS
```

Table 3IBM LAN Support Parameter Listing

Driver	Parameter	Purpose
DXMA0MOD.SYS	001	Defines US English as the language for load-time messages.
DXME0MOD.SYS	12	Gives a 12KB work space for the network card adapter
	1	Transmits Ethernet DIX Version 2.0 frames with swapped address bits.

NDIS_DRIVER.DOS is replaced with the network card driver name.

AUTOEXEC.BAT

```
C:\CENTURY\NETBIND.COM
PATH=C:\CENTURY;%PATH%
```

PROTOCOL.INI

```
[PROTMAN_MOD]
 DRIVERNAME = PROTMAN$

[DXMAIDXCFG]
 DXME0_NIF = DXME0.NIF

[DXME0_NIF]
 DRIVERNAME=DXME0$
 BINDINGS = NETWORK_CARD

[NETWORK_CARD]
 DRIVERNAME =DRIVER$

[MAR-NDIS]
 DRIVERNAME=MAR_NDI$}
 BINDINGS=NETWORK_CARD
 PCXNET_INT=0x60
```

NETWORK_CARD is replaced with the network card driver name.

Microsoft LAN Manager and *Century TCP*

Microsoft LAN Manager supports network adapters via NDIS device drivers. LAN Manager may implement the NDIS NETBIND functionality via the following call in *autoexec.bat*:

```
NET START WORKSTATION
```

If the current version of LAN Manager includes NET START WORKSTATION call, remove the entry that *Century TCP* placed in *autoexec.bat:*

```
C:\CENTURY\NETBIND
```

Novell NetWare and *Century TCP*

Century TCP and NetWare can coexist when NetWare uses the Open Data-Link Interface (ODI) protocol to access the network adapter. In non-ODI environments, the NetWare protocol and driver for the specific network adapter are combined into *ipx.com*. In ODI environments, *ipx.com* is replaced by:

- A NetWare protocol module that is not tied to one specific network adapter (*ipxodi.com*).
- An ODI network adapter driver (represented by ODI_DRV.COM in the example on the following page).
- A Link Support Layer (lsl.com) that sends and receives NetWare and non-NetWare network information.

For *Century TCP* to install and use ODI, the PC must be running ODI during the *Century TCP* installation. *Century TCP* detects the ODI installation and edits *autoexec.bat* and *net.cfg* accordingly.

AUTOEXEC.BAT

```
C:\path\LSL.COM
C:\path\ODI_DRV.COM
C:\CENTURY\MAR_ODI.COM 0x60
C:\path\IPXODI.COM
C:\path\NETX.EXE
```

The command-line option for MAR_ODI.COM (designated as CENTURY in this example), is determined by the type of network data (Frame) used on the PC, as designated in the *net.cfg* file. Run MAR_ODI.COM without any options to display the list of available options. This Frame type is added to the *net.cfg* file if the file does not already contain the type.

C:\path\NET.CFG

```
Link Driver ODI_DRV
 Frame Ethernet_802.3
 Frame Ethernet_II
 Frame Ethernet_802.2
 Frame Ethernet_SNAP
```

```
Link Support
 Buffers 12 1575
```

Troubleshooting

Protocol Manager (PROTMAN) Displays an Error

Compare the entries made in *config.sys, autoexec.bat* and *protocol.ini* with the *Example NDIS and ODI Configurations* in Appendix B. Carefully examine the *protocol.ini* file. The *Century TCP* section [MAR_NDIS] has a BINDINGS= statement that must point to the *protocol.ini* section name of the network adapter.

Netbind Fails

Verify that the network devices loaded in *config.sys* load correctly. Most of these devices emit diagnostic messages when they are loaded. Ensure that the diagnostic messages are error free. If error messages occur, carefully examine each network DEVICE= statement in *config.sys*. Next, examine the *protocol.ini* file. Ensure that the [MAR_NDIS] section's BINDINGS= statement correctly matches the section name for the network adapter.

If Netbind still fails, refer to the *Netbind Error Codes* section in this manual.

If problems still occur, comment out the *Century TCP* commands in *config.sys* by placing REM at the beginning of the line. Leave the previous network's device statements unchanged. Reboot the PC to ensure that the pre-existing network configuration is correct. If there are problems with the pre-existing configuration, refer to the user's manual for that particular network.

Netbind Succeeds but Only One Network Protocol Works

Edit *config.sys* and place REM at the beginning of the *Century TCP* command line. Leave the previous network's device statements unchanged. Reboot the PC to ensure that the pre-existing configuration is correct. If there are problems with the pre-existing configuration, refer to the user's manual for that particular network.

Example NDIS and ODI Configurations

In This Section:

NDIS Configuration for Microsoft Windows 3.1

The following is an example NDIS Century configuration for Microsoft Windows 3.1. These configurations do not apply to Windows 95 users, the configuration changes made using Windows 95 are made to Windows files automatically.

NDIS_DRV.DOS is a place holder for the specific network card NDIS driver.

CONFIG.SYS

```
LASTDRIVE=Z
DEVICE=C:\CENTURY \PROTMAN.DOS /I:C:\CENTURY
DEVICE=C:\CENTURY\NDIS_DRV.DOS
DEVICE=C:\CENTURY\MAR_NDIS.DOS
```

AUTOEXEC.BAT

```
C:\CENTURY \NETBIND.COM
PATH=C:\CENTURY;%PATH%
```

C:\CENTURY\PROTOCOL.INI

```
[NDIS_DRIVER]
 DRIVERNAME=NDIS_DRV$
[MAR_NDIS]
DRIVERNAME=MAR_NDI$
BINDINGS=NDIS_DRIVER
PCXNET_INT=0X60
```

NDIS Configuration for Microsoft Windows for Workgroups Network

NDIS Version 2 (Real Mode or Real and Enhanced Mode Driver)

Here is the same NDIS example on an Microsoft Windows for Workgroups machine that is also running the Microsoft Windows for Workgroups network. NDIS_DRIVER is a placeholder for the network card section name in PROTOCOL.INI.

CONFIG.SYS

```
LASTDRIVE=Z
DEVICEHIGH=C:\WINDOWS\IFSHLP.SYS
```

AUTOEXEC.BAT

```
C:\WINDOWS\NET START
set path=C:\CENTURY;%PATH%
```

C:\WINDOWS\PROTOCOL.INI

```
[NDIS_DRIVER]
DRIVERNAME=NDIS_DRV$

[MAR_NDIS]
DRIVERNAME=MAR_NDI$
BINDINGS=NDIS_DRIVER
PCXNET_INT=0X60
```

Other sections to support Microsoft Windows for Workgroups network are also included:

C:\WINDOWS\SYSTEM.INI

```
[network drivers]
netcard=NDIS_DRV.DOS
devdir=C:\WINDOWS
transport=C:\CENTURY \MAR_NDIS.DOS,ndishlp.sys,*netbeui
loadRMdrivers=yes
```

NDIS Version 3 (Enhanced Mode NDIS Driver)

Here is the same NDIS example on an MS Windows for Workgroups machine that is also running the MS Windows for Workgroups network. NDIS_DRIVER is a place holder for the network card section name in PROTOCOL.INI.

CONFIG.SYS

```
LASTDRIVE=Z
DEVICEHIGH=C:\WINDOWS\IFSHLP.SYS
```

AUTOEXEC.BAT

```
C:\WINDOWS\NET START
set path=C:\CENTURY;%PATH%
```

C:\WINDOWS\PROTOCOL.INI

```
 [NDIS_DRIVER]
DRIVERNAME=NDIS_DRV$
```

C:\WINDOWS\SYSTEM.INI

```
[boot]
secondnet.drv=C:\CENTURY \mar_net.drv

[386Enh]
device=C:\CENTURY \mar_nfs.386
device=C:\CENTURY \mar_com.386
device=C:\CENTURY \mar_tcp.386
```

```
[Century]
Binding=NDIS_DRV$
```

If Windows for Workgroups is running without the Windows for Workgroups network, see the NDIS Configuration for Microsoft Windows for Workgroups Network section.

ODI Configuration for Microsoft Windows 3.1

The following is an example ODI Century configuration for Microsoft Windows. ODI_DRV.COM should be replaced with the specific network card ODI driver.

AUTOEXEC.BAT

```
C:\path\LSL.COM
C:\path\ODI_DRV.COM
C:\CENTURY\MAR_ODI.COM 0x60
C:\path\IPXODI.COM
C:\path\NETX.EXE
```

C:\path\NET.CFG

```
Link Driver ODI_DRV
  Frame Ethernet_802.3
  Frame Ethernet_II
  Frame Ethernet_802.2
  Frame Ethernet_SNAP
Link Support
  Buffers 12 1575
```

Century ensures that the proper "Frame" entry exists in the Link Driver section. This Frame entry matches the option on the MAR_ODI.COM line in AUTOEXEC.BAT. Run MAR_ODI.COM without any options to see the list of available options.

ODI Configuration for Microsoft Windows for Workgroups Network

Here is the same ODI example on an Microsoft Windows for Workgroups machine that is also running the Microsoft Windows for Workgroups network. ODI_DRV.COM should be replaced with the specific network card driver.

CONFIG.SYS

```
DEVICEHIGH=C:\WINDOWS\IFSHLP.SYS
```

AUTOEXEC.BAT

```
C:\WINDOWS\NET START
C:\path\LSL.COM
C:\path\ODI_DRV.COM
C:\path\IPXODI.COM
C:\path\NETX.EXE
C:\WINDOWS\ODIHLP.EXE
```

C:\path\NET.CFG

```
Link Driver ODI_DRV
  Frame Ethernet_802.3
  Frame Ethernet_II
  Frame Ethernet_802.2
  Frame Ethernet_SNAP

Link Support
  Buffers 12 1575

NetWare DOS Requester
  FIRST NETWORK DRIVE = F
```

C:\WINDOWS\PROTOCOL.INI

```
[net.cfg]
PATH=C:\path\NET.CFG

[Link Driver ODI_DRV]
data=Frame Ethernet_SNAP
data=Frame Ethernet_802.2
data=Frame Ethernet_II
data=Frame Ethernet_802.3

[NWLINK]
BINDINGS=ODI_DRV
```

```
[NetBEUI]
BINDINGS=ODI_DRV
LANABASE=1
SESSIONS=10
NCBS=12
[Link Support]
NewMaxBoards=Max Boards 4
```

Token Rings and Source Routing

If source routing is necessary over ODI, refer to the NetWare documentation for information about the ROUTE command. Since TCP/IP uses a different Frame type than NetWare, ROUTE must be loaded twice, once for each Frame type. The ROUTE command is appended to the AUTOEXEC.BAT file ODI entries:

```
C:\path\ROUTE BOARD=1
C:\path\ROUTE BOARD=2
```

Netbind Error Codes

Error Code Listing

The following table lists error codes that may be returned by the NDIS NETBIND.COM module.

Error Codes	Messages	Solutions
0	No error	N/A
9	Not supported	The network driver received an unsupported function request. It may be necessary to find an updated NDIS driver for the network adapter.
32	Already started	Examine **CONFIG.SYS** for duplicate PROTMAN device statements.
33	Incomplete binding	One of the BINDINGS= statements in **PROTOCOL.INI** is incorrect. The BINDINGS= statement in the [MAR_NDIS] section must match the name of the network adapter section.
34	Driver not initialized	The NDIS network adapter driver in **CONFIG.SYS** did not initialize correctly.
35	Hardware not found	The network adapter is not found by the network adapter device driver.
37	Configuration failure	The configuration specified for the network adapter in **PROTOCOL.INI** is incorrect.
39	Incompatible MAC	A network protocol has determined that the network adapter (Media Access Controller) driver is not compatible with the network adapter.
41	No binding	A network driver in **CONFIG.SYS** did not load correctly or PROTMAN could not find **PROTOCOL.INI**.
42	Network may not be connected.	The network adapter may not be connected to a network.
46	Insufficient memory	**PROTMAN.EXE** could not load due to insufficient DOS memory.

Network Addresses

In This Section:

Overview

This section highlights IP network addresses. Detailed specifications are available in Request for Comment (RFC) documents. RFC documents can be obtained via anonymous FTP at NIC.DDN.MIL.

Each computer (or host) on the network has an IP (Internet) address that uniquely identifies it. The IP address may be used in commands to identify and connect to specific hosts (individual machines connected to the network).

Each IP address is one 32-bit value. A portion of the address defines the network, while another portion defines the host on that network.

The 32-bit IP address is commonly divided into four 8-bit decimal values. Each decimal value is separated from other values by dots (.). This network address notation is known as a dotted decimal. Since each decimal digit represents 8 binary digits, the maximum dotted decimal value is 255. The following is an example of a dotted decimal IP address:

192.86.85.4

Address Classes

The following network classes are used to group networks according to the number of hosts on the network.

Table 1 Network Class Listing

Network Class	Number of Hosts
Class A	Can contain millions of hosts.
Class B	Can contain thousands of hosts.
Class C	Can contain up to 254 hosts.
Class D	Used to identify a group of computers all at one time ("multicast" addresses).
Class E	Reserved.

Each of the five network classes (A-E) is described on page 196 through 197.

Class A Networks

As shown below, class A networks use 7 bits to define the network and 24 bits to define the hosts. The uppermost bit is always 0. This allows 128 class A networks.

Table 2 Class A Networks

Address Range	Status
0.0.0.0	Reserved
1.0.0.0 through 126.0.0.0	Available
127.0.0.0	Reserved

Class B Networks

As shown below, class B networks use the uppermost 2 bits as 1,0, the next 14 bits define the network, and the last 16 bits define the hosts. This allows up to 16,384 class B networks.

Table 3 Class B Networks

Address Range	Status
128.0.0.0	Reserved
128.1.0.0 through 191.254.0.0	Available
191.255.0.0	Reserved

Class C Networks

As shown in the following table, class C networks use the uppermost 3 bits as 1,1,0, the next 21 bits define the network and the latter 8 bits define the hosts. This allows up to 2,097,152 class C networks.

Table 4 Class C Networks

Address Range	Status
192.0.0.0	Reserved
192.0.1.0 through 223.255.254.0	Available
223.255.255.0	Reserved

Class D Networks

As shown below, class D networks use the uppermost 4 bits as 1,1,1,0. The remaining 28 bits are used for multicast groups of computers. RFC988 explains multicast groups.

Table 5 Class D Networks

Address Range	Status
224.0.0.0 through 255.255.255.254	Reserved

Class E Networks

As shown below, class E networks use the uppermost 4 bits as 1,1,1,1. Class E networks are reserved for future use. The only class E address currently used is 255.255.255.255 which is a global broadcast address.

Broadcast Addresses

The broadcast address is an address common to all nodes on a network. The broadcast address has the host bits set to ones. In a non-subnetted network, the broadcast address is 255 in each host field. Data sent to the broadcast address is received by all hosts on the network and is equivalent to sending data directly to each network host.

Subnets and Subnet Mask s

Subnets

Subnets are logical subsections of a single network. Subnets are created for administrative or technical reasons, isolating similar network traffic or similar network technology to one area of the network. RFC950 explains the Internet Standard Subnetting Procedure.

Subnets are created by partitioning the host field of the network address. Each partition of the host field defines a subnet. For example, Class C networks use the last 8 bits to define the host. To divide this network into two subnets with an equal number of addresses in each, 1 bit of the host field is used (since 1 bit takes on 2 different values and 2 partitions are needed). When the subnet bit value changes, a different partition of hosts is referenced. The broadcast address differs for each subnet, thus broadcasts only reach those hosts in the subnet.

Here are some subnet examples:

Table 6 Subnets

Network	Subnet Partitions	Subnet Bits	Broadcast Address
192.86.85.0	0	0	192.86.85.255
192.86.85.0	2	1	
	when 0: 192.86.85.0 through 192.86.85.127		192.86.85.127
	when 1: 192.86.85.128 through 192.86.85.255		192.86.85.255
192.86.85.0	8	3	
	when 000: 192.86.85.0 through 192.86.85.31		192.86.85.31
	when 001: 192.86.85.32 through 192.86.85.63		192.86.85.63
	when 010: 192.86.85.64 through 192.86.85.95		192.86.85.95
	when 011: 192.86.85.96 through 192.86.85.127		192.86.85.127
	when 100: 192.86.85.128 through 192.86.85.159		192.86.85.159
	when 101: 192.86.85.160 through 192.86.85.191		192.86.85.191
	when 111: 192.86.85.192 through 192.86.85.223		192.86.85.223
	when 111: 192.86.85.224 through 192.86.85.255		192.86.85.255

Subnet Masks

Subnet partitions are identified to the network software by the subnet mask. The subnet mask is the network address with ones in each subnet bit location. Continuing with the previous examples:

Table 7 Subnet Masks

Network	Host Partitions	Subnet Bits	Subnet Mask
192.86.85.0	0	0	192.86.85.0 (no subnet)
192.86.85.0	2	1	192.86.85.128 (derived from the binary value of 10000000)
192.86.85.0	8	3	192.86.85.224 (derived from the binary value of 11100000)

Gateways and Routing

Gatewaysare devices on the network that route data between networks. Data not destined for the sending host's network and subnet (if any) is sent to the router for transmission to the destination.

When data is sent on the network, the network software on the sending host examines the destination address. If the network portion of the destination address does not match the network address of the sending host (it is on another network) the data is sent to the gateway. If the network portion of the destination address matches the network address of the sending host, the local subnet mask is applied. If the destination address is on this subnet, the data is sent directly to the destination machine; otherwise, the data is sent to the gateway.

The gateway has two or more network addresses to different networks. The gateway examines the network address of the destination address, looks up routing information for that network, and sends the packet to its final destination or to another router in the destination chain.

Transferring Files

In This Section:

Getting Started

The Century FTP application allows the transferring of files between a personal computer and a host across a TCP/IP network. To transfer files with FTP, just drag and drop the files the same way as done in the Microsoft Windows File Manager or Windows Explorer. Files may be transferred, previewed, renamed or deleted files, as well as creating directories all within the same application.

What to Know Before Using FTP

Before using FTP, check the following:

What is the remote host name or IP address, and what is a user name and password on that machine?

Known - Proceed.

Unknown - Contact the administrator for that host.

Will “anonymous” login capability be needed?

Yes - Be sure to know the correct e-mail address.

No - Proceed.

Starting FTP

The Century FTP application is installed automatically when TinyTERM Plus is installed. Look for the Network File Transfer icon in the Century program group.

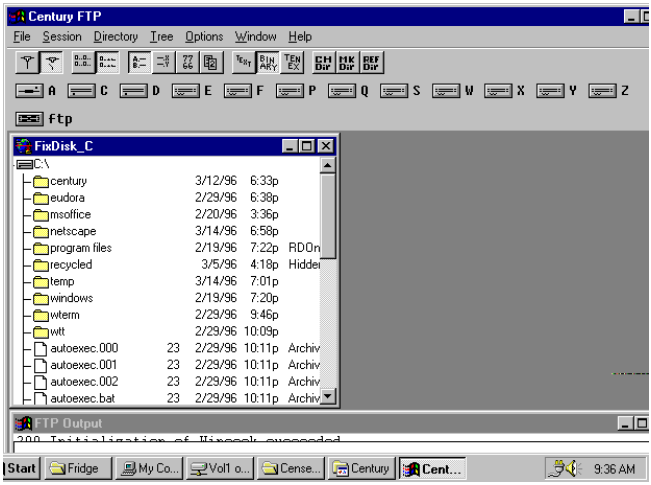
1. To run FTP, double-click on the *startup* icon. The FTP main window displays, as does the Century FTP *Configuration Info* dialog.
2. Fill in the Configure tab. For now, just fill in the following:

- Description: Enter a short description to help identify this connection. (For example, Connection to host “office”.).
- Hostname: Enter the name of a host with FTP capability. (For example, “office”).
- User Name: Enter the user name for your account on this host. (For example, billf)
- Password: Enter the password for your account on this host. It will appear in the password field as asterisks (*).

To learn more about connecting and this dialog, see *Connecting to a Host* on page 199.

3. Click Save, then click Connect. A new drive window appears, as shown in the following figure:

Figure 1 FTP Main Window



From this main window, files may be transferred, files and directories can be managed, and other features of FTP may be accessed.

Using FTP Features

This section describes how to:

- Connect to a remote host and view its files.
- Transfer files between the host and the PC.
- Manage files and directories on the host and the PC.
- Customize the FTP program to accomodate specific needs.

Connecting to a Host

FTP has the ability to define and save connections for commonly used hosts. How the connection is made depends on whether the connection has been defined.

Defining a New Connection

When FTP is started, it automatically prompts a connection to a remote host. To create the first or a new connection, follow these steps:

1. The program opens a dialog called *Century FTP-Configuration Info* In this dialog, fill in the Configure tab as follows:

- Description: Type a word or a brief phrase to refer to this connection. This description should be description enough to allow selection from a list. If a description is not entered, FTP uses a default description that includes the host name and the user name entered.
- Hostname: The name or IP address of the remote host to connect to. If a name is entered, FTP asks the network software to find the host's address. FTP can also check a user-defined host name database (FTP.HST) for the host's address. For more information on using a host name database, see *Using a Host List File* on page 214.
- User Name: The user name (login name) for the account on this host.
- Password: The password for the account on this host. The password will appear on the screen as asterisks (*).

- Use Anonymous Account Logon (Optional): Choose this option if planning to transfer files from a host using that host's anonymous account. For example, many Internet services allow the downloading of public files if logged in using the anonymous login account. When this option is selected, the User Name field shows "anonymous." Enter the correct e-mail address in the format username@domain. (Most FTP hosts use e-mail addresses as passwords for anonymous logins. If this host uses a different password, enter that password instead.)
- Directory (Optional): Type the default directory to work from on the remote host. Enter the directory to be shown at the top of the host's file list. If a directory name is not entered, FTP will use the host's default directory for the account.

2. Click Save. If this session information is saved, it won't need to be entered the next time a connection is made to this host.
3. Click Connect. FTP connects to the host, logs in, and opens a drive window for the host.

Using a Defined Connection

1. Select Session | Connect to Host
2. Select the description of this host/connection from the list shown. If the connection desired is not listed here, follow the previous steps for *Defining a New Connection*
3. Click OK.

Disconnecting From a Host

FTP allows connection to one host at a time. When finished with the connection to the host, the connection must be terminated prior to connecting to a different host.

To disconnect, do one of the following:

- From the toolbar, select 
- From the menus, select Session | Disconnect from Host.
- Close the drive window for the host. (From the system menu in the upper left corner of the open drive window, select Close).

Transferring Files and Directories

FTP allows the transfer of files and directories between the host and the PC. However, FTP cannot transfer files between a local PC drive and another local PC drive. If files must be moved between local PC drives, use the Microsoft Windows File Manager or Windows Explorer if Windows 95 is installed.

To transfer files and directories between the host and the PC:

1. Decide which types of files will be transfered and set the transfer mode using the appropriate button on the toolbar.

   Select:

   - 

(Text) for files that contain ASCII characters only. PC text files can be displayed in Windows Notepad and usually have extensions such as TXT.
   - 

(Binary) for executable files or application programs. PC binary files usually have extensions such as .EXE or .COM
   - 

(Tenex) for TENEX, also known as Local8, files.

These mode options are also available through the menus. When Session | Transfer... is selected the transfer type is saved for that connection.

If the type is not known for the files to be transferred select binary mode. All executable files transfer correctly and text files are readable. However, some host files may use different end-of-line codes than those used in DOS text files. Those text files may need reformatting after transfer.

2. Select the file(s) or directory to transfer.
   - To select several adjacent files, click on the first file, then hold down the Shift key and click on the last file. To select files not adjacent to one another, click on the first file, then hold down the Ctrl key and click on each additional file.

FTP cannot transfer multiple selected directories. To transfer one directory and its contents (including subdirectories), select the directory only.

3. Drag and drop the selection to the target directory or select File | Copy File. To drag and drop, position the cursor anywhere over the selection. Click and hold the mouse button as you drag the selection over to the other window. When the cursor is positioned over the target directory, release the mouse button.

Look at the status line in the lower right corner as you move the cursor. The status line will show the name of the current target directory.

4. When the confirmation dialog appears, make sure the Destination Directory and files are correct. Then click *Copy Files*.

Managing Files and Directories

FTP provides some (but not all) of the capabilities provided by the Microsoft Windows File Manager. Functions in FTP include:

- Sort the file list by name, type, size, date, or type of file
- Choose which file details to display
- Expand all directories to show one or all levels below
- Change the file list to display a different top directory
- Create new directories
- Delete files
- Rename files
- Preview a file using its associated application
- Print text files

Each of the options is described in detail in the following pages.

Sorting the File List

FTP allows the sorting of files in several ways as shown in Table 1

Table 1 FTP Sort File Options

To Sort by...	Choose This Button	Or This Command
Name (A to Z)		Session|View/Sort|Order=Name
File Type (file extentions)		Session|View/Sort|Order=Extension
Size (smallest to largest)		Session|View/Sort|Order=Size
Date on which the file was created or last modified (oldest to newest)		Session|View/Sort|Order=Date
Reversed order for any of the above		Session|View/Sort|Order=Reverse

Showing File Details

FTP provides the option of which file details to display.

- Select the Short List button  to show file names only.
- Select the Long List button  to expand the display to include those items selected under Session | View/Sort | Detail.

Showing Directory Contents

Double-clicking directories expands the directory tree one level at a time. The Tree menu also expands the selected directory.

- Select Tree | Expand One Level to expand the selected directory one level.
- Select Tree | Expand Branch to expand all levels of the selected directory.
- Select Tree | Expand All to expand all directories and subdirectories in the selected drive window. This may take quite some time.
- Select Tree | Collapse Branch to hide the directory levels below the selected directory.

Sorting Files and Directories

Files and directories may be sorted as desired using one of the functions found in Table 2.

Table 2 File/Directory Sort Options

To show . . .	Choose
All files and then directories	**Session**| **View/Sort**| **Mixture**|Files/Dirs
All directories and then files	Session | View/Sort | Mixture |**Dirs/Files**
Intermix files and directories alphabetically	Session | View/Sort | Mixture |**InterMix (default)**
Files and directories without regard to uppercase and lowercase	Session| View/Sort | Mixture |**CaseFold**

Changing the Top Directory Displayed

To change a drive window to display a different directory at the top:

1. Make sure the drive window to be changed is the active window. (Click anywhere inside the window to make it active.)
2. Select one of the following:

   OR Directory | Change Directory.

3. Enter the directory displayed at the top of the window.
4. Click OK.

Use this command to reset the window to its default display.

Creating a Directory

1. Type the path name where the new directory should be created..
2. Select one of the following:

   OR Directory | Create Directory.

3. Enter the name of the new directory.
4. Click OK.

Deleting Files

Through FTP, files on the PC and files with access permission on the remote host may be deleted.

To delete:

1. Select the file(s) to delete.
   To select several adjacent files, click on the first file, then hold down the
   Shift key, and click on the last file. To select files not adjacent to one another, click on the first file, then hold down the Ctrl key, and click on
   each additional file.
2. Select File | Delete.
3. Click Yes (or Yes to All if more than one file is selected).

Renaming a File

1. Highlight the name of the file to rename.
2. Select File | Rename.
3. Enter the new file name.
4. Click Yes.

Previewing a File

FTP provides the option to view the contents of a file on either the PC or the host. When a file is selected to preview, FTP looks for an application associated with that file. If FTP finds no associated application for a file, it opens the file using Windows Notepad. To associate a file with an application use File Manager for Windows 3.1 or Windows Explorer for Windows 95. For further information on file associations, review the information in the Window's help screens.

To preview a file:

1. Select the file to preview.
2. Select File | Preview.
3. Click Yes.
4. When finished, close the application.

If attempting to preview a large file, a limit may be encountered in Windows Notepad. Notepad displays files that are 64K bytes or smaller.

Printing a File

FTP prints text files using the PC's default Windows printer. This command will not print files from other applications.

To print a text file:

1. Check the printer setup.
   From the menus, choose File | Print Setup. This screen is the same setup screen found in the Windows Print Manager or the Control Panel Printers utility. Make sure the printer setup is correctly.
2. Select the file to print.
3. Select File | Print.
4. Click Yes.
5. Select any of the printing options, then click OK.

Customizing the Program and Screens

FTP may be customized in a variety of ways. For example:

- Show or hide the toolbar, drivebar, and status line.
- Set startup options such as remembering window sizes and which drive Windows is to open.
- Set window options such as background and text color, tiling or cascading.
- Send output to a text file.

Options Menu

To begin, select Options | Preferences. The Preferences screen is divided into tabs labelled Layout, Startup, Options, and Misc. For details, see the following tables.

Table 3 Preferences-Layout Options

Item	Description
Toolbar Icons	If checked, show toolbar. If unchecked, hide toolbar. (Also found in Options | Show Toolbar.)
Drivebar Icons	If checked, show drivebar. If unchecked, hide it. (Also found in Options | Show Drivebar.)
Status Line	If checked, show status line. If unchecked, hide it. (Also found in Options | Show Status Line)
Left/Right	If checked, windows line up across the screen.
Top/Bottom	If checked, windows line up from top to bottom.
Overlapped	If checked, windows pile on top of one another so only the title bars of underlying windows show.

Table 4 Preferences-Startup Options

Item	Description
Remember Window Size	If checked, windows retain most recent size the next time you start FTP.
Load Last Directory Specified	If checked, file lists retain most recently selected top directory at next startup.
Autoload drives on Startup	If checked, all local PC drive windows open when FTP terminates open again at next startup. This includes network drives and CD-ROM drives.
Iconify Output Window	If checked, output window is minimized at startup. To view output, restore window.

Table 5 Preferences-Options List

Item	Description
File naming collision behavior for Local files	If a file is copied to a local location where the same file name exists,either overwrite the fiel (default), or rename the file with a numeric extension.
File naming collision same behavior for Remote files	If a file is copied to a remote location where the file name exists, either overwrite the file (default), or rename the file with a numeric extension.
Proportional resize windows based on frame window	If checked, drive and output windows resize automatically when you resize the main window

Table 6 Preferences-Misc Options

Item	Description
Logfile name/ Output to Logfile enabled	If checked, output is sent to the text file you specify in the Logfile name field. If unchecked, output goes only to the output window. Use this option if you need to save or print the output.
E-Mail Address: login	Enter your e-mail address here to avoid having to type it in when you connect using “anonymous” as your user name. (When you use the anonymous account, your e-mail address is usually your password.)
Disconnect inactive client after _____ if minutes	If you enter a value greater than zero, FTP monitors your connection to the remote host and disconnects your PC remains idle for longer than the value entered here. If the value is zero, FTP stays connected indefinitely (or until the host breaks the connection.)
Text Font & Color...	Choose fonts and colors for the drive windows.
Window Color...	Choose a color for the FTP window backgrounds.

Table 7 Preferences-Options Common to All Tabs

Item	Description
Save File	Lets you save this configuration for later use. Use a file name other than FTP.INI. Later you can regenerate current Preferences settings just by loading this file.
Load File	Load a previously saved configuration file.

Window Menu

The Window menu allows the rearrangement of windows and icons in FTP. Details about each menu item can be found in Table 8.

Table 8 Windows Menu

Item	Description
Tile Horizontal	Arranges the windows top to bottom so that they do not overlap.
Tile Vertical overlap.	Arranges the windows side by side so that they do not
Cascade	Arranges the windows so they overlap. The title bar of each window remains visible.
Arrange Icons	Rearranges icons.
Show Output Window	Opens the FTP Output window if the window is closed.

Advanced Topics

This section focuses on the more technical aspects of FTP, such as:

- How FTP works
- How to build a host list file with the Edit Known Hosts command
- How to use the output window to track progress or find errors

How FTP Works

The FTP application takes simple Windows actions (such as double-click or drag-and-drop) and translates them into standard FTP commands that a host understands. For example, when a double-click is performed on the top directory in the remote host's drive window a file list must be built. To build the file list, FTP sends a command to the remote host and gets a reply containing the host's file list and associated details. It's the equivalent of sending the UNIX command *ls -l* from the PC.

This interaction with the remote host can take time, especially if the host is halfway around the world. A double-click may not bring the instantaneous response expected from Windows

This interaction can be monitored by checking the FTP Output window. FTP logs every command it sends and every response it receives in the output window. Read the contents of the output window to see what goes on behind the scenes.

Keeping Track of Hosts and Connections

To create a connection to a remote host, FTP requires the entry of the host's name but not its IP address. Most networks use a service such as DNS (domain name

services) to provide hostname-to-address matching, and FTP uses whatever service is already available on the network.
Once connection information has been saved for a host, FTP stores the information in a file called FTP.INI. This means that the next time FTP is run, the same connections may be used by simply selecting them from a list.

File Name Translation

When files are transferred, FTP must account for the difference between DOS file names and the longer names used in UNIX or VMS systems.

PC to Host

When a DOS file is transferred to a host, FTP leaves the file name alone. If the target directory on the remote host already contains a file with the same name, FTP overwrites the existing file with the file transferred.

Host to PC

When a file is tranferred to the PC from a host that supports long names, FTP uses the following method:

- FTP converts all characters to upper case.
- FTP checks whether the file name is longer than eight (8) characters. If so, FTP truncates the name to the first eight characters.
- If the original file name had sections divided by decimal points, FTP uses the first three characters of the final section as the new file name extension. If not, FTP adds no file name extension.

Example:

- Original long name: *app_a_backup*
- New DOS name: *APP_A_B*

If the original name contained any characters that DOS file names don't allow, FTP replaces these characters with an underscore (_).

Example:

- Original long name: *Lost+Found.doc*
- New DOS name: *LOST_FOU.DOC*

Once the file names are translated, if two or more files have the same name, FTP replaces the duplicate extensions with unique numbers (.000, .001, .002, etc.).

Example:

- Original long names: *status.report_april*
  status.report_may
  status.report_june

- New DOS names: *STATUS.REP*
  STATUS.000
  STATUS.001

Using a Host List File

A list file may be set up containing host names and IP addresses to simplify host selection. By entering the host name and the IP address, a host may be selected from the list without having the network name services convert the host name into an IP address.

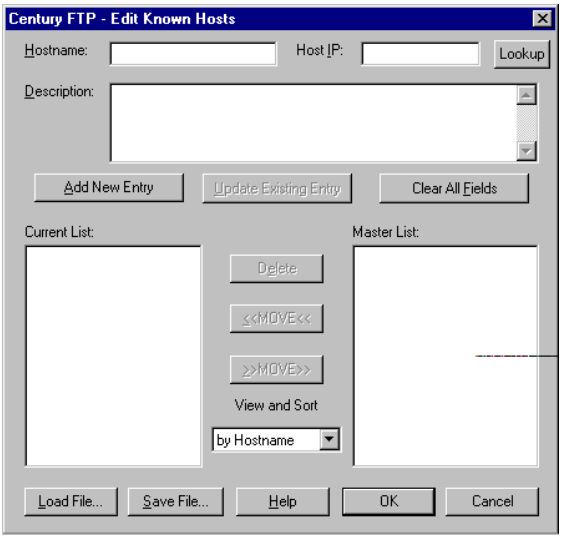
If a HOSTS file has already been set up for the PC network software, it may be used as the basis for the FTP host list. If there is not an existing HOSTS file, one can be built using FTP's Edit Known Hosts command.

The rest of this section explains how to build a new host list file or load an existing HOSTS file.

Building a New Host List File

1. From the menus, select Session | Edit Known Hosts.

Figure 2 Main Window-Edit Known Hosts



2. Enter the following:

- Hostname: Enter the network name of the remote host.
- Host IP: The host's internet address. If the desired host's IP address is not known, either click Lookup or enter a question mark (?) in the IP address field. FTP will use the network name services to find the matching address.
- Description (Optional): Enter a description that will allow easy selection of this from a list of other host names. If an entry has no description, FTP will use the hostname entered.

3. Click Add New Entry.
4. To begin the next host entry, select Clear All Fields. Then repeat steps 1 through 3. When all desired hosts have been added, go on to step 5.
5. To save this list as the regular working list, click OK. This saves the list in the main FTP.HST file (the file FTP opens every time it runs).. To save this list to a different name, click Save File. Enter a file name, then click OK.
6. Exit the FTP program, then restart. If the list was saved to the main FTP.HST file, the hosts should appear in the drop-down list labelled Hostnamewhen Session | Configure.. is selected. If the list was saved to a different name, follow the steps below to load the file.

Using an Existing HOSTS File

1. From the menus, select Session | Edit Known Hosts.
2. Click Load File.
3. Open the directory and highlight the file to use. FTP expects the file to use the following format:

   IP_Address Host_Name #comment

The pound sign (#) must appear before any comment. The comment field is optional. If present, however, FTP uses the comment as a description. For entries that have no description, FTP uses a default description of the hostname entered.

4. When the correct file appears in the File Name field, click OK. FTP copies the contents of the HOSTS file into its Master List.
5. Move a subset (or all) of the names in the Master List to the Current List by selecting the names and choosing Move.
6. When the Current List is complete, click OK.

The hosts in the Current List should display in the drop-down list labelled Hostname when Session | Configure is selected.

Using the FTP Output Window

FTP connections and transfers require many low-level commands and feedback from the remote host. FTP logs all of this information to the FTP Output window, which by default displays at the bottom of the main window. This output window is the best source of information for checking status, tracking the progress of a transfer, or finding out about errors.

Viewing the Contents of the Output Window

To expand the output window and view its contents, use the maximize button in the upper right corner of the output window. If the window gets too crowded it may be cleared by selecting File | Empty Log Window.

Logging Output to a Text File

Follow these steps to send all subsequent output messages to a text file as well as to the output window.

1. From the menus, select Options | Preferences | Misc.
2. Select Output to Logfile enabled.
3. Enter a path and file name in the field labelled Logfile name. If a path is not entered, FTP stores the file in the PC's root directory.
4. Click OK.

The Output Window Command Line

The bottom portion of the output window (enclosed in an outline) is a command field. FTP commands may be sent to the remote host by typing them in this field. (To see a list of commands, enter a question mark (?) on the command line.) The FTP application sends the commands to the host and returns responses to the output window.

Using this command line is optional; it is not needed to perform normal FTP operations.

Troubleshooting FTP

If a problem is encountered while using FTP, always check the FTP Output window immediately. The output window is where FTP logs all system commands and error messages, and is the best source of troubleshooting information.

This section describes common problems and presents some suggestions for troubleshooting. Find the description below that best matches the problem and try the corresponding suggestions.

Unsuccessful connection to the host

- Make sure the network software is installed and running.
- Make sure the remote host is available for connection. Use a utility such as Ping to verify connectivity with the host.
- Check the output window for a message such as "Incorrect account information" or "Login incorrect." If such a message is displayed, go back to the Session | Configure window and re-enter the User Name and Password. Make sure the password is typed correctly; FTP can't verify the password until it tries to connect.
- If using an "anonymous" login, FTP limitations may have been encountered on the remote host. Some FTP services set limits on the number of anonymous logins allowed simultaneously, or limit the hours

of anonymous login availability. Check with the host's administrator or documentation.

The remote host you want is not listed

Most likely, the connection information was not saved for this host. To connect, select Session | Configure. After the required information is entered, select Save. Then select Connect. The next time Connect button or Session | Connect to Host is selected, the FTP-Select Connection Session list should include an entry for this host.

If a host list file using the Edit Known Hosts command was built recently, the file may not be loaded. If the host is listed in the main FTP.HST file, exit the FTP program and restart. This loads the FTP.HST file. If this host is listed in a different file, select Session | Edit Known Hosts | Load File and load the appropriate host list file.

Connection terminated

Some hosts have a time-out parameter that disconnects inactive applications after a set length of time. If the PC is connected to a host but has remained idle, the time-out limit may have been exceeded. Reconnect to the host. (In addition, FTP may be set to send periodic signals to the host to avoid this time-out. To do this, select Session | Transfer, and select Send Keep-Alives to prevent FTP host timeout.)

The FTP program has a time-out option of its own and could possibly have been exceeded. Select Options | Preferences | Misc. Select Disconnect inactive client after __ minutes. To change the minutes value, enter a new number in the Number field. (If the value is zero (0), FTP stays connected indefinitely. A time-out would have to be initiated by the remote host. See the previous suggestion.)

Remote host window shows no files

If a top directory is shown, double-click to open it. FTP doesn't build the whole file list until the desired directories are open. This saves processing time.)

File | Preview does not work

When Previewis selected, FTP tries to open the file using an associated application. If no association exists for the file, FTP opens the file using Microsoft WindowsNotepad. Notepad displays text files correctly, but if the file is not a plain text file, the Notepad display won't look like the original file. To make sure a file, set an association for that type of file. To set an association, open the File Manager and select File | Associate.

If the file is very large (several megabytes, for example), there may be a problem previewing the file. If the file had an associated application, check that application for a file-size limit. If the file had no associated application and FTP opened the file in WindowsNotepad, the limit is 64K bytes (this is Notepad's size limit).

Transfer fails

Check the output window for error messages. If any of the error messages refer to a failed connection, see the suggestions under *"Unsuccessful connection to the host"* on page217.

Retry the transfer. An intermittent network traffic problem may have been encountered, and another transfer attempt may succeed.

Transfer takes too long

If communication to the remote site is particularly indirect, transfers may take a long time. Similarly, if attempting to transfer during peak network usage hours (such as weekdays 9 to 5), transfers may be slow. If possible, check with the system administrator about reasonable transfer times.

File is corrupted after transfer

If the file is a binary file (e.g., executable file, application program, etc.), it may have been transferred in the wrong mode. Select binary mode , then transfer the file again.

If the file is a plain ASCII text file, it may have been transferred in binary mode and thus lost some of its formatting. Binary mode doesn't convert ASCII carriage return/line feed codes. Either open the file in a text editor and reformat the file, or set the transfer mode to text and transfer the file again.

Managing Network Services

In This Section:

Configuring Printer (LPD)

The Line Printer Daemon (LPD) server allows a remote line printer client to print files on printers managed locally on the PC using LPD. Century provides a simple way to print host files on a printer connected to the PC.

Options are provided so LPD may be configured to:

- Set the system message logging levels.
- Select the directory for print jobs.
- Specify the amount of spool disk space that must always remain free.
- Administer multiple printers, either locally or on the network.
- Print text-only print jobs on local printers.
- Control banner sheet printing and print job requests for each printer.
- Accept or deny print requests on a per host basis.

Getting Started

LPD print capabilities are provided when running Windows 3.1, Windows for Workgroups or Windows 95. However, LPD for Windows 95 is not automatically installed when NFS is installed as it is for Windows 3.1 and Windows for Workgroups. If running Windows 95, perform the following tasks (if running Windows 3.1 or Windows for Workgroups skip this section):

1. Select Control Panel from the main Windows 95 screen.
2. Select the Network icon. The *Networks* dialog will be displayed.

3. Select the Add button, select Service, then select the Add button.
4. Click the Have Disk button and specify the directory *TinyTERM Plus* was installed to (the default is c:\century) and click OK.
5. Highlight the Century Internet Services item, then click the OK button. The *Windows 95 Network* dialog will then be displayed.
6. Highlight the Century Internet Services selection and select the Properties button.

Changing the Message Logging Levels

To change the priority of the message logging level for LPD, select the Properties button from the *Windows 95 Network dialog*, then:

1. Select the Services tab. A list of managed services displays in the box.
2. Highlight the desired printer. The Configuration window is then displayed.
3. Select Logging
4. Choose the desired level (the default is set to level 3). Messages are written to the system log file at the chosen level and below. Messages with values greater than the chosen level are not posted. For example, if level 5 is selected, levels 0 through 5 are posted to the system log file, and levels 6 and 7 are not.
5. Click OK to accept the changes.

Customizing the Spooling Parameters

To change where received print jobs are stored on the local machine, select the Properties button from the *Windows 95 Network dialog*, then:

1. Select the Services tab. A list of managed services displays in the box.
2. Highlight the desired printer, then click the Configure button. The Configuration window is then displayed.

3. Select Spooling.

4. Decide where to spool print jobs. To spool print jobs to the directory path specified by the DOS environment's TEMP variable, click Use local machine TEMP directory. (TEMP is a DOS environment variable used by Microsoft Windows to designate a temporary storage directory.)

   OR

   To spool print jobs to a specific directory, unselect Use local machine TEMP directory, and enter the directory path in the Path box.

   If the exact pathname is not known, click Browse to select the desired directory path, then click OK. LPD enters the pathname automatically in the Path box.

When in the Select Diretory Path dialg box, clicking Network allows the creation of paths to remote machines. If running Windows 3.1 or Windows 95 the Network button does not display.

5. Specify the amount of space reserved by LPD for spooling print jobs. The default is 4096 Kbytes (4 megabytes).

6. Click OK to accept the changes and return to the Services main window.

Defining LPD Printers

When defining a new LPD printer, enter the name to be used by the network for the printer. This printer name must also be known by the LPD client machine sending print jobs to the PC. machine. Select the Properties button from the *Windows 95 Network dialog* then:

To define a new LPD printer:

1. Select the Services tab. A list of managed services displays.

2. Highlight the desired printer., then click on the Configure button.

3. Select Printer Connections.

4. Click New. The *Specify Printer Name* dialog displays.

5. Enter the name of the printer for the PC. The name entered should be descriptive so other users will know which printer is referenced.

6. Click OK. The new printer is added to the *Printer Name* listbox.

The bracketed information next to the name is the local Windows printer or remote network printer associated with the new printer name. Initially, the printer association is set to the default Windows printer. To associate to a different printer, see the instructions below for associating a local or network printer to a printer name. (If a default Windows printer is not defined, the bracketed information will be displayed as <non defined on nul:>.)

Associating a Local or Network Printer to a Printer Name

To allow Windows to reference the correct printer and configuration when using LPD, the printer name must be associated with a printer set up in Windows. To make this association, select the Properties button from the *Windows 95 Network dialog*, then:

1. Select the Services tab. A list of managed services displays.

2. Highlight the desired printer, then select the Configure button.

3. Click on the New button.

4. Type the desired name for the printer.

5. Highlight the printer for the association. If more than one printer name is selected, any changes will be applied to all selections. However, only the first name selected displays in the *Specify Network Printer Connection* dialog.

   Click Connect. The *Specify Network Printer Connection* dialog displays.

   Decide what type of printer should be associated to the printer name(s) selected. To associate to a local printer, select the desired printer from the list of possible local printers, and choose OK. The printer selected now displays in brackets next to the printer name in the Printer Names listbox.

It may become necessary to redirect print requests to another printer if the local printer is down. To associate the local printer to a remote network printer, select the Redirect to remote printer box. Enter a network printer pathname in the Printer Path box, using the NFS network printer path with a format of machine name:printer name. Century NFS may be used to browse and find printer names on remote machines.

6. Click OK to accept the changes.

Specifying Printer Options

LPD allows control of the print queue, page orientation, and font used for print documents.

To change printer options:

Select the Properties button from the *Windows 95 Network dialog*, then:

1. Select the Services tab. A list of managed services is displayed.
2. Highlight the desired printer, then select the Configure button.
3. Select Printer Connections.
4. Select the printer name(s) from the *Printer Name* listbox.
5. Click Setup.

   If more than one printer name is selected, changes are applied to all selections. However, only the first name selected displays in the *Network Printer Options* dialog box.

6. Make changes to any of the following.

Print Queue Control

Choose from the following options to control print requests:

Table 1 Print Queue Control Options

Option	Function
Allow new print jobs	Honors new print job requests, allowing them to accumulate in the local queue (default).
Disallow new print jobs	Does not honor print job requests; requests do not accumulate.
Resume job printing	Starts printing jobs accumulated in the print queue (default).
Pause job printing	Stops printing the current print job.

Options for Text-only Print Jobs

If the printer name is associated with a local Windows printer, additional options may be selected for text-only print jobs.

Table 2 Text Only Print Options

Option	Description
Portrait orientation	One page per physical printed page.
Landscape orientation	One page per physical printed page.
Portrait orientation	Two pages per physical printed page.
Landscape orientation	Two pages per physical printed page.
Portrait orientation	Four pages per physical printed page.
Landscape orientation	Four pages per physical printed page.
Wrap long lines	Lines longer than the width of the printable page are automatically wrapped to the beginning of the next line; otherwise, lines are truncated.
Show page borders	Borders print around each page when there is more than one page printed per physical page.
Font used for printing	Fonts other than the defauls are available in the listbox.

Print banner sheets for each print job

Select this option to print banner pages. Banner pages (one page printed before each print job, identifying the user, printer, and document being printed) allow multiple users to easily identify and separate their print jobs. Click OK to save any option changes.

Specifying Access Rights

Specific host machines can be selected to have the ability to print to specific LPDs using the Access Rights for the LPD.

To define access rights:

Select the Properties button from the *Windows 95 Network dialog*, then:

1. Select the Services tab. A list of managed services displays.
2. Highlight the desired printer and click the Connect button.
3. Select Access Rights. Within this selection, the following options are available:
   - Add a host machine.
   - Allow or deny access to any of the listed host machines.
   - Change the position of the host entries in the listbox.
   - Remove a host machine.

Each option is described in detail in the following pages. After making all the desired changes within this selection, click OK.

Adding a Host Machine

To add a host machine, select the Properties button from the *Windows 95 Network dialog*, then:

1. Click Add. The *Specify Remote Host* dialog box displays.
2. Either enter a host name or click Any Host. Selecting *Any Host* adds an entry allowing all hosts to use LPD.
3. Click OK. The system adds the host name as the first entry in the listbox.

Allowing or Denying Access to a Host Machine

To allow or deny access to a host machine, select the Properties button from the *Windows 95 Network dialog* then:

1. Select a host machine from the *Host Entries* listbox.
2. Click Allow Access or Deny Access. Each host entry is preceded by + or -.

   Hosts preceded by + are allowed access, and those preceded by - are denied LPD access.

Changing the Position of Host Entries

To change the position of host entries in the listbox, select the Properties button from the *Windows 95 Network dialog* then:

1. Select a host machine from the Host Entries listbox.
2. Click either Move Up or Move Down. The position of a host entry is important because the access list is always scanned from the first entry to the last. The first entry to match the hostname sending LPD request terminates the search.

Deleting a Host Machine

To delete a host machine, select the Properties button from the *Windows 95 Network dialog* then:

1. Select a host machine from the *Host Entries* listbox.
2. Click the Remove button.

Removing a Network Printer

To remove a previously defined printer, select the Properties button from the *Windows 95 Network dialog* then:

1. Select the Services tab. A list of managed services is displayed.
2. Highlight the selected printer, then click Connect.
3. Select Printer Connections.

4. From the *Printer Names* listbox, select the printer to remove.
5. Click Remove. The printer name is deleted from the listbox.
6. Click OK.

Configuring TFTP

The Trivial File Transfer Protocol (TFTP) server allows a remote TFTP client to request the storage and/or retrieval of files between the client machine and the server (PC) machine. TFTP allows connections without requesting login names and passwords.

The standard TFTP protocol is lax about security issues. If security is a concern, use FTP to transfer files.

The TFTP directory path uses UNIX-style path designators. To change the directory to the PC c:\Century directory, specify c:/Century.

The options are given to allow changing the message logging levels, specify the startup directory, and restrict access to certain directories. Select the Properties button from the *Windows 95 Network dialog* then:

1. Select the Services tab. A list of managed services is displayed.
2. Highlight tftp. The *Configuration* dialog box is then displayed.

Changes may be made to any of the following:

Message Logging Levels

Choose the desired level (the default is set to level 3). Messages are written to the system log file at the chosen level and below. Messages with values greater than the chosen level are not posted. For example, if you choose level 5, levels 0 through 5 are posted to the system log file, and levels 6 and 7 are not.

Startup directory:

Enter a pathname. The pathname entered is used as the path for files without specified paths. This is also the login directory for TFTP users.

OR

Click Browse and choose a directory pathname.

Restrict access to the following directories:

Select the directories to provide clients access. Clients cannot access any files or directories outside of the ones specified here and the Startup Directory described above.

Click OK to save any changes made.

Configuring Finger

The finger server returns information about logged in users and extended information about users, whether or not they are logged in. Finger waits for a connection on port 79. Once connected, it reads a single command line terminated by line feed. if the command line is null, finger returns a retport of all logged in users. If the command line contains a user name, finger returns extended information about that user.

Configuring FTP

The FTP server supports File Transfer Protocol logins from remote machines to the PC. Remote FTP clients request the storage and/or retrieval of files between the client machine and the server (PC) machine. Remote users cannot FTP to the PC unless they are configured as users through the Manage Users tab or the FTP server allows “anonymous” as a login name and is enabled in Server Status. FTP users must have passwords to log in. The “anonymous” login name requires the user’s electronic mail address. Other user names require the password set up in the Manage Users tab.

Printing Files (LPR)

In This Section:

Getting Started

Choosing a Print Method

TinyTERM Plus supports three different methods to print files to network printers. The method selected depends on:

- Where the print file resides.
- How the printer is enabled for the network.
- Whether printing PC files from an application or from File Manager

Before Starting

Before using LPR, check the following:

- The host name or IP address of the machine providing service for the intended network printer.
- The name of the network printer, if it has a name, that will be used.

Starting LPR

The LPR application is installed automatically when *TinyTERM Plus* is installed. Look for the Network Printing icon in the Century program group.

Figure 1 LPR Icon

Windows 95

After selecting the Network Printing icon from the Century program group, the main LPR screen is displayed.

1. Select File | New Port. The Port Name dialog box will be displayed. Type the desired host name, exclamation point (!) and the printer name (e.g. *sales!oki*). The format of the entry is very important for this item. If an invalid host name is entered, a message will be displayed to that effect. The Port Name will then need to be re-entered with a valid host name.

2. Click OK when the information entered is correct.

After adding the Port Name for the printer, the remaining printer information will be entered using the Windows 95 Settings | Printers option. Select the Add Printer icon.

1. The printer wizard information will be displayed. Click Next.

2. The option is then given to have the printer set up as a local printer or as a network printer. Select the local printer option.

3. A list of valid printer types will then be displayed. Highlight the correct manuafacturer and the correct model for the printer.

4. Highlight the correct Port to use for the printer. The port that was added using the LPR function at the beginning of this section will be listed as a valid port. This is the port that should be selected.

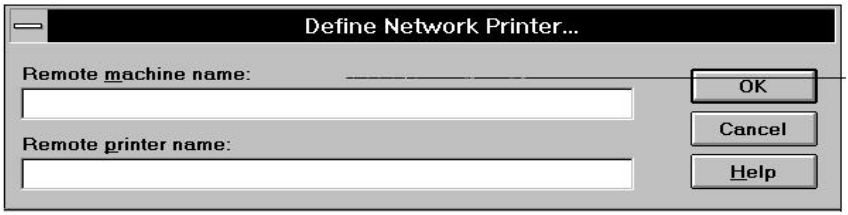
5. If the new printer should be used as the default printer for Windows based programs, click on the Yes option. If this printer should not be set as the default, click No.

6. The final screen provides the option to print a test page for the printer. A test page will verify communication with the printer (this verifies that the printer has been connected properly and the PC can send information to the printer).

Windows 3.1/Windows for Workgroups

1. To run LPR, double-click on the LPR icon. For Windows 3.1 and Windows for Workgroups, the first time LPR is run, the following *Define Network Printer* dialog displays:

Figure 0-2 Define Network Printer Dialog Box



Remote machine name is the host name or IP address of the machine that defines the printer for the network. Some printers define themselves to the network. For these network printers, the remote machine name is the IP address of the printer.

Remote printer name is the name for the printer on the network. Some network printers may not have a remote printer name.

2. Type in the Remote machine name and the Remote printer name (if any) and click *OK*.

From the main window, files may be printed, options changed and other features of LPR may be used. The following pages provide detailed instructions on using each of these options.

File Menu

Throughout the rest of this chapter, the term drag and drop will be used. To drag and drop an icon or a file, select it by moving the cursor over the icon or file. Press and hold down the left mouse button. Drag the cursor by moving the mouse to the new location. The icon or file follows the cursor to the new location. Release the mouse button to drop the icon or file to the new position.

Defining a New Printer

To define a new printer, the remote machine name and the printer name must be known. Refer to the System Administrator for this information.

The remote machine name is the host name or IP address of the machine that defines the printer via LPD for the network. Some printers define themselves to the network. For these network printers, the remote machine name is the IP address of the printer.

The steps to defining a new printer are as follows:

1. Select File | New Printer. The *Define Network Printer* dialog displays.
2. Enter the Remote machine name and the Remote printer name and click *OK*.

A new printer icon with the names assigned are displayed in the Printers Icon Bar.

Selecting a Printer Protocol

Some network printers do not support the Line Printer Daemon (LPD) protocol or only support LPD in a limited fashion. LPR supports a number of common network printer protocols. If the protocol the printer uses is not known, leave the Configure | Protocol | Available Protocols entry in its default LPD setting. If it is known that the printer does not use LPD:

1. Select Configure | Protocol
2. Select a protocol from *Available Protocols*.
3. Click Configure. The options for the selected printer are displayed.
4. Fill in the necessary option information.
5. Click OK

Creating a Desktop Icon for a Printer

A printer icon can be created for the Microsoft Windows desktop, and then printed by dragging and dropping a file onto that icon. To create a desktop icon:

1. Select a printer icon.
2. Select Configure | On Screen.
3. Click on the *Create desktop icon*

A shortcut method is:

1. Move the cursor over the printer icon and press the right mouse button. the Quick Menu displays. (See *Quick Menu* on page 244)
2. Select the *Create Desktop* Icon.

The icon appears at the bottom of the screen. The icon name includes the machine name and remote printer name.

Setting the Default Printer

The default printer prints any print job that is dragged and dropped to the main LPR window. The remote machine name and the remote printer name of the default printer always appear in the title bar of the LPR main window.

To set the default printer:

1. Select a printer icon.
2. From Configure | Misc, check Set as the default printer.

A shortcut method is:

1. Move the cursor over the printer icon and press the right mouse button. The Quick Menu displays.
2. Select Make Default Printer.

The first printer defined is automatically set as the default printer.

Changing the Printers Icon Bar

The LPR window shows the defined printers as icons under *Printers*: in the Printers Icon Bar. To create a personalized printer description for these printer icons:

1. Select Configure | Misc.
2. Type a description in the *Description* field, up to a 255 characters.

When the cursor is held over the printer icon, the printer description appears.

The printer icons are arranged in the *Printers Icon Bar* with the most recently created icon appearing last in the list. These icons may be re-ordered in the list. Just drag and drop the icon to a new location within the *Printers Icon Bar*.

The Remote machine name and the Remote printer name of the currently selected printer icon appear on the right above the Printers Icon Bar

Using a Banner Page

For each printer icon created, a banner page option may be selected. A banner page acts like the cover sheet for a fax: it provides the name of the person sending the print job, the name of the file, and usually the date and time the file was printed.

To print a banner page, select Configure | Misc, and select Print a banner for each job.

Deleting a Printer

To delete a printer:

1. Select the printer to be deleted from the *Printers Icon Bar*.
2. From the *File* menu, select Delete Printer.

A shortcut method is:

1. Move the cursor over the printer icon and press the right mouse button. The Quick Menu displays.
2. Select *Delete Printer*.

Printing

LPR offers four easy ways to print files; the File Manager may be used to print files to the default print or a specific printer may be selected, the LPR File menu may be used or files may be printed via a Windows application.

Printing a File from File Manager

default printer Open up Microsoft File Manager and select the file you want to print. Drag and drop the file from File Manager onto the LPR window. The default printer prints the file.

specified printer: Select the file to be printed, and drag and drop the file onto an LPR printer icon. The Printers Icon Bar, a desktop printer icon, or the

minimized LPR window icon may be used. For information on creating a desktop icon, see *Creating a Desktop Icon for a Printer* on page 5-5.

If a printer from the Printers Icon Bar is used, that printer prints the file. If the minimized LPR window is used, the default printer prints the file. If a desktop printer icon is used, that printer prints the file.

Printing a File From LPR's File | Print Files

1. Select a printer icon in the *Printers Icon Bar*.
2. Select LPR's File | Print Files.
3. Type the directory and filename in *File Name*.

   OR

   Browse through the files of a directory and highlight the file(s) to print. To select multiple files, hold down Ctrl and click the left mouse button.
4. Click OK.

The printer selected from the *Printers Icon Bar* prints the file.

Printing from within the LPR Menu

To print from within an application, for example, Microsoft Word to an LPR printer, the Microsoft Windows printer must be associated with the LPR print queue.

The Microsoft Windows printer and the remote printer must be the same type of printer; for example, if the remote printer is a PostScript printer, the Microsoft Windows printer must also be a PostScript printer.

To associate the Microsoft Windows printer with the LPR application print queue:

1. Select a printer icon in the LPR window.
2. Select Configure | Misc.
3. In *Directory for spooled files*, type the directory to which the files will be copied before printing.

   OR

Browse through the directories and select one.

4. Make note of the port specification listed below the Directory for spooled files window.
5. Click Control Panel The *Control Panel Printers* dialog displays.
6. Highlight a printer and click Connect.
7. Scroll down through the *Ports* window until the LPR port specification is found (it is probably at the bottom of the list).
8. Highlight the port specification (as noted in step 5) and click OK.
9. Click Close in the *Printers* dialog.

To print from a Microsoft Windows application

1. Start the Microsoft Windows application.
2. In the application, select File | Print Setup or File | Print | Printer.
3. Select the Microsoft Windows printer you have associated with the LPR printer and click OK.
4. To print the file, select File | Print.

Controlling Print Jobs

Each LPR printer can be setup to print a specific number of copies and to delete files.

Printing Multiple Copies

To specify the number of copies:

1. Select a printer icon from the *Printers Icon Bar*.
2. Select Configure | Misc.
3. Type the number of copies desired in *Number of copies*.

Deleting Print Files

Before proceeding, be sure the files should be deleted after they are printed. LPR does not display a confirmation window before deleting the file.

To delete files after printing:

1. Select a printer icon from the *Printers Icon Bar*.
2. Select Configure | Misc.
3. Select Delete files after printing.

Cancelling a Print Job

Although other print jobs can be highlighted in the Printer Queue Status window, only print jobs owned by the user can be cancelled.

To cancel a specific print job:

1. Select a printer icon from the *Printers Icon Bar*.
2. Select Status.
3. Click Remote.
4. In the *Printer Queue Status* window, highlight the print job(s) to cancel.
5. Click Remove Selected.

To cancel all owned print jobs:

1. Select a printer icon from the *Printers Icon Bar*.
2. Select Status.
3. Click Remote.
4. Click Remove All.

Viewing Print Status

Viewing Local Queue Status

The local queue contains print jobs that have not been sent to the remote printer. To view the local queue status:

1. Select a printer icon from the *Printers Icon Bar*.
2. Select Status.
3. Click Local.

Viewing Remote Queue Status

The remote queue contains jobs queued on the remote machine. To view the remote queue status:

1. Select a printer icon from the *Printers Icon Bar*.
2. Select Status.
3. Click Remote.

Refreshing the Printer Queue StatusWindow

To automatically refresh the *Printer Queue Status* window at regular intervals:

1. Select a printer icon from the *Printers Icon Bar*.
2. Select Configure | On Screen.
3. Click Refresh manually to remove the check.
4. In Every X secs, type the number of seconds time lapse to refresh the window.

The Printer Queue Status can be refreshed manually even after it has been set up to refresh automatically. Just click Refresh in Status.

Advanced Topics

Quick Menu

Move the mouse to a printer icon in the Printers Icon Bar. Hold down the right mouse button. The following menu appears:

Create Desktop Icon**
Delete Printer
Properties
Make Default Printer

Once an icon window has been created, Create Desktop Icon becomes Remove Desktop Icon.

Create Desktop Icon

Creates an icon for the printer and places that icon on the Microsoft Windows desktop. This menu selection is the same as Configure | On Screen | Create desktop icon.

Remove Desktop Icon

Replaces Create Desktop Icon when a desktop printer icon already exists. Choose Remove desktop Icon to remove the selected printer icon from the desktop. This menu selection is the same as Close selected from the desktop printer icon system menu.

Delete Printer

Removes the printer configuration from LPR and removes any associated icon from the desktop. This menu selection is the same as File | Delete Printers.

Properties

Brings the Configure tab to the front. The last used Configure tab (Misc, On Screen, or Protocol) is selected.

Make Default Printer

Turns the selected printer into the default printer. The default printer name appears in LPRs titlebar.This menu selection is the same as Configure | Misc | Set as the default printer.

Pausing Print Jobs

To hold a print job in the local print queue while someone else prints a job, or while you replace a print cartridge, you can pause the print job.

To pause a print job:

1. Select the printer icon from the *Printers Icon Bar*.
2. Select Status.
3. Click Hold.

To send the job to the printer, just click Resume.

Filter Options

To print the files correctly, sometimes a filter must be specified. For example, if the file is in TROFF, select the TROFF filter so that the network printer can filter the file to print correctly.

It is very important to know the capabilities of the remote printer. If a TROFF print job is sent to a printer that does not understand TROFF, the print job might print unexpected characters or might be discarded.

LPR offers the following filter options for the LPD protocol:

Table 1 Filter Options for LPD Protocol

Filter	Description
CIF	Prints file with data produced by cif-plot.
Ditroff	Treats data in file as ditroff output.
DVI	Prints the file in TeX output.
FORTRAN	Causes the first column of each line to be interpreted as a FORTRAN carriage control.
Plot	Treats data in file as output from the Berkeley UNIX plot library.
pr	Prints the file with a heading, page numbers, and pagination. The heading includes the date and time that printing started, the title and page number identifier followed by the page number. You cannot specify the length of the page.
Sun Raster	Causes the file to be printed as Sun Raster format.
Text (no CTRL chars)	Prints the file as a text file with no control characters.
Text (CTRL chars)	Prints the file as a text file with control characters.
TROFF	Causes the file to be printed as Graphic Systems C/A/Tphoto typesetter input.

To specify a filter:

1. Select Configure | Protocol.
2. Select the LPD protocol from *Available Protocols*.
3. Click Configure. LPD Protocol Options displays.
4. Select a filter from the *Filter options* list box.
5. Click OK.

Changing the Spool Directory

If the spool directory is changed, LPR automatically changes the Control Panel | Printers | Connect | Ports value to reflect the new directory. Any previously

configured printers will still be connected to the previous spool directory. To connect them to the new directory, follow the steps in *Printing from within an Application* on page 240

Deleting the Spool Directory

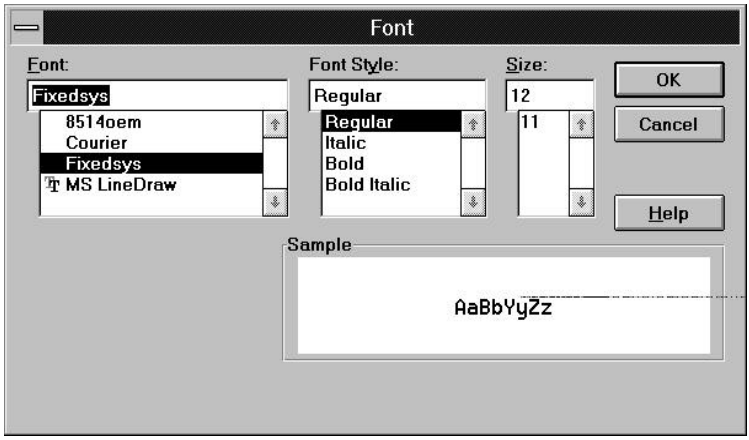
If printing from an Microsoft Windows application to the LPR printer is no longer needed, the directory entry in Directory for spooled files may be deleted. To delete the directory entry in Directory for spooled files, highlight the entry and press Delete, then press Enter.

Deleting the directory entry removes the printer attached to that port in Control Panel | Printers | Installed Printers. To notify the user before the printer is removed, LPR displays a warning dialog. The dialog allows an entry in Control Panel | Printers and connect the printer to another port, saving that printer as the installed printer.

Changing the Printer Queue Status Window Font

Only fixed-width fonts will be displayed. The font may be changed, the font style, and the font size of the *Printer Queue Status* window. To change the font, select Options | Status Font. The following dialog is then displayed:

Figure 0-3 LPR Font Dialog



Scroll through each list and make the desired selections, then click OK.

Troubleshooting LPR

Files do not print properly

The wrong filter may have been used. Find out what the correct filter is, select it, and re-send the job. Microsoft Windows may have been configured with a printer that does not match the printer device. Review the printer setup in Control Panel | Printers.

Error message is displayed

The remote LPD is not available or is out of service. Contact the system administrator.

Cannot Print to a Network Printer

Perhaps the network printer does not support Line Printer Daemon (LPD). Change the defined protocol for the printer in Configure | Protocol Logging.

LPR Messages

LPR contains a facility to log messages. Messages are logged to the SYSLOG file in the *TinyTERM Plus* installation directory. The SYSLOG file is an ASCII file. Use Century Windows Notepad to view the file. Since *TinyTERM Plus* applications, including LPR, write to the SYSLOG periodically, the SYSLOG entries displayed by Notepad may not be current. For that reason, do not keep Notepad opened on the system log for long periods of time.

More or less log information is placed in the system log through the Options | Message Logging Level menu item. Level zero logs the least messages.

Glossary

authentication	When connecting to a server, or when a computer is acting as a server, the computer will verify that the connecting machine has the right to connect and access it.
banner page	Similar to a cover page.
CSLIP	Compressed header SLIP; this option is a variant of SLIP that compresses the 40 bytes of TCP/IP headers that are transmitted with each data packet down to approximately 5 or 6 bytes.
COM	An abbreviation for Communication Port. This is the port that is used to connect the computer to a serial or modem connection.
daemon	A process that monitors other processes running on the system. For example, the print daemon controls print jobs that have been sent but are waiting in line to actually print.
DHCP/BOOTP	Configuration utilities that automatically send the PC configuration when requested. Ask the System Administrator if either of these options are available.
DMA Channel	Direct Memory Access; a channel of the network card. If grayed out, this typically means the DMA channel is either not used or is configured automatically by the software on the network card. Refer to the network card documentation for further information.
DNS	Domain Name Server; generally used by UNIX systems. This must be set up by the System Administrator to be used.
export	Files and directories may be “exported” to other computers on the network.
gateway	A connection between one network and another, usually networks of different types.

Hayes compatible modem	"Hayes compatible modems" are an industry standard similar to IBM compatible PC's. Commands used to tell the modem what to do, as well as the "protocol" used (the way the modem communicates with the PC or other modem) are standardized.
HOSTS file	This is set up by the System Administrator and must have the host name and the I/P address for each computer with which you will communicate.
Interrupt Level	In order for the computer to receive one task at a time from the different devices (PC's, printers, modems, etc.), each device is assigned a number. This must be a unique number for each device. Check the NIC (network interface card) for the number assigned to the card.
I/O	Input and Output; information going into or out of a computer or computer device.
LAN	Local Area Network; the PC communicates with the main network computer (server) through a network interface card (NIC) installed on the PC.
memory caching	Memory caching allows the smooth flow of data when transferred. This eliminates a machine on one end waiting for a machine on the other end causing sporadic speed. The data will flow continuously and will be stored in memory until the computer is ready to use it.
network connection	The term "network connection" is used to describe all aspects of the connection between the PC and the network server. This includes cabling and communication parameters set on the server and the PC.
network interface card	The board that allows the PC to "talk to" the network.
NIS	Network Information Services, a central database used on some UNIX systems for tracking machine names. Refer to the UNIX documentation for details specific to the machine used.
ODI	Open Datalink Interface

PCMCIA	This is a Plug and Play compliant device. The device is plugged into the PC and is automatically configured when the PC is started.
ping	Allows the check of the PC's connection to the network.
PPP	Point to Point Protocol allows hosts to link via TCP/IP over an asynchronous RS-232C port. PPP offers a more complete set of options than SLIP.
resolve machine names	Machines running TCP/IP are known by an IP (Internet Protocol) address (192.43.45.133) and a machine name (PC_10). Machine names are easy for people to remember, but the network needs to know the IP address. The two ways of making this association is with DNS (Domain Name Server) or the HOSTS files.
RS-232C	A cable that connects the PC to the modem or main network computer (server).
script	A list of commands that can be run to automate tasks such as connections, logins and disconnects.
serial or modem communications	A serial or modem connection is one where the PC or modem is connected to a multi-user system.
SLIP	Serial Line Internet Protocol allows hosts to link via TCP/IP over an asynchronous RS-232C port.
Standard Login	This type of login is the most common. Usually when a connection is made, the user must type their user id (name) and the correct password to gain access to the system.
TCP/IP	Transmission Control Protocol/Internet Protocol (network protocol) that provides communication across interconnected networks that use different hardware platforms (i.e. Windows 95 to UNIX systems).
validates	The pcnfsd server will validate whether or not the machine can access the network.