TM

User's Guide

Ethernet is a registered trademark of Xerox Corporation.

UNIX is a registered trademark of UNIX System Laboratories, Inc. in the U.S.A. and other countries.

Windows NT is a trademark of Microsoft Corporation.

ELECTRONIC EMISSION NOTICES

Installation Statement:

Note: Installation of equipment is to be performed by a Qualified Service Personnel.

Federal Communication Commission (FCC) Statement:

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against armful interference when equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at their own expense.

Caution: Changes or modifications not expressly approved could void the user's authority to operate this equipment.

Canadian EMC Cautionary Statement:

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numerique de la classe A respecte toutes les exigences du Reglement sur le materiel brouilleur du Canada.

European (CE) Cautionary Statements:

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

European Telecom Statement (TUV & CE):

Caution: The NetTerminal is intended for connection to the Host Machine Only. DO NOT connect this terminal to the Telecom System.

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INTRODUCTION

This document provides information and procedures for the administration of the NetTerminal hardware with Model 100 and Model 500 Flashware. This document is intended for NetTerminal administrators and advanced NetTerminal users and assumes an understanding of UNIX, Windows NT (for Model 500), UNIX networking, and TCP/IP.

NetTerminal Hardware

The NetTerminal hardware platform contains a VGA video engine, AT compatible keyboard interface, a 10 Mbps Ethernet port supporting twisted pair or thin Ethernet media, two asynchronous serial ports, and one Centronics parallel port. Two LEDs are provided in the front for power and network activity.

NetTerminal Flashware Model 100

The NetTerminal Flashware is an embedded 32-bit operating system and TCP/IP protocol stack that provides a high performance, versatile feature set.

The NetTerminal Flashware Model 100 provides the core features described in the following table.

Feature	Description
Terminal capabilities	Terminal sessions: TELNET over Ethernet or local SLIP, ASCII over local serial and remote serial over an asynchronous modem. Up to 12 simultaneous terminal sessions. Each session can be configured independently for SCO ANSI, AT&T, AT386, DEC VT320/220/100, ADDS VP or Wyse 60/50 emulations, video modes of 80 or 132 columns and 25 or 43 rows, standard VGA foreground and background colors, and an optional login session information/status line.
Print services	The NetTerminal parallel port and 2 serial ports can be configured for use with a printer allowing it to act as a print server for up to 3 printers. Each port can be accessed by clients using either the RCMD or LPD protocols. NetTerminal can service up to 3 simultaneous client requests per port.
Networking protocols	SLIP and CSLIP (compressed SLIP) for error free multi-session serial connections, TCP/IP, UDP, ARP and DNS.
Remote management	NetTerminal can be managed remotely via rcmd or telnet to configure devices, sessions ,etc.
UNIX device interface	NetTerminal video/keyboard, parallel, and serial ports can be accessed as standard UNIX devices in the /dev directory on SCO Open Server. In Unixware 7.0 and Linux NetTerminal parallel and serial ports can be accessed as standard devices in the /dev directory.
International support	Support for the following Western European languages: German, French, Italian, Norwegian, Spanish, Swedish, Swiss-German, Swiss-French, English. Support for other languages is available upon request.

Table 1: NetTerminal Model 100 Flashware Software Features

NetTerminal Flashware Model 500

This Flashware model contains Web browser client[1]. To add this option contact your reseller or visit www.atlabs.com for contact information.

Feature	Description
Web enabled	This feature set allows the NetTerminal to run latest Netscape 4.7 or Internet Explorer 5.0 browser from NT 4.0 workstation or server, using NetTerminal Services software for NT.
Terminal Server	The NetTerminal's 2 serial ports can be configured for use as a Dumb terminal server.
Management via web browser	Built in HTTP management server allows administrators to configure NetTerminal via their favorite browser.
Boot O/S from HTTP server	This feature allows the NetTerminal to boot different O/S or future feature sets from HTTP server.

Table 2: NetTerminal Model 500 Software Features

[1] Only NetTerminal with Firmware Runtime version 4.0 and above can be field upgradeable to model 500

CHAPTER 1:NETTERMINAL ADMINISTRATION

All NetTerminal administration is performed using the NetTerminal Administration Interface at each NetTerminal. The NetTerminal Administration Interface is activated by pressing *<ALT>+<PRINT SCREEN>* on the NetTerminal keyboard to switch to the NetTerminal Administration Interface screen.

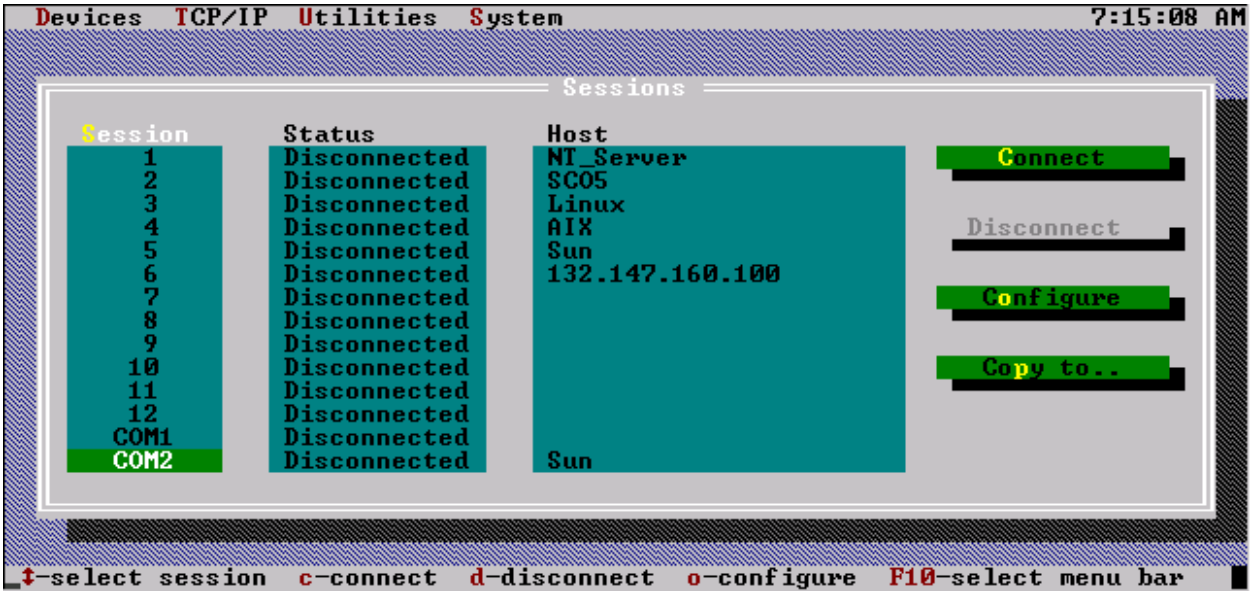


Figure 1: NetTerminal Administration Interface Screen

The NetTerminal Administration Interface screen is shown above. By default it contains a menu bar listing the main administration options and the Session Dialog, which provides session status and control.

Navigation of the NetTerminal Administration Interface will be familiar to most computer users. Menu bar menus are activated by pressing *<ALT>* with the highlighted letter of the menu you want to activate. Options in a menu are activated by pressing the highlighted letter of the option you want to activate or by using the vertical cursor movement keys to select the option you want to activate. A menu is exited by pressing *<ESC>.*

Configuration

NetTerminal administration includes the following tasks:

- Session configuration
- Device configuration
- TCP/IP configuration
- System administration configuration

These tasks are normally performed by a system administrator familiar with TCP/IP networking. Each NetTerminal configuration task is explained in the following sections.

Session Configuration

The NetTerminal allows up to twelve simultaneous sessions. Following session types are supported:

- A telnet session using TCP/IP or SLIP.
- A dumb terminal (ASCII) session using a direct serial connection or a Hayes compatible modem. This allows the NetTerminal to function as a conventional dumb terminal.
- Remote display session using TCP/IP.
- Web Browser session to connect to Windows NT 4.0 server running NetTerminal Services software.

Each of the above session types require specific configuration information.

Login sessions (referred to in this documentation as just 'sessions') are controlled using the Sessions Dialog on the NetTerminal Administration screen. The Sessions dialog-box is always displayed in the center of the screen and allows connection, disconnection, and configuration of sessions. The Sessions Dialog is shown below:

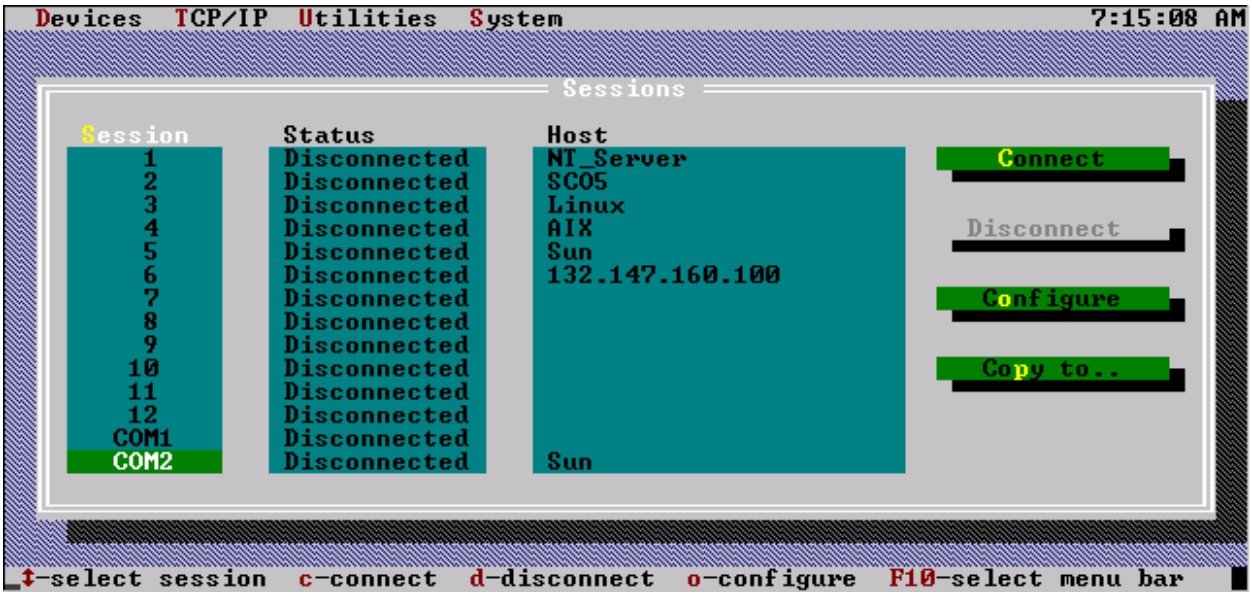


Figure 2: Sessions Dialog

Each session has a corresponding session screen. The session screen is activated by pressing <*ALT*>+<*F1*> through <*ALT*>+<*F12*>[1] allowing for a total of twelve sessions. Session screens can only be activated when session status is not disconnected (i.e. connecting or connected).

A session must first be selected before it can be connected, disconnected, or configured. A session is selected by moving the cursor using the vertical cursor movement keys in the Session list in the Sessions Dialog. Once the desired session is selected, it can be connected by pressing *c*, disconnected by pressing *d*, or configured by pressing *o*.

The following sections describe how to configure each type of NetTerminal session. In addition to configuration information required for each type of session, the Sessions Dialog allows configuration of emulation, video mode, foreground and background colors, and various startup options. The section below describes the configuration of these options.

Configuring a telnet session

A telnet session is used to log into any host reachable on a TCP/IP network using the telnet protocol. A telnet session requires the IP address of the host. If the host cannot be reached on the local IP network,

[1] See Devices-Keyboard "Session switch keys" for correct sequence required for session activation.

an appropriate entry must be added to the NetTerminal routing table using the Routing Dialog in the TCP/IP Menu.

1. To configure a telnet session switch to the NetTerminal Administration Interface screen by pressing *<ALT>+<PRINT SCREEN>*.
2. Select the session you want to configure using the Session list in the Sessions Dialog.
3. Press *o* to activate the session configuration dialog for the selected session.

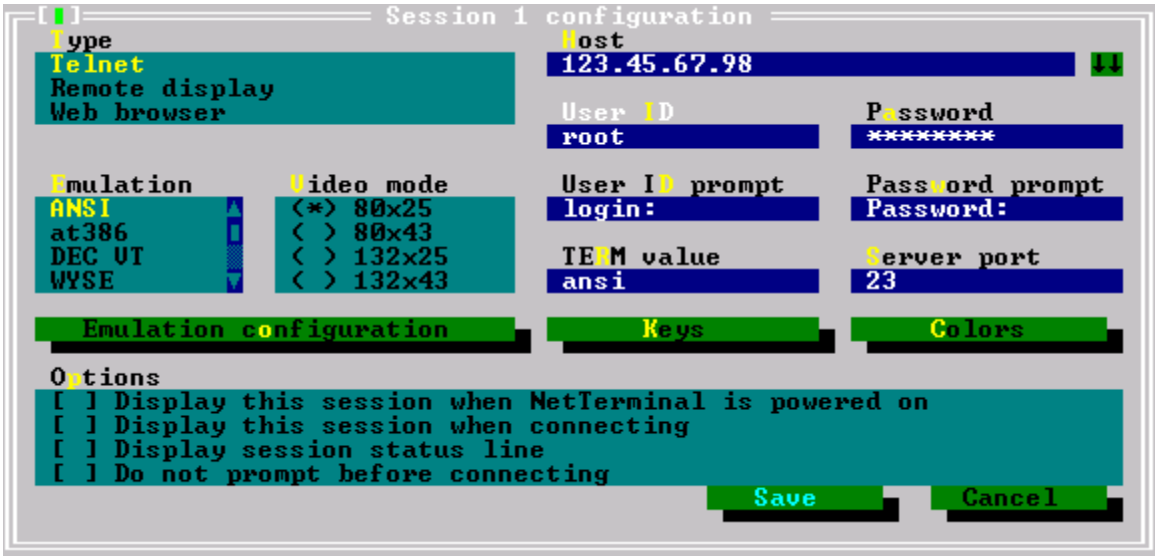


Figure 3: Telnet Session Configuration

4. Select telnet in the Type field.
5. Enter the IP address or symbolic name of the desired host.
6. Configure any other desired options. See *Table 3: Session Configuration Dialog options for Telnet, Remote display and Dumb Terminal*
7. Select **Save** or press *<RETURN>* to save the session configuration or select **Cancel** or press *<ESC>* to discard the new configuration.

Configuring a dumb terminal session

Dumb terminal sessions allow the NetTerminal to function as a conventional dumb terminal. However, unlike a dumb terminal, the NetTerminal supports as many dumb terminal sessions as it has serial ports, and still allows telnet sessions over TCP/IP.

Dumb terminal sessions can be constructed using two types of serial connections: direct and modem. Direct connections consist of connecting a NetTerminal serial port to a host using a null modem cable. Modem connections consist of connecting a NetTerminal serial port to a Hayes compatible modem which is used to dial and connect to a remote host over conventional analog phone lines.

1. To configure a dumb terminal session switch to the NetTerminal Administration screen by pressing *<ALT>+<PRINT SCREEN>*.
2. Activate the appropriate COM dialog from the Devices Menu for the serial port you want to configure, for example COM1.
3. In the usage field, select Dumb terminal.
4. In the mode field, select **Direct** for a direct serial connection to the host using a null modem, or **Modem** for a remote serial connection to the host using a Hayes compatible modem.
5. For a Direct connection, skip this step. For a modem connection, select the **Configure Modem** button by pressing *o*. Enter the phone number of the remote host. Configure any other modem

specific parameters as required. Select **Save** or press <*ENTER*> to save modem configuration changes or select **Cancel** or <*ESC*> to discard modem configuration changes.

6. Configure the baud rate, flow control, stop character, start character, character size, stop bits, and parity to coincide with the remote host's port configuration.
7. Select **Save** or press <*ENTER*> to save the serial port configuration. Select **Cancel** or press <*ESC*> to discard changes to the serial port configuration.
8. Select the session you want to configure for use as a dumb terminal session using the Sessions list in the Sessions Dialog.
9. Press *o* to activate the Session Configuration Dialog for the selected session.

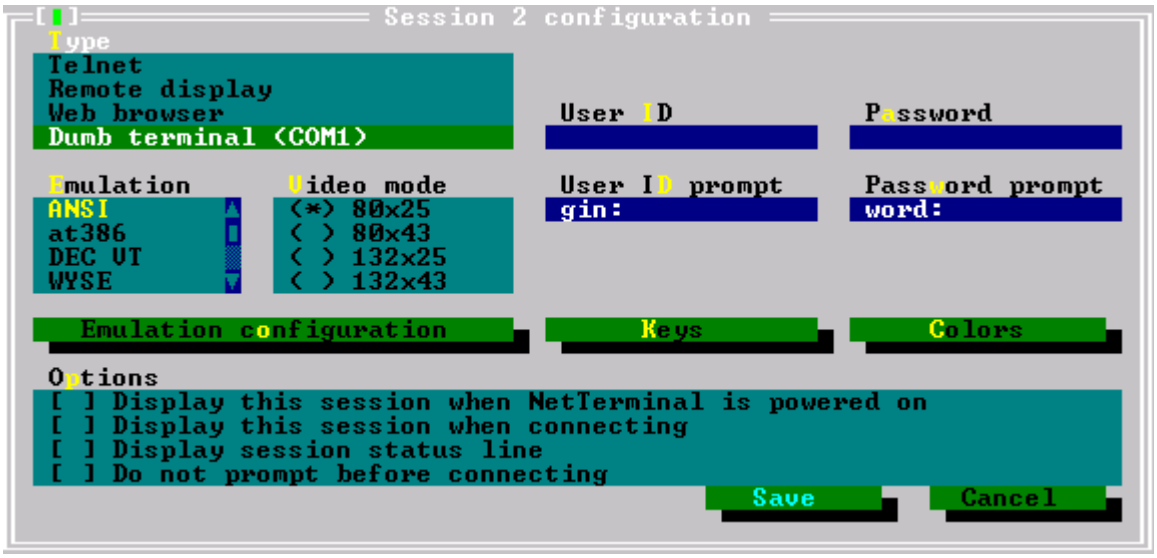


Figure 4: Dumb Terminal Session Configuration

10. Select the serial port you want to use for the dumb terminal session in the Type field. If the serial port you want to use is not listed, it is already configured for some other purpose, including use as a serial port for some other session. To quickly determine the configuration of a serial port, select the desired port in the Devices Menu. See

Device Configuration section for more information about configuring serial ports.

8. Configure any other session options as desired. See *Table 3: Session Configuration Dialog options for Telnet, Remote display and Dumb Terminal*

11. Select **Save** or press <*ENTER*> to save the new session configuration. Select **Cancel** or press <*ESC*> to discard changes to the session configuration.

Configuring a Remote display session

Remote display session is used to make the NetTerminal a TCP/IP remote display terminal. Information can be sent to the NetTerminal display remotely using RCMD/RSH command. Only one session can be configured as Remote display session. To configure remote display session:

1. Press *o* to activate the session configuration dialog for the selected session.
2. Select Remote display in the Type field.

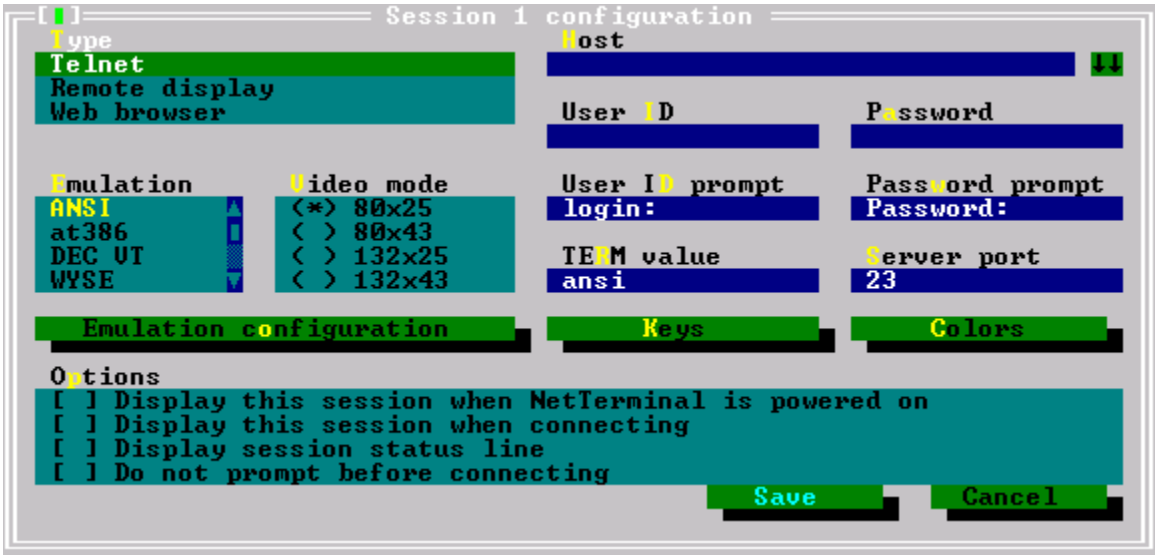


Figure 5: Remote Display Session Configuration

3. Enter the IP address or symbolic name of the desired host.

9. Configure any other desired options. Note: User ID and Password field have no meaning when selecting remote display. See *Table 3: Session Configuration Dialog options for Telnet, Remote display and Dumb Terminal*

4. Select **Save** or press <*RETURN*> to save the session configuration or select **Cancel** or press <*ESC*> to discard the new configuration.

5. Press <*ALT*>+*s* *i* to enter Administration access menu and enable RCMD/RSH option

   To send information to the NetTerminal remote display session:

   ```
   rcmd netterm1 display < filename
   ```

   Where `netterm1` is the symbolic name defined in */etc/hosts* file and `filename` is the name of the file that contains the text to be displayed on the NetTerminal display.

The following table describes the field for Telnet, Remote display and Dumb terminal session.

Option	Description
Host	Enter the IP address of the Host this session will connect to. The name of the Host can also be entered, if it is defined in the Host Table or DNS feature is enabled in the TCP/IP menu.
User ID	If a user login name is entered, the NetTerminal will wait for the User ID prompt string to appear and send this ID to the host.
Password	If a user password is entered, the NetTerminal will wait for the Password prompt to appear and send the password to the host upon connection.
User ID prompt	This field contains the character string the Host will send to the NetTerminal for login prompt. Upon receiving the sting the NetTerminal will send the User ID to the Host for login
Password prompt	This field contains the character string the Host will send to the NetTerminal for password prompt. Upon receiving the string the NetTerminal will send the password to the Host for login
Term value	This field contains the string that a NetTerminal send the Host for terminfo/termcap.
Server Port	The TCP/IP port this session will communicate with the server. The default TCP/IP port for telnet is 23.
Emulation	The NetTerminal emulates a VGA console supporting SCO ANSI, AT&T at386 control sequences and a dumb terminal which supports the DEC VT320/220/100, ADDS VP and Wyse 60/50 control sequences. The desired emulation for each session is selected using the Emulation radio-buttons.
Video mode	The NetTerminal is capable of a variety of video modes. A video mode can be uniquely configured for each session using the Video mode radio-buttons. The selection of a video mode is usually based on user preferences, application, requirements, and video display dimensions. The 132x43 text mode requires the resources of two sessions. Selecting 132x43 will consume the next session's resources. The next session's status is marked 'Reserved' for 132x43 expansion. Session 12 cannot be configured as 132x43 because there is no next session from which it can obtain resources.
Emulation configuration	Depending on what emulation is selected in the Emulation field a new menu will be displayed specific to that emulation.
Color	When selected, a Sessions colors menu will appear. Following color sequence can be configured: normal video foreground, normal video background, reverse video foreground, reverse video background and Border. Samples of the resulting colors are shown in the Normal Video and Reverse Video sample bars located below the foreground and background color selectors. Note certain colors might not work properly if you select monochrome emulations.
Keys	When selected, a Key configuration menu will appear. This menu provides option of programming function, arrows and some addition keys for the specific session. See section *Configuring session keys*.
Options/ Display this session when NetTerminal is powered on	When checked, the session is automatically started each time the NetTerminal is powered on. The NetTerminal will activate the screen for the lowest number session with this option checked instead of activating the NetTerminal Administration Interface. This mechanism can be used to hide all NetTerminal administration from the user.
Options/Display this session when connecting	When checked, the session is displayed whenever connection is made form the NetTerminal administration screen. Typically a login prompt is displayed, allowing the user to login again.
Options/Display status line	When checked, this option displays a status line at the last line of the session screen. Note when this option is selected, the number of rows for the session screen is decreased by one line. Screen oriented applications can typically be notified of this by setting the LINES environment variable appropriately.
Options/Do not prompt before connecting	When checked, the will connect to the Host that is entered in the Host field. Upon every power up or disconnect the session will auto connect it self.

Table 3: Session Configuration Dialog options for Telnet, Remote display and Dumb Terminal

Configuring session keys

Key configuration Dialog contains programmable function key text specific to each session. Following are the options and their description. These options are not available for Web Browser session.

Option	Description
Shift state	This state defines the shifted key sequence for programming or displaying of the selected key in the Keys field. Shift state can be a combination of *<ALT>*, *<CTRL>* and *<SHIFT>* key
Keys	This field contains list of all the keys that can be programmed.
Key text	This field display the text programmed for the key selected in Shift state and Key field. The text in the field can be changed to program new sequence. To enter any non displayable
Restore key default	Restore the key default for the key selected in Shift state and Key field.
Restore all key defaults	Restore key default for all the programmable keys.

Table 4: Key Configuration Dialog options

Configuring a Web Browser session (Model 500 only)

This option is only available on NetTerminal Flashware Model 500. Based on your hardware you can upgrade your NetTerminal to support Netscape 4.7 or Microsoft Internet Explorer 5.0 from NT using NetTerminal Services Software. This section only discuss how to configure a client. Refer to *Chapter 4: NetTerminal Services for Windows NT* for more information.

1. To configure session to access Web Browser, switch to the NetTerminal Administration screen by pressing *<ALT>+<PRINT SCREEN>*.
2. Press o to activate the session configuration dialog for the selected session.
3. Select Web Browser in the Type field.
4. Enter or select from the list the IP address or symbolic name of the desired Server.
5. Using *<TAB>* go to the Web Browser dialog box and select the browser of your choice.
6. Enter any other desired option. See table below for description of options
7. Select **Save** or press *<ENTER>* to save the new session configuration. Select **Cancel** or press *<ESC>* to discard changes to the session configuration

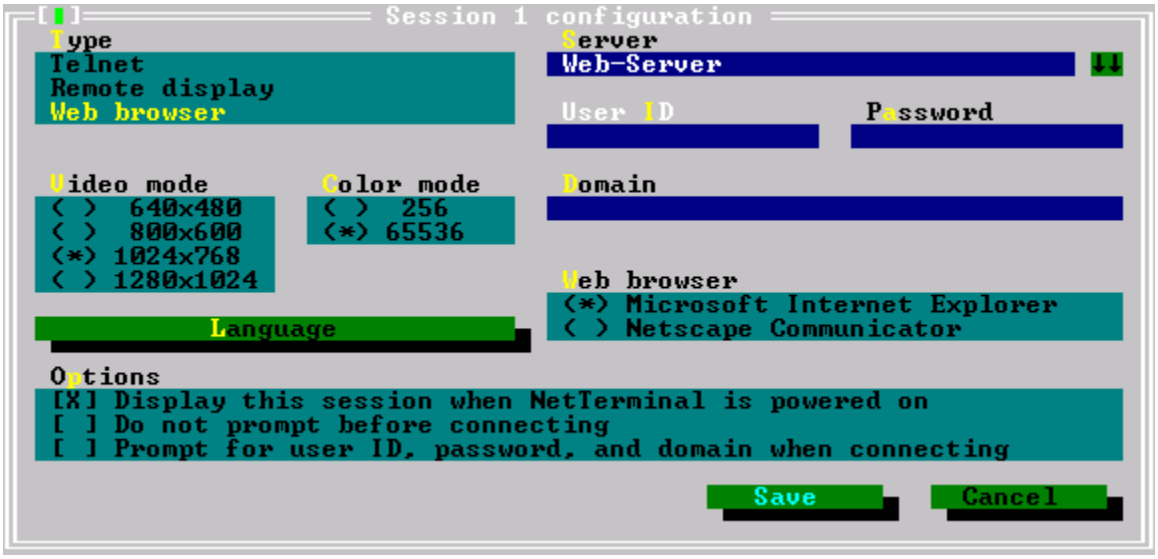


Figure 6: Web Browser Session Configuration

The following table describes the fields for Web Browser sessions.

Option	Description
Server	Enter the IP address of the Server this session will connect to. The name of the Server can also be entered, if it is defined in the Host Table or DNS feature is enabled in the TCP/IP menu.
User ID	If a user login name is entered, the NetTerminal will send this ID to the NT server.
Password	If a user password is entered, the NetTerminal will send the password to the NT server upon connection.
NT domain	If the NT domain is entered, the NetTerminal will send the domain name to the NT server upon connection.
Web Browser	Select either Netscape Communicator or Microsoft Internet Explorer. Note: NetTerminal Services and selected browser should be installed on Windows NT.[2]
Video mode	The NetTerminal is capable of a variety of video modes. . The selection of a video mode is usually based on user preferences.
Color mode	This option allows to you configure color resolution.
Language	By selecting this button a new Language window will appear. Desired languages can be entered to support multiple languages in windows session. Once the session is connected to multilingual NT server, user can change language by pressing left <*ALT*>+<*SHIFT*> key.
Options/Display this session when NetTerminal is powered on	When checked, the session is automatically started each time NetTerminal is powered on. The NetTerminal will activate the screen for the lowest number session with this option checked instead of activating the NetTerminal Administration Interface. This mechanism can be used to hide all NetTerminal administration from the user.
Options/Display this session when connecting	When checked, the session is displayed whenever connection is made form the NetTerminal administration screen. Typically a login prompt is displayed, allowing the user to login again.
Options/Prompt for user ID, password and domain when connecting	When checked, this option will prompt the user for all the 3 fields before logging the user.

Table 5: Session Configuration Dialog options for Web Browser

Connecting / Disconnecting a session

To Connect

1. Switch to the NetTerminal Administration Interface Screen by pressing <*ALT*>+<*PRINT SCREEN*>.
2. In the Sessions Dialog select the session you want to connect. This session must have been previously configured with a valid configuration.
3. Press *c* to connect the session.
4. Press <*ALT*>+<*Fx*>[3] where x is the session number of the newly connected session to activate the session screen.

To Disconnect

1. Switch to the NetTerminal Administration Interface screen by pressing <*ALT*>+<*PRINT SCREEN*>.

---

[2] Currently Netscape Communicator 4.7 and Microsoft Internet Explorer 5.0 are supported.

[3] See Devices-Keyboard "Session switch keys" for correct sequence required for session activation.

2. In the Sessions dialog select the session you want to disconnect.

Press *d* to disconnect the session.

Warning!
Disconnecting a session causes all host applications associated with the session to be terminated. Any data not saved in such applications may be lost.

Device Configuration

NetTerminal device configuration is required whenever a peripheral is connected to the NetTerminal. NetTerminal device configuration consists of configuring device specific options, configuring TCP/IP if the device is to be used with TCP/IP, and configuring sessions if the device is to be used for session connectivity. Figure 7 illustrates the NetTerminal device configuration procedure.

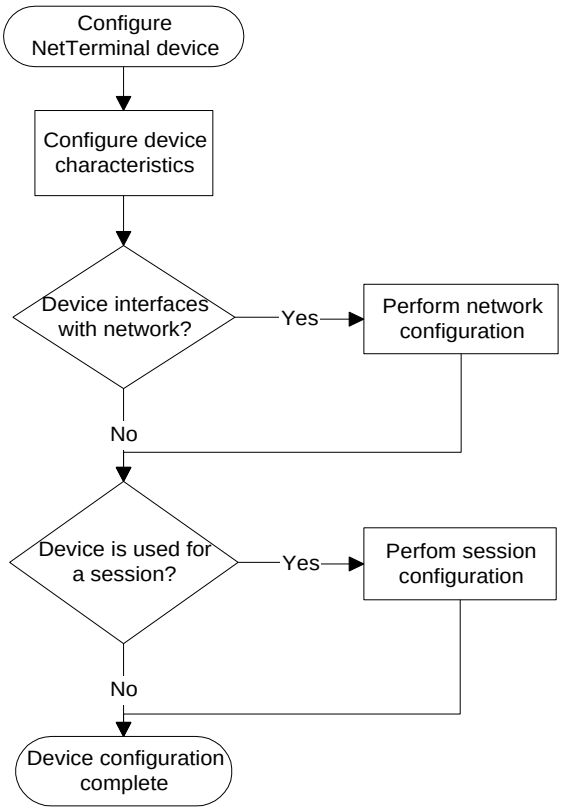


Figure 7: NetTerminal device configuration procedure

Device configuration must be performed when:

- The NetTerminal Ethernet interface is connected to a network.
- A NetTerminal parallel port is connected to a parallel printer.
- A serial port is used to connect the NetTerminal to a local host using an ASCII or SLIP protocol.
- A NetTerminal serial port is connected to a serial printer.
- User preferences which require modification of any of the following device specific options including:
    - Keyboard configuration
    - Video configuration
    - Sound configuration
    - Front panel LED configuration
    - Setting the time-of-day clock
    - NetTerminal internationalization

The Devices Menu

The Devices Menu is used to configure each NetTerminal device. The Devices Menu is selected by pressing *<ALT>+d* on the NetTerminal Administration Interface and is shown Figure 8. Each option in the Devices Menu provides a dialog box allowing configuration of a specific NetTerminal device. The dialog box presented by each menu option is described below.

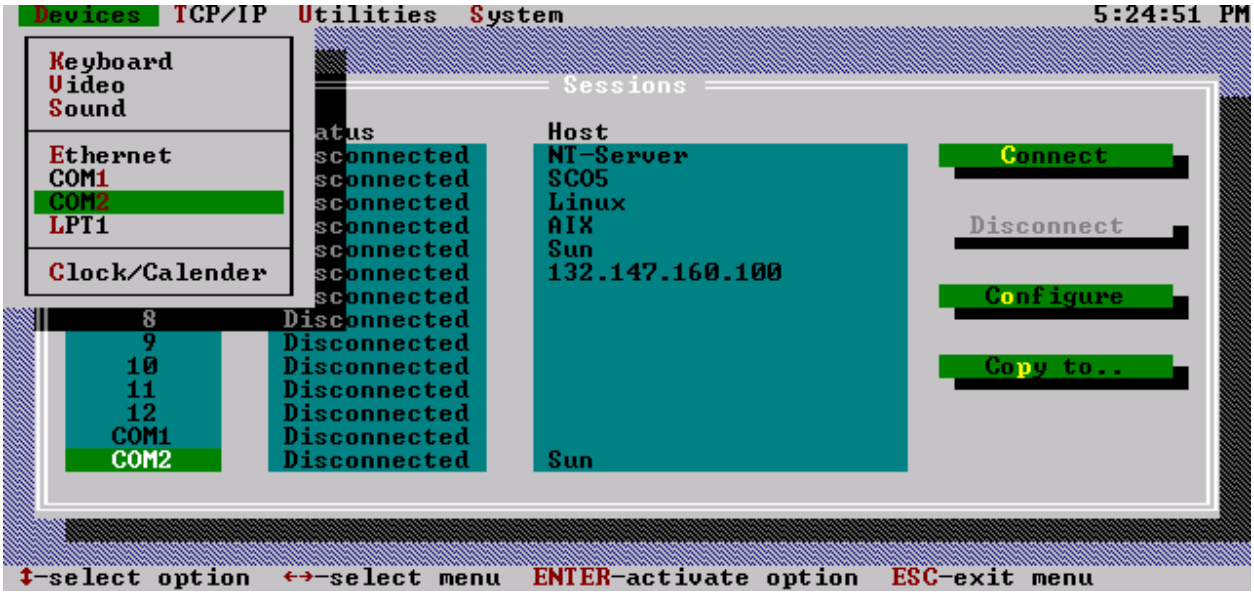


Figure 8: Devices Menu

Keyboard

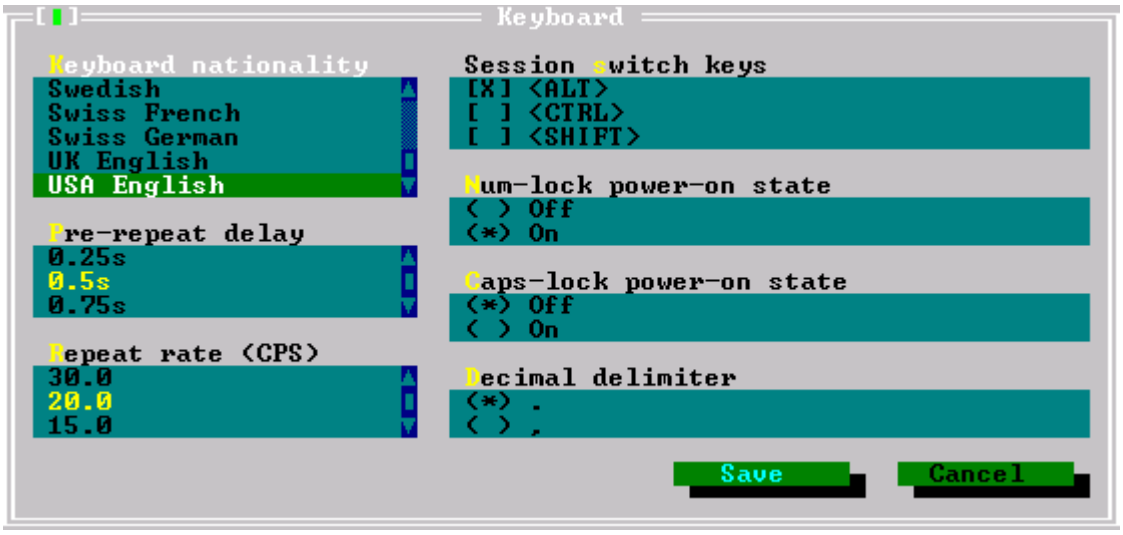


Figure 9: Keyboard Dialog

The Keyboard dialog allows configuration of the following keyboard related items:

Item	Description
Keyboard nationality	This field controls the keyboard map used with the NetTerminal keyboard. Keyboard maps are usually selected during internationalization. User can also download desired keyboard maps for selected emulation. See section, *Appendix A: Internationalization*

Item	Description
Num-lock power-on state	This field controls the default state of the Num-lock LED on the AT keyboard when the NetTerminal is powered on.
Caps-lock power-on state	This field controls the default state of the Caps-lock LED on the AT keyboard when the NetTerminal is powered on.
Session switch keys	This field control the key sequence required for switching between sessions along with Function keys <*Fx*>. Default is <*ALT*>+<*Fx*> where *x* is the number of Session.
Decimal delimiter	This field controls the characteristics of decimal character.
Pre-repeat delay	This field controls the time required for the key to be pressed, before the repeating of character is started.
Repeat rate (CPS)	This field controls the rate, in characters per second, at which the key should be repeated.

Table 6: Description of Keyboard Dialog items

Video

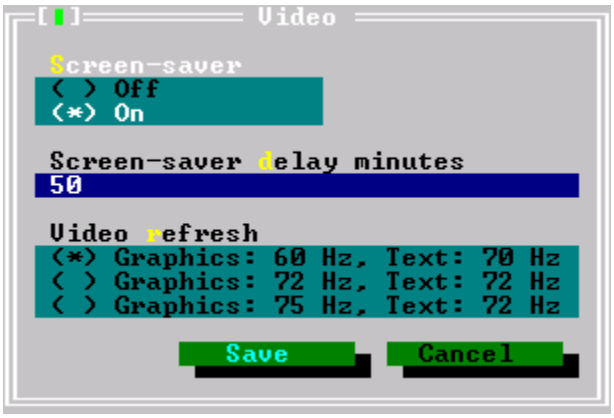


Figure 10: Video Dialog

The Video dialog allows configuration of the following video related items:

Item	Description
Screen-saver	These radio buttons control the operation of the screen-saver. Selecting **on** causes the screen to be blanked after the number of minutes specified.
Screen-saver delay minutes	This field specifies the number of minutes of keyboard inactivity that must pass before the screen is blanked.
Video refresh	These radio buttons control the screen refresh rate for graphics and text modes.

Table 7: Description of Video Dialog items

Sound

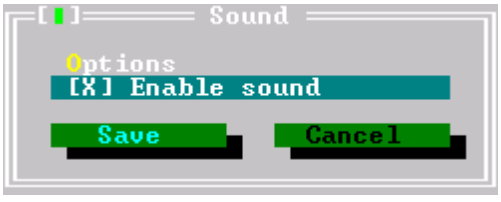


Figure 11: Sound Dialog

The Sound dialog allows NetTerminal sound to be enabled or disabled.

Ethernet

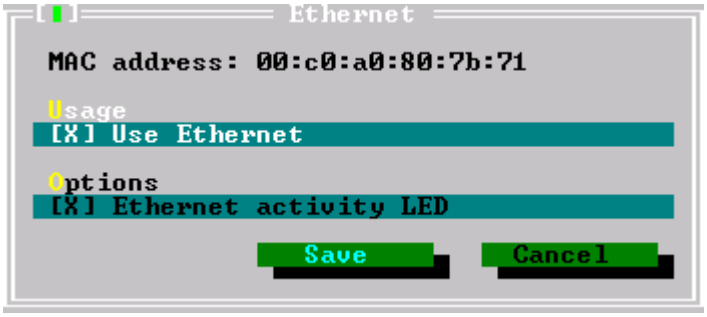


Figure 12: Ethernet Device Dialog

The Ethernet dialog allows configuration of the following Ethernet related items:

Item	Description
Usage/Use Ethernet	This check-box controls the usage of the Ethernet port. When checked the Ethernet port can be configured and used with TCP/IP.
Options/Ethernet activity LED	This check-box controls the Ethernet activity LED located on the NetTerminal front panel. When this check-box is checked, the Ethernet activity LED on the front panel will light when the NetTerminal is transmitting data onto the Ethernet. When this check-box is not checked, the Ethernet activity LED with remain off.

Table 8: Description of Ethernet Dialog items

The Ethernet dialog also shows the MAC (node) address of the Ethernet port that uniquely identifies the NetTerminal on an Ethernet network.

COM1 and COM2

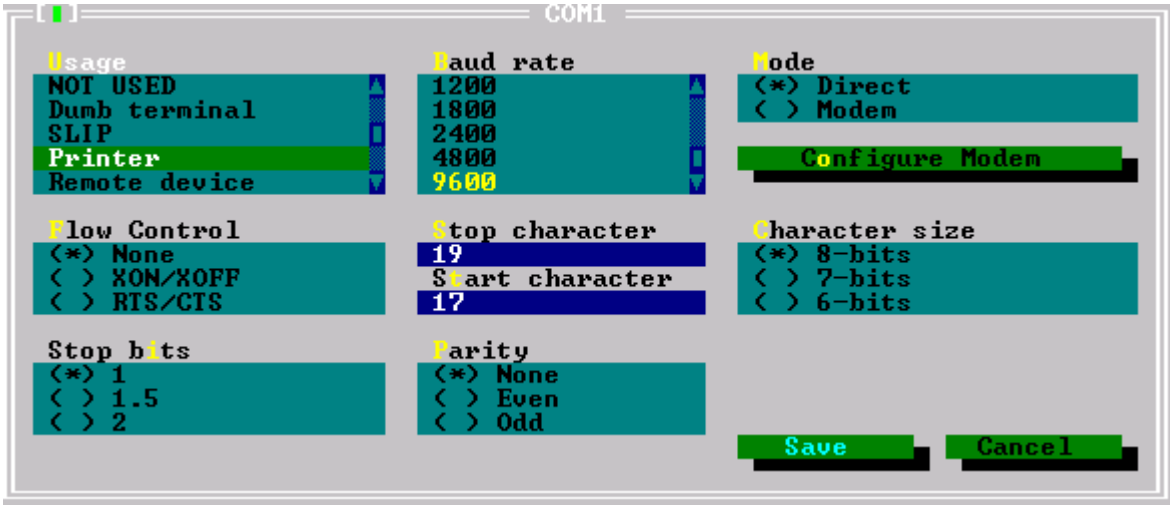


Figure 13: COM1 Dialog

The COM dialogs allow configuration of the serial interfaces, referred to as COM1 and COM2 in this documentation. These dialogs allow configuration of the following items:

Item	Description
Usage	Serial interfaces can be used for a variety of purposes which include emulating a dumb terminal ASCII connection, acting as a SLIP interface, socket access, controlling a printer as a print server , a mouse port, or acting as a remote device.
Baud rate	This field selects the baud rate for the serial port. Baud rates from 50 to 115.2K bauds are supported. Note: not all devices work well on high speed.
Mode	When the **Modem** radio-button is selected, the modem dialer is enabled. When using a

	modem, the session will remain in the connecting state until communication with the remote modem is established. When the **Direct** radio-button is selected, a session immediately connects. **Modem** mode only supported in **Dumb terminal** Usage mode.
Configure Modem	This command-button displays the Modem Dialer Dialog for the respective serial port. A description of the Modem Dialer Dialog is provided below.
Flow control	This field selects the type of flow control. Selecting **None** disables all flow control. Selecting **XON**/**XOFF** enables software (in-band) flow control using the ASCII ^S and ^Q characters. Selecting **RTS**/**CTS** enables hardware (out-of-band) flow control using the RTS and CTS RS232 interface signals.
Stop character	This field defines the decimal value of the stop character when **XON**/**XOFF** flow control is selected. This field should normally be decimal 19 (ASCII ^S).
Start character	This field defines the decimal value of the start character when **XON**/**XOFF** flow control is selected. This field should normally be decimal 17 (ASCII ^Q).
Character size	This field selects the asynchronous character size: 8 data bits or 7 data bits.
Stop bits	This field controls the number of stop bits for an asynchronous character: 1 stop bit, 1.5 stop bits, or 2 stop bits.
Parity	This field controls parity for an asynchronous character: **none**, **even**, or **odd**. Selecting **None** disables parity.

Table 9: Description of COM1 and COM2 Dialog items

Modem Dialer

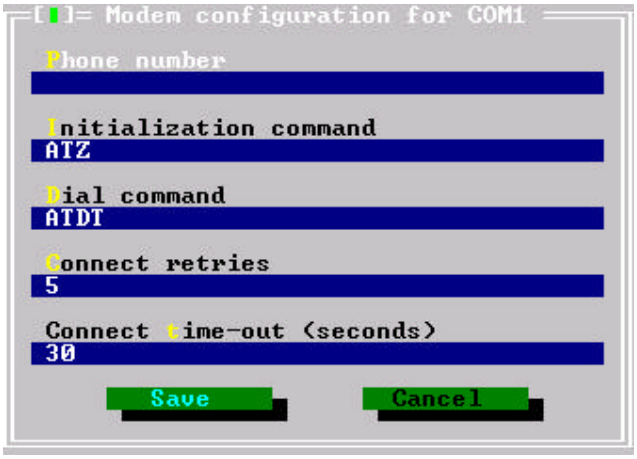


Figure 14: Modem Dialer Dialog

The Configure Modem command button in the COM1 and COM2 dialogs activate the Modem Dialer Dialog shown in *Figure 14: Modem Dialer Dialog*. The modem dialer is designed to operate with Hayes compatible modems. This dialog allows configuration of the following modem specific items:

Item	Description
Phone number	This is the telephone number which the modem dials to reach the remote modem.
Initialization command	This is an ASCII string which is sent to the modem before the dial command.
Dial command	This is an AT command instructing the modem how to dial the phone number.
Connect retries	This is the number of times the dialer will attempt a connection before aborting.
Connect time-out	This is a time interval in seconds. The dialer will abort or retry after this time interval has passed without achieving a connection with the remote modem.

Table 10: Description of Modem Dialer Dialog items

LPT1

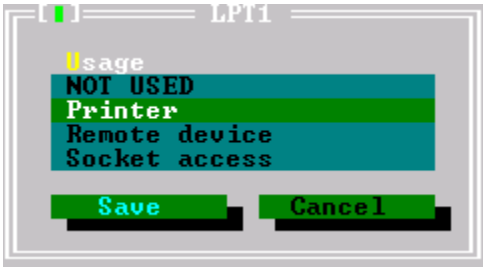


Figure 15: LPT1 Dialog

The LPT1 dialog box allows configuration of the NetTerminal parallel port, commonly referred to as LPT1. The following options may be configured:

Option	Description
Usage	This field controls how LPT1 is used. When **NOT USED** is selected, LPT1 is disabled and cannot be accessed. When **Printer** is selected, LPT1 is accessible via RCMD and LPD (TCP/IP menu). Also in this mode Transparent printing and print screen is supported, See section *Local Printer*. When **Remote device** is selected, LPT1 is accessible via a /dev/ entry on a UNIX host. When **Socket access** is selected, LPT1 is accessible via standard TCP socket access. For more information see *Appendix B: Developer Information* - Socket Access

Table 11: Description of LPT1 Dialog items

TCP/IP Configuration

TCP/IP configuration is required whenever a NetTerminal device must interact with a TCP/IP network. Examples are configuring the Ethernet port IP address, configuring print services on the parallel port or serial ports, route configuration, and configuring the serial ports for SLIP. This section provides detailed descriptions about performing such configurations.

The TCP/IP Menu

All NetTerminal TCP/IP configuration is performed using options from the NetTerminal Administration Interface TCP/IP Menu. The TCP/IP Menu is selected by pressing *<ALT>+t* at the NetTerminal Administration Interface screen. The TCP/IP Menu is shown in *Figure 16: TCP/IP Menu*. Each option in the TCP/IP menu provides a dialog box allowing configuration of one aspect the NetTerminal TCP/IP protocol suite. A description of each menu option follows.

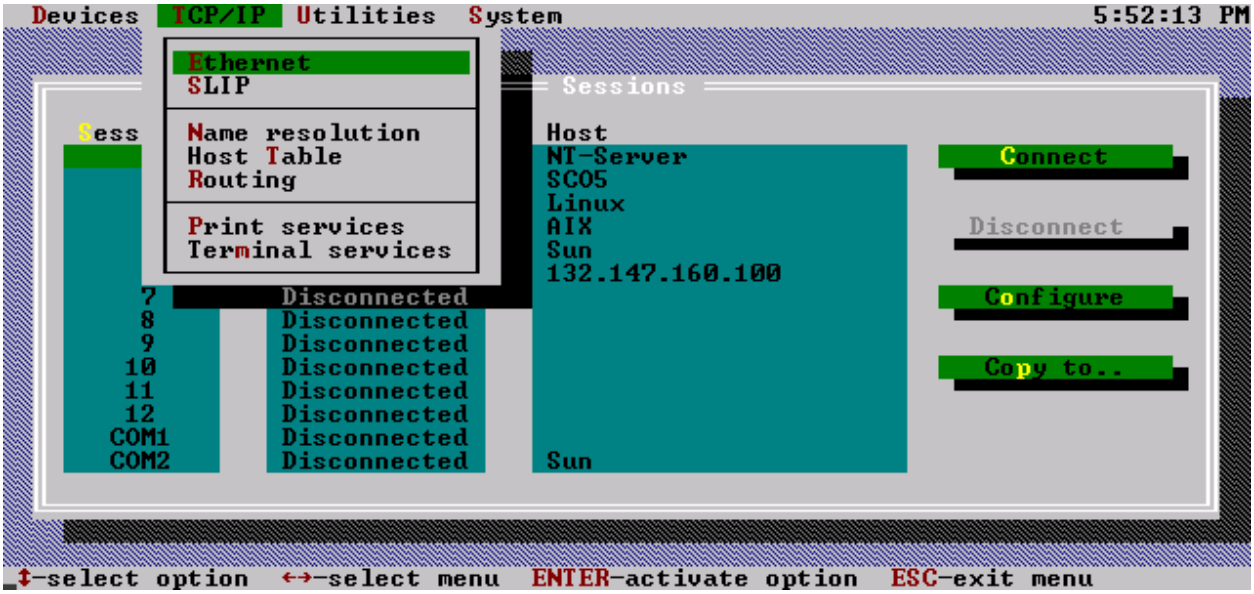


Figure 16: TCP/IP Menu

Ethernet interface configuration

The Ethernet interface is configured using the Ethernet Dialog in the TCP/IP menu. To activate the Ethernet dialog press *<ALT>+t e*.

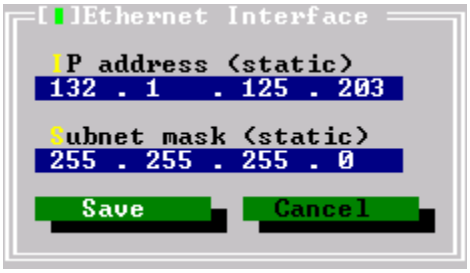


Figure 17: Ethernet Interface Dialog

The Ethernet Interface Dialog allows configuration of the Ethernet interface. The following items are configurable for TCP/IP:

Item	Description
IP address	This field defines the IP address of the Ethernet interface. IP address must be entered in dotted decimal notation such as 123.45.67.89 The NetTerminal Administration Interface accepts IP address and symbolic names wherever an IP address is required. The NetTerminal host table maps IP addresses to symbolic names. A symbolic name can be used when an entry is provided in the host table.
Subnet mask	This field defines the subnet mask for the Ethernet interface. The default subnet mask can be selected leaving this field blank.

Table 12: Description of Ethernet Interface Dialog items

SLIP interface configuration

The first step in configuring a SLIP interface is to configure a serial port as a SLIP interface. This is done using the COM1 or COM2 dialog in the devices menu. Press *<ALT>+1* or *<ALT>+2* to activate the COM1 or COM2 dialog. The following table lists the configuration required for a SLIP interface:

Field	Value
Usage	SLIP
Baud rate	This port's baud rate must match the remote node's baud rate.
Mode	Direct. (Remote connection over modems are not supported with the NetTerminal Basic Edition Software).
Flow control	None or RTS/CTS. RTS/CTS should only be set if the remote node supports it also. XON/XOFF should never be set since SLIP requires an 8-bit binary channel.
Stop character	N/A
Start character	N/A
Character size	8-bits
Stop bits	1
Parity	None

Table 13: COM Dialog configuration for SLIP interface

Once the serial port is configured to operate as a SLIP interface, the SLIP interface must be configured for TCP/IP. This is done using the SLIP Dialog in the TCP/IP menu. Activate the SLIP dialog by pressing *<ALT>+t s*.

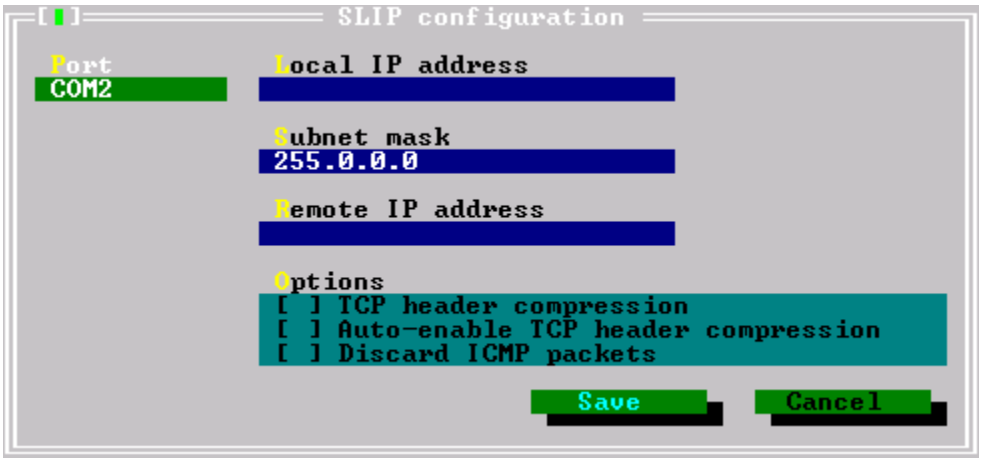


Figure 18: SLIP Configuration Dialog

The SLIP Dialog allows configuration of COM1 and COM2 when configured COM1 and/or COM2 are configured for use with SLIP in their respective dialogs in the Devices Menu. The following items are configurable for each SLIP interface:

Item	Description
Port	These radio-buttons select the SLIP interface being configured.
Local IP address	This field defines the IP address of the SLIP interface on the NetTerminal side of the point-to-point connection.
Subnet mask	This field defines the subnet mask of the SLIP interface on the NetTerminal side of the point-to-point connection. The default subnet mask can be configured by leaving this field blank.
Remote IP address	This field defines the IP address of the SLIP interface on the remote node side of the point-to-point connection.
Options/TCP header compression	Checking this check-box enables Van Jacobson TCP header compression. Do not check this option if the remote system does not support or is not configured for Van Jacobson TCP header compression.
Options/Auto-enable TCP header compression	Checking this check-box enables Van Jacobson header compression if the remote system uses it.
Options/Discard ICMP packets	Checking this check-box causes ICMP packets to be discarded conserving bandwidth for the transfer of data.

Table 14: Description of SLIP Dialog items

Select the appropriate port using the Port radio-buttons. Enter the local IP address, subnet mask, remote IP address and select options.

Name resolution configuration

Before a Domain Name Service (DNS) is configured, Domain Name of the host is required which is running DNS . To activate the Name Resolution Dialog press <*ALT*>+*t n*.

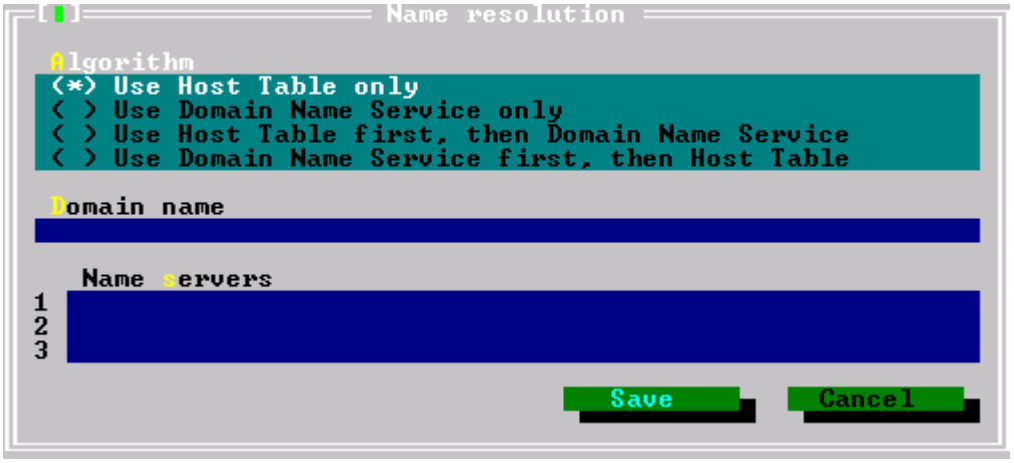


Figure 19: Name Resolution Dialog

Name resolution dialog provides an option of enabling and disabling the Domain Name Service for the NetTerminal. Four options are provided on how the NetTerminal should find the Host.

Item	Description
Algorithm	Select the option, which best suits your needs.
Domain Name	Enter the Name of the host running DNS.

Name servers	Enter the IP address of the host entered in Domain Name. If you have more then one host running DNS you can enter 2 secondary IP addresses in case the primary host is inaccessible.

Host table configuration

The host table maps IP addresses to symbolic names. Symbolic names are easier to remember and can be used in NetTerminal administration wherever an IP address is expected. Typical host table entries include:

- IP addresses of the NetTerminal Ethernet and SLIP interfaces
- IP addresses of hosts accessed via telnet session
- IP addresses of gateway configured in the Routing Dialog

The Host Table Dialog is activated by pressing <*ALT*>+*t t*.

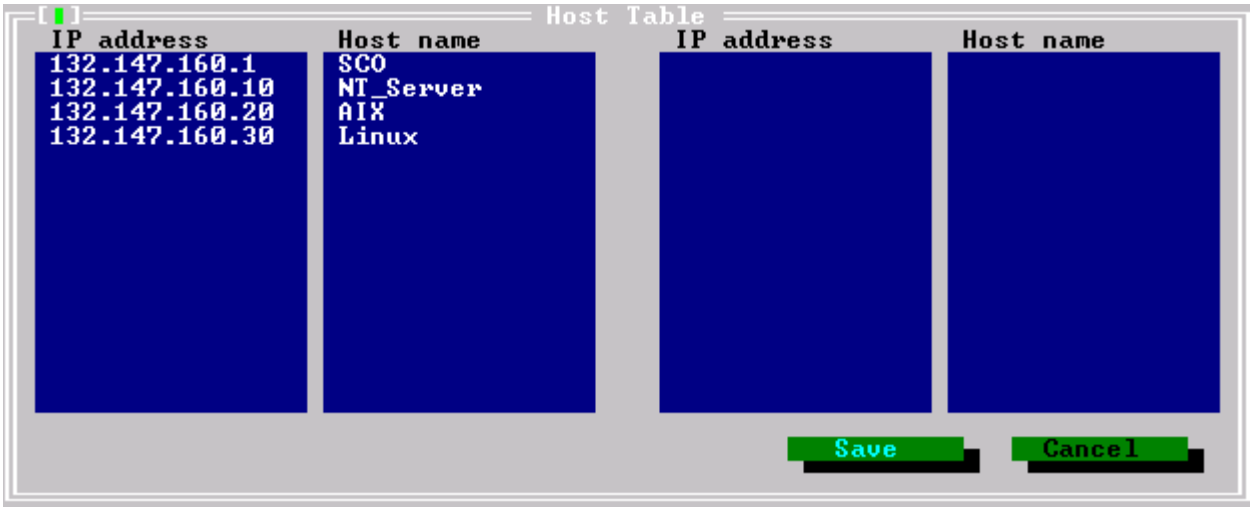


Figure 20: Host Table Dialog

This dialog allows editing of the contents of the NetTerminal host table. The host table holds 30 entries. The IP address field of each entry should be entered using dotted decimal notation. The host name field is a character string representing a symbolic name. Since the Host Table dialog consists of a group of text-boxes, fields are selected using <*TAB*> and <*SHIFT*>+<*TAB*>.

Route configuration

Route configuration can range from very simple to very complex. In cases where the NetTerminal is connected to a single TCP/IP network, no route configuration is required. However, in cases where the NetTerminal is connected to an enterprise-wide TCP/IP network, with access to the Internet, a detailed route configuration may be required.

A route configuration typically consists of identifying a default gateway which can allows access to most hosts and a few host or net specific routes to access remote networks. Once these routes are identified they can be entered into the NetTerminal routing table using the Routing Dialog.

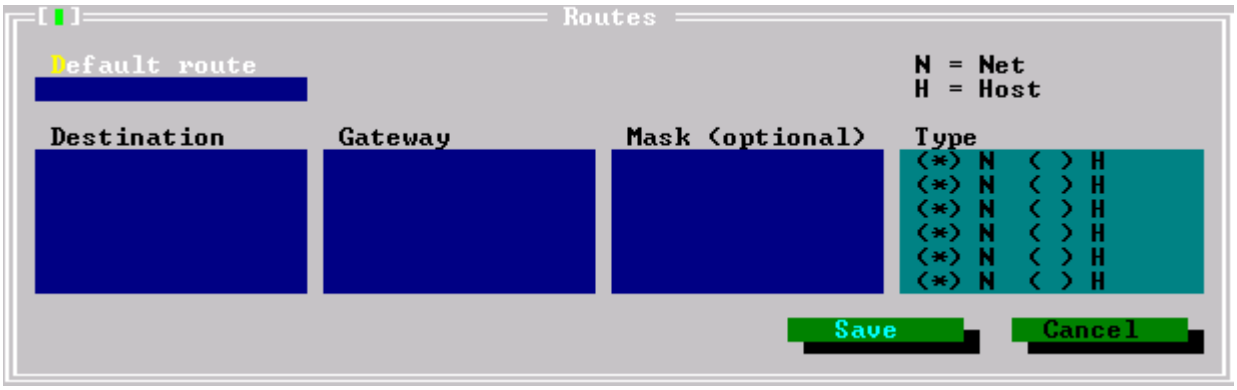


Figure 21: Routing Dialog

The Routing dialog allows configuration of the default IP route, routes to IP networks, and routes to IP hosts. The NetTerminal routing table supports one default route and six additional routes to hosts or networks. Following is a description of each item in the Routing dialog:

Item	Description
Default route	This field defines the default IP route. The default IP route is used if a suitable route is not configured in the NetTerminal routing table.
Destination	This field specifies the destination that can be reached via the **Gateway** field.
Gateway	This field specifies the gateway to which traffic to Destination is directed.
Mask	This is the subnet mask to apply to the Destination field when making routing decisions. The default subnet mask can be selected by leaving this field blank
Type	These radio-buttons select the route type. Selecting **Net** causes the routing table entry to be interpreted as a route to an IP network. Selecting **Host** causes the routing table entry to be interpreted as a route to an IP host.

Table 15: Description of Routing Dialog items

Printer service configuration

This section provides a detailed description of NetTerminal print service configuration and addresses client configuration issues. NetTerminal print service configuration is achieved using the Print Services Dialog which is activated by selecting the Print services option in the TCP/IP Menu.

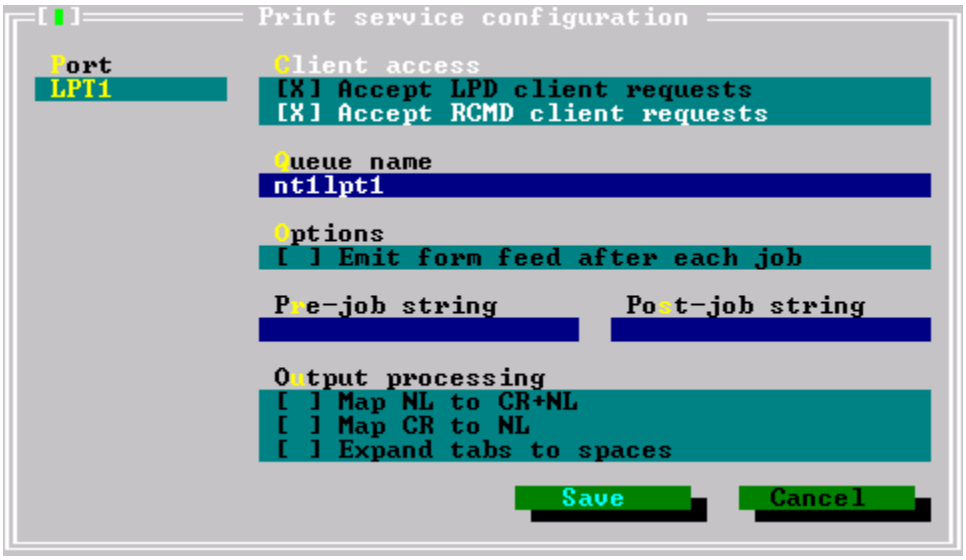


Figure 22: Print Service Configuration Dialog

The Print Services dialog allows configuration of LPD and RCMD access to the parallel port and serial ports configured for use with printers. The following items are configurable for each port:

Item	Description
Port	These radio-buttons select the port being configured.
Client access/Accept LPD client requests	This check-box, when checked, allows LPD clients to submit requests to the selected port.
Client access/Accept RCMD client requests	This check-box, when checked, allows RCMD clients to submit requests to the selected port.
Queue name	This field defines a configurable text string which names the queue for the selected port. This name is used primarily for LPD clients because each queue on an LPD client must have a unique name. This field allows configuration of unique queue names on a host which accesses multiple NetTerminals acting as LPD servers. Clients using RCMD can use the fixed queue names of lpt1, com1, and com2.
Options/Emit form feed after each job	When this check-box is checked, an ASCII form feed character is sent to the printer after each print job.
Pre-job string	The string entered into this text-box is sent to the printer before each job. All text is entered literally. Non-printable characters are entered by preceding their decimal encoding with a back slash. For example, \10.
Post-job string	The string entered into this text-box is sent to the printer after each job. All text is entered literally. Non-printable characters are entered by preceding their decimal encoding with a back slash. For example, \13.

Table 16: Description of Print Services Dialog items

The Output processing section contains various options useful for printing ASCII only data on a printer. These options should not be enabled if you intended to print graphics or a combination of ASCII and graphics on a printer. The following table describes each option:

Option	Description
Map NL to CR-NL	This option maps all ASCII carriage-return characters (ASCII code 13 decimal) to a two character sequence of characters consisting of an ASCII carriage-return character plus an ASCII new-line character (ASCII code 10 decimal).
Map CR to NL	This option maps all ASCII carriage-return characters (ASCII code 13 decimal) to ASCII new-line character (ASCII code 10 decimal).
Expand tabs to spaces	This options expands an ASCII tab character (ASCII code 9 decimal) to a sequence of ASCII space characters (ASCII code 32 decimal). The number of tab characters generated is a function of the current cursor location and a fixed tab length of 8 columns. Enough tab characters are generated to move the cursor to the next tab location.

Table 17: Description of printer services output processing options

The NetTerminal can act as a print server for a maximum of three printers: a parallel printer connected to its LPT1 port and two serial printers connected to its COM1 and COM2 ports. When multiple ports are configured for print services, one job for each port can be printed simultaneously.

The NetTerminal Basic Edition Software allows up to three simultaneous print requests for each port. Print requests are sent to the printer on a first-come-first-served basis. A print request is an RCMD or LPD client wanting to send a job to a printer. Any additional requests will be rejected until the first of the three pending requests is completed. This allows three different hosts to send jobs to a single NetTerminal printer. However, even with this capability, multiple requests to the same remote printer should be coordinated using a print spooler on the client.

Issues specific to accessing print services from clients using the RCMD and LPD protocols are covered in the following sections. Tips on printing ASCII data and graphics data on printers connected to a NetTerminal are also covered in separate sections. Please consult the section pertinent to your configuration requirements.

Printing Via RCMD

Clients can access a printer on a NetTerminal using the RCMD protocol. Most clients can do this using `rcmd` or `rsh` syntax such as:

```
cat file | rcmd netterm1 lpt1 onlcr
```

In the above example, `file` is the name of the file to be sent to the printer, `netterm1` maps to the IP address contained in a hostname/IP address database such as a host table, `lpt1` refers to the LPT1 port on the NetTerminal, and `onlcr` specifies an output processing option which maps CR to CR-NL. Refer to your host's `rcmd` or `rsh` documentation for more information.

Because the NetTerminal supports up to three simultaneous requests for a single port, three different clients can execute the above command concurrently. Any additional requests will be ignored. However, it is recommended that a print spooler be used to coordinate requests.

Note that the syntax for this command is standard except for the remote command and command options which are specific to the NetTerminal.

The remote commands supported by the NetTerminal Model 100 are `lpt1`, `com1`, and `com2`. The respective queue names for each port can also be used. These commands specify a NetTerminal port to which a printer should be attached and configured to accept RCMD requests.

The remote command options are described in the following table:

Option	Description
onlcr	This causes CR to mapped to CR-NL for all data sent to the printer for the current RCMD request. This overrides the state of the Map NL to CR-NL output processing option for the port.
-onlcr	This causes CR not be mapped to CR-NL for all data sent to the printer for the current RCMD request. This overrides the state of the Map NL to CR-NL output processing option for the port.
ocrnl	This causes CR to be mapped to NL for all data sent to the printer for the current RCMD request. This overrides the state of the Map CR to NL output processing option for the port.
-ocrnl	This causes CR not to be mapped to NL for all data sent to the printer for the current RCMD request. This overrides the state of the Map CR to NL output processing option for the port.
tab3	This causes tabs to be expanded to spaces for all data sent to the printer for the current RCMD request. This overrides the state of the Expand tabs to spaces output processing option for the port.
-tab3	This causes tabs not to be expanded to spaces for all data sent to the printer for the current RCMD request. This overrides the state of the Expand tabs to spaces output processing option for the port.

Table 18: RCMD printing options

LPD client configuration

Access to printers connected to a NetTerminal are accessed using the LPD protocol by configuring the LPD client with a remote printer. The remote configuration requires a server name, which in this case is the name of the NetTerminal to which the desired printer is connected, and a queue name, which is a symbolic name for the remote printer. Users on the client (in the case of a multi-user host) can access the printer using this queue name.

Because all remote printers on an LPD client must have a unique queue name (a feature of the original BSD LPD), the NetTerminal allows configuration of a unique queue name for each NetTerminal printer queue. This way LPT1 on one NetTerminal can be differentiated from LPT1 on another NetTerminal. The Queue name field in the Print Services Dialog for each port defines this name and can be used for this purpose.

SCO UNIX network printer configuration

A multi-user SCO UNIX host can be configured to use a NetTerminal printer as follows:

Configure a network printer as instructed in the Using Printers section of the System Administrator's Guide.

The line added to the */usr/spool/lp/remote* file should be similar to the following:

```
/usr/spool/lp/bin/rlpcmd netterm1 lpt1 onlcr
```

for printing ASCII and should omit or clear any output processing options for printing graphics. If you want to print both graphics and ASCII data on a printer connected to a NetTerminal, you can configure two network printers. One line in */usr/spool/lp/remote* would specify the appropriate output processing options printing ASCII and the other would specify the appropriate output processing options for printing graphics (usually none). Note that this would allow one request to each logical printer to be pending simultaneously. Since the NetTerminal Basic Edition Software allows a maximum of three pending requests, only one additional printer queue may be configured to access the port.

Advanced Configuration

This section describes NetTerminal system administration configuration and diagnostic utilities.

The Utilities Menu

The utilities menu contains a ping utility for diagnosing connection problems.

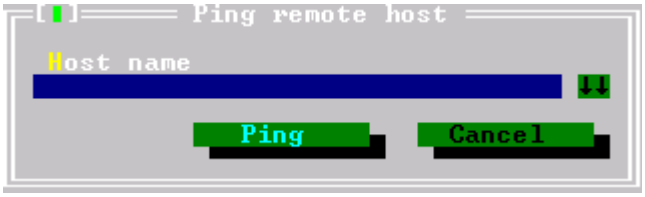


Figure 23: Ping Dialog

The NetTerminal ping utility is activated by pressing *<ALT>+u p* to activate the Ping Dialog. A host name or IP address can be specified. Host names must have entries in the NetTerminal host table.

Ping sends an ICMP echo request to the specified remote host. Ping will display a failure message if it cannot find a route to the host or it receives no response within two seconds.

The System Menu

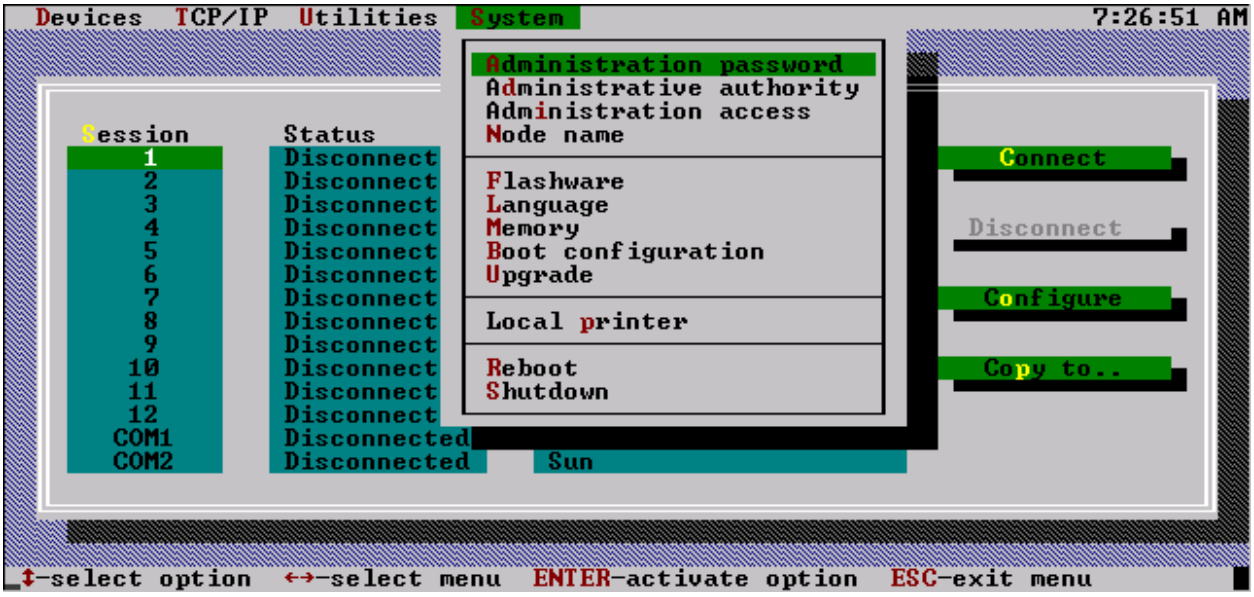


Figure 24: System Menu

The System Menu contains options which apply to the NetTerminal as a system. The System Menu is activated by pressing *<ALT>+s* at the NetTerminal Administration Interface. This section describes the options available in the System Menu.

Systems Administration

NetTerminal contains a very comprehensive administration features. NetTerminal administration can be preformed locally or remotely. Following administrative options are provided.

Administration password

Figure 25: Administration Password Dialog

The Administration password dialog provides options of adding a password to the NetTerminal System. Once the password is entered, user will be prompted to enter the password every time the NetTerminal configuration is to be changed.

Administrative authority

Figure 26: Administrative Authority Dialog

The Administrative authority Dialog provides an option to set the authorization of the NetTerminal to either the User or Administrator. If the password is entered in the Administration password Dialog and the Administrative authority is set to Administrator, no password is required when changing any of the configuration of the NetTerminal. If authority is set to User then user will be prompted to enter the password every time NetTerminal configuration is to be changed.

Administrative access

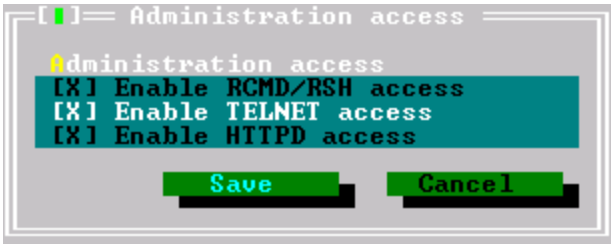


Figure 27: Administrative Access Dialog

The Administrative access dialog provides an option of enabling access of rcmd/rsh, telnet and HTTP to the NetTerminal. To prevent uses from telnet-ing into the NetTerminal or sending remote command to the NetTerminal, remove the check from these options.

Node name

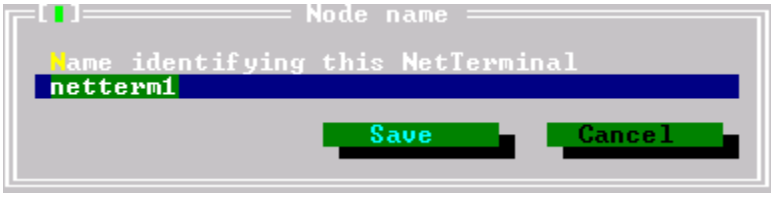


Figure 28: Node Name Dialog

This dialog provides an option to enter node name specific to the NetTerminal. This is an optional field, but can be helpful to distinguish NetTerminal. See *Appendix B: Developer Information* on how to query the node name.

Local Client Options

Flashware

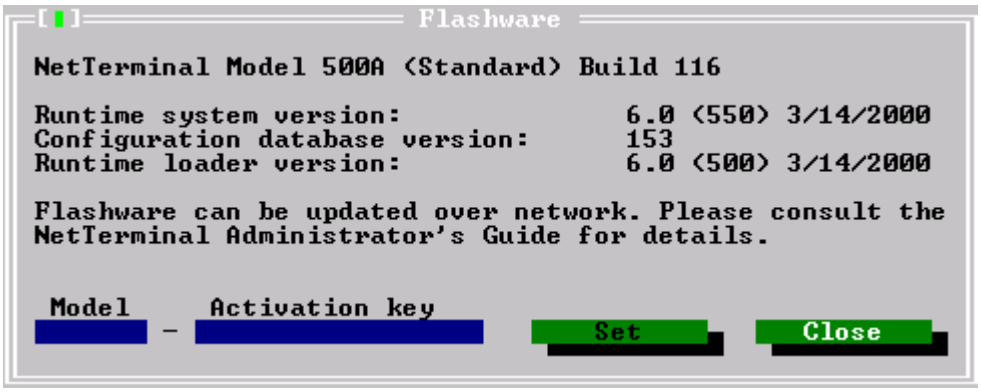


Figure 29: Flashware Dialog

The Flashware Dialog provides NetTerminal firmware revision information and a key field to upgrade NetTerminal model and feature sets.

Language

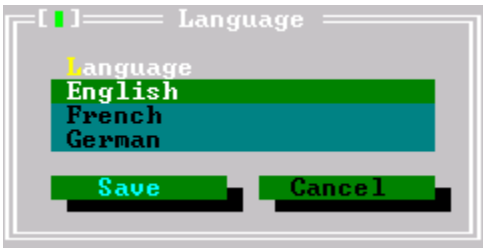


Figure 30: Language Dialog

This dialog provides an option of selecting the language for NetTerminal Administrative screen and messages. The following languages are supported: English, French and German.

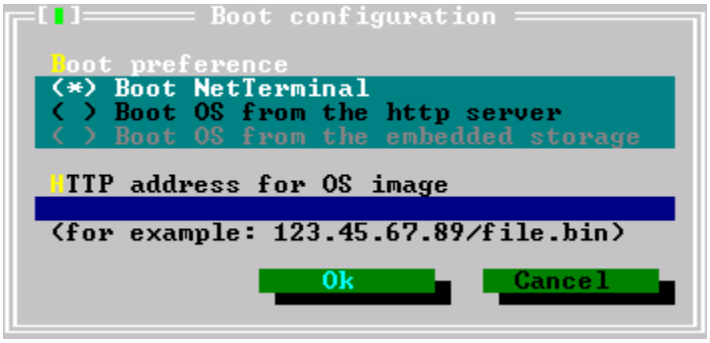
Memory

Figure 31: Memory Dialog

This dialog is provided for informational purpose only. Information regarding NetTerminal memory configuration and available memory is provided.

Boot Configuration

This option is used to boot operating system other then NetTerminal OS. By entering the HTTP server name or IP address along with the file location users will be able to boot different OS thus increasing the life cycle of the client



Local Printer

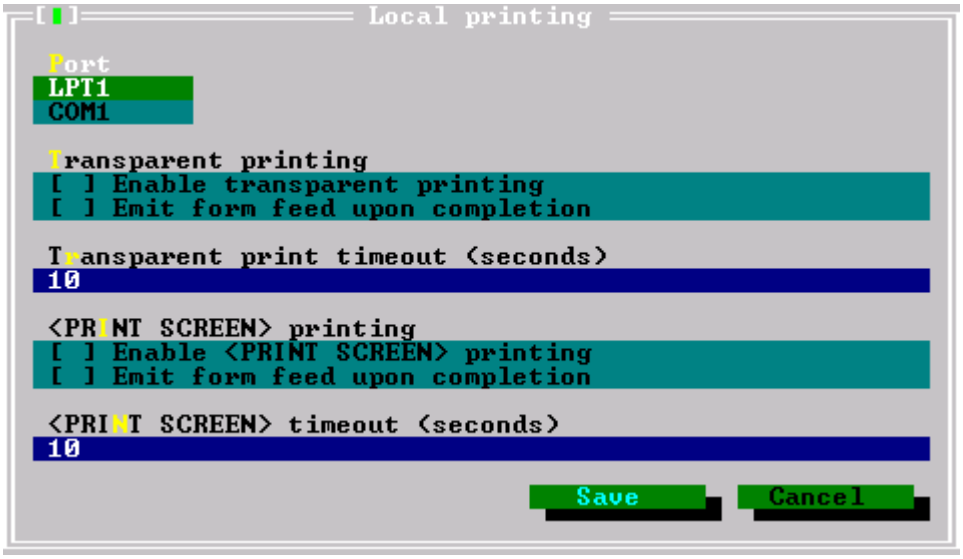


Figure 32: Local Printer Dialog

This dialog allows the enabling and disabling of Transparent printing and Print Screen. Timeout field is also provided to remove jobs from buffer after the specified time, if the local printer is not ready.

Reboot

Figure 33: Reboot Confirmation Dialog

The Reboot Dialog allows the NetTerminal runtime system to be re-started without cycling power. When activated, this menu option disconnects all sessions and closes all print server connections before the NetTerminal runtime system is re-started.

Shutdown

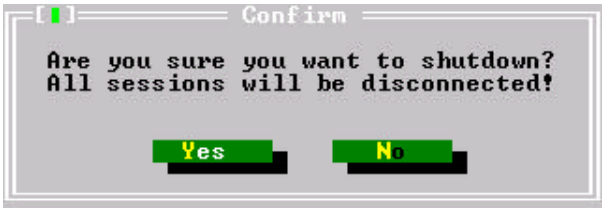


Figure 34: Shutdown Confirmation Dialog

The Shutdown Dialog allows the NetTerminal to be 'gracefully' shutdown. All sessions are disconnected and all print server connections are closed. A message will be displayed when the shutdown is complete.

Starting and Stopping the NetTerminal

The NetTerminal can be powered off at any time. However, it is recommended that a NetTerminal acting as print server be powered down using the Shutdown option in the System Menu of the NetTerminal Administration Interface. This command closes all print server connections so that clients will quickly detect that the NetTerminal is no longer accessible. The shutdown command also closes all session connections so these connections are not left open on the host.

CHAPTER 2: REMOTE MANAGEMENT

The NetTerminal is designed as a network device with tools to simplify network management and remote configuration.

Remote Administration Using TELNET

NetTerminal telnet features allow administrator to login to the NetTerminal to view and/or modify NetTerminal system specific setting. To use this feature a user must be a root user and TELNET access should be enabled on the NetTerminal. TELNET access can be enabled on the NetTerminal by going into System -> Administration access menu. Press *<Alt>+s c.* to telnet in to the NetTerminal, from the root prompt type:

```
telnet netterm1
```

Once the connection is established you will see the NetTerminal administrative screen menus.

Note: `netterm1` is the symbolic name of the NetTerminals defined in */etc/hosts* file.

Remote Administration Using RCMD/RSH

NetTerminal can be remotely managed via a rcmd to configure each specific parameter. To use this feature a user must be a root user and RCMD/RSH access should be enabled on the NetTerminal. RCMD/RSH access can be enabled on the NetTerminal by going into System -> Administration access menu.

Following are few examples of how the rcmd configuration works.

To configure or modify session 1 host

```
rcmd netterm1 session.1.host=123.45.67.89
```

To configure com1 for printing

```
rcmd netterm1 devices.com1.usage=Printer
```

To see current configuration of com1 baud rate parameter

```
rcmd netterm1 devices.com1.baud
```

Note: `netterm1` is the symbolic name of the NetTerminals defined in */etc/hosts* file.

Remote Administration Using HTTP

NetTerminal can be remotely managed via any web browser. To use this feature HTTP access should be enabled on the NetTerminal. HTTP access can be enabled on the NetTerminal by going into System -> Administration access menu

To view or modify NetTerminal configuration parameters using a browser, enter the IP address or host name of the NetTerminal on the browser address / location bar.

Configuring Multiple NetTerminals

NetTerminal provides a feature such that administrators can configure one NetTerminal and copy the configuration to multiple NetTerminals over the network. This feature is especially helpful when there are multiple NetTerminals which are to be configured on a network.

There are 2 options of configuring Multiple NetTerminals.

1) Configuring with **`getconfig/putconfig`** commands

2) Configuring via **`config`** command

Configuring with `getconfig/putconfig` commands

This is a fast way of configuring multiple Netterminals but it requires that you have the same version of configuration database for all the NetTerminal you want to configure.

To save the configuration of a NetTerminal type the following:

```
rcmd netterm1 getconfig > config1
```

To upload the configuration of NetTerminal form a file type the following:

```
rcmd netterm1 putconfig < config1
```

Note: **`putconfig`** will not update the IP address and the node name of the NetTerminal.

Configuring via `config` command

This is a flexible way of configuring NetTerminal since administrators can retrieve entire or specific configurable parameters and change them as desired.

For example:

To save configuration of sessions configuration type the following

```
rcmd netterm1 session.* > config1
```

To save configuration of devices com1 configuration type the following

```
rcmd netterm1 devices.com1.* > config1
```

To save the configuration of an entire NetTerminal type the following:

```
rcmd netterm1 '*' > config1
```

To upload the configuration

```
rcmd netterm1 config < config1
```

Note: Configuration file `config1` can be edited before uploading to another NetTerminal.
Note: `netterm1` is the symbolic name of the NetTerminals defined in */etc/hosts* file.

CHAPTER 3: NETTERMINAL HOST SOFTWARE FOR SCO UNIX

This section describes the installation, configuration and usage of the NetTerminal Host Software for SCO UNIX systems. The NetTerminal Host Software for SCO UNIX provides the following capabilities and features:

- Remote Device Access: Access to NetTerminal serial and parallel ports via UNIX device names
- TELNET Login Devices: Fixed UNIX device names for NetTerminal TELNET sessions

NetTerminal Remote Device Access

NetTerminal Remote Device Access is a component of the NetTerminal Host Software which allows applications running on a UNIX host to access NetTerminal serial and parallel ports as if they were local to the host. NetTerminal serial and parallel ports are accessed via entries in the host's /dev directory just like conventional tty devices, providing 100% application compatibility with local tty devices. However, with NetTerminal Remote Device Access, applications can access NetTerminal serial and parallel ports located anywhere on a TCP/IP network.

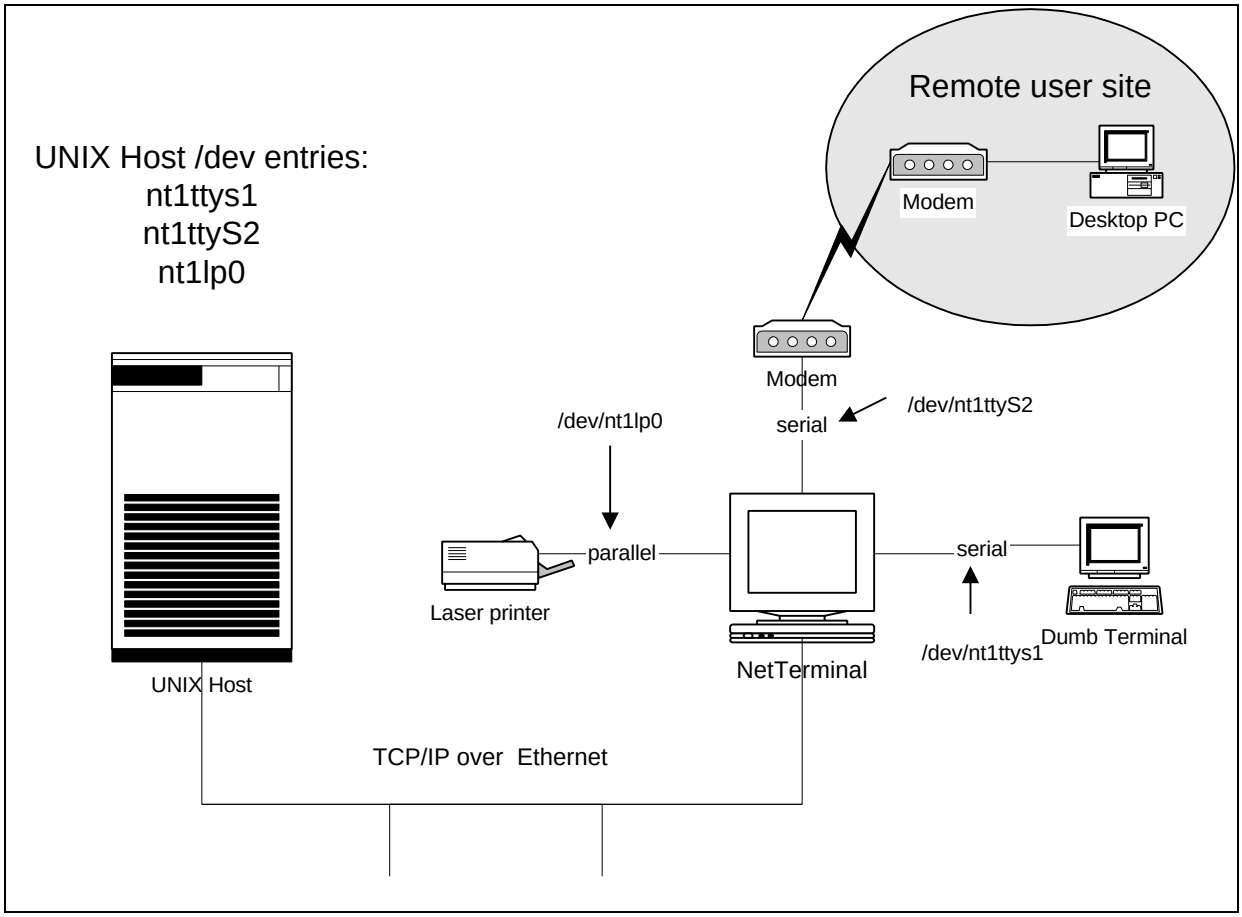


Figure 35: NetTerminal Remote Device Access

When to use NetTerminal Remote Device Access

NetTerminal Remote Device Access is designed to solve problems which are not addressed with standard TCP/IP protocols and/or services provided by open networking devices such as the NetTerminal. However, because Remote Device Access extends local device interfaces over TCP/IP networks, Remote Device Access is inherently host operating system dependent. Remote Device Access should only be

used when a more “open” solution is not available. Open solutions such as printing via the NetTerminal RCMD or LPD services allow heterogeneous client access and are scalable.

Most uses of Remote Devices Access are for Point-Of-Sales applications where data must be read from various types of devices such as bar-code scanners. Other uses include process control and data acquisition where specific devices must be read from and written to. Applications requiring write only access to a NetTerminal port can usually use RCMD or RSH, a more open mechanism. Developers creating new applications requiring read/write capabilities at a NetTerminal port at a fixed baud rate should consider the NetTerminal Socket Access mechanism, which is host operating system independent and therefore portable.

Remote Device Access is most useful when a true tty device is required. A NetTerminal serial or parallel port can be accessed just like a local port and are 100% compatible with local host ports of the same type. The following table considers some applications of NetTerminal Remote Device Access:

Application	Remarks
Reading from a NetTerminal serial port connected to a Point-Of-Sale device such as a serial bar-code reader	This is a common application of Remote Device Access. However, if the baud-rate does not need to be programmable, the NetTerminal Socket Access mechanism can be used instead. Socket Access is an operating system independent mechanism. Alternatively, a bar-code scanner which uses a standard AT keyboard interface can be connected to the NetTerminal keyboard board via a wedge and requires no specific configuration effort.
Reading from and writing to a valve controller connected to a NetTerminal serial port for a process control application	This is a common application of remote device access. However, if the baud rate does not need to be programmable, the NetTerminal Socket Access mechanism could be used instead. Socket Access is an operating system independent mechanism
Writing to a printer connected to a NetTerminal parallel port or serial port	If a /dev entry is not required for some application specific reason, the RCMD or LPD printing mechanism should be used instead. RCMD and LPD provide an open networking host independent printing mechanism.
Providing dial-up access via a modem connected to a NetTerminal serial port.	This allows a host to provide all the modem services a host normally provides with a local serial at a remote NetTerminal serial port.

Table 19: Example applications of NetTerminal Remote Device Access

NetTerminal port configuration for remote devices

NetTerminal ports accessed as remote devices can be configured in two ways: Host Defined Port Configuration or NetTerminal Defined Port Configuration. The type of configuration is selected by the device names in the host’s /dev directory used to access a NetTerminal port.

Host Defined Port Configuration

Host Defined Port Configuration allows the UNIX host to control the port configuration in the same way it controls a local tty device. This allows the host to control the baud rate, flow control, character size, stop bits and parity of the remote device. The configuration specified for the port using the NetTerminal Administration Interface at the NetTerminal is ignored. NetTerminal remote device names **without** the ‘r’ extension operate with a Host Defined Port Configuration and are 100% compatible with local tty devices. Refer to the *NetTerminal Remote Device Access Device Names* section for more information about remote device names

NetTerminal Defined Port Configuration

NetTerminal Defined Port Configuration allows the port configuration to be specified via the Devices menu at the NetTerminal using the NetTerminal Administration Interface. Configuration changes specified by the host are ignored. NetTerminal remote device names **with** the ‘r’ extension operate with a NetTerminal Defined Port Configuration. Refer to the *NetTerminal Remote Device Access Device Names* section for more information about remote device names. NetTerminal remote device operations with a NetTerminal

Defined Port Configuration are useful when a single port configuration, such as in many Point-Of-Sales (POS) applications, is required.

NetTerminal TELNET Login Devices

The NetTerminal TELNET Login Devices is a component of the NetTerminal Host Software which provides fixed device names for TELNET sessions initiated from a NetTerminal. Traditionally, TELNET sessions have dynamically assigned device names making them difficult to administer. With NetTerminal TELNET Login Devices, each NetTerminal TELNET session always has the same device name allowing NetTerminal TELNET sessions to be administered as tty devices.

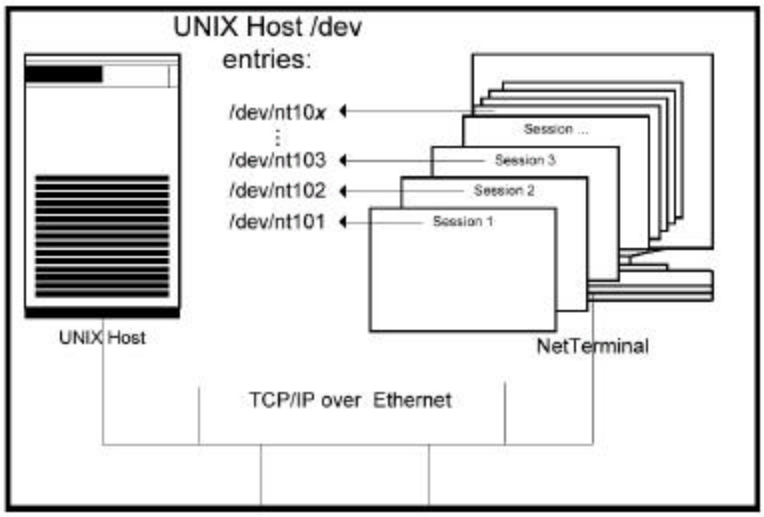


Figure 36: NetTerminal TELNET Login Devices

When to use NetTerminal TELNET Login Devices

TELNET Login Devices are generally used when fixed device names for NetTerminal TELNET sessions are required. TELNET sessions with fixed device names can be administered and configured like a tty device. For example, the **tset(C)** command can be used to determine and set the TERM environment variable when a user logs in. A default terminal type can be specified in the /etc/ttys file for each NetTerminal TELNET session. And a special access password can also be configured. Refer to the appropriate SCO documentation about terminal administration for more information.

Installation and Configuration Procedures

Verify that each NetTerminal has version 3.0 or above of NetTerminal Flashware installed. Upgrade each NetTerminal as required as described in the appropriate NetTerminal User's Guide.

NetTerminal Remote Device Access Installation and Configuration Procedure

The NetTerminal Remote Device Access Installation and Configuration procedure consists of the following steps:

1. Configuring a NetTerminal for Remote Device Access
2. NetTerminal Host Software installation
3. Editing the /etc/netterms file
4. Testing the /etc/netterms file

Detailed descriptions of each of the above steps are provided in the *Installation and Configuration Procedures* section. All steps must be correctly executed to ensure proper software operation.

NetTerminal TELNET Login Devices Installation and Configuration Procedure

The NetTerminal TELNET Login Devices Installation and Configuration procedure consists of the following steps: [Note: There is no need to execute this procedure if you have already executed the NetTerminal Remote Device Access Installation and Configuration Procedure.]

1. NetTerminal Host Software installation
2. Editing the /etc/netterms file
3. Testing the /etc/netterms file

Detailed descriptions of each of the above steps are provided in the *Installation and Configuration Procedures* section. All steps must be correctly executed to ensure proper software operation.

Configuring a NetTerminal for Remote Device Access

In order for a host to access a NetTerminal serial or parallel port as a remote device, the NetTerminal port must be configured for remote device access. This configuration is performed at the NetTerminal using the NetTerminal Administration Interface. The remote device access configuration procedure is described below.

1. At the NetTerminal, switch to the NetTerminal Administration Interface by pressing *<ALT>+<PRINT SCREEN>*.
2. Press *<ALT>+d* to select the Devices menu. The Devices menu is shown in *Figure 8: Devices Menu.*
3. Select the serial port (COM1 or COM2) or the parallel port (LPT1) you want to configure for remote device access.
4. In the **Usage** field select **Remote device**.
5. If you want to use a NetTerminal Port Defined Configuration, configure the baud rate, flow control, character size, stop bits, and parity as required by your application. Remember to specify a remote device name with an ‘r’ extension when accessing this port, which causes the NetTerminal to use its local port configuration and ignore any port configuration changes requested by the host.
6. Press *<ENTER>* to save the configuration.
7. Repeat steps 2 - 6 for other ports which must be configured for remote device access.

NetTerminal Host Software Installation

Install the appropriate NetTerminal Host Software using the SCO UNIX **custom(ADM)** utility. For each version of SCO UNIX be sure to install the correct version of the NetTerminal Host Software.

The following table lists the NetTerminal Host Software which must be used with each version of SCO UNIX:

SCO UNIX version	NetTerminal Host Software version
SCO OpenServer	2.0.1a
SCO ODT 3.0 or SCO UNIX 3.2v4.2	1.0.2h

Table 20: NetTerminal Host Software versions for each SCO UNIX version

Upon completing the installation of the NetTerminal Host Software, reboot your system.

If you want to use NetTerminal Remote Device Access, verify that the NetTerminal Host Software is operational using one of the following approaches:

> Verify that the '`Starting NetTerminal remote devices I/O daemon: netiod`' message is displayed on the console when the host enters multi-user mode.
>
> OR
>
> Verify that the **netiod** process is running by executing the **ps(C)** command.

The **netiod** daemon must be running in order for remote NetTerminal Remote Device Access to operate. **netiod** does not affect the operation of the NetTerminal TELNET Login Devices.

Editing the /etc/netterms file

A */etc/netterms* file must be created for Remote Devices Access and/or TELNET Login Device operation. The */etc/netterms* file is a simple text file used to map the ports and TELNET sessions of a NetTerminal to a set of device names in the host's */dev* directory.

Each line in the */etc/netterms* files contains the symbolic name of a NetTerminal as specified in the host's */etc/hosts* file or the DNS database. For example, if your */etc/hosts* file contains:

```
123.45.67.89            netterm1
123.45.67.90            netterm2
```

Then your /etc/netterms file should contain:

```
netterm1
netterm2
```

The order of names in the */etc/netterms* file is unimportant and only affects device name mapping.

In this example, the first set of remote devices in the */dev* directory correspond to `netterm1` and the second set to `netterm2`.

Hence the following remote devices correspond to netterm1:

/dev/nt1ttys1	COM1 without modem control
/dev/nt1ttys2	COM2 without modem control
/dev/nt1lp0	LPT1 write only

And the following remote devices correspond to netterm2:

/dev/nt2ttys1	COM1 without modem control
/dev/nt2ttys2	COM2 without modem control
/dev/nt2lp0	LPT1 write only

Similarly, the following TELNET login devices correspond to netterm1:

/dev/nt101	TELNET Session 1
/dev/nt102	TELNET Session 2
/dev/nt103	TELNET Session 3
…	
/dev/nt112	TELNET Session 12

And the following TELNET login devices correspond to netterm2:

/dev/nt201	TELNET Session 1
/dev/nt202	TELNET Session 2
/dev/nt203	TELNET Session 3
…	
/dev/nt212	TELNET Session 12

Refer to *NetTerminal Remote Device Access Device Names* section and the *NetTerminal TELNET Login Device Names* section for a description of each NetTerminal */dev* entry.

Testing the /etc/netterms file

For each NetTerminal symbolic name entered in the */etc/netterms* file, perform the following steps:

1. Start a TELNET session from the NetTerminal to the host.
2. Verify that the following message is displayed when the TELNET session connects:

`NetTerminal login on /dev/nt`***NS***

Where ***N*** is the nth entry in the */etc/netterms* file and ***S*** corresponds to the NetTerminal TELNET session. ***S*** is always a two digit number.

If the above message is not displayed check the following:

1. Verify that the IP address of the NetTerminal you are testing has a unique entry in the host's */etc/hosts* file or DNS database.
2. Verify that the symbolic name corresponding to the NetTerminal you are testing has an entry in the */etc/netterms* file.

NetTerminal Remote Device Access Device Names

NetTerminal serial port device names

The following table lists the corresponding device names for each of the NetTerminal serial ports for use in Host Defined Port Configurations. These devices are created in the hosts */dev* directory.

Local Serial Devices	Modem Control Serial Devices

NetTerminal	COM1	COM2	COM1	COM2
1	nt1ttys1	nt1ttys2	nt1ttyS1	nt1ttyS2
2	nt2ttys1	nt2ttys2	nt2ttyS1	nt2ttyS2
...	...	...	...	...
15	nt15ttys1	nt15ttys2	nt15ttyS1	nt15ttyS2
16	nt16ttys1	nt16ttys2	nt16ttys1	nt16ttyS2

Table 21: Device names for NetTerminal serial ports using Host Defined Port Configuration

The following table lists the corresponding device names for each of the NetTerminal serial ports for use in NetTerminal Defined Port Configurations. These devices are created in the hosts */dev* directory.

	Local Serial Devices		Modem Control Serial Devices	
NetTerminal	COM1	COM2	COM1	COM2
1	nt1ttys1r	nt1ttys2r	nt1ttyS1r	nt1ttyS2r
2	nt2ttys1r	nt2ttys2r	nt2ttyS1r	nt2ttyS2r
...	...	...	...	...
15	nt15ttys1r	nt15ttys2r	nt15ttyS1r	nt15ttyS2r
16	nt16ttys1r	nt16ttys2r	nt16ttys1r	nt16ttyS2r

Table 22: Device names for NetTerminal serial ports using NetTerminal Defined Port Configuration

NetTerminal parallel port device names

The following table lists the corresponding device names for each of the NetTerminal parallel ports. These devices are created in the hosts */dev* directory.

NetTerminal	LPT1
1	nt1lp0
2	nt2lp0
...	...
15	nt15lp0
16	nt16lp0

Table 23: Device names for NetTerminal parallel ports

NetTerminal TELNET Login Device Names

The following table lists the corresponding device names for each of the TELNET sessions initiated on the NetTerminal VGA display. These devices are created in the hosts */dev* directory.

	TELNET session started from the NetTerminal VGA display								
NetTerminal	1	2	3	4	...	9	10	11	12
1	nt101	nt102	nt103	nt104	...	nt109	nt110	nt111	nt112
2	nt201	nt202	nt203	nt204	...	nt209	nt210	nt211	nt212
...	...	...	...	...	...	...	...	...	...
15	nt1501	nt1502	nt1503	nt1504	...	nt1509	nt1510	nt1511	nt1512
16	nt1601	nt1602	nt1603	nt1604	...	nt1609	nt1610	nt1611	nt1612

Table 24: Device names for TELNET sessions started from the NetTerminal VGA display

CHAPTER 4: NETTERMINAL SERVICES FOR WINDOWS NT

NetTerminal Services (NTS) is an add-on to Windows NT Server or Workstation 4.0 that provides access to Netscape 4.7 or Internet Explorer 5.0 web browsers from NetTerminal clients. Once NTS is installed on NT 4.0 and the Flashware Model 500 is installed on the NetTerminal only a simple session configuration is required to connect and run a Web Browser on a NetTerminal session. Refer to *Configuring a Web Browser session* section for details.

NetTerminal Services Installation

NetTerminal Services (NTS) Software can be downloaded from a Web site (www.atlabs.com) or can be ordered on a CD. However, a license is required to enable the software. NTS can be used for 15 days without a license. Please consult you sales person regarding the license.

NT Server Requirements

The following table lists important server requirements.

Option	Description
NT Server operating system	Windows NT 4.0 Server or Workstation for Intel x86; US, German, or French versions with Service Pack 3 or 4 or 5.
Console video adapter device driver	• While Host Software supports most common video adapters the recommended video adapters are ATI, S3, S3 Virge, Diamond Stealth, Matrox Mystique, Cirrus Logic and Neomagic. • If you are using a different adapter and having problems with service (service not starting or causing an NT crash), reboot your server in VGA mode. • True color mode on the server is not supported.
Physical memory	32 – 64 MB base plus 12 MB per user.
Swap space	2 – 4 times the physical memory installed in the server.
Disk space	1 GB for Windows NT and swap space plus the 5 MB Host Software base and 1 MB per NetTerminal user.
Network protocol	TCP/IP
CPU	Pentium 400MHz or greater

NetTerminal Services Installation Procedure

- Logon to the NT server / workstation console as an Administrator
- Make sure server meets the requirements defined in *NT Server Requirements* section.
- Uninstall any previous NTS release installed on your system before proceeding with the installation of a newer version of NTS
- Run setup.exe from the NetTerminal Services installation CD-ROM or hard-drive where X is the drive letter where the file is located.
- The installation wizard will start and the NetTerminal Services setup welcome screen will appear. Select **Next** to continue to the Software License Agreement.
- Select **Yes** to accept the terms of the License Agreement and continue installation. If you do not accept the license you can select **No** and the setup procedure will terminate.
- Enter your name and the name of your company in the User Information window. Select **Next** to continue. You may select **Back** at any time during the installation process to view or change the information entered in a previous screen.
- Select **Next** to accept *C:\NTS* as the default installation directory or select **Browse** if you wish to specify a different directory.
- Select the Program Folder as you wish it to appear in your Start Menu. You may type in a new folder name or select one of the existing folders in your start menu. Click **Next** to continue.
- You will be asked if you would like the NTS Diagnostics icon to be placed on your desktop. If you would like the icon for the NTS Diagnostics to appear on your desktop select **Yes**. If you select **No**, you will still be able to start Diagnostics by selecting NTS Diagnostics from the NTS program group in your start menu.
- Enter the name of the server as you wish it to appear on NTS Diagnostics application. Select **Next** to continue.
- NTS setup will display the settings you have chosen in the previous screens. If you wish to change any of the information listed, use the **Back** button to return to the screen containing the information that you wish to change. Select **Next** to continue.
- Before NetTerminal clients can connect to the server, you must reboot the server to allow the NetTerminal Services to be properly initiated.
- You have the option of rebooting immediately by selecting **Yes** or select **No** if you wish to reboot at a later time.
- Select **Finish** to complete NTS setup.

Add-on Removal Procedure

To remove the NetTerminal Services from your server, select Uninstall from the NetTerminal Services program group in the start menu. Follow the instructions presented by the wizard.

Important
If installing new services pack, remove NTS prior to service pack installation

Configuration and management

User Management

NetTerminal Services leverages the robust security infrastructure provided by Windows NT. NetTerminal Services uses NT user accounts to authenticate users and execute applications in the security context of these users, just as a console application is executed on behalf of the user logged onto the console.

Set the following properties for user accounts from 'NT User Manager':

- User Must Change Password at Next Logon' option not selected
- Password Never Expires' option selected

Important
Any new user account created on NT server should first logon to the server from the console before using NetTerminal to connect to the server.

List of Client Sessions

All NetTerminal Browser sessions on a server can be viewed with the NTS diagnostics. In order to view NetTerminal session status information, the administrator should perform the following steps:

1. Start NTS Diagnostics application. This application will show all Windows NT running NTS. Login to the desired NTS server by double clicking on the NTS icon. This can be done on the server console or remotely.
2. Right-click on the desired NTS server and select View Sessions. The session view pane for that server will be displayed. Selecting the session in the left pane will display the corresponding applications for the session in the right pane.

Terminating Client Applications

Applications of NetTerminal browser session can be terminated from the NTS Diagnostics View Sessions Pane. Users without administrator privileges can only terminate their own applications. However, the administrator may terminate applications for any user.

To terminate an NetTerminal browser application:

1. Display the View Sessions Pane as described in the Viewing Client Sessions section above.
2. Select the application in the session you want to terminate.
3. Click on the end task button to terminate the application.

Printing

To print from a Web Browser session to local NetTerminal printer, use Microsoft TCP/IP printing Services in Windows NT Network configuration. On NetTerminal enable LPD print option. See section *Printer service configuration* in The TCP/IP Menu

Troubleshooting

Problems installing the NetTerminal Services

Please check NT server requirements section. If there is video corruption on the client, make sure that your video adapter is included in the supported adapters list. Recommended video mode of the server console is high-color mode (64K colors).

Cannot Connect to the Server

If a NetTerminal browser session cannot connect to a server, please verify the following:

1. Check if the NetTerminal Service (NTS) is running on the server by examining the status of the NetTerminal Service using the services applet in the Windows NT control panel.
2. Using the NTS Diagnostics installed on the server, try to login to the NTS server. If you cannot login the network may be configured incorrectly.
3. Verify that other computers can reach the server over the network.
4. The NetTerminal Services can generate errors and notification events (such as user logon, license change, etc) for the NT event logger which can be viewed with the NT Event Viewer as application events. Events are generated for the following conditions:

Unable to Login to the Server

If a NetTerminal browser client user cannot login to a server:

1. Check if User ID and password is entered in NetTerminal Web Browser session or option to “Prompt for user ID, password, and domain when connecting” is selected.
2. Try to login on the server console as the same user who is having the login problem. If you cannot login, the user ID/password/domain name may be incorrect or the user may not have been assigned the right to login to the console.

Unable to Create a Session on the Server

If a NetTerminal browser user cannot create a session on a server:

1. Verify that the user license limit has not been exceeded.
2. Use the task manager to verify the system is not low on memory.

Performance Problems

In the event a NetTerminal user experiences poor performance, please verify the following:

1. Use Task Manager examine the CPU load and memory usage. Is either of them abnormally high?
2. Login in from another client and test the performance.

APPENDIX A: INTERNATIONALIZATION

NetTerminal internationalization consists of selecting the correct character set and keyboard map based on the language requirements of a NetTerminal user. The following sections describe keyboard and character set configurations.

Keyboard Map Configuration

NetTerminal keyboard maps are configured by selecting a keyboard map from the Keyboard Dialog option of the Devices Menu. A keyboard map should be chosen which matches the nationality of the keyboard connected to the NetTerminal and the desired character set.

The NetTerminal comes factory configured with multiple keyboard maps. If the required keyboard map is not available, a user defined keyboard map can be downloaded into the NetTerminal. The format of a user defined keyboard map is identical to the format used on SCO UNIX and UNIXWARE systems. Any keyboard map which works on the VGA console can be downloaded to the NetTerminal. The procedure for downloading a keyboard map to the NetTerminal is described below:

1. From a host containing the keyboard map file (`keymapfile`) execute the following command:

   ```
   cat keymapfile | rcmd netterm1 keymap
   ```

2. In the Session Configuration, select Emulation Configuration
3. In emulation configuration screen select User Defined in Keyboard map dialog box.

Character Set Configuration

Character set configuration consists of selecting the desired character set in the **Character set** field of the Video Dialog option of the Devices Menu. The NetTerminal comes factory configured with multiple character sets. Each character set consists of an 8x8 font for the 43 row text modes and an 8x16 font for the 25 row text modes.

If the required character set is not available, a user defined character set can be downloaded. An 8x8 font must be downloaded if sessions will be configured for any of the 43 row text modes. An 8x16 font must be downloaded if sessions will be configured for any of the 25 row text modes. The format of each of the fonts is a binary image identical to that used on SCO UNIX and UNIXWARE systems. Any VGA font which can be used on the VGA console can be downloaded to the NetTerminal. The procedure for downloading user defined fonts is described below:

1. Execute the following commands:

   ```
   cat 8x8fontfile | rcmd netterm1 font8x8
   cat 8x16fontfile | rcmd netterm1 font8x16
   ```

2. In the Session Configuration, select Emulation Configuration
3. In emulation configuration screen select User Defined in Character set dialog box**.**

APPENDIX B: DEVELOPER INFORMATION

NetTerminal Login Session Identification

NetTerminal contains the mechanisms which allow administrators and developers to identify login sessions, node name, IP address and model number for the NetTerminal.

Query	Escape sequence format	Response
Model Number	Esc [0 p	NetTerminal Model 100
Login Session Number	Esc [1 p	1 for session 1…
Node Name	Esc [2 p	Contents of node name field
IP Address	Esc [3 p	IP address in dotted notation such as 132.147.160.1

Table 25: Escape sequence for login session identification

Socket Access

NetTerminal Socket Access allows host applications to access devices connected to NetTerminal serial and parallel ports via the Sockets Application Programming Interface (API). The Sockets API originated in BSD UNIX but is supported on many systems today, making applications to develop for this API is host independent.

NetTerminal Socket Access programming

I/O can be preformed on the NetTerminal serial and parallel ports by creating a TCP connection with a NetTerminal and a host application using the Sockets API. The procedure is described in the following steps:

1. Configure the desired NetTerminal ports for Socket Access using the Devices menu in the NetTerminal Administration Interface. For serial ports, configure the desired operational parameters.
2. In the application, create a socket of `domain == AF_INET` and `type == SOCK_STREAM`. Example:
```
int s;
s = socket (AF_INET, SOCK_STREAM, 0);
```
3. Specify remote address and port number for the socket and initiate a connection to the NetTerminal. The remote address is the IP address of the desired NetTerminal. The port number is a function of the desired port. The following table lists the TCP port number corresponding to each NetTerminal port:

NetTerminal Port	TCP port number
com1	10000
com2	10001
lpt1	10002

Table 26: Socket access : TCP port numbers

Example:

```
struct sockaddr_in sin;
sin.sin_family = AF_INET;
sin.sin_addr.s_addr = netterm_addr;
sin.sin_port = htons(10001); /* com2 */
connect(s, (struct sockaddr *) &sin, sizeof(sin));
```

4. Now I/O can be performed on the NetTerminal com2 port using standard system calls such as read and write.

Example:

```
read(s, buf, len) or write (s, buf, len)
```

NetTerminal port behavior under Socket Access

Serial port behavior

The RS232 signals DTR and RTS are asserted as soon as the TCP connection is established for the port.

When the TCP connection is closed for the port, the NetTerminal will continue to transmit all data still in its transmit buffer. Upon transmitting all data, the RS232 signals DTR and RTS are de-asserted and the NetTerminal will wait for another connection.

Parallel port behavior

When the TCP connection is closed for the port, the NetTerminal will continue to transmit all data still in its transmit buffer. Upon transmitting all data, the NetTerminal will wait for another connection.

Parallel port control signals are not altered upon establishing or closing the TCP connection.

APPENDIX C: SUMMARY OF RCMD/RSH COMMANDS

Command Format

`rcmd` `netterm1` **`<command>`**

`rsh` `netterm1` **`<command>`**

Where `netterm1` is the symbolic name defined in */etc/hosts* file

Description of Commands

Commands	Description
com1	Access serial port 1. For example: **`rcmd`** `netterm0` **`com1 <`** `/etc/hosts`.
com2	Access serial port 2
lpt1	Access parallel port.
firmware	Used for downloading firmware.
flashware	Used for downloading flashware.
key	To download key, for upgrading to higher model.
mac	Returns MAC address
keymap	Download user defined keymap file
getconfig > file	Gets entire database configuration, except IP and Node name and save to a file
putconfig < file	Puts entire database configuration, except IP and Node name from a file.
font8x8	Download user defined character set (8x8 fonts)
font8x16	Download user defined character set (8x16 fonts)
config	Uploads configuration from a file to the NetTerminal see section *Configuring Multiple NetTerminals*
*	See section *Remote Administration Using RCMD/RSH*
reboot	Reboot the NetTerminal
system	Returns system info: CPU Manufacturer, type, speed and total system memory.

Table 27: Summary of rcmd/rsh commands

Notes

1. When accessing com1, com2 and lpt1 ports the administrator must enable the rcmd/rsh access to these ports from the TCP/IP->Print services menu.
2. NetTerminal with version 2.3 Build 15 and above have an added security option of enabling or disabling rcmd/rsh access from the System-> Administration access menu. If the box is not check for Enable RCMD/RSH access then no RCMD/RSH command will be accepted by that NetTerminal.

APPENDIX D: NETTERMINAL SOFTWARE UPGRADE

NetTerminal software is field upgradable. Upgrades are used to repair possible software defects and provide new functionality effectively preserving your NetTerminal hardware investment. The software upgrade process consists of downloading a software binary image into the NetTerminal FLASH memory. This type of software is typically referred to as firmware.

FLASH memory allows the NetTerminal to function as a self-contained networking device, capable of booting without the help of a server and capable of storing its own configuration information. The NetTerminal stores its configuration information in its configuration database. All information in the configuration database is preserved during a software upgrade. Only in special cases, such as downloading of software which supports a different feature set, is the configuration database altered.

NetTerminal software can be downloaded using a TCP/IP network via the NetTerminal ethernet port.

Downloading NetTerminal software using RCMD

NetTerminal software can be downloaded using the `rcmd` or `rsh` commands available on most hosts running TCP/IP. Only valid firmware images can be downloaded into the NetTerminal. A firmware image can be downloaded by typing a command similar to the following:

```
cat firmwareimage | rcmd netterm1 flashware
```

This command places the contents of the `firmwareimage` file into netterm1's FLASH memory. The NetTerminal must be rebooted to activate the new software.

APPENDIX E: FREQUENTLY ASKED QUESTIONS

How do I test my connection?

After you setup your NetTerminal press *<ALT>+u p* to activate the Ping Utility dialog box, enter the host IP address and press *<ENTER>* The ping should respond by displaying the message: "Host is alive". If you do not receive this message, check NetTerminal IP and subnet mask *<ALT>+t e* . Also check your network connection.

How can I configure a Print Server ?

If you are familiar with TCP/IP networking you can configure a remote printer either using lpd or rcmd option. See section *Printer service configuration*. If you have an SCO UNIX system you can configure the printer as a local printer. See *Chapter 3: NetTerminal Host Software for SCO UNIX*

Can I reprogram the function keys and cursor keys?

Yes, in the *Session configuration* menu there is an option called *Keys*. Also for each session Function key programming can be unique.

I have forgotten my Administrative password, is there a way of resetting it?

The only way to reset the password is to reset the entire NetTerminal configuration to factory settings. Press *<Ctrl>+<Alt>+<Print Screen>* the entire configuration, including the password will be restored to the factory settings.

Can I run a different emulation on different sessions ?

Yes.

Can I see and change the configuration while I am connected in a session ?

Yes, by pressing *<Alt>+<SysRq>* or *<Alt>+<Print Screen>* you can enter the configuration menu to view and/or change the configuration.

I do not want my users to change any terminal setting, how can I achieve that ?

By setting an *Administration password* in the *System* menu, no one will be able to change any configuration without knowing the password.

Is there a way of configuring the NetTerminal remotely ?

Yes, refer to *Chapter 2: Remote Management*.

I have configured a NetTerminal, is there a way of downloading the configuration of this NetTerminal to other NetTerminals?

Yes, refer to section Configuring Multiple NetTerminals.

Can I have a fixed tty device for my sessions ?

Yes, this is possible under SCO UNIX. See section *Chapter 3: NetTerminal Host Software for SCO UNIX*

Can I use Print Screen ?

Yes. Make sure print screen option is enabled in the *System* menu under *Local printer* option.

Can I run multiple UNIX and Web Browser simultaneously?

Yes.

For list of updated FAQs or latest Flashware updates please visit:

http://www.atlabs.com

APPENDIX F: NETTERMINAL PROBLEM REPORT

You can report problem by faxing the information to your distributor or sending email to:

support@atlabs.com

Contact Name:_____

Company:_____

Tel:_____Fax:_____

Server Hardware Section

System/Server manufacturer:_____

Server specification (CPU, RMA, etc.)_____

Network cards:_____

Multi-user operating system:

[ ] SCO UNIX [ ] AIX UNIX [ ] BSD UNIX [ ] UnixWare [ ] Linux

[ ] Sun Solaris [ ] Windows NT [ ] Other Specify:_____

Version:_____ TCP/IP version:_____

Version of NetTerminal software with date:_____

List of servers, if connected to more than one server:_____

_____

Please complete the following sections where appropriate. Provide as much information as possible so that we can duplicate your problem as quickly as possible.

Problem description:_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Estimated frequency of problem:_____