Ethernet Terminal Server

ELS-8 Terminal Server
ELS-16 Terminal Server
Installation and Management

EQUINOX

PN560068

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ELS-16 Terminal Server
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ELS-8 / ELS-16 Terminal Server Manual
Part Number 560068/Rev B
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Equinox Systems Inc.
One Equinox Way
Sunrise, Florida 33351-6709

(954) 746-9000
BBS (954) 746-0282
FAX (954) 746-9101

Warning This equipment has been tested and found to comply with the limits for Class A Digital Device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the 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 his own expense.

Operation is subject to the following conditions:

- This device may cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

115 volt cord set requirements UL Listed Cord Set: minimum of 18 AWG; type SVT or SJT three-conductor cord; maximum 15-feet in length; parallel blade, grounding type attachment plug rated 15 A 125 V.

220 volt (international) cord set requirements Minimum of 18 AWG; grounding type attachment plug rated 15 A, 220 V. Cord Set should have appropriate safety approvals for the country in which the equipment will be installed and marked HAR.

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Introduction

The ELS-8 and ELS-16 are dual protocol terminal servers which support LAT (Local Area Transport) and TCP/IP (Transmission Control Protocol/Internet Protocol). Both servers offer high performance and connection for 8 or 16 terminals, PCs, printers, modems and hosts to an Ethernet network. *The ELS-8 / ELS-16 Terminal Server Manual* is your guide to installing, configuring, managing and using the ELS-8 and the ELS-16 Terminal Servers. This manual contains the following:

Chapter 1 Getting Started — Describes the ELS-8 and ELS-16 Terminal Servers. This chapter provides a quick reference guide to assist you in locating additional help during the installation, configuration and management of your server.

Chapter 2 Hardware Installation — Describes the correct installation of the ELS-8 and the ELS-16 terminal servers as freestanding or wall-mounted units. This chapter describes the terminal server unit and general operation of the system LEDs.

Chapter 3 Terminal Server Basics — Whether you plan to use the LAT protocol, TCP/IP, or a combination of the two, there are basic principles that apply to all protocols. This chapter tells you what to expect when you plug in your server, and how to return the server to factory default settings. This chapter also provides you with an introduction to commands and use of the remote console.

Chapter 4 Using LAT Protocol — If you are using your ELS-8 or ELS-16 as a LAT terminal server, this section will assist you in configuring your server, services and ports for the LAT protocol. Examples of installing for different device types provide specific help in configuring modems, terminals, printers and host computers.

Chapter 5 Using TCP/IP Protocol	If you are using your ELS-8 or ELS-16 as a TCP/IP terminal server, this chapter will assist you in configuring your server, services, nodes and ports for the TCP/IP protocol. Examples of installing for different device types provide specific help in configuring modems, terminals, printers and host computers.
Section 6 Using Dual Protocol	If you are using your ELS-48 as both a LAT and a TCP/IP terminal server, this chapter will assist you in using your terminal server as a dual protocol server.
Appendix A Commands	There are many commands that help you to configure, manage and use your terminal server. Appendix A provides details for each command available to you on the ELS-8 and ELS-16.
Appendix B Wiring	This appendix contains detailed wiring diagrams for the connectors and accessories that you can connect to the ELS-8 and ELS-16.
Appendix C Troubleshooting	Occasionally you may experience a problem, or have a question, about a specific action on your terminal server. This appendix provides you with help in solving the most commonly encountered problems in configuring and managing the ELS-8 and ELS-16.
Appendix D Messages	Messages assist you in identifying problems you may encounter when using your terminal server. This appendix describes each message and recovery procedures where applicable.
Glossary	The glossary contains brief definitions of terms that may be unfamiliar to you. Refer to this section when you need additional help in understanding new words or concepts.

Equinox Terminal Server Commands and Messages Manual Equinox Part Number 560058
This is an in depth reference manual that covers all of the terminal server commands and messages. Contact Customer Service at (954) 746-9000 for more information.

Release Notes
Provides the latest information about the ELS-8 and ELS-16 Terminal Servers. Release notes are available with the distribution of software revisions.

Equinox Bulletin Board
Equinox provides a 24-hour electronic bulletin board service. Current revisions of software, release notes, and general information are maintained on the BBS. Messages can be left for Equinox staff, including technical support. Call Equinox for the phone number (954) 746-9000.

Document Conventions

The following conventions are used in this manual:

- **References to the ELS-8 / ELS-16**
  All material covered in this manual refers to both the ELS-8 and the ELS-16 Terminal Servers unless specifically noted otherwise.

- **Return Key**
  [RETURN] indicates you should press the return key on your keyboard. The **[RETURN]** key is sometimes labeled **[ENTER]** on certain keyboards. They are synonymous.

- **lowercase**
  Lowercase letters in command lines indicate keywords that must be entered. They can be entered in either uppercase or lowercase. Command keywords can be abbreviated to the first two or three characters in most cases.

- ***lowercase italics***
  Lowercase italics in command lines indicate variables which you supply to the command.

- { }
  Braces indicate choices you must make when entering commands. The braces are not included when entering the command.

- [ ]
  Square brackets indicate choices that are optional when you enter a command. You can choose to not enter an option or select one of the options. The brackets are not included when entering the command.

Chapter 1 Getting Started

The Equinox ELS-8 and ELS-16 Terminal Servers provide all of the high performance features found in our larger dual-protocol servers. This chapter provides a brief overview of major features.

You want to be sure that you have received everything needed to install and use your terminal server. A checklist in this chapter provides you with a quick way to verify you have all you need to get started.

The ELS-8 and ELS-16 Terminal Servers include these features:

- **Self Booting.** When you power up the ELS-8 or ELS-16 there is no need for a host to be present on the network to download the software. The terminal server powers up and comes to a run state immediately.

- **Support for TCP/IP and LAT Protocols.** Industry standard TCP/IP and DEC's LAT protocol are fully supported for seamless and concurrent access to DEC and UNIX hosts.

- **8 or 16 Serial Ports.** Eight and sixteen port versions are offered with industry standard RJ-45 connectors. Full modem control is supported.

- **Parallel Printer Port.** Built-in PC-style parallel port that supports standard Centronics or Dataproducts printers.

- **Thick and Thin Ethernet Interfaces.** Switchable interface permits a choice of Thin Coax or standard 15-pin AUI interface connection to the Ethernet.

- **High Performance Operation.** Custom RISC processors sustain maximum data rates on all ports simultaneously, providing fast response times for graphics applications and print jobs, even when all ports are operating at maximum speed.

- **Easy Software Upgrades.** Upgrades and enhancements are easily accomplished by downloading new operational software from a host into Flash ROM.

- **Multi-session and Split-screen Support.** Up to four concurrent sessions can be established on each port, and the split screen feature permits VT420 or compatible terminals to display two active sessions simultaneously.

Check your ELS-8 / ELS-16 Package

Your ELS-8 / ELS-16 Terminal Server package should include the following items:

ELS-8 or ELS-16 Server Unit

Power Supply

Power Cord

The ELS-8 / ELS-16 Terminal Server Manual

A registration card

If you are missing any of these items, please call the Equinox Sales Department at (954) 746-9000.

Registering Your Server

Complete and mail the enclosed registration card to receive the full benefits of being a registered user.

Equinox Bulletin Board

Additional support is available on the Equinox Bulletin Board. You can use the BBS to leave messages for Technical Support or download current versions of software. Call Equinox for the BBS number (954) 746-9000.

Chapter 2 Hardware Installation

The Equinox ELS-8 and ELS-16 terminal servers connect up to eight or 16 asynchronous serial devices to an Ethernet network. Chapter 2 of this manual describes the hardware installation of the ELS-8 and the ELS-16. With the exception of the number of ports on the server, the ELS-8 and the ELS-16 are identical in installation and configuration.

Planning is an important element of the installation process. You must decide what devices will be connected to the terminal server and where you will physically locate the server. This chapter will help you in this effort.

Review of Installation Steps

Before continuing with the installation, review the steps you will follow during the installation process:

① Decide on the location of the terminal server based on convenience of cabling and power access.

② Unpack all equipment and identify the various components.

③ Mount the server unit.

④ Power on the terminal server by plugging it into an electrical outlet. Check the LEDs to validate correct operation.

⑤ Plug a cable into the Ethernet connector you plan to use:

- DB-15 AUI
- RJ-58 Thin Coaxial

⑥ Install cables between the port boards and the devices.

Planning the Network Installation

Take the following into consideration when you plan the location and installation of your terminal server:

- ❑ What users will be connected to the server?
  - List all of the users who will be connected to the server. List their physical location and their distance from the server.

- ❑ What devices will be supported on the server?
  - List all of the devices that will be connected to the server. List their physical location and their distance from the server.

- ❑ What type of Ethernet cabling will you use to connect the network?
  - There are two types of connectors on the ELS-8 and the ELS-16 terminal servers:

    Determine if you are using *Ethernet transceiver cable* or *thinwire Ethernet interface.*

- ❑ What are the distance specifications for all of the cabling you will be installing?

- ❑ How will you mount the terminal server?
  - Table or Shelf Mount
  - Rack Mount
    Instructions for rack mounting the server are included in the rack mount kit.

- ❑ Will you be using LAT, TCP/IP or dual protocol? What services will be offered?
  - Appendix E contains worksheets that will help you plan your network protocols and services. Complete these worksheets, listing each device and service.

The ELS-8 and the ELS-16 terminal servers are stand-alone devices. The server software is stored in *Flash ROM*. This eliminates the need to download software from a host. The serial ports are industry standard RJ-45 connectors supporting full modem control. The parallel printer port supports standard Centronics or DataProducts printers. A switchable interface lets you choose between thin coax and standard 15-pin AUI connection to the network.

System Unit

The major components of the system unit are described below. Take a moment to familiarize yourself with the various elements.

Front Panel

Figure 2-1 provides an illustration of the front panel of the ELS-8/ELS-16 terminal server.

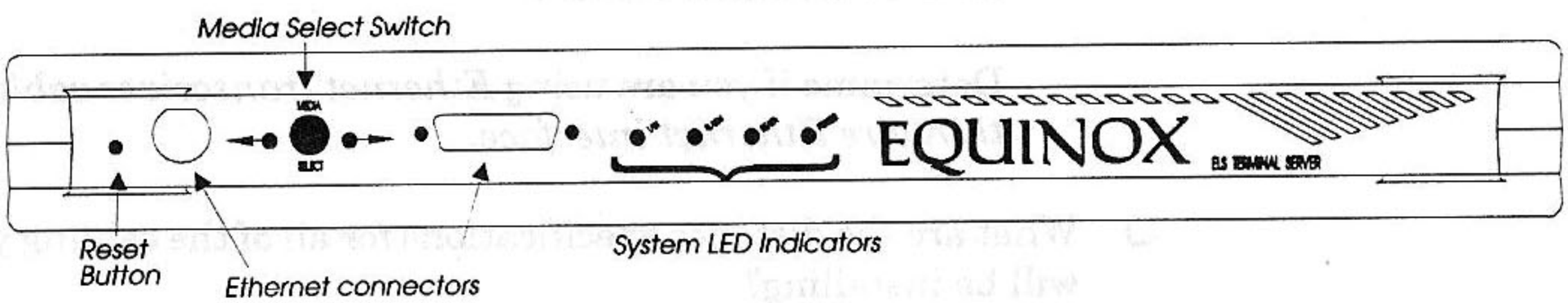


Figure 2-1 ELS-8 / ELS-16 Front Panel

Reset Button

The reset button permits you to easily return the ELS-8 or ELS-16 to factory default settings.

Ethernet Connectors

There are two network connectors on the ELS-8 and the ELS-16: RJ-58 Thin Coax and DB-15 AUI. Plug your network cable into the appropriate connector.

Media Switch

Selects RJ-58 Thin Coax or DB-15 AUI interface.

System LED Indicators

The ELS-8 and the ELS-16 have the following LED's on the front panel of the unit to assist you in monitoring the network:

LAN	Blinks when the server receives or sends messages to or from the network.
ALARM	Light displays solid when a software or hardware failure is encountered.
READY	Light displays solid when the unit is plugged in and receiving power.
PRINTER	Light displays when the parallel printer is in use.

Back Panel

Figure 2-2 provides an illustration of the back panel of the ELS-16 terminal server. The ELS-8 has only eight ports instead of the 16 shown below.

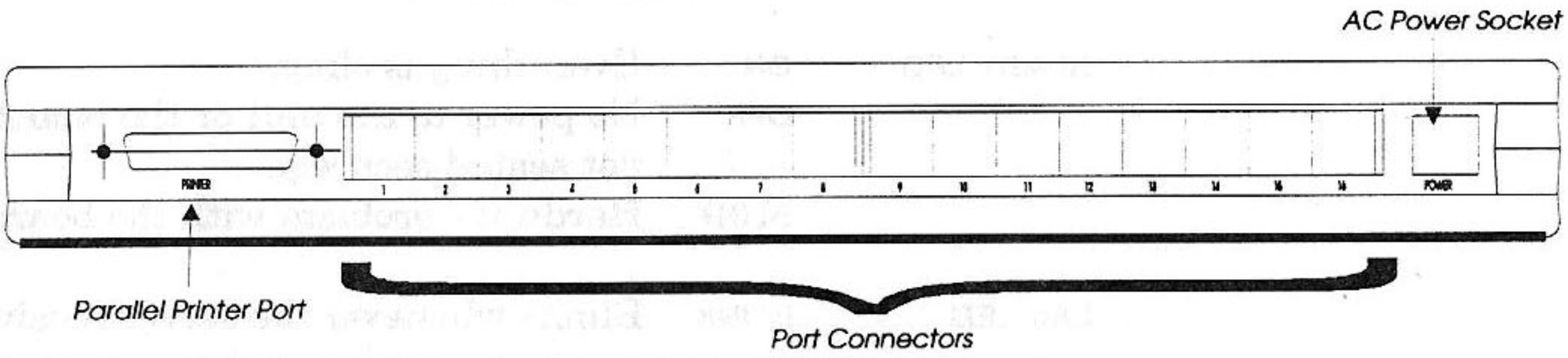


Figure 2-2 ELS-16 Back Panel

Parallel Printer Port

Supports standard Centronics or DataProducts printer.

Port Connectors

8 or 16 ports with industry standard RJ-45 connectors.

AC Power Socket

Power cord plugs into socket.

Locating the Terminal Server

Once you have determined where you are going to locate the terminal server, physically place it using one of the following methods:

Table Mount
Rack Mount (*instructions included with rack mount kit*)

The terminal server requires no special installation if you do not intend to mount it on the wall. The unit can be set flat so that it rests on the four rubber feet located on the bottom of the unit. Or, if space is a problem, it can be set on its side.

Powering on the Terminal Server

You are now ready to power on the terminal server. Plug the female end of the power cord into the back of the server. Plug the other end of the power cord into an electrical outlet.

LED indicators

The READY LED on the front of unit blinks several times and then displays as a solid red LED. Check the following table for the meaning of each of the LEDs on the front of the Ethernet control board:

READY LED	**ON**	Everything is okay.
	OFF	No power to the unit or the board is not seated securely.
	BLINK	Hardware problem with the board.
LAN LED	**BLINK**	Blinks whenever the server receives or sends messages from or to the network. This LED should blink periodically on lightly used networks. On networks that are kept busy with traffic the light could appear solid.
ALARM	**ON**	When a software or hardware failure is encountered an alarm light displays. The alarm LED is cleared automatically when the error condition is corrected.
PRINTER	**ON**	Displays solid when printer port is in use.

Plugging in the Network Cable

Plug the network cable into the appropriate socket on the front of the terminal server unit. The type of cable you plug into the board depends upon how you plan to connect the server to your Ethernet network.

Standard Ethernet Interface

Plug the DB-15 male connector of the Ethernet Transceiver Cable (*Equinox #690197*) into the female DB-15 connector on the front of the terminal server unit. Plug the other end into your Ethernet transceiver. On both ends, slide the latch to securely hold the cable in place.

Thinwire Ethernet Interface

Plug the BNC connector of the thinwire cable to the T-Connector on the terminal server.

IMPORTANT: When you connect thinwire cable, the T-connector **must** be installed **directly** on the BNC connector of the terminal server. **DO NOT** use an extension cable to tap into the thinwire network.

If this server is at the **end** of the thinnet, you should install a terminator directly on the T-Connector.

This section explains how to connect devices to the ELS-8 and the ELS-16 terminal servers. Each of the modular jacks support standard RS-232 DTE signals on 8-pin, RJ-45 modular jacks. Standard modular cable is used to wire the port to your terminal, printer or modem. From there an Equinox modular adaptor routes the signals to a standard RS-232 DB-25 connector.

Modular Cables

Appendix B Wiring provides detailed wiring diagrams for the cables and adapters used with the Equinox terminal servers.

RJ-11 modular cable is the same type of modular flat cable used for wiring telephones inside of buildings. The cable is terminated at each end with an RJ-11 modular plug which is inserted into the modular jack of an appropriate wiring module.

Standard modular cables available from Equinox or wiring distributors are **reversing**; that is the pins are reversed on each end. Some companies sell modular cables that are non standard. These are **straight-through cables** rather than **reversing cables.** Straight-through cable will not work with Equinox wiring accessories.

Although the terminal server uses 8-pin modular jacks, the signal pinouts have been arranged such that 4- and 6- wire modular plugs may be used. The terminal server is designed for quick and simple installation using telephone wiring techniques. All terminal connections may be made using standard telephone twisted pair wiring or modular wiring.

Using Modular Adapters and Cables

Modular adapters are used to adapt modular wiring to the RS-232 connector found on terminals, PCs, modems and printers. (See *Figure 2-3*).

Connecting Parallel Printers

Use a standard PC-type Centronics printer cable to connect a parallel printer to the ELS-8 / ELS-16 terminal servers. Plug one end of the cable into the printer port on the server. Plug the other end of the cable into the parallel port of your printer. An adaptor cable in required to connect DataProducts printers, or printers using a DataProducts connector.

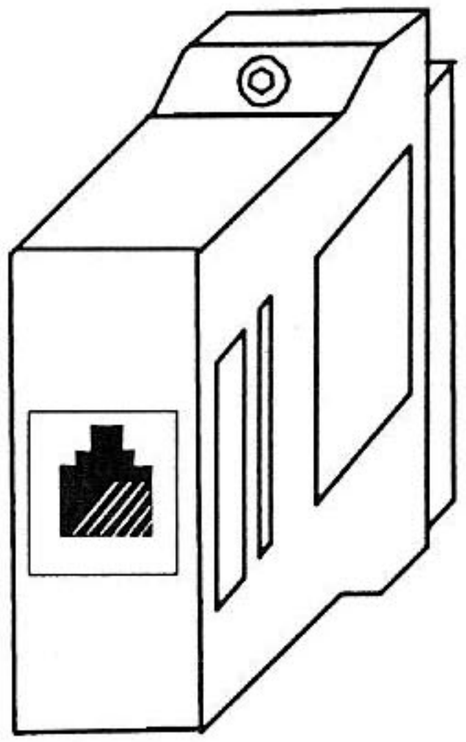


Figure 2-3 Modular Adaptor

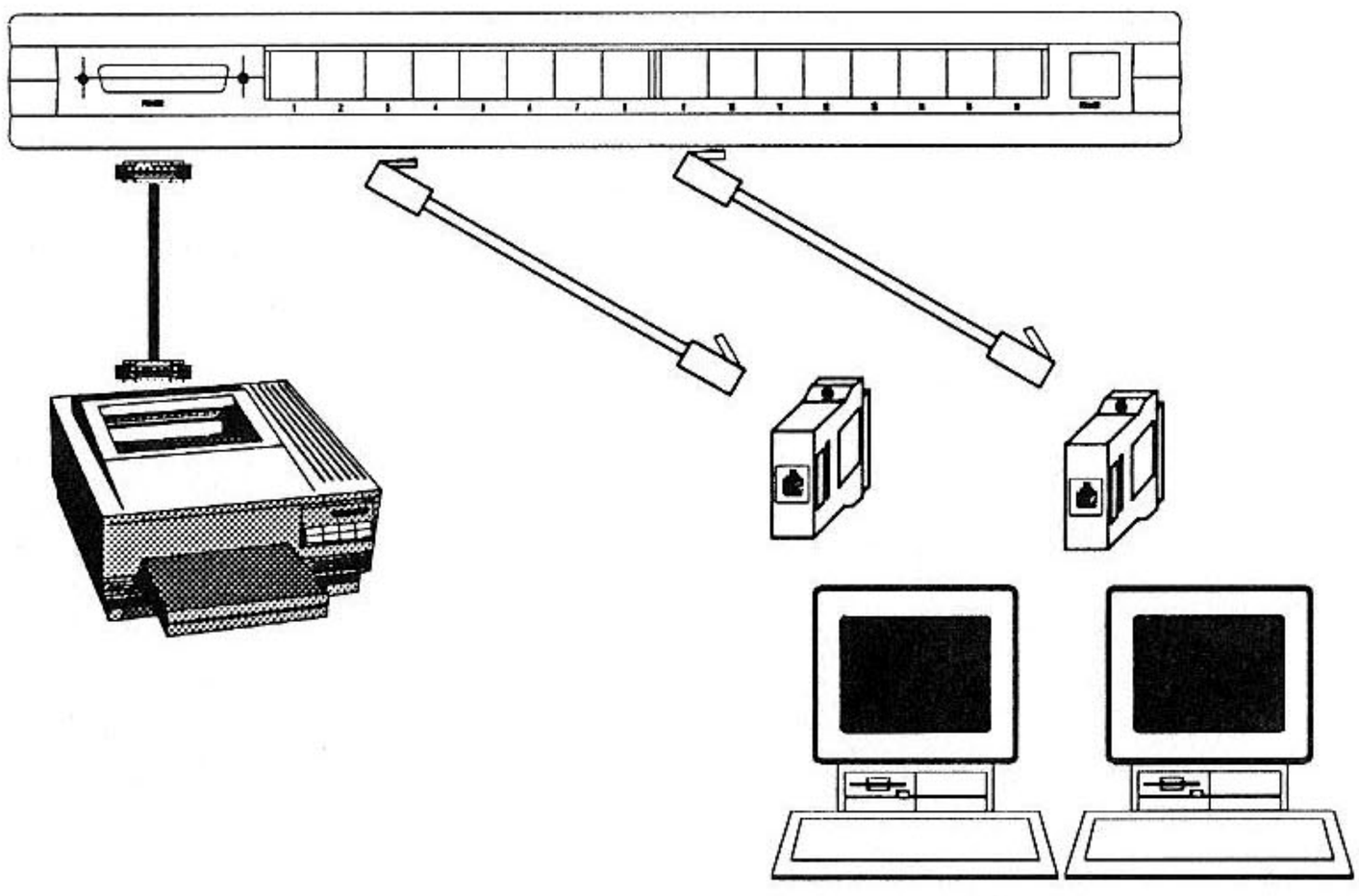
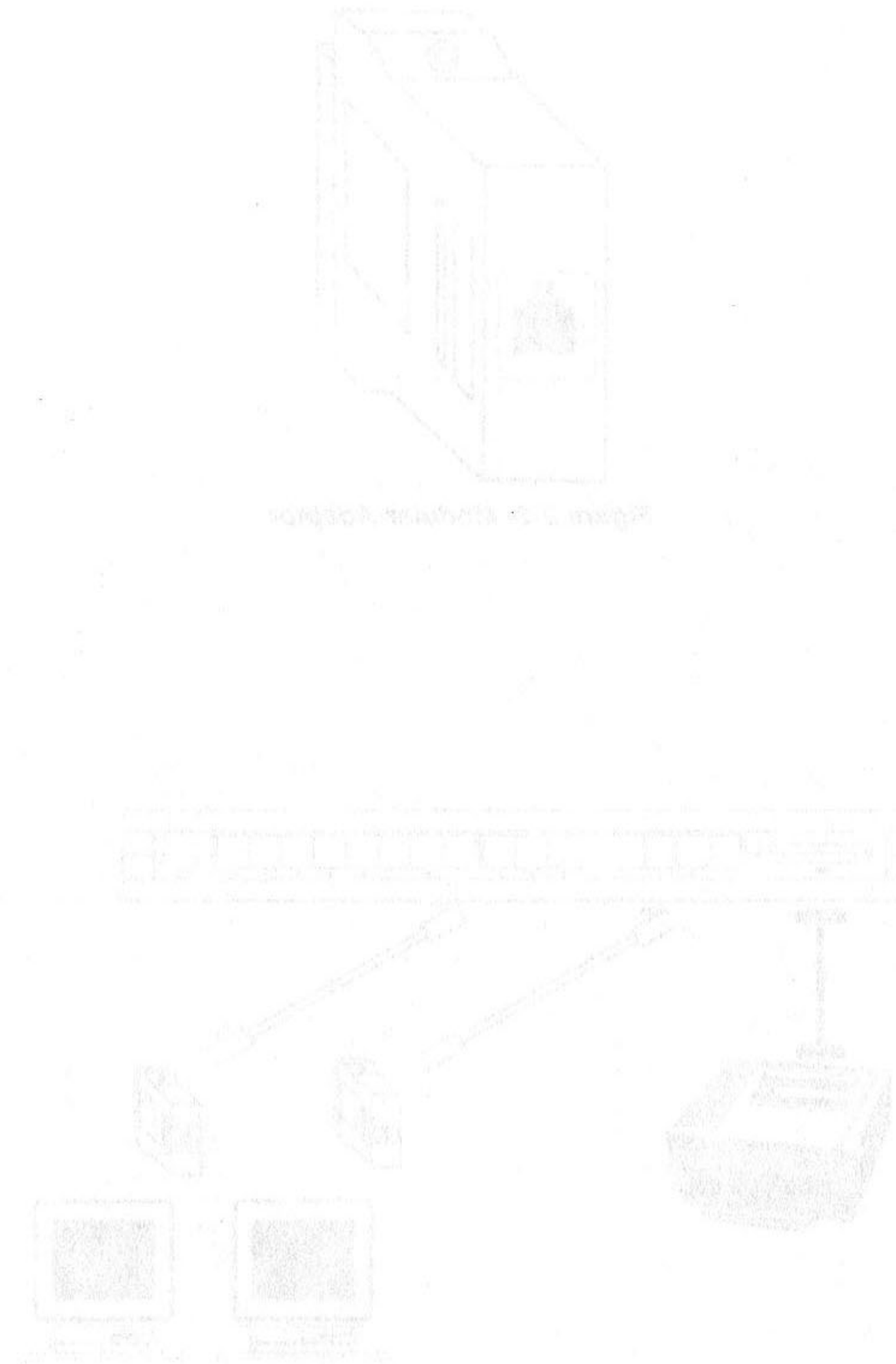


Figure 2-4 Connecting Devices



Chapter 3 Terminal Server Basics

The ELS-8 and ELS-16 terminal servers are dual protocol servers supporting LAT and TCP/IP, including TELNET and RLOGIN. Whichever protocol you use, there are basic principles that apply to all implementations of the servers. Section 3 provides a general introduction to basic operation of the server. For specific protocol implementations refer to the appropriate section of this manual.

Default Settings

The terminal server is configured to factory default settings. All of the ports on the server are configured to operate as an interactive terminal with the settings shown below:

Baud Rate	**9,600**
Data Bits	**8**
Parity	**None**
Autobaud	**Enabled**

The server automatically adapts to the speed of your terminal because the factory default is **AUTOBAUD ENABLED.**

Getting the Local Prompt

Follow these steps to begin communicating with your server:

① Press **<CR>** to get the server's attention.

The server displays its *name, identification string* and a *welcome message.*

② The server then prompts you to enter a *username.*

Enter your name and press **<CR>**.

③ The server responds with the LOCAL> prompt. This means you are logged onto the server and can begin using it.

Enter the following commands at the prompt to get a feel for how the server works:

- Display a list of *services* available on the network:

  LOCAL> **SHOW SERVICES**

- Read the introduction to the server HELP:

  LOCAL> **HELP**

- View the current terminal server default settings of your port:

  LOCAL> **SHOW PORT**

Remote console operates like DEC's remote console (accessed through NCP) with one exception: you do not have to have your VAX running to use remote console with the ELS-8 or ELS-16. This means you do not need a VAX in your network at all.

Using this feature the system manager can connect to any Equinox server on his network from any other server (including non-Equinox servers) on the network. Once connected the system manager is logged into the server and may configure it or access any information about the server.

Remote console works in a unique manner. Each Equinox server has a permanently configured remote console service. This service appears as follows when a privileged user types **SHOW SERVICES LOCAL:**

Service Name	Status	Identification
RC_00807D012345	Available	Remote Console on node LAT_00807D012345

For example, if the **node name** is changed to "FINANCE_DEPT", the identification is automatically modified by the server as follows:

Service Name	Status	Identification
RC_00807D012345	Available	Remote Console on node FINANCE_DEPT

This service is broadcast on the network like any other service and is available for connection from any server. **CLEAR/PURGE/DELETE SERVICE** does not remove the remote console service from a server. Nonprivileged users do not see the service when they type **SHOW SERVICES** on an Equinox server, however users on non-Equinox servers do see the service.

There are four different ways to connect as a remote console to an Equinox server:

① Local>> **REMOTE** ***node name***

Node name is the default or assigned node name for the remote console.
Using the example above:

```
Local>> REMOTE LAT_00807D012345
```

or

```
Local>> REMOTE FINANCE_DEPT
```

② Local>> **REMOTE** ***remote console service name***

Remote console service name is the name assigned to the remote console service by the server.

Using the example above:

```
Local>> REMOTE LAT_00807D012345
```

③ Local>> **REMOTE** ***ethernet address***

Ethernet address is the 16 hex character Ethernet address formatted as follows:

```
Local>> REMOTE 00-80-7D-01-23-45
```

④ Local>> **REMOTE** ***serial number***

Serial number is the permanently assigned number for the Ethernet Control Board in an Equinox server. The serial number is on the **SHOW SERVER** screen of an Equinox server. It is also stamped on the back of the Ethernet control boards.

For example:

```
Local>> REMOTE XB001009
```

From a non-Equinox server you can connect to the remote console only by **CONNECT**ing to the *service name*:

```
Local> CONNECT RC_00807D012345
```

Use any of the above methods to connect to the desired remote console. Enter the login password when prompted. The default password is **ACCESS.**

```
Local>> REMOTE FINANCE_DEPT


Local -010- Session 1 to RC_00807D012345 established

#> password

FINANCE_DEPT
Equinox Systems Inc., ELS-8
Welcome to the Equinox Server Network

Local>
```

You are now fully logged into the remote server! Execute commands or configuration changes as if you were directly connected to the server then simply **LOGOUT** when finished:

```
Local> LOGOUT

Local -010- Session 1 disconnected from RC_00807D012345

Local>>
```

Guidelines for Using Remote Console

☞ The remote console facility is on a non-physical or virtual port. This means that certain actions are not valid:

- ✔ Some commands, such as **SHOW PORT**, are not valid because there is no physical port connected.
- ✔ Configurations of a remote console port cannot be changed.
- ✔ Ongoing connections cannot be made from a remote console.

Note: Some commands such as **SET/DEFINE/CHANGE SERVER CIRCUIT TIMER** *and* **SET/DEFINE/ CHANGE SERVER NAME** *cannot be changed while remote console is active. See Appendix A Commands.*

☞ While the remote console is in use the server has a fully operational virtual circuit on the network. Since this is an active virtual circuit, many of the server configuration parameters related to the network cannot be altered. If you need to change these parameters, use the **DEFINE** command to change only the permanent database. The new value will take effect at the next initialization of the server.

☞ If you want to **INITIALIZE** a server via the remote console simply type **INITIALIZE SERVER**. There will be no response to your command, but after about 10 seconds the connection will be broken and you will be at the local prompt of your own server again. Once the remote server completes initialization you may connect to it again.

☞ Use remote console to:

- ✔ Completely configure all servers on your network through one server.
- ✔ Monitor server counters and usage levels of any server.
- ✔ Broadcast messages to users on any server.
- ✔ Check port status on remote servers for ports not being used (i.e. in local mode with a long period of inactivity) and log them off.
- ✔ Use the **TEST PORT** command to check the validity of hardware connections to ports.

Returning the Terminal Server to Factory Default Settings

CAUTION

Use the procedure outlined in this section with caution. It is disruptive to <u>all</u> active users of the server. They will be logged off automatically and all sessions will be discontinued.

Caution: Pressing the reset button erases all configuration information stored in the non-volatile memory on your controller board. ALL configuration settings will be returned to factory default settings.

There will be times you will want to return your server to its factory default settings (e.g. your terminal screen does not display the messages in the preceding examples).

① You can easily return your server to factory default settings by pressing the *reset* button located on the front panel of the server.

Use a pointed object such as a pencil to hold the button in for several seconds. In approximately five seconds, the **LEDs** on the control board will start to blink rapidly. Release the button. The **LEDs** will continue to blink while the non-volatile memory is erased and rewritten. The **LEDs** return to a normal state in about 15 seconds.

② After completing the above procedure, repeat the steps on the previous page. You should now see the server's messages and prompt. If you still don't see anything, check the wiring and settings on your terminal.

Also make sure the **READY LED** on both the control board and the port board are solid. If **either LED** is flashing it means you have a hardware problem and should contact Equinox Technical Support.

What services are available on the network?

As soon as you connect the server to the Ethernet, it automatically begins to *learn* what services are available. It does this by listening to *multicast* messages from other *servers* and *service nodes*. The server gradually builds a list of *service names* available on the network. This takes several minutes.

NOTE: For true transparent operation in the transfer of binary files, etc., you must set up your port with the **SET SESSION TYPE PASSALL** *command. See Appendix A, Commands.*

To display the list of names use the **SHOW SERVICE** command. A list of service names displays. You can select any of these service names to connect to. For example, to connect to a service named VAX which displays in your list of available services, type:

LOCAL> **CONNECT VAX**

The server connects you to the VAX. The VAX login prompt displays asking you for your USERNAME.
Once you connect to a service, you are in a *session*. The terminal server is no longer part of the process except to transparently move the data and commands between your terminal and the service you connected to, in the above case the VAX.

Multiple Sessions

You can be connected to more than one session at a time on the server. You do this by *suspending* your current session and connecting to another service. This is referred to as **multiple sessions**. In effect, you are connected to one service while another session is on hold. Although you can change the number of sessions you can have open at one time, the default is four sessions.

Follow these steps to connect to multiple sessions:

① Connect to the first service. For example, connect to the VAX:

LOCAL> **CONNECT VAX**

NOTE: You can define a ***local switch*** *character to perform the same function as the* **<BREAK>** *key. Refer to* **SET/DEFINE/CHANGE PORT LOCAL SWITCH** *in Appendix A Commands.*

② Suspend your current session by pressing the **<BREAK>** key on your keyboard. This gets the attention of the terminal server and returns you to LOCAL mode.

Remember that your current session is **not** disconnected. You can resume this session at any time with the **RESUME** command.

③ Connect to a new service:

LOCAL> **CONNECT** ***service name***

The server connects you to the new service while holding your previous session ready for you to resume.

④ To return to the previous session, and keep the second session active, press the <**BREAK**> key to return to LOCAL mode. Resume the previous session by typing **RESUME** or **R**.

The **SHOW SESSIONS** command displays a list of all the sessions you have on hold at any given time. The server assigns a *session number* to a session when you place it on hold. Use this number to resume a specific session when you have more than one session on hold.

The following example shows three different commands you can use to resume a session. Substitute your session number for the **3** in the example (any one of these commands will resume session 3):

```
LOCAL> RESUME 3
```

or

```
LOCAL> R 3
```

or

```
LOCAL> 3
```

Switching Between Sessions

Multiple sessions are especially useful when you have to simultaneously move between several different applications. Although you can easily move to LOCAL mode and select the specific session you want to change to, there are two other ways to resume concurrent sessions:

Note: *If a host computer tries to send data for a session that is on hold to your terminal, that data is held in a buffer until you resume the session.*

❑ Use the **SET/DEFINE/CHANGE PORT FORWARD** or **SET/DEFINE CHANGE PORT BACKWARD** commands to specify a switching character that will move you automatically between sessions without having to go into LOCAL mode. With the switch character you can move through the session list one session at a time until you resume the session you want to work in.

❑ When you are in LOCAL mode, use the **FORWARD** and **BACKWARD** commands to resume the next or previous session in your session list.

Disconnecting From Sessions

Note: *You do not have to log off the server. If the server is a shared resource you would want to log off to make it available to other users. If you do not log off the server you will remain in* **LOCAL>** *mode.*

When you are finished with a session on the server, you should end the session. Use one of the following methods to disconnect from a session:

- **LOGOFF**
  Logoff the host that offers the service. The terminal server automatically disconnects all sessions and returns you to LOCAL mode.

- **<BREAK>**
  Press the **<BREAK>** key to return to the LOCAL mode on the server. Then type **DISCONNECT**. When you press the **<BREAK>** key the server places the current session on hold. The **DISCONNECT** command actually ends the session. If you have more than one session active, the current session is the only one that is disconnected.

- **LOCK**
  You do not have to disconnect from a service if you are working with confidential data and need to be away from your desk. Use the **LOCK** command to protect your terminal while you are gone. You can then return to your session without having to reconnect, login, etc. See *Appendix A Commands*.

- **DISCONNECT ALL**
  If you want to disconnect all of your active sessions enter **DISCONNECT ALL** at the LOCAL prompt.

Don't forget to use the CLS command to erase sensitive data from your screen before LOCKing your port. This command clears your screen.

COMMANDS

Appendix A, Commands provides detailed information on the commands and command syntax for the terminal server. This section of the installation manual gives you a brief overview of the commands and their use in network management.

The principles for command use are the same for all protocols on the server. Refer to the following sections for protocol-specific configuration assistance:

- ❑ Section 4 Using LAT Protocol
- ❑ Section 5 Using TCP/IP Protocol
- ❑ Section 6 Using Dual Protocol

Entering Commands

You operate and configure the terminal server by entering commands at the LOCAL> prompt. The commands you enter fall into one of the following categories:

Operational Commands

Use these commands to connect to services, switch between sessions, disconnect services, etc.

Database Commands

Use these commands to enter configuration information (e.g., baud rate and parity for each port), Ethernet operating characteristics, security information (e.g., passwords and access restrictions), customizing prompts and messages, etc.

Network Management Commands

Use these commands to monitor server activity, port activity and usage, test ports, monitor Ethernet usage, etc.

Privileged / Nonprivileged Commands

There is a further distinction within each of the above categories that gives user's the ability to execute specific commands. User's are given *privileged* or *nonprivileged* status depending upon how you set up your network.

Privileged users are typically system managers. They are given the capability of changing the configuration of **any** port on the server, disconnecting sessions and resetting (initializing) the

server. The only thing they cannot do is look at another user's private **PORT LOCK** password.

Nonprivileged users cannot do anything that would affect another user on the server. Usually they only use the server to connect to services.

When you log onto the server initially you are considered to be a **nonprivileged** user. Follow these steps to enter **privileged** mode:

① At the LOCAL> prompt type:

```
LOCAL> SET PRIVILEGED
```

Note: The privileged password can be changed with the **SET/DEFINE/ CHANGE SERVER PRIVILEGED PASSWORD** *command. See Appendix A, Commands.*

② The server responds by asking you to enter a *password*. The default password set at the factory is **SYSTEM**.

```
PASSWORD> SYSTEM
```

③ You are returned to the LOCAL> prompt after you enter the correct password. The prompt now indicates you are a privileged user by displaying the prompt with a second **>**:

```
LOCAL>>
```

④ You can now execute any server commands. Return to nonprivileged mode when you have finished using privileged commands:

```
LOCAL>> SET NOPRIVILEGED
LOCAL>
```

Note that the prompt returns to a single **>**.

You will not be able to enter privileged mode if another user is logged on as a privileged user, or if another port was left in privileged mode. To override the other port's privilege:

```
LOCAL> SET PRIVILEGED OVERRIDE
```

This takes the other port **out** of privileged mode and makes you the privileged user.

Only one port can be in privileged mode at a time.

Command Line Editing

The terminal server uses *command line editing* to make entering and changing commands easier. This feature functions in a manner similar to DEC's command line editing. The terminal server has a buffer that stores the last **512** bytes typed at the keyboard. You can *recall* previous command lines and then edit them to correct or create new commands.

Control characters are used to perform this editing. A control character is a combination of two keys, the <**CTRL**> key and another key that you press while holding down the <**CTRL**> key. Often you will see the control key displayed as a carat (^) followed by the second character, such as ^A, ^Z, etc.

The following table lists the keys you can use to edit commands on the command line:

Key	How to use....
<CTRL> A	Toggles between insert and overwrite modes. Position your cursor anywhere on the command line, press ^**A** and insert the characters in the command line.
<CTRL> B	Recalls the previous command line(s), one line at a time. On ANSI terminals you can also use the up arrow (↑) key.
<CTRL> D	Moves the cursor to the left one position. On ANSI terminals you can also use the left arrow (←) key.
<CTRL> E	Moves the cursor to the end of the command line.
<CTRL> F	Moves the cursor to the right one position. On ANSI terminals you can also use the right arrow (→) key.
<CTRL> H	Moves the cursor to the beginning of the command line.
<CTRL> J	Deletes the previous word.
<CTRL> R	Redraws the current command line. This lets you check your edits before accepting the line.
<CTRL> U	Erases an entire command line.
<CTRL> Z	Aborts the entry of a password. You can also use this to exit HELP.
BACKSPACE	Use the backspace key to move your cursor to the beginning of a line without erasing any characters on the line. This is available on ANSI terminals only.
BREAK	Halts the current command line or display.
DELETE or RUBOUT	Erases the character immediately to the left of the cursor.
CR (carriage return)	Executes the current command line.

The terminal server includes a great many commands and features. We have included an extensive online help facility so that you are not constantly having to turn to the manual to answer quick questions.

① To access *help*, type:

```
LOCAL> HELP
```

The server displays a list of commands for which there is additional help. The prompt displays as TOPIC?. The commands that display depend upon whether you are currently a *privileged* or *nonprivileged* user.

Enter a ? to repaint the list of commands displayed when you first enter HELP.

② To display help on a specific topic, select a command from the list and enter it at the prompt:

```
TOPIC? LOGOUT
```

You can exit HELP at any time by pressing ^Z.

An explanation of the command and any parameters displays. If there is any additional help text that relates to this command, a list of *subtopics* displays after the explanation. You can continue to select additional topics and subtopics until you have an understanding of the command.

③ There is an alternate method of accessing help that does not require that you work your way through the help menus. At the prompt, type **HELP** followed by the command you want additional information on.
For example, assume you want an explanation of how to change the default privileged password. You would type:

Note: *Remember that certain commands are available to privileged users only. If you attempt to get help on a privileged command and are not in privileged mode, a message displays that tells you the command requires privileged mode.*

```
LOCAL>> HELP CHANGE SERVER PRIVILEGED PASSWORD
```

The server responds by displaying information about the *privileged password* command.

Operational Commands

Operational commands are usually entered with required and/or optional parameters that determine what the command will do. These commands are typically routine commands used on a daily basis by all users (*privileged* and *nonprivileged*).

Operational commands are listed below. For a detailed description of each command and their valid parameters, refer to *Appendix A Commands*.

BROADCAST	Sends a message to one or more ports on your server.
CLS	Clears your terminal display.
CONNECT	Connects to services on the Ethernet network.
DISCONNECT	Disconnect services on the Ethernet network.
HELP	Displays the help menus.
LOCK	Places your port in a secure or locked state while you are away from the terminal.
LOGOUT	Logs the terminal server off.
RESUME	Returns you to a session that you had placed on hold.
SHOW	Displays a ports configuration, lists service names, examines a ports status, etc.
1 | 2 | 3 | 4	Toggle between sessions.

The **permanent** and **operational** databases contain all the information required by the terminal server to operate. The operational database is maintained in memory while the server is turned on. The permanent database is store in permanent memory.

The two databases are identical when the server is turned on for the first time. Database commands make up the largest set of commands for the terminal server.

The **SET**, **DEFINE** and **CHANGE** commands are used to configure the databases. All three commands use the same parameters but affect different terminal server databases:

SET **SET** changes the *operational* database. For example, when you **SET** the baud rate of a port, you change the baud rate in the operational database only. When you later log off the server, or when the server is powered off, the port is set back to the original baud rate setting stored in the permanent database.

DEFINE **DEFINE** changes the *permanent* database. For example, when you **DEFINE** the baud rate of a port, you change the baud rate in the permanent database. The baud rate on your port is not actually changed until you power off the server, power it back on and log back into the port. You can also use the command **INITIALIZE SERVER** to effect the change.

CHANGE **CHANGE** changes both the *permanent* and the *operational* databases with a single command. For example, when you **CHANGE** the baud rate of a port, you change the baud rate in both the permanent and the operational database immediately.

Database commands are listed below. For a detailed description of each command and their valid parameters, refer to *Appendix A, Commands.*

SET/DEFINE/CHANGE	Makes configuration changes to the operational and/or permanent databases.
CLEAR/PURGE/DELETE	Removes local service names from the operational and/or permanent databases.
SAVE	Copies the current operational database to the permanent database.
RESTORE	Restores the permanent database to the operational database.
SHOW/LIST	Lists the database settings.

Network Management Commands

Network management commands are useful when you are diagnosing problems with your server. For example, **MONITOR PORT STATUS** will tell you why certain ports are locking up. Or, **TEST PORT** and a loopback connector help to locate data errors on a terminal located some distance from the server.

You can also monitor many different counters that provide information on network activity, data errors, port errors, etc.

Network management commands are listed below. For a detailed description of each command and their valid parameters, refer to *Appendix A Commands*.

INITIALIZE SERVER	Resets the server. This is equivalent to powering the server off.
SHOW / LIST / MONITOR	Displays changing events on the server in real time.
REMOVE QUEUE	Deletes entries from the printer queue.
TEST	Sends a test pattern out a port, performs loopback testing, etc.
ZERO COUNTERS	Resets the error counters, data counters, etc. This lets you do analysis for specific time periods.

The ELS-8 and the ELS-16 terminal servers are preset to *factory default configuration*. The configuration settings are commonly used values. In many cases you will be able to plug in your server and begin using it right away. However, at some point you will probably want to makes changes to meet your specific network requirements. Areas where you are most likely to want to change configurations are:

- **SERVER**
  Operating parameters have to be established for the server. Parameters include circuit timer, multicast timer, session limits, etc.

- **PORTS**
  Configure the communications settings for ports on the server. This includes baud rate, parity, etc. You can also configure some of the operational characteristics for users.

- **NODES**
  TCP/IP nodes have to be defined in the terminal server's internal node table. Parameters include the Ethernet address of the node, assigning an alias to the node, the IP address, etc.

- **SERVICES**
  If the server is going to be a *service node*, services to be offered must be defined.

Plan your changes before you begin changing settings.

Chapter 4 Using LAT Protocol

Chapter 4 explains how to configure the ELS-8 or the ELS-16 terminal servers using LAT protocol. Because the LAT networking software has been designed to make networks easy to manage and access, configuring your terminal server is quite simple and straightforward.

The first thing you will do after powering on the terminal server is to set up the server, services and finally devices on ports. Unless you make a major change to your network, most of these parameters will need to be set once. For those of you already familiar with LAT terminal server operation, refer to the *Quick Start* section of this chapter. We have followed *Quick Start* with examples of setting up the server, services and devices. For detailed explanations of terminal server commands, refer to *Appendix A Commands*.

What is LAT?

Local Area Transport (LAT) networking software was developed by DEC to make local area networking with serial devices more efficient. The LAT protocol is supported by most DEC operating systems, as well as other operating systems. The Equinox terminal server supports the LAT protocol with many enhanced features.

Services Services are devices available to users on the Ethernet network. They can be dedicated devices such as printers or host computers which can be a service as well as a user. Services can be given names with the same name defined for more than one service on a network. The **SHOW SERVICES** commands lists the services available on the network.

Nodes Nodes are devices on a network through which you can access one or more services. In LAT, nodes broadcast their services to the network through multicast messages. Hosts on the network receive these multicast messages and let their users know what services are available to them. The **SHOW NODES** command displays information about nodes on the network.

Multiple Sessions Ports on the terminal server can run more than one session at a time thus providing communication with multiple hosts simultaneously.

Preferred Services You can connect automatically to a specific host when you issue the **CONNECT** command without entering a host name. Additionally, if **AUTOCONNECT** is enabled, you will be connected to your preferred service whenever you log into your terminal.

Dedicated Services You can force a port to connect to a particular service whenever it logs on. This will be the only service the port has access to, therefore the port is logged off the terminal server when the service is logged off.

Quick Start

If you are familiar with configuring a terminal server for LAT, use the following steps as a guideline to setting up your server:

Step 1 **Plan your network.**
Complete the worksheets in *Appendix E*. This will provide you with a record of your network.

Step 2 **Install your hardware.**
Refer to *Chapter 2* of this manual for additional information.

Step 3 **Power up your server.**
Verify that the server has power and the LEDs indicate correct operation. Refer to *Chapter 3* for additional information.

Step 4 **Configure your server.**
In you need help, refer to *Configuring your server* in this chapter and to the **SET/DEFINE/CHANGE SERVER** commands in *Appendix A Commands*.

Step 5 **Configure services.**
If you need help, refer to *Configuring services* in this chapter and to the **SET/DEFINE/CHANGE SERVICES** commands in *Appendix A Commands*.

Step 6 **Configure terminals and PCs.**
If you need help, refer to *Configuring terminals and PCs* in this chapter and to *Appendix A Commands*.

Step 7 **Configure serial and parallel printers.**
If you need help, refer to *Configuring serial printers* and *Configuring parallel printers* in this chapter and to *Appendix A Commands*.

Step 8 **Configure modems.**
If you need help, refer to *Configuring modems* in this chapter and to *Appendix A Commands*.

Step 9 **Configure host computers.**
If you need help, refer to *Configuring host computers* in this chapter and to *Appendix A Commands*.

Step 10 **Configure any miscellaneous serial device types.** Configure PLCs (Programmable logic controller), ATM machines, etc. If you need help, *Configuring other serial devices* in this chapter and to *Appendix A Commands*.

The ELS-8 and the ELS-16 terminal servers are preset to *factory default configurations*. The configuration settings are commonly used values. In many cases you will be able to plug in your server and begin using it immediately. However, at some point you will probably want to make changes to meet your specific networking needs. Areas where you are most likely to want to change configurations:

- **SERVER**
  Terminal server operating parameters should be configured first. Parameters include circuit timers, multicast timer, session limits, etc.

- **SERVICES**
  If the server is going to be a *service node*, the services to be offered must be configured.

- **PORTS**
  Configure the communications settings for the ports on the server. This includes baud rates, parity, etc. You can also configure some of the operational database for users.

Configuring SERVER Characteristics

The terminal server should be configured to meet your networking needs. Display the current characteristics with the **SHOW SERVER CHARACTERISTICS** command. Figure 4-1 contains the default server configuration. Table 4-1 lists all of the parameters that can be configured on the server, their default values, and valid parameters. For more information about each parameter, refer to **SET/DEFINE/CHANGE SERVER** in *Appendix A Commands*.

```
Equinox ELS-8 v2.13
IP Address:          0.0.0.0                 Uptime:              0 00:01:30
Name:                LAT_00807D04D804        Serial Number:       XB001240
Alias:                                       Number               0
                                             Subnet Mask          0.0.0.0

Identification:      Equinox Systems, Inc., ELS-16
Welcome Message:     Welcome to the Equinox Server Network

Keepalive Timer:     20 sec                  Retransmit Limit:    0
IP Revision:         n/a                     Nodename Resolution: Remote
TCP Revision:        n/a                     Learn Node:          Disabled
TELNET Revision:     n/a                     TCP/IP Checksum:     Disabled
RLogin:              Disabled                Default Protocol:    Lat
Domain Name:

Slow Delay:          50ms                    Fast Delay:          50ms
```

Figure 4-1 SHOW SERVER Display

Table 4-1 Server Parameters

Parameter	Defaults	Values
Announcements	Enabled	ENABLED / DISABLED
Broadcast	Enabled	ENABLED / DISABLED
Circuit Timer	80ms	30 to 120 milliseconds
Console Port	None	*port_number* / NONE
Default Protocol	Lat	LAT / TCPIP / SERVER / RLOGIN / TELNET
Identification	Equinox Systems, Inc. ELS-8 or ELS-16	*"text_string"* / " "

Parameter	Defaults	Values
Inactivity Timer	00:30:00	*hh:mm:ss* 10 seconds to 10 hours
Keepalive Timer	20 seconds	10 to 180 seconds
Load Name	ELS48DLV.SYS	*file_name* / " "
Local Prompt	LOCAL>	*"text_string"*
Lock	Enabled	ENABLED / DISABLED
Login Password	Access	*"text_string"* / " "
Login Prompt	#	*"text_string"*
Maintenance Password	None	*"hex_string"*
Multicast Timer	30 seconds	10 to 180 seconds
Name	Lat_ethernet address	*server_name*
Node Limit	50	1 to 100
Nodename Resolution	Remote	LOCAL / REMOTE
Number	0	*id_number*
Password Limit	3	1 to 250
Privilege Password	System	*"password"*
Queue Limit	24	*host_requests*
Receive Buffer	Small	SMALL / MEDIUM / LARGE
Retransmit Limit	8	4 to 120
Security	Disabled	ENABLED / DISABLED
Service Groups	All Enabled	0 to 255 ENABLED / DISABLED
Session Limit	48	1 to 96
Welcome Message	Welcome to the Equinox Server Network	*"text_string"* / " "

Services that will be available on the server should be configured at this time. Display current services with the **SHOW SERVICES CHARACTERISTICS** command. Figure 4-2 contains the default service configuration. Table 4-2 lists all of the parameters that can be configured for services, their default values, and valid parameters.

The **SET/DEFINE/CHANGE SERVICE LOCAL** commands are used to configure services. *Appendix A Commands* provides additional information about each of the parameters.

```
Local Service:  RC_00807D04D804
Identification: Remote Console on node LAT_00807D04D804
Ports:
Rating:         255
Announcements:  Enabled                    Queuing:  Disabled
Connections:    Enabled                    Password: Disabled
```

Figure 4-2 SHOW SERVICES Display

Table 4-2 Service Parameters

Parameters	Default	Values
Announcements	Enabled	ENABLED / DISABLED
Connections	Enabled	ENABLED / DISABLED
Identification		*"text_string"* / " "
Password	None	*password*
Ports	None	*port_range* / ALL / NONE
Queue	Disabled	ENABLED / DISABLED

Ports are configured to match the device connected to the port. Devices connected to ports should be configured next on the terminal server. Display the current port characteristics with the **SHOW PORT CHARACTERISTICS** command. Figure 4-3 contains default port settings. Table 4-3 lists all of the parameters that can be configured on the server, their default values, and valid parameters.

For more information about each parameter, refer to **SET/DEFINE/CHANGE PORTS** in *Appendix A Commands*.

```
Port 1:                                          PORT_01

Input Speed:          9600 (auto)        Terminal Type:      Softcopy
Output Speed:         9600 (auto)        Session Limit:      4
Character Size:       8                  Default Protocol:   Server
Parity:               None               Break:              Local
Flow Control:         Xon                Local Switch:       None
Device Type:          Dataonly           Backwards Switch:   None
Access:               Local              Forwards Switch:    None
Preferred Service:    None

Authorized Groups:    All
(Current) Groups:     All

Input Flow Control:   Enabled            Password:           Disabled
Output Flow Control:  Enabled            Interrupts:         Disabled
Remote Queuing:       Enabled            Security:           Disabled
Verification:         Enabled            Autobaud:           Enabled
Autoconnect:          Disabled           Autoprompt:         Enabled
Message Codes:        Enabled            Broadcast:          Enabled
Loss Notification:    Enabled            Inactivity:         Disabled
Multisessions:        Disabled           Pause:              Disabled
```

Figure 4-3 SHOW PORT Display

Table 4-3 Port Parameters

Parameter	Default	Values
Access	Local	LOCAL / REMOTE / DYNAMIC / NONE
Authorized Groups	All	0 to 255 / ALL / NONE
Autobaud	Enabled	ENABLED / DISABLED
Autoconnect	Disabled	ENABLED / DISABLED
Autoprompt	Enabled	ENABLED / DISABLED
Backwards Switch	None	*character* / *control character*
Break	Local	LOCAL / REMOTE / DISABLED
Broadcast	Enabled	ENABLED / DISABLED
Character Size	8	7 / 8
Control Autoconnect	Disabled	ENABLED / DISABLED
Control Connected	Pass	ON / OFF / PASS
Control Delay	Disabled	ENABLED / DISABLED
Control Disconnect	Disabled	ENABLED / DISABLED
Control Fade	Disabled	ENABLED / DISABLED
Control Idle	On	ON / OFF
Control Required	Disabled	ENABLED / DISABLED
Control Toggle	Disabled	ENABLED / DISABLED
Dedicated Service	None	*service_name* / NONE / IP *ip_address* / *node_name* / *node_name.* / *alias_name.*
Default Protocol	Lat	LAT / RLOGIN / SERVER / TCPIP / TELNET
Device Type	Dataonly	CENTRONICS / CUSTOM / DATAONLY / DATAPRODUCTS / DRT / MODEM / PC / PRINTER
Equal	None	*port_number*
Flow Control (Input) Flow Control (Output)	Enabled	ENABLED /DISABLED
Flow Control	Xon	CTLSIG / XON / XOFFANY
Forwards Switch	None	*character* / *control character*
Groups	All Enabled	0 to 255 / ALL ENABLED / DISABLED
Inactivity Logout	Disabled	DISABLED / LOCAL / SINGLE / MULTIPLE
Interrupts	Disabled	ENABLED / DISABLED
Local Switch	None	*character* / *control character*
Loss Notification	Enabled	ENABLED / DISABLED
Message Codes	Enabled	ENABLED / DISABLED
Multisession	Disabled	ENABLED / DISABLED
Name	Port_nn	*port_name*

Parameter	Default	Values
Parity	None	NONE / ODD / EVEN / MARK / SPACE
Password	Disabled	ENABLED / DISABLED
Pause	Disabled	ENABLED / DISABLED
Preferred Service	None	*service_name* / NONE / *tcp_port_name* / IP *ip_address* / Node *node_name(.) alias_name.*
Remote Queuing	Disabled	ENABLED / DISABLED
Security	Disabled	ENABLED / DISABLED
Session Limit	4	0 to 4
Speed (Input) Speed (Output)	9600 (autobaud) 9600 (autobaud)	75 to 38,400 bps
Type	Softcopy	ANSI / HARDCOPY / SOFTCOPY / TELEVIDEO_910 / VT100 / WYSE_60
Username	None	*user_name* / *"user_name"*
Verification	Enabled	ENABLED / DISABLED

You can *downline* load the terminal server software from an established DECnet *load host* to the terminal server. The *load host* is a system that stores the server image, as well as maintains entries in the DECnet node database for specific servers. This permits the load host to *downline load*, or send, the server image to servers on the local Ethernet. In order to downline load the server software, you must first put the distribution software on the load host using the standard VMS utility **VMSINSTAL.COM**.

Preparing for the Installation

The following requirements must be met before you begin the installation of the terminal server software:

- ❑ you must have at least 1600 free blocks of disk space on the load host;
- ❑ the Ethernet controller of the DECnet load host must be the same Ethernet as the Equinox terminal server;
- ❑ the DECnet load host must be running VMS 4.7 or higher;
- ❑ the installer account in VMS must have both **CMKRNL** and **SYSPRV** privileges;
- ❑ the terminal server DECnet node name, DECnet node address and Ethernet hardware address should be available;
- ❑ load the Equinox software media on the appropriate drive.

The VMSINSTAL Utility

Use **VMSINSTAL.COM** to install the terminal server software onto your DECnet load host. **VMSINSTAL.COM** creates a directory on the load host, copies the terminal server files from your distribution media, and, optionally, prints a copy of the Equinox Terminal Server Release Notes. Be sure that you install the distribution software on each system you are specifying as a load host for the terminal server. **VMSINSTAL.COM** takes approximately 5 minutes to run.

Step 1 Enter the following command to start **VMSINSTAL.COM:**

```
$ @sys$update:vmsinstal
```

Step 2 The system responds with a message telling you that you have entered the VAX/VMS installation procedure and that your DECnet network is running. It also indicates any active users on the system. It asks if you want to continue the installation. Enter **Y** to continue or **N** to stop the installation at this point:

Note: The installation procedure does not affect the system.

```
* Do you want to continue anyway [NO]? y
```

Step 3 If you answer yes, the following displays:

```
* Are you satisfied with the backup of your system disk [YES]?
```

Enter **Y** if you are satisfied or **N** if you want to discontinue the installation and verify the backup.

Step 4 Enter the location of the distribution volumes. In this example, the location is **MUA0:**

```
* Where will the distribution volumes be mounted: MUA0
```

Step 5 You are asked to enter the products to be processed from the distribution volume. Enter an * to have all products processed.

```
Enter the products to be processed from the first distribution volume
    set.
* Products: *
```

Step 6 You are next asked if there are any installation options you want to use. Enter return to specify no options:

```
* Enter installation options you wish to use (none):
```

Step 7 You are prompted to mount the first volume of your distribution media at the location you specified above:

```
Please mount the first volume of the set on  MUA0:
```

Step 8 You are given a final prompt to ask if you want to continue. Enter **Y** to continue or **N** to stop the procedure.

```
* Are you ready? Y
```

Step 9 The system responds by initiating the procedure and displaying the following information:

```
%MOUNT-I-MOUNTED, EQUINOX mounted on _MUA0:

The following products will be processed:

ELS_V2 V10.B

Beginning installation of ELS_V2 V10.B at 17:37

%VMSINSTAL-I-RESTORE, Restoring product save set A ...
%VMSINSTAL-I-REMOVED, Product's release notes have been moved to
    SYS$HELP.
            EQUINOX ELS-48 TERMINAL SERVER SOFTWARE
                    Software revision: 2.10b
Release notes for ELS-48 terminal server will be copied to the file
    SYS$SYSROOT:[DECSERVER]els48dlv.RELEASE_NOTES
* Do you wish to print a copy of the release notes to SYS$PRINT [YES]?
    y
```

Step 10 If you are running Terminal Server Manager (TSM) software, answer **Y** to the next question:

```
Are you currently running DIGITAL'S TERMINAL SERVER MANAGER
    SOFTWARE? (Y/N): y
```

The following message displays:

```
An ELS-48 TSM compatible defaults file has been provided. Any changes
you make in the default configuration of the ELS-48 may be placed in this
file and used by TSM to download this file to your ELS-48 terminal server.

%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target
directories...
```

Step 11 The software installation for the terminal server is complete. The following files are placed in the **SYS$SYSROOT:[DECSERVER]** directory:

```
ELS48DLV.SYS
ELG48DLV.SYS
ESICONFIG.COM
ESICONFIG.DAT
ELS48DLV.RELEASE_NOTES
```

The following files are also placed in the directory noted above. The are used to control printing on a UNIX host and on the terminal server.

```
MAKEFILE
RPRINT.C
RPRINT.DOC
RPRINT.H
UTIL.C
```

Completing the Installation

Follow these steps to complete the installation of the terminal server software:

Step 1 Add the following to your site specific startup file (**SYS$MANAGER:SYSTARTUP.COM** or **SYSTARTUP_V5.COM** for VMS 5.x). This defines the directory that contains the downline load file. You do not need to complete this step if you have already made this change for a previous software installation.

Example:

```
$define/system/exec/name_attribute=no_alias  mom$load
    "current_definition" sys$common:[decserver]
```

Step 2 Run the Equinox utility, **ESICONFIG.COM**, to configure the node database of the DECnet load host to accommodate the terminal server.

Using ESICONFIG.COM

The DECnet load host's node database must be configured when you install one or more servers. **ESICONFIG** is an automated procedure provided by Equinox that assists you with this part of the software installation. Once you have completed **ESICONFIG**, your VMS system will be a valid load host for the terminal server. **ESICONFIG.COM** offers the following options:

- ❒ Add new terminal servers
- ❒ Display all known servers
- ❒ Modify existing terminal servers
- ❒ Delete existing terminal servers
- ❒ Restore all known terminal servers
- ❒ Import terminal servers from the DECserver database
- ❒ Export Equinox terminal servers to the DECserver database
- ❒ Downline load image files to the terminal server

Step 1 Enter the following command to start **ESICONFIG.COM**:

```
$ set def mom$load:
$ @esiconfig
    A unique DECnet node name and DECnet node address is
    needed for each terminal server. Check your DECnet
    database via NCP to ensure integrity.

Press <RET> to start or <CTRL/Z> to exit.
```

```
EQUINOX Server Utility

    1  -  Add Server
    2  -  Display known servers
    3  -  Modify existing server
    4  -  Delete an existing server
    5  -  Restore all known servers
    6  -  Import servers from the DECserver database
    7  -  Export Equinox servers to the DECserver
          database
    8  -  Downline load image file to the ELS-48
          servers
   ^Z  -    Exit
```

Step 2 Select *<1> Add server* from the main menu. Be prepared to supply the following information:

- Ethernet address of the terminal server
- A unique DECnet node name
- DECnet number

Note: *To find a node name and number not used by DECnet, enter the following commands in VMS:*

```
$ mcr ncp
NCP> show known nodes
NCP> exit
```

Use caution when entering a node name into the server database. If you attempt to add a node name that is not unique to the NCP database, the new server will overlay the current node information.

If you used DEC's **DSVCONFIG.COM** procedure, use menu option <6> to import the DECservers into your Equinox database.

① You are prompted to enter the type of server you are installing. Enter a question mark at the prompt to display a list of the currently supported servers:

```
Enter server type for new server:  ?
```

If you enter a question mark, a list of currently supported terminal servers displays. Enter the type of server you are installing.

② Enter the unique DECnet node name for the server you are adding. The node name is one to six alphanumeric characters. In our example, we are adding the node name **SRV_1.**

```
Enter DECnet name for new server: SRV_1
```

③ Enter the unique DECnet node address for the server you are adding. The number must be between 1 and 1023. If your network is divided into areas, each node address has the format ***aa.nnnn***.

```
Enter DECnet ID for new server:  55.6
```

④ Enter the Ethernet address for the server you are adding:

```
Enter Ethernet address for new server: 00-80-7d-00-00-01
```

⑤ Enter the service circuit for the server you are adding:

```
Enter service circuit for new server, default=[ QNA-0 ]:
```

Press **[Enter]** to accept the default service circuit. If an error message displays at this point, the server you just added was not added correctly to the network database. Delete the server with main menu option <4>. Re-install the server using option <1> from the main menu.

Step 3 The downline load process takes approximately five minutes. The terminal server is triggered from the **ESICONFIG** utility or directly through NCP. After the server receives its downline load, the software is permanently written to ROM.

Step 4 Display the terminal server's default characteristics to ensure the correct file will be requested for downloading. If the name of the load file is incorrect, you must change it before initializing the downline load.

Example:

```
LOCAL>>  show server characteristics
```

If the file is not correct, perform the following:

```
LOCAL>> change server load elg48dlv.sys
LOCAL>> change server load els48dlv.sys
```

Step 5 Log onto the load host. Select <*8*> *Downline load image file* from the main menu to start the downline load.

Step 6 ***Optional:*** Alternately you can use the NCP utility and trigger the node to start the downline load process.

Example:

```
#mcr ncp
$NCP> trigger node srv1
```

ESICONFIG Menu Choices

ESICONFIG.COM provides more than the ability to add terminal servers to your load host. It is a management tool that interfaces between your terminal server and your load host. The rest of the options available to you from the main menu are described below.

<2> Displaying Known Servers

Select <2> on the menu to list all servers that are known to the Equinox Server Utility.

If you press **<RET>** to continue the Equinox server utility menu displays. Pressing **CTRL-Z** ends the utility.

```
Enter Selection: 1

DECnet       DECnet       Circuit      Server       Ethernet              Load          Dump
Name         Address      Type         Type         Address               File          File
=============================================================================================
DOCSRV       50.1         QNA-0        ELS48        00-80-7D-04-83-08     ELS48DLV.SYS
ELSDOCSRV.DMP
GARY         52.12        QNA-0        ELS48        00-80-7D-04-7E-07     ELS48DLV.SYS
ELSGARY.DMP
Press <RET> to continue.
TOTAL NUMBER OF SERVERS = 2

Press <RET> to continue or <CTRL/Z> to exit.
```

<3> Modify Existing Servers

Use option <3> from the main menu to modify servers already in the network database. Use caution when entering a node name into the server database. If you attempt to add a node name that is not unique to the NCP database, the new server will overlay the current node information.

① Enter the DECnet name of the server you are modifying:

```
Enter DECnet name of server to modify: SRV_1
```

② Change all, or specific, elements of the server. If you do not change an element, the default will be the existing value. In the example below, we will change the Ethernet address only.

```
Enter server type, default=[ ELS48 ]:
        Enter DECnet name, default=[ SRV_1 ]:
        Enter DECnet ID, default=[ 55.6 ]:
        Enter Ethernet address, default=[ 00-80-7D-00-00-01 ]:
00-80-7d-00-00-02
        Enter service circuit for server, default=[ QNA-0 ]:
```

Press **[Enter]** to accept the default service circuit. If an error message displays at this point, the server you just added was not added correctly to the network database. Delete the server with main menu option <4>. Re-install the server using option <2> from the main menu.

<4> Delete an Existing Server

Delete a server from the DECnet database by selecting <4> from the main menu. Enter the name of the server to be deleted:

```
Enter DECnet name of server to delete: SRV_1
%NCP-I-SUCCESS, Success
Remote node = 55.6 (SRV_1)
%NML-I-RECDELET, Database entry deleted
```

<5> Restore All Known Servers

Restore all known terminal servers to the DECnet database with option <5> from the main menu.

<6> Import Servers from the DECserver Database

Convert existing DECserver databases (**DSVCONFIG.DAT**) to the Equinox format and insert them into the Equinox database (**ESICONFIG.DAT**) using option <6> on the main menu. With this procedure you will have all defined servers in one place. If an entry has a DECnet address or a name that exists in the Equinox database, that entry will not be added to the Equinox database.

```
Conversion in process, please wait.....
Total new servers added to database = 1
```

<7> Export Equinox Servers to DECserver

Export the Equinox database (**ESICONFIG.DAT**) to the DECserver database (**DSVCONFIG.DAT**) using option <7> on the main menu. The file will be written to **SYS$COMMON:[DECSERVER]**. This option is provided so that DEC utilities that use the DECserver

database can access all Equinox servers in addition to DECservers. If a duplicate DECnet address or server name is found between the databases, a message displays. The Equinox terminal server record will replace the DEC entry. All Equinox terminal servers are assigned a server type of DS200.

```
File to receive merged data, default=[ DSVCONFIG.DAT ]

    Conversion in process, please wait.....

    DECnet address of  54.5 , name=  SRV_1, is in use, and will not be
        included

    1 duplicate server record(s) found
    3 server record(s) found in SYS$COMMON:[DECSERVER]ESICONFIG.DAT
    1 server record(s) found in
        SYS$COMMON:[DECSERVER]DSVCONFIG.DAT
    3 server record(s) written to
        SYS$COMMON:[DECSERVER]DSVCONFIG.DAT
```

<8> Downline Load Image File

Downline load the server image file with <8> on the main menu. The following displays:

```
DECnet       DECnet      Circuit     Server      Ethernet                  Load
Dump
Name         Address     Type        Type        Address                   File
File
=============================================================================
SRV_1        50.1        QNA-0       ELS48       00-80-7D-04-83-08         ELS48DLV.SYS
ELSDOCSRV.DMP
GARY         52.12       QNA-0       ELS48       00-80-7D-04-7E-07         ELS48DLV.SYS
ELSGARY.DMP
GARY1        54.5        QNA-0       DS200       00-80-75-00-00-00         PR0801ENG.SYS
DS2GARY1.DMP
```

A prompt asks you to enter the name of the server you want to download:

```
Enter the DECnet name of the server you want to downline load: SRV_1
IF YOU CONTINUE THE SERVER WILL REBOOT ITSELF NOW! Press
    <RET> to continue or <EXIT> to abort.
```

Exit

Enter **EXIT** to leave the menu and return to the prompt.

LAT Configuration Examples

The remainder of this chapter provides examples of configuring and using the server, services and ports for LAT protocol.

- The examples include a mix of full and abbreviated commands to give you a feel for the commands and their abbreviations. More complete information about each command can be found in *Appendix A Commands*.

- You may enter more than one parameter on a command line. The examples include a mix of command lines with single parameter changes and commands that contain multiple parameters to give you a better understanding about combining parameters.

The examples make the following assumptions in order to establish a networking environment:

- There is a VAX computer running VMS 5.5 operating system. It is connected to an existing Ethernet network.

- An Equinox terminal server is being added to the Ethernet network. It will be configured for LAT protocol only.

- The terminal server hardware has been installed following the instructions found in *Chapter 2 Hardware Installation.*

- The **SET** command has been used in the examples therefore changes will be made to the operational database only. The next time the server is initialized, default settings will be restored. Use the **DEFINE** command to effect the changes in the permanent database. Changes will take place the next time you initialize the terminal server. Use the **CHANGE** command to make changes to both the operational and permanent databases simultaneously.

Ethernet Address 00807D047E07 **Server Name** SRV_1

PORT #	DEVICE	REMOTE LOCAL DYNAMIC	LAT/ SERVICE		TCP/IP ONLY		LAT & TCP/IP	
			LAT	Service	TCP	Service	Both	Service
1	Terminal	L	yes	no	no	no	no	no
2	Terminal	L	yes	no	no	no	no	no
3	Terminal	L	yes	no	no	no	no	no
4	Terminal	L	yes	no	no	no	no	no
5	Terminal	L	yes	no	no	no	no	no
6	PC	L	yes	no	no	no	no	no
7	PC	L	yes	no	no	no	no	no
8	Serial Printer	R	yes	yes	no	no	no	no
9	Modem_in	L	yes	no	no	no	no	no
10	Modem_out	R	yes	yes	no	no	no	no
11	Modem_in_out	D	yes	yes	no	no	no	no
12	Data General	R	yes	yes	no	no	no	no
13	Data General	R	yes	yes	no	no	no	no
14	Data General	R	yes	yes	no	no	no	no
15	PLC_2	R	yes	no	no	no	no	no
16	PLC_1	R	yes	no	no	no	no	no
37	Parallel Printer	R	yes	yes	no	no	no	no

Figure 4-4 Example Worksheet #1

Device (Ports)/ Host (Nodes)	Username	Services (N=Network; L=Local)						
		VAX (N)	Serial Printer (L)	Modem Out (L)	Modem In/Out (L)	Data General (L)	PLC (L)	Parallel Printer (L)
Terminals Ports 1-3	101 202 205	dedicated	no	no	no	no	no	no
Terminals Ports 4-5	206 301	none	yes	no	no	yes	no	no
PC's Ports 6-7	John Marsha	preferred	yes	yes	yes	yes	no	no
Serial printer Port 8	Laser	no	no	no	no	no	no	no
Modem In Port 9	Modem-In	yes	no	no	no	yes	no	no
Modem Out Port 10	Modem-Out	no	no	no	no	no	no	no
Modem In/Out Port 11	Modem In/Out	yes	no	no	no	no	no	no
DataGeneral Ports 12-16	DG	no	no	no	no	no	no	no
PLC Ports 17-18	PLC_1 PLC_2	no	no	no	no	no	no	no
Parallel Printer Port 37	Parallel	no	no	no	no	no	no	no
VAX Host Node	VAX		yes	yes	yes	no	yes	yes

Example # 1 Privileged Status and Security

In this example, you log onto the server, enable privileged status, change passwords for security purposes and enable command line editing and recall.

Step 1 ❑ Press **[Return]** from the terminal keyboard.

❑ If using a PC as a terminal, load the terminal emulation software (e.g. Procomm, Xtalk, etc.) and set the following parameters:

Terminal type	**VT100**
Speed	**Autobaud**
Parity	**None**
Stop bits	**8**
COM port	***user determined***

Enter terminal mode and press **[Return]**.

Step 2 The initial screen displays:

```
LAT_00807D047E07
EQUINOX SYSTEMS
WELCOME
```

The top line contains the Ethernet address of the terminal server.

Step 3 The following prompt displays:

```
USERNAME> john
LOCAL>
```

Enter any character except the letter H at the prompt. Typically you would enter your name or the terminal location.

Step 4 Enable privileged mode to permit access to all of the terminal server commands:

```
LOCAL> set privileged
PASSWORD> system
LOCAL>>
```

Step 5 Change the port type to **ANSI** to take advantage of command line editing. Configure a break key to make it possible to get out of sessions easily.

```
LOCAL> set port type ansi
LOCAL> set port local ^I
```

Step 6 Change the privileged password to protect system integrity.

```
LOCAL>> set server privileged password "mauve"
```

You can reset the password to factory default by resetting the terminal server. This should be done with caution because it does reset **all** of the terminal server configuration to factory default values.

Step 7 You should prevent others from accessing the privileged commands when you are not on the server. Issue the **SET NOPRIVILEGED** command or log out of the server at your port.

Example # 2 Configuring The Server

The terminal server is already configured for LAT protocol. However, you should make sure that all of the broadcasted services are available to the server.

Step 1 Display the broadcasted LAT services available to the server:

```
LOCAL>> sho services
```

Step 2 If the service nodes are not listed, follow these procedures:

- ❑ Wait two to five minutes to assure that the system has learned all of the services. Repeat the **SHOW SERVICE** command.

  If the service nodes are still not listed:

- ❑ Use the **SHOW SERVER STATUS** command to determine the number of nodes currently available. If there are more than 100 nodes on your network, you will need to increase the number of nodes.

  ```
  LOCAL>> set server node 200
  LOCAL>> sho services
  ```

  If the service nodes are still not listed:

- ❑ Check your host computer to make sure the LAT device driver for your operating system is running. Log into your system using the system console and connect using the LAT configuration utility.

  For example, if you are using VMS, the commands are:

  ```
  $set default sys$system
  $run latcp
  LATCP> sho char
  ```

  This displays the LAT characteristics of your host computer. Verify that the service is being broadcast.

- If the service is not displayed, you need to create a service. Refer to the system documentation for your operating system for information on creating a LAT service on the host.

- If the service is displayed, check the service rating. If the service rating is 0 (zero), call Equinox Technical Support.

- If you receive an error message when you run your operating system LAT software (i.e. LATCP), call your operating system vendor or consult the system documentation for your operating system.

Step 3 **OPTIONAL** If you plan to downline load the server software, or use DEC's remote console facility (MOP), change the terminal server name to reflect the name that exists (or will exist) in the DECnet server database. In our example, the server name is **SRV_1**. Exit the LAT control program and return to the terminal server prompt:

```
LATCP> exit
$ mcr ncp
NCP> set node 3.00 name srv_1 service circuit una-0 hardware address 00-80-7d-
     04-83-08
NCP> define node 3.00 name srv_1 service circuit una-0 hardware address 00-80-
     7d-04-83-08
NCP> exit
$ logout
LOCAL>>
```

Step 4 Change the terminal server name to **SRV_1**:

```
LOCAL>> change server name srv_1
```

The server configuration is complete.

Example #3 Configuring Terminals and PCs

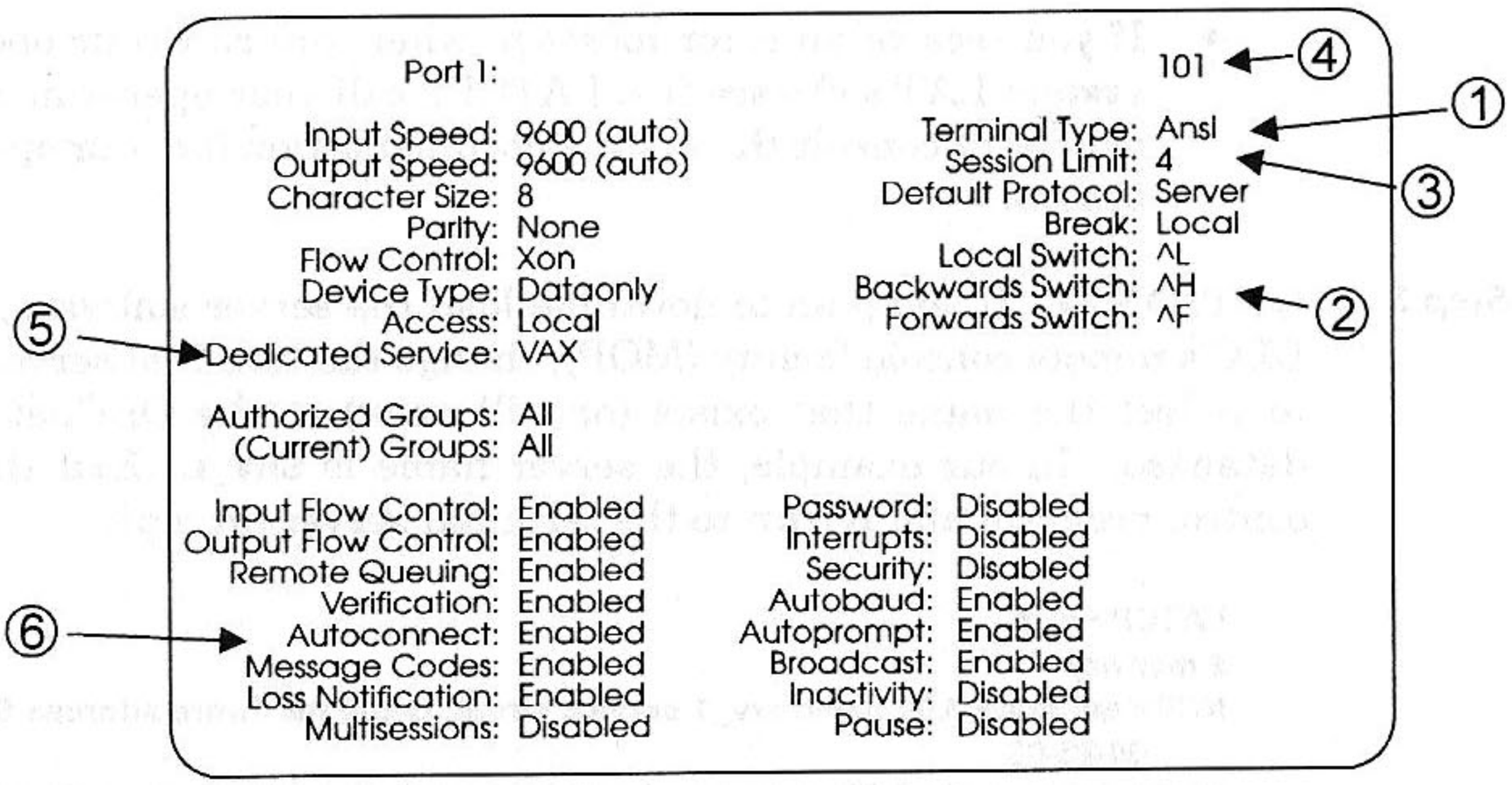


Figure 4-6 SHOW PORT 1

①	**set ports 1-7 type ansi**	Permits command line editing and recall
②	**set ports 1-7 local ^l** **set ports 1-7 forward ^h** **set ports 1-7 backward ^f**	Establishes a break key to get out of sessions easily. Defines switch characters for moving between sessions.
③	**set ports 4-5 sessions 2**	Limits the number of active sessions on ports 4 & 5 to two.
④	**set port 1 name 101** **set port 2 name 102** **set port 3 name 103** **set port 4 name 104** **set port 5 name 105** **set port 6 name john** **set port 7 name ashley**	Assigns names to each port that uniquely identify the individual port. This assists later when you are troubleshooting the system.
⑤	**set ports 1-3 dedicated vax**	Permits the terminals on ports 1 to 3 to access the VAX only.
⑥	**set ports 1-3 autoconnect enabled**	Connects anyone logging in at terminals on ports 1 to 3 directly to the VAX.
⑦	**show port 1 char**	Displays the new port characteristics (*Figure 4-6*).

Example #4 Configuring A Serial Printer as a Service

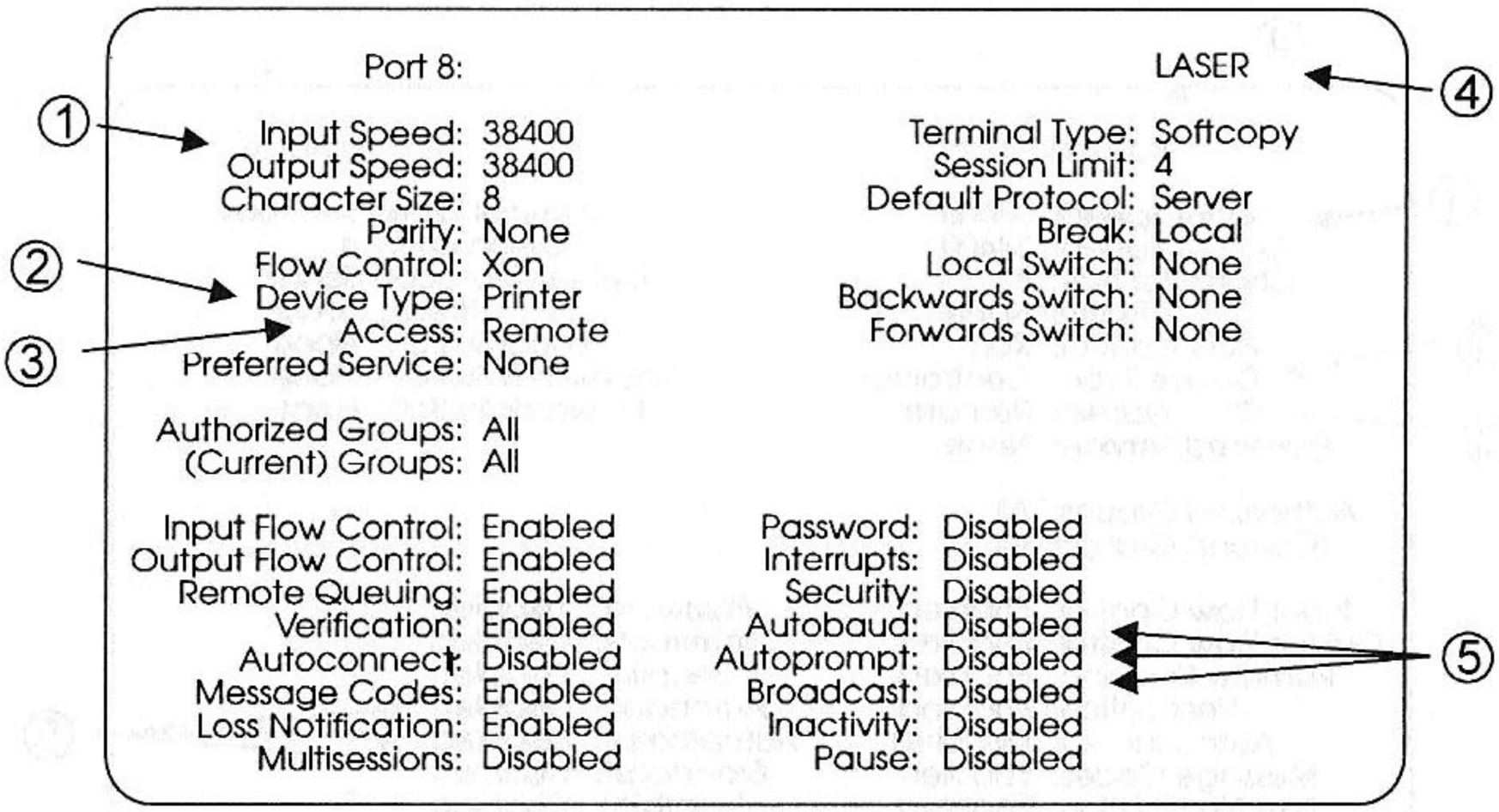


Figure 4-7 SHOW PORT 8

①	**set port 8 speed 38.4**	Changes the default input and output speed to 38.4.
②	**set port 8 device printer**	Changes the device type to printer thus permitting correct control signal handling.
③	**set port 8 access remote**	Permits the printer to receive calls only.
④	**set port 8 name laser**	Assigns a name to the printer.
⑤	**set port 8 autobaud disabled** **set port 8 autoprompt disabled** **set port 8 broadcast disabled**	Turns off autobaud, autoprompt and broadcasting of messages.
⑥	**show port 8 char**	Displays the new port characteristics (*Figure 4-7*).
⑦	**set service laser port 8 ident "laser printer"**	Configures the printer as a service.

Example #5 Configuring A Parallel Printer As A Service

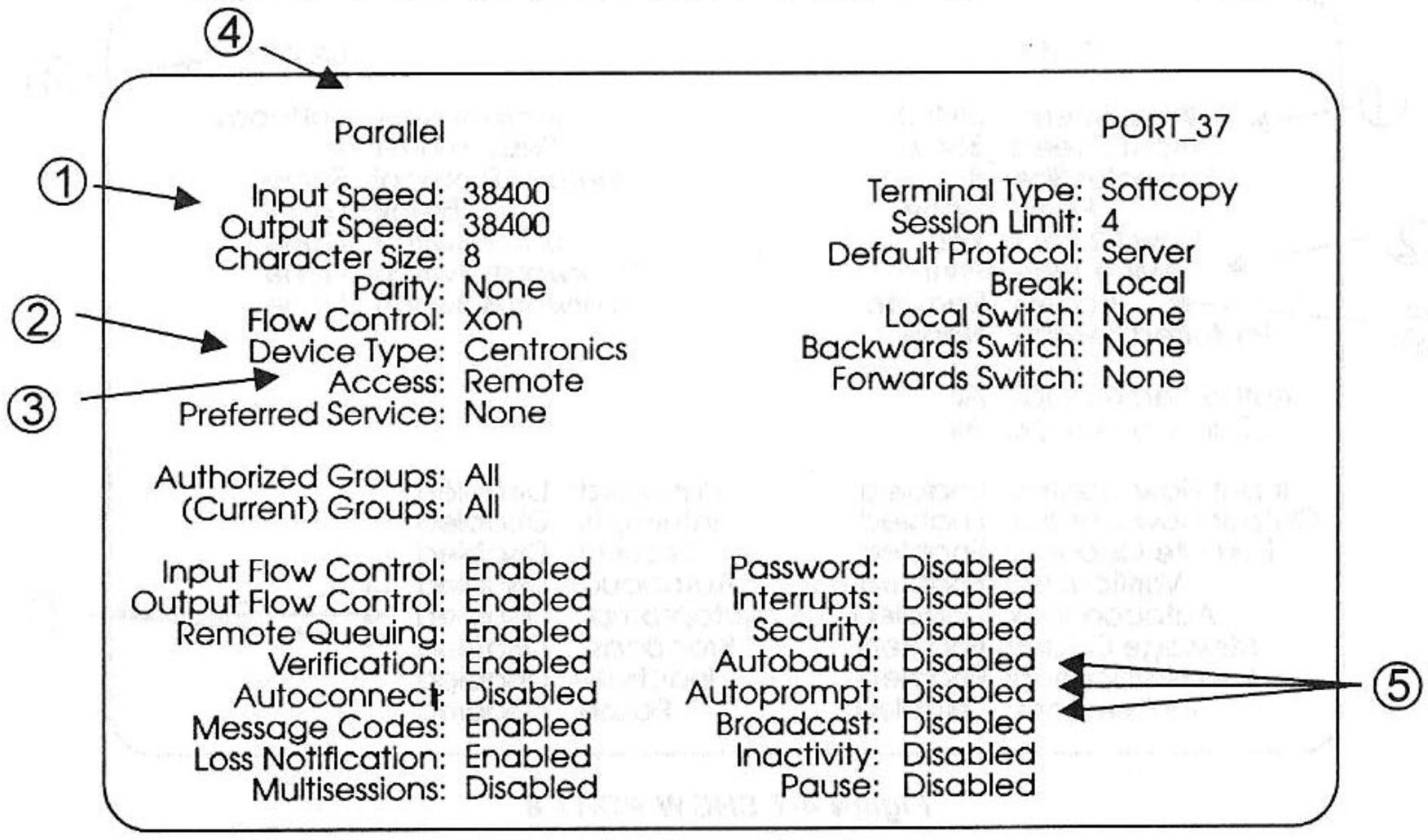


Figure 4-8 SHOW PORT 37

①	**set port 37 speed 38.4**	Changes the default input and output speed to 38.4.
②	**set port 37 device printer**	Changes the device type to printer thus permitting correct control signal handling.
③	**set port 37 access remote**	Permits the printer to receive call only.
④	**set port 37 username parallel**	Assigns a username to the printer.
⑤	**set port 37 autobaud disabled** **set port 37 autoprompt disabled** **set port 37 broadcast disabled**	Turns off autobaud, autoprompt and broadcasting of messages.
⑥	**show port 8 char**	Displays the new port characteristics (*Figure 4-8*).
⑦	**set service parallel port 37 ident "parallel printer port"**	Configures the parallel printer as a service.

Example #6 Configuring a Printer on the Host Computer

Step 1 Configure each printer on the host computer, in this case a VAX. The following example configures the laser printer on port 7 for VMS LAT.

Note: For additional information, refer to your host operating system documentation.

```
LOCAL>> connect vax
USERNAME: JOHN
PASSWORD: JH
$mcr latcp
LATCP> create port lta300
LATCP> set port lta300 /node=srv1 /port=laser
LATCP> sh po lta300
```

Note: The 300 in LTA300 is user supplied.

```
LATCP> exit
$
```

Put the above steps into the LAT load file so that the printer is connected every time the system boots. Edit the file **LAT$STARTUP.COM** if using a release of the VMS operating system above 5.4.2. If using release 5.4 and lower, edit LTLOAD.COM. Refer to your operating system documentation for instructions.

Step 2 Place the following commands in the system managers startup file:

```
$sh term lta300
$set term/perm/dev=lta300 lta300:
$set device/spool lta300:
$init/que/processor=latsym/prot=
(s:rwed,g:rwed,o:rwed)/start/on=lta100: printer
$sh que/full printer
```

The following response displays:

```
TERMINAL QUE PRINTER, ON LTA300:,MOUNTED FROM DEFAULT/BASE
PRIORITY=4 /DEFAULT=(FEED,FORM=DEFAULT)
LOWERCASE/OWNER=[SYSTEM]/PROCESSOR=LATSYSTEM/PROTECTION=(S:
RWED,G:RWED,W:RWED)
/RETAIN=ERROR
```

Step 3 Test the printer to make sure everything is functioning correction. Create a test file for this purpose. Press **CONTROL-L** to return to the terminal server.

```
$print/que=printer test.dat
```

Example #7 Configuring Modems

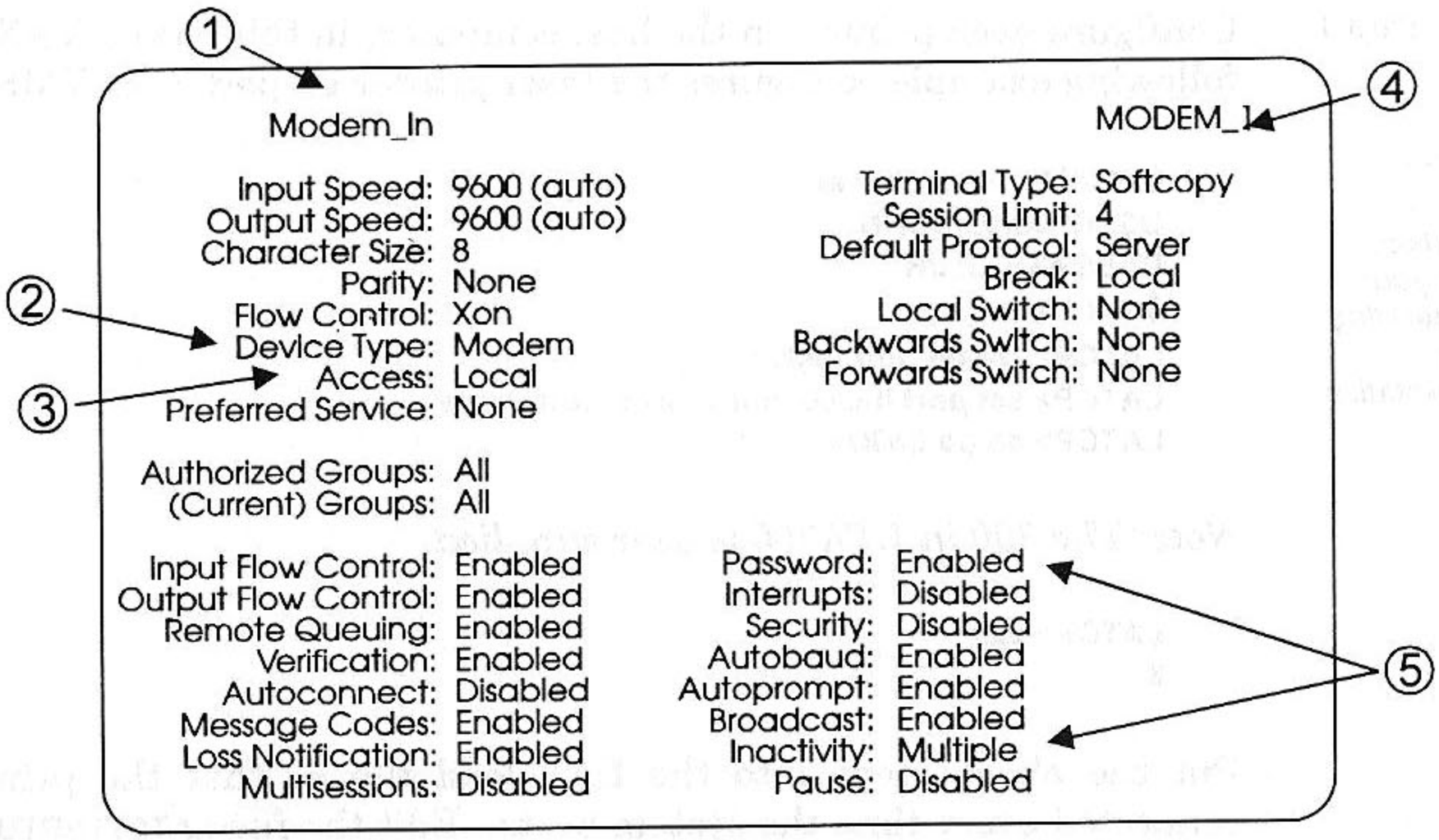


Figure 4-9 SHOW PORT 9

① **set port 9 username modem_in**
set port 10 username modem_out
set port 11 username modem_inout

Defines a username for each modem port.

② **set port 9-11 device modem**

Defines the device type for the devices on ports 9-11 as modem.

③ **set port 10 access remote**

Configures the port 10 as a remote access port.

④ **set port 9 name modem_1**
set port 10 name modem_2
set port 11 name modem_3

Assigns a name to each modem.

⑤ **set port 9 password enabled**
set port 9-11 inactivity multiple

Enables the use of a password on the modem on port 9. Sets the inactivity logout to multiple so that the server automatically logs the port out after a specified period of inactivity.

⑥ **show port 9 char**

Displays the new port characteristics for the ports (*Figure 4-9*).

⑦ **set service modem_pool port 10-11 ident "modem pool" pass "mint"**

Creates a modem pool as a service.

Example #8 Configuring Modems on a Host Computer

Step 1

Note: The example at the right applies to VMS operating system. Refer to your operating system documentation for procedures specific to your system.

Configure the VAX for the modems. If you used **CONTROL-L** to leave your last VAX session, enter an **R** at the local prompt to return to the session in progress. Otherwise, use **CONNECT VAX**, to go to the VAX host.

```
LOCAL>> r
      $mcr latcp
      LATCP>> create port lta301
      LATCP>> create port lta302
      LATCP>> set port lta301 /node=srv1 /port=modem1
      LATCP>> set port lta302 /node=srv1 /port=modem2
      LATCP>> exit
      $
```

Put the above steps in the **LAT$STARTUP** file.

Step 2

Set up any site-specific terminal characteristics for modems to access through your host. These are placed in the network managers system startup file. Return to the terminal server to continue the configuration.

```
$ ^L
LOCAL>>
```

Example #9 Configuring A Host Computer As A Service

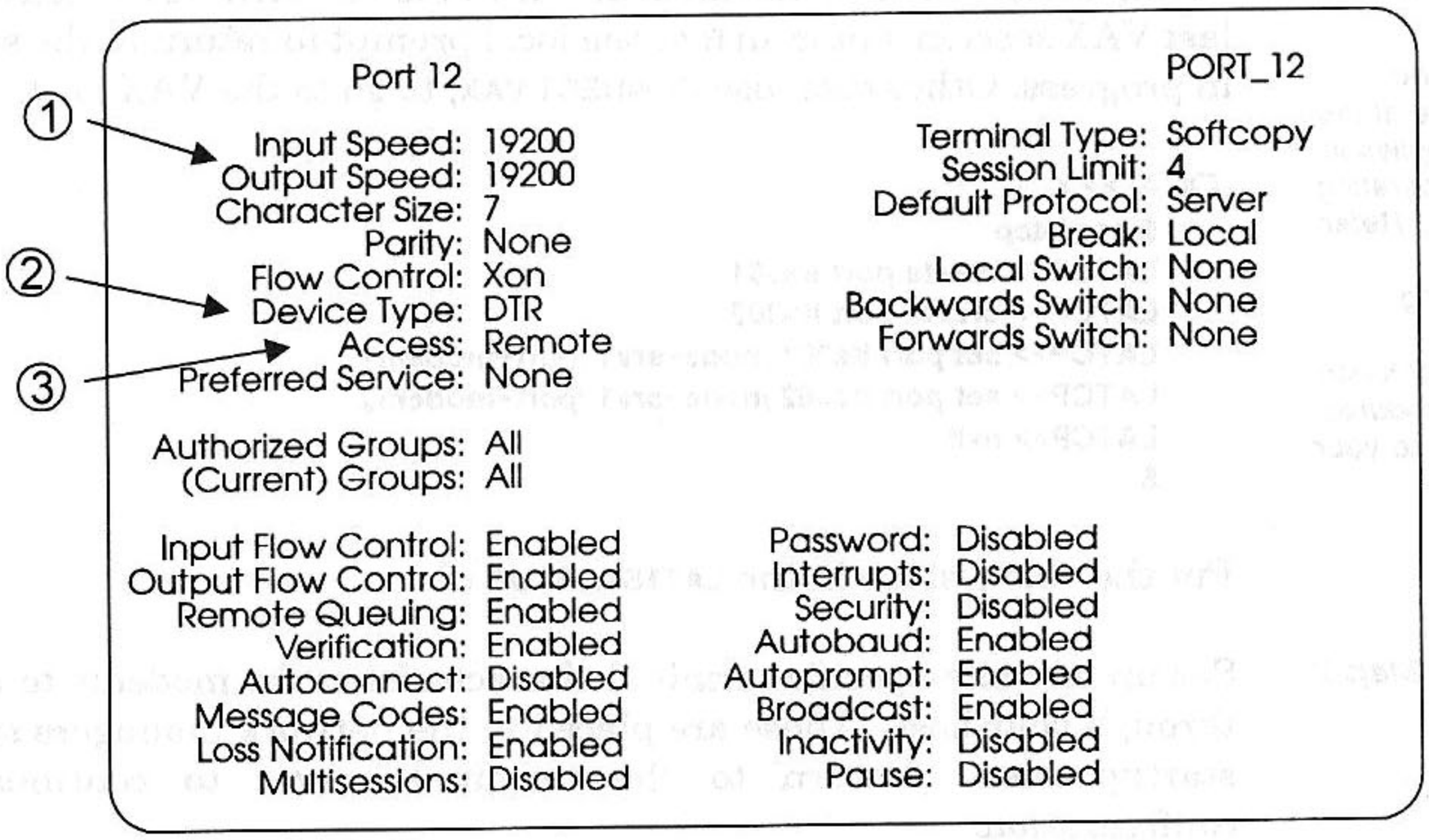


Figure 4-10 SHOW PORT 12

①	**set ports 12-14 speed 19200** **set ports 12-14 char 8**	Sets the port speed to 19,200 with character bits 8.
②	**set ports 12-14 device type dtr**	Defines the device type to DTR.
③	**set ports 12-14 access remote**	Configures the ports as remote access ports.
④	**set service dg ports 12-14 ident "data general"** **set service password "secret"**	Configures the Data General as a service. Assigns an identifying string to the port and sets security with a password.
⑤	**show port 12 char**	Displays the port characteristics (*Figure 4-10*).

Example #10 A Terminal Server Session

You can access serial devices such as modems, printers and host computers when your PC or terminal is connected to an ELS-8 or ELS-16 terminal server. This example takes you through a LAT session.

Logging On

❑ Press **[Return]** from your terminal keyboard.

❑ If you are using a PC as a terminal, load the terminal emulation software (e.g., Procomm, Xtalk, etc.) and set the following parameters:

Terminal Type	**VT100**
Speed	**Autobaud**
Parity	**None**
Stop Bits	**8**
COM port	***user determined***

Enter terminal mode and press **[Return]**.

❑ The terminal server initial screen displays:

```
LAT_00807D047E07
Equinox Systems
Welcome
```

❑ The following prompt displays:

```
USERNAME> john
LOCAL>
```

Enter the username assigned by your network administrator. If a name has not been assigned, enter any character except H at the prompt.

Begin A Session

❑ List the services available to you:

```
LOCAL> show services
```

❑ A list of all the services you can access displays. Let's access the VAX which is on our network.

```
LOCAL> connect vax
```

You are now connected to your VAX. Use it as you would normally.

Chapter 5 Using TCP/IP Protocol

Chapter 5 explains how to configure the ELS-8 or the ELS-16 terminal server as a TCP/IP terminal server. The default protocol of the terminal server is LAT. You will need to configure the server, services, nodes and ports for TCP/IP.

Unless you make a major change to your network, most of these parameters will need to be set only once. This chapter takes you through the configuration process. For those of you who are already familiar with TCP/IP terminal server operation, you may want to refer to the *Quick Start* section of this chapter. We have followed *Quick Start* with examples of setting up the server, services and devices. For detailed explanations of terminal server commands, refer to *Appendix A, Commands*.

TCP/IP is an acronym for Transmission Control Protocol/ Internet Protocol. It provides a reliable, full duplex service on which many application protocols depend. Using TCP/IP, you can send data from an application on one machine to an application on another. The Internet protocol provides the basis for a connectionless, best-effort packet delivery system.

RLOGIN

RLOGIN is a protocol that lets you initiate TCP/IP sessions. It is offered by Berkeley 4.3 BSD UNIX systems and permits users of one machine to connect to other UNIX systems across the Internet. Terminals work as if they were connected directly to the system.

TELNET

TELNET is the Internet standard protocol for remote terminal connection service. It uses the TCP/IP network protocols to create terminal connections to any networked host that supports **TELNET**. **TELNET** is supported on most UNIX systems.

Using the **TELNET** protocol, a user on a network can access a foreign host and start a session. It doesn't matter what type of computer or operating system is on the foreign host, nor does it matter to the foreign host what type of terminal is connected.

Domain Name Servers

The terminal server supports the use of **DOMAIN NAME SERVERS** that permits a network name server to translate text node names into numeric Internet (IP) addresses. This lets you use a host name when an IP address is required.

Reverse TELNET

UNIX hosts can initiate connections to the terminal server using **REVERSE TELNET**. This means you can print files from your UNIX host to a printer attached to the terminal server.

If you are familiar with configuring the terminal server for TCP/IP, use the following steps as a guideline to setting up your server:

Step 1 **Plan your network.**
Complete the worksheets in Appendix E. This will provide you with a record of your network.

Step 2 **Install your hardware.**
Refer to *Chapter 2* of this manual for additional information.

Step 3 **Power up your server.**
Verify that the server has power and the LEDs indicate correct operation. Refer to *Chapter 3* for additional information.

Step 4 **Configure your server.**
In you need help, refer to *Configuring your server* in this chapter and to the **SET/DEFINE/CHANGE SERVER** commands in *Appendix A Commands*.

Step 5 **Configure services.**
If you need help, refer to *Configuring services* in this chapter and to the **SET/DEFINE/CHANGE SERVICES** commands in *Appendix A Commands*.

Step 6 **Configure nodes.**
If you need help, refer to *Configuring nodes* in this chapter and to the **SET/DEFINE/CHANGE NODES** commands in *Appendix A Commands*.

Step 7 **Configure terminals and PCs.**
If you need help, refer to *Configuring terminals* and *Configuring PCs* in this chapter and to *Appendix A Commands*.

Step 8 **Configure serial and parallel printers.**
If you need help, refer to *Configuring serial printers* and *Configuring parallel printers* in this chapter and to *Appendix A Commands*.

Step 9 **Configure modems.**
If you need help, refer to *Configuring modems* in this chapter and to *Appendix A Commands*.

Step 10 **Configure host computers.**
If you need help, refer to *Configuring host computers* in this chapter and to *Appendix A Commands*.

Step 11 **Configure any miscellaneous serial device types.**
Configure PLCs (Programmable logic controller), ATM machines, etc. If you need help, *Configuring other serial devices* in this chapter and to *Appendix A Commands*.

The ELS-8 and the ELS-16 terminal servers are preset to *factory default configurations*. The configuration settings are commonly used values for LAT protocol. You must configure the server for TCP/IP protocol. The areas that need to have configuration changes are:

- **SERVER**
  Configure terminal server operating parameters first. Parameters include circuit timers, multicast timer, etc.

- **SERVICES**
  TCP/IP offered services need to be configured and offered.

- **NODES**
  TCP/IP nodes must be configured.

- **PORTS**
  Devices that will be using TCP/IP protocol or that will be offered as a service need to be configured.

The terminal server can be configured to meet your networking needs. Display the current characteristics with the **SHOW SERVER CHARACTERISTICS TCP** command. Figure 5-1 contains the default server configuration. Table 5-1 lists all of the TCP/IP characteristics that can be configured on the server, their default values and valid configurations.

```
Equinox ELS-8 v2.13
IP Address:      0.0.0.0                          Uptime:          0 00:01:30
Name:            LAT_00807D04D804                 Serial Number:   XB001240
Alias:                                            Number           0
                                                  Subnet Mask      0.0.0.0

Identification:  Equinox Systems, Inc., ELS-16
Welcome Message: Welcome to the Equinox Server Network

Keepalive Timer: 20 sec                           Retransmit Limit:  0
IP Revision:     n/a                              Nodename Resolution: Remote
TCP Revision:    n/a                              Learn Node:      Disabled
TELNET Revision: n/a                              TCP/IP Checksum: Disabled
RLogin:          Disabled                         Default Protocol: Lat
Domain Name:

Slow Delay:      50ms                             Fast Delay:      50ms
```

Figure 5-1 SHOW SERVER Display

Table 5-1 Server Parameters

Parameter	Defaults	Values
Alias	None	*alias_name.* / NONE
Broadcast	Enabled	ENABLED / DISABLED
Console Port	None	*port_number* / NONE
Default Protocol	Lat	LAT / TCPIP / SERVER / RLOGIN / TELNET
Domain Name	None	*domain_name* / NONE
Fast Delay	50ms	10 to 5000 milliseconds
Inactivity Timer	00:30:00	*hh:mm:ss* 10 seconds to 10 hours
IP	0.0.0.0	*ddd.ddd.ddd.ddd* where *ddd* is a decimal value between 0 and 255
Learn Node	Disabled	ENABLED / DISABLED
Load Name	ELS48DLV.SYS	*file_name* / " "

Parameter	Defaults	Values
Local Prompt	LOCAL>	*"text_string"*
Lock	Enabled	ENABLED / DISABLED
Login Password	Access	*"text_string"* / " "
Login Prompt	#	*"text_string"*
Nodename Resolution	Remote	LOCAL / REMOTE
Password Limit	3	1 to 250
Privilege Password	System	*"password"*
Receive Buffer	Small	SMALL / MEDIUM / LARGE
Rlogin	Disabled	ENABLED / DISABLED
Security	Disabled	ENABLED / DISABLED
Session Limit	48	1 to 96
Subnet Mask	0.0.0.0	*ddd.ddd.ddd.ddd* where *ddd* is a decimal value between 0 and 255
TCPIP Checksum	Disabled	ENABLED / DISABLED
Welcome Message	Welcome to the Equinox Server Network	*"text_string"* / " "

TCP/IP services can be configured on the terminal server to meet your networking needs. Figure 5-2 displays the default services characteristics with the **SHOW SERVICES CHARACTERISTICS** command. Table 5-2 lists all of the service characteristics that can be configured for TCP/IP, their default values and valid configurations.

The **SET/DEFINE/CHANGE SERVICE LOCAL** command is used to configure services. *Appendix A Commands* provides additional information about each of the parameters.

```
Local Service: RC_00807D04D804
Identification: Remote Console on node LAT_00807D04D804
Ports:
Rating: 255
Announcements: Enabled                    Queuing: Disabled
Connections: Enabled                      Password: Disabled
```

Figure 5-2 SHOW SERVICES Display

Table 5-2 Service Parameters

Parameters	Default	Values
Announcements	Enabled	ENABLED / DISABLED
Connections	Enabled	ENABLED / DISABLED
Identification		*"text_string"* / " "
Ports	None	*port_range* / ALL / NONE
Queue	Disabled	ENABLED / DISABLED
Telnet	Disabled	ENABLED / DISABLED

Use **SET/DEFINE/CHANGE SERVICE REMOTE** to assign a name to a service that is associated with a specific TCP/IP socket.

Nodes are configured on the terminal server to meet your networking needs. Figure 5-3 displays the current node characteristics with the **SHOW NODES CHARACTERISTICS** command. Table 5-3 lists all of the TCP/IP characteristics that can be configured for nodes, their default values and valid configurations.

```
Node Name:  LAT_00807D04D805
Alias:                                  IP Address:        0.0.0.0
                                        Ethernet Address:  00-00-00-00-00-00
Identification:
TCP/IP connections  Disabled            NameServer:        Disabled
Gateway:            Disabled            NetIP Address:     0.0.0.0
```

Figure 5-3 SHOW NODES Display

Table 5-3 Nodes Parameters

Parameters	Default	Values
Address	00-00-00-00-00-00	*nn-nn-nn-nn-nn-nn* where *nn* is a hexadecimal digit
Alias	None	*alias_name* / NONE
Gateway	Disabled	ENABLED / DISABLED /DEFAULT
Identification	None	*"text_string"*
IP	0.0.0.0	*ddd.ddd.ddd.ddd* where *ddd* is a decimal value between 0 and 255
Nameserver	Disabled	ENABLED / DISABLED /DEFAULT
Netip	0.0.0.0	*ddd.ddd.ddd.ddd* where *ddd* is a decimal value between 0 and 255 / NONE
TCPIP	Disabled	ENABLED / DISABLED

Ports are configured to match the device connected to the port. Figure 5-4 displays the default port characteristics with the **SHOW PORT CHARACTERISTICS** command. Table 5-4 lists all of the port characteristics that can be configured for TCP/IP ports, their default values and valid configurations.

```
Port 1:                                          PORT_01

Input Speed:  9600 (auto)          Terminal Type:  Softcopy
Output Speed:  9600 (auto)         Session Limit:  4
Character Size:  8                 Default Protocol:  Server
Parity:  None                      Break:  Local
Flow Control:  Xon                 Local Switch:  None
Device Type:  Dataonly             Backwards Switch:  None
Access:  Local                     Forwards Switch:  None
Preferred Service:  None

Authorized Groups:  All
(Current) Groups:  All

Input Flow Control:  Enabled       Password:  Disabled
Output Flow Control:  Enabled      Interrupts:  Disabled
Remote Queuing:  Enabled           Security:  Disabled
Verification:  Enabled             Autobaud:  Enabled
Autoconnect:  Disabled             Autoprompt:  Enabled
Message Codes:  Enabled            Broadcast:  Enabled
Loss Notification:  Enabled        Inactivity:  Disabled
Multisessions:  Disabled           Pause:  Disabled
```

Figure 5-4 SHOW PORT Display

```
Port 1:                                          Port_01

Preferred Service -  None
TCP Node Name:  n/a
IP Address:  n/a                   Default Protocol:  Server
TCP Port Name:  n/a                Verbose:  Disabled
Socket:  n/a                       Icrlf:  Enabled
                                   Ocrlf:  Disabled
                                   TELNET Keys:  Disabled

TELNET Option   Loc     Rem        TELNET Command Key  Char

Echo:  Wont     Do                 Abort Output (AO):  None
Suppress GA:  Will      Do         Are You There (AYT):  None
Binary Transmit:  Wont  Dont       Break (BRK):  None
                                   Erase Char (EC):  None
                                   Erase Line (EL):  None
                                   Go Ahead (GA):  None
                                   Interrupt Process (IP):  None
                                   Clear Data Path (SYN):  None
```

Table 5-4 Port Parameters

Parameter	Default	Values
Access	Local	LOCAL / REMOTE / DYNAMIC / NONE
Autobaud	Enabled	ENABLED / DISABLED
Autoconnect	Disabled	ENABLED / DISABLED
Autoprompt	Enabled	ENABLED / DISABLED
Backwards Switch	None	*character / control character*
Break	Local	LOCAL / REMOTE / DISABLED
Broadcast	Enabled	ENABLED / DISABLED
Character Size	8	7 / 8
Control Autoconnect	Disabled	ENABLED / DISABLED
Control Connected	Pass	ON / OFF / PASS
Control Delay	Disabled	ENABLED / DISABLED
Control Disconnect	Disabled	ENABLED / DISABLED
Control Fade	Disabled	ENABLED / DISABLED
Control Idle	On	ON / OFF
Control Required	Disabled	ENABLED / DISABLED
Control Toggle	Disabled	ENABLED / DISABLED
Dedicated Service	None	*service_name* / NONE / IP *ip_address / node_name / node_name. / alias_name.*
Default Protocol	Lat	LAT / RLOGIN / SERVER / TCPIP / TELNET
Device Type	Dataonly	CENTRONICS / CUSTOM / DATAONLY / DATAPRODUCTS / DRT / MODEM / PC / PRINTER
Equal	None	*port_number*
Flow Control (Input) Flow Control (Output)	Enabled	ENABLED /DISABLED
Flow Control	Xon	CTLSIG / XON / XOFFANY
Forwards Switch	None	*character / control character*
Inactivity Logout	Disabled	DISABLED / LOCAL / SINGLE / MULTIPLE
Interrupts	Disabled	ENABLED / DISABLED
Local Switch	None	*character / control character*
Loss Notification	Enabled	ENABLED / DISABLED
Message Codes	Enabled	ENABLED / DISABLED
Multisession	Disabled	ENABLED / DISABLED
Name	Port_nn	*port_name*
Parity	None	NONE / ODD / EVEN / MARK / SPACE

Parameter	Default	Values
Password	Disabled	ENABLED / DISABLED
Pause	Disabled	ENABLED / DISABLED
Preferred Service	None	*service_name* / NONE / *tcp_port_name* / IP *ip_address* / Node *node_name(.) alias_name.*
Remote Queuing	Disabled	ENABLED / DISABLED
Security	Disabled	ENABLED / DISABLED
Session Limit	4	0 to 4
Speed (Input) Speed (Output)	9600 (autobaud) 9600 (autobaud)	75 to 38,400 bps
Telnet AO	None	*character* / NONE
Telnet AYT	None	*character* / NONE
Telnet Binary	Wont Dont	WILL / WONT • DO / DONT
Telnet Brk	None	*character* / NONE
Telnet Ec	None	*character* / NONE
Telnet Echo	Wont Dont	WILL / WONT • DO / DONT
Telnet El	None	*character* / None
Telnet Ga	None	*character* / None
Telnet ICRLF Telnet OCRLF	Enabled Disabled	ENABLED / DISABLED
Telnet Ip	None	*character* / NONE
Telnet Keys	Disabled	ENABLED / DISABLED
Telnet Suppress Ga	Will Do	WILL / WONT • DO / DONT
Telnet Syn	None	*character* / NONE
Telnet Verbose	Disabled	ENABLED / DISABLED
Type	Softcopy	ANSI / HARDCOPY / SOFTCOPY / TELEVIDEO_910 / VT100 / WYSE_60
Username	None	*user_name* / *"user_name"*
Verification	Enabled	ENABLED / DISABLED

Most host systems have the ability to send print jobs to other host systems via Ethernet. Usually the printing is sent as a file transfer from one host to the print spooler of the other host. While LAT hosts automatically share printers using host-initiated connections, TCP/IP hosts require some additional software. Equinox provides an answer to this problem with software called **RPRINT**.

RPRINT makes printing through a terminal server easier and more reliable. It lets you establish a connection to a printer that is connected to the terminal server. You load **RPRINT** onto your host system as an application. It monitors predefined *pipes* or **ptys** (half of a **pty/ttyp** device pair) for data. When **RPRINT** detects data, it establishes a network connection to the printer associated with that device and transfers the data to the printer. Once the data transfer is complete, the connection is broken so that other host systems may access the printer.

The system manager compiles the **RPRINT** program for the particular host system. Then it is a simple matter of setting up print queues using a named *pipe* or a **pty** device as the printer device. This takes the place of a typical **tty** device. When **RPRINT** starts it reads the **EQUINOX.CONF** file. This file indicates which *pipe* or **pty** is associated with which printer and terminal server.

- ❑ The user sends a print job to the printer queue, for example, **LASER**.
- ❑ The host print spooler receives the print job. It uses the predefined parameters in the printer interface file for **LASER** to send the print job to the assigned device, which may be a named *pipe*, or a **pty**. When you use the **pty/ttyp** device pair, the spooler uses the **ttyp** device and **RPRINT** uses the **pty** device.
- ❑ **RPRINT** runs in the background where it monitors all *pipes* and **ptys** that are configured in the **EQUINOX.CONF** file. When it finds data in the *pipe* associated with **LASER**, **RPRINT** creates a copy of itself to handle the job and establishes a network connection to the printer associated with the *pipe*. All of the data that goes into the *pipe* from the spooler is transferred

to the printer. The network connection is disconnected after all of the data has been transferred.

Using this process, you can have multiple *pipes* and **ptys** serviced by a single **RPRINT** master process. You do not have to maintain separate copies of the program for each printer.

The **RPRINT** software is available from Equinox in either DOS or UNIX **tar** formats. In either case, the following files need to be copied to the UNIX system and compiled using the UNIX **make** command.

```
makefile
rprint.c
util.c
rprint.h
equinox.con
```

The following procedure sets forth the steps to follow to create the necessary files and configure your network for remote printing via the server:

Step 1 Create a directory for the **rprint** files on the UNIX system.

```
#mkdir rprint
#cd rprint
```

Step 2 Copy the files into the newly created subdirectory.

- ❑ If you are copying the files from a DOS formatted diskette, follow these steps:

```
#doscp a:rprint.c /rprint
#doscp a:rprint.h /rprint
#doscp a:util.c /rprint
#doscp a:equinox.con /rprint
#doscp a:makefile /rprint
```

Note: After copying the files, rename the file ***equinox.con*** *to* ***equinox.conf****.*

- ❑ If you are copying the files from a UNIX **tar** formatted diskette, follow these steps:

```
#tar xv2
```

Note: This example assumes you are using SCO UNIX/ XENIX with high density drives. Verify the correct commands for your particular configuration.

Step 3 Edit the file **makefile** to match your system. System configurations for SCO UNIX/XENIX, Interactive and other operating systems are already in the file. Uncomment the operating system parameters that are correct for your system.

Step 4 Run the **make** command. This will recompile **rprint.c** into an executable file for use by the system.

```
#make
```

Step 5 If you are using a *pipe*, create a named *pipe* for the printer:

```
#mknod /rprint/pipe1 p
```

Note: The location and pipe name are not important. You do, however, need to make a note of what they are.

Step 6 Create a printer and assign it to use the named *pipe* or **ttyp**. If your system uses **LPADMIN** the command is:

```
#/usr/lib/lpadmin -v/rprint/pipe1 -plaser -mhplaser
```

This creates a printer spool queue named **laser** that will use the named *pipe* **/rprint/pipe1** and the printer interface driver **hplaser.**

Step 7 Start the print scheduler, enable the queue for **LASER** and allow it to accept jobs:

```
#/usr/lib/lpsched
#/usr/lib/enable laser
#/usr/lib/accept laser
```

Step 8 Create a **REVERSE TELNET** service for the printer connected to the terminal server. For example, to set up a service called **LASER** on port 1 of a terminal server with a socket of 3001:

```
Local> set privilege
Password> (enter privilege password)
Local>> change service laser 3001 port 1 telnet enable
Local>> change port 1 access remote
Local>> change port 1 device printer
Local>> change port 1 speed 38400
Local>> change port 1 autobaud disable
Local>> change port 1 broadcast disable
Local>> change port 1 verification disable
Local>> change port 1 loss notification disable
```

Modify the parameters in the above example to suit your particular application. For example, if your printer will not be accessed by DEC LAT hosts, use the following command to keep the service from being announced as a LAT service:

```
Local>> change service laser announcements disable
```

You can test the connection from the terminal server by connecting to it with the following command:

```
Local> connect telnet laser
```

A connection should be established with any data you send from the keyboard going to the printer. You may need to enter a **[CTRL-L]** or perform a manual form feed on the printer to get a printout.

Step 9 Edit the **/etc/hosts** file of the UNIX system to include the name and IP address of the terminal server.

Step 10 Verify that the host can connect to the **REVERSE TELNET** service on the terminal server using the **TELNET** protocol. If you do not specify 3001 as the socket number, connection will probably be refused. If your system is unable to request a **TELNET** connection in this manner, change the socket number on the service from 3001 to 23 for this step.

Step 11 Edit the **equinox.conf** file to include the host name, *pipe* or **pty** device path and the socket number for each remote printer to be supported by **rprint.**

equinox.conf is a text file with the following format:

```
host_name   pipe_name/device_name  socket_number
```

where

host_name is the terminal server node name as it appears in the **/etc/hosts** file;
pipe_name/device_name is the path to the pipe created in step 5 or the path to the **pty ttyp** device pair to be used;
socket_number is the socket number assigned to the printer port on the terminal server.

Step 12 Start the **rprint** program in the background:

```
#./rprint &
```

For each entry in **equinox.conf**, the system will respond with:

```
HOST=host_name PIPE=/path
SOCKET=socket_number
```

Step 13 Print a job to the printer **laser:**

```
#lp -dlaser filename
```

The job should print on the printer connected to the terminal server.

Checking the Status of the Print Queue

- ❑ Check the status of the print queue with the following command:

```
#lpstat (or lpstat -a)
```

- ❑ Check the status of the network connection to the terminal server with the following command:

```
#netstat (or netstat -a) not applicable on all systems
```

netstat will show an established connection between the host and the terminal server during the transfer. After the transfer the status will change to *time_wait* and then drop.

In Conclusion

After you have successfully tested the network printing through the terminal server, **RPRINT** can be initialized from a startup file. For example, you might place it in **/etc/rc.d/8** in SCO XENIX or **/etc/rc.2** in SCO UNIX at boot time.

Repeat the procedure for each system that needs to access the remote printer. If there are no print jobs being processed, the **ps** command will show a single **RPRINT** process running. **RPRINT** scans all assigned *pipes* and **ptys** for data. When **rprint** detects data, it creates a second process to handle the transfer to the printer via Ethernet. When you add a printer to the system, exit **equinox.conf**, then stop and restart **RPRINT.**

The remainder of this chapter provides examples of configuring and using the server, services, and ports with the TCP/IP protocol.

- The examples include a mix of full and abbreviated commands to give you a feel for the commands and their abbreviations. More complete information about commands and their usage can be found in *Appendix A Commands*.

- You may enter more than one parameter on a command line. The examples include a mix of command lines with single parameter changes and commands that contain multiple parameters to give you a better understanding of combining parameters.

The examples make the following assumptions in order to establish a networking environment:

- There is a 486 PC running the SCO UNIX operating system connected to an existing Ethernet network.

- A terminal server is being added to the Ethernet network. It will be configured for TCP/IP protocol only.

- The terminal server hardware has been installed following the instructions found in *Chapter 2 Hardware Installation*.

- The completed worksheets that define the devices and the services on the network are shown in Figures 5-5 and 5-6.

- The **SET** command has been used to make changes to the server configurations. This changes the operational database only. The next time the server is initialized, the default settings will be restored. Use the **DEFINE** command to effect the changes in the permanent database. Changes will take place the next time you initialize the terminal server. Use the **CHANGE** command to make the changes to both the permanent and operational databases simultaneously.

Ethernet Address *00807D047E07* **Server Name** *SRV 1*

PORT #	DEVICE	REMOTE LOCAL DYNAMIC	LAT/ SERVICE		TCP/IP ONLY		LAT & TCP/IP	
			LAT	Service	TCP	Service	Both	Service
1	Terminal	L	no	no	yes	no	no	no
2	Terminal	L	no	no	yes	no	no	no
3	Terminal	L	no	no	yes	no	no	no
4	Terminal	L	no	no	yes	no	no	no
5	Terminal	L	no	no	yes	no	no	no
6	PC	L	no	no	yes	no	no	no
7	PC	L	no	no	yes	no	no	no
8	Serial Printer	R	no	no	yes	yes	no	no
9	Modem_in	L	no	non	yes	no	no	no
10	Modem_out	R	no	no	yes	yes	no	no
11	Modem_in_out	D	no	no	yes	yes	no	no
12	Data General	R	no	no	yes	yes	no	no
13	Data General	R	no	no	yes	yes	no	no
14	Data General	R	no	no	yes	yes	no	no
15	PLC_2	R	no	no	yes	no	no	no
16	PLC_1	R	no	no	yes	no	no	no
37	Parallel Printer	R	no	no	yes	yes	no	no

Figure 5-5 Example Worksheet #1

Device (Ports)/ **Host** (Nodes)	**Username**	**Services (N=Network; L=Local)**						
		UNIX (N)	*Serial Printer (L)*	*Modem Out (L)*	*Modem In/Out (L)*	*Data General (L)*	*PLC (L)*	*Parallel Printer (L)*
Terminals Ports 1-3	*101 202 205*	*dedicated*	*no*	*no*	*no*	*no*	*no*	*no*
Terminals Ports 4-5	*206 301*	*none*	*yes*	*yes*	*yes*	*yes*	*no*	*no*
PC's Ports 6-7	*John Hershey*	*preferred*	*yes*	*yes*	*yes*	*yes*	*no*	*no*
Serial printer Port 8	*Laser*	*no*	*no*	*no*	*no*	*no*	*no*	*no*
Modem In Port 9	*Modem-In*	*yes*	*no*	*no*	*no*	*yes*	*no*	*no*
Modem Out Port 10	*Modem-Out*	*no*	*no*	*no*	*no*	*no*	*no*	*no*
Modem In/Out Port 11	*Modem In/Out*	*yes*	*no*	*no*	*no*	*no*	*no*	*no*
DataGeneral Ports 12-16	*DG*	*no*	*no*	*no*	*no*	*no*	*no*	*no*
PLC Ports 17-18	*PLC_1 PLC_2*	*no*	*no*	*no*	*no*	*no*	*no*	*no*
Parallel Printer Port 37	*Parallel*	*no*	*no*	*no*	*no*	*no*	*no*	*no*
UNIX host Node	*UNIX*		*yes*	*yes*	*yes*	*no*	*yes*	*yes*

Figure 5-6 Example Worksheet #2

Example # 1 Privileged Status and Security

In this example, you log onto the server, enable privileged status, change passwords for security purposes and enable command line editing and recall.

Step 1 ❑ Press **[Return]** from the terminal keyboard.

❑ If using a PC as a terminal, load the terminal emulation software (e.g. Procomm, Xtalk, etc.) and set the following parameters:

Terminal type	**VT100**
Speed	**Autobaud**
Parity	**None**
Stop bits	**8**
COM port	***user determined***

Enter terminal mode and press **[Return]**.

Step 2 The initial screen displays:

```
LAT_00807D047E07
EQUINOX SYSTEMS
WELCOME
```

The top line contains the Ethernet address of the terminal server.

Step 3 The following prompt displays:

```
USERNAME> john
LOCAL>
```

Enter any character except the letter H at the prompt. Typically you would enter your name or the terminal location.

Step 4 Enable privileged mode to permit access to all of the terminal server commands:

```
LOCAL> set privileged
PASSWORD> system
LOCAL>>
```

Step 5 Change the port type to **ANSI** to take advantage of command line editing. Configure a break key to make it possible to get out of sessions easily.

```
LOCAL> set port type ansi
LOCAL> set port local ^I
```

Step 6 Change the privileged password to protect system integrity.

```
LOCAL>> set server privileged password "mauve"
```

You can reset the password to factory default by resetting the terminal server. This should be done with caution because it does reset **all** of the terminal server configuration to factory default values.

Step 7 You should prevent others from accessing the privileged commands when you are not on the server. Issue the **SET NOPRIVILEGED** command or log out of the server at your port.

Example # 2 Configuring The Server

The terminal server needs to be configured for the TCP/IP protocol.

Step 1 Change the Internet (IP) address and the server name. Change the default protocol to TCP/IP:

```
LOCAL>> set server ip 200.200.0.0
LOCAL>> set server name srv_1
LOCAL>> set server default protocol tcpip
```

Step 2 Enable the server to learn TCP/IP services. Display the nodes available to the server:

```
LOCAL>> set server learn node enable
LOCAL>> sho nodes
```

Note: If the status for a node is LEARNED, the node is a TCP/IP node.

Step 3 If the node is not listed, ARP or RWHO may not be running on the remote host.

- ❑ If there is no Domain Name Server, perform the following steps to assign a name to a remote service:

```
LOCAL>> set service remote unix ip 200.201.0.0 iden "Unix Host"
LOCAL>> show service unix char
```

where

unix is the name of the remote service
200.201.0.0 is the internet address of the remote service
"Unix Host" is a phrase that identifies the remote host

- ❑ If there is a Domain Name Server (DNS) and it supports ARP and RWHO, identify the nameserver by node and enable DNS:

```
LOCAL>> set node unix nameserver default
```

- ❑ If there is a Domain Name Server and it does not support ARP or RWHO, contact your network manager to obtain the node name and internet address of the nameserver. Then perform the following commands:

```
LOCAL>> set node unix ip 200.201.0.0
LOCAL>> set node unix nameserver default
```

Step 4 The server configuration is now complete.

Example # 3 Configuring Terminals and PCs

```
Port 1:                                          101

Input Speed:  9600 (auto)                Terminal Type:  Ansi
Output Speed:  9600 (auto)               Session Limit:  4
Character Size:  8                       Default Protocol:  Telnet
Parity:  None                            Break:  Local
Flow Control:  Xon                       Local Switch:  ^L
Device Type:  Dataonly                   Backwards Switch:  ^H
Access:  Local                           Forwards Switch:  ^F
Dedicated Service:  None

Authorized Groups:  All
(Current) Groups:  All

Input Flow Control:  Enabled             Password:  Disabled
Output Flow Control:  Enabled            Interrupts:  Disabled
Remote Queuing:  Enabled                 Security:  Disabled
Verification:  Enabled                   Autobaud:  Enabled
Autoconnect:  Disabled                   Autoprompt:  Enabled
Message Codes:  Enabled                  Broadcast:  Enabled
Loss Notification:  Enabled              Inactivity:  Disabled
Multisessions:  Disabled                 Pause:  Disabled
```

Figure 5-7 SHOW PORT 1

①	**set ports 1-7 type ansi**	Permits command line editing and recall
②	**set ports 1-7 local ^l** **set ports 1-7 forward ^h** **set ports 1-7 backward ^f**	Establishes a break key to get out of sessions easily. Defines switch characters for moving between sessions.
③	**set ports 4-5 sessions 2**	Limits the number of active sessions on ports 4 & 5 to two.
④	**set port 1 name 101** **set port 2 name 102** **set port 3 name 103** **set port 4 name 104** **set port 5 name 105** **set port 6 name john** **set port 7 name ashley**	Assigns names to each port that uniquely identify the individual port. This assists later when you are troubleshooting the system.
⑤	**set port 1-7 default protocol telnet**	Changes the default protocol for the terminals and PCs to **TELNET**.
⑥	**show port 1 char**	Displays the new port characteristics (*Figure 5-7*).

Example # 4 Configuring A Serial Printer as a Service

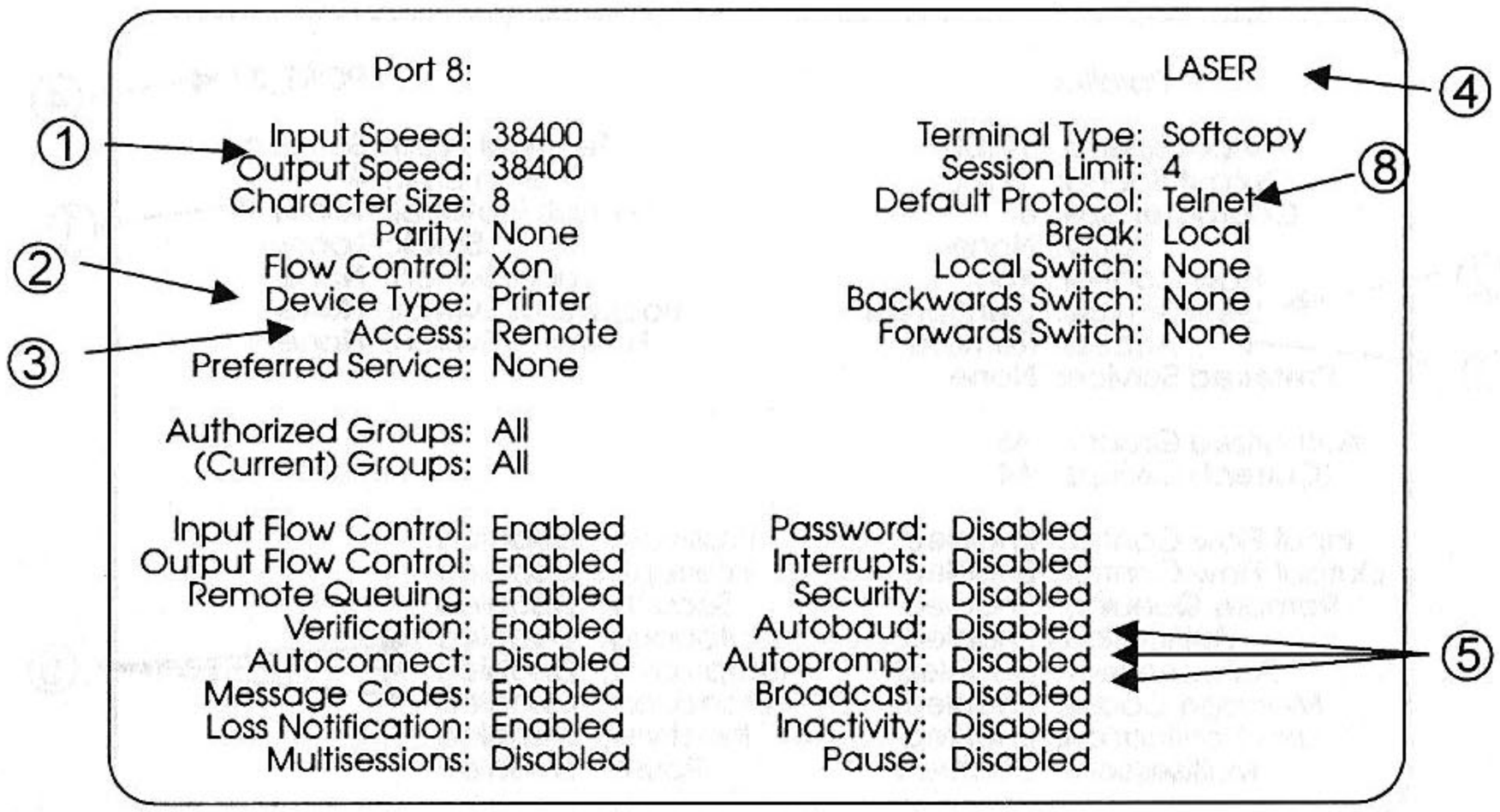


Figure 5-8 SHOW PORT 8

①	**set port 8 speed 38.4**	Changes the default input and output speed to 38.4.
②	**set port 8 device printer**	Changes the device type to printer thus permitting correct control signal handling.
③	**set port 8 access remote**	Permits the printer to receive calls only.
④	**set port 8 name laser**	Assigns a name to the printer.
⑤	**set port 8 autobaud disabled** **set port 8 autoprompt disabled** **set port 8 broadcast disabled**	Turns off autobaud, autoprompt and broadcasting of messages.
⑥	**show port 8 char**	Displays the new port characteristics (*Figure 5-8*).
⑦	**set service 8 ident "laser printer"**	Configures the printer as a service.
⑧	**set port 8 default protocol telnet**	Makes **TELNET** the default protocol for the port.

Example #5 Configuring A Parallel Printer As A Service

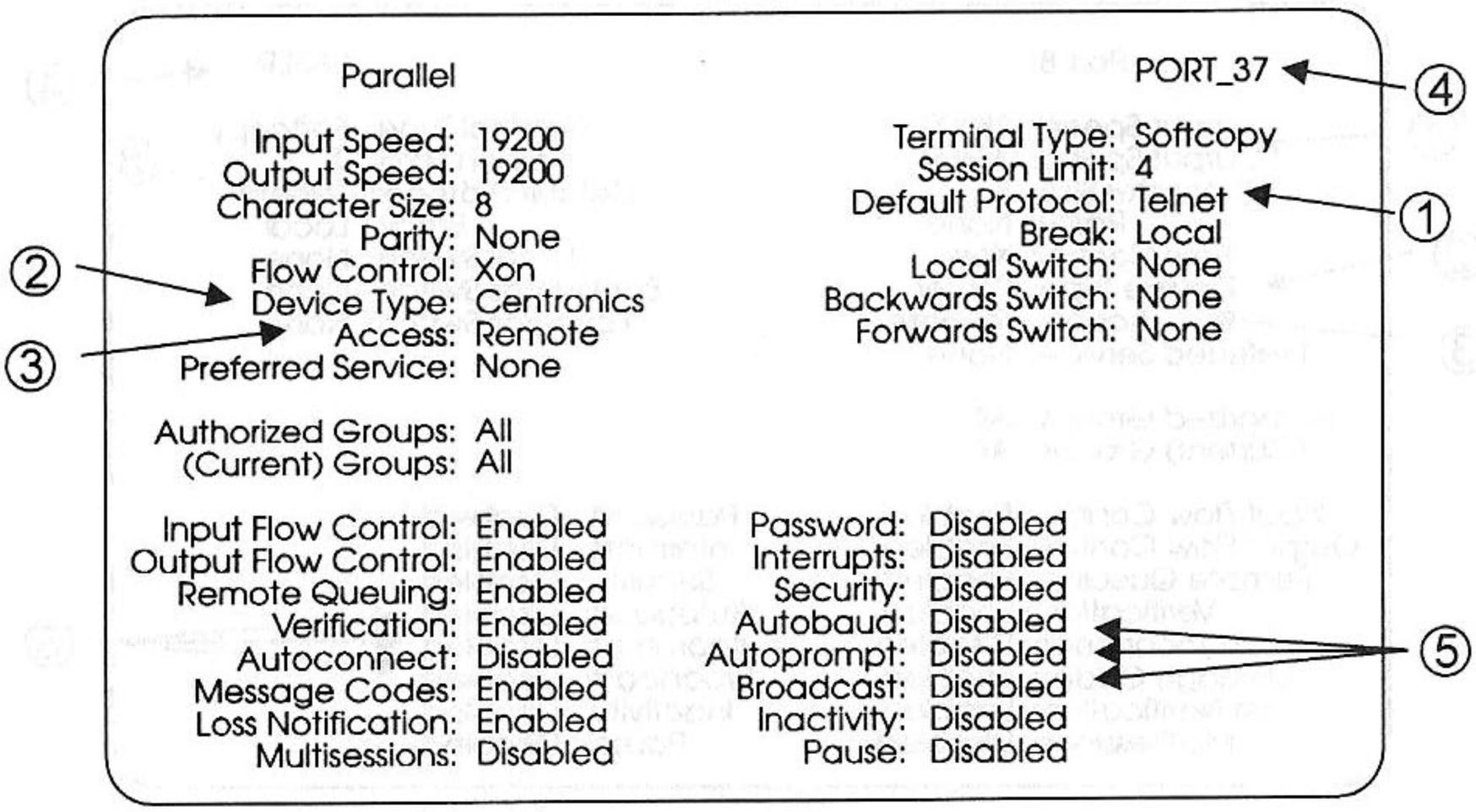


Figure 5-9 SHOW PORT 37

① **set port 37 default protocol telnet**

Changes the default protocol to **TELNET**. Use the **CONNECT** command to connect with a different protocol.

② **set port 37 device centronics**

Changes the device type to Centronics thus permitting correct control signal handling.

③ **set port 37 access remote**

Permits the printer to receive call only.

④ **set port 37 username parallel**

Assigns a username to the printer.

⑤ **set port 37 autobaud disabled**
set port 37 autoprompt disabled
set port 37 broadcast disabled

Turns off autobaud, autoprompt and broadcasting of messages.

⑥ **show port 8 char**

Displays the new port characteristics (*Figure 5-9*).

⑦ **set service parallel 37 port 37 telnet enabled ident "parallel printer port"**

Configures the parallel printer as a service.

Example #6 Configuring A Printer for Unix

Step 1 *Note: The example in this section assumes you are using SCO UNIX/XENIX with high density drives. Verify the correct commands for your particular configuration.*

Create a directory for the **RPRINT** files on the UNIX system. Copy all files into the newly created subdirectory:

```
# mkdir rprint
# cd rprint
```

Step 2 If you are copying files from a DOS formatted diskette, follow these steps:

```
$ doscp a:rprint.c /rprint
$ doscp a:rprint.h /rprint
$doscp a:util.c /rprint
$doscp a:equinox.con /rprint
$doscp a:makefile /rprint
```

Rename the file **equinox.con** to **equinox.conf.**

If you are copying the files from a UNIX **tar** formatted diskette, follow these steps:

```
# tar xv2
```

Step 3 Edit **makefile** to match your system. System configurations for SCO UNIX/XENIX, Interactive and other operating systems are already in the file. Uncomment the operating system parameters that are correct for your system.

Step 4 Run the **make** command. This recompiles **rprint.c** into an executable file for use by your system.

Step 5 If you are using a *pipe*, create a named *pipe* for the printer:

```
# mknod /rprint/pipe1 p
```

Note: The location and pipe names are not important. You do, however, need to make a note of what they are.

Step 6 Create a printer and assign it to use the name *pipe* or **ttyp.** If your system used **LPADMIN**, the command is:

```
# /usr/lib/lpadmin -v/print/pipe1 -plaser /mhplaser
```

This creates a printer spool queue named **LASER** that uses the named *pipe* **/rprint/pipe1** and the printer interface driver **hplaser.**

Step 7 Start the print scheduler, enable the queue for **LASER** and allow it to accept jobs:

```
# /usr/lib/lpsched
# /usr/lib/enable laser
# /usr/lib/accept laser
```

Step 8 Create a **REVERSE TELNET** server for the printer connected to the terminal server. In our example, a service called **LASER** is set up on port 8 of the server with a socket number of 3008.

```
LOCAL>> set service laser 3008 port 8 telnet enabled
```

Step 9 Disable service announcements because the printers on this server will not be accessed by a DEC LAT host.

```
LOCAL>> set service laser announcements disable
```

Step 10 Test the connection from the terminal server by connecting to it with the following command.

```
LOCAL>> connect telnet laser
```

A connection is established with any data sent from the keyboard to the printer.

Step 11 Edit the **/etc/hosts** file of the UNIX system to include the name and internet address of the terminal server.

Step 12 Verify that the host can connect to the **REVERSE TELNET** service on the terminal service using **TELNET** protocol. Specify 3008 as the socket number or the connection will be refused. If your system is not able to request a **TELNET** connection in this manner, change the socket number on the service from 3008 to 23 for this step.

Step 13 Edit the **equinox.conf** file to include the host name, *pipe* or **pty** device path and the socket number for each remote printer to be supported by **RPRINT. equinox.conf** is a text file with the following format:

```
host_name pipe-name/device_name socket_number
```

where

host_name is the terminal server node name as it appears in the **/etc/hosts** file;
pipe_name/device_name is the path to the pipe or to the **pty ttyp** device pair to be used;
socket_number is the socket number assigned to the printer port on the terminal server.

Our file would contain the following:

```
unix pipe1 3008
```

Step 14 Start the **rprint** program in the background.

```
# ./rprint &
```

For each entry in the **equinox.conf**, the system will respond with:

```
HOST=host_name PIPE=/path
SOCKET=socket_number
```

Step 15 Print a job to the printer **LASER:**

```
# lp -dlaser filename
```

The job should print on the printer connected to the terminal server.

Step 16 After the testing has been completed successfully, **RPRINT** can be initialized from a startup file. For example, place it in **/etc/rc.d/8** in SCO XENIX or **/etc/rc.2** in SCO UNIX at boot time.

Example # 7 Configuring Modems

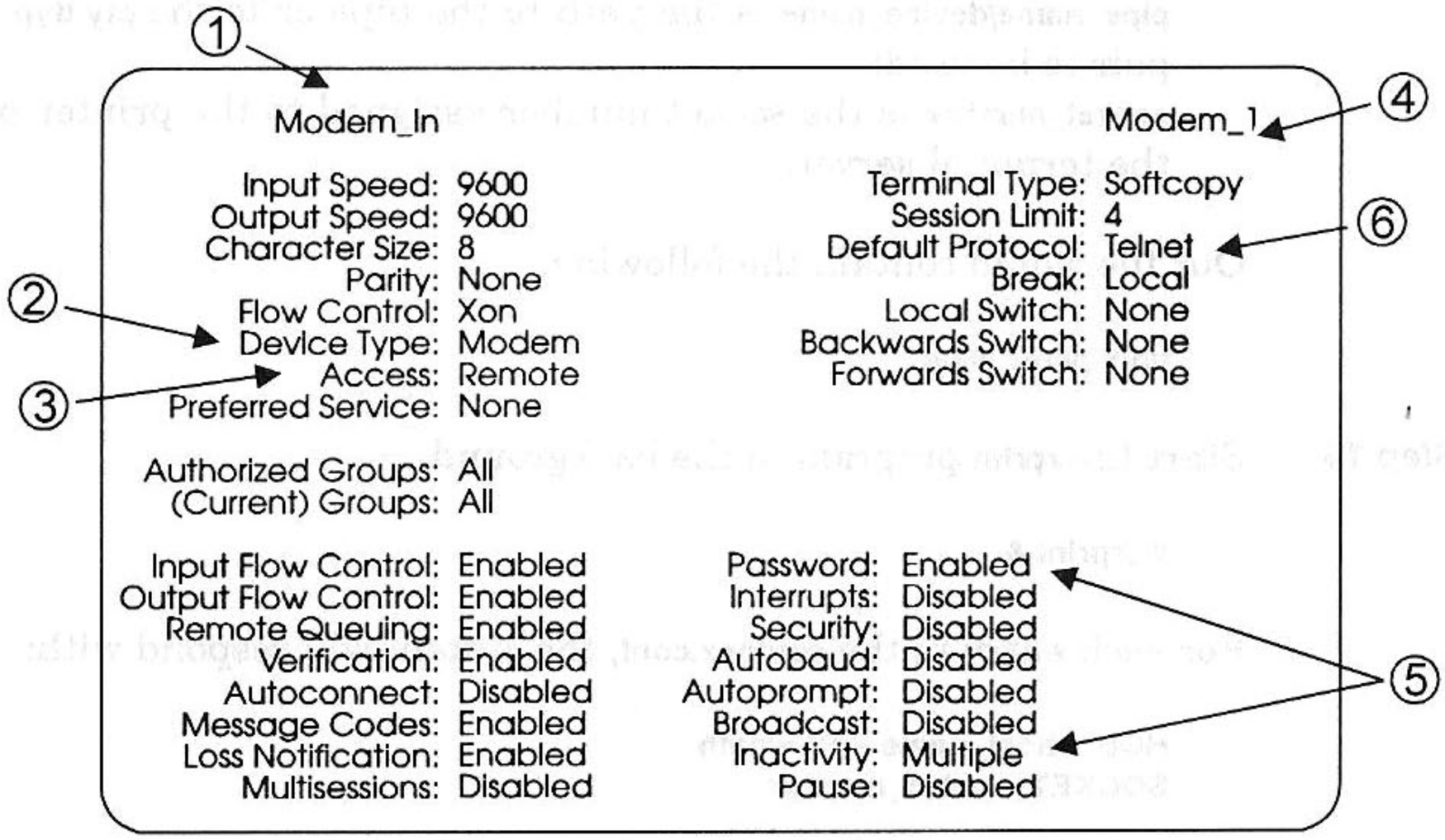


Figure 5-10 SHOW PORT 9

① **set port 9 username modem_in**
set port 10 username modem_out
set port 11 username modem_inout

Defines a username for each modem port.

② **set port 9-11 device modem**

Defines the device type for the devices on ports 9-11 as modem.

③ **set port 10 access remote**

Configures port 10 as a remote access port.

④ **set port 9 name modem_1**
set port 10 name modem_2
set port 11 name modem_3

Assigns a name to each modem.

⑤ **set port 9 password enabled**
set port 9 password "chocolate"
set port 9-11 inactivity multiple

Defines a password and enables its use for the modem on port 9. Sets the inactivity logout to multiple so that the server automatically logs the port out after a specified period of inactivity.

⑥ **set port 9 default protocol telnet**

Changes the default protocol on port 9 to TELNET.

⑦ **show port 9 char**

Displays the new port characteristics for the ports (*Figure 6-6*).

⑧ **set service modem_pool port 10-11**
ident "modem pool" pass "mint"

Creates a modem pool as a service.

⑨ Configures the Unix host for the modems. Connects to the UNIX host and set up the modems for any site-specific terminal characteristics.

Example # 8 Configure A Host Computer As A Service

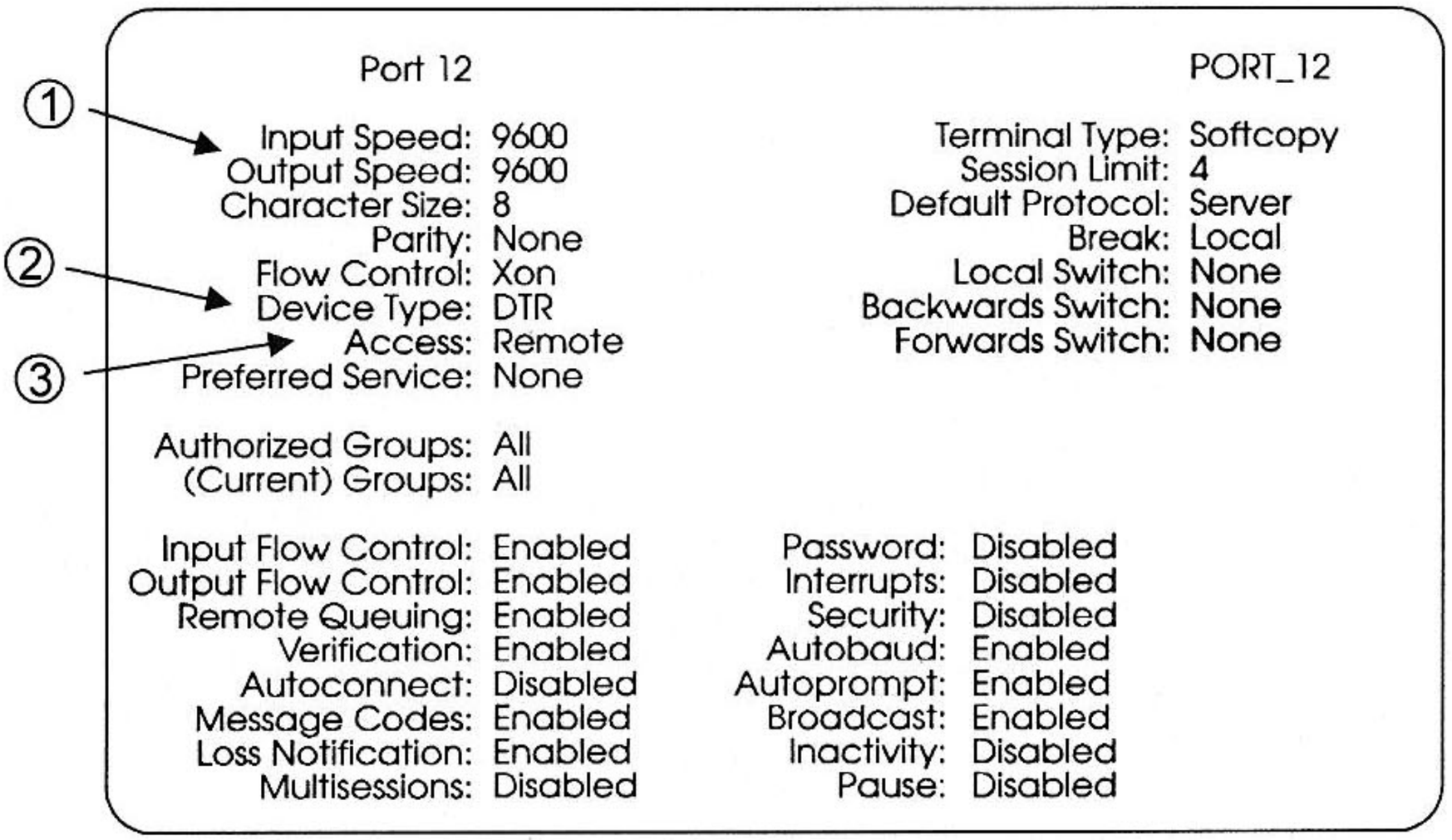


Figure 5-11 SHOW PORT 12

① **set ports 12-14 speed 19200**
set ports 12-14 char 8

Sets the port speed to 19,200 with character bits 8.

② **set ports 12-14 device type dtr**

Defines the device type to DTR.

③ **set ports 12-14 access remote**

Configures the ports as remote access ports.

④ **set service dg ports 12-14 ident "data general" telnet enabled**
set service password "secret"

Configures the Data General a service. Assigns an identifying string to the port and sets security with a password.

⑤ **show port 12 char**

Displays the port characteristics (*Figure 6-7*).

Example # 9 A Terminal Server Session

You can access serial devices such as modems, printers and host computers when your PC or terminal is connected to an ELS-8 or ELS-16 terminal server.

Logging On

❑ Press **[Return]** from your terminal keyboard.

❑ If you are using a PC as a terminal, load the terminal emulation software (e.g., Procomm, Xtalk, etc.) and set the following parameters:

Terminal Type	**VT100**
Speed	**Autobaud**
Parity	**None**
Stop Bits	**8**
COM port	***user determined***

Enter terminal mode and press **[Return]**.

❑ The terminal server initial screen displays:

```
LAT_00807D047E07
Equinox Systems
Welcome
```

❑ The following prompt displays:

```
USERNAME> john
LOCAL>
```

Enter the username assigned by your network administrator. If a name has not been assigned, enter any character except H at the prompt.

Begin A Session

❑ List the services available to you:

```
LOCAL> show services
```

❑ A list of all the services you can access displays. Access the Unix host which is on our network.

```
LOCAL> connect unix
```

You are now connected to your Unix host. Use it as you would normally.

Chapter 6 Using Dual Protocol

Chapter 6 explains how to configure the ELS-8 / ELS-16 as a dual protocol terminal server. The default protocol for the terminal server is LAT. After powering on the terminal server, you configure the server and then the ports for the protocols you plan to use. Unless you make a major change to your network, most of these parameters will need to be set only once. This chapter will take you through the configuration process. If you are already familiar with dual protocol terminal server operation, you may want to refer to the *Quick Start* section of this chapter. *Quick Start* is followed by a detailed tutorial on setting up the server, devices and services for dual protocol. For detailed explanation of commands, refer to the *Appendix A Commands*.

What is Dual Protocol?

The ELS-8 and ELS-16 terminal servers support LAT and TCP/IP protocols. LAT is a protocol developed by DEC (Digital Equipment Corporation) for local network terminal connections. It is supported on most DEC operating systems. TCP/IP network protocol is supported through **TELNET** and **RLOGIN**. Most UNIX systems support TCP/IP.

The default protocol for the server is LAT. The default protocol for each port is SERVER. You can configure the server to TCP/IP and individually configure ports for default protocols. Set up the ports to support the most commonly used protocol for that port. You can change protocols for a port by connecting to the port using the **CONNECT** command with a different protocol entered as an option.

LAT The LAT protocol was developed by DEC to make local area networking easy to manage and use. Services are provided by the LAT node to offer resources such as applications on hosts, printers and modems to be networked.

RLOGIN **RLOGIN** is a protocol that lets you initiate TCP/IP sessions. It is offered by Berkeley 4.3 BSD UNIX systems and permits users of one machine to connect to other UNIX systems across the Internet. Terminals work as if they were connected directly to the system.

TCP/IP TCP/IP is an acronym for Transmission Control Protocol/ Internet Protocol. It provides a reliable, full duplex service on which many application protocols depend. Using TCP/IP, you can send data from an application on one machine to an application on another. The Internet protocol provides the basis for a connectionless, best-effort packet delivery system.

TELNET **TELNET** is the Internet standard protocol for remote terminal connection service. It uses the TCP/IP network protocols to create terminal connections to any networked host that supports **TELNET**. **TELNET** is supported on most UNIX systems.

Using the **TELNET** protocol, a user on a network can access a foreign host and start a session. It doesn't matter what type of computer or operating system is on the foreign host, nor does it matter to the foreign host what type of terminal is connected.

Domain Name Servers

The ELS-8 and ELS-16 terminal servers support the use of **DOMAIN NAME SERVERS** that permit a network name server to translate text node names into numeric Internet (IP) addresses. This lets you use a host name when an IP address is required.

If you are familiar with configuring the terminal server, use the following steps as a guideline to setting up your server:

Step 1 **Plan your network.**
Complete the worksheets in *Appendix E*. This will provide you with a record of your network.

Step 2 **Install your hardware.**
Refer to *Chapter 2* of this manual for additional information.

Step 3 **Power up your server.**
Verify that the server has power and the LEDs indicate correct operation. Refer to *Chapter 3* for additional information.

Step 4 **Configure your server.**
In you need help, refer to *Configuring your server* in this chapter and to the **SET/DEFINE/CHANGE SERVER** commands in *Appendix A Commands*.

Step 5 **Configure terminals and PCs.**
If you need help, refer to *Configuring terminals and PCs* in this chapter and to *Appendix A Commands*.

Step 6 **Configure serial and parallel printers.**
If you need help, refer to *Configuring serial printers* and *Configuring parallel printers* in this chapter and to *Appendix A Commands*.

Step 7 **Configure modems.**
If you need help, refer to *Configuring modems* in this chapter and to *Appendix A Commands*.

Step 8 **Configure host computers.**
If you need help, refer to *Configuring host computers* in this chapter and to *Appendix A Commands*.

Step 9 **Configure any miscellaneous serial device types.**
Configure PLCs (Programmable Logic Controller), ATM machines, etc. If you need help, refer to *Appendix A Commands*.

Dual Protocol Configuration Example

Chapters 4 and 5 provide detailed information on configuring for LAT and TCP/IP. Please familiarize yourself with the material in these two chapters before proceeding with the following examples. The examples describe the installation of an ELS-16 terminal server using both LAT and TCP/IP protocols. Note the following as the network develops:

- The examples includes a mix of full and abbreviated commands to give you a feel for the commands and their abbreviations. More complete information about commands and their usage can be found in *Appendix A Commands*.

- You may enter more than one parameter on a command line. The examples include a mix of command lines with single parameter changes and commands that contain multiple parameters to give you a better understanding about combining parameters.

The examples make the following assumptions in orders to establish a networking environment:

- There is a VAX computer running the VMS 5.5 operating system. It is connected to an existing Ethernet network.

- There is a 486 PC running the SCO UNIX operating system. It is connected to an existing Ethernet network.

- An ELS-16 terminal server is being added to the Ethernet network. It will be configured for both LAT and TCP/IP protocols.

- The completed worksheets that define the devices and the services on the network are shown in Figures 6-1 and 6-2. Use the worksheets to identify which services a port can access, whether local, network or both. Network services are services offered to the server. Local services are offered by the server.

- ❑ The terminal server hardware has been installed and the devices connected to the server. Refer to *Chapter 2 Hardware Installation* for information on hardware installation.

- ❑ The **SET** command has been used to make changes to the server configurations. This changes the operational database only. The next time the server is initialized, the default settings will be restored. Use the **DEFINE** command to effect the changes in the permanent database. Changes will take place the next time you initialize the terminal server. Use the **CHANGE** command to make the changes to both the operational and permanent databases simultaneously.

Ethernet Address *00807D047E07* **Server Name** SRV 1

PORT #	DEVICE	REMOTE LOCAL DYNAMIC	LAT/ SERVICE		TCP/IP ONLY		LAT & TCP/IP	
			LAT	Service	TCP	Service	Both	Service
1	Terminals	L	yes	no	yes	no	yes	no
2	Terminal	L	yes	no	yes	no	yes	no
3	Terminal	L	yes	no	yes	no	yes	no
4	Terminal	L	yes	no	yes	no	yes	no
5	Terminal	L	yes	no	yes	no	yes	no
6	PC	L	yes	no	yes	no	yes	no
7	PC	L	yes	no	yes	no	yes	no
8	Serial Printer	R	yes	yes	yes	yes	yes	yes
9	Modem_In	L	yes	no	yes	no	yes	no
10	Modem_Out	R	yes	yes	yes	yes	yes	yes
11	Modem_InOut	D	yes	yes	yes	yes	yes	yes
12	Data General	R	yes	yes	yes	yes	yes	yes
13	Data General	R	yes	yes	yes	yes	yes	yes
14	Data General	R	yes	yes	yes	yes	yes	yes
15	PLC	R	yes	no	yes	no	yes	no
16	PLC	R	yes	no	yes	no	yes	no
37	Parallel Printer	R	yes	yes	yes	yes	yes	yes

Figure 6-1 Worksheet #1

Device (Ports)/ Host (Nodes)	Username	Services (N=Network; L=Local)							
		VAX (N)	*Serial Printer (L)*	*Modem Out (L)*	*Modem In/Out (L)*	*Data General (L)*	*PLC (L)*	*Parallel Printer (L)*	*UNIX (N)*
Terminals Ports 1-5	*101 202 205*	*yes*	*no*	*no*	*no*	*no*	*no*	*no*	*yes*
Terminals Ports 6-7	*206 301*	*yes*	*yes*	*no*	*no*	*yes*	*no*	*no*	*yes*
PC's Ports 6-7	*John Hershey*	*yes*	*yes*	*yes*	*yes*	*yes*	*no*	*no*	*yes*
Serial printer Port 8	*Laser*	*no*	*no*	*no*	*no*	*no*	*no*	*no*	*no*
Modem In Port 9	*Modem-In*	*yes*	*no*	*no*	*no*	*yes*	*no*	*no*	*yes*
Modem Out Port 10	*Modem-Out*	*no*	*no*	*no*	*no*	*no*	*no*	*no*	*no*
Modem In/Out Port 11	*Modem In/Out*	*yes*	*no*	*no*	*no*	*no*	*no*	*no*	*yes*
DataGeneral Ports 12-14	*DG*	*no*	*no*	*no*	*no*	*no*	*no*	*no*	*no*
PLC Ports 15-16	*PLC_1 PLC_2*	*no*	*no*	*no*	*no*	*no*	*no*	*no*	*yes*
Parallel Printer Port 37	*Parallel*	*no*	*no*	*no*	*no*	*no*	*no*	*no*	*no*
VAX Host Node	*VAX*	*yes*	*yes*	*yes*	*yes*	*no*	*yes*	*yes*	*yes*

Figure 6-2 Worksheet #2

Example # 1 Privileged Status and Security

In this example, you log onto the server, enable privileged status, change passwords for security purposes and enable command line editing and recall.

Step 1 ❑ Press **[Return]** from the terminal keyboard.

❑ If using a PC as a terminal, load the terminal emulation software (e.g. Procomm, Xtalk, etc.) and set the following parameters:

Terminal type	**VT100**
Speed	**Autobaud**
Parity	**None**
Stop bits	**8**
COM port	***user determined***

Enter terminal mode and press **[Return]**.

Step 2 The terminal server initial screen displays:

```
LAT_00807D047E07
EQUINOX SYSTEMS
WELCOME
```

The top line contains the Ethernet address of the terminal server.

Step 3 The following prompt displays:

```
USERNAME> john
LOCAL>
```

Enter any character except the letter H at the prompt. Typically you would enter your name or the terminal location.

Step 4 Enable privileged mode to permit access to all of the terminal server commands:

```
LOCAL> set privileged
PASSWORD> system
LOCAL>>
```

Step 5 Change the port type to **ANSI** to take advantage of command line editing. Configure a break key to make it possible to get out of sessions easily.

```
LOCAL> set port type ansi
LOCAL> set port local ^I
```

Step 6 Change the privileged password to protect system integrity.

```
LOCAL>> set server privileged password "mauve"
```

You can reset the password to factory default by resetting the terminal server. This should be done with caution because it resets **all** of the terminal server configuration to factory default values.

Step 7 You should prevent others from accessing the privileged commands when you are not on the server. Issue the **SET NOPRIVILEGED** command or log out of the server at your port.

Example # 2 Configuring The Server

The terminal server is already configured for LAT protocol. However, you should make sure that all of the broadcasted services are available to the server.

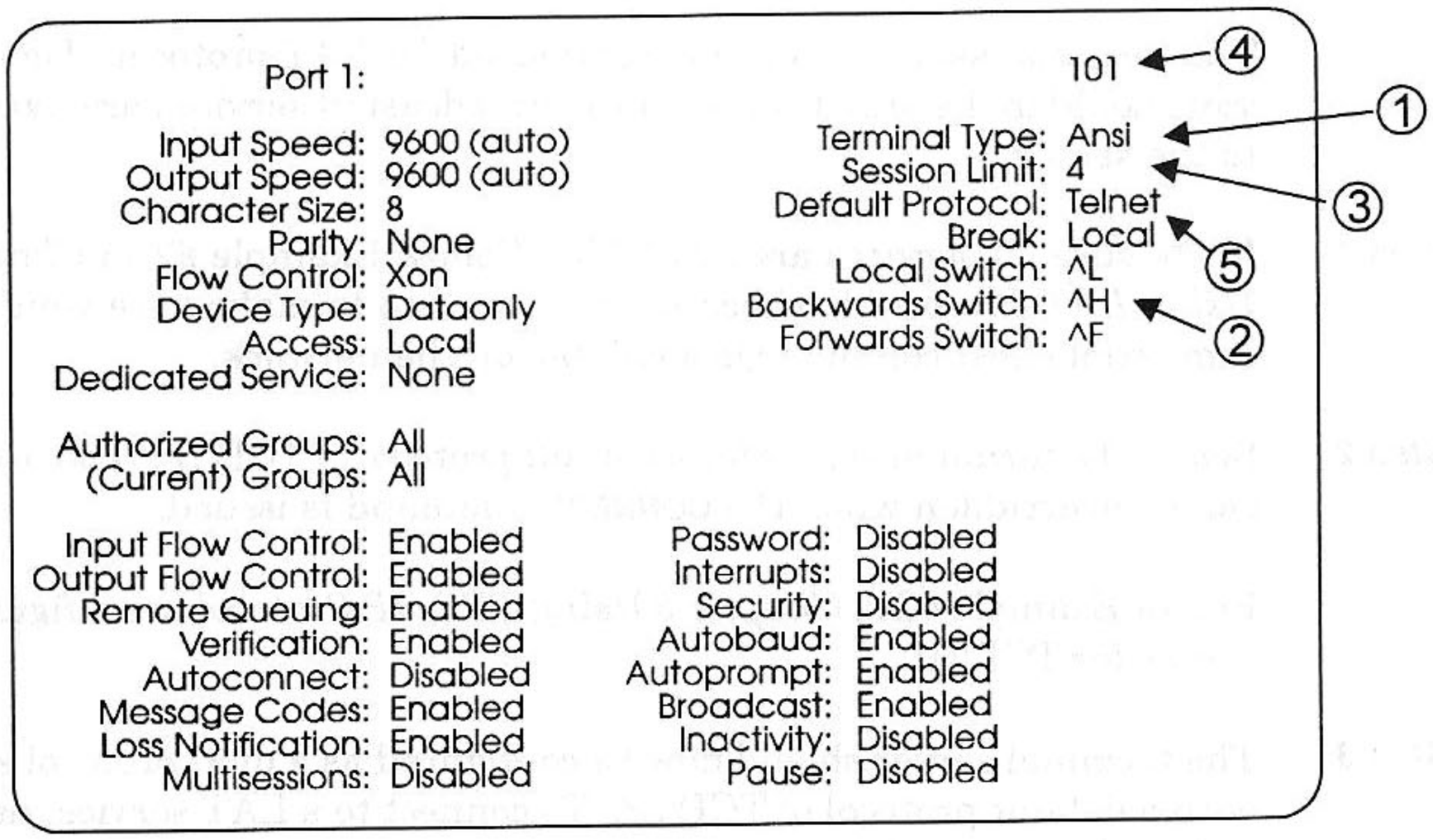
Step 1 Make sure all services are available. Follow Example #2 in *Chapter 4 Using LAT Protocol* to check for services and to make sure your LAT-compatible host computer is available on the network.

Step 2 Set up the terminal server for a default protocol of TCP/IP. The protocol can be overridden when the **CONNECT** command is issued.

Follow Example #2 in *Chapter 5 Using TCP/IP Protocol* to configure the server for TCP/IP.

Step 3 The terminal server should now be configured as a dual protocol server with a default protocol of TCP/IP. To connect to a LAT service, use the **CONNECT** command with the **LAT** option.

Example #3 Configuring Terminals and PCs



①	**set ports 1-7 type ansi**	Permits command line editing and recall
②	**set ports 1-7 local ^l** **set ports 1-7 forward ^h** **set ports 1-7 backward ^f**	Establishes a break key to get out of sessions easily. Defines switch characters for moving between sessions.
③	**set ports 4-5 sessions 2**	Limits the number of active sessions on ports 4 & 5 to two.
④	**set port 1 name 101** **set port 2 name 102** **set port 3 name 103** **set port 4 name 104** **set port 5 name 105** **set port 6 name john** **set port 7 name ashley**	Assigns names to each port that uniquely identify the individual port. This assists later when you are troubleshooting the system.
⑤	**set port 1-7 default protocol telnet**	Changes the default protocol for the terminals and PCs to **TELNET**. An alternate protocol can be used at the time a connection is made using the appropriate option with the **CONNECT** command.
⑥	**show port 1 char**	Displays the new port characteristics (*Figure 6-3*).

Example #4 Configuring A Serial Printer as a Service

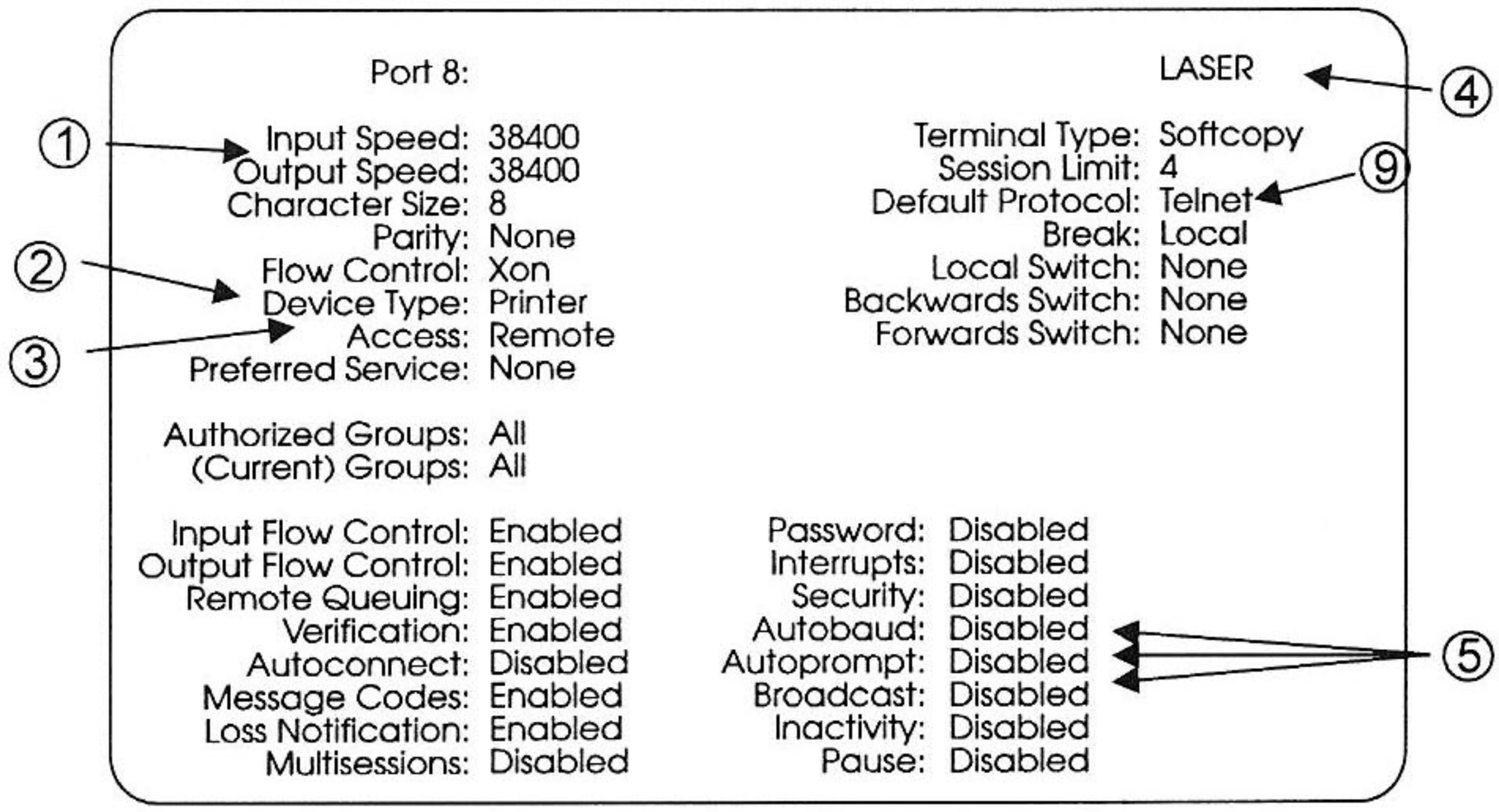


Figure 6-4 SHOW PORT 8

①	**set port 8 speed 38.4**	Changes the default input and output speed to 38.4.
②	**set port 8 device printer**	Changes the device type to printer thus permitting correct control signal handling.
③	**set port 8 access remote**	Permits the printer to receive calls only.
④	**set port 8 name laser**	Assigns a name to the printer.
⑤	**set port 8 autobaud disabled** **set port 8 autoprompt disabled** **set port 8 broadcast disabled**	Turns off autobaud, autoprompt and broadcasting of messages.
⑥	**show port 8 char**	Displays the new port characteristics (*Figure 6-4*).
⑦	**set service 8 ident "laser printer"**	Configures the printer as a service.
⑧		Configures the LAT host computer for the laser printer. Refer to *Example #6* in *Chapter 4 Using LAT Protocol.*
⑨	**set port 8 default protocol telnet**	Makes **TELNET** the default protocol for the port. To use the LAT protocol on the port, connect to the service using the LAT option.

⑩ Sets up the UNIX host for printing. Refer to *Example #6* in *Chapter 5 Using TCP/IP Protocol.*

Example #5 Configuring A Parallel Printer As A Service

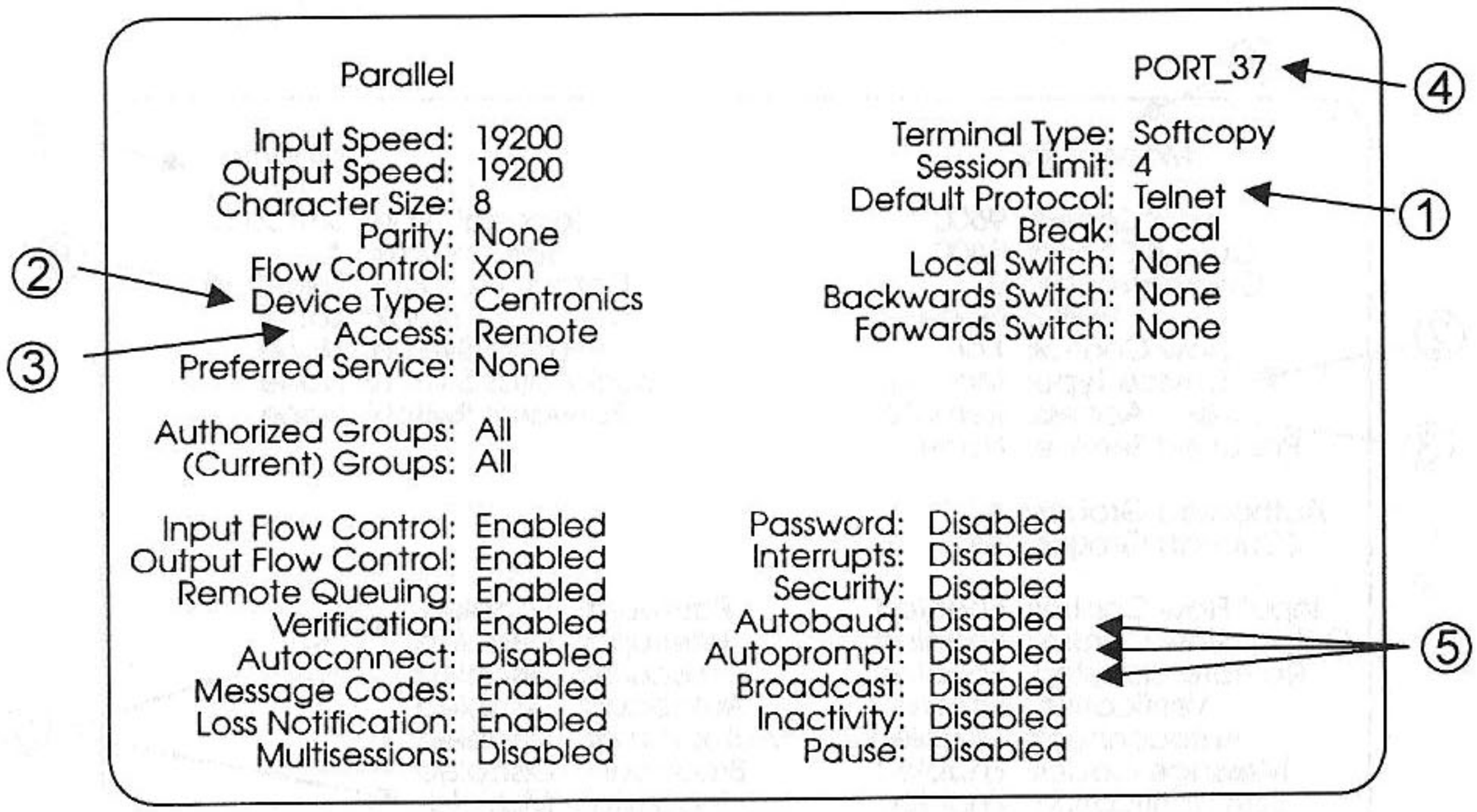


Figure 6-5 SHOW PORT 37

①	**set port 37 default protocol telnet**	Changes the default protocol to **TELNET**. Use the **CONNECT** command to connect with a different protocol.
②	**set port 37 device centronics**	Changes the device type to Centronics thus permitting correct control signal handling.
③	**set port 37 access remote**	Permits the printer to receive call only.
④	**set port 37 username parallel**	Assigns a username to the printer.
⑤	**set port 37 autobaud disabled** **set port 37 autoprompt disabled** **set port 37 broadcast disabled**	Turns off autobaud, autoprompt and broadcasting of messages.
⑥	**show port 8 char**	Displays the new port characteristics (*Figure 6-5*).
⑦	**set service parallel 37 port 37 telnet enabled ident "parallel printer port"**	Configures the parallel printer as a service.

Example #6 Configuring Modems

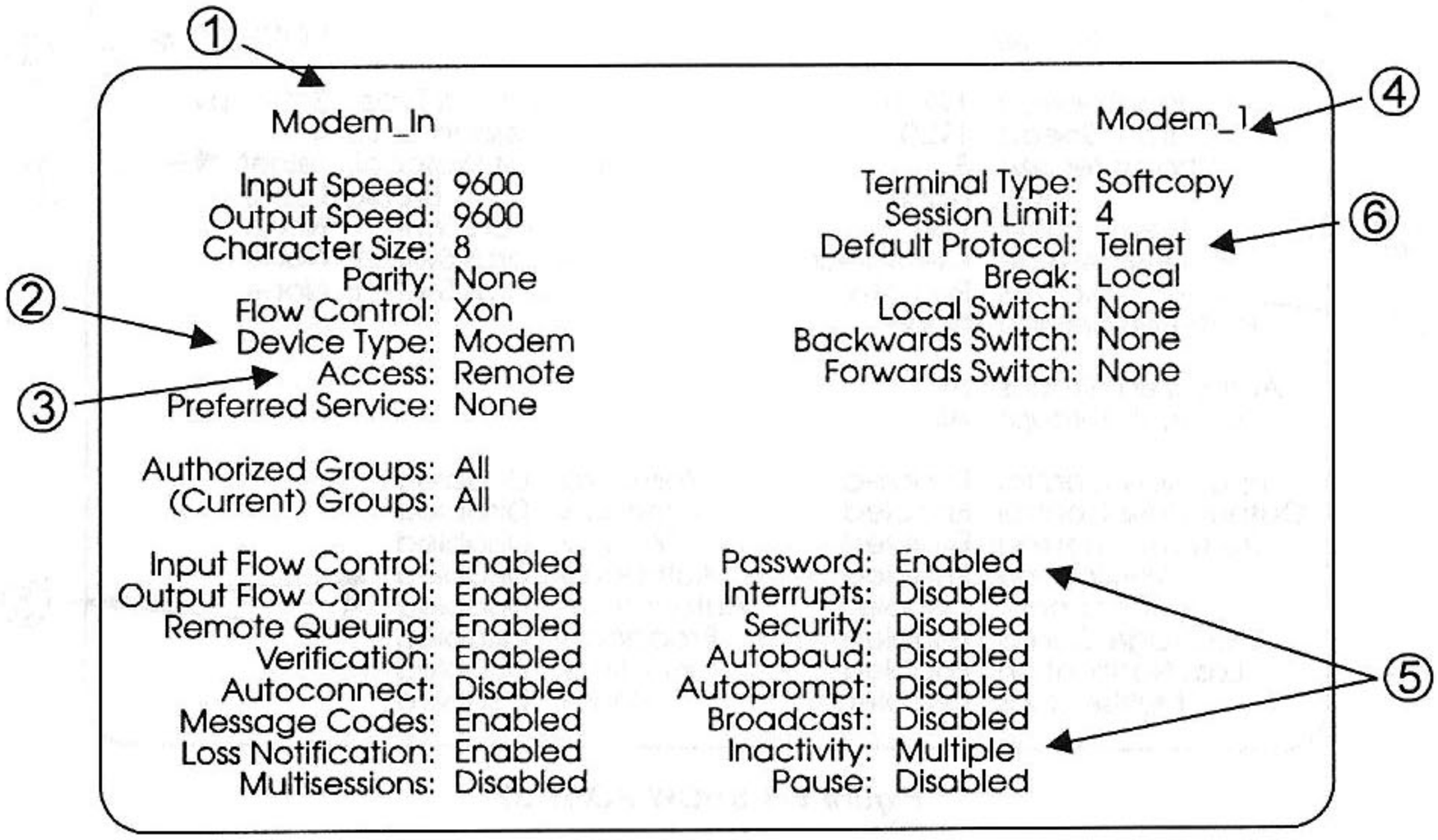


Figure 6-6 SHOW PORT 9

① **set port 9 username modem_in**
set port 10 username modem_out
set port 11 username modem_inout

Defines a username for each modem port.

② **set port 9-11 device modem**

Defines the device type for the devices on ports 9-11 as modem.

③ **set port 10 access remote**

Configures port 10 as a remote access port.

④ **set port 9 name modem_1**
set port 10 name modem_2
set port 11 name modem_3

Assigns a name to each modem.

⑤ **set port 9 password enabled**
set port 9 password "chocolate"
set port 9-11 inactivity multiple

Defines a password and enables its use for the modem on port 9. Sets the inactivity logout to multiple so that the server automatically logs the port out after a specified period of inactivity.

⑥ **set port 9 default protocol telnet**

Changes the default protocol on port 9 to **TELNET**.

⑦ **show port 9 char**

Displays the new port characteristics for the ports (*Figure 6-6*).

⑧ **set service modem_pool port 10-11**
ident "modem pool" pass "mint"

Creates a modem pool as a service.

⑨ Configures the modems on any host computers. Refer to *Example#8* in *Chapter 4 Using LAT Protocol*.

Example #7 Configure A Host Computer As A Service

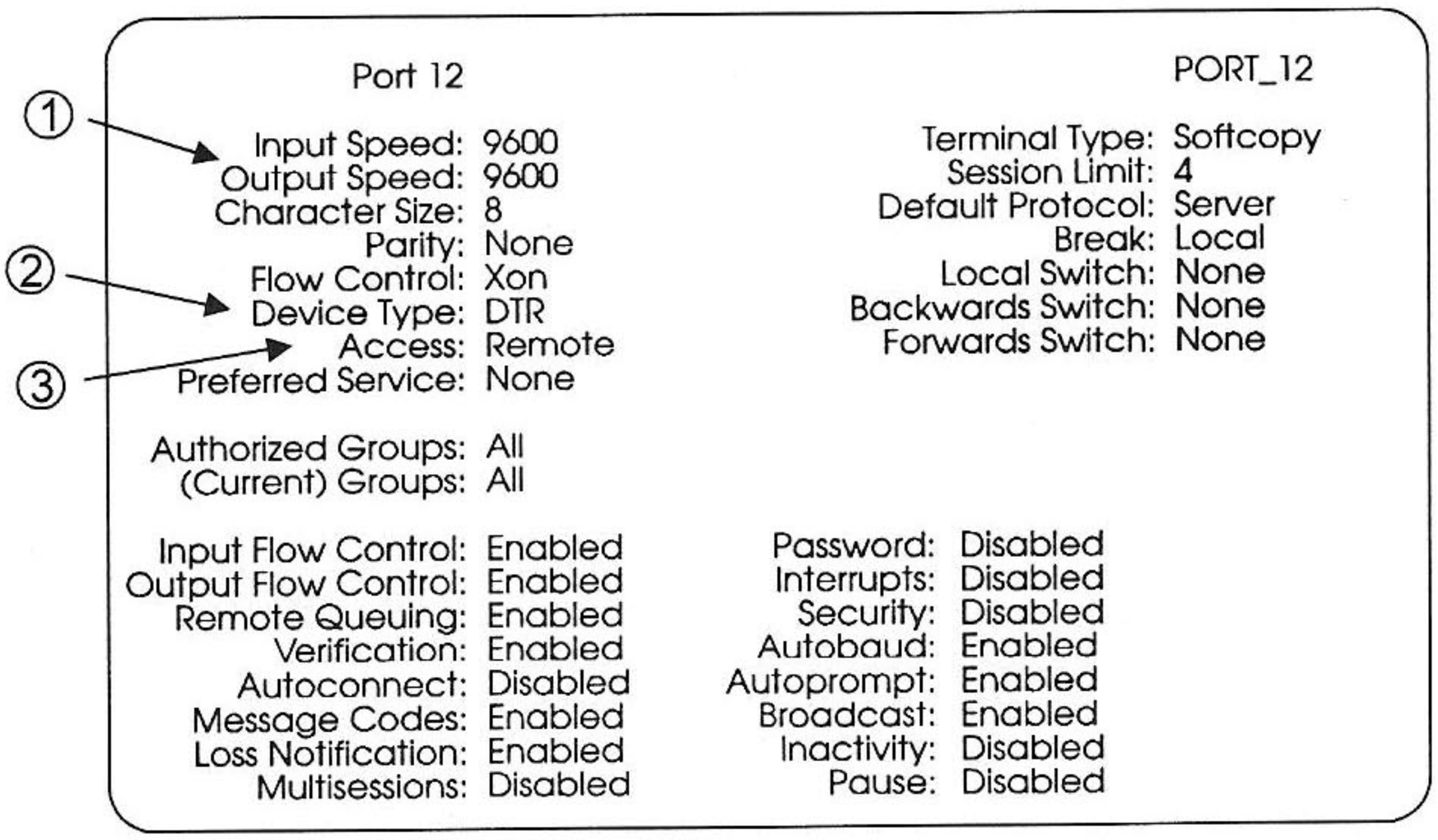


Figure 6-7 SHOW PORT 12

① **set ports 12-14 speed 19200**
set ports 12-14 char 8

Sets the port speed to 19,200 with character bits 8.

② **set ports 12-14 device type dtr**

Defines the device type to DTR.

③ **set ports 12-14 access remote**

Configures the ports as remote access ports.

④ **set service dg ports 12-14 ident "data general" telnet enabled**
set service password "secret"

Configures the Data General a service. Assigns an identifying string to the port and set security with a password.

⑤ **show port 12 char**

Displays the port characteristics (*Figure 6-7*).

Example #8 A Terminal Server Session

You can access serial devices such as modems, printers and host computers when your PC or terminal is connected to an ELS-8 or ELS-16 terminal server. This example takes you through a LAT session.

Logging On

- ❑ Press **[Return]** from your terminal keyboard.

- ❑ If you are using a PC as a terminal, load the terminal emulation software (e.g., Procomm, Xtalk, etc.) and set the following parameters:

Terminal Type	**VT100**
Speed	**Autobaud**
Parity	**None**
Stop Bits	**8**
COM port	***user determined***

Enter terminal mode and press **[Return]**.

- ❑ The terminal server initial screen displays:

```
LAT_00807D047E07
Equinox Systems
Welcome
```

- ❑ The following prompt displays:

```
USERNAME> john
LOCAL>
```

Enter the username assigned by your network administrator. If a name has not been assigned, enter any character except H at the prompt.

Begin A Session

- ❑ List the services available to you:

```
LOCAL> show services
```

- ❑ A list of all the services you can access displays. Let's access the VAX, using LAT protocol, which is on our network.

```
LOCAL> connect lat vax
```

You are now connected to your VAX. Use it as you would normally.

Appendix A Commands

Appendix A describes the terminal server commands available on the Equinox terminal server for all supported protocols, including LAT and TCP/IP.

Format of Command Descriptions

The command descriptions use the following format:

Definition Provides a brief description about the function of the command.

Syntax Provides a diagram of the command showing you how to enter a command so that it can be interpreted by the terminal server.

{ } Required value. You must enter one of the choices enclosed in the brackets.

[ ] Optional value. You may enter one of the choices enclosed in the braces.

lowercase italic Indicates a variable you are to supply.

Parameters Describes each of the components that make up the command.

Notes Provides additional information about using a command.

See also Supplemental information about using a command can be found under descriptions of other commands.

Entering Commands

Follow these conventions when you enter commands on the terminal server:

- Enter commands in uppercase or lowercase characters, or a combination of both.
- Press carriage return <CR> after typing in the command. The terminal server will then execute the command.
- Most command can be abbreviated to one, two or three characters. The *Table of Abbreviations* gives you a quick list of all abbreviations. In addition, each command description includes the valid abbreviations for that command.

Command Line Editing

The ELS-8 and ELS-16 use *command line editing* which makes entering and changing commands easier. This feature functions in a manner similar to DEC's command line editing. The terminal server has a buffer that stores the last **512** bytes typed at the keyboard. You can *recall* previous command lines and then edit them to correct or create new commands.

Control characters are used to perform this editing. A control character is actually a combination of two keys, the <CTRL> key and another key that you press while holding down the <CTRL> key. Often you will see the control key displayed as a carat (^) followed by the second character, such as ^A, ^Z, etc.

The following table lists the keys you can use to edit commands on the command line:

Key	How to use....
<CTRL> A	Toggles between insert and overwrite modes. Position your cursor anywhere on the command line, press ^A and insert the characters in the command line.
<CTRL> B	Recalls the previous command line(s), one line at a time. On ANSI terminals you can also use the up arrow (↑) key.
<CTRL> D	Moves the cursor to the left one position. On ANSI terminals you can also use the left arrow (←) key.
<CTRL> E	Moves the cursor to the end of the command line.
<Ctrl> F	Moves the cursor to the right one position. On ANSI terminals you can also use the right arrow (→) key.
<CTRL> H	Moves the cursor to the beginning of the command line.
<CTRL> J	Deletes the previous word
<CTRL> R	Redraws the current command line. This lets you check your edits before accepting the line.
<CTRL> U	Erases an entire command line.
<CTRL> Z	Aborts the entry of a password. You can also use this to exit HELP.
BACKSPACE	Use the backspace key to move your cursor to the beginning of a line without erasing any characters on the line. This is available on ANSI terminals only.
BREAK	Halts the current command line or display
DELETE or RUBOUT	Erases the character immediately to the left of the cursor.
CR (carriage return)	Executes the current command line.

The following variables are used in the command descriptions:

***** The asterisk is a wildcard character which may be used with the **SHOW/LIST/MONITOR SERVICES** and **SHOW/LIST/MONITOR NODES** commands. When entering a specific name for a node or service, you may use a single asterisk, an asterisk followed by text or text followed by an asterisk. You may not specify asterisks at the beginning and the end of a name at the same time. The asterisk matches blank or more characters:

*	The equivalent of **ALL**;
***ABC**	Matches all sequences of characters that end with ABC;
ABC*	Matches all sequences of characters that begin with ABC;
ABC	Invalid - cannot have two asterisks;
****ABC**	Invalid - cannot have two asterisks;
ABC**	Invalid - cannot have two asterisks;
A*B	Invalid - asterisk must be at the beginning or end of string.

alias_name
alias_name. An alternate name assigned to a node or server. The maximum length is 16 characters and must end in a period when using it to identify a node.

ethernet_address Hexadecimal code that represents a specific Ethernet address. Format for an ethernet address is 12 hexadecimal digits, entered as pairs, separated by hyphens:

dd-dd-dd-dd-dd-dd

group range One or more decimal codes which represent a group or range of groups. Multiple groups are separated by commas. Ranges of groups are defined with hyphens. Example: 2,6.

ip_address An Internet address in the format ***ddd.ddd.ddd.ddd***, where ***ddd*** is a decimal between 0 and 255 that identifies a specific node on the network. The IP address always had priority over other types of node ID.

node_name Name of a network node. The maximum length is 16 characters.

node_name. The full name of a node. The full name consists of the local node name plus the domain name. The maximum length is 64 characters and must end in a period.

port_list List containing one or more port numbers.

port_name Name assigned to a port. Maximum of 16 characters.

port_number Number of the port connector on the terminal server hardware unit.

port_range If the status on the port is **nonprivileged**, the ***port_range*** must be the port you are currently logged on to. If your current port status is **privileged**, ***port_range*** can be:

- **ALL** Modifies all ports on the server.
- ***n-n*** Modifies a range of ports (e.g., 7-23) on the server.
- ***n-n,n,n-n*** Modifies multiple ranges of ports (e.g., 1-12,15,28-41).
- ***n-n/n-n*** Modifies a range of ports and excludes ports within the range (e.g. 6-12,20-30/10,24-26 *excludes port(s) 10 and 24-26).*

serial_number Serial number of a terminal service. The number is usually converted to an Ethernet address prior to making a connection.

service_name Name assigned to a service or a server. Maximum of 16 characters.

socket Identifies a particular process by TCP/IP socket number. This is similar to the UNIX file access procedures that identify an endpoint communications process.

user_name Identifies the user of a port. User names that contain both upper and lower case or have embedded spaces must be enclosed in quotation marks (*"user_name"*). Maximum of 16 characters.

The following tables provide an overview of the commands available on the terminal server.

Table 1-1 Command Abbreviations — Lists all commands and options recognized by the terminal server. Abbreviations are indicated by bold, uppercase letters.

Table 1-2 Operating Commands — Lists all commands used to operate the terminal server and tells you who may use the command: *privileged*, *nonprivileged*, and/or *secure* users.

Tables 1-3 through 1-7 Configuration Commands — Lists all of the commands used to configure the terminal server, ports and nodes on the server, sessions, and services offered by the server. Also indicates who may use the command: *privileged*, *nonprivileged*, and/or *secure* users.

Table 1-1 Command Abbreviations

ABbreviations	**DIS**able	**LOS**s	Resume
ACcess	**DIS**abled	**MA**intenance	**RET**ransmit
ADdress	**DI**sconnect	**MAN**ual	**RL**ogin
ALIas	**DO**	**MA**rk	**SA**ve
ALI	**DOM**ain	**MAS**k	**SEC**urity
ANnouncements	**DON**t	**ME**ssage	**SERVE**r
ANsi	**DTR**	**MO**dem	**SER**vice
AO	**DY**namic	Monitor	**SER**vices
ARP	**EC**	**MU**lticast	**SES**sion
ASsistant	**ECH**o	**MUL**tiple	**SES**sions
AUTHorized	**EL**	**MUL**tisession	**SE**t
AUTOBaud	**EN**abled	**NA**me	**Sh**ow
AUTOConnect	**EN**try	**NAMES**erver	**SIN**gle
AUTOPrompt	**EQ**ual	**NET**ip	**SI**ze
AYT	**EV**en	**NOD**e	**SL**ow
BAckward	**EX**ternal	**NODEN**ame	**SO**ftcopy
BINary	**FA**de	**NOD**es	**SP**ace
BREak	**FA**st	**NON**e	**SP**eed
BRief	**FL**ow	**NOP**rivilege	**ST**atus
BRK	Forward	**NOR**mal	**SUB**net
BROadcast	Full	**NOT**ification	**SU**mmary
CAncel	**GA**	**NU**mber	**SUP**press
CENtronics	**GAT**eway	**OD**d	**SW**itch
CHange	Groups	**OF**f	**SYN**
CHaracter	**HA**rdcopy	**ON**	**TCP**ip
CHaracteristics	Heartbeat	**ONLY**	**TEL**evideo
CHEcksum	Help	**OU**tput	**TEL**net
CIrcuit	Here	Override	**TE**rminal
CLear	**IC**mp	**PAR**ity	Test
CLS	Identification	**PAS**s	**TI**mer
CODes	Idle	**PAS**sall	**TO**ggle
Connect	**INA**ctivity	**PAS**sword	**TR**ans
Connected	**INI**tialize	**PAST**hru	**TR**ansmit
Connections	**INP**ut	**PAU**se	**TY**pe
COnsole	Interactive	**PC**	**UD**p
CONtrol	**IN**ternal	**PI**ng	Username
COUnt	**INT**errupts	**PO**rt	Users
COunters	**IP**	**PO**rts	**VERB**ose
CRlf	Keepalive	**PRE**ferred	Verification
CTLsig	**KEY**s	**PRI**nter	**VT**100
CUstom	Lat	**PRI**vileged	**WE**lcome
DAtabase	Learn	**PRO**mpt	**Wi**dth
DATAOnly	**LEN**gth	**PRO**tocol	**WI**ll
DATAProducts	**LIM**it	Purge	**WI**ring
DEdicated	**LI**st	Queue	**WO**nt
DEFault	**LOA**d	Queuing	**WYse_60**
DEFine	**LOC**al	**RE**ceive	**XO**ffany
DElay	**LOCK**	**REM**ote	**Xon**
DELete	**LOG**in	**RE**move	**Zero**
Destination	**LO**gout	**REQ**uired	
DEvice	**LOO**p	**RES**olution	
DIAgnose	**LOO**pback	**RES**tore	

Table 1-2 Operating Commands

COMMAND	Privileged	Nonprivileged	Secure
BACKWARD	•	•	•
BROADCAST	•	•	
CHANGE NODES	See Table 1-3 Node Configuration Commands		
CHANGE PORTS	See Table 1-4 Port Configuration Commands		
CHANGE SERVER	See Table 1-5 Server Configuration Commands		
CHANGE SESSIONS	See Table 1-7 Session Configuration Commands		
CLEAR NODES	•		
CLEAR SERVICES	•		
CLS	•	•	•
CONNECT PORT	•		
CONNECT *[protocol]*	•	•	•
DEFINE NODES	See Table 1-3 Node Configuration Commands		
DEFINE PORT	See Table 1-4 Port Configuration Commands		
DEFINE SERVER	See Table 1-5 Server Configuration Commands		
DEFINE SERVICE	See Table 1-6 Service Configuration Commands		
DEFINE SESSIONS	See Table 1-7 Session Configuration Commands		
DELETE NODES	•		
DELETE SERVICES	•		
DISCONNECT	•	•	•
DISCONNECT PORT	•		
FORWARD	•	•	•
HELP	•	•	•
INITIALIZE [SERVER]	•		
INITIALIZE [SERVER] CANCEL	•		
INITIALIZE [SERVER] DATABASE	•		
LIST NODES	•	•	•

COMMAND	Privileged	Nonprivileged	Secure
LIST PORTS	•	•	•
LIST SERVER	•	•	•
LIST SERVICES	•	•	•
LOCK	•	•	•
LOGOUT	•	•	•
MANUAL	•	•	•
MONITOR NODES	•		
MONITOR PORTS	•		
MONITOR QUEUE	•		
MONITOR SERVER	•		
MONITOR SERVICES	•		
MONITOR SESSIONS	•		
MONITOR USERS	•		
PING	•		
PURGE NODES	•		
PURGE SERVICES	•		
REMOTE [CONNECT]	•		
REMOVE QUEUE	•		
RESTORE	•		
RESUME	•	•	•
RLOGIN	•	•	•
SAVE	•		
SET NODES	See Table 1-3 Node Configuration Commands		
SET NOPRIVILEGED	•	•	
SET PORT	See Table 1-4 Port Configuration Commands		
SET PRIVILEGED	•		
SET SERVER	See Table 1-5 Server Configuration Commands		

COMMAND	Privileged	Nonprivileged	Secure
SET SERVICE	See Table 1-6 Service Configuration Commands		
SET SESSIONS	See Table 1-7 Session Configuration Commands		
SHOW NODES	•		
SHOW PORTS	•		
SHOW QUEUE	•		
SHOW SERVER	•		
SHOW SERVICES	•		
SHOW SESSIONS	•		
SHOW USERS	•		
TELNET	•	•	•
TEST LOOP	•		
TEST PORT	•	•	•
ZERO [COUNTERS]	•		

Table 1-3 Node Configuration Commands

SET/DEFINE/CHANGE NODES	Privileged Only	Sessions may be Active
ADDRESS	•	Yes
ALIAS	•	Yes
GATEWAY	•	Yes
IDENTIFICATION	•	Yes
IP	•	Yes
NAMESERVER	•	Yes
NETIP	•	Yes
TCPIP	•	Yes

Table 1-4 Port Configuration Commands

SET/DEFINE CHANGE PORT	Privileged	Nonprivileged			Secure
		SET/DEFINE/CHANGE			
ACCESS	•				
AUTHORIZED [GROUPS]	•				
AUTOBAUD	•				
AUTOCONNECT	•	•	•	•	
AUTOPROMPT	•	•	•	•	•
BACKWARD [SWITCH]	•	•	•	•	•
BREAK	•	•	•	•	
BROADCAST	•	•	•	•	
CHARACTER [SIZE]	•	•	•	•	
CONTROL AUTOCONNECT	•				
CONTROL CONNECTED	•				
CONTROL DELAY	•				
CONTROL DISCONNECT	•				
CONTROL FADE	•				
CONTROL IDLE	•				
CONTROL REQUIRED	•				
CONTROL TOGGLE	•				
DEDICATED [SERVICE]	•				
[DEFAULT] PROTOCOL	•	•	•	•	
DEVICE [TYPE]	•				
EQUAL	•				
FLOW [CONTROL] ENABLED/DISABLED	•				
FLOW [CONTROL] {CTLSIG / XON / XOFFANY}	•				
FORWARD [SWITCH]	•	•	•	•	•

SET/DEFINE CHANGE PORT	Privileged	Nonprivileged			Secure
		SET/DEFINE/CHANGE			
GROUPS	•	•			• (SET only)
INACTIVITY [LOGOUT]	•				
[INPUT] FLOW [CONTROL]	•	•	•	•	
[INPUT] SPEED	•	•	•	•	
INTERRUPTS	•				
LOCAL [SWITCH]	•	•	•	•	•
LOSS [NOTIFICATION]	•	•	•	•	
MESSAGE [CODES]	•	•	•	•	
MULTISESSION	•	•	•	•	
NAME	•				
[OUTPUT] FLOW [CONTROL]	•	•	•	•	
[OUTPUT] SPEED	•	•	•	•	
PARITY	•	•	•	•	
PASSWORD	•				
PAUSE	•	•	•	•	•
PREFERRED [SERVICE]	•	•	•	•	
[REMOTE] QUEUING	•	•	•	•	
SECURITY	•				
SESSION [LIMIT]	•				
SPEED	•	•	•	•	
TELNET	•	•	•	•	
TYPE	•	•	•	•	•
USERNAME	•	•	•	•	
VERIFICATION	•	•	•	•	•

Table 1-5 Terminal Server Configuration Commands

SET/DEFINE/CHANGE SERVER	Privileged Only	Sessions may be Active
ALIAS	•	Yes
ANNOUNCEMENTS	•	No
BROADCAST	•	Yes
CIRCUIT [TIMER]	•	No
CONSOLE PORT	•	Yes
[DEFAULT] PROTOCOL	•	Yes
DOMAIN [NAME]	•	Yes
FAST [DELAY]	•	Yes
GATEWAY IP	•	Yes
HOST IP	•	Yes
IDENTIFICATION	•	Yes
INACTIVITY [TIMER]	•	Yes
IP	•	Yes
KEEPALIVE [TIMER]	•	No
LEARN [NODE]	•	Yes
LOAD [NAME]	•	Yes
LOCAL [PROMPT]	•	Yes
LOCK	•	Yes
LOGIN PASSWORD	•	Yes
LOGIN PROMPT	•	Yes
MAINTENANCE [PASSWORD]	•	Yes
MULTICAST [TIMER]	•	No
NAME	•	No
NODE [LIMIT]	•	Yes
[NODENAME] RESOLUTION	•	Yes
NUMBER	•	Yes

SET/DEFINE/CHANGE SERVER	Privileged Only	Sessions may be Active
PASSWORD [LIMIT]	•	Yes
PRIVILEGED [PASSWORD]	•	Yes
QUEUE [LIMIT]	•	No
RETRANSMIT [LIMIT]	•	Yes
RLOGIN	•	Yes
SECURITY	•	Yes
[SERVICE] GROUPS	•	Yes
SESSION [LIMIT]	•	No
SLOW [DELAY]	•	Yes
[SUBNET] MASK	•	Yes
[TCPIP] CHECKSUM	•	Yes
WELCOME [MESSAGE]	•	Yes

Table 1-6 Service Configuration Commands

SET/DEFINE/CHANGE SERVICE	Privileged Only	Sessions may be Active
[LOCAL] ANNOUNCEMENTS	•	Yes
[LOCAL] CONNECTIONS	•	Yes
[LOCAL] IDENTIFICATION	•	Yes
[LOCAL] PASSWORD	•	Yes
[LOCAL] PORTS	•	Yes
[LOCAL] QUEUE	•	Yes
[LOCAL] TELNET	•	Yes
REMOTE	•	Yes

Table 1-7 Session Configuration Commands

SET/DEFINE/CHANGE SESSION	Privileged Only	Sessions may be Active
BINARY [TRANS]	•	Yes
CRLF	•	Yes
ECHO	•	Yes
KEYS	•	Yes
NAME	•	Yes
SUPPRESS [GA]	•	Yes
VERBOSE	•	Yes
TYPE	•	Yes

BACKWARDS ■ FORWARDS

Definition Use these commands from the LOCAL> prompt to move back and forth between sessions when you have more than one terminal session active.

User Privileged • Nonprivileged • Secure

Syntax { *BACKWARDS* / *FORWARDS* }

Parameters None

Notes

- Use **RESUME SESSION**, followed by a session number, to switch to a specific session.

See Also

{BACKWARD S / FORWARDS} SWITCH *character*
RESUME SESSION
{SET / DEFINE / CHANGE} PORT {BACKWARDS / FORWARDS} SWITCH
SHOW SESSIONS

BROADCAST

Definition Sends a message to one or more ports connected to the same terminal server.

User Privileged • Nonprivileged

Syntax

BROADCAST { *PORT port_range* / *ALL* / *REMOTE* / *user_name* / *"user_name"* } { *"message_text"* / *message_text* }

Parameters

PORT ***port_range*** • **ALL** • **REMOTE** • ***user_name*** • ***"user_name"***
Enter a specific port, a ***port_range***, **ALL**, or ***user_name*** where you want to send the message. **REMOTE** sends your message to the remote console.

message_text • ***"message_text"***
Enter the text of the message you are sending. The message is **BROADCAST** in all uppercase letters unless you enclose the text in quotation marks ("). Maximum text length is 105 characters.

Notes

❑ Non-privileged users can send messages to only one port or user name at a time.

❑ The sender of a message is notified of all ports that are logged on but do not receive the message.

See also

{SET / DEFINE / CHANGE} PORT BROADCAST
{SET / DEFINE / CHANGE} SERVER BROADCAST

CHANGE

Definition Changes the configurations of both the *operational* database and the *permanent* database simultaneously. Changes take effect immediately in both databases. **CHANGE** follows the same format and uses the same options as the **SET** and **DEFINE** commands.

Refer to the **SET** command in this section for a detailed description of the use of **SET**, **DEFINE** and **CHANGE**.

See
{SET / DEFINE / CHANGE} NODES
{SET / DEFINE / CHANGE} PORT
{SET / DEFINE / CHANGE} SERVER
{SET / DEFINE / CHANGE} SERVICES

{CLEAR ■ DELETE ■ PURGE} NODES

Definition This set of commands removes TCP/IP nodes from the server's internal node table:

CLEAR NODES *temporarily* removes nodes from the table.

DELETE NODES *immediately* and *permanently* removes nodes from the table.

PURGE NODES *permanently* removes nodes from the table. Nodes remain available until the server is turned off or the **INITIALIZE SERVER** command is issued.

User Privileged

Syntax

{ *CLEAR* / *DELETE* / *PURGE* } *NODES* { *ALL* / [*IP*] *ip_address* / { [*NAME*] { *alias_name.* / *node_name* / *node_name.* } } }

Parameters **ALL** • **IP** ***ip_address*** • **NAME** ***{alias_name / node_name / node_name.}***

Enter **ALL** to remove all TCP/IP nodes from the node table. To remove individual nodes from the node table, enter a specific *ip_address* or a specific node identified by name.

Notes

❑ Nodes that have active connections cannot be removed from the server's configuration.

❑ TCP/IP nodes that have been learned cannot be removed from the local node table.

See also

{CLEAR / DELETE / PURGE} SERVICES
DISCONNECT PORT
REMOVE QUEUE
{SHOW / LIST / MONITOR} NODES

{CLEAR ■ DELETE ■ PURGE} SERVICES

Definition This set of commands removes a local service or TCP/IP port from the *operational and/or permanent* database.

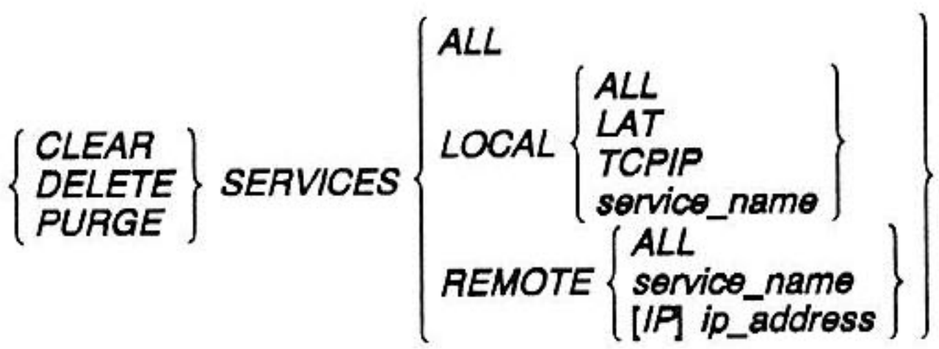
CLEAR SERVICES temporarily removes a service or port from the *operational* database.

DELETE SERVICES immediately and permanently removes a service or port from both the operational and permanent databases.

PURGE SERVICES removes a service from the permanent database. The change takes place the next time the server is powered off, or you use the **INITIALIZE SERVER** command.

User Privileged

Syntax



Parameters

ALL • LOCAL • REMOTE
Enter **ALL** to remove all services from the database(s). Use **LOCAL** or **REMOTE** to remove specific services from the permanent and/or operational databases.

Notes Services that are available to both LAT and TCP/IP nodes are deleted when **LOCAL TCPIP** or **LOCAL LAT** is specified.

See also

{CLEAR / DELETE / PURGE} NODES
DISCONNECT PORT
REMOVE QUEUE
{SHOW / LIST / MONITOR} SERVICES

CLS

Definition Clears your terminal screen.

User Privileged • Non Privileged • Secure

Syntax *CLS*

Parameters None

See also **{SET / DEFINE / CHANGE} PORT TYPE**

CONNECT [LAT ■ RLOGIN ■ TCPIP ■ TELNET]

Definition Establishes a session between your port and an offered service. Use the **CONNECT** command to connect to local LAT or TCP/IP ports or LAT or TCP/IP port located on other nodes.

User Privileged • Non Privileged • Secure

Syntax Use the command syntax described below that corresponds to the protocol to which you are connecting.

Notes

❑ If you do not specify a protocol, a protocol is selected based on the following:

- If the port protocol is **LAT** or **LAT ONLY**, a LAT connection is started;
- If the port protocol is **TCP** or **TCP ONLY**, a TCP connection is started;
- If the port protocol is **SERVER**, the server's default protocol is read.

❑ **USERNAME** is passed to the host system when a connection is established. If you do not specify a user name, the port's user name is used.

See also

CONNECT PORT
DISCONNECT
RLOGIN
{SET / DEFINE / CHANGE} SERVER
SHOW / LIST / MONITOR NODES
SHOW / LIST / MONITOR SERVICES
TELNET

CONNECT LAT

Definition

Establishes a session between your port and a service using the LAT compatible protocol.

Syntax

CONNECT [*LAT*] [*service_name* [*NODE node_name*] [*DESTINATION port_name*]]

Parameters

service_name
Enter the name of the LAT service to which you want to connect.

NODE *node_name*
Enter name of the LAT node that offers the service.

DESTINATION *port_name*
Enter the name of the port on the host to which you want to connect.

CONNECT RLOGIN

Definition

Establishes a session between your port and a TCP/IP node or service using the **RLOGIN** protocol.

Syntax

CONNECT [*RLOGIN*] [[*IP*] *ip_address* | *service_name* | *USERNAME "user_name"* | *NODE* { *alias_name.* | *node_name.* | *node_name* }] [*service_name* | *socket* | *USERNAME "user_name"*]

Parameters

IP *ip_address* • *service_name* • USERNAME *"user_name"* • NODE {*alias_name.* • *node_name* • *node_name.*}
Enter the Internet address, service name, username or node name of the node to which you want to connect.

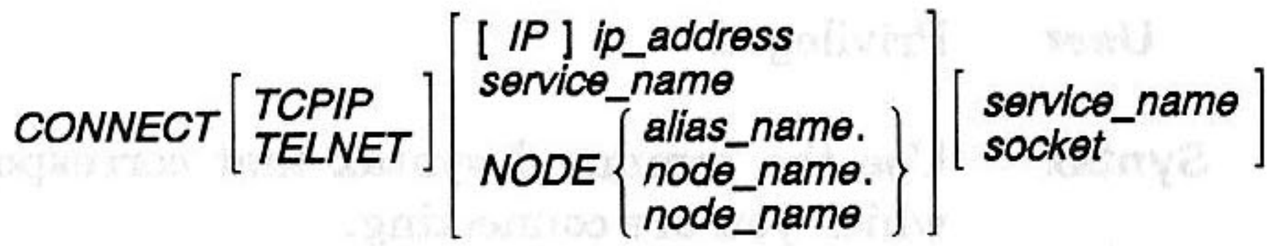
service_name* • *socket* • USERNAME *user_name
Enter the name of a specific TCP/IP port, port number or RLOGIN user name of the node to which you want to connect.

CONNECT [TCPIP • TELNET]

Definition

Establishes a connection between your port and a TCP/IP node or service using **TELNET protocol or** raw TCP/IP.

Syntax



Parameters

IP *ip_address* • *service_name* • NODE {*alias_name.* • *node_name* • *node_name.*}

Enter the Internet address, service name, username or node name of the node to which you want to connect.

service_name* • *socket

Enter the name of a specific TCP/IP port, port number or RLOGIN user name of the node to which you want to connect.

CONNECT PORT [LAT ■ RLOGIN ■ TCPIP ■ TELNET]

Definition Establishes a session between a port on your server that is not your port and a node or service offered by the network.

User Privileged

Syntax Use the command syntax that corresponds to the protocol to which you are connecting.

Notes

❑ If you do not specify a protocol, a protocol is selected based on the following:

- If the port protocol is **LAT** or **LAT ONLY**, a LAT connection is started;
- If the port protocol is **TCP** or **TCP ONLY**, a TCP connection is started;
- If the port protocol is **SERVER**, the server's default protocol is read.

❑ The target port cannot have a session in progress.

❑ **USERNAME** is passed to the host system when a connection is established. If you do not specify a user name, the port's user name is used.

See also

CONNECT
DISCONNECT PORT
RLOGIN
{SET / DEFINE / CHANGE} SERVER
SHOW / LIST / MONITOR NODES
SHOW / LIST / MONITOR SERVICES
TELNET

CONNECT PORT **LAT**

Definition

Establishes a connection between another port on the server and a node or service using the LAT protocol.

Syntax

CONNECT PORT LAT port_name

***LAT* Parameters**

service_name
Enter the name of the LAT service to which you want to connect.

NODE *node_name*
Enter name of the LAT node that offers the service.

DESTINATION *port_name*
Enter the name of the port on the host to which you want to connect.

CONNECT PORT **RLOGIN**

Definition

Establishes a session between another port on the server and a TCP/IP node service using the **RLOGIN** protocol.

Syntax

CONNECT PORT port_number [*RLOGIN*] [[*IP*] *ip_address* | *service_name* | *USERNAME "user_name"* | *NODE* { *alias_name.* | *node_name.* | *node_name* }] [*service_name* | *socket* | *USERNAME "user_name"*]

Parameters

IP *ip_address* • service_name • USERNAME *"user_name"* | NODE {*alias_name.* • *node_name* • *node_name.*}
Enter the Internet address, service name, username or node name of the node to which you want to connect.

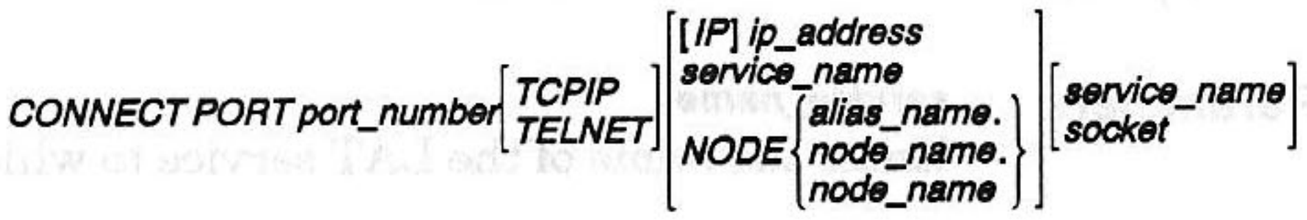
service_name* • *socket* • USERNAME *user_name
Enter the name of a specific TCP/IP port, port number or RLOGIN user name of the node to which you want to connect.

CONNECT PORT [TCPIP • TELNET]

Definition

Establishes a session between another port on the server and a TCP/IP node or service using the raw TCP/IP protocol or the TELNEt protocol.

Syntax



Parameters

IP *ip_address* • service_name • NODE {*alias_name.* • *node_name* • *node_name.*}

Enter the Internet address, service name, username or node name of the node to which you want to connect.

service_name* • *socket

Enter the name of a specific TCP/IP port, port number or RLOGIN user name of the node to which you want to connect.

DEFINE

Definition Use the **DEFINE** command to change the configuration stored in the *permanent* database. Changes **do not** take place immediately. They take affect when the server is next initialized or powered off. **DEFINE** follows the same format and uses the same options as the **SET** and **CHANGE** commands.

Use **DEFINE** to make changes to the configuration that cannot be made with **SET** or **CHANGE** because of current activity on the server.

Refer to the **SET** command in this section for a detailed description of the use of **SET**, **DEFINE** and **CHANGE**.

Abbreviation DEF

See **RESTORE**
SAVE
{SET / DEFINE / CHANGE} NODES
{SET / DEFINE / CHANGE} PORT / TERMINAL
{SET / DEFINE / CHANGE} SERVER
{SET / DEFINE/CHANGE} SERVICE

DISCONNECT

Definition Disconnects your port from active session(s). **DISCONNECT** can also be used to log off a port(s) other than your own if you have **PRIVILEGED** status.

User Privileged • Nonprivileged • Secure

Syntax

DISCONNECT [*PORT port_number* | *ALL*] [*SESSION*] [*session_name* | *session_number*]

Parameters **PORT *port_number*** • **ALL** • **SESSION [*session_name* • *session_number*]**
Disconnects all or specific sessions. If a parameter is not specified, your current session is disconnected.

Notes

- Use **DISCONNECT PORT** to disconnect ports other than your own. This terminates only the current session on the target port.
- Use **LOGOUT PORT** to terminate all sessions on a target port.

See also **LOGOUT**

HELP ■ MANUAL

Definition Displays online information and help about commands and configurations used on the terminal server.

User Privileged • Nonprivileged • Secure

Syntax { *HELP* / *MANUAL* } [*topic*] [*subtopic(s)*]

Parameters

topic
Enter the command for which you want help.

subtopic
Enter the parameter or minor topic for which you want help.

Notes

❑ Use <**CTRL**> **Z** or successive <**CR**>'s to exit **HELP**.

❑ Privileged users can display information about all commands used on the server. Nonprivileged and secure users can display information about commands they are allowed to use.

INITIALIZE [SERVER]

Definition Reinitializes the server. This is the same as turning the server off and turning it back on. All users are disconnected, power-on diagnostics are run and the parameters stored in the permanent database are restored to the operational database.

User Privileged

Syntax *INITIALIZE[SERVER][DELAYminutes][DISABLE][DIAGNOSE[BRIEF / NORMAL]]*

Parameters

DELAY *minutes*
Enter the number of minutes (1 to 1440) before the server is to stop and the initialization process is started. If a delay is not entered, reinitialization begins immediately.

DISABLE
Inhibits the **CONNECT** and **AUTOCONNECT** functions after initialization. To re-enable, enter **INITIALIZE** again without the **DISABLE** option or use the reset-to-factory-defaults procedure.

DIAGNOSE [BRIEF • NORMAL]
Specifies which test(s) are to be performed after system reset: **BRIEF** - internal self-test only or **NORMAL** - standard self-test.

Notes

- Use this command when you want to reset the server back to its normal operating state. This is especially useful if you have been testing a new operational configuration and want to return to a working configuration.

- As the server begins to initialize, the **LAN** and **ALARM LEDs** on the Ethernet Control Board will blink alternately. When initialization is complete, the **READY LED** illuminates.

See also
INITIALIZE [SERVER] CANCEL
INITIALIZE [SERVER] DATABASE
RESTORE

INITIALIZE [SERVER] CANCEL

Definition Cancels a previously issued **INITIALIZE SERVER** command **if** the **delay** has not lapsed.

User Privileged

Syntax *INITIALIZE [SERVER] CANCEL*

Parameters None

Notes

- **CANCEL** cannot be combined with other options.
- The **DELAY** must still be active **before** the **INITIALIZE CANCEL** command is executed.
- Use **SHOW / LIST / MONITOR SERVER STATUS** to find out if the **INITIALIZE SERVER DELAY** command has been issued. This will also tell you how much time is left before the server is initialized.

See also

INITIALIZE [SERVER]
INITIALIZE [SERVER] DATABASE
SHOW / LIST / MONITOR SERVER COUNTERS
SHOW / LIST / MONITOR SERVER STATUS

INITIALIZE [SERVER] {DATABASE ■ TRIGGER}

Definition Resets the terminal server to factory default configuration parameters. The system is reset immediately after you issue this command. You **cannot** cancel this command.

User Privileged

Syntax *INITIALIZE* [*SERVER*] { *DATABASE* / *TRIGGER* }

Parameters

DATABASE
Resets the terminal server to factory default configuration parameters.

TRIGGER
Resets the terminal server to factory default configuration followed by a request for a download (MOP).

Notes

CAUTION

The INITIALIZE DATABASE command should only be used when absolutely necessary. All configuration information stored in the terminal server will be erased when you issue this command. The server returns to ***factory default*** settings. All active sessions are disconnected and all users are logged off.

See also **INITIALIZE [SERVER]**
INITIALIZE [SERVER] CANCEL

LIST

Definition Use the **LIST** command to display a list of the current **permanent** database settings for a particular node, port, server or service. The settings displayed may be different than the **operational** database settings. **LIST** follows the same format and uses the same options as the **SHOW** and **MONITOR** commands.

Refer to the **SHOW** command in this section for a detailed description of the use of **SHOW, MONITOR** and **LIST.**

User Privileged

Abbreviation **LI**

See
{SHOW / LIST / MONITOR} NODES
{SHOW / LIST / MONITOR} PORTS
{SHOW / LIST / MONITOR} QUEUE
{SHOW / LIST / MONITOR} SERVER
{SHOW / LIST / MONITOR} SERVICES

LOCK

Definition Prevents unauthorized access to your terminal. A password prevents anyone from using the port until it is unlocked by reentering the password. You do not have to disconnect from your sessions to use **LOCK**.

How to use **LOCK**:

❶ Go to the LOCAL> prompt.

❷ Type **LOCK** and press **<CR>**.

❸ The server prompts you to enter a password (LOCK PASSWORD>). Enter a 1 to 6 character text string and press **<CR>**.

❹ The server then prompts you for verification of the password by asking you to enter the password again (VERIFICATION>). Enter the password again and press **<CR>**.

❺ If the two passwords match, the terminal keyboard is locked. The screen displays the number of the locked port and a prompt, UNLOCK PASSWORD>.

❻ To unlock the terminal, enter the password at the prompt and press **<CR>**.

❼ If the password is valid the LOCAL> prompt displays and you can **RESUME** your session.

User Privileged • Nonprivileged • Secure

Syntax *LOCK*

Parameters None

Notes

❑ To use **LOCK** on your port, the parameter must be enabled for every port on the server with the **{SET/DEFINE/CHANGE} SERVER LOCK [ENABLED/DISABLED]** command.

❑ If you forget your password, the system manager must logout your port. This also disconnects your session(s).

See also **{SET / DEFINE / CHANGE} SERVER LOCK**

LOGOUT

Definition Logs your port off the server. **LOGOUT** can also be used to log off a port(s) other than your own if you have **PRIVILEGED** status. When you log off the server all local and remote sessions associated with the port(s) are disconnected.

User Privileged • Nonprivileged • Secure

Syntax *LOGOUT* [*PORT* { *port_range* / *ALL* }]

Parameters ***port_range*** **• ALL**
Logs off a specific port or set of ports, or all ports.

Notes

❑ If a port(s) is not entered, the port you are currently on is logged off.

❑ You must have **PRIVILEGED** status in order to logout any port other than the one you are currently logged onto.

❑ *Logging out* from a port is more complete than simply *disconnecting* from a service. When you **LOGOUT**, your port is actually closed and waits for another *login*. All sessions are disconnected.

See also **DISCONNECT**

MONITOR

Definition Current statistics and counters are maintained by the terminal server for nodes, ports, and the server. This information is constantly being monitored and updated. You can use the **MONITOR** command to display these statistics and counters in *realtime* mode. The **MONITOR** command also displays information about the **operational** database settings for a particular node, port, server or service.

MONITOR follows the same format and uses the same options as the **SHOW** and **LIST** commands. Refer to the **SHOW** command in this section for a detailed description of the use of **SHOW**, **MONITOR** and **LIST**.

See
{SHOW / LIST / MONITOR} NODES
{SHOW / LIST / MONITOR} PORTS
{SHOW / MONITOR} QUEUE
{SHOW / LIST / MONITOR} SERVER
{SHOW / LIST / MONITOR} SERVICES
{SHOW / MONITOR} SESSIONS
{SHOW / MONITOR} USERS

PING

Definition PING (Packet InterNet Groper) tests the ability to reach destination devices on the network.

User Privileged

Syntax

PING { [IP] ip_address | NODE { alias_name. | node_name | node_name. } } [COUNT dd]

Parameters

IP *ip_address* • NODE {*alias_name.* • *node_name* • *node_name.*}
Enter the address or node name to be tested.

COUNT *dd*
Enter the number of times to test the node. The default is **1 ping**. Entering a count of **0** causes the test to repeat continuously until a <**BREAK**> is received.

Notes

- When a response or a timeout occurs, a message displays indicating the amount of time taken to communicate with the node. If a response is not received, the test is aborted and a message displays.

See also **TEST LOOP**

REMOTE [CONNECT]

Definition Provides a way to connect to the console port of another Equinox terminal server. Once connected you can become a privileged user and configure and monitor the remote server as if your terminal was connected directly to the server.

User Privileged

Syntax

REMOTE [*CONNECT*] { *ethernet_address* | *node_name* | *serial_number* | *service_name* }

Parameters ***ethernet_address**** • ***node_name**** • ***serial_number**** • ***service_name***
Connects to the port identified by a specific address, node name, serial number or service name.

* These parameters can only be used on an Equinox Terminal Server. The Equinox Terminal Server converts them to the correct service name.

Notes

❑ After you connect to a remote console, you receive a prompt (#>). You must enter the server password at the prompt to access the remote console. The default password is **ACCESS**.

ACCESS ***is the default remote access***

❑ Remote connect ***service names*** are only visible to privileged users on Equinox terminal servers. If you have a non-Equinox Terminal Server, these services display with an **RC_** at the beginning of the service name.

❑ Once your log on as a remote console to a server, your terminal becomes a virtual port (**49th port**). Certain functions such as **SHOW PORT** do not reflect your port.

❑ You can not connect to other services from the remote console port.

See also
CONNECT
{SET / DEFINE / CHANGE} SERVICES
SHOW / MONITOR NODES
SHOW / LIST / MONITOR SERVICES

REMOVE QUEUE

Definition Removes a host-initiated request for remote access to server ports from the server queue. The server sends a message to the service node that requested the remote access. The message informs the requester that the request was deleted by a server user.

User Privileged

Syntax

REMOVE QUEUE { *ALL* | *ENTRY entry_number* | *NODE node_number* | *PORT port_name* | *SERVICE service_number* }

Parameters **ALL** • **ENTRY** *entry_number* • **NODE** *node_number* • **PORT** *port_name* • **SERVICE** *service_number*

Removes all or the specified entries from the queue.

Notes

- Use **SHOW / LIST / MONITOR QUEUE** to display a list of queued requests. The currently executing job is marked with an asterisk (*).

See also **SHOW/LIST/MONITOR QUEUE**

{RESTORE ■ SAVE}

Definition Use **RESTORE** to transfer all, or part, of the permanent database to the operational database. This command is similar to **INITIALIZE SERVER** except that you can transfer the database to selected ports, services, etc. without resetting the server.

Use **SAVE** to transfer all, or part, of the operational database to the permanent database.

User Privileged

Syntax Use the command syntax described below that corresponds to the type of restore you want to effect.

Notes

- Characteristics may not be **RESTORED** while sessions are active. Use the **RESTORE** command on ports that are logged on with care because individual characteristics set by the user will be lost.
- Characteristics may be **SAVED** while sessions are active.

See also **INITIALIZE [SERVER]**

{RESTORE • SAVE} ALL

Definition **RESTORE** transfers all of the permanent database to the operational database of the server. **SAVE** transfers all of the operational database to the permanent database of the server.

Syntax { *RESTORE* / *SAVE* } *ALL*

Parameters

ALL
Transfers all of the database.

{RESTORE • SAVE} NODE

Definition

RESTORE transfers the configuration for the specified node from the permanent database to the operational database. **SAVE** transfers all of the operational database to the permanent database.

Syntax

{ *RESTORE* / *SAVE* } *NODE* { *ALL* / *GATEWAY* / *NAMESERVER* / [*IP*] *ip_address* / [*NAME*] { *alias_name.* / *node_name.* / *node_name* } }

Parameters

ALL • GATEWAY • NAMESERVER • IP *ip_address* • NAME {*alias_name* • *node_name.* • *node_name*}

Transfers all, or selected TCP/IP node settings from the desired database.

{RESTORE • SAVE} PORT

Definition

RESTORE transfers the configuration for the specified port from the permanent database to the operational database. **SAVE** transfers all of the operational database to the permanent database.

Syntax

{ *RESTORE* / *SAVE* } *PORT* { *ALL* / *port_range* }

Parameters

ALL • *port_range*

Transfers the database to all or selected ports.

{RESTORE • SAVE} SERVER

Definition

RESTORE transfers the server characteristics from the permanent database to the operational database. **SAVE** transfers the server characteristics from the operational database to the permanent database.

Syntax

{ *RESTORE* | *SAVE* } *SERVER*

Parameters

None

{RESTORE • SAVE} SERVICE

Definition

RESTORE transfers services from the permanent database to the operational database. **SAVE** transfers services from the operational database to the permanent database.

Syntax

{ *RESTORE* | *SAVE* } *SERVICE* { *ALL* | *LOCAL* [*ALL* | *LAT* | *TCPIP* | *service_name*] | *REMOTE* [*ALL* | [*IP*] *ip_address* | *service_name*] | *service_name* }

Parameters

ALL • LOCAL • REMOTE • service_name
Transfers all, or specific services from the database.

RESUME

Definition Restarts a suspended session when you are in local mode.

User Privileged • Nonprivileged • Secure

Syntax

```
{ RESUME [ SESSION ] [ session_name   ] }
{                    [ session_number ] }
{ session_number                        }
```

Parameters

session_name • session_number

Enter the ***session_name*** or ***session_number*** of the session you want to resume. The default is your most current session.

Notes

❑ A handy abbreviation for the **RESUME** command is available in the Equinox Terminal Server. Enter the number of the session you want to resume and press <**CR**>. To resume a session (i.e. session 2), type:

LOCAL> **RESUME SESSION 2**

or

LOCAL> **R 2**

or

LOCAL> **2**

See also

BACKWARDS • FORWARDS
DISCONNECT
{SET / DEFINE / CHANGE} SERVER SESSION LIMIT
SET SESSION
{SHOW / MONITOR} SESSIONS

RLOGIN

Definition Establishes a connection between your port and a TCP/IP node or service using the **RLOGIN** protocol.

User Privileged • Nonprivileged • Secure

Syntax

RLOGIN [[*IP*] *ip_address* | *service_name* | *USERNAME "user_name"* | *NODE* { *alias_name.* | *node_name.* | *node_name* }] [*service_name* | *socket* | *USERNAME "user_name"*]

Parameters **IP** ***ip_address*** • ***service_name*** • **USERNAME** ***user_name*** • **NODE** ***{alias_name. • node_name. • node_name}***

The Internet address, service name, user name or specific node name to which you want to connect.

service_name • ***socket*** • **USERNAME** ***user_name***

The service name, socket number or user name of the specific TCP/IP port to which you want to connect.

Notes

- You must specify the node offering the TCP/IP port and the TCP/IP port name or the TCP/IP port number of the service.

See also **CONNECT**
{SET / DEFINE / CHANGE} PORT PREFERRED
{SHOW / LIST MONITOR} SERVICES

{SET ■ DEFINE ■ CHANGE} NODES

TCP/IP

Definition Use **{SET / DEFINE / CHANGE} NODES** to modify TCP/IP nodes defined in the server's internal node table.

SET modifies TCP/IP node options *temporarily* and takes place *immediately*. The next time the node is logged in, the *permanent* settings replace these temporary settings.

DEFINE modifies TCP/IP node options *permanently* and takes effect the next time the server is reinitialized.

CHANGE modifies TCP/IP node options *immediately* and *permanently*.

User Privileged

Syntax

$$\left\{\begin{matrix}SET\\DEFINE\\CHANGE\end{matrix}\right\}\ NODES\ [\ NAME\ ]\ \left\{\begin{matrix}node_name.\\node_name\end{matrix}\right\}\ options$$

Parameters

NAME {*node_name* • *node_name.*}
Enter the name of the node you want to modify.

options
Use the command syntax described below for individual options.

Notes

- LAT node information must be learned. Therefore you cannot change LAT node information with the **SET / DEFINE / CHANGE} NODES** command.
- There is no limit to the number of options you can enter on a single command line. However, there is a limit of 115 characters to a single command line.

See also

INITIALIZE SERVER
RESTORE
SAVE

{SET / DEFINE / CHANGE} NODES **ADDRESS**

Definition

Assigns an Ethernet address to a node.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *NODES* [*NAME*] { *node_name* / *node_name.* } *ADDRESS ethernet_address*

Parameters

ethernet_address
Enter a valid Ethernet address to assign to the node.

{SET / DEFINE /CHANGE} NODES **ALIAS**

Definition

Assigns a short, alternate name to a TCP/IP node. Alias names are only used locally on the server

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *NODES* [*NAME*] { *node_name* / *node_name.* } *ALIAS* { *alias_name.* / *NONE* }

Parameters

alias_name. • **NONE**
Enter up to 16 characters followed by a period as an alternate name. **NONE** removes the name.

{SET / DEFINE / CHANGE} NODES **GATEWAY**

Definition

Defines a TCP/IP node as a **GATEWAY** between networks. Only one node can be defined as a default.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *NODES*[*NAME*] { *node_name* / *node_name.* } *GATEWAY* [*ENABLED* / *DISABLED* / *DEFAULT*]

Parameters

ENABLED • DISABLED • DEFAULT
Enable or disable a TCP/IP node as a gateway, or define a node as a default gateway when multiple gateways are present.

{SET / DEFINE / CHANGE] NODES **IDENTIFICATION**

Definition

Defines a message to display locally when a TCP/IP node is accessed.

Syntax

$$\left\{\begin{matrix}SET\\DEFINE\\CHANGE\end{matrix}\right\}\ NODES\ [\ NAME]\ \left\{\begin{matrix}node_name\\node_name.\end{matrix}\right\}\ IDENTIFICATION\ "text_string"$$

Parameters

"text_string"
Enter up to 40 characters of identifying text.

{SET / DEFINE / CHANGE} NODES **IP**

Definition

Defines an Internet address to a TCP/IP node. This is required for TCP/IP communication.

Syntax

$$\left\{\begin{matrix}SET\\DEFINE\\CHANGE\end{matrix}\right\}\ NODES\ [\ NAME]\ \left\{\begin{matrix}node_name\\node_name.\end{matrix}\right\}\ IP\ \left[\begin{matrix}ip_address\\NONE\end{matrix}\right]$$

Parameters

ip_address • **NONE**
Enter a specific Internet address for the node, or remove an existing address with **NONE**.

{SET / DEFINE / CHANGE} NODES **NAMESERVER**

Definition

Defines a TCP/IP node as a **NAMESERVER** between networks. Only one **NAMESERVER** can be the default at any given time.

Syntax

$$\left\{\begin{matrix}SET\\DEFINE\\CHANGE\end{matrix}\right\}\ NODES\ [\ NAME]\ \left\{\begin{matrix}node_name\\node_name.\end{matrix}\right\}\ NAMESERVER\ \left[\begin{matrix}ENABLED\\DISABLED\\DEFAULT\end{matrix}\right]$$

Parameters

ENABLED • DISABLED • DEFAULT
Enable or disable a TCP/IP node as a nameserver, or define a node as a default nameserver when multiple nameservers are present.

{SET / DEFINE / CHANGE} NODES NETIP

Definition

Use this command to assign an Internet address to a **GATEWAY**.

Syntax

{SET / DEFINE / CHANGE} *NODES* [*NAME*] {*node_name* / *node_name.*} *NETIP* [[*IP*] *ip_address* / *NONE*]

Parameters

IP *ip_address* • NONE

Enter a valid Internet address or remove a currently defined address associated with a **GATEWAY**.

{SET / DEFINE / CHANGE} NODES TCPIP

Definition

Use this command to controls whether TCP/IP connections are supported by a node.

Syntax

{*SET* / *DEFINE* / *CHANGE*} *NODES* [*NAME*] {*node_name* / *node_name.*} *TCPIP* [*ENABLED* / *DISABLED*]

Parameters

ENABLED • DISABLED

Enables TCP/IP connections on a node or disables TCP/IP connections. If disabled, you will not be able to make TCP/IP, TELNET or RLOGIN connections to the node.

{SET ■ DEFINE ■ CHANGE} PORT

Definition Use **{SET / DEFINE / CHANGE} PORT** to modify terminal server *port* characteristics such as operating speed (baud rate), parity and other configuration parameters.

SET modifies the *operational* database and takes place *immediately*. The next time the port is logged in, the *permanent* settings replace these temporary settings.

DEFINE modifies the *permanent* database and takes effect at the next login of that port. Requires privileged status.

CHANGE modifies both the *operational* and *permanent* databases *immediately*. Requires privileged status.

User See individual commands

Syntax

$$\left\{\begin{matrix}SET\\DEFINE\\CHANGE\end{matrix}\right\}\left\{\begin{matrix}PORT\left[\begin{matrix}port_range\\ALL\end{matrix}\right]\\TERMINAL\end{matrix}\right\}\ options$$

Parameters

PORT [*port_range* • ALL] • TERMINAL

If the status on the port is **nonprivileged**, the *port_range* must be the port you are currently logged on to. If your current port status is **privileged**, you can specify all ports or a *port_range*.

options

Enter any configuration changes to be made to the port. There is no limit to the number of options you can enter on a single command line. There is a limit, however, of 125 characters to a single command line.

Use the command syntax described below for individual options.

Notes

- Permanent database parameters are retained when the terminal server power is off. The permanent database is copied to the operational database at power-up or with the **INITIALIZE SERVER** command.
- **DEFINE** and **CHANGE** require a user status of **PRIVILEGED.**

{SET / DEFINE /CHANGE} PORT **ACCESS**

Definition Use this command to determine how a port can connect to a service node or how other users or service nodes can connect to it.

User Privileged

Syntax

$$\left\{\begin{matrix}SET\\DEFINE\\CHANGE\end{matrix}\right\}\left\{PORT\left[\begin{matrix}port_range\\ALL\end{matrix}\right]\right\}\ ACCESS\ \left\{\begin{matrix}LOCAL\\REMOTE\\DYNAMIC\\NONE\end{matrix}\right\}$$

Parameters ***Default*** **= LOCAL**

LOCAL
Permits a device that is connected to the port(s) to originate connections to other services on the network and to use the server's local mode command set.

REMOTE
Restricts the port(s) to receiving connections only. The port(s) cannot originate connections or use any local mode commands.

DYNAMIC
Allows the port(s) to originate connections and to accept remotely originated connections. This is a combination of **REMOTE** and **LOCAL** access.

NONE
Disables all access to the port(s).

Notes

- **ACCESS** and **DEVICE TYPE** define the usage of the port.

	Local	Remote	Dynamic
Data Only	Terminal	Foreign host port	PC
DTR	PC or other control signal device	Foreign host port with control signal	PC or other control signal device
Modem	Dial-in modem	Dial-out modem	Dial in/out modem

Table 2-3 Device Types

See also **{SET / DEFINE / CHANGE} PORT DEVICE [TYPE]**
{SET / DEFINE / CHANGE} SERVICE

{SET / DEFINE / CHANGE} PORT **AUTHORIZED GROUPS**

Definition Use to specify groups of LAT service nodes that will be available to a port.

User Privileged

Syntax

{SET / DEFINE / CHANGE} { PORT [port_range / ALL] / TERMINAL } AUTHORIZED [GROUPS] { group_range / ALL / NONE } [ENABLED / DISABLED]

Parameters

***Default* = 0 - 255**

GROUP *group_range*

Enter the range (between 0 and 255) for the group of LAT services the port is allowed to access on the network.

ENABLED• DISABLED

If **ENABLED**, the group is added to the list of currently defined groups for the port. If **DISABLED**, the specified group is removed from the list. If neither is entered, the specified group replaces the current list.

See also **{SET / DEFINE / CHANGE} PORT GROUPS**

{SET / DEFINE / CHANGE} PORT **AUTOBAUD**

Definition Use to automatically detect the speed of incoming data and to adjust the server port to match the setting when a port is logs in.

User Privileged

Syntax

{SET / DEFINE / CHANGE} { PORT [port_range / ALL] / TERMINAL } AUTOBAUD { ENABLED / DISABLED }

Parameters

***Default* = ENABLED**

ENABLED • DISABLED

If **ENABLED**, the server automatically detects the speed of the port input devices. If **DISABLED**, the port runs only at the speed for which the port speed, character and parity are configured.

See also **{SET / DEFINE / CHANGE} PORT CHARACTER [SIZE]**
{SET / DEFINE / CHANGE} PORT PARITY

{SET / DEFINE / CHANGE} PORT **AUTOCONNECT**

Definition Controls whether the terminal server connects you immediately to a specific service whenever the port is logged on.

User Privileged • Nonprivileged

Syntax

{SET / DEFINE / CHANGE} {PORT [port_range / ALL] / TERMINAL} AUTOCONNECT {ENABLED / DISABLED}

Parameters

***Default* = DISABLED**

ENABLED • DISABLED

If **ENABLED**, the server automatically connects the port(s) to a dedicated or preferred service at login. If **DISABLED**, you must manually connect to services.

Notes

❑ Press <**BREAK**> to return to LOCAL> mode if you want to connect ports with another service. This applies to *preferred services* only. Ports with dedicated services cannot enter local mode.

See also

{SET / DEFINE / CHANGE} PORT DEDICATED [SERVICES]
{SET / DEFINE / CHANGE} PORT PREFERRED [SERVICES]

{SET / DEFINE / CHANGE} PORT **AUTOPROMPT**

Definition Use this command to speed up the login process by automatically initiating the login procedure when the connection is made.

User Privileged • Nonprivileged • Secure

Syntax

{SET / DEFINE / CHANGE} {PORT [port_range / ALL] / TERMINAL} AUTOPROMPT {ENABLED / DISABLED}

Parameters

***Default* = ENABLED**

ENABLED • DISABLED

If **ENABLED**, a carriage return is automatically sent when a connection is made to a service. This usually results in the service prompt. If **DISABLED**, a carriage return is not sent automatically when a connection is made to a service. You must press <**CR**> to get a prompt.

{SET / DEFINE / CHANGE} PORT **BACKWARDS SWITCH**

Definition Defines a character or control character that you can use to switch a previous session without returning to the LOCAL> prompt.

User Privileged • Nonprivileged • Secure

Syntax

{SET / DEFINE / CHANGE} {PORT [port_range / ALL] / TERMINAL} BACKWARDS[SWITCH] {character / NONE}

Parameters ***Default*** **= NONE**

character **• NONE**

Enter any alphanumeric or control character you want to use to switch to previous sessions. Enter control characters by preceding the desired letter with a caret (^). **NONE clears defined characters.**

See also **{SET / DEFINE / CHANGE} PORT FORWARDS [SWITCH]**

{SET / DEFINE / CHANGE} PORT **BREAK**

Definition Defines the response port(s) make when the <**BREAK**> key is pressed. The default response is the LOCAL> prompt.

User Privileged • Nonprivileged

Syntax

{SET / DEFINE / CHANGE} {PORT [port_range / ALL] / TERMINAL} BREAK {LOCAL / REMOTE / DISABLED}

Parameters ***Default*** **= LOCAL**

{LOCAL • REMOTE • DISABLE}

LOCAL returns to the LOCAL> prompt when you press the <**BREAK**> key within a session.

REMOTE passes breaks to the connected service.

DISABLED causes breaks to be ignored by the server and the service while you are in a session.

See also **{SET / DEFINE / CHANGE} PORT LOCAL [SWITCH]**

{SET / DEFINE / CHANGE} PORT **BROADCAST**

Definition Gives port(s) the ability to receive messages that have been broadcast on the server.

User Privileged • Nonprivileged

Syntax

$$\left\{\begin{matrix}SET\\DEFINE\\CHANGE\end{matrix}\right\}\left\{\begin{matrix}PORT\left[\begin{matrix}port_range\\ALL\end{matrix}\right]\\TERMINAL\end{matrix}\right\}\ BROADCAST\ \left\{\begin{matrix}ENABLED\\DISABLED\end{matrix}\right\}$$

Parameters ***Default*** **= ENABLED**

ENABLED • DISABLED

If **ENABLED**, messages will be received by the specified ports. If **DISABLED**, messages will not be received by the ports.

Notes ❑ **{SET / DEFINE / CHANGE} SERVER BROADCAST ENABLED** must have been issued before this command will work.

See also **BROADCAST**
{SET / DEFINE / CHANGE} SERVER BROADCAST

{SET / DEFINE / CHANGE} PORT **CHARACTER SIZE**

Definition Data transmitted between the terminal server and a connected service is done with a series of 7 or 8 bits per character. **CHARACTER [SIZE]** lets you specify the number of bits per character received and transmitted by a port(s).

User Privileged • Nonprivileged

Syntax

$$\left\{\begin{matrix}SET\\DEFINE\\CHANGE\end{matrix}\right\}\left\{\begin{matrix}PORT\left[\begin{matrix}port_range\\ALL\end{matrix}\right]\\TERMINAL\end{matrix}\right\}\ CHARACTER\ [\ SIZE]\ \left\{\begin{matrix}7\\8\end{matrix}\right\}$$

Parameters ***Default*** **= 8**

7/8

Enter the number of data bits in characters to be exchanged between the port and the server.

See also **{SET / DEFINE / CHANGE} PORT PARITY**

{SET / DEFINE / CHANGE} PORT **CONTROL**

Definition Modifies the custom control signal handling options for a port(s).

User Privileged

Syntax $\left\{\begin{matrix}SET\\DEFINE\\CHANGE\end{matrix}\right\}\left\{PORT\left[\begin{matrix}port_range\\ALL\end{matrix}\right]\right\}$ *CONTROL options*

Parameters ***Default* = See individual options**

options

Options can be set up independently to achieve the desired control signal handling characteristics. The only time you can set control signal options is when **DEVICE** is set to **CUSTOM.**

Each control option is described individually below.

{SET / DEFINE / CHANGE} PORT **CONTROL AUTOCONNECT**

Definition Enables or disables automatic connection to a dedicated or preferred service when an input control signal is received.

User Privileged

Syntax $\left\{\begin{matrix}SET\\DEFINE\\CHANGE\end{matrix}\right\}\left\{PORT\left[\begin{matrix}port_range\\ALL\end{matrix}\right]\right\}$ *CONTROL AUTOCONNECT* $\left\{\begin{matrix}ENABLED\\DISABLED\end{matrix}\right\}$

Parameters ***Default* = DISABLED**

ENABLED • DISABLED

If **ENABLED**, **AUTOCONNECT** is initiated when **CTRL IN** turns **on** and **AUTOCONNECT** is enabled for the port(s). If **DISABLED**, there is no **AUTOCONNECT** on **CTRL IN** transition.

See also **{SHOW / LIST / MONITOR} PORTS**

{SET / DEFINE / CHANGE} PORT **CONTROL CONNECTED**

Definition Use to select the outbound control signal state for the server.

User Privileged

Syntax

{SET / DEFINE / CHANGE} {PORT [port_range / ALL] / TERMINAL} CONTROL CONNECTED {ON / OFF / PASS}

Parameters ***Default*** **= PASS**

ON • OFF • PASS

ON **CTRL-OUT** is **on** when connected.

OFF **CTRL-OUT** is **off** when connected.

PASS **CTRL-OUT** is **equal** to **CTRL-IN** (from the connected port) when connected.

See also **SHOW / LIST / MONITOR PORTS**

{SET / DEFINE / CHANGE} PORT **CONTROL DELAY**

Definition Use to turn on or turn off a 1.5 second delay between connections.

User Privileged

Syntax

{SET / DEFINE / CHANGE} {PORT [port_range / ALL] / TERMINAL} CONTROL DELAY {ENABLED / DISABLED}

Parameters ***Default*** **= DISABLED**

ENABLED • DISABLED

If **ENABLED**, 1.5 seconds must pass after a disconnect before another connect is allowed. If **DISABLED**, immediate reconnections are allowed.

{SET / DEFINE / CHANGE} PORT **CONTROL DISCONNECT**

Definition Use to turn on or turn off an automatic disconnect when the inbound control signal turns off.

User Privileged

Syntax

$$\left\{\begin{matrix}SET\\DEFINE\\CHANGE\end{matrix}\right\}\left\{PORT\left[\begin{matrix}port_range\\ALL\end{matrix}\right]\middle|\begin{matrix}\\TERMINAL\end{matrix}\right\}\ CONTROL\ DISCONNECT\left\{\begin{matrix}ENABLED\\DISABLED\end{matrix}\right\}$$

Parameters ***Default*** **= DISABLED**

ENABLED • DISABLED

If **ENABLED**, a disconnect is executed when **CTRL-IN** turns **off**. If **DISABLED**, there is no disconnect when **CTRL-IN** is **off**.

See also **SHOW / LIST / MONITOR PORTS**

{SET / DEFINE / CHANGE} PORT CONTROL **FADE**

Definition Use to turn on or turn off automatic disconnect if the inbound control signal turns off for more than 1.5 seconds.

User Privileged

Syntax

$$\left\{\begin{matrix}SET\\DEFINE\\CHANGE\end{matrix}\right\}\left\{PORT\left[\begin{matrix}port_range\\ALL\end{matrix}\right]\middle|\begin{matrix}\\TERMINAL\end{matrix}\right\}\ CONTROL\ FADE\left\{\begin{matrix}ENABLED\\DISABLED\end{matrix}\right\}$$

Parameters ***Default*** **= DISABLED**

ENABLED • DISABLED

If **ENABLED**, a disconnect is performed if **CTRL-IN** turns off for more than 1.5 seconds. If **DISABLED**, no disconnect occurs on carrier fade.

{SET / DEFINE / CHANGE} PORT CONTROL **IDLE**

Definition Use to select the outbound control signal state of the port when it is not connected.

User Privileged

Syntax $\left\{\begin{matrix}SET\\DEFINE\\CHANGE\end{matrix}\right\}\left\{PORT\left[\begin{matrix}port_range\\ALL\end{matrix}\right]\right\}$ *CONTROL IDLE* $\left\{\begin{matrix}ON\\OFF\end{matrix}\right\}$

Parameters ***Default*** **= ON**

ON • OFF

If **ON**, **CTRL-OUT** is **on** when not connected. If **OFF** is specified, **CTRL-OUT** is **off** when not connected

{SET / DEFINE / CHANGE} PORT **CONTROL REQUIRED**

Definition Use to turn on or off the requirement that a port(s) inbound control signal must be **on** to make a connection.

User Privileged

Syntax $\left\{\begin{matrix}SET\\DEFINE\\CHANGE\end{matrix}\right\}\left\{PORT\left[\begin{matrix}port_range\\ALL\end{matrix}\right]\right\}$ *CONTROL REQUIRED* $\left\{\begin{matrix}ENABLED\\DISABLED\end{matrix}\right\}$

Parameters ***Default*** **= DISABLED**

ENABLED • DISABLED

When **ENABLED**, **CTRL-IN** must be **on** to make a connection or to enter local mode. When **DISABLED**, you do not need **CTRL-IN** to make a connection.

{SET / DEFINE / CHANGE} PORT **CONTROL TOGGLE**

Definition Use to turn on or turn off the requirement that inbound control signals must be raised and dropped between connections.

User Privileged

Syntax

{SET / DEFINE / CHANGE} {PORT [port_range / ALL] / TERMINAL} CONTROL TOGGLE {ENABLED / DISABLED}

Parameters

Default **= DISABLED**

ENABLED • DISABLED

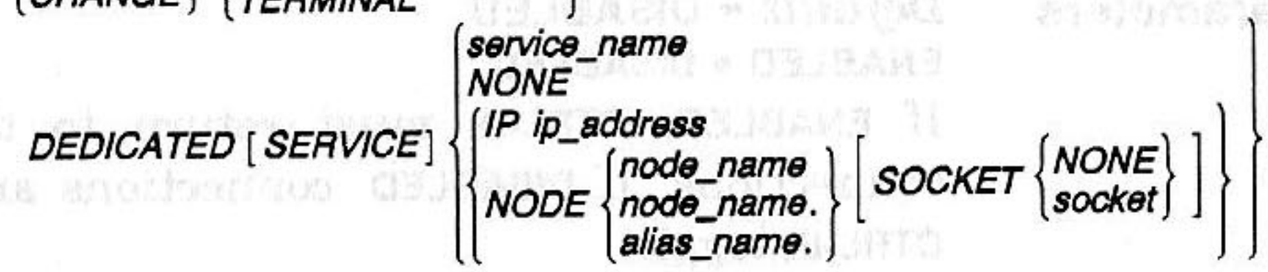
If **ENABLED**, **CTRL-IN** must return to the **off** state between connections. If **DISABLED**, connections are allowed without the **CTRL-IN** toggle.

{SET / DEFINE / CHANGE} PORT **DEDICATED SERVICE**

Definition Use to establish one service that this port connects to automatically whenever it is logged onto the server. Once connected to the service you cannot enter local mode or connect to any other service from this port.

User Privileged

Syntax



Parameters ***Default*** **= NONE**

service_name **• NONE • IP** ***ip_address*** **• NODE {***node_name* **|** ***node_name.*** **|** ***alias_name.*****}**

Enter the name, address or node name of the LAT or TCP/IP service this ports connects to automatically at login.

SOCKET {NONE | ***socket*****}**

Enter the TCP/IP ***socket***, for non-LAT connections. **NONE** resets the socket selection to blank.

Notes

❑ **AUTOCONNECT** must be enabled for a port to execute the connection to the specified **DEDICATED** service.

❑ A port may have either a dedicated or a preferred service, but cannot have both specified at the same time.

❑ When a dedicated service is configured, the default protocol setting for the port controls how the service will be accessed.

See also

SET/DEFINE/CHANGE PORT AUTOCONNECT
SET/DEFINE/CHANGE PORT PREFERRED [SERVICE]

{SET / DEFINE / CHANGE} PORT **DEFAULT PROTOCOL**

Definition Establishes a default protocol to be used by port(s) when making a connection. This can be overridden at the command line.

User Privileged • Nonprivileged

Syntax

{SET / DEFINE / CHANGE} {PORT [port_range / ALL] / TERMINAL} [DEFAULT] PROTOCOL {LAT / RLOGIN / SERVER / TCPIP / TELNET} [ONLY]

Parameters

***Default* = SERVER**

LAT • RLOGIN • SERVER • TCPIP • TELNET

Enter the protocol to be used during the connection process.

ONLY

Use this option when you want to prevent the use of other protocols on the port(s).

Notes

- If you do not use the **ONLY** option, the protocol may be overridden with the **CONNECT** command.

See also

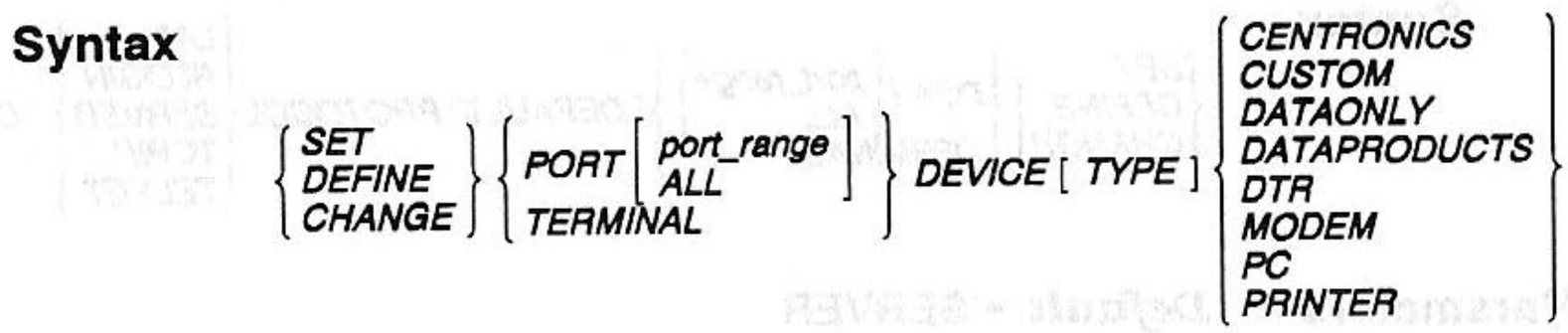
CONNECT
CONNECT PORT
RLOGIN
{SET / DEFINE / CHANGE} SERVER PROTOCOL
TELNET

{SET / DEFINE / CHANGE} PORT DEVICE TYPE

Specifies the device type for a port(s). This lets you establish how the server will handle control signals on a port(s).

User Privileged

Syntax



Parameters *Default* = **DATAONLY**
{CENTRONICS • CUSTOM • DATAONLY • DATAPRODUCTS • DTR • MODEM • PC • PRINTER}
CENTRONICS causes the port to handle control signals as if connected to a parallel printer. This parameter is only valid with the **12-PORT-CS+PTR** board, on ports 13 or 37.

CUSTOM lets you customize the handling of control signals for the port. This causes the server to handle control signals in the manner specified by the **PORT CONTROL** characteristics for the port.

DATAONLY causes all connects and disconnects to be handled by entering commands. Control signals are not used for connects or disconnects by the device connected to this port.

DATAPRODUCTS causes the port to handle control signals as if connected to a parallel printer. This parameter is only valid with the **12-PORT-CS+PTR** board, on ports 13 or 37.

DTR causes the port to make connections and disconnections based on the transitions of incoming control signals.

MODEM causes the port to handle control signals as if connected to an in-dial or out-dial modem.

PC causes the port to handle control signals as if it were connected to a personal computer.

PRINTER causes the port to handle control signals as if it were connected to a serial printer.

Notes

❑ There are eight control options used in the server that define how the input and output control signals are handled. You may select the setting of these control options manually using the **CUSTOM** device type or allow the server to automatically set them based on selection of one of the other general device types.

CUSTOM should only be used as a last resort. That is if none of the standard device types are appropriate for the port.

Table 2-5 lists the internal control options for each type of device.

❑ When using modems, setting the port's **access type** causes the port to act like:

Dial-in modem	**Local Access**
Dial-out modem	**Remote Access**
Both	**Dynamic Access**

	DATAONLY		DTR		MODEM	
	Access		Access		Access	
	Dynamic /Local	Remote /None	Dynamic/ Local	Remote/ None	Dynamic/ Local	Remote/ None
AUTOCONNECT	Disabled	Disabled	Enabled	n/a	Enabled	n/a
CONNECTED	Pass	Pass	On	On	On	On
DELAY	Disabled	Disabled	Enabled	Enabled	Enabled	Enabled
DISCONNECT	Disabled	Disabled	Enabled	Enabled	Disabled	Disabled
FADE	Disabled	Disabled	Disabled	Disabled	Enabled	Enabled
IDLE	On	Off	On	Off	On	Off
REQUIRED	Disabled	Disabled	Enabled	Enabled	Enabled	Disabled
TOGGLE	Disabled	Disabled	Disabled	Enabled	Enabled	Enabled

	PC		PRINTER	
	Access		Access	
	Dynamic/ Local	Remote/ None	All	
AUTOCONNECT	Enabled	n/a	n/a	
CONNECTED	On	On	On	
DELAY	Enabled	Enabled	Disabled	
DISCONNECT	Enabled	Enabled	Disabled	
FADE	Disabled	Disabled	Disabled	
IDLE	On	Off	On	
REQUIRED	Enabled	Enabled	Enabled	
TOGGLE	Disabled	Disabled	Disabled	

Table 2-5 Internal Control Options

{SET / DEFINE / CHANGE} PORT **EQUAL**

Definition Copies all of a ports configuration characteristics to any other port(s).

User Privileged

Syntax

{ *SET* / *DEFINE* / *CHANGE* } { *PORT* [*port_range* / *ALL*] / *TERMINAL* } *EQUAL* [*port_number*]

Parameters

port_number
Enter the port number of the port that has the source characteristics you want to copy to all ports specified by *port_range*. If you do not enter a ***port_number***, the default source is the port you are logged into.

{SET / DEFINE / CHANGE} PORT **FLOW CONTROL**

Definition Use to prevent the loss of data that is transmitted too rapidly to be processed by the port or the attached device. You can temporarily stop the flow of data each time the memory buffer is full by turning **FLOW CONTROL** on (enabled).

User Privileged • Nonprivileged

Syntax

{ *SET* / *DEFINE* / *CHANGE* } { *PORT* [*port_range* / *ALL*] / *TERMINAL* } [*INPUT* / *OUTPUT*] *FLOW* [*CONTROL*] { *ENABLED* / *DISABLED* }

Parameters

Default **= ENABLED for INPUT and OUTPUT**

INPUT • OUTPUT
If you want to control flow in one direction only, specify **INPUT** or **OUTPUT**. Omitting **INPUT** and **OUTPUT** causes the port to both give and accept flow control.

ENABLED • DISABLED
If enabled, flow control is turned on. If disabled, no flow control is set for the port.

See also **{SET / DEFINE / CHANGE} PORT FLOW [CONTROL] {CTLSIG/XON/ XOFFANY}**

{SET / DEFINE / CHANGE} PORT **FLOW CONTROL**

Definition Establishes how the data flow in and out of a port(s) is to be handled.

User Privileged • Nonprivileged

Syntax

{SET / DEFINE / CHANGE} { PORT [port_range / ALL] / TERMINAL } FLOW [CONTROL] { CTLSIG / XON / XOFFANY }

Parameters ***Default*** **= XON**
{CTLSIG • XON • XOFF}
CTLSG enables out-of-band (control signal) flow control.

XON sets XON/XOFF (in band) flow control. This is standard for all DEC-type terminals.

XOFFANY is used to stop data flow. Enter any character to resume transmission.

See also **{SET / DEFINE / CHANGE} PORT FLOW [CONTROL] {ENABLED | DISABLED]}**

{SET / DEFINE / CHANGE} PORT **FORWARDS SWITCH**

Definition Defines a character or control character that you can use to switch to a session without returning to the LOCAL> prompt.

User Privileged • Nonprivileged • Secure

Syntax

{SET / DEFINE / CHANGE} { PORT [port_range / ALL] / TERMINAL } FORWARDS[SWITCH] { character / NONE }

Parameters ***Default*** **= NONE**
character **• NONE**
Enter any alphanumeric or control character to use to switch to the next session. Enter control characters by preceding the desired letter with a caret (^). **NONE clears defined characters.**

See also **{SET / DEFINE / CHANGE} PORT BACKWARDS [SWITCH]**

{SET / DEFINE / CHANGE} PORT **GROUPS**

Definition

Use **GROUPS** to define a list of groups that displays when you do a **{SHOW / LIST / MONITOR}** command. This is useful when you have many groups defined on the Ethernet, but only a few are actually needed by users.

User

Privileged • Nonprivileged (**SET** only) • Secure (**SET** only)

Syntax

{*SET* / *DEFINE* / *CHANGE*} {*PORT* [*port_range* / *ALL*] / *TERMINAL*} *GROUPS* {*group_range* / *ALL*} {*ENABLED* / *DISABLED*}

Parameters

Default **= ALL**

group_range **• ALL**

Enter valid group codes in the range of 0 to 255. This will be valid for the current session only. The list is reset to **AUTHORIZED GROUPS** at the end of every session.

ENABLED • DISABLED

If enabled, adds groups to the existing list for the port. If disabled, removes groups from the existing list for the port. If you do not specify **ENABLED** or **DISABLED**, the existing group list is replaced with the new group list.

See also

{SET / DEFINE / CHANGE} PORT AUTHORIZED GROUPS
{SHOW / LIST / MONITOR} PORTS

{SET / DEFINE / CHANGE} PORT **INACTIVITY LOGOUT**

Definition Use to turn automatic logging out on or off. If **INACTIVITY [LOGOUT]** is enabled and a port is inactive for a predetermined period of time, the server automatically logs the port off.

User Privileged

Syntax

{SET / DEFINE / CHANGE} {PORT [port_range / ALL] / TERMINAL} INACTIVITY [LOGOUT] {DISABLED / LOCAL / SINGLE / MULTIPLE}

Parameters

***Default* = DISABLED**
{DISABLED • LOCAL • SINGLE • MULTIPLE}
If **DISABLED**, the server does not automatically log out a port after a specified period of time. The port remains active as long as a logout is not entered.

If **LOCAL**, the server automatically logs out a port after a predefined period of inactivity if the port is in local mode and there are no suspended sessions.

If **SINGLE**, the server automatically logs out a port after a predefined period of inactivity if there are no sessions or only one session.

If **MULTIPLE**, the server automatically logs out a port after a predetermined period of inactivity, regardless of the number of sessions. Data received from the port, or from any session, will reset the inactivity timer.

Notes

- The duration of allowed inactivity is the same for all ports and is defined by the **{SET / DEFINE / CHANGE} SERVER INACTIVITY [LOGOUT]** command.

See also

LOGOUT
{SET / DEFINE / CHANGE} SERVER INACTIVITY

{SET / DEFINE / CHANGE} PORT **INTERRUPTS**

Definition Use to specify whether you can interrupt a remote connection and return to local mode from this port(s).

> ***The port must be configured for ACCESS DYNAMIC to allow interrupts.***

User Privileged

Syntax

{ *SET* / *DEFINE* / *CHANGE* } { *PORT* [*port_range* / *ALL*] / *TERMINAL* } *INTERRUPTS* { *ENABLED* / *DISABLED* }

Parameters ***Default* = DISABLED**

ENABLED • DISABLED

If **ENABLED**, a remotely connected port may interrupt the connection and return to the idle mode (waiting for **<CR>** for login). If **DISABLED**, interrupts are not allowed. You cannot interrupt an active remote access connection. Remote sessions must be completed or disconnected from the privileged port before you can initiate a local session.

Notes

- ❑ If interrupt is turned on and a host is printing on a hardcopy terminal, you can stop the printing and take control of the terminal by pressing **<BREAK>** on the terminal. Interrupted print jobs can be restarted with the **RESUME** command.

See also

RESUME
{SET / DEFINE / CHANGE} PORT ACCESS

{SET / DEFINE / CHANGE} PORT **LOCAL SWITCH**

Definition Use to define a character or control character to use to return to the local mode from within a currently active session.

User Privileged • Nonprivileged • Secure

Syntax

{ *SET* / *DEFINE* / *CHANGE* } { *PORT* [*port_range* / *ALL*] / *TERMINAL* } *LOCAL* [*SWITCH*] { *character* / *NONE* }

Parameters

***Default* = NONE**

***character* • NONE**

Enter the character you want to use to switch between a session and local mode. You may enter any alphanumeric or control character. Enter control characters by preceding the desired letter with a caret (^). **NONE** clears the character(s) used to switch to local mode.

See also

BACKWARDS / FORWARDS
RESUME
{SET / DEFINE / CHANGE} PORT BREAK
SET SESSION
{SHOW / LIST / MONITOR} SESSIONS

{SET / DEFINE / CHANGE} PORT **LOSS NOTIFICATION**

Definition Sends an audible beep from the terminal server to the port device whenever a typed character is lost because of data overruns.

User Privileged • Nonprivileged

Syntax

{ *SET* / *DEFINE* / *CHANGE* } { *PORT* [*port_range* / *ALL*] / *TERMINAL* } *LOSS* [*NOTIFICATION*] { *ENABLED* / *DISABLED* }

Parameters

***Default* = ENABLED**

ENABLED • DISABLED

If **ENABLED**, the server sends a beep when a typed character is lost because of data overruns. If **DISABLED**, the device is not notified when errors occur during transmission.

{SET / DEFINE / CHANGE} PORT **MESSAGE CODES**

Definition The terminal server displays status and error messages with a 3-digit code followed by a brief message. You can suppress the display of the 3-digit code by turning **MESSAGE [CODES]** off.

User Privileged • Nonprivileged

Syntax

{ *SET* / *DEFINE* / *CHANGE* } { *PORT* [*port_range* / *ALL*] / *TERMINAL* } *MESSAGE* [*CODES*] { *ENABLED* / *DISABLED* }

Parameters ***Default*** **= ENABLED**
ENABLED • DISABLED
If **ENABLED**, both the three-digit code and a brief message display. If **DISABLED**, status and error messages display without the three-digit code.

{SET / DEFINE / CHANGE} PORT **MULTISESSION**

Definition Use to enable two terminal windows on terminal models VT350 and above.

User Privileged • Nonprivileged

Syntax

{ *SET* / *DEFINE* / *CHANGE* } { *PORT* [*port_range* / *ALL*] / *TERMINAL* } *MULTISESSION* { *ENABLED* / *DISABLED* }

Parameters ***Default*** **= DISABLED**
ENABLED • DISABLED
If **ENABLED**, the use of two terminal windows on terminal models VT350 and above is supported. If **DISABLED**, the terminal is a standard, single-window terminal.

Notes

- Only one terminal window can be in local mode at a time. If you switch windows while you are in local mode, local mode processing is terminated in the window you left.

{SET / DEFINE / CHANGE} PORT **NAME**

Definition Use to assign a unique, logical name to each port on the terminal server.

User Privileged

Syntax { *SET* / *DEFINE* / *CHANGE* } { *PORT port_range* / *TERMINAL* } *NAME port_name*

Parameters ***Default*** **= PORT_nn**

port name

Enter the unique name you want assigned to the port. Names can be 1 to 16 alphanumeric characters. If you enter the name in lowercase letters, they are converted to uppercase by the server. The default port name is **PORT_nn**, where **nn** is the port number.

{SET / DEFINE / CHANGE} PORT **PARITY**

Definition Specifies the type of parity to be used by a port for both receiving and transmitting data. The parity setting must match the device connected to the port.

User Privileged • Nonprivileged

Syntax

{SET / DEFINE / CHANGE} {PORT [port_range / ALL] / TERMINAL} PARITY {NONE / ODD / EVEN / MARK / SPACE}

Parameters ***Default*** **= NONE**
{NONE • ODD • EVEN • MARK • SPACE}

NONE sets no parity bit. Use this option if the connected device does not support parity.

ODD selects odd parity. The value of the parity is determined by totaling the sum of the data bits that precede it. If you select **ODD**, the total value of bits in the frame must be odd.

EVEN selects even parity. The value of the parity is determined by totaling the sum of the data bits that precede it. If you select **EVEN**, the total value of bits in the frame must be even.

MARK sets the parity bit to a logic 1. This value never changes no matter what the sum of the preceding bits.

SPACE sets the parity bit to a logic 0. This value never changes no matter what the sum of the preceding bits.

See also **{SET / DEFINE / CHANGE} PORT CHARACTER [SIZE]**
{SET / DEFINE / CHANGE} PORT SPEED

{SET / DEFINE / CHANGE} PORT **PASSWORD**

Definition Use to designate whether you must enter a password from this port(s) when logging in to the terminal server for local access.

User Privileged

Syntax

{ *SET* / *DEFINE* / *CHANGE* } { *PORT* [*port_range* / *ALL*] / *TERMINAL* } *PASSWORD* { *ENABLED* / *DISABLED* }

Parameters ***Default* = DISABLED**

ENABLED • DISABLED

If **ENABLED**, you must enter the password specified by the **SERVER LOGIN PASSWORD** command when logging in to the server. If **DISABLED**, no password is required on this port.

See also **{SET / DEFINE / CHANGE} SERVER LOGIN [PASSWORD]**
{SET / DEFINE / CHANGE} SERVER PASSWORD LIMIT

{SET / DEFINE / CHANGE} PORT **PAUSE**

Definition Set **PAUSE** to **ENABLED** if you want the terminal server to pause between multiple screen displays sent by the **SHOW** and **LIST** commands.

User Privileged • Nonprivileged • Secure

Syntax

{ *SET* / *DEFINE* / *CHANGE* } { *PORT* [*port_range* / *ALL*] / *TERMINAL* } *PAUSE* { *ENABLED* / *DISABLED* }

Parameters ***Default* = DISABLED**

ENABLED • DISABLED

If **ENABLED**, the terminal server pauses between screens of multiple screen displays. Strike any key to continue the display. If **DISABLED**, data output scrolls without pausing.

See also **{SHOW / LIST / MONITOR} commands**

{SET / DEFINE / CHANGE} PORT **PREFERRED SERVICE**

Definition This command lets you specify a service to which this port is connected when it logs in. It also lets you enter the **CONNECT** command without entering the name of the preferred service.

User Privileged • Nonprivileged

Syntax

{SET / DEFINE / CHANGE} {PORT [port_range / ALL] / TERMINAL}

PREFERRED [SERVICE] { service_name / NONE / tcp_port_name / { { IP ip_address / NODE {node_name / node_name. / alias_name.} } [SOCKET {NONE / socket}] } }

Parameters

Default **= NONE**

service_name **•** **NONE** **•** ***tcp_port_name*** **•** **IP** ***ip_address*** **•** **NODE** **{*node_name* | *node_name.* | *alias_name.*}**

Enter the name or address of the preferred service to be connected to at login or with **CONNECT**.

SOCKET

Enter the TCP/IP socket number for non-LAT connections. The default socket is 23 (**TELNET**).

Notes

❑ **PREFERRED [SERVICE]** lets you return to LOCAL> mode and connect to other services. This differs from **DEDICATED [SERVICE]** which lets you connect to one defined service only.

See also

CONNECT
{SET / DEFINE / CHANGE} PORT AUTOCONNECT
{SET / DEFINE / CHANGE} PORT DEDICATED [SERVICE]

{SET / DEFINE / CHANGE} PORT **REMOTE QUEUING**

Definition Use to enable *Host Initiated Connection* queuing for a port(s).

User Privileged • Nonprivileged

Syntax

{ *SET* / *DEFINE* / *CHANGE* } { *PORT* [*port_range* / *ALL*] / *TERMINAL* } [*REMOTE*] *QUEUING* { *ENABLED* / *DISABLED* }

Parameters ***Default*** **= DISABLED**

ENABLED • DISABLED

If **ENABLED**, host initiated connections can be queued on this port(s). If **DISABLED**, host initiated connections cannot be queued.

{SET / DEFINE / CHANGE} PORT **SECURITY**

Definition Specifies whether a port(s) has secure status or not. If a port has a status of secure, the **SHOW** command cannot be used to look at the status of other ports or sessions. There are also restrictions associated with other terminal server commands.

User Privileged

Syntax

{ *SET* / *DEFINE* / *CHANGE* } { *PORT* [*port_range* / *ALL*] / *TERMINAL* } *SECURITY* { *ENABLED* / *DISABLED* }

Parameters ***Default*** **= DISABLED**

ENABLED • DISABLED

If **ENABLED**, the port is in secure status. The **BROADCAST** command is automatically disabled when port security is enabled. If **DISABLED**, the status for the port is returned to nonprivileged or normal state.

{SET / DEFINE / CHANGE} PORT **SESSION LIMIT**

Definition Sets the total number of active port sessions at any one time.

User Privileged

Syntax

{SET / DEFINE / CHANGE} { PORT [port_range / ALL] / TERMINAL } SESSION [LIMIT] session_number

Parameters

***Default* = 4**

session_number

Enter a value between 0 and 4. 0 allows only local mode operation.

See also **{SET / DEFINE / CHANGE} SERVER SESSION [LIMIT]**

{SET / DEFINE / CHANGE} PORT **[INPUT / OUTPUT] SPEED**

Definition Use to specify the speed at which data is transmitted to, or from, the port(s) to the terminal server.

User Privileged • Nonprivileged

Syntax

{ SET / DEFINE / CHANGE } { PORT [port_range / ALL] / TERMINAL } [INPUT / OUTPUT] SPEED baud_rate

Parameters

***Default* = 9600 in both directions**

INPUT • OUTPUT

Use to specify a different speed for incoming and outgoing data.

baud_rate

Enter a valid baud rate: 75, 110, 300, 600, 1200, 2400, 4800, 9600, 19200, and 38400.

Notes

- **INPUT** speed can be set to a different value than **OUTPUT** speed. If neither **INPUT** or **OUTPUT** is specified, the command selects the same speed in both directions.

See also **{SET / DEFINE / CHANGE} PORT AUTOBAUD**

{SET / DEFINE / CHANGE} PORT TELNET

Definition

TCP/IP

Use to modify the **TELNET** protocol options for the port(s). These options permit you to define a character you will use to force a specific action. You can also specify whether the server will or will not support an option.

User

Privileged • Nonprivileged

Syntax

{ *SET* / *DEFINE* / *CHANGE* } { *PORT* [*port_range* / *ALL*] / *TERMINAL* } *TELNET options*

Parameters

options

Options can be set independently. Each option is described individually below.

See also

{SET / DEFINE / CHANGE} [TELNET] VERBOSE

{SET / DEFINE / CHANGE} TELNET AO

Definition

TCP/IP

Use to define a command key for the **TELNET** Abort Output command.

User

Privileged • Nonprivileged

Syntax

{ *SET* / *DEFINE* / *CHANGE* } { *PORT* [*port_range* / *ALL*] / *TERMINAL* } *TELNET AO* { *character* / *NONE* }

Parameters

***Default* = NONE**

***character* NONE**

Enter the character to use to define the abort output command. **NONE** clears the currently defined character for abort output.

Notes

❑ Suppressed data is discarded by the server. Normally, transmission resumes with the next record.

{SET / DEFINE / CHANGE} PORT **TELNET AYT**

Definition Defines a command key for the **TELNET** Are You There command.

TCP/IP

User Privileged • Nonprivileged

Syntax

{SET / DEFINE / CHANGE} { PORT [port_range / ALL] / TERMINAL } TELNET AYT { character / NONE }

Parameters

Default **= NONE**

character **• NONE**

Enter the character to use to define the *are you there* command. **NONE** clears the currently defined character for *are your there*.

{SET / DEFINE / CHANGE} PORT **TELNET BINARY**

Definition Use to control the binary transmission for a **TELNET** session.

TCP/IP

User Privileged • Nonprivileged

Syntax

{SET / DEFINE / CHANGE} { PORT [port_range / ALL] / TERMINAL } TELNET BINARY[TRANS] { { WILL / WONT } / { DO / DONT } }

Parameters

Default **= WONT DONT**

WILL • WONT

Used in **local** mode. When set to **WILL**, all characters transmitted by the receiving node are 8 bit binary data. When set to **WONT**, transmission is not treated as 8 bit binary data.

DO • DONT

Used in **remote** mode. When set to **DO**, all characters received by the receiving node are 8 bit binary data. When set to **DONT**, transmission is not treated as 8 bit binary data.

See also **SET SESSION**

{SET / DEFINE / CHANGE} PORT TELNET BRK

Definition Use to define a command key for the TELNET BReaK.

TCP/IP

User Privileged • Nonprivileged

Syntax

{SET / DEFINE / CHANGE} { PORT [port_range / ALL / TERMINAL] } TELNET BRK { character / NONE }

Parameters ***Default*** = **NONE**

character • **NONE**

Enter the character you will use to define the *break* command. **NONE** clears the currently defined character for *break*.

{SET / DEFINE / CHANGE} PORT TELNET EC

Definition Defines a command key for the TELNET Erase Character.

TCP/IP

User Privileged • Nonprivileged

Syntax

{SET / DEFINE / CHANGE} { PORT [port_range / ALL / TERMINAL] } TELNET EC { character / NONE }

Parameters ***Default*** = **NONE**

character • **NONE**

Enter the character you will use to define the *erase character* command. **NONE** clears the currently defined character.

{SET / DEFINE / CHANGE} PORT **TELNET ECHO**

Definition

TCP/IP

Specifies where character echoing will occur. Echoing characters occurs in only one place during the connection. If more than one echo is enabled, multiple characters will be echoed to the terminal.

User

Privileged • Nonprivileged

Syntax

{ *SET* / *DEFINE* / *CHANGE* } { *PORT* [*port_range* / *ALL*] / *TERMINAL* } *TELNET ECHO* { { *WILL* / *WONT* } / { *DO* / *DONT* } }

Parameters

Default **= WONT DO**

WILL • WONT

WILL causes the server to echo all characters received from the remote node back to the remote node. **WONT** causes the server to not echo characters.

DO • DONT

DO enables echoing at the remote node. Characters sent to the remote node are echoed back to the server. **DONT** causes characters sent to the remote node to not be echoed back.

Notes

❑ Do not set both local and remote to echo characters. Characters will echo back and forth indefinitely.

{SET / DEFINE / CHANGE} PORT **TELNET EL**

Definition

TCP/IP

Use to define a command key for the **TELNET** Erase Line command.

User

Privileged • Nonprivileged

Syntax

{ *SET* / *DEFINE* / *CHANGE* } { *PORT* [*port_range* / *ALL*] / *TERMINAL* } *TELNET EL* { *character* / *NONE* }

Parameters

Default **= NONE**

character **• NONE**

Enter the character you will use to define the *erase line* command. **NONE** clears the currently defined character for *erase line*.

{SET / DEFINE / CHANGE} PORT **TELNET GA**

Definition Define a Go Ahead command that allows data to be transmitted.

TCP/IP

User Privileged • Nonprivileged

Syntax

{ *SET* / *DEFINE* / *CHANGE* } { *PORT* [*port_range* / *ALL*] / *TERMINAL* } *TELNET GA* { *character* / *NONE* }

Parameters ***Default*** **= NONE**

character **• NONE**

Defines the character for the *go ahead* command. **NONE** clears the currently defined character. Specifying **NONE** eliminates the need for manually issuing the transmit command.

See also **{SET / DEFINE / CHANGE} PORT [TELNET] SUPPRESS [GA]**

{SET / DEFINE / CHANGE} PORT **TELNET {ICRLF ■ OCRLF}**

Definition Use to convert carriage returns to carriage return and line feeds.

TCP/IP

User Privileged • Nonprivileged

Syntax

{ *SET* / *DEFINE* / *CHANGE* } { *PORT* [*port_range* / *ALL*] / *TERMINAL* } *TELNET* { *ICRLF* / *OCRLF* } { *ENABLED* / *DISABLED* }

Parameters ***Default*** **= ENABLED**

ICRLF • OCRLF

ICRLF appends a line feed to a carriage return when data is sent from the port to the network.

OCRLF appends a line feed to a carriage return when data is sent from the network to the port.

ENABLED • DISABLED

If **ENABLED**, carriage-returns are converted to carriage-return and line-feed pairs. If **DISABLED**, carriage-returns are converted to carriage-return and a NUL.

See also **SET SESSION {ICRLF | OCRLF}**

{SET / DEFINE / CHANGE} PORT **TELNET IP**

Definition Use to define a command key for the **TELNET** InterruPt command.

TCP/IP

User Privileged • Nonprivileged

Syntax

{ *SET* / *DEFINE* / *CHANGE* } { *PORT* [*port_range* / *ALL*] / *TERMINAL* } *TELNET IP* { *character* / *NONE* }

Parameters

Default **= NONE**

character **• NONE**

Enter the character you will use to issue the *interrupt* command. **NONE** clears the currently defined character for *interrupt*.

Notes

❑ The interrupt command key lets you suspend, interrupt, abort or terminate the current process. Use it with caution.

{SET / DEFINE / CHANGE} PORT **TELNET KEYS**

Definition Use to permit special processing of the **TELNET** options that have character definitions.

TCP/IP

User Privileged • Nonprivileged

Syntax

{ *SET* / *DEFINE* / *CHANGE* } { *PORT* [*port_range* / *ALL*] / *TERMINAL* } *TELNET KEYS* { *ENABLED* / *DISABLED* }

Parameters

Default **= DISABLED**

ENABLED • DISABLED

ENABLED turns on special processing for **TELNET** options that have character definitions. **DISABLED** turns off special processing for **TELNET** options.

Notes

❑ Use this command to set all command keys that have been defined to on or off.

{SET / DEFINE / CHANGE} PORT TELNET SUPPRESS GA

Definition Suppresses the Go Ahead feature which allows data to be transmitted without manual intervention.

TCP/IP

User Privileged • Nonprivileged

Syntax

{SET / DEFINE / CHANGE} {PORT [port_range / ALL] / TERMINAL} TELNET SUPPRESS [GA] {{WILL / WONT} / {DO / DONT}}

Parameters ***Default*** **= WILL DO**

WILL • WONT

WILL enables the server to transmit data without sending the **TELNET GA** command. **If WONT** is set, the server must use the **TELNET GA** command to transmit data.

DO • DONT

DO enables a remote node to transmit data without sending the **TELNET GA** command. If **DONT** is set, the remote node must use the **TELNET GA** command to transmit data.

Notes

- If your terminal is a full duplex terminal, you would normally set this to **WILL DO**. If your terminal runs in half duplex, disable this capability by setting the parameters to **WONT DONT**.

See also **{SET / DEFINE / CHANGE} PORT TELNET GA**

{SET / DEFINE /CHANGE} PORT **TELNET SYN**

Definition Use to define a command key for the **TELNET SYN**c mechanism.

TCP/IP

User Privileged • Nonprivileged

Syntax

{ *SET* / *DEFINE* / *CHANGE* } { *PORT* [*port_range* / *ALL*] / *TERMINAL* } *TELNET SYN* { *character* / *NONE* }

Parameters ***Default* = NONE**

***character* NONE**

Enter the character you will use to issue the *sync mechanism* command. **NONE** clears the currently defined character for *sync mechanism*.

{SET / DEFINE / CHANGE} PORT **TELNET VERBOSE**

Definition Use to display messages reporting the progress of the **TELNET** options negotiations.

TCP/IP

User Privileged • Nonprivileged

Syntax

{ *SET* / *DEFINE* / *CHANGE* } { *PORT* [*port_range* / *ALL*] / *TERMINAL* } *TELNET VERBOSE* { *ENABLED* / *DISABLED* }

Parameters ***Default* = DISABLED**

ENABLED DISABLED

If **ENABLED**, **TELNET** option negotiation messages are displayed. **DISABLED** turns off the display of messages that report the progress of **TELNET** options negotiations.

SET / DEFINE / CHANGE} PORT **TYPE**

Definition Use to specify the type of terminal connected to the port.

User Privileged • Nonprivileged • Secure

Syntax

{SET / DEFINE / CHANGE} {PORT [port_range / ALL] / TERMINAL} TYPE {ANSI / HARDCOPY / SOFTCOPY / TELEVIDEO_910 / VT100 / WYSE_60}

Parameters ***Default*** **= SOFTCOPY**

ANSI • HARDCOPY • SOFTCOPY • TELEVIDEO_910 • VT100 • WYSE_60

ANSI The server clears the screen for each display and allows use of cursor keys for command line editing. Monitors are updated in place instead of being scrolled.

HARDCOPY The server echoes any deleted characters between back slashes.

SOFTCOPY The server erases and overwrites any deleted characters.

TELEVIDEO_910 The display is updated in place.

VT100 This is the same as ANSI except that the terminal type reported to the host is VT100 when making TCP/IP connections.

WYSE_60 The display is updated in place.

Notes

- **TYPE** affects the **<DELETE>** key, command line editing, and formatting of the **SHOW/LIST/MONITOR** commands.
- All screen control functions are executed by the service when a port is operating in *service* mode rather than *local* mode.

{SET / DEFINE / CHANGE} PORT **USERNAME**

Definition When you log into a port, the terminal server prompts you to enter a port user name. Use this command to define a unique user name that identifies you when you log into one of the server's local access ports.

User Privileged • Nonprivileged

Syntax

{ *SET* / *DEFINE* / *CHANGE* } { *PORT* [*port_range* / *ALL*] / *TERMINAL* } *USERNAME* { *user_name* / *"user_name"* }

Parameters ***Default*** **= no user name**

user_name • "user_name" • " "

Identifies the user of a port. Maximum length of *user_name* is 16 characters. If the name is enclosed in quotes, it is stored exactly as entered. If the quotes are omitted, the name is converted to uppercase. To delete a name, enter double quotes in place of the name.

See also **SHOW/LIST/MONITOR USERS**

{SET / DEFINE / CHANGE} PORT **VERIFICATION**

Definition You can have the terminal server display a brief message that confirms session connects, disconnects and session switches. Use **VERIFICATION** to turn on or turn off this type of messaging.

User Privileged • Nonprivileged • Secure

Syntax

{ *SET* / *DEFINE* / *CHANGE* } { *PORT* [*port_range* / *ALL*] / *TERMINAL* } *VERIFICATION* { *ENABLED* / *DISABLED* }

Parameters ***Default*** **= ENABLED**

ENABLED • DISABLED

If enabled, the server sends confirmation messages. If disabled no confirmation messages are sent.

SET {PRIVILEGED ■ NOPRIVILEGED}

Definition Privileged users can enter all Equinox terminal server commands from the privileged port. Privileged status can be active on only one port at any given time. However privileged status can be transferred to another port using the **SET PRIVILEGED** command.

User Privileged • Nonprivileged

Syntax *SET* {*PRIVILEGED* [*OVERRIDE*] / *NOPRIVILEGED*}

Parameters

PRIVLEGED • NOPRIVELGED

OVERRIDE
Specifies privileged status is to be transferred to your port from the current privileged port.

Notes

❑ Only one port may have privileged status at a time.

SYSTEM *is the default privileged password.*

❑ The server prompts you for the privilege-level password. The factory default password is **SYSTEM**.

❑ Use **SET SERVER PRIVILEGED PASSWORD** to change the default password. The password should be changed to prevent unauthorized use of terminal server commands.

See also

SET NOPRIVILEGED
{SET / DEFINE / CHANGE} SERVER PRIVILEGED [PASSWORD]

{SET ■ DEFINE ■ CHANGE} SERVER

Definition Use **{SET / DEFINE / CHANGE} SERVER** to modify terminal server characteristics such as login passwords, session limits, and security access. All terminal server users are affected by the changes made with these commands.

SET modifies the terminal server characteristics in the *operational* database and takes place *immediately*. The next time the server is reinitialized, the *permanent* settings replace these temporary settings.

DEFINE modifies the terminal server characteristics in the *permanent* database and takes effect the next time the server is reinitialized.

CHANGE modifies the terminal server characteristics in both the *operational* and the *permanent* databases *immediately*.

User Privileged

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVER options*

Parameters

options

Enter any configuration changes to be made to the server. There are not limits to the number of options you can enter on a single command line. There is a limit, however, of 125 characters to a single command line.

Refer to the command descriptions described below for individual options.

See also

RESTORE
SAVE

{SET / DEFINE / CHANGE} SERVER **ALIAS**

Definition

Use to define a short name to identify this TCP/IP server or node.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVER ALIAS* [*NAME*] { *alias_name.* / *NONE* }

Parameters

Default **= NONE**

alias_name. **• NONE**

Enter a name of one to 16 followed by a period to be used to identify the server. **NONE** cancels a previously entered alias name.

{SET / DEFINE / CHANGE} SERVER **ANNOUNCEMENTS**

Definition

Use to specify whether the terminal server will multicast messages that tell other nodes on the Ethernet the names of its available services.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVER ANNOUNCEMENTS* { *ENABLED* / *DISABLED* }

Parameters

Default **= ENABLED**

ENABLED • DISABLED

If **ENABLED**, the server will send regular multicast messages to the Ethernet network. The messages contain information on LAT services offered locally. If no local services are defined, an announcement is not sent. If **DISABLED**, messages are not sent to the Ethernet network and other LAT nodes will be unaware of the presence of this server.

{SET / DEFINE / CHANGE} SERVER **BROADCAST**

Definition

Determines whether port users can use the **BROADCAST** command to send messages to other ports on the terminal server. All users are affected by the setting of this command.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVER BROADCAST* { *ENABLED* / *DISABLED* }

Parameters

***Default* = ENABLED**

ENABLED • DISABLED

If **ENABLED**, all logged-in users may send messages to other ports on the server. **PORT BROADCAST** must be enabled on the target ports in order to receive messages. If **DISABLED**, **BROADCAST** is globally disabled on this server.

See also

BROADCAST
{SET / DEFINE / CHANGE} PORT BROADCAST

{SET / DEFINE / CHANGE} SERVER **CIRCUIT TIMER**

Definition

Sets the interval between LAT packets sent from the server to other nodes on the network.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVER CIRCUIT* [*TIMER*] *timer_value*

Parameters

***Default* = 80 milliseconds**

timer_value

Enter a message interval time in milliseconds. Must be between 30 and 120 milliseconds.

Notes

❑ Setting a higher value enhances network efficiency. Setting a lower value enhances the response time at the expense of network traffic.

❑ If any sessions are active on the server, you can only use the **DEFINE** command to change the **CIRCUIT [TIMER]**.

{SET / DEFINE / CHANGE} SERVER **CONSOLE PORT**

Definition Use to specify one port on the terminal server as the system console port. The console port receives all of the error and status messages.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVER CONSOLE PORT* [*port_number* / *NONE*]

Parameters

Default **= NONE**

port_number **• NONE**

The number of the port that is to receive all system and error messages from the server. **NONE** disables the current console port.

Notes

❑ Console messages won't be sent to a port that has **AUTOBAUD** enabled.

{SET / DEFINE / CHANGE} SERVER **DEFAULT PROTOCOL**

Definition Use to define the protocol that you will use if a **port's** default is set to **SERVER**.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVER* [*DEFAULT*] *PROTOCOL* [*LAT* / *TCPIP*]

Parameters

Default = LAT

LAT • TCPIP

Enter the protocol to be used as the default on the server.

Notes

❑ You can override the default protocol when you issue the **CONNECT** command.

See also

CONNECT
RLOGIN
{SET / DEFINE / CHANGE} PORT DEFAULT PROTOCOL
TELNET

{SET / DEFINE / CHANGE} SERVER **DOMAIN NAME**

Definition

Use to define a domain string that will be added to a user supplied node name in order to create a complete node name.

TCP/IP

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVER DOMAIN* [*NAME*] [*domain_name* / *NONE*]

Parameters

Default **= NONE**

domain_name **• NONE**

Enter a name to be used to identify the network domain for the server. The name can be one to 47 characters. Do not enter a trailing period when defining a ***domain_name***. **NONE** removes a previously defined name for the server.

Notes

❑ During connections, the domain name can be added automatically to a specified node name thus providing a full TCP/IP route.

{SET / DEFINE / CHANGE} SERVER **{FAST / SLOW} DELAY**

Definition

TCP/IP

Use to define the time delay that will elapse before the server responds to a TCP/IP message. You will experience smoother network performance when the delay is set correctly.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVER* { *FAST* / *SLOW* } [*DELAY*] <*timer_value*>

Parameters

Default **= 50 ms**

FAST • SLOW

FAST delays the time for ports that run faster than 9600.
SLOW delays the time for ports that run slower than 9600.

DELAY <***timer_value***>

Enter a value for the delay. The value must be between 10 and 5000 milliseconds.

Notes

❑ Larger values do not necessarily have an impact on system delays because of the normal timeouts between nodes.

{SET / DEFINE / CHANGE} SERVER **GATEWAY IP**

Definition Use to define the IP address of the gateway used to reach the **BOOPTP** host computer.

TCP/IP

Syntax

$$\left\{\begin{matrix}SET\\DEFINE\\CHANGE\end{matrix}\right\}\ SERVER\ GATEWAY\ [\,IP\,]\ \left\{\begin{matrix}ip_address\\NONE\end{matrix}\right\}$$

Parameters ***Default*** **= NONE**

ip_address **• NONE**

ip_address is the IP address of the gateway.

NONE deletes an ***ip_address***.

Notes

- The gateway IP needs to be defined if there is a gateway between the Equinox server and the host computer and the gateway does not support proxy ARP.

See also **{SET / DEFINE / CHANGE} SERVER HOST IP**
{SET / DEFINE / CHANGE} SERVER IP

{SET / DEFINE / CHANGE} SERVER **HOST IP**

Definition Use to define the IP address of the **BOOTP** host computer.

TCP/IP

Syntax

$$\left\{\begin{matrix}SET\\DEFINE\\CHANGE\end{matrix}\right\}\ SERVER\ HOST\ [\,IP\,]\ \left\{\begin{matrix}ip_address\\NONE\end{matrix}\right\}$$

Parameters ***Default*** **= NONE**

ip_address **• NONE**

ip_address is the IP address of the host computer.

NONE deletes an ***ip_address***.

Notes

- Both **SERVER IP** and **SERVER HOST IP** must be defined if you want to use the **BOOTP** option with the **INITIALIZE** command.

See also **{SET / DEFINE / CHANGE} SERVER GATEWAY IP**
{SET / DEFINE / CHANGE} SERVER IP

{SET / DEFINE / CHANGE} SERVER **IDENTIFICATION**

Definition

Use this command to define an identifying phrase that describes the terminal server to other service nodes on the network. This message is displayed when the terminal server broadcasts announcements about the availability of local services it offers.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVER IDENTIFICATION* { *"text_string"* / *" "* }

Parameters

Default **= no text string**

"text_string" **•** ***" "***

Enter the text that identifies the server to other devices on the network. The text string can be up to 40 characters and must be enclosed in quotes. " " removes the identification string.

Notes

❑ The text string cannot be changed with the **SET** or **CHANGE** commands if there are active sessions in progress.

{SET / DEFINE / CHANGE} SERVER **INACTIVITY TIMER**

Definition

Use to define the amount of time the terminal server will wait before logging out a port that has not had any input or output in the local mode during the waiting period.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVER INACTIVITY* [*TIMER*] *hh:mm:ss*

Parameters

Default **= 00:30:00**

hh:mm:ss

Enter the length in hours:minutes:seconds of the inactivity timer. Must be in the range of 10 seconds to 10 hours. Times are interpreted from the right. For example 1:2 would be interpreted as 1 hour and 20 minutes.

Notes

❑ Ports with **INACTIVITY LOGOUT ENABLED** are logged out after the timer value elapses and there is no activity.

See also

{SET / DEFINE / CHANGE} PORT INACTIVITY [LOGOUT]

{SET / DEFINE / CHANGE} SERVER IP

Definition Use to define the server's TCP/IP address.

TCP/IP

Syntax { *SET* / *DEFINE* / *CHANGE* } *SERVER IP* { *ip_address* / *NONE* }

Parameters

Default = 0.0.0.0

***ip_address* • NONE**

Enter an IP address in the format ***ddd.ddd.ddd.ddd***, where ***ddd*** is a decimal value between 0 and 255. **NONE** resets the server address to ***0.0.0.0***.

Notes

- ❑ If the IP address is not set, that is it equals *0.0.0.0*, only LAT connections can be made to or from the server.

See also

{SET / DEFINE / CHANGE} PORT INACTIVITY [LOGOUT]
{SET / DEFINE / CHANGE} SERVER GATEWAY IP
{SET / DEFINE / CHANGE} SERVER HOST IP
{SET / DEFINE / CHANGE} SERVER SUBNET MASK

{SET / DEFINE / CHANGE} SERVER KEEPALIVE TIMER

Definition Use to define the amount of time the terminal server will wait before sending its identification message to the other nodes on the virtual circuit. The message lets other nodes know that even though there is no activity currently, the server is still active.

LAT

Syntax { *SET* / *DEFINE* / *CHANGE* } *SERVER KEEPALIVE* [*TIMER*] *timer_value*

Parameters

***Default* = 20 seconds**

timer_value

Sets the interval in seconds between messages sent on a virtual circuit when no data is being transmitted. The ***timer_value*** must be between 10 and 180 seconds.

Notes

- ❑ You can change this characteristic when there are active sessions on the server. The new setting is used for all new circuits. Currently active circuits are not affected by the change.

{SET / DEFINE / CHANGE} SERVER **LEARN NODE**

Definition Use to add learned TCP/IP nodes to the operational database.

TCP/IP

Syntax

$$\left\{\begin{matrix}SET\\DEFINE\\CHANGE\end{matrix}\right\}\ SERVER\ LEARN\ [\ NODE\ ]\ \left\{\begin{matrix}ENABLED\\DISABLED\end{matrix}\right\}$$

Parameters

Default **= Disabled**

ENABLED • DISABLED

If **ENABLED**, nodes may be learned from the network via ARP and RWHO packets. DISABLED permits only nodes manually added to the local database.

Notes

- ❑ The server will automatically place nodes learned from the network into the operational database node table.

{SET / DEFINE / CHANGE} SERVER **LOAD NAME**

Definition Use to define the file name of the server software load image.

User Privileged

Syntax

$$\left\{\begin{matrix}SET\\DEFINE\\CHANGE\end{matrix}\right\}\ SERVER\ LOAD\ [\ NAME\ ]\ \left\{\begin{matrix}file_name\\" "\end{matrix}\right\}$$

Parameters

Default **= ELS48DLV.SYS**

file_name **• " "**

The file name of the server software load image. The file name can be one to 12 characters and must in enclosed in quotation marks. " " clears the file name of the server software load image.

Notes

- ❑ Download takes place when a MOP packet is received that contains a trigger command.

{SET / DEFINE / CHANGE} SERVER **LOCAL PROMPT**

Definition Use this command to change the prompt that displays when the server is in local mode.

Syntax { *SET* / *DEFINE* / *CHANGE* } *SERVER LOCAL* [*PROMPT*] *"text_string"*

Parameters ***Default*** **= LOCAL>**

"text_string"
Enter a text string to be used as a prompt when you are in local mode. String may be 1 to 8 characters and must be enclosed in quotes. The server always adds a > after the prompt if the port is not privileged. It adds a >> if the port is privileged.

Notes
- When you make a MOP connection to the ETS remote console, the local prompt always displays as LOCAL>. This overrides the database and privileged port settings.

{SET / DEFINE / CHANGE} SERVER **LOCK**

Definition This determines the ability of users of the server to use the **LOCK** command. The **LOCK** command prevents unauthorized users from entering data through the attached keyboard when a terminal is left unattended while logged on.

Syntax { *SET* / *DEFINE* / *CHANGE* } *SERVER LOCK* { *ENABLED* / *DISABLED* }

Parameters ***Default*** **= ENABLED**

ENABLED • DISABLED

ENABLED permits users to use of the **LOCK** command on their logged-in terminals. **DISABLED** blocks the use of the **LOCK** command.

See also **LOCK**

{SET / DEFINE / CHANGE} SERVER **LOGIN PASSWORD**

Definition

Use to define a password that must be entered by users who want to log into the server.

Syntax

{*SET* / *DEFINE* / *CHANGE*} *SERVER LOGIN PASSWORD* {*"text_string"* / *" "*}

Parameters

***Default* = ACCESS**

"text_string"* • *" "

Sets the server login password. May be 1 to 16 characters. Must be enclosed in quotes. If a string is not entered the server prompts for one.

Notes

ACCESS *is the default login password.*

- **{SET / DEFINE / CHANGE} PORT PASSWORD** must be enabled for login passwords. You can enable password protection for specific ports.
- **{SET / DEFINE / CHANGE} SERVER PASSWORD LIMIT** must be set for login passwords to work.
- A login password will not be requested, even if password is enabled for the port, if you enter a ***text_string*** value of NUL.

See also

{SET / DEFINE / CHANGE} PORT PASSWORD
{SET / DEFINE / CHANGE} SERVER PASSWORD LIMIT
{SET / DEFINE / CHANGE} SERVICE PASSWORD

{SET / DEFINE / CHANGE} SERVER **LOGIN PROMPT**

Definition

Use to define a prompt that displays when the terminal server is waiting for a login password.

Syntax

{*SET* / *DEFINE* / *CHANGE*} *SERVER LOGIN PROMPT "text_string"*

Parameters

***Default* = #**

"text_string"

Enter the prompt you want to display when the server is waiting for the login password. May be 1 to 8 characters and enclosed in quotes.

{SET/DEFINE/CHANGE} SERVER **MAINTENANCE PASSWORD**

Definition

Use to define a password that must be entered when a user connects to the remote console using the Maintenance Operations Protocol (MOP).

Syntax

{ *SET* | *DEFINE* | *CHANGE* } *SERVER MAINTENANCE* [*PASSWORD*] *"hex_string"*

Parameters

***Default* = 0**

hex_string

Enter a string of hexadecimal digits up to eight characters long. If empty quotation marks are used or the string value is zero, no password is required.

{SET / DEFINE / CHANGE} SERVER **MULTICAST TIMER**

Definition

Multicast announcements are successive announcements made by the terminal server that describe the services supported by the local service node. Use **MULTICAST [TIMER]** to define how long the terminal server will wait between making these successive announcements.

Syntax

{ *SET* | *DEFINE* | *CHANGE* } *SERVER MULTICAST* [*TIMER*] *timer_value*

Parameters

***Default* = 30 seconds**

timer_value

Enter an interval in seconds. Value must be between 10 to 180 seconds. The terminal server waits 30 seconds between multicasts if you do not enter a value for the timer.

Notes

❑ The terminal server does not announce any local services to the network until the *multicast timer* has expired. This means that you may have to wait up to two minutes before the network sees the services offered by your server.

{SET / DEFINE / CHANGE} SERVER **NAME**

Definition

Use to define the LAT node name used to identify the terminal server in **CONNECT** commands, host-initiated connections and remote console connects.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVER NAME server_name*

Parameters

Default* = LAT_*ethernet address

server_name

Defines a unique node name (one to 16 characters) for the server. This name is used

- in **CONNECT** commands to specify the server;
- in host-initiated connections;
- to connect to the remote console service of an Equinox terminal server.

Notes

❑ **NAME** must be unique from all other server names if the server accepts host-initiated connections or offers services.

❑ Changes to the server name automatically change the *identification string* of the remote console service.

See also

CONNECT
REMOTE CONNECT

{SET / DEFINE / CHANGE} SERVER **NODE LIMIT**

Definition

Use to define the maximum number of service nodes for which information is stored in the database of the terminal server. When the limit is reached, the database ignores any information received from new nodes.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVER NODE* [*LIMIT*] *node_limit*

Parameters

***Default* = 50**

node_limit

Enter the maximum number of nodes (one to 100) for which the server internally stores information.

{SET / DEFINE / CHANGE} SERVER **NODENAME RESOLUTION**

Definition Use to specify where the server will look for TCP/IP nodes during the connection process.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVER* [*NODENAME*] *RESOLUTION* { *LOCAL* / *REMOTE* }

Parameters

***Default* = REMOTE**

LOCAL • REMOTE

LOCAL causes the server to search the local database for TCP/IP nodes during connection. **REMOTE** causes the server to use all TCP/IP nodes from the local database as well as those learned from the network through ARP and RWHO requests.

{SET / DEFINE / CHANGE} SERVER **NUMBER**

Definition You can define a unique identification number for the terminal server. The number displays when the **SHOW SERVER CHARACTERISTICS** command is performed.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVER NUMBER id_number*

Parameters

***Default* = 0**

id_number

Enter a server identification number between 0 and 32767. If you do not enter a number, zero (0) is automatically assigned.

Notes

- If there are any active sessions on the server, you must use the **DEFINE NUMBER** command to take effect the next time the server is initialized.

{SET / DEFINE / CHANGE} SERVER **PASSWORD LIMIT**

Definition

You can specify the maximum number of times you may enter an invalid password when the server or a service prompts you for one. If you exceed the maximum number, your port is disconnected and you must wait before trying to logon again. If you are unable to enter the correct privileged password, the port through which they are operating is logged off. If you try to connect to services that require a password and do not enter the correct password, connection to the requested service is denied.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVER PASSWORD* [*LIMIT*] *retries*

Parameters

Default **= 3**

retries

Enter the maximum number of times you can retry a password on a port before you are automatically logged out by the server. Must be between one and 250.

Notes

- If **SERVER** security is enabled, the port must be logged out using a **LOGOUT PORT** command. This requires a user with privileged status. The port will not be automatically enabled after one minute.

See also

{SET / DEFINE / CHANGE} SERVER SECURITY

{SET / DEFINE / CHANGE} SERVER **PRIVILEGED PASSWORD**

Definition

Specifies the password that must be entered in response to the **SET PRIVILEGED** command. The password is required before any privileged commands can be entered.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVER PRIVILEGED* [*PASSWORD*] *"password"*

Parameters

***Default* = SYSTEM**

"password"

Enter a password to be used to access privileged status on the server. The password may be one to 16 characters and must be enclosed in quotation marks.

Notes

❑ You must have a privileged password on the server. You can change the privileged password but you cannot disable it.

SYSTEM *is the default privileged password*

❑ If you forget the password, you can reset the server to factory defaults which returns the password to **SYSTEM.**

❑ **CAUTION:** If you change the privileged password and later forget the new password you cannot enter privileged mode. You must *manually* initialize the terminal server database to the factory defaults. Do this by pressing the recessed **initialize** button on the front panel of the Ethernet Control Board.

See also

SET PRIVILEGED

{SET / DEFINE / CHANGE} SERVER **QUEUE LIMIT**

Definition Host-initiated requests for connection to the servers remote access port are stored in the terminal server's internal queue. Use **QUEUE [LIMIT]** to specify the maximum number of host requests that the server can store in the internal queue.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVER QUEUE* [*LIMIT*] *host_requests*

Parameters

***Default* = 24**

host_requests

Enter the maximum number of host requests the server is allowed to store in its internal queue. Value must be between 0 and 100.

Notes

❑ If you enter a value of 0, no requests are allowed to be queued.

❑ Memory is pooled on the terminal server to provide maximum efficiency in the handling of data, active sessions, active nodes, service lists, queuing and displays. This means, however, that the larger the limit set on queuing host initiated requests, the less memory is made available for opening simultaneous sessions on a busy server.

{SET / DEFINE / CHANGE} SERVER **RECEIVE BUFFER**

Definition Use to change the size of the Ethernet packet receive pool (the area used when reading from the network).

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVER RECEIVE* [*BUFFER*] { *SMALL* / *MEDIUM* / *LARGE* }

Parameters

***Default* = SMALL**

SMALL • MEDIUM • LARGE

SMALL 20% of the area is used

MEDIUM 30% of the area is used

LARGE 60% of the area is used

Notes

❑ Increasing the area gives the server greater ability to process bursts of Ethernet data. Reducing the size makes more memory available to users.

{SET / DEFINE / CHANGE} SERVER **RETRANSMIT LIMIT**

Definition

If a LAT transmission from the terminal server is not successful, the server continues to retry the transmission at one-second intervals. The server will continue to retry until it receives an acknowledgement or the maximum number of retries is reached. Use **RETRANSMIT [LIMIT]** to set this value. The connection between the server and the service node is broken when the limit is reached. All active sessions are ended immediately.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVER RETRANSMIT* [*LIMIT*] *retries*

Parameters

Default **= 8**

retries

Enter the number of times you want a message to be retransmitted to a remote node when no acknowledgement is received. Value must be between 4 and 120.

Notes

- If your Ethernet network is prone to errors, or is frequently being disconnected and reconnected, set the ***value*** high (e.g. greater than 100). When the retransmit limit is reached on a virtual circuit, the circuit is "torn down" and all sessions using it are disconnected.

{SET / DEFINE / CHANGE} SERVER **RLOGIN**

Definition

The **RLOGIN** command permits you to globally disable RLOGIN connections in the server.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVER RLOGIN* { *ENABLED* / *DISABLED* }

Parameters

Default **= Disabled**

If **ENABLED** , **RLOGIN** connections are allowed. If **DISABLED**, **RLOGIN** connections cannot be established to or from this server.

{SET / DEFINE / CHANGE} SERVER **SECURITY**

Definition

If this feature is enabled and you enter privileged mode, the server displays a message that identifies the port number of the last user to enter privileged mode. Any users who try to login and exceed the password limit are disconnected permanently. A privileged user must reinstate the port with the **LOGOUT PORT** command.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVER SECURITY* { *ENABLED* / *DISABLED* }

Parameters

***Default* = DISABLED**

If **ENABLED**, security is set as follows:

❶ Users who exceed the password limit when logging into the server are disconnected permanently. The port is said to be in a *disabled* state. To re-enable the port, a privileged user must issue a **LOGOUT PORT** for the port.

❷ Whenever privileged mode is entered a message is sent to the server telling the port number and user name of the last user to enter the privileged mode.

If **DISABLED**, the server secure status does not go into effect.

{SET / DEFINE / CHANGE} SERVER **SERVICE GROUPS**

Definition

Specifies the group codes for the terminal server. The group code applies to local LAT services and ports only.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVER* [*OFFERED* / *SERVICE*] *GROUPS group_range* [*ENABLED* / *DISABLED*]

Parameters

***Default* = ALL**

group_range

Enter a single group or range of groups to be assigned to locally defined services. Valid group codes are 0 to 255.

ENABLED • DISABLED

If **ENABLED**, groups are added to the list of groups already served by the terminal server. If **DISABLED**, groups are removed from the list of groups. If **ENABLED** or **DISABLED** are not specified, the existing list is replaced with the new ***group_range***.

See also

{SET / DEFINE / CHANGE} PORT AUTHORIZED GROUPS

{SET / DEFINE / CHANGE} SERVER **SESSION LIMIT**

Definition Specifies the maximum number of active sessions the server allows at any time. The higher the limit, the greater the number of simultaneous sessions and the lower the memory available to the terminal server. The lower the value, the more memory there is available for active sessions but you can have fewer simultaneous sessions.

Syntax { *SET* / *DEFINE* / *CHANGE* } *SERVER SESSION* [*LIMIT*] { *sessions* / *NONE* }

Parameters ***Default* = 48**

***sessions* • NONE**

Enter the maximum number (up to 96) of active sessions the server allows at one time. **NONE** causes the maximum number to be determined by the memory constraints of the server.

See also **{SET / DEFINE / CHANGE} PORT SESSION LIMIT**

{SET / DEFINE / CHANGE} SERVER **SUBNET MASK**

TCP/IP

Definition Use to filter subnet address information from IP addresses.

Syntax { *SET* / *DEFINE* / *CHANGE* } *SERVER* [*SUBNET*] *MASK mask_value*

Parameters ***Default = 0.0.0.0***

mask_value

Enter a value in the format ***ddd.ddd.ddd.ddd*** where ***ddd*** is a decimal value between 0 and 255.

See also **{SET / DEFINE / CHANGE} SERVER IP**

{SET / DEFINE / CHANGE} SERVER **TCPIP CHECKSUM**

Definition

Disables calculations of TCP/IP checksums on information received from the network. TCP/IP checksums are redundant on **local** Ethernet networks because the Ethernet packets already contain a checksum.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVER* [*TCPIP*] *CHECKSUM* { *ENABLED* / *DISABLED* }

Parameters

Default **= Disabled**

ENABLED • DISABLED

If **ENABLED**, all TCP/IP checksums are verified. If **DISABLED**, TCP/IP checksums are not verified.

Notes

❑ Ethernet packets are checksumed independently. Therefore it is not necessary to enable TCP checksum on an Ethernet-only network.

❑ Enabling **CHECKSUM** improves network and server performance.

{SET / DEFINE / CHANGE} SERVER **WELCOME MESSAGE**

Definition

Use to define a message that displays when the user logs onto the terminal server.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVER WELCOME* [*MESSAGE*] { " " / *"text_string"* }

Parameters

Default **= Welcome to the Equinox Server Network**

"text_string" **• " "**

Enter the text of the welcome message that displays when a user logs onto the server. The text may be up to 80 characters. Use quotation (") marks if you want the message to display exactly as you enter it. Omit the quotation marks to have the message display in uppercase letters. " " removes the welcome message. The message will not display when the user logs onto the server.

Notes

❑ Use only printable ASCII characters. Control characters may not be used in welcome messages.

{SET ■ DEFINE ■ CHANGE} SERVICE [LOCAL]

Definition

The terminal server functions as a service node as well as a server. Use **SET/DEFINE/CHANGE [LOCAL] SERVICE** to setup and change locally offered LAT and TCP/IP services offered by the terminal server to the network.

SET creates or modifies services in the *operational* database and takes place *immediately*. The next time the server is reinitialized, the service is deleted.

DEFINE creates or modifies services in the *permanent* database and takes effect the next time the server is reinitialized.

CHANGE creates or modifies services in both the *operational* and the *permanent* databases immediately.

User

Privileged

Syntax

$$\left\{\begin{matrix}SET\\DEFINE\\CHANGE\end{matrix}\right\}\ SERVICE[\ LOCAL\ ]\ service_name\ [\ socket\ ]\ options$$

Parameters

service_name

Enter up to 16 characters to identify the name of the local service. This is the name that is used to connect to the service.

socket

Enter the socket number of the process to which you want to connect. This parameter is valid for TCP/IP connections only.

options

Enter any configuration changes to be made to the service. There are no limits to the number of options you can enter on a single command line. There is a limit, however, of 125 characters to a single command line.

Refer to the command descriptions described below for individual options.

❑ Any ports that are assigned to services must have access set to **REMOTE** or **DYNAMIC.**

❑ A service can be configured to support LAT, TCP/IP, LAT and TCP/IP.

❑ You can enter a TCP/IP port number of zero. This tells the server that the service is no longer available through TCP/IP. TCP/IP connections in progress are **not** affected.

See also **SHOW/LIST/MONITOR SERVICES**

{SET/DEFINE/CHANGE} SERVICE LOCAL **ANNOUNCEMENTS**

Definition You can specify whether a service will be included in multicast announcements by enabling or disabling **ANNOUNCEMENTS.**

Syntax {*SET* / *DEFINE* / *CHANGE*} *SERVICE*[*LOCAL*] *service_name ANNOUNCEMENTS* {*ENABLED* / *DISABLED*}

Parameters

***Default* = ENABLED**

ENABLED • DISABLED

If **ENABLED**, local services are included in multicast announcements thus making it available to network users. If **DISABLED**, local services are not announced to the network and are not available to users for LAT connections.

Notes

❑ If a local service has a TCP/IP port number and **ANNOUNCEMENTS** is disabled, the service may be accessed via TCP/IP protocols only.

❑ You can configure a service to support LAT, TCP/IP, LAT and TCP/IP or no connections. The following chart shows the parameters for type of configuration:

To Support	*tcp_port_number*	Announcements
LAT only	Undefined (zero)	Disabled
TCP/IP only	Defined (not zero)	Disabled
LAT & TCP/IP	Defined (not zero)	Enabled
None	Undefined (not zero)	Disabled

{SET / DEFINE / CHANGE} SERVICE LOCAL **CONNECTIONS**

Definition

Determines the ability of the terminal server, acting as a service node, to honor additional requests to connect to the desired service.

Syntax

$$\left\{\begin{matrix}SET\\DEFINE\\CHANGE\end{matrix}\right\}\ SERVICE[\ LOCAL\ ]\ service_name\ [\ socket\ ]\ CONNECTIONS\left\{\begin{matrix}ENABLED\\DISABLED\end{matrix}\right\}$$

Parameters

Default **= ENABLED**

ENABLED • DISABLED

If **ENABLED**, the server is able to accept new connections to the service. Use this option when you want to resume access to the service after it was turned off. If **DISABLED**, access is not allowed to the service. Requests that are queued are not connected to the service as their turn comes in the queue. Sessions currently in progress are not affected.

Notes

❑ Use **CONNECTIONS** to place a service "out of service" gradually. With this disabled, users will be unable to reconnect after they disconnect from the service. Eventually the service will be freed as everyone disconnects. Use this to approach to handle preventive maintenance on printers; disable foreign hosts, etc.

❑ You can make a service support TCP/IP only by disabling the LAT service connection parameter.

{SET / DEFINE / CHANGE} SERVICE LOCAL **IDENTIFICATION**

Definition

Use to define a short message that describes the service. This helps users identify more precisely what a service provides.

Syntax

$$\left\{\begin{matrix}SET\\DEFINE\\CHANGE\end{matrix}\right\}\ SERVICE[\ LOCAL\ ]\ service_name[\ socket\ ]\{\ IDENTIFICATION\ "text_string"\ \}$$

Parameters

Default **= " "**

"text_string"

Enter a phrase to describe the service. May be up to 40 characters. The description of the service is included in multicast messages. If you do not enter a phrase, no identifying message displays.

See also

SHOW/LIST/MONITOR SERVICES

{SET / DEFINE / CHANGE} SERVICE LOCAL **PASSWORD**

Definition

Use to define a password users must enter before establishing a session with a service. This provides additional network security by requiring a password prior to establishing a connection.

Syntax

$$\left\{\begin{matrix}SET\\DEFINE\\CHANGE\end{matrix}\right\} SERVICE[\,LOCAL\,]\ service_name\ \{\,PASSWORD\ "password"\,\}$$

Parameters

Default **= NONE**

password **• " "**

Enter a character string to use as a password to access the service. String can be one to 16 characters. Use double quotation marks to clear an established password.

Notes

❑ Use **SET/DEFINE/CHANGE SERVER PASSWORD [LIMIT]** to define the maximum number of attempts a user may have to enter the correct password before being disconnected from the service.

See also

SET/DEFINE/CHANGE SERVER PASSWORD [LIMIT]
SHOW/LIST/MONITOR SERVICES

{SET / DEFINE / CHANGE} SERVICE LOCAL **PORTS**

Definition Use to associate a port (or set of ports) with an offered service.

Syntax $\left\{\begin{matrix}SET\\DEFINE\\CHANGE\end{matrix}\right\}$ *SERVICE*[*LOCAL*] *service_name*[*socket*] $\left\{PORTS\left[\begin{matrix}port_range\\ALL\\NONE\end{matrix}\right]\left\{\begin{matrix}ENABLED\\DISABLED\end{matrix}\right\}\right\}$

Parameters

Default **= NONE**

port_range **• ALL • NONE**

Enter the port or range of ports that offer the designated local service. This list replaces a previous list unless **ENABLED** or **DISABLED** are included as options. **NONE** indicates that no ports offer the service.

ENABLED • DISABLED

If **ENABLED**, ports are added to the list of ports currently offering the service. If **DISABLED**, ports are removed from the list of ports currently offering the service. If **ENABLED** or **DISABLED** are omitted, the list is replaced with the new list.

Notes

❑ Just listing the port as offering a service does not activate the service on that port. The port must also:

- be set for either **remote** or **dynamic** access (ports defined for local access only are not useful in a service group).
- have **autobaud** disabled.

❑ When you connect to a service that has multiple ports assigned to it, you are connected to the next available port. If you then log off and reconnect, the server rotates you to the next higher port. This is called "round robin" hunting: each time you connect to the service, a new port is picked. This ensures that you are not connected repeatedly to an unresponsive or "dead" port.

See also

SET/DEFINE/CHANGE PORT ACCESS
SET/DEFINE CHANGE PORT AUTOBAUD
SHOW/LIST/MONITOR SERVICES

{SET / DEFINE / CHANGE} SERVICE LOCAL **QUEUE**

Definition

For host-initiated requests, specifies whether the terminal server stores the request in the queue if the port(s) that offer the local service are not available.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVICE* [*LOCAL*] *service_name QUEUE* { *ENABLED* / *DISABLED* }

Parameters

Default **= DISABLED**

ENABLED • DISABLED

If **ENABLED** and the local service offered through the terminal server is busy, the server will store a host-initiated request for that service in a queue. If the queue is full, no additional requests will be queued. IF **DISABLED** and the local service offered through the terminal server is busy, the request is rejected.

See also

SET/DEFINE/CHANGE SERVER QUEUE [LIMIT]

{SET / DEFINE / CHANGE} SERVICE LOCAL **TELNET**

TCP/IP

Definition

Use to specify where **TELNET** connections can be made to an offered service.

Syntax

{ *SET* / *DEFINE* / *CHANGE* } *SERVICE*[*LOCAL*] *service_name*[*socket*] { *TELNET* { *ENABLED* / *DISABLED* } }

Parameters

Default **= DISABLED**

ENABLED • DISABLED

If **ENABLED**, the **TELNET** protocol can be used for connections made to the service. If **DISABLED**, the **TELNET** protocol is not supported by the service.

See also

SET/DEFINE/CHANGE SERVER QUEUE [LIMIT]
SHOW/LIST/MONITOR SERVICES

{Set ■ Define ■ Change} Service REMOTE

Definition Use to assign a name to a service associated with a specific TCP/IP socket.

User Privileged

Syntax

{SET / DEFINE / CHANGE} SERVICE REMOTE *service_name* [*socket*] { [IP] *ip_address* / IDENTIFICATION *text_string* / *socket* / TELNET [ENABLED / DISABLED] }

Parameters **IP *ip_address* • IDENTIFICATION *text_string* • *socket* • TELNET [ENABLED • DISABLED]**

IP *ip_address* is the address of a TCP/IP node offering the service.

IDENTIFICATION *text_string* is a text string that identifies the service.

socket is the number of the process to which you want to connect.

TELNET ENABLED indicates the connection will always be a TELNET connection. **TELNET DISABLED** indicates the connection will never be a TELNET connection.

Notes

- Only TCP/IP services can be configured as remote services. LAT services must be learned from multicast announcements.

SET SESSION

Definition

Use **SET SESSION** to change options within the current session. If a port characteristic is defined for one or more of these special control characters, the terminal server recognizes the control character and operates according to the control setting during the session. Users are permitted to change the data transparency mode of their current session. Such changes last only for the current session.

Users may opt to change the data transparency for a session when it becomes necessary to transfer files such as programs or text or to run a program which uses XON or XOFF characters as editing commands. **SET SESSION** is especially useful when neither the service node nor the file transfer software contain commands or utilities to control data transparency automatically.

User

Privileged • Nonprivileged • Secure

Syntax

SET SESSION optons

Parameters

options

Enter any configuration changes to be made to a session. There are no limits to the number of options you can enter on a single command line. There is a limit, however, of 125 characters t a single command line.

Refer to the command descriptions described below for individual options.

Notes

❑ Enter the local server mode to change TELNET options during a session. Then issue the **SET SESSION** command for those options you want to change for the current session. Use the **RESUME** command to return to the active session.

❑ **SET SESSION** affects the *operational* database only. Changes made with this command are valid for the current session only.

❑ You do not have to specify the session number when you use the **SET SESSION** command because the command affects the current or most recent session only.

See also

SET SESSION [TYPE]

{SET / DEFINE / CHANGE} SESSION **BINARY TRANS**

Definition Use to modify the binary transmission for a **TELNET** session.

Syntax

SET SESSION BINARY [*TRANS*] { { *WILL* / *WONT* } / { *DO* / *DONT* } }

Parameters ***Default*** **= WONT DONT**

WILL • WONT

These parameters are used in **local** mode. When set to **WILL**, all characters transmitted by the receiving node are 8 bit binary data. When set to **WONT**, transmission is not treated as 8 bit binary data.

DO • DONT

These parameters are used in **remote** mode. When set to **DO**, all characters received by the receiving node are 8 bit binary data. When set to **DONT**, transmission is not treated as 8 bit binary data.

See also **SET/DEFINE/CHANGE PORT [TELNET] BINARY TRANSMIT**

{SET / DEFINE / CHANGE} SESSION **{ICRLF ■ OCRLF}**

Definition Use to convert carriage returns to carriage return and line feeds.

Syntax

SET SESSION { *ICRLF* / *OCRLF* } { *ENABLED* / *DISABLED* }

Parameters ***Default*** **= ENABLED**

ICRLF • OCRLF

ICRLF causes a line feed to be added to a carriage return when data is send from the port to the network. **OCRLF** causes a line feed to be added to a carriage return when data is send from the network to the port.

ENABLED • DISABLED

If **ENABLED**, Converts carriage returns to carriage return and line feed pairs. If **DISABLED** converts carriage returns into carriage return and NUL.

See also **SET/DEFINE/CHANGE PORT [TELNET] CRLF**

{SET / DEFINE / CHANGE} SESSION **ECHO**

Definition Use to specify where character echoing will occur for the current session. If more than one echo is enabled, multiple characters will be echoed to the terminal.

Syntax

SET SESSION ECHO { { *WILL* / *WONT* } / { *DO* / *DONT* } }

Parameters

***Default* = WONT DO**

WILL • WONT

The server **WILL** echo all characters received from the remote node back to the remote node. The server **WONT** echo characters received from the remote node back to the remote node.

DO • DONT

DO enables echoing at the remote node. Characters sent to the remote node are echoed back to the server. **DONT** causes characters sent to the remote node are not echoed back to the server.

Notes

- When establishing **TELNET** options, specify both a **WILL/WONT** option and a **DO/DONT** option.

See also **SET/DEFINE/CHANGE PORT [TELNET] ECHO**

{SET / DEFINE / CHANGE} SESSION **KEYS**

Definition Use to permit special processing of the **TELNET** options that have character definitions.

Syntax

SET SESSION KEYS { *ENABLED* / *DISABLED* }

Parameters

***Default* = DISABLED**

ENABLED • DISABLED

If **ENABLED**, special processing is turned on for the **TELNET** options that have character definitions. If **DISABLED**, special processing is turned off for **TELNET** options.

See also **SET/DEFINE/CHANGE PORT [TELNET] KEYS**

{SET / DEFINE / CHANGE} SESSION **NAME**

Definition Use to assign a temporary name to the current session. This name can be used in **RESUME** and **DISCONNECT** commands.

Syntax *SET SESSION NAME session_name*

Parameters

***Default* = no name**

session_name

Enter a text string of one to 16 characters that identifies the current session.

{SET / DEFINE / CHANGE} SESSION **SUPPRESS GA**

TCP/IP

Definition Use to suppress the Go Ahead feature. This allows data to be transmitted without manual intervention.

Syntax

SET SESSION SUPPRESS [*GA*] { { *WILL* / *WONT* } / { *DO* / *DONT* } }

Parameters

***Default* = WILL DO**

WILL • WONT

WILL enables the server to transmit data without sending the **TELNET GA** command. **WONT** forces the server to use the **TELNET GA** command to transmit data.

DO • DONT

DO enables a remote node to transmit data without sending the **TELNET GA** command. **DONT** forces the remote node to use the **TELNET GA** command to transmit data.

Notes

- When establishing **TELNET** options, set both the **WILL/WONT** and **DO/DONT** options.

See also **SET/DEFINE/CHANGE PORT [TELNET] SUPPRESS [GA]**

{SET / DEFINE / CHANGE} SESSION **TYPE**

Definition

Use to change how special characters that are defined for a port(s) are handled. Special characters include user-defined switch characters (e.g., *backward, forward,* etc.) and flow control characters (*XON, XOFF*). This is referred to as data transparency.

If a port characteristic is defined for one or more of these special control characters, the terminal server recognizes the control character and operates according to the control setting during the session. Users are permitted to change the data transparency mode of their current session. Such changes last only for the current session.

Syntax

SET SESSION [TYPE] { *INTERACTIVE* | *PASSALL* | *PASTHRU* }

Parameters

***Default* = INTERACTIVE**

INTERACTIVE • PASSALL • PASTHRU

INTERACTIVE makes all special control characters active. This is used to reactivate special control characters during a session where **PASSALL** or **PASTHRU** were selected as options. XON and XOFF are used for flow control if selected.

PASSALL ignores flow control and passes all characters used to do binary file transfers.

PASTHRU responds to flow control characters but passes all other characters. Session switching characters are not recognized when this is enabled.

Notes

❑ Once a session is set for **PASSALL**, the only way you can return to the local mode is via a <**BREAK**>. Be sure to **enable** breaks for the port **prior** to setting **PASSALL**.

❑ When you use **PASSALL**, be sure that the devices on either end are capable of accepting a complete packet of information without requiring flow control.

{SET / DEFINE / CHANGE} SESSION **VERBOSE**

Definition Use to display messages reporting the progress of the **TELNET** options negotiations.

Syntax *SET SESSION VERBOSE* { *ENABLED* / *DISABLED* }

Parameters ***Default* = DISABLED**

ENABLED • DISABLED

ENABLED turns on the display of messages that reports the progress of **TELNET** options negotiations. **DISABLED** turns off the display of messages that reports the progress of **TELNET** options negotiations.

See also **SET/DEFINE/CHANGE PORT TELNET VERBOSE**

{SHOW ■ LIST ■ MONITOR} NODES

Definition

Use **SHOW/LIST/MONITOR NODES** to display information from the *operational* database about service nodes available to the terminal server users.

SHOW NODES is available to all users. It displays information about service nodes available on the Ethernet. The display is not updated continuously.

Nonprivileged and secure users see information that relates to the service nodes that are in their authorized groups. Privileged users view information about **all** of the service nodes on the Ethernet.

MONITOR NODES is available to privileged users only. It displays the same information as **SHOW NODES**, but the display is updated every second.

User

Privileged • Nonprivileged • Secure

Syntax

{ *SHOW* | *LIST* | *MONITOR* } *NODES* [* | *ALL* | *LAT* | *TCPIP* | *node_name* | *node_name.* | *alias_name.*] [*CHARACTERISTICS* | *COUNTERS* | *STATUS* | *SUMMARY*]

Parameters

Default **= Status (one node) Summary (multiple nodes)**

*** • ALL • LAT • TCPIP •** ***node_name*** **•** ***node_name.*** **•** ***alias-name.***

The asterisk is a wild card character which allows you to limit your display to specific ports with common name characteristics. Use the asterisk anywhere in the search term.

ALL displays information about all of the service nodes for which you can request information. The display includes all authorized service nodes, regardless of their ability to accept new connections.

LAT displays information about all LAT service nodes.

TCPIP displays information about all defined nodes accessible through TCP/IP protocol.

node_name **•** ***node_name.*** **•** ***alias-name*** Enter the name of the node on the local network for which you want information.

CHARACTERISTICS • COUNTERS • STATUS • SUMMARY

CHARACTERISTICS displays information about node characteristics for each node you specify. **LAT** cannot be used with **CHARACTERISTICS.**

COUNTERS displays one **counter** screen per node you specify. The display shows information about the number of connections the server has made to the node, the number of messages sent, etc.

STATUS displays one status screen per node that you specify. The display contains the Ethernet address of the node, group codes, services offered, etc. This is the default if one node is specified.

SUMMARY displays one screen that contains a single line summary for each node that you specify. This is the default if multiple nodes are specified.

Notes

- ❑ Nonprivileged and Secure Users:
  - If you do not specify a node name, a summary of data for each service node that falls within a group whose code number matches the setting of your **PORT GROUPS** option is displayed.
  - If you specify **ALL**, your screen displays a summary of data for each service node that falls within a group whose code number matches the settings of your **PORT AUTHORIZED GROUPS** option.

- ❑ Privileged Users:
  - If you do not specify a node name, a summary of data for each service node that the service is aware of is displayed.
  - If you specify **ALL**, your screen displays a summary of data for each service node that the terminal server is aware of, regardless of the access restrictions of the group through which you currently are operating.

- ❑ Terminate the **MONITOR** display by pressing any key.

- ❑ **SHOW NODES** incorporates both LAT and TCP/IP information on a single display. The display indicates which protocol the service may be accessed by.

See also

SET/DEFINE/CHANGE PORT AUTHORIZED GROUPS
SET/DEFINE/CHANGE PORT GROUPS

{SHOW ■ LIST ■ MONITOR} PORTS

Definition

Use **SHOW/LIST/MONITOR PORTS** to display information about ports on the server. These three commands are grouped together for convenience, however each command has a unique function:

SHOW displays current information about ports on the server. This includes port options stored in the *operational* database.

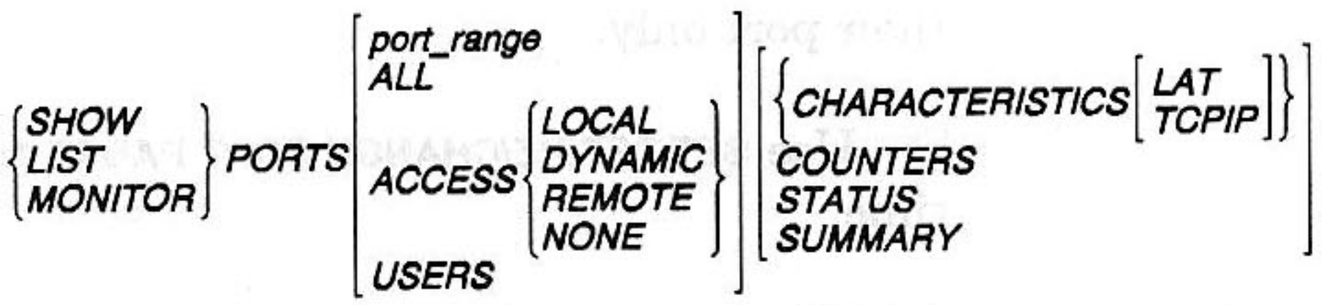
LIST displays permanent information about ports on the server. This includes port options that will take effect the next time the port is logged in or out.

MONITOR is similar to the **SHOW** command except that it displays continuously updated information about ports on the server. The display is updated every second for privileged users.

User

Privileged • Nonprivileged • Secure

Syntax



Parameters

***port_range* • ALL • ACCESS • USERS**

Enter the port or range of ports for which you want information displayed. If a port number is not entered, information is displayed about your port. **ALL** displays information for all server ports.

ACCESS displays information about ports that have specific access types. Port numbers are not used if you specify an access type.

USERS displays all ports that are currently in use.

CHARACTERISTICS • COUNTERS • STATUS • SUMMARY

CHARACTERISTICS displays information about the port characteristics for each port your specify in *port_range*. This is the default display if only one port is requested.

COUNTERS displays one **counters** screen per port that you specify. The screen contains information about the number of connections the port has made, number of errors detected, etc.

STATUS displays one status screen per port that you specify. The screen contains the port's user name, access settings, etc.

SUMMARY displays all of the locally offered services to which the port is assigned. This is the default if multiple ports are specified.

Notes

- The **CHARACTERISTICS** screen does not display TCP/IP specific information. **Dedicated** and **preferred** services are displayed on the LAT screens. If a service is not a LAT service, a message displays instead of the service name.
- Terminate the **MONITOR** display by pressing any key.
- Nonprivileged users can **MONITOR** more than one port using the **SUMMARY** option. Secure users can display information about their port only.
- Use **SET/DEFINE/CHANGE PORT PAUSE** to view screens one at a time.

See also **SET/DEFINE/CHANGE PORT PAUSE**

{SHOW ■ MONITOR} QUEUE

Definition Use to display information about items in the server queue. These two commands are grouped together for convenience, however each command has a unique function:

SHOW displays the current status of the server queue.

MONITOR is similar to the **SHOW** command except that the display is updated every second for privileged users and every 10 seconds for nonprivileged users.

User Privileged • Nonprivileged

Syntax

$$\left\{ \begin{matrix} SHOW \\ MONITOR \end{matrix} \right\} QUEUE \left[\begin{matrix} ALL \\ NODE\ node_name \\ PORT\ port_name \\ SERVICE\ service_name \end{matrix} \right]$$

Parameters **ALL • NODE** ***node_name*** **• PORT** ***port_name*** **• SERVICE** ***service_name***

ALL displays all service requests in the server queue.

NODE ***node_name*** displays service requests from the specified server node.

PORT ***port_name*** displays all service requests to the specified server port.

SERVICE ***service_name*** displays service requests to the specified local service.

{SHOW ■ LIST ■ MONITOR} SERVER

Definition Use to display information about the server itself. These three commands are grouped together for convenience, however each command has a unique function:

SHOW displays current information about the server. This includes server options that have changed temporarily with the **SET** command.

LIST displays permanent information about the server. This includes server options that will take effect the next time the server is initialized.

MONITOR is similar to the **SHOW** command except that it displays continuously updated information about the server.

User Privileged • Nonprivileged (LIST only)

Syntax

$$\left\{\begin{matrix}SHOW\\LIST\\MONITOR\end{matrix}\right\}\ [SERVER\ ]\left[\begin{matrix}CHARACTERISTICS\left[\begin{matrix}LAT\\TCPIP\end{matrix}\right]\\COUNTERS\left[\begin{matrix}IP\\ICMP\\LAT\\TCPIP\\UDP\end{matrix}\right]\\STATUS\\SUMMARY\end{matrix}\right]$$

Parameters ***Default*** **= CHARACTERISTICS**

CHARACTERISTICS • COUNTERS • STATUS • SUMMARY

CHARACTERISTICS display includes server options that are strictly *local*, options that affect *network* operation, and a description of the server *hardware*.

COUNTERS displays includes server counters that relate *Ethernet* activity and counters that relate to terminal server activity.

STATUS displays the status of the server, including resource utilization and load host information.

SUMMARY displays a shorted version of the characteristics screen.

Notes

- Only the **CHARACTERISTICS** option is valid with the **LIST SERVER** command.

- Server **COUNTERS** unique to TCP/IP are displayed separately from Ethernet and LAT counters.

- Server characteristics unique to TCP/IP are displayed separately from LAT characteristics.

{SHOW ■ LIST ■ MONITOR} SERVICES

Definition

Use to display information about the services you may connect to. These three commands are grouped together for convenience, however each command has a unique function:

SHOW displays current information about services. This includes services that have been created or changed temporarily with the **SET** command.

LIST displays permanent information about services. This includes options that will take effect the next time the server is initialized.

MONITOR is similar to the **SHOW** command except that it displays continuously updated information about services. The display is updated every second for privileged users.

User

Privileged • Nonprivileged (LIST only) • Secure (LIST only)

Syntax

{ *SHOW* | *LIST* | *MONITOR* } *SERVICES* [* | *ALL* | *HERE* | *LAT* | *LOCAL* | *REMOTE* | *TCPIP* | *service_name* | *tcp_port_name*] [*CHARACTERISTICS* | *STATUS* | *SUMMARY*]

Parameters

*** • ALL • HERE • LAT • LOCAL • REMOTE • TCPIP • *service_name* • *tcp_port_name***

*** / ALL** displays information for all services offered by the server, both locally configured and those learned from the network. Use asterisk (*) as a prefix or suffix character to select specific services.

HERE displays information on all locally configured services.

LAT displays information for all locally configured LAT services and LAT services learned from the network.

LOCAL displays information for all locally offered LAT and TCP/IP services.

REMOTE displays information for all remote TCP/IP services.

TCPIP displays information for all locally offered and remote TCP/IP services and TCP/IP services learned from the network.

service_name indicates a specific service for which you want information. The default is for all services that are authorized for your port.

tcp_port_name indicates a specific TCP/IP port for which you want information.

CHARACTERISTICS • STATUS • SUMMARY

CHARACTERISTICS displays characteristics for local service(s). Name and I.D. only are displayed for remote services.

STATUS displays operational information about the service(s).

SUMMARY displays one-line summary information for the service(s).

Notes

- The *status* and *summary* options may not be used with the **LIST** command.

{SHOW ■ MONITOR} SESSIONS

Definition Use to display information about active sessions on a port. These two commands are grouped together for convenience, however each command has a unique function:

SHOW displays the current sessions on a port.

MONITOR is similar to the **SHOW** command except that the display is updated every second for privileged users.

User Privileged • Nonprivileged

Syntax { *SHOW* / *MONITOR* } *SESSIONS* [*PORT port_range* / *ALL*]

Parameters

ALL • *port_range*

Range of ports for which session information is to be displayed. If a port number is not entered, sessions are displayed for your port.

{SHOW ■ MONITOR} USERS

Definition Use to display information about each port user. These two commands are grouped together for convenience, however each command has a unique function:

SHOW displays information about each user on the server.

MONITOR is similar to the **SHOW** command except that the display is updated every second for privileged users.

User Privileged • Nonprivileged

Syntax { *SHOW* / *MONITOR* } *USERS*

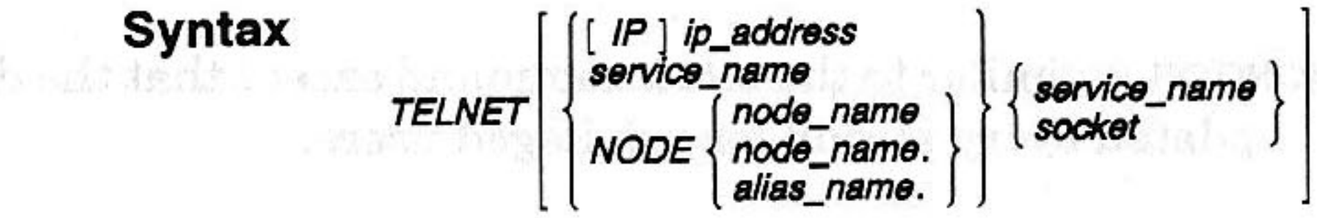
Parameters None

TELNET

Definition Establishes a connection between your port and a TCP/IP node or service using the **TELNET** protocol.

User Privileged • Nonprivileged • Secure

Syntax



Parameters

IP *ip_address* • *service_name* • NODE {*node_name* • *node_name.* • *alias_name.*

Enter the Internet address, service name or node name to which you want to connect.

service_name* • *socket

Enter the name of a specific TCP/IP service or socket number of the process to which you want to connect.

Notes

❑ You must specify the node offering the TCP/IP port and the TCP/IP port name or the TCP/IP port number of the service.

❑ **SHOW/LIST/MONITOR SERVICES** lists those services that are known to your server.

See also

CONNECT
CONNECT PORT
SET/DEFINE/CHANGE PORT PREFERRED
SHOW/LIST/MONITOR SERVICES

TEST LOOP

Definition Use to check a LAT node for errors. The command causes the server to transmit a message to the specified node.

User Privileged

Syntax

[*TEST*] *LOOP* { *ethernet_address* / *node_name* / *serial_number* } [*COUNT n*]

[*HELP* { *FULL* / *RECEIVE* / *TRANSMIT* } *ASSISTANT* { *ethernet_address* / *node_name* / *serial_number* }]

Parameters

ethernet_address • node_name • serial_number

Enter the *ethernet_address*, *node_name* or *ESI serial_number* of the node to be tested. The default is the node you are logged on to. The node name and serial number are converted to their Ethernet address.

COUNT <*n*>

Enter the number of lines of test data to be sent to the port. The default is 23-lines. If the number of lines is set to zero, the server performs a continuous test. Press the **<BREAK>** key at any time on the *initiating* port to terminate the test.

HELP {FULL • RECEIVE • TRANSMIT}

Defines the type of help you want when you are in assistant mode.

FULL relays both outgoing and returning server transmissions.
RECEIVE relays transmissions returning from the server.
TRANSMIT relays outgoing server transmissions.

ASSISTANT

Enter the address of the location where you want the help to be transmitted.

TEST PORT

Definition Use to check a port for errors. The command causes the server to transmit a repeating and continuous pattern of ASCII characters to the specified port. Errors in the pattern on the port indicate possible problems with the device connected to the port, problems with the physical connection to the port, or incorrect port configuration.

User Privileged • Nonprivileged

Syntax *TEST PORT* [*port_range*] [*COUNT <n>*] [*WIDTH <n>*] [*LOOPBACK* { *EXTERNAL* / *INTERNAL* }]

Parameters

port_range
Enter the port(s) to be tested. The default is the port you are logged on to. If more than one port is specified, the tests are performed sequentially by port number.

COUNT <*n*>
Enter the number of lines of test data to be sent to the port. The default is 23-lines. If the number of lines is set to zero, the server performs a continuous test. Press the **<BREAK>** key at any time on the *initiating* port to terminate the test.

WIDTH <*n*>
Enter the number of characters of test data per line. The default is 79 characters. The range can be from 1 to 132.

LOOPBACK {EXTERNAL • INTERNAL}
Indicates whether the test data is looped back from an **external** loopback connector or it is to utilize **internal** loopback.

Notes

- Nonprivileged users may test **their** port only.
- Any messages output as a result of the command are displayed at the originating port, not at the tested port.

ZERO [COUNTERS]

Definition Use to reset statistical counters that accumulate the totals for the server, node and port counter displays.

User Privileged

Syntax

Parameters ***Default*** **= ALL**
ALL • NODE • PORT • SERVER • ARP
ALL resets all counters. **ALL** does not flush the ARP node cache.

NODE resets the counters for data exchanges between the server and the specified node.

PORT ***port_range***
Resets the error and status counters for the specified port(s).

SERVER
Resets the error and status counters for the server.

ARP
Removes ARP node cache. All nodes in the cache that do not have network communications pending are removed from the cache.

Notes

- The terminal server stores database information and accumulated totals about the server and each node and port on the server. This data is used in the **SHOW/LIST/MONITOR** displays whenever **COUNTER** is specified as an option.
- Counter values are lost whenever the server is reset or initialized.

See also **SHOW/MONITOR NODES**
SHOW/LIST/MONITOR PORTS
SHOW/LIST/MONITOR SERVER

Appendix B Wiring

Appendix B provides you with wiring diagrams for the cables and adapters used with the ELS-8 / ELS-16 terminal servers. The ELS-8 and ELS-16 support Control Signals and provide a standard RS-232 interface with full modem control signals. They support a wide variety of devices (i.e. terminals, PCs, modems, printers and other serial devices).

To assist you in wiring your terminal server, Equinox sells a complete set of cabling accessories. Refer to the Equinox Ordering Guide for more information.

Ethernet Connectors

Mounted on the front of the ELS-8 and the ELS-16 terminal servers are two Ethernet connectors:

- DB-15 Female Connector
- RG-58 Thin Coax Connector

DB-15 Connector

The wiring for the DB-15 Connector is shown in Figure B-1.

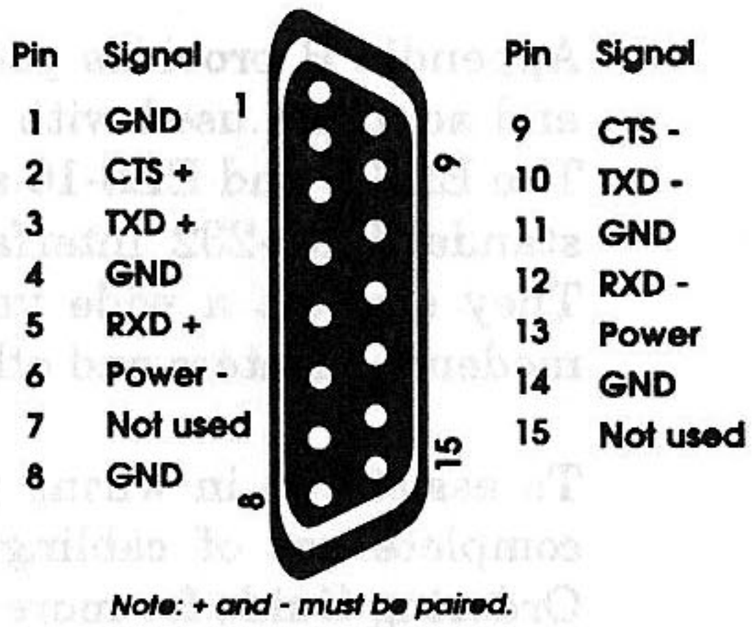


Figure B-1 DB-15 Wiring

BNC Connector

Figure B-2 illustrates the BNC connector located on the front of the terminal server.

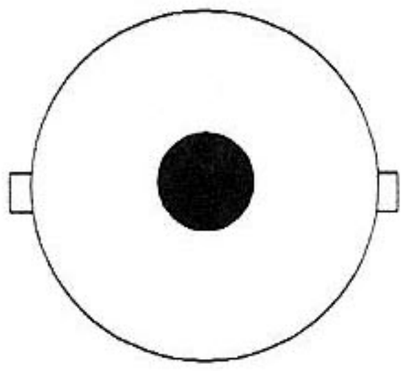


Figure B-2
BNC Connector

Mounted on the back of the ELS-8 and the ELS-16 terminal server are 8 or 16 RJ-45 connectors, one parallel printer port and a connector for the power supply (*Figure B-3*).

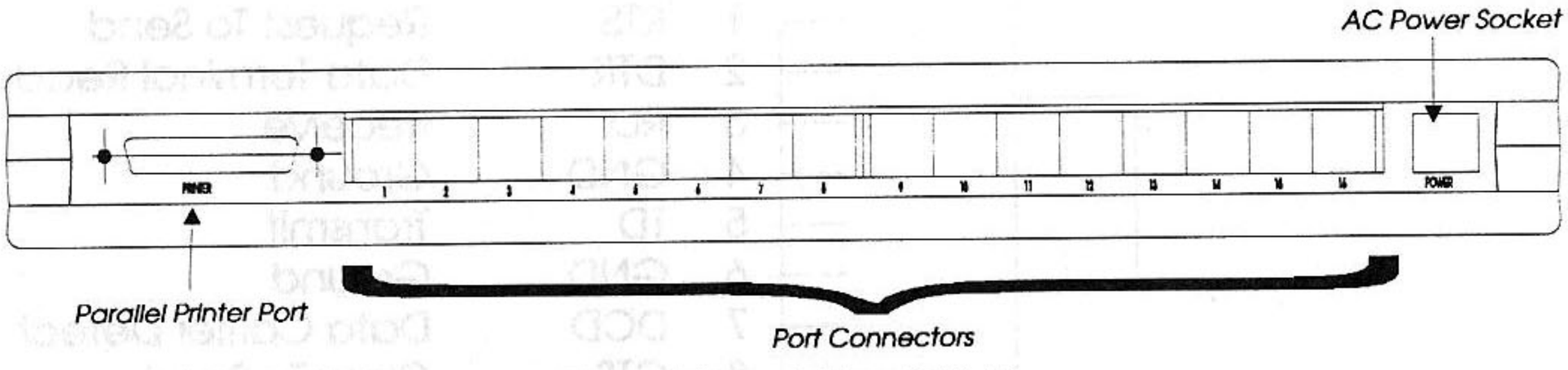


Figure B-3 Back View ELS-16

The rest of this chapter details the wiring of the connectors used with the elements located on the back of the terminal server:

- ❑ RJ-45 Serial Ports
- ❑ Modular Cables
- ❑ Modular Adaptors
- ❑ Parallel Printer Port

The ELS-8 and the ELS-16 support standard RS-232 DTE signals on 8 or 16, 8-pin, RJ-45 modular jacks, one for each device to be connected. The pinouts of these jacks are show in Figure B-4.

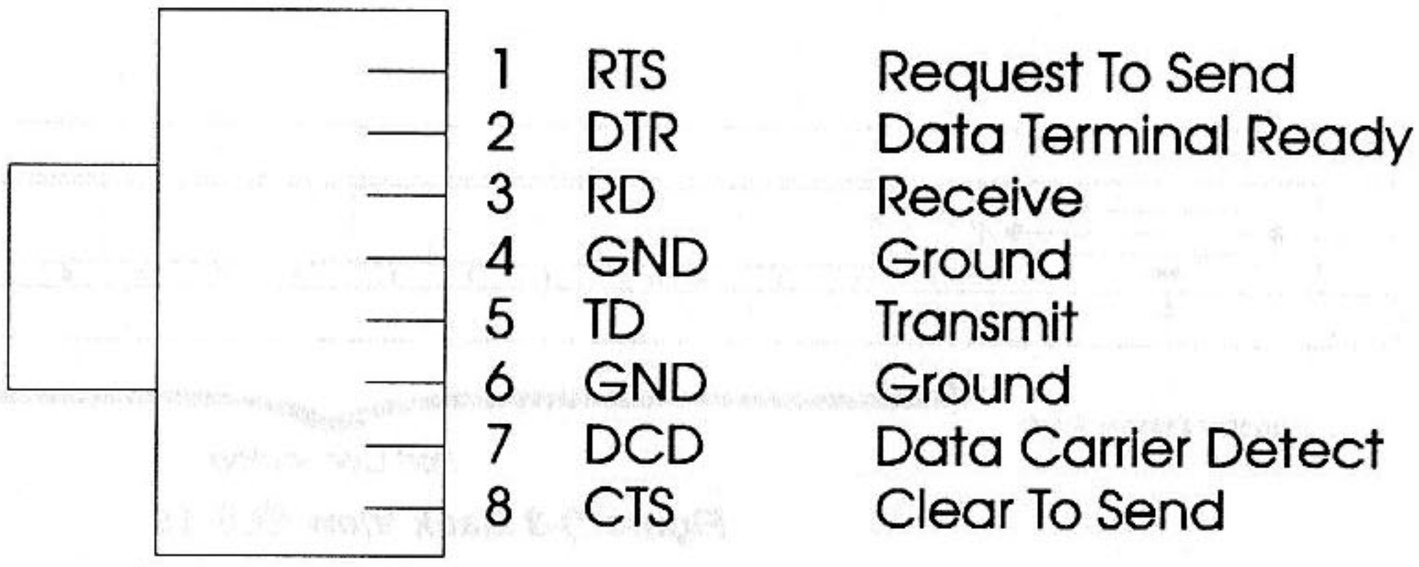


Figure B-4 RJ-45 Wiring

- Although the terminal server uses 8-pin modular jacks, the signal pinouts have been arranged such that 4- and 6-wire modular plugs may also be used. The receive and transmit signals (and ground) are on the inner four wires, therefore a 4-wire connection may be made to data-only devices.

- Use either twisted-pair or flat modular cable to wire from the terminal server to a device. Standard modular cables available from Equinox or wiring distributors are **reversing**, that is the pins are reversed are each end.

RJ-45 Modular Cable is the same type of modular flat cable used for wiring telephones inside of buildings. The cable is terminated at each end with an RJ-45 modular plug (connector) which is inserted into the modular jack of an appropriate adaptor. Standard modular cable available from Equinox or wiring distributors are **reversing**; that is the pins are reversed at each end.

Caution: Whether you wire your own modular adaptors or buy them from an outside source, make sure the wiring on the adaptors matches Equinox standard wiring as shown in the figure below. Unlike telephones, modular adaptors from different manufacturers are not all wired the same and will not necessarily work together correctly.

Figure B-5 illustrates the signals passed through modular cables when connected to an Equinox terminal server.

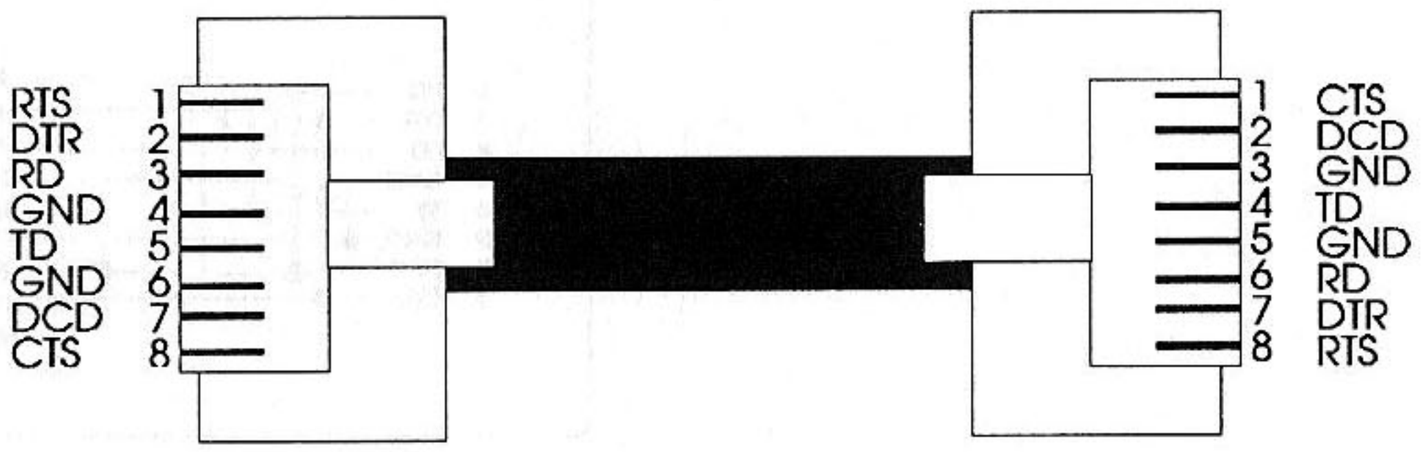


Figure B-5 8-Wire Reversing Cable Wiring

Modular Adaptors

Modular adaptors convert modular jacks to DB-25 or DB-9 connectors. Use the following guides in conjunction with the documentation provided with your equipment to select the correct modular wiring accessories

Part Number	Adaptor Type	Connects to
210051 210055	DB-25 DCE Male DB-24 DCE Female	Terminals & Printers
210054	DB-25 DTE Male	Modems
210062	DB-9 Female	IBM PC/AT

Terminals & Printers

Use the following wiring with any DTE device. DTE devices transmit data on pin 2 and receive data on pin 3.

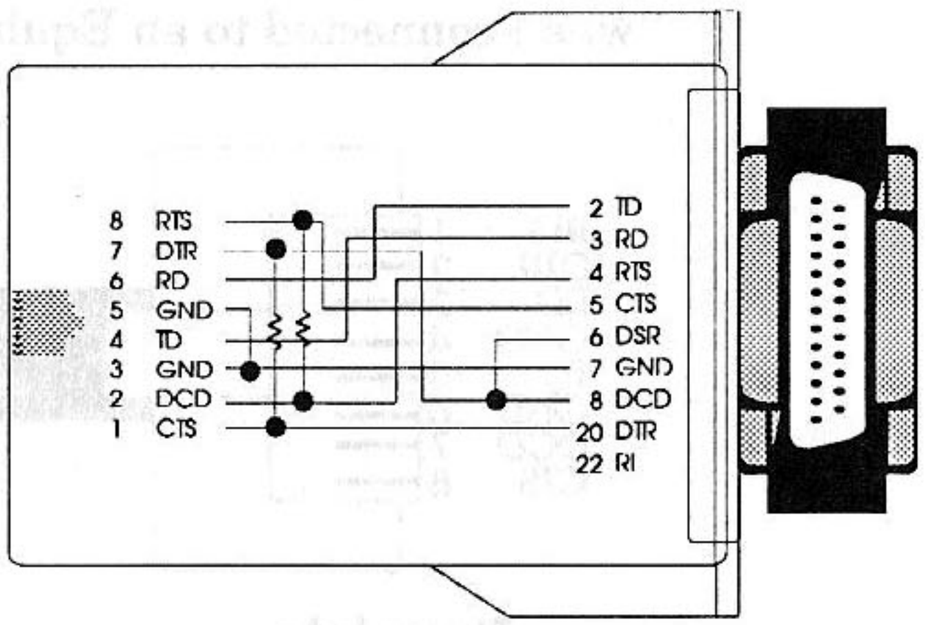


Figure B-6
210051 DB-25 DCE Male
210055 DB-25 DCE Female

Modems

Use the wiring diagram in Figure B-7 with any DCE device. DCE devices transmit data on pin 3 and receive data on pin 2.

Note: The 3K resistors shown in the diagrams permit the adapters to be used with 4- or 6-wire modular cable.

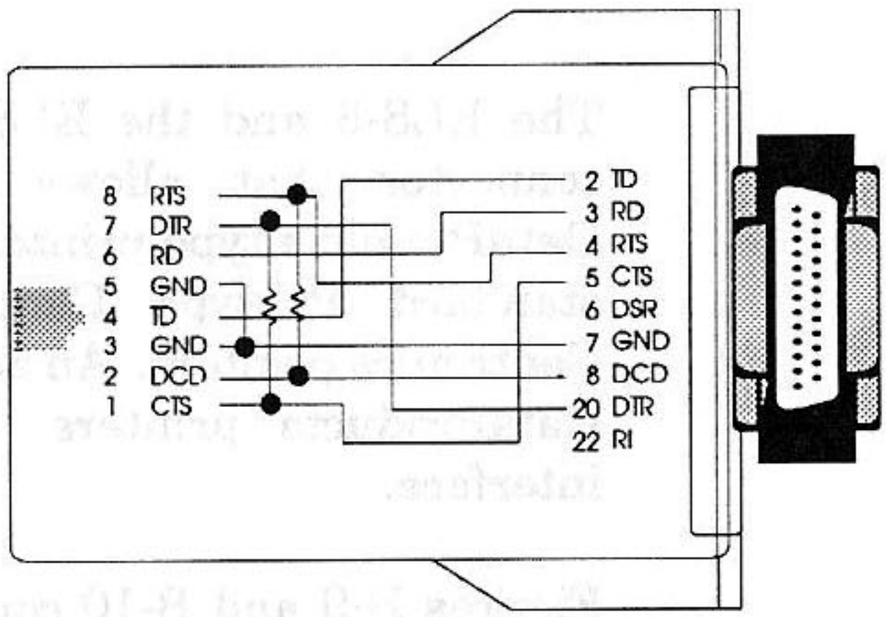


Figure B-7 210054 DB-25 DTE Male

IBM PC/AT

Use the following wiring with any IBM PC/AT or compatible that has a DB-9 connector instead of the normal DB-25 connector for a serial interface.

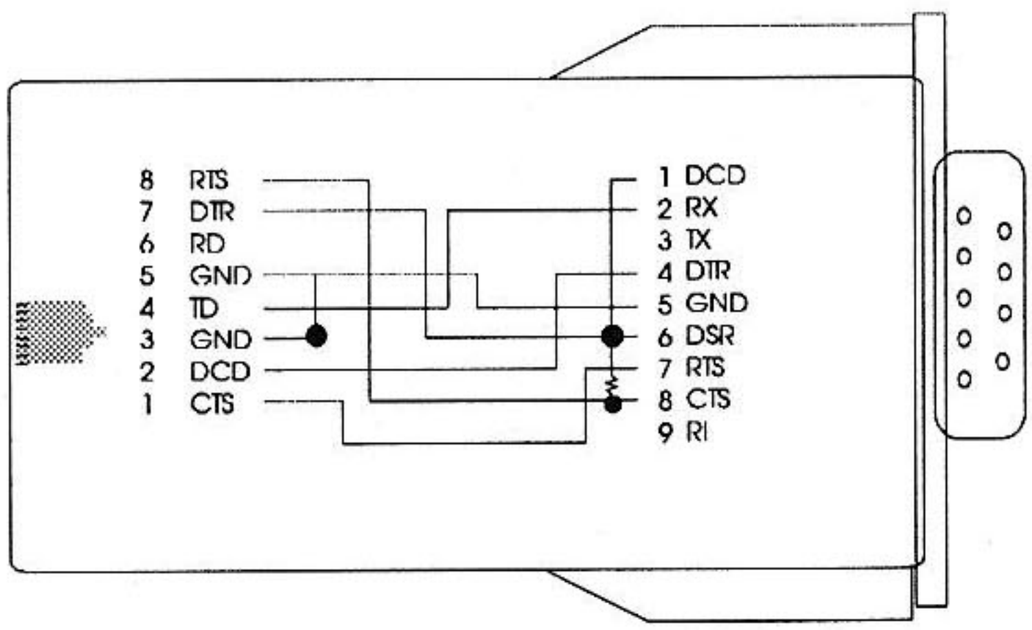


Figure B-8 210062 DB-9 Female

Parallel Printer Port

The ELS-8 and the ELS-16 terminal servers have a 25-pin connector that allows you to connect a Centronics or DataProducts type printer to the terminal server. You can use standard PC-type Centronics adaptor cables to connect Centronics printers. An adaptor cable is required for connecting DataProducts printers, or printers using a DataProducts interface.

Figures B-9 and B-10 contain wiring diagrams for Centronics and DataProducts connectors.

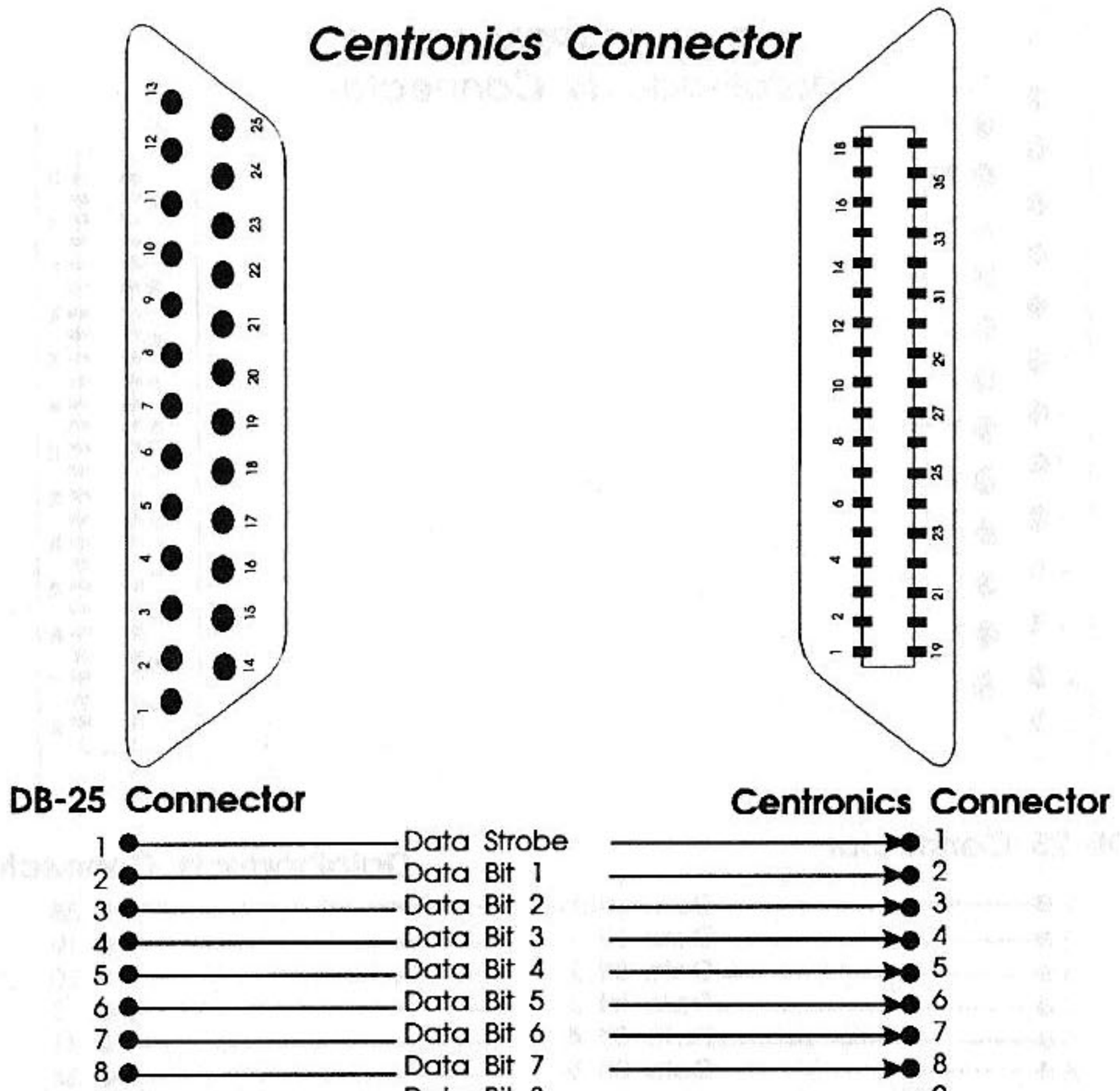
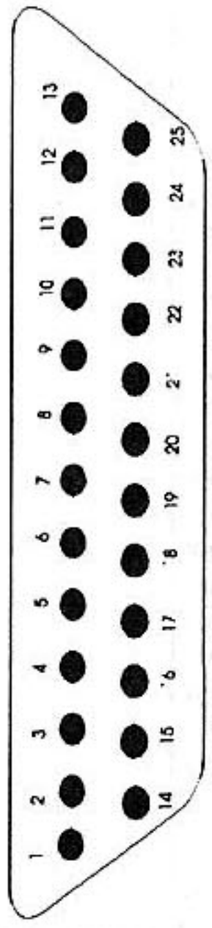
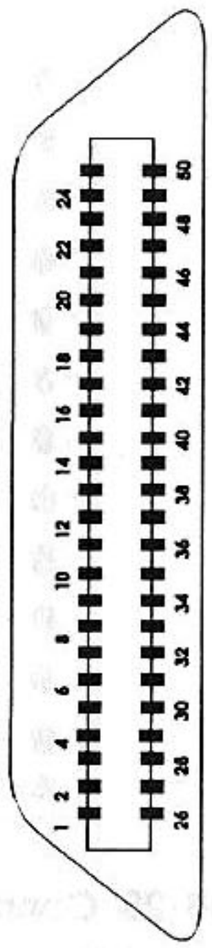


Figure B-9 Centronics Wiring

12-Port-CS+PRN Board
DataProducts Connector





DB-25 Connector → **DataProducts Connector**

DB-25		DataProducts
1	Data Strobe	38
2	Data Bit 1	19
3	Data Bit 2	20
4	Data Bit 3	1
5	Data Bit 4	41
6	Data Bit 5	34
7	Data Bit 6	43
8	Data Bit 7	36
9	Data Bit 8	28
10	Acknowledge	Demand 23
11	Busy	No Connection 27
12	Paper End	No Connection 11
13	Select	On Line 21
14	Autofeed	Paper Instructions 30
15	Error	Ready 22
16	Initialize	Buffer Clear 31
17	Select Inhibit	Interface Connect Verify 46
18	Ground	Buffer Clear Return 15
		Interface Connect Return 45
19	Ground	Ready Return 6
		Paper Instruction Return 14
20	Ground	On Line Return 5
		No Connection 25
21	Ground	Demand Return 7
		Paper Move 44
22	Ground	Data 7 Return 35
		Data 6 Return 42
23	Ground	Data 5 Return 18
		Data 4 Return 40
24	Ground	Data 3 Return 2
		Data 2 Return 4
25	Ground	Data 1 Return 3
		Data Strobe Return 37
		No Connection 8, 9, 10, 12, 13
		No Connection 16, 17, 22, 24
		No Connection 26, 29, 33, 39
		No Connection 47, 48, 49, 50

Figure B-10 DataProducts Wiring

Appendix C Troubleshooting

Appendix C describes specific problems that may arise when you are installing, configuring and managing the ELS-8 or ELS-16 terminal server. We have included suggested solutions to these problems.

- ❒ Abnormal LED Indications
- ❒ Terminal Server and Terminals not Communicating
- ❒ Using Services on the Network
- ❒ Diagnosing Port Board Problems
- ❒ Printer Problems

Abnormal LED Indications

Ethernet Control Board LEDs

Ready LED blinks continuously

There is a hardware problem with the terminal server. Contact your distributor for assistance.

Alarm LED lights solid

This indicates a software problem has occurred with the unit. **INITIALIZE** the server (or power clear) when convenient. If the problem keeps reoccurring, contact your distributor or Equinox for further assistance.

LAN Activity LED never lights

If you are properly connected to the Ethernet and there is activity, you should see this LED light periodically. It may be solid if there is a lot of traffic in/out of your server. If the LED never lights, there is a problem with your connection to the Ethernet.

No LEDs are lit

Check the power to the unit. There are no user serviceable fuses. Make sure AC voltage is present in the wall outlet and that the plug is fully inserted into the rear of the unit.

Terminal Server and Terminals not Communicating

No response at terminal

Pressing <CR> at the terminal does not get a response from the terminal server

Power off the terminal server and power it back on. Make sure the terminal is set to a standard baud rate between 75 bps and 38.4 Kbps. Press <CR>. The server should automatically detect the terminal's speed and display a local prompt.

If not there is no response:

- Check the wiring between the terminal and the terminal server. Try several different ports on the terminal server. Refer to *Appendix B, Wiring*.

- Make sure the terminal is working properly. Use a breakout box to loop pins 2 and 3 on the RS-232 interface of the terminal. Type on the terminal keyboard and see if the data is displayed on the screen.

- From a terminal connected to a working port on the server check that the problem port's **ACCESS TYPE** is set to **LOCAL** or **DYNAMIC**. Check to make sure that the **DEVICE TYPE** is not one that requires control signals to operate.

- The port's configuration may have been changed to a speed that does not match your terminal. Reinitialize the server's configuration. The ports may have been changed from their factory defaults. Return them to the factory default of **AUTOBAUD ENABLED**.

Unrecognizable characters or garbage at terminal

When pressing <CR>, garbage is displayed on the terminal screen

Every port on the server is set to automatically detect the baud rate of the terminal. But the terminals must initially be set for no parity and 8 data bits. Garbage on the terminal screen most often is caused by the terminal being set to something else.

Data to terminal screen jumbled/out of order

When doing a SHOW PORT, MONITOR SERVER, etc. the screen formats are jumbled

The *terminal type* setting on the port must be set to match the type of terminal connected. If ANSI is selected but the terminal is not an ANSI terminal, escape sequences will be misread, and the screen will not be formatted properly.

Large pieces of text missing

When displaying multiple screens of data to the terminal, large gaps appear in the text

Missing data is usually indicative of a flow control problem. Make sure the terminal is set for XON/XOFF flow control initially. Use the **TEST PORT** command to verify proper operation between the terminal and the server.

No services are listed

When doing a SHOW SERVICES nothing displays. The server says "No services known..."

The terminal server automatically learns what services are on the network. If you have services defined and enabled, it will display a list of all the services your server is allowed to use.

- Wait a couple of minutes. The "learning" process can take several minutes before services start to show up.

- Verify the connection to the Ethernet. Is the LAN LED blinking periodically (or on solid) showing LAN activity? If not, there is a problem with the physical connection to the Ethernet.

- Make sure your service nodes are announcing services. Go to another Server and see if it is recognizing services.

- Check your port's **AUTHORIZED GROUP CODES**. You will only see services that are in the same group that your port is in (group 0 by default).

- Do a **SET PRIVILEGED** to make yourself a privileged user. You will then be able to see any and all services on the network, regardless of the **GROUP CODE** settings. This is a good troubleshooting aid as it takes a lot of the possible configuration mistakes out of the picture.

No nodes are listed

When doing a SHOW NODES, it says "No Nodes known..."

Like services, it may take several minutes before your server automatically learns what nodes are on the Ethernet.

- If no nodes are seen after several minutes, verify the connections to the Ethernet. Verify that you have an operating node on the Ethernet.

- Verify that your Ethernet cable is properly terminated. If you have not installed the proper terminators on your network, it can wreak havoc with data transmission.

- Do a **SET PRIVILEGED** and make yourself a privileged user. You will then be able to see any and all Nodes on the network, regardless of the **GROUP CODE** settings.

Cannot connect to remote console

*Cannot connect (or see) **Remote Console Services** on other Equinox Servers*

You must be a privileged user to see **remote console services** on another Equinox server.

NOTE: You do not need a VAX and NCP for Equinox's Remote Console to operate.

Random Disconnects from sessions

In the middle of a session, the Server disconnects with the message "No progress being made"

This usually means that there have been excessive errors on the Ethernet and the virtual circuit between your terminal and the node has been torn down.

- Examine the Server's Ethernet counters (**SHOW COUNTERS**). If you see an excessive number of retransmissions, TX or RX errors, or duplicate message counts check to see:
  - ✓ Is the network terminated properly?
  - ✓ Have you exceeded distance recommendations?
  - ✓ Is there some piece of equipment which may be causing problems on the network?
- If a particular Node seems to be having problems, check the node counters. This sometimes help indicate where the problem lies.
- Try increasing the **SERVER RETRANSMIT LIMIT.** The default value is 8 but in noisy or marginal network you may have to increase this count (the maximum is 120).

Services offered by your server

Other Servers don't see the services offered on your server

Locally defined services are announced to the network using multicast messages. If other Servers do not see your services:

- Make sure that **SERVER ANNOUNCEMENTS** have been enabled.
- Make sure that **connections** have been enabled for the service.
- Verify the **GROUP CODE** for your Server. It must match that of the other servers for them to see your services.

Cannot connect to services offered by other servers -

- The ports defined for the local service must be set for **DYNAMIC ACCESS** or **REMOTE ACCESS**. **LOCAL ACCESS** ports may not be used in a service group.

- The device connected to the service port (printer, modem, etc.) is not ready (i.e. the proper control signals are not turned on).
- All of the ports are in use for the requested service. Unlike Data PBXs, terminal servers do not allow queuing for busy services.

Port Counters

SHOW PORT COUNTERS shows that there have been Port Errors

Port errors can be caused by faulty wiring, electrical noise, or hardware problems. The best way to trace these errors is to use the **TEST PORT** command with a loopback connector:

① Loop back the TXD/RXD pins on the terminal interface to the terminl server. Use a breakout box or similar device.

② Execute the **TEST PORT** command. A block of data will be sent out and checked for errors. If errors occur, trace the wiring to try to find the problem.

You can also use the **TEST PORT** command and specify an internal loopback. The server will then electronically loop the port and test it. This verifies your hardware out to the RS-232 interface circuitry but does completely test the data path.

Ports lock up randomly

Users complain that their ports are locked up

This is a common symptom of a flow control problem. You can easily tell if the port is "Xoff'd" by doing a **SHOW PORT STAT** command. If the port is in an XOFF state, tell the user to enter a ^Q (XON).

Sometimes terminals are locked up by users trying to log on at the wrong baud rate or with bad parity. Often the best thing to do here is to turn off the terminal, log out the port (LO PORT XX) and start over.

Flow control problems

Flow control problems can be recognized by large gaps in the printed material. Flow control is the throttling of data flow between the printer and the server. Since printers are relatively slow devices, they cannot accept data from the server at full speed. They must throttle this flow until they catch up. Then they'll be able to take more data.

Both the printer and the terminal server are set for XON/XOFF flow control, yet they still don't work

- On some printers, the flow control characters will be prevented from reaching the server if the proper control signals are not raised to the printer. Check control signal wiring.

- The printer may be set to use control signal flow control but the control signal it uses is a non-standard signal - i.e., a signal on pin 11, pin 20 or something else. Printers are notorious for using whatever pin they feel will work, forcing you to custom wire your connectors.

Short print jobs work fine. A couple of pages print perfectly, but when I print longer jobs, gaps appear in my text

- This is a classic flow control problem that keeps you looking elsewhere. Printers usually have large buffers that can hold several pages of text without having to invoke flow control. Therefore, the flow control may not be working, but smaller jobs will print just fine. But larger jobs will still be messed up.

Connecting problems

Everything is configured properly, yet I can't connect to the printer

- The **PRINTER READY** signal from the printer is normally wired to the CNTL IN on the server. This signal is often used to tell the server that the printer is online, has paper, and is ready to print. Once printing has started, it becomes a flow control signal. If you can't connect to the printer initially, check this control signal (or the paper).

LED Indicators

The LED indicator on the front of the terminal server indicates problems with the board:

- ❑ No LED Indicator Light
  - Make sure the printer is turned on
  - Make sure the printer is online
  - Make sure the printer is connected
- ❑ The LED Indicator Blinks
  - Make sure the printer has paper

If the printer is still not working correctly, check the pinouts on your wiring. Refer to *Appendix B, Wiring*

Appendix D Messages

The terminal server generates messages as a response to activities on the server. Appendix D contains a list of all status and error messages you might encounter in using the terminal server.

All of the messages displayed by the terminal server include a unique 3-digit error code as well as the message itself. You can suppress the display of this optional code with the **SET/DEFINE/CHANGE PORT MESSAGE CODES** command.

There are two types of messages. Messages can be further distinguished by the optional error code (*See Figure D-1)*.

STATUS MESSAGES

This type of message is usually informational and displays for various reasons. The message displays on the console of the port to which the messages pertains.

ERROR MESSAGES

These messages display when an error occurs. Depending upon the type of error, they display on the port where the error occurred or on the port defined as the *console port* by the **SET/DEFINE/CHANGE SERVER CONSOLE PORT** command.

Error Code	Purpose
000-099	Informational messages given in response to user commands.
100-199	General warning messages about potential error conditions and unexpected activities.
200-299	Error messages that relate to incomplete connections or connection terminations.
500-599	Terminal server informational messages. Normal response to user command.
700-799	User entry error messages. Reasons why user commands are not honored.
900-999	Server specific error messages. Status and error messages issued from the server's memory.

Figure D-1 Status and Error Message Codes

010 Session <*session_number*> to <*service_name*> established

Displays when a connection was successfully made to a service. The message displays only if **SET/DEFINE/CHANGE PORT VERIFICATION ENABLED** is set for the port.

011 Session <*session_number*> disconnected from <*service_name*>

Displays following the normal disconnection of a session between a port and a service. The message displays only if **SET/DEFINE/CHANGE PORT VERIFICATION ENABLED** is set for the server port.

012 <*service_name*> session <*session_number*> resumed

Displays following the successful execution of the **RESUME** command. The message displays only if **SET/DEFINE/CHANGE PORT VERIFICATION ENABLED** is set.

019 Port <*port_number*> locked

Displays after a successful execution of the **LOCK** command. **LOCK** must be *enabled* with the **SET/DEFINE/CHANGE SERVER LOCK** command.

020 Logged out port <*port_number*>

Displays after the successful execution of the **LOGOUT PORT** command or when the port is logged out of the terminal server.

030 Session management activated

Multisession protocol communication is in use with a port.

031 Session management terminated

Multisession protocol will not be used with a port. The terminal is not a multisession device or it is not responding.

101 <*n*> other sessions active

Displays when you connect to a service while other sessions are active.

102 No other sessions active

Displays if you issue the **FORWARDS** or **BACKWARDS** command when only one session is active. The active session is resumed.

111 Port(s) with broadcast disabled not notified

Displays when you attempt to use the **BROADCAST** command to send message(s) to specific ports and some of those ports have not been *enabled* to receive messages.

198 WARNING - Server shutdown has been canceled

Displays when the network manager issues the **INITIALIZE CANCEL** command. No action required.

199 WARNING - Server shutdown in <*n*> minutes

Displays at regular intervals to all ports following an **INITIALIZE** command. The message displays the number of minutes remaining until the server is reinitialized. No additional notice follows the 1-minute message. Save your work and log off any active sessions before the timeout expires.

203 Connection to <*service_name*> not established
Service node retransmission limit exceeded

Displays when a request to **CONNECT** or autoconnect to a service fails because there are no packets returned to the terminal server within the number of retransmit attempts set in the **SET/DEFINE/CHANGE SERVER RETRANSMIT LIMIT** command. This message usually is caused by a noisy Ethernet cable, heavy traffic on the Ethernet, or too heavy a load on the host to process replies from the server. Check the status of the remote node with the **SHOW/MONITOR NODES STATUS** command. If the status is "*UNREACHABLE*", the node is no longer operational. Contact your network manager.

206 Connection to <*service_name*> terminated
Timeout after retransmit limit exceeded

Displays when a session has been disconnected because a remote TCP/IP node is no longer responding. Check with the network manager.

207 Connection to <*service_name*> terminated
Session reset

This message displays when the node receives a reset command from the host node. The session must be disconnected. Try connecting to the service. If repeated attempts are not successful, contact your network manager.

211 Connection to <*service_name*> not established
Session deleted

Displays when the remote host rejects the connection. Retry the connection. If repeated attempts are not successful contact your network manager.

213 Connection to <*service_name*> not established
Protocol error: start/run

Displays when an error occurs in network communication. Continue to try connecting to the service. If repeated attempts are not successful, contact your network manager.

217 Connection to <*service_name*> not established
Insufficient service resources

Connection failed because of lack of resources on the remote host. Retry the connection later.

218 Connection to <*service_name*> not established
Insufficient local resources

Connection failed because of the lack of resources within the terminal server. Retry the connection later.

219 Connection to <*service_name*> not established
Service not available

Displays when you try to connect to a specific service and the service is not available. Continue to try connecting to the service. If repeated attempts are not successful, contact the network manager.

222 Connection to <*service_name*> not established
System shutdown in progress

Displays when you try to connect to a specific service and the target service node will not accept the request. The host node that supports the service is in the process of being shut down and reinitialized. Continue to try connecting to the service. If repeated attempts are not successful, contact your network manager.

225 Connection to <*service_name*> not established
Invalid service class

Displays when you try to connect to a specific service and the target service node will not accept the request because you used **SET SESSION** to change the characteristics of a session to a new value that is not compatible with the values allowed for the host service node. Check the remote host's operating system documentation for the valid node session settings. Change the settings with the **SET SESSION** command.

226 Connection to <*service_name*> not established
Invalid message or slot received

Displays when you try to connect to a specific service and the target service node will not accept the request. Data received in an Ethernet packet is corrupted possibly due to host software malfunction or hardware problems. Reinitialize the terminal server. If the error continues to occur, contact your network manager.

228 Connection to <*service_name*> not established
No progress being made

Displays when you try to connect to a specific service and the target service node will not accept the request. The remote service is too heavily loaded to accept the connection. Try your connection later when the service is less busy.

229 Connection to <*service_name*> not established
Service not offered on requested port

Displays when you try to connect to a specific service on a specific port and the target service node will not accept the request. The requested service is not available on the requested port. Either (a) issue a **CONNECT** command without specifying a specific port; the terminal server will route your connection to a port that offers the service. Or, (b) find out which ports on the target server offer the service by issuing the **SHOW/LIST/MONITOR SERVICE CHARACTERISTICS** and then connect to the service on an appropriate port.

230 Connection to <*service_name*> not established
Object port name not known

Displays when you try to connect to a specific service and the target port will not accept your request. The requested port name does not exist on the target service node. Either (a) issue a **CONNECT** command without specifying a port name, the terminal server will connect you to a port that offers the service. Or, (b) use the **SHOW/LIST/MONITOR SERVICE CHARACTERISTICS** command to determine which ports offer the requested service. Connect to the service on the appropriate port.

231 Connection to <*service_name*> not established
Invalid password

Displays when you try to connect to a specific service and the target service node will not accept your request. You did not enter the correct password that is required to obtain entry into that service. Verify that you have the correct password for that service. Retry the connection with the appropriate password. Contact your network manager for assistance.

232 Connection to <*service_name*> not established
Service in use

Displays when you try to connect to a specific service and the target service node will not accept your request. Although the requested service is available on the service node, it is available only through select ports, all of which are currently busy. Retry the connection later.

233 Connection to <*service_name*> not established
No such service

Displays when you try to connect to a specific service and the target service node will not accept the request. Either (a) there is a host failure, or (b) the service has recently been removed from the service node. If the service has been unavailable for more than a few minutes, error message 711 displays instead. Check with the network manager.

234 Connection to <*service_name*> not established
Service disabled

Displays when you try to connect to a specific service and the target service node will not accept the request. All connections to the requested service have been disabled. Check with the network manager.

235 Connection to <*service_name*> not established
Requested entry not in queue

Displays when you try to connect to a specific service and the target service node will not accept the request. The remote host attempted to remove an entry from the server's internal queue and the request did not exist. Continue to try connecting to the service. If repeated attempts are not successful, contact the network manager.

236 Connection to <*service_name*> not established
Immediate access rejected

Displays when you try to connect to a specific service and the target service node will not accept the request. The target service node is available but the device itself is not available. Make sure that the modem controls for the port are enabled. Then make sure the device is responding to those modem controls.

237 Connection to <*service_name*> not established
Access denied

Displays when you try to connect to a specific service and the target service node will not accept the request. This is a generic message that is displayed when the host does not have a more specific reason for denying the connection request. Check with the network manager.

238 Connection to <*service_name*> not established
Corrupted solicit request

Displays when a host processor tries to connect to a specific service or port on the terminal server and the terminal server will not accept the request. There are probably problems with the host software or hardware. Retry the command. If the problem persists, reinitialize the terminal server. If this doesn't work, call Equinox Technical Support for further help.

239 Connection to <*service_name*> not established
Invalid/unexpected reason code *xxh*

Displays by default when a specific message is not available for the failed action. The message displays with the internal code in hexadecimal for the error. Retry the connection. If repeated attempts are unsuccessful, contact your network manager.

240 Connection to <*service_name*> not established
RLOGIN connections are disabled

Displays when an attempt is made to establish an **RLOGIN** connection and the **SERVER TCP RLOGIN** characteristic is disabled. Check with your network manager.

501 From port <*port_number*>, <*user_name*> <*message_text*>

Displays when a message has been **BROADCAST** to your port. The port number and user name display on the first line. The message itself displays on the second line. No action required.

505 Port <*port_number*>: Test NOT canceled, no test in progress

Displays when you attempt to cancel a **TEST** command and there is no **TEST** currently running on the specified port. No action required.

506 Test aborted

Displays when a test of the port is aborted. No action required.

507 Port <*port_number*>: Board unavailable

Displays when you attempt an operation on a port or line board that is not installed or is malfunctioning. Verify the port number and reissue the command. Make sure there is a board installed correctly and retry the command. Replace the board if it is defective.

508 Port <*port_number*>: Cannot test because of current activity

Displays when the **TEST PORT** command is issued and there is current activity on the port specified in the command. For example, an attempt is made to test a port that is waiting for autobaud processing. Wait till the port is free and issue the command again.

509 Port <*port_number*>: Test canceled

Displays when the **TEST PORT** command is canceled. No action required.

510 Port <*port_number*>: Test complete, <*n*> bytes written

Displays at the completion of the **TEST PORT** command. The message displays the number of bytes that were written during the test. No action required.

511 Port <*port_number*>: Test complete. <*n*> characters sent, <*n*> characters lost, *n* sequence errors

Displays at the completion of a loopback test initiated by the **TEST PORT** command. The message displays the number of bytes that were read and/or written during the test and the number of data discrepancies or errors detected by the terminal server. If the number of errors is not zero, there is a possible port hardware problem. Contact Equinox Technical Support for additional assistance.

512 Loop test complete: <*n*> successful, <*n*> failed

Displays at the successful completion of a **TEST LOOP** command. No action required.

513 Loop test continuing: <*n*> successful, <*n*> failed

Informational message displays every ten seconds during the **TEST LOOP** command. The number of tests that were successful and the number of tests that failed displays. This message displays only if the **COUNT** option is used in the command. No action required.

515 Port <*port_number*>: Test continuing, <*n*> bytes written

Intermediate status message displays every ten seconds during **TEST** of a port. No action required.

516 Ping <*n*> complete - Time <*n*> ms

Informational message received in response to the **PING** command. No action required.

517 Ping <*n*> failed - Timeout

Displays when a pass of the **PING** command fails because a remote node is not responding. No action required.

518 Ping command complete: <*n*> sent, <*n*> timeouts. Average time: <*n*> ms

Displays at the successful completion of a **PING** command. No action required.

519 Ping <*n*> aborted

Displays when a <**BRK**> is received from the port that issued the **PING** command. The **PING** command is aborted before the terminal count was reached. No action required.

520 Ping <*n*> failed - could not find node by name

Displays when you attempt to issue the **PING** command on a node that cannot be found in the local database. Reissue the command with the correct node information.

521 Ping not done - local IP address is invalid

Displays when the terminal server's TCP/IP address is 0.0.0.0 Use the SET/DEFINE/CHANGE SERVER TCPIP command to establish a correct IP address.

701 Command syntax error

Displays when you enter a command incorrectly. You have omitted a command keyword or the command options were invalid. This message is used when none of the more specific error messages is applicable. Reenter the command with the correct syntax.

702 Keyword <*keyword*> not known or ambiguous

Displays when you enter a command incorrectly. The terminal server did not recognize the keyword specified by <*keyword*>; the keyword was not in the correct order; or the keyword was too abbreviated to distinguish it from other keywords. Reenter the command with the correct syntax.

703 Value invalid or out of range, <*n*>

Displays when you enter a command incorrectly. A numerical value (<*n*>) that defines a limit is invalid because it is out of range or exceeds the limit in the current environment. Reenter the command with a valid value.

704 Operation requires privilege

Displays when you enter a privileged command or option from a port that is not privileged. Enter the **SET PRIVILEGED** command and then issue the original command.

706 Secure operation requires privilege

Displays when you enter a command that is unavailable on secure ports. The port you are issuing the command from has the **SECURITY** characteristic enabled. Enter the **SET PRIVILEGED** command and disable the **SECURITY**. Reissue the original command.

707 Existing or queued connections prevent operation

Displays when you enter a **CLEAR SERVICES, PURGE SERVICES** or **DELETE SERVICES** command and there are sessions currently connected to the service, or connection requests are pending in the server queue. Issue the **SET/DEFINE/CHANGE SERVICE CONNECTIONS DISABLED** command. Then issue the **SET/DEFINE/CHANGE SERVICE QUEUE DISABLED** command. Reissue the **CLEAR SERVICES** or **PURGE SERVICES** command. Use the **LOGOUT PORT** command to force disconnection of active sessions. Delete queued requests with the **REMOTE QUEUE** command.

708 No match found for given parameter(s)

Displays when you issue the **SHOW PORT ACCESS** command and there are no matching ports. No action required.

710 Node <*node_name*> not known

Displays when you try to connect to a service on a specific service node and the service node name does not exist. It may be that (a) the node does not exist any longer; (b) the name has been changed; or (c) you have misspelled the node name. Use the **SHOW/MONITOR NODES ALL** command to list all nodes known to the terminal server. Reissue the command with the correct node name.

711 Service <*service_name*> not known or port protocol mismatched

Displays when you issue a **SHOW/LIST/MONITOR SERVICES** command or a **CONNECT** command for a specific service that is not in the terminal server database. This message will also display if the terminal server attempts an *autoconnect* to a service that is not known to it. It may be that (a) the node does not exist any longer; (b) the name has been changed; or (c) you have misspelled the node name. Use the **SHOW/MONITOR NODES ALL** command to list all nodes known to the terminal server. Reissue the command with the correct node name.

712 No connection established

Displays when you attempt to issue one the following commands and there are no active sessions: **RESUME SESSION, DISCONNECT SESSION, BACKWARD,** or **FORWARD. CONNECT** to a session and reissue the original command.

713 Connection already established

Displays when you attempt to issue the **CONNECT PORT** command to access a port that is already connected to a service node. Wait until the requested port is free.

714 Preferred service has not been defined

Displays when you enter a **CONNECT** command without entering a service name and you do not have a preferred service defined. Use **SET/DEFINE/CHANGE PORT PREFERRED SERVICE** to define a preferred service for your port. You will then be connected to this service whenever you issue a **CONNECT** command without a service name. Or, enter a specific service name with the **CONNECT** command.

717 Session <*session_number*> not established

Displays when you try to issue the **RESUME SESSION** command or the **DISCONNECT SESSION** command and there are no active sessions. Issue the **SHOW/MONITOR SESSIONS** or **RESUME <session_number>** to display a list of all your current sessions.

718 Session limit reached

Displays when you try to connect your port to an additional port and the port has already reached the maximum number of sessions allowed. No additional sessions can be connected through the port. Either disconnect one of your old sessions, or have a privileged user increase your session limit.

719 Insufficient resources to complete operation

Displays when you attempt to issue a command and the terminal server cannot complete the command because of internal limitations such as inadequate memory or the maximum number of queued requests has been reached. Wait a little while and then retry the command.

720 No connection established - local IP address is invalid

Displays when the TCP/IP address of the server has not been configured. Change the local server TCP/IP address to one that is compatible with your network.

721 No dedicated service on port <*port_number*>

Displays when you attempt to issue a **CONNECT PORT** command or a **DISCONNECT PORT** command without entering a service name and a dedicated service is not defined for the port specified in the message. Reissue the command and specify a service name or session number.

722 Server disabled

Displays when your **CONNECT** request cannot be executed because the terminal server has been disabled by an **INITIALIZE DISABLE** command. Retry the command after the server has been initialized.

727 Port <*port_number*> database not updated due to incompatible board types

Displays when the specified port has not been updated because the value entered for the characteristic is not allowed for the board. For example, if you change a port on a 12-Port-LD or 24-Port-LD board to use control signals, the characteristics would be rejected. No action required.

728 Parameter cannot be modified for port <*port_number*> while active

Displays if you attempt to modify an option on the terminal server that cannot be modified while sessions are active on any server ports. Wait until all active sessions connected through the terminal server are terminated. Modify the desired option. Or, use the **DEFINE PORT** command to change the option in the permanent database. Then set the **INITIALIZE SERVER** command to run at a later time. This will update all databases with the new value.

729 Parameter cannot be modified by a SET command

Displays when you attempt to modify certain parameters on the terminal server using the **SET** command. Some parameters can not be changed dynamically; they can only be changed when the server is initialized. Use the **DEFINE** command to change the parameter and re-initialize the server. Refer to the appropriate **SET/DEFINE/CHANGE** command for more information.

733 Port <*port_number*> already under test

Displays when you attempt to issue the **TEST PORT** command on a port that is already being tested. Reissue the command after the current test is completed.

734 Invalid operation from a remote console

Displays when you attempt to issue a **CONNECT** command from a *remote console.* This is an invalid operation. No action required.

737 Invalid operation for a remote console

Displays if you attempt to issue a **SET/DEFINE/CHANGE PORT** command or a **SHOW/LIST/MONITOR PORT** command from a remote console with no port specified. You cannot change or monitor remote console characteristics. This is an invalid operation. No action required.

738 Requested node does not support remote console

Displays when you attempt to connect to a remote console that is not a node on an Equinox terminal server. Reissue the command using a node that is connected to a valid Equinox terminal server. Or, connect to the requested node via another.

740 Illegal use of reserved keyword <*keyword*>

Displays when you attempt to use a reserved keyword in a command where it is not allowed. Reissue the command using a keyword that is not reserved.

741 Illegal password

Displays when you attempt to establish a password that does not conform to established rules. All passwords must be 1 to 6 ASCII characters. Reissue the command using a valid password that conforms to the established rules.

742 Password verification failed

Displays when security is enabled and you attempt to create a password for the **LOCK** or **SET PRIVILEGED** commands and do not enter the correct password verification. You entered an incorrect password when the terminal server asked you to verify your password. Enter the password creation and verification again.

743 Port <*port_number*> <*user_name*> is already privileged

Displays when security is enabled and you issue the **SET PRIVILEGED** command while another port already has privileged status. Only one port can be privileged at a time. If the port has a user name associated with it, the user name displays. Use the **SET PRIVILEGED OVERRIDE** command to transfer privileged status from the other port to the current port. Note that this removes privileged status from the original port without warning.

744 Port <*port_number*>, user <*user_name*> was privileged

Displays if **SET PRIVILEGED OVERRIDE** has been issued successfully when another port had privileged status and **SET/DEFINE/CHANGE SERVER SECURITY** is enabled. No action required.

748 No entries in local system queue

Displays when you issue the **REMOTE QUEUE** command when there are no entries in the queue. No action required.

749 Operational/Permanent default gateway/nameserver <*old_name*> is superseded by <*new_name*>.

Displays when a new *default gateway* or *default nameserver* has been configured in the terminal server. You may define only 1 gateway/nameserver as a default. The message will tell you which database is being updated (operational or permanent). No action required.

750 Port <*port_number*> is configured as <*port_name*> in its <*database_name*> database

Displays when you attempt to define a name for a port on the terminal server that is already assigned to another port on the server. All ports on a single server must be assigned unique names. Reissue the command using a unique port name.

751 Broadcast command disabled

Displays when you attempt to issue the **BROADCAST** command and it has not been *enabled*. If you wish to issue the **BROADCAST** command, you must get a privileged user to enable it with the **SET/DEFINE/CHANGE SERVER BROADCAST** command. Then reissue the **BROADCAST** command with the desired message.

752 All Service database entries are in use

Displays when you attempt to **SET** or **DEFINE** more services than are allowed to be offered on the terminal server. The maximum number of services that can be defined is 100.

753 Lock command disabled

Displays when you attempt to **LOCK** a port on the terminal server and the **LOCK** command is *disabled*. If you wish to issue the **LOCK** command, you must get a privileged user to enable it with the **SET/ DEFINE/CHANGE SERVER LOCK** command. Then reissue the **LOCK** command on the desired port.

754 Cannot specify the same name for multiple ports

Displays when you attempt to change more than one port name in a single command. Reissue the command specifying a single port and port name.

755 All node database entries are in use

Displays when all of the database entries for a node are in use. Remove an existing entry and reissue the command.

757 Node <*node_name*> shares ip address <*ip_address*> with services

Displays when the listed services are configured with the same <*ip_address*> as the node you are attempting to delete. Delete the services and reissue the command to remove the node.

770 Invalid operation with multisessions enabled on port *port_number*

Displays when an attempt is made to issue the **TEST PORT** command when a terminal has a multisession activity in progress. Ports with multisessions active may **issue** the **TEST PORT** command.

771 Invalid operation to self on port *port_number*

The **TEST PORT LOOPBACK INTERNAL COUNT 0** command cannot be issued against your own port because testing cannot be terminated from the issuing port.

777 Parameter not supported by protocol in use by selected sessions

Displays when you attempt to connect using parameters or destinations that are not supported by the active protocol. For example, if you attempt to connect to an IP address using the LAT protocol. Reissue the command using the correct syntax.

778 Parameters and protocol selected in conflict

Displays when you use invalid parameters during a connection attempt. For example, you cannot make an **RLOGIN** connection to a port whose default protocol is **LAT only**. Change the configuration for the port and reissue the command.

779 Insufficient data supplied to establish a connection

Displays when you attempt to issue a connect command and do not provide sufficient information to complete the connection. This applies to **CONNECT**, **CONNECT PORT**, **RLOGIN**, and **TELNET** commands. Reissue the command with the required information.

783 No LAT services will be seen from port *port_number*

Displays the ports that will not see LAT services. TCP/IP services are still displayed. No action required.

784 Printer port selection invalid for this server

An attempt has been made to select parallel printer port and the port is not present on the server.

785 Name contains blanks or illegal characters

Displays when you attempt to enter a ***port_name*** or ***service_name*** that contains a space or invalid characters. Reissue the command using a valid name.

786 Name must be from 1 to 16 characters

Displays when you attempt to enter a ***user_name*** that contains more than 16 characters. Reissue the command using a valid name.

787 Specified printer port does not exist on this server

The requested printer port is not installed on the server.

790 Invalid ports will be ignored

The requested port, or ports, are not present on the server.

792 BOOTP support is not present in the installed ROM chips.

The ROM chips installed in your terminal server do not support **BOOTP**.

793 BOOTP requires both local and host IP addresses.

The local and/or host IP address has not been configured. This usually means your ROM chips do not support BOOTP.

798 No services are known to the local system

Displays when you issue the **SHOW SERVICES** command and there are no services in the terminal server database. Wait for multicast announcements. If no announcements occur, verify that the network is connected.

799 Ethernet unit address is corrupt
Must be reset before command will execute

Displays on the console when the permanently stored Ethernet address is invalid. Contact Equinox Technical Support for help.

901 Starting server <*address*>, version <*software version*>

Displays approximately ten seconds after power up of the terminal server or when the **INITIALIZE** command is executed. The message displays the Ethernet address of the server (<*address*>). No action required.

909 <*node_name*> has connected to the remote console port

Displays after the successful execution of the **REMOTE CONNECT** command on the node to which you connect. It tells the system manager that you have connected to the remote console port. No action required.

910 Unexpected interrupt #

Indicates an internal system error. Contact Equinox Technical Support for help.

918 Server has been disabled

Displays when connections are disabled following an **INITIALIZE DISABLE** command.

953 Image load aborted

Displays when the network manager aborts a software downline load. No action required.

996 Ethernet unit address is corrupt - must be reset before using server

Displays on the console when the terminal server is powered up and the permanently stored Ethernet address is invalid. Contact Equinox Technical Support for help.

997 Database update interrupted - data may not be valid

Displays when the terminal server is updating the permanent database configuration and that update is interrupted prematurely. The message displays on the console when the system is started. Verify the changes that did not take place. Correct the configuration.

998 Server database initialized by manual command

Displays on the console at power up to remind you that the database was initialized with the **INITIALIZE DATABASE** command. No action required.

999 Server database initialized

Displays on the console at power up to remind you that the database was reset using the front panel initializing switch. No action required.

Appendix E Worksheets

Appendix E contains blank worksheets to assist in layout of your network. Refer to Chapters 4, 5 and 6 for additional assistance in completing the worksheets.

Worksheet # 1 - Devices and Services

Use worksheet number one to list:

Ports List all of the ports on your terminal server.

Devices List each device next to the port number to which it will be connected.

Remote / Local / Dynamic / None
Indicate how the port connects to a service node or how other users or service nodes can connect to it.

Local - The device on the port can connect to other services on the network an use the server's local mode command set.

Remote - The port can receive connections only.

Dynamic - The port can originate connections and accept remotely originated connections.

None - Disables all access to the port.

LAT/Service • TCP/IP Only • LAT & TCP/IP
Indicate whether a device will use the LAT protocol only, TCP/IP protocol only, or will be able to use both protocols. Also note whether the device will be offered as a service.

Ethernet Address _____ Server Name _____

PORT #	DEVICE	REMOTE LOCAL DYNAMIC	LAT/ SERVICE		TCP/IP ONLY		LAT & TCP/IP	
			LAT	Service	TCP	Service	Both	Service

Worksheet # 2 - Services

Use worksheet number two to list the services available to the devices on the terminal server:

Device (Ports) / Host (Nodes)

List all of the devices and their ports on your terminal server. Also list any additional services on the Ethernet that will be available to the server devices.

Username

List the username for each device. This will help you in later troubleshooting.

Services (N=Network; L=Local)

Enter each service that will be available to the server devices. Indicate whether that service is available to each individual device. Also note whether the service is a local service or a network service.

Device (Ports)/ **Host** (Nodes)	**Username**	**Services (N=Network; L=Local)**					

Glossary

Active session — *Active sessions* encompasses all of the sessions to which you are current connected. You can have more than one *active session* as a time. Use the **SHOW SESSIONS** command to display a list of your active sessions. See also *current session*.

Asynchronous — *Asynchronous* is a method of transmitting data in which every character that is sent begins with one or more start bits and ends with one or more stop bits. In *asynchronous* communication, clock and timing information is not exchanged between devices that are communicating with each other.

Authorized Groups — *Authorized groups* gives you a way to gather user names into common groups on a terminal server. It is also a way to provide security to services and nodes by requiring that each service and node be assigned to at least one group. If you want to connect to a specific service or node, your port must be authorized to connect to the *authorized group* that supports the service **and** the node offering the service must be part of the same *authorized group*. All ports and all service nodes must be members of one or more *authorized groups*. *Authorized groups* are similar to **SECURITY ACCESS GROUPS** in the Equinox DS-5 and DS-15 Data PBX. Valid *authorized group* codes are numbers between 0 and 255.

Buffer — *Buffer* is an area in internal memory that is allocated for temporary storage during input and output operations. In most cases there are both transmit and receive buffers on both the port and the Ethernet.

CCITT — **C**onsultative **C**ommittee for **I**nternational **T**elegraphy and **T**elephony. *CCITT* is an acronym for the standards group that recommends rules and requirements for international communications.

Circuits — *Circuits* are the physical transmission lines over which data is transmitted. See also *virtual circuits*.

Coaxial Wire — *Coaxial cable* is a transmission medium that consists of a central single conductor surrounded by an insulator. It is covered with a metal shield and an outer insulating jacket. There is a very low loss of transmission with *coaxial cable*.

Commands — *Commands* are instructions to the terminal server to perform specific actions. This provides you with a means of communicating with the server, services on the network and other users. Commands available to you at any given time depend upon your user status. See also *status*.

Configuration — *Configuration* is the process you use to tailor the characteristics of the terminal server, ports and services to the specific needs of your installation. *Configuration* information is stored in non-volatile memory. You can configure each terminal server differently, depending on the requirements of each installation.

Current session — *Current session* is the session that you are currently using. If you are in local mode, your *current session* is the one you were most recently in. You can have only one current session at a time. See also *active sessions*.

Data Transparency — *Data transparency* controls how special control characters are handled during file and/or program transfers. Special characters can be flow control characters as well as user-defined switch characters.

DECnet — *DECnet* is a layered software product that is sold by Digital Equipment Corporation. It controls communication between DEC CPUs on a single Ethernet network.

DESTA — *DESTA* is the thinwire Ethernet station adaptor. It converts a standard 15-pin transceiver cable connection to thinwire Ethernet.

EAROM — **E**lectrically **A**lterable **R**ead **O**nly **M**emory. *EAROM* is memory that contains configuration information for the terminal server permanently, whether power is going to the server or not. Changes made to configuration databases with the **CHANGE**, **DEFINE** and **PURGE** commands are made in the *EAROM* of the server.

Ethernet — *ETHERNET* is a type of local area network that uses coaxial, fiber or twisted pair cable to interconnect different types of computers and computer devices.

Flow Control

Flow control is a method used to prevent the loss of data transmitted too rapidly for processing by the port or an attached device. Data that arrives too rapidly can be lost because the amount of data received is greater than the storage available in the buffer. *Flow control* provides a means of starting and stopping the flow of data. Two methods of *flow control* used are:

XON/XOFF

This is the most common method of *flow control*. The device receiving data sends an XOFF character if data is coming in faster than it can be processed. The device sends an XON character when it is ready to receive for data. The device sending data responds to the XON/XOFF characters by starting and stopping data transmission.

Control Signal

This method of *flow control* is also known as EIA flow control. Modem signals are used to control the flow of data. A device raises the modem signal when it is ready to accept data and lowers the signal when the data flow needs to be stopped.

Group

Groups are a means used by network managers to arrange a network into workable sections. Groups that are selected for each server port let each port have a specific relationship with the network. Ports can connect only to those services offered by service nodes that share a minimum of one enabled group with the server port. *Groups* also provide a way for the network manager to limit the number of nodes for which the terminal server must retain information.

Group Codes

Group codes are numbers assigned to nodes that offer services. Valid codes range between 0 and 255. Use *group codes* to divide a network into logical working groups. A device on the network can have more than one group code.

For example, if some of the nodes on a network have a group code of 0 and other nodes have a group code of 1, the two sets of nodes will not be able to communicate with each other. However, a device that has a group code of 0 **and** 1 would be able to communicate with both groups.

Host

A *host* is a computing resource on the Ethernet network. Usually it is a computer that runs application programs.

Host-Initiated Request

A *host-initiated request* is a request initiated by a host for a service node to connect to that host. The server port's application device is connected to a specific application on a host node.

Identification String — An *identification string* is a text string that identifies the service nodes and services to users of the network. The *identification string* is transmitted to all nodes.

Initialization — *Initialization* is the process of resetting the terminal server to permanent database configuration. It usually occurs as the result of a request by the system manager.

LAT — **L**ocal **A**rea **T**ransport. *LAT* is a communications protocol that is used in local area networking. It is the protocol used by DECservers and DEC Compatible terminal servers to communicate with DEC host computers.

Line Cards — *See PORT CARDS*

Load Balancing — *Load balancing* is a means of distributing user requests evenly over service nodes on the terminal server. With *load balancing* service ratings are evaluated to help manage connection requests. The server connects to the service node with the highest rating for the service requests.

Local Area Network — Local **A**rea **N**etwork (**LAN**). A *LAN* is a system of data communication that passes information over a ring, star or bus network. LANs are typically used to connect devices located with close proximity to each other.

Local Mode — *Local mode* is the mode you use to communicate directly with the Equinox terminal server. It is in this mode that you enter server commands. Local mode is identified by the prompt **LOCAL>** displayed on your terminal screen. See also *Service Mode*.

Local Service — A *local service* is a device or resource that is offered as a service on the network. Examples of local services are printers, modem or personal computers. Services are considered to be local to other users on the same terminal server. You must specifically include ports in a local service when that service is created. The server, acting as a service node, then multicasts the service to users on the network.

Log-in Password — *Log-in passwords* provide an added measure of security for the terminal server. This is done by requiring users to enter a password in order to access a port.

Login — *Login* is the process you follow to gain entry to a computer system. This process involves identifying yourself and verification with passwords.

Maintenance Password — *Maintenance passwords* are used with the **REMOTE CONSOLE** command. **REMOTE CONSOLE** lets you connect to any remote console port on the terminal server from any other terminal server. A VAX/VMS host is not required. However you must enter the appropriate maintenance password in order to log in.

Memory — *Memory* is an area where data is stored in the form of binary characters. Memory is located by physical addresses.

Message — A *message* is information being broadcast over the Ethernet network. Messages can be exchanged between service nodes and the terminal server. They can also be exchanged between hosts and the terminal server.

Modem Control — *Modem control* is a set of signals that controls the interaction of the modem, or other device using control signals, with the port on the terminal server.

Multicast Announcements — *Multicast announcements* are messages that are broadcast by service nodes. These messages include information such as service name, service rating, etc. about the service node and its services.

Node — A *node* is any device that is directly connected to a network. *Nodes* can include VAX hosts, terminals and terminal servers.

Operational Database — The *operational database* contains the configuration of the terminal server used to run the terminal server. Characteristics in the operational database can be set. However these changes are temporary. The **SET** command is used to configure the operational database. The **CHANGE** command configures both the operational and permanent databases.

Packet — A *packet* is a unit of data that is routed from one node to another node over a virtual circuit. Each packet may contain data from several different ports.

Peripheral Devices — *Peripheral devices* are any resources that act as input to the network node, or accept output from it. Examples of peripheral devices are line printers and terminals. The CPU and physical memory, however, are **not** peripheral devices.

Permanent Database — The *permanent database* is where the permanent configuration of the server, ports and local service characteristics are stored. Use the **CHANGE** or **DEFINE** commands to change the permanent database.

Physical Address — The *physical address* is the unique address associated with a given station on the network. An Ethernet physical address is defined to be distinct from all other physical addresses on all Ethernet networks.

Port A *port* provides the physical connection for plugging in devices on a port card. The ELS-8 has 8 ports and the ELS-16 has 16 ports.

Protocol *Protocol* is a set of rules that governs communications between nodes. This provides for error free exchange of data. Two protocols common in Ethernet are LAT and TCP/IP.

Queue A *queue* is an area reserved in server memory to store requests that are waiting to be executed. The terminal server processes each request in the order in which they were received.

Rating *Rating* is a measure of the ability of a service to accept connections from users. Ratings go from 0 to 255. The higher the rating, the greater the ability of the service to accept new connections. A low rating means that the service is busy. A rating of zero indicates the service should not accept any new connections.

Remote Console A *remote console* is a feature unique to the terminal server. A *remote console* is a port that is created by the terminal server software as port 49. It is not a physical port on the terminal server. With the remote console feature you can configure and manage terminal servers from a remote location rather that performing that function at a specific terminal on the server.

Remote Devices *Remote devices* are devices that are not directly connected to a node but are available on the network.

Service A *service* is anything on the Ethernet that users or host computers can connect to. *Local services* are those services that are offered by the server itself. *Remote services* are services offered by another node on the network.

Service Mode *Service mode* indicates that you are connected to a service. You enter the *service mode* by issuing the **CONNECT** command when you are in local mode.

Service Password The *service password* is the password you must use to gain access to a service. *Service passwords* provide for a greater level of security for accessing services. You can set a limit on the number of times a user can enter a password incorrectly before being logged off the service.

Service Rating *Service ratings* are given to services by nodes on the Ethernet to indicate the different levels of activity of the service node that offers a particular service. *Service ratings* are included in the multicast messages that the service node broadcasts over the network.

Session A *session* is the logical connection between the terminal server and the service node.

Slot A *slot* is a field carried in the Ethernet packet that carries information about a single session on the server.

Split Speed *Split speed* refers to the use of different baud rates (input and output speeds) on a single port. *Split speed* is occasionally used with special modems. However, it is generally not used with direct-connect terminals.

Status *Status* refers to the access capabilities of each user on the network. The network manager assigns *status* to each port which gives that port access to certain commands on the terminal server. There are three levels of *status*:

- **Privileged Status**. This status gives a port access to all commands. This means that the user at that port can change server, port and service settings, as well as use all general commands.

- **Nonprivileged Status**. This status provides a port access to general commands, including **SHOW** commands. The default for all ports is nonprivileged.

- **Secure Status**. This status gives a port limited access to nonprivileged commands.

TCP/IP **T**ransmission **C**ontrol **P**rotocol/**I**nternet **P**rotocol. *TCP/IP* is combination of transport and network level protocols adopted for network-wide use on the ARPANET.

Terminal Server A *terminal server* provides a way for diverse devices to be accessed and shared by users on a local area network.

Thick Wire *Thick wire* is the standard Ethernet baseland coaxial cable that serves as the backbone transmission medium for the local area network.

Thin Wire *Thin wire* is coaxial cable used to connect devices on the Ethernet network. Also referred to as *Cheapernet*®, the *BNC thin wire* uses a female BNC connector that allows direct access to the Ethernet using Cheapernet transceivers.

Twisted Pair Wire *Twisted pair wire* is a form of wiring that uses small conductor cable that is twisted together inside a sheath so that radiation from the conductors will be minimized.

Virtual Circuit A *virtual circuit* is the logical connection between the terminal server and a remote node. A single *virtual circuit* carries data for all sessions between the server and the remote node. A *virtual circuit* exists between the server and a node only if there is at least one user connected to the node. There is never more than two *virtual circuits* between the server and a single node.

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ELS-8 / ELS-16 Terminal Server Manual
Part No. 560068, Rev. B

Problem:

Suggested Solution:

Name:	**Title:**	
Company:	**Dept/Mail Stop:**	
Street:		
City:	**State:**	**Zip:**
Country:		
Phone Number:		
System Purchased From:		
Purchase Date:		