**Prime**®

NTS User's Guide

*Revision 22.0*

*DOC10117-2LA*

# NTS User's Guide

*Second Edition*

Andrew Shores

*This guide documents the software operation
of the Prime Computer and its supporting
systems and utilities as implemented at
Master Disk Revision Level 22.0 (Rev. 22.0).*

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# About This Book

## Purpose

The *NTS User's Guide* explains how to use the Network Terminal Service (NTS) software running on a LAN Terminal Server (LTS). The book presents an overview of NTS and explains how to use it to communicate with 50 Series™ hosts. For more advanced users, it describes how to tailor the characteristics of the terminal line and explains how to use NTS assigned lines.

## Audience

This book is for NTS terminal users; that is, people using an LTS to connect their terminal to a 50 Series computer. System Administrators can find information about planning, installing, and configuring an NTS network in the *NTS Planning and Configuration Guide*. The *Operator's Guide to Prime Networks* explains how to monitor and control NTS.

## Organization

The *NTS User's Guide* contains six chapters, two appendices, and a glossary, which are summarized below.

Chapter 1 — What is NTS?
  Introduces NTS and the LAN300 network on which it runs. Also explains how to use NTS in conjunction with other Prime network products.

Chapter 2 — Basic LTS Commands
  Outlines the commands that all NTS users need to know in order to communicate with Prime host computers.

Chapter 3 — LTS Parameters
  Describes the configuration parameters that allow advanced users to customize their terminal's communication over the network.

Chapter 4 — Setting Parameters

Explains how to use the commands that display and change the LTS parameters.

Chapter 5 — Status Commands

Presents the commands that show the status of the LTS and the LAN300 network.

Chapter 6 — NTS Assigned Lines

Contains information on NTS assigned lines, which support printers, tape drives, and other asynchronous devices.

Appendix A — LTS Command Summary

Summarizes the LTS commands by displaying their syntax and briefly describing how to use them.

Appendix B — LTS Parameter Summary

Provides reference charts on the LTS parameters.

Glossary

Defines LAN300 network terminology. The terms that appear in the Glossary are printed in boldface type the first time they are described in the text.

# Related Documentation

These documents provide related information:

- *LTS300 Installation Guide* (DOC11034-1LA)

- *WSI300 User's Guide* (DOC10155-2LA)

- *User's Guide to Prime Network Services* (DOC10115-1LA)

- *PRIMOS User's Guide* (DOC4130-5LA)

- *PRIMOS Commands Reference Guide* (DOC3108-7LA)

- *NTS Planning and Configuration Guide* (DOC10159-1LA) and its update for Rev. 22.0 (UPD10159-11A)

The following chart shows where to find the information you need in the Prime networks document set. There is a column for each network product and a row for each functional activity. For example, to find information on monitoring and controlling PRIMENET™, refer to the *Operator's Guide to Prime Networks*.

| | PRIMENET | NTS | WSI300 |
|---|---|---|---|
| Configuration | *PRIMENET Planning and Configuration Guide* | *NTS Planning and Configuration Guide* | |
| Installation | | *LTS300 Installation Guide* | *WSI300 User's Guide* |
| Monitoring and Control | *Operator's Guide to Prime Networks* | | |
| Using the Software | *User's Guide to Prime Network Services* | *NTS User's Guide* | |
| Programming | *Programmer's Guide to Prime Networks* | | |

## Prime Documentation Conventions

The following conventions are used in command formats, statement formats, and in examples throughout this document. Examples illustrate the uses of these commands and statements in typical applications.

| Convention | Explanation | Example |
|---|---|---|
| UPPERCASE | In command formats, words in uppercase bold indicate the names of commands, options, statements, and keywords. Enter them in either uppercase or lowercase. | SLIST |
| *italic* | In command formats, words in lowercase bold italic indicate variables for which you must substitute a suitable value. In text and in messages, variables are in non-bold lowercase italic. | LOGIN *user-id*<br><br>Supply a value for *x* between 1 and 10. |
| Abbreviations in format statements | If a command or option has an abbreviation, the abbreviation is placed immediately below the full form. | SET_QUOTA<br>SQ |

| Convention | Explanation | Example |
|---|---|---|
| Brackets<br>[ ] | Brackets enclose a list of one or more optional items. Choose none, one, or several of these items. | $LD\begin{bmatrix} -BRIEF \\ -SIZE \end{bmatrix}$ |
| Braces<br>{ } | Braces enclose a list of items. Choose one and only one of these items. | $CLOSE\begin{Bmatrix} filename \\ ALL \end{Bmatrix}$ |
| Braces within brackets<br>[{}] | Braces within brackets enclose a list of items. Choose either none or only one of these items; do not choose more than one. | $BIND\begin{bmatrix} \begin{Bmatrix} pathname \\ options \end{Bmatrix} \end{bmatrix}$ |
| User input in examples | In examples, user input is in bold italic but system prompts and output are not. | OK, *RESUME MY_PROG*<br>This is the output<br>of MY_PROG.CPL<br>OK, |
| Ellipsis<br>. . . | An ellipsis indicates that you have the option of entering several items of the same kind on the command line. | **SHUTDN** *pdev-1*<br>[*...pdev-n*] |
| Hyphen<br>– | Wherever a hyphen appears as the first character of an option, it is a required part of that option. | **SPOOL –LIST** |
| Subscript | A subscript after a number indicates that the number is not in base 10. For example, the subscript 8 is used for octal numbers. | $200_8$ |
| Key symbol | In examples and text, the name of a key enclosed within a rectangle indicates that you press that key. | Press [Return] |

# New Features at Rev. 22.0

The major enhancement at Rev. 22.0 is multiple sessions support. You can now establish as many as eight concurrent connections to the same or different hosts. A new command, SWITCH, allows you to switch between your sessions. Many of the LTS commands have been modified to support multiple sessions.

For example, you might connect to Host A to edit a file with EMACS, then establish sessions with other hosts to look at files and gather information to be manually incorporated into the EMACS file. When you need to collect information from a variety of hosts, multiple sessions saves you the inconvenience of having to continually log out, establish a new connection, and log in again as you switch between hosts. The STATUS command has been enhanced to show you the status of all of your sessions.

# What is NTS?

This chapter introduces Network Terminal Service, NTS. With NTS, you can use your terminal to communicate with host computers over a Prime local area network, a LAN300. The chapter also shows you the range of networking possibilities available through NTS. Your network may use NTS alone, or in conjunction with other Prime networking products.

## Introducing NTS

NTS is a combination of hardware and software that allows asynchronous terminals to communicate with 50 Series computers on a LAN300. (PT250™, PT200™, PST100™, and PT45™ terminals are all asynchronous terminals.) These 50 Series computers are referred to as hosts because you connect to them remotely over the LAN300 and then use their services as a guest. LAN300 products comply with the IEEE 802.3 standard, a widely used standard for local area networks defined by the Institute of Electrical and Electronics Engineers.

Ordinarily, user terminals are wired directly to a single computer. On a LAN300, however, all the computers and terminals are attached to one network cable. A terminal attaches to the cable through an interface unit called a LAN Terminal Server (LTS). Any terminal can communicate with any computer attached to the common transmission medium, the network cable. Figure 1-1 shows the difference between directly wired terminals and a LAN300.

### Note

For simplicity's sake, the drawings in this manual do not show any disk drives, tape drives, terminals, or printers connected to LAN300 hosts. In practice, each host has its own disk drives, tape drives, and supervisor terminal connected directly to it; and each might also have local (non-LAN) user terminals and printers wired directly to it.

When you want to use one of the LAN300 computers, enter a CONNECT command and type the name of the computer you want to use. NTS establishes a connection between your terminal and that computer. Once that connection is made, you can log in and start working, as if you were using a directly wired terminal.

To end the connection, just log out. You can then connect to a different computer on the LAN300. NTS gives you other options for breaking connections (covered in Chapter 2), but logging out is the simplest method.

Direct Wiring
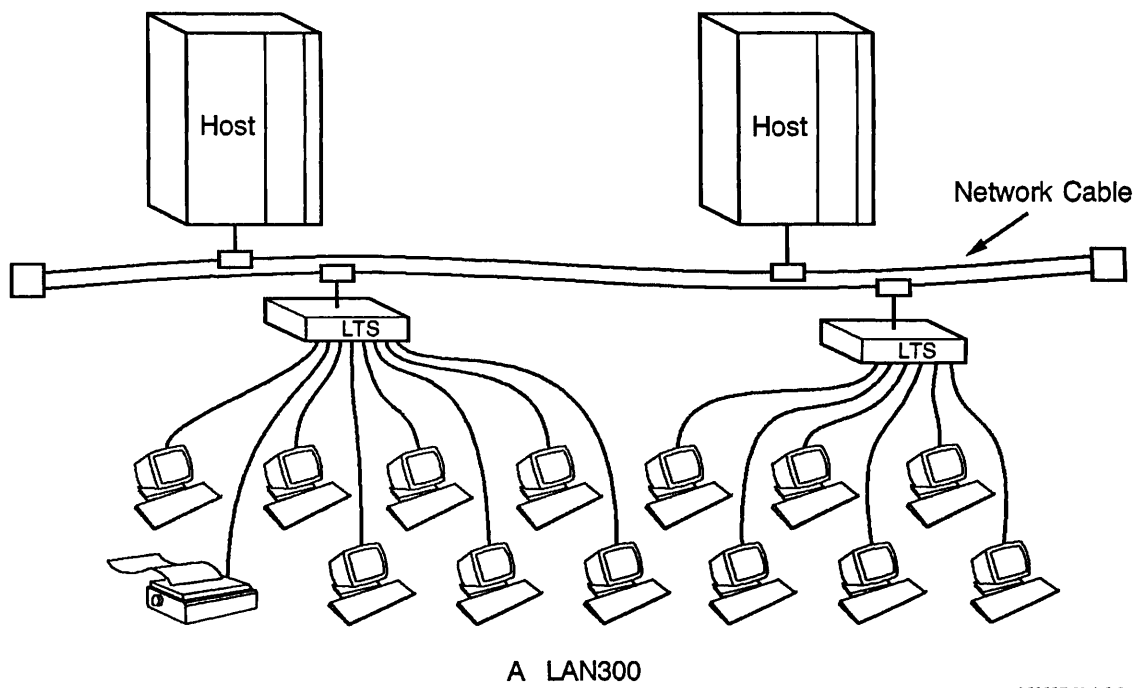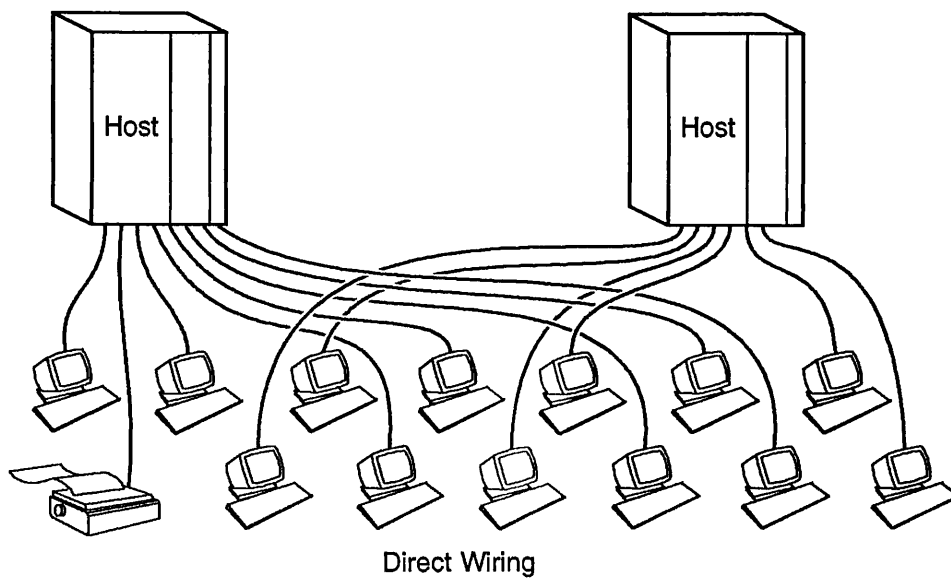
A  LAN300

*QI0117-2LA-1-2*

**Figure 1-1**
**Cabling for Directly Wired Terminals and for a LAN300**

By issuing CONNECT commands, you can use any of the computers on the LAN, if your Administrator has granted you access.

For some users, the CONNECT command is the only NTS command needed. For most others, the commands covered in Chapter 2, Basic LTS Commands, are sufficient. To make use of the full range of NTS features, consult Chapter 4, Setting Parameters and Chapter 5, Status Commands.

## A Typical NTS Session

Although NTS provides a great deal of functionality, a typical session is simple. A sample session might look like this:

```
<1>CMD: CONNECT SYSA        1. Connect to a LAN300 host.


SYSA Connected.
LOGIN DAVE                  2. Log in.


Password?
    .                       3. Do your work.

    .

    .
LOGOUT                      4. Log out.


SYSA Disconnected on session 1.
```

### Note

In the examples, anything a user types appears in bold italic type to distinguish user entries from screen messages and prompts. Commands are shown in uppercase letters, but you can use uppercase, lowercase, or a combination.

## New Functionality at Rev. 22.0: Multiple Sessions

At Rev. 22.0, NTS allows you to establish as many as eight connections at once to the same or different host computers. Each connection is a separate session. While you can actually communicate with only one of the hosts at a time, you can switch back and forth among the sessions without repeating the login dialog. When you go back to a session, you are returned to the same place you left off in the file or application. The section entitled LTS Sessions, in Chapter 2, has a full description of sessions and how to use them.

## Benefits of NTS

NTS offers a number of benefits:

* Users can access multiple computers from one terminal.

* Users can establish as many as eight connections at once to the same or different hosts. Each connection is a separate session; the user can switch between them and then return to the same place in the file or application program.

* Terminals that are not in use do not tie up valuable computer lines. (NTS terminals tie up a line only while a connection is established.)

* If one computer goes down, users can connect to another system.

* Fewer cables are required, so there is less wiring congestion.

* Relocating a terminal does not require expensive rewiring between the terminal and the computer. Instead, you just plug the terminal into a LAN Terminal Server at the new location.

# NTS Interface Units

Two types of LAN interface units allow the network equipment to communicate over the shared network cable. Terminals and printers attach to one type of interface unit, a LAN Terminal Server. 50 Series computers use a different type of interface unit, a LAN Host Controller.

## LAN Terminal Server (LTS)

A LAN Terminal Server (LTS) is a small standalone unit that supports as many as eight asynchronous terminals or printers. Cables from these devices attach to ports on the LTS, and a cable from the LTS attaches to the network cable (see Figure 1-2).

---

### Caution

Do not touch the controls on the front panel of the LTS; they are for use by the network installer or administrator. Touching the controls can reinitialize (restart) the LTS and disrupt communication between the LTS and any attached terminals.

---

*QI0117-2LA-8-1*
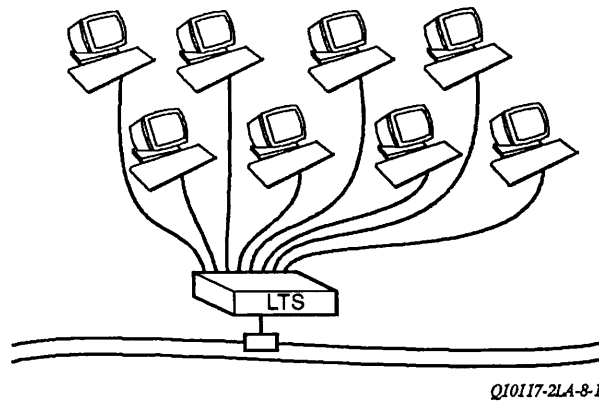
**Figure 1-2**
**LAN Terminal Server**

## LAN Host Controller (LHC)

A LAN Host Controller (LHC) is a board that is installed inside a 50 Series host computer. The LHC connects the host to the network cable (see Figure 1-3).



LAN
Host
Controller

*QI0117-2LA-26-0*
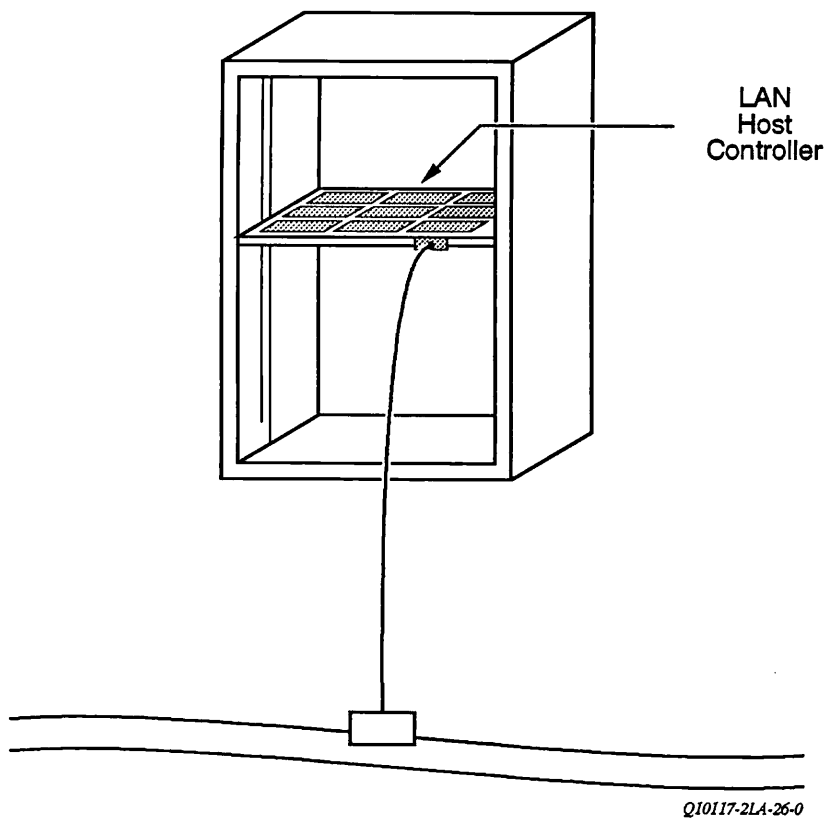
**Figure 1-3**
**LAN Host Controller**

Each LHC allows as many as 128 LAN300 terminal connections to the host at one time. (Only 32 connections are allowed if PRIMENET software is also running on that LHC; see the section on NTS and PRIMENET in this chapter.) Each host can have as many as four LHCs for NTS (and two more for PRIMENET). Multiple LHCs can all attach to the same LAN300 cable or they can attach to different LAN300s. (More information on attaching a host to multiple LANs is available later in this chapter.)

A typical LAN300 (as shown in Figure 1-4) contains 50 Series hosts (each with at least one LHC), several LTSs, terminals, and printers.
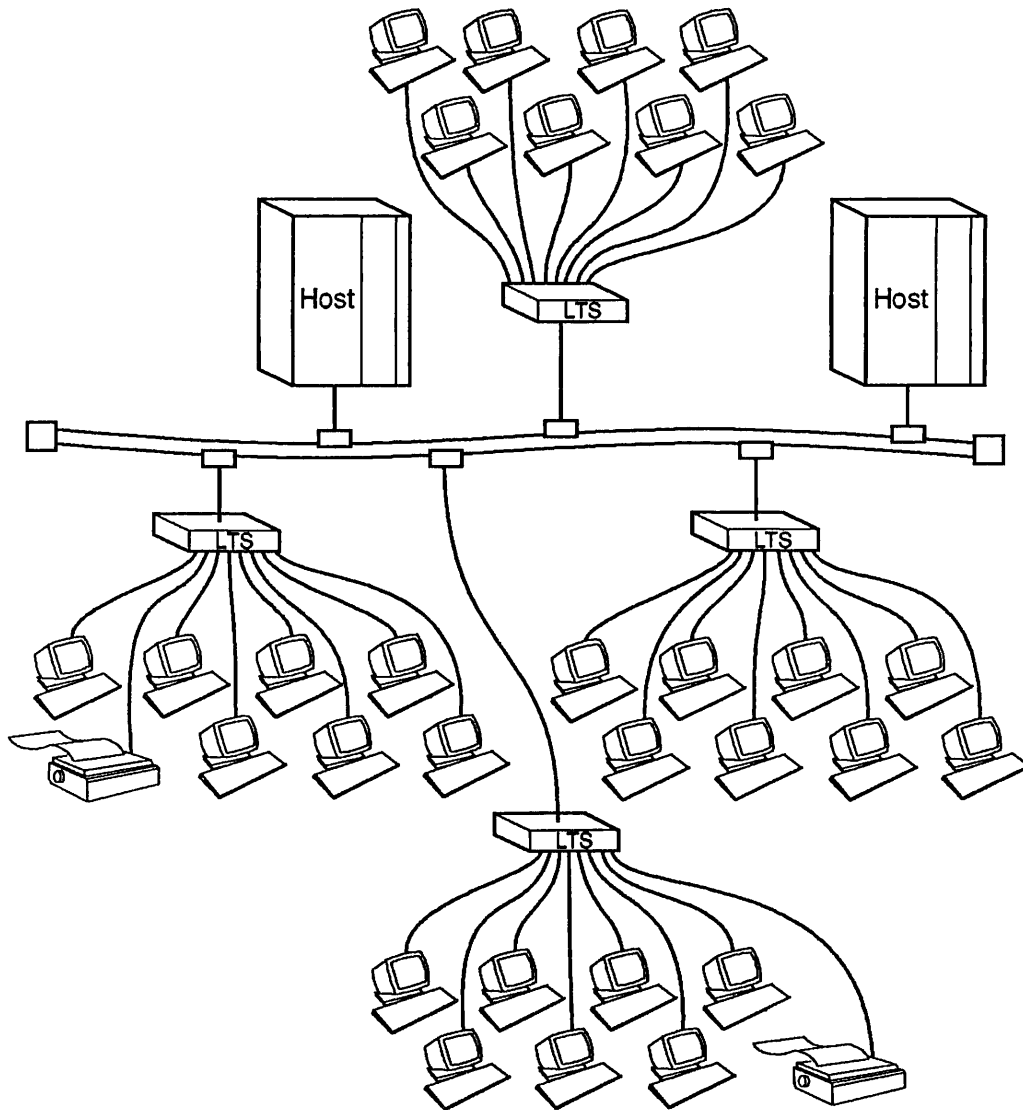


*Q10117-2LA-9-1*

**Figure 1-4**
**A Typical LAN300**

# Multiple LANs

A host can be attached to more than one LAN300. Because a host can have as many as four LHCs for NTS, a host can be attached to a maximum of four different LAN300s. In Figure 1-5, Host A is a 50 Series computer with two LHCs, each attached to its own LAN300.
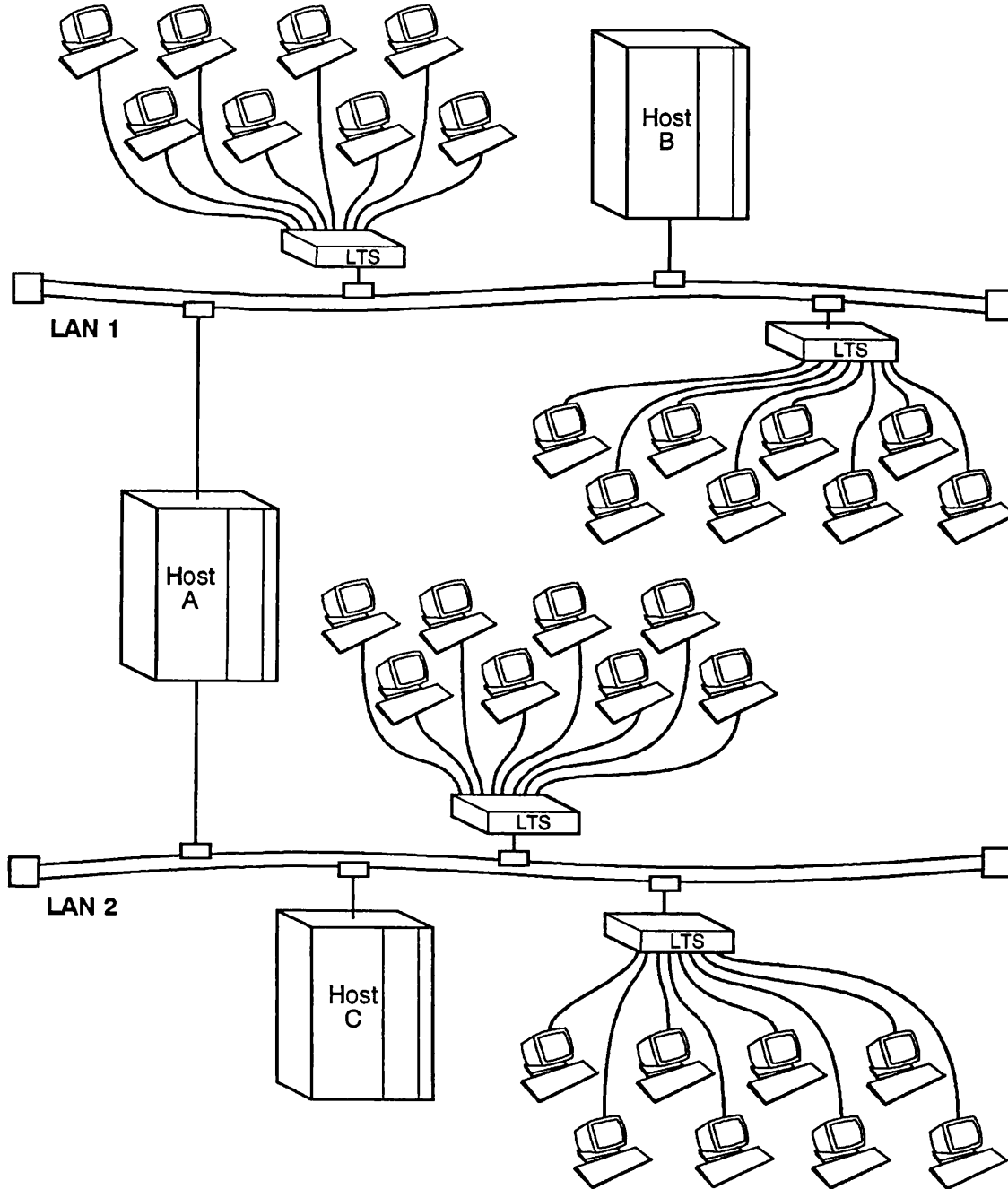


*10117-2LA-2-3*

**Figure 1-5**
**Host Attached to Two LANs**

Terminal users on either LAN can communicate with Host A. NTS does not support connections from one LAN300 to hosts on another LAN300. In Figure 1-5, terminal users on LAN 1 cannot connect to Host C; terminal users on LAN 2 cannot connect to Host B. (PRIMENET remote login allows terminals to access computers across LAN300s; see the section on NTS and PRIMENET later in this chapter.)

Although terminal users cannot make NTS connections across LAN300s, multiple LANs can be useful for other purposes:

- For security — Systems that need extra security can be placed on separate LAN300s.

- For improved performance — A single overused LAN300 can be split into two networks.

# NTS and PRIMENET

NTS allows terminals to make connections to hosts; in other words, NTS supports LTS-to-LHC connections as shown in Figure 1-6. (NTS also supports LHC-to-LTS connections for assigned lines. For more information, see Chapter 6, NTS Assigned Lines.)
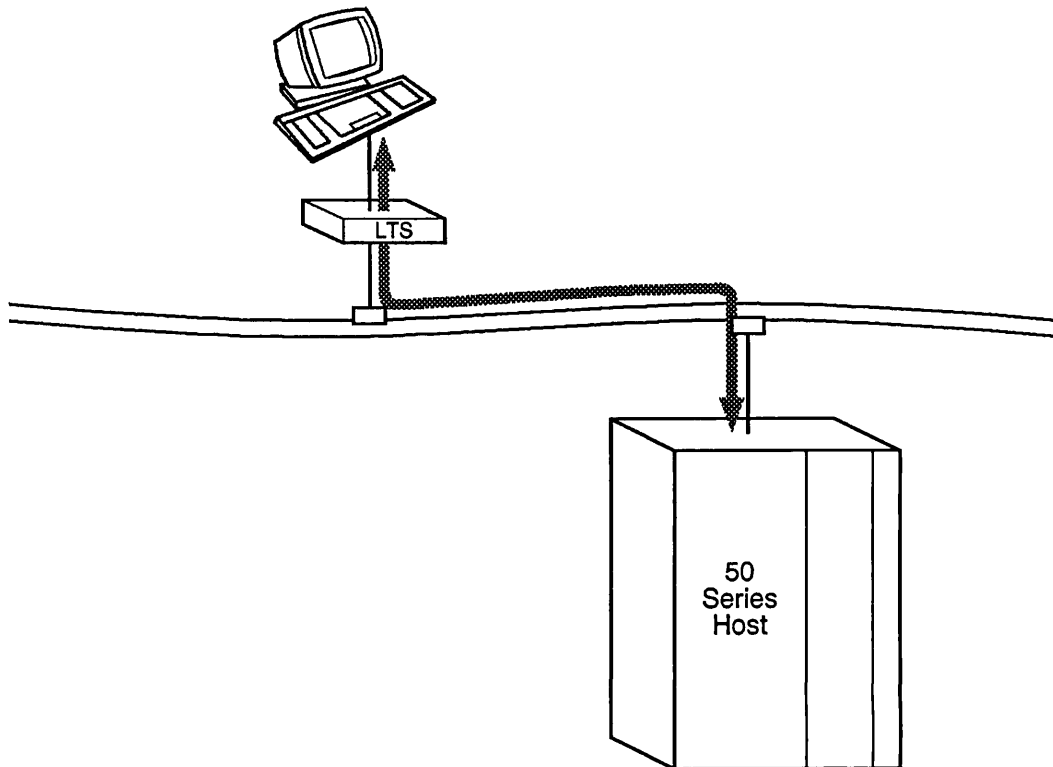


QI0117-2LA-6-1

**Figure 1-6**
**NTS Allows Terminal-to-host Communication**

NTS does not support communication between terminal servers (LTS to LTS) or host-to-host communication (LHC to LHC). Host-to-host communication over a LAN300 requires PRIMENET (see Figure 1-7).



QI0117-2LA-5-2
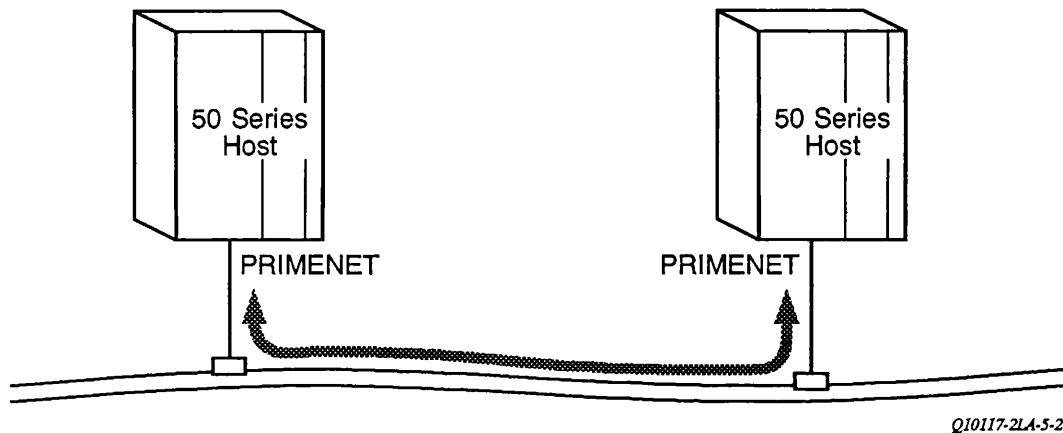
**Figure 1-7**
**Host-to-host Communication Requires PRIMENET**

For host-to-host communication on a LAN300, both hosts must be running PRIMENET software and they must be configured as part of a PRIMENET network. (PRIMENET also supports communications with non-Prime hosts across LAN300s and full-duplex lines. The non-Prime hosts must be running networking software that complies with the X.25 1984 standard.) PRIMENET can run on a LAN300, a Prime ring network, a full-duplex or half-duplex synchronous line, or across a Packet Switched Data Network (PSDN). Gateway systems can route data among hosts that are not directly connected (for example, between PRIMENET hosts on a LAN300 and PRIMENET hosts on a ring network).

PRIMENET gives you access to PRIMENET hosts that are not part of your LAN300 network; for example, to PRIMENET hosts on a ring network or to PRIMENET hosts on another LAN300.

Figure 1-8 shows a PRIMENET network. One part of the PRIMENET network is a LAN300 with Hosts A, B, C, and D.

The other part of the PRIMENET network in Figure 1-8 is a ring network. Ring networks, like LAN300s, are local area networks. The Prime ring network is called a RINGNET™ network. Hosts D, X, Y, and Z belong to a RINGNET. Host D serves as the gateway between the LAN300 and the RINGNET.

If your LAN300 hosts are also PRIMENET hosts, you can take advantage of these PRIMENET features:

- Remote file access — to use files stored on a remote host. (You log in to one host and use files stored on another host.)

- Remote login — to log in to a remote PRIMENET host. (You connect to a LAN300 host and, instead of logging in to that host, you log in to another PRIMENET host.)

- File Transfer Service — to transfer files between PRIMENET hosts.

- NETLINK — to access another PRIMENET host or a host on a Packet Switched Data Network (PSDN), a type of public data network that offers wide-area communications to its subscribers.
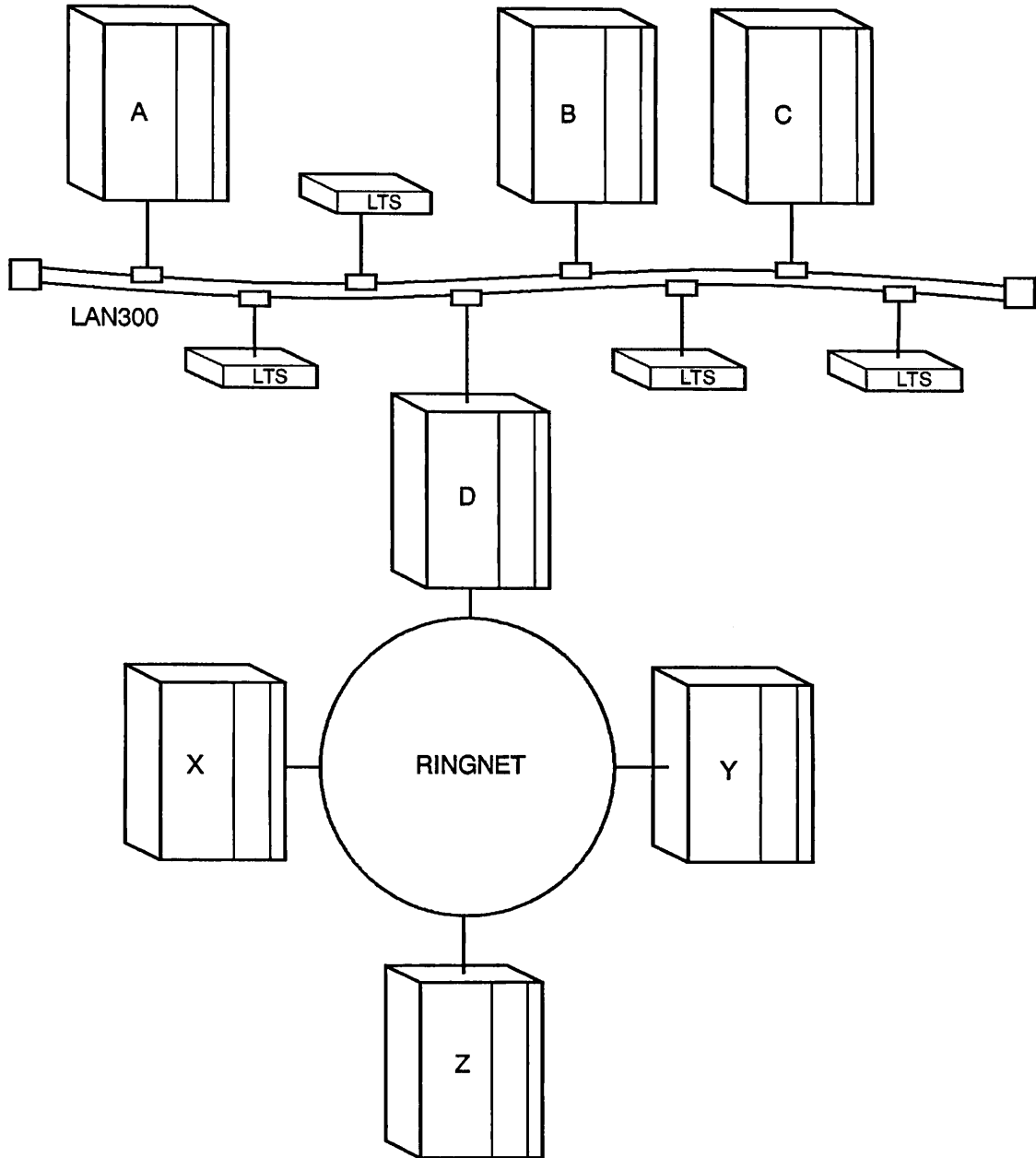


*QIOII7-2LA-4-2*

**Figure 1-8**
**A PRIMENET Network Containing a LAN300 and a RINGNET**

For full information on these PRIMENET features, see the *User's Guide to Prime Network Services.*

**Note**

This discussion of PRIMENET describes potential access. In practice, the administrator at any site decides what limitations to place on access to a Prime host.

To use any PRIMENET features from an NTS terminal, first use the CONNECT command to establish a connection with a LAN300 host running PRIMENET. Then you can log in and use PRIMENET to gain access to files on other PRIMENET hosts, transfer files between PRIMENET hosts, or use NETLINK to talk to hosts on a PSDN.

If you want to access a file on a non-LAN300 host from a LAN300 terminal, use NTS to connect to a LAN300 host, log in, and ask for access to the file you want. PRIMENET routes your request through the gateway to the non-LAN300 host. Figure 1-9 illustrates this process.

If you want to use the PRIMENET remote login feature from an NTS terminal, first use the CONNECT command to establish a connection with a LAN300 host running PRIMENET. Then, without logging in to that host, you can use PRIMENET to log in to any PRIMENET host. For example,

```
<1>CMD: CONNECT SYSA

SYSA Connected.
LOGIN SANDY -ON SYSY
```

If a LAN300 host is not part of a PRIMENET network, you can connect to that host and log in, but you cannot access files on any other hosts. Similarly, you cannot transfer files between the LAN300 host and any other system.

# Workstation/System Interconnect 300 (WSI300)

Workstation/System Interconnect 300 (WSI300) is a Prime network product that enables communication between a 50 Series host and a workstation or system running the Transmission Control Protocol (TCP) and the Internet Protocol (IP) over a LAN300.

Although WSI300 uses some of the same hardware and software as NTS, WSI300 has its own commands and functions. To learn how to use WSI300, see the *WSI300 User's Guide.*
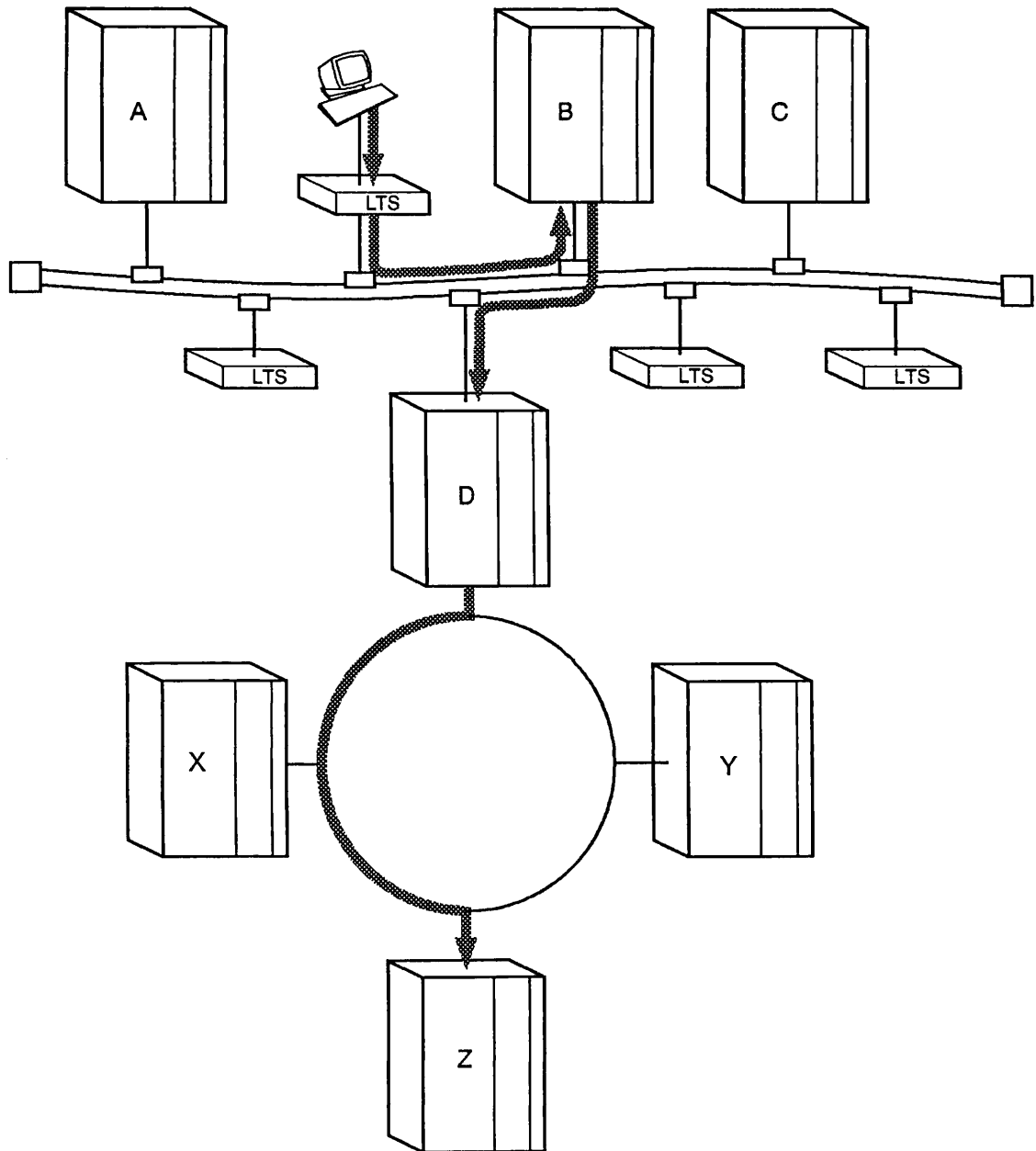
Q10117-2LA-3-2

**Figure 1-9**
**Accessing a Remote File Using NTS and Primenet**

## Communicating With Systems Made by Other Vendors

An NTS host can also communicate with computer systems made by other vendors. You use NTS to connect to the appropriate LAN300 host, log in, and then use the host software to communicate with the destination system.

Prime products that enable communication with other systems include the following:

- NETLINK (a PRIMENET command) — for communicating with a Packet Switched Data Network (PSDN). Both Prime systems and systems from other vendors can be PSDN subscribers. In Figure 1-10, Host C is connected to a PSDN.

- PRIME/SNA™ — for enabling communication between Prime computers and IBM systems that use IBM Systems Network Architecture (SNA). In Figure 1-10, Host B is using PRIME/SNA.

- Prime Remote Job Entry (RJE) emulation packages — for submitting jobs to other systems from Prime terminals.

- Distributed Processing Terminal Executive (DPTX) — for using Prime terminals in an IBM environment.

The next chapter covers the basic commands you use for communicating with LAN300 host computers from NTS terminals.

SNA System

PRIME/SNA

PSDN

A

B

C

LTS

LAN300

LTS

LTS

LTS

D

X

RINGNET

Y

Z
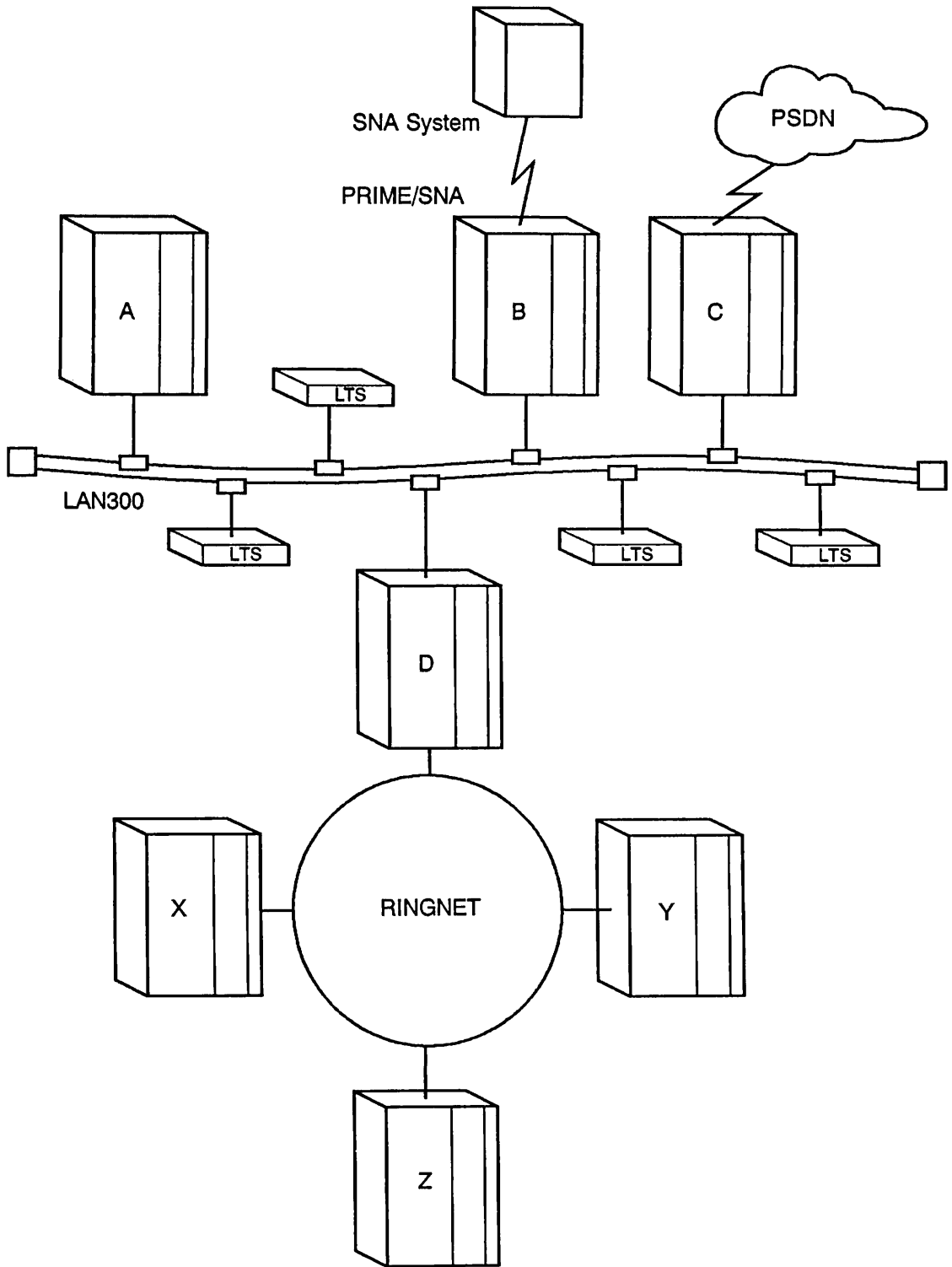
*QI0II7-2LA-7-3*

**Figure 1-10**
**A LAN300 With Other Prime Network Services**

# Basic LTS Commands

This chapter explains how to use the basic LTS commands: those that let you communicate with your terminal's LTS, and those that make and break connections with LAN300 hosts. The chapter shows you how to

- Establish communication between your terminal and the LTS, in case no one has prepared your line
- Correct typing mistakes in LTS commands
- Make and break connections with host computers
- Make more than one connection to the same or different hosts
- Switch between connections
- Display the status of your connections
- Switch from one LTS operating mode to another
- Display, change, or disable the LTS escape character
- Change the LTS prompt

The commands covered in this chapter are summarized in Table 2-1 at the end of the chapter. For quick reference, summary information on all LTS commands is available in Appendix A, LTS Command Summary.

## Before You Begin

Once the LAN300 hardware and software have been installed and NTS is up and running, you can start to establish connections over the network from your terminal. Your administrator will provide you with

- The name of each LAN300 host you can connect to
- A user ID and password for each of the hosts
- Appropriate access rights to host files and directories

This guide assumes that you know how to use a 50 Series system and that you can log in to the system, communicate with the PRIMOS® operating system, log out, and perform basic functions. For information on working with PRIMOS, see the *PRIMOS User's Guide* and the *PRIMOS Commands Reference Guide*.

# LTS Operating Modes

A terminal connected to an LTS has two modes of operation: command mode and data transfer mode. Figure 2-1 illustrates these two modes.

## Command Mode

When you turn on your terminal, you are in LTS command mode. In command mode, you enter LTS commands. These commands perform tasks such as requesting connections to host computers, breaking connections, and changing terminal parameters.

In command mode, your terminal communicates only with your LTS. The only commands you can use in command mode are LTS commands. If you try to use PRIMOS commands during command mode, the LTS cannot understand them and sends you the error message Illegal command.

When you see the LTS prompt (<1>CMD: by default), you are in LTS command mode. (The number in the prompt varies depending on your current session number, as described in the section entitled LTS Sessions. You can change the text portion of the prompt with the PROMPT command, described later in this chapter.) In command mode, nothing that you type is sent out over the LAN. Instead, the LTS receives your commands, interprets them, and takes the appropriate actions.

## Data Transfer Mode

Once you establish a connection to a host computer, you enter data transfer mode. The PRIMOS prompt (OK, by default) appears on your screen. In data transfer mode, you communicate with the host over the LAN, through the LTS. You use data transfer mode to log in and accomplish whatever work you want to do at the host.

While you are in data transfer mode, the LTS does not try to interpret the characters that you type at your terminal. Instead, the LTS passes everything you type directly to the host (with two exceptions, noted below). The host then interprets the text. For example, when you type LOGIN during data transfer mode, the LTS passes the characters to the host, which interprets them as a PRIMOS command. In the opposite direction, the LTS passes to your terminal all messages and responses sent to you from the host; the LTS does not try to interpret them.

QI0117-2LA-II-I
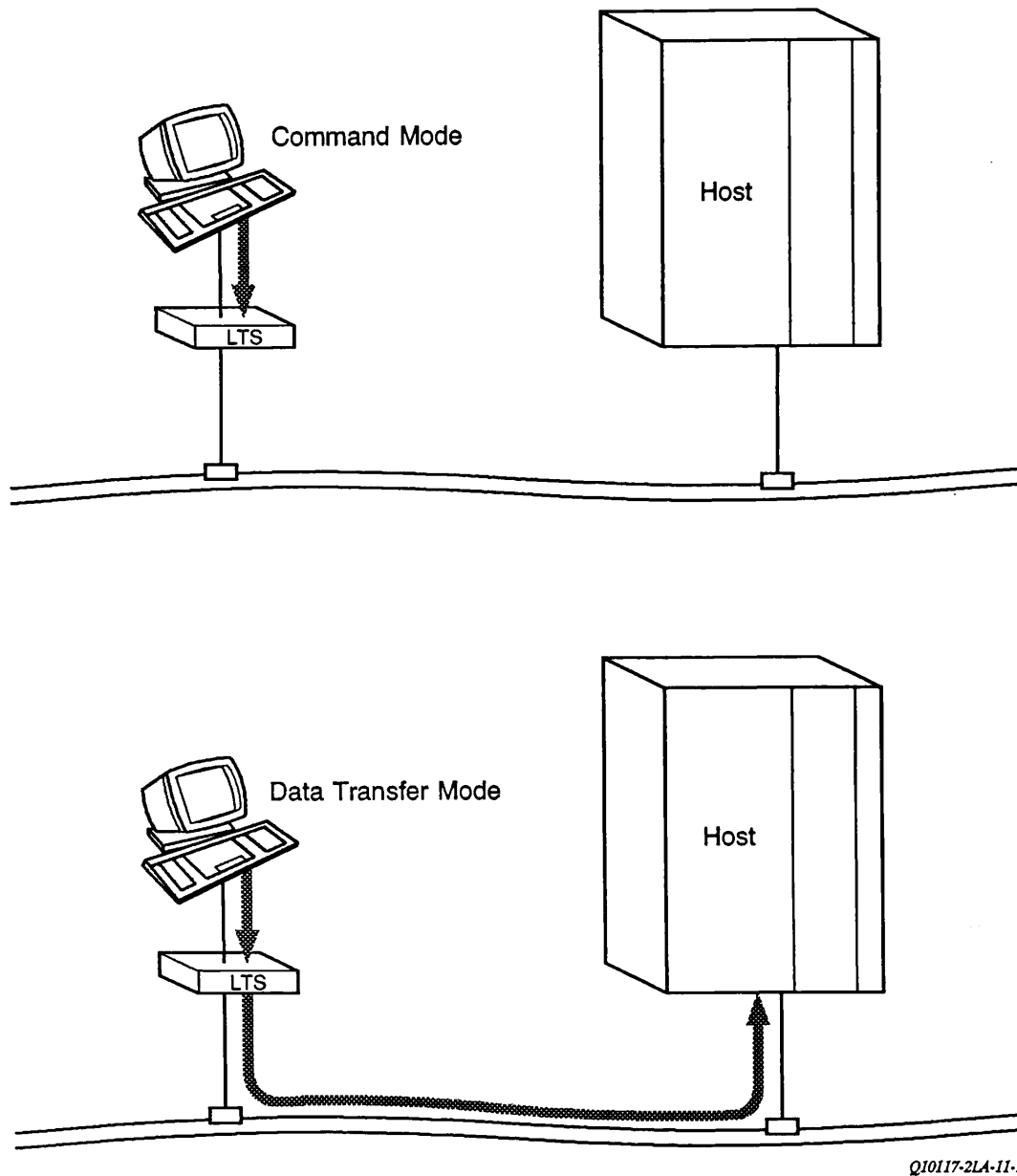
**Figure 2-1**
**LTS Command Mode and Data Transfer Mode**

## Note

In data transfer mode, the LTS forwards all characters to the host except for the LTS escape character (if the escape character is enabled) and the XON/XOFF characters (if you enable character flow control). The LTS escape character is explained later in this chapter. Chapter 3, LTS Parameters, contains information on XON/XOFF flow control.

## LTS Sessions

Eight sessions are associated with your port on the LTS. A session is the same as a call or a connection to a host. These sessions allow you to make as many as eight connections at once, one per session. The connections can be to the same host, or to different hosts.

For example, if you want to use a spreadsheet application to prepare a financial report on HOSTA, you can make a connection to it on one of your sessions. Then, you can return to command mode (described in more detail later) and establish connections with HOSTB and HOSTC, which contain databases of financial information. You can then switch back and forth between the connections with the SWITCH command (also described later in this chapter), manually gathering information from HOSTB and HOSTC and typing it into your financial report on HOSTA. (You cannot pick up data from one session and place it in another session. Instead, you must manually record the data from the source session and then type it into the target session.) When you return to a connection with a host, you do not have to repeat the login dialog. NTS returns you to the same position in the file or application program you were using. Figure 2-2 illustrates this scenario.

**Note**

When you go back to a session, NTS returns you to the same place in the file or application program. However, NTS does *not* save the state of the terminal. Therefore, when you return to certain screen-oriented application programs, the cursor positioning and other features of the screen display may be different.



Spread Sheet Aplication

Database

Database

A

B

C

LTS

Q10117-2LA-29-1
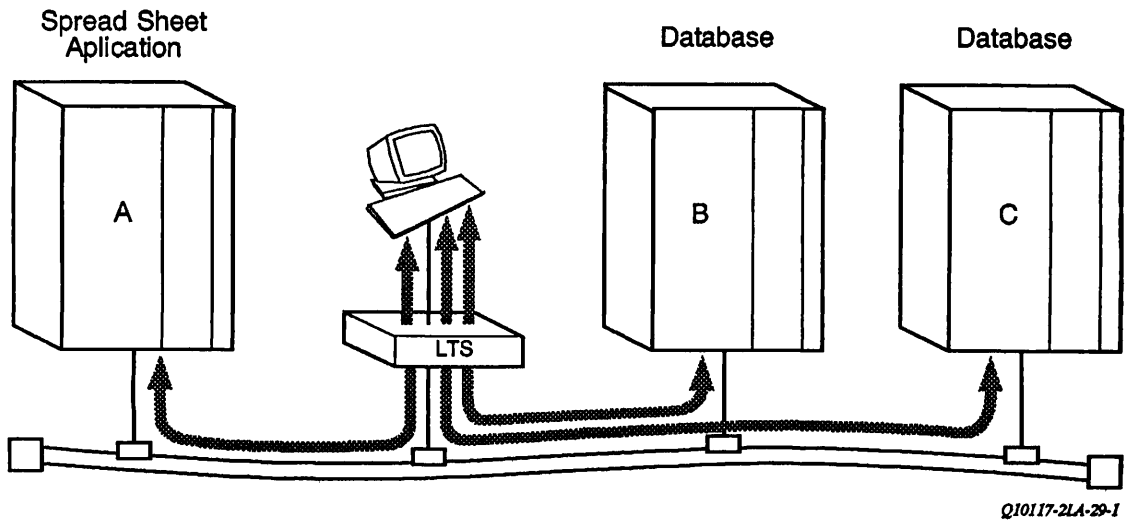
**Figure 2-2**
**LTS Sessions In Use**

Each session has a number from 1 to 8. A session is **free** if you have not established a connection to a host on it. It is **active** if you are communicating with a host in data transfer mode, or **active but suspended** if you established a connection and then returned to command mode. The STATUS command, described later in this chapter, displays the status of your sessions.

The term **current session** appears frequently in this manual. When you are in data transfer mode, your current session is the one on which you are communicating with the host. Remember, you can communicate with only one host at a time. Any other connections are active but suspended. When you are in command mode, your current session is indicated in the first part of the LTS prompt, <1>CMD: by default. (You can change the text portion of the prompt with the PROMPT command, described later in this chapter.) For example, if your LTS prompt is <3>CMD:, your current session is 3. This is important because many of the LTS commands, such as CONTINUE, DISCONNECT, and DEFAULT, act on your current session unless you give another session number with the command.

You can customize each session to match the characteristics of the host with which you are communicating. You can establish a different escape character and enable or disable it for each session. (For more information, see the section entitled Switching Modes: The LTS Escape Character, and the section entitled Defining the Escape Character: The ESCAPE Command.) You can also change the configuration parameters for each session, as described in Chapter 3, LTS Parameters, and Chapter 4, Setting Parameters.

## Communicating With the LTS

If your terminal is ready to communicate with the LTS, your screen displays the default LTS command mode prompt, <1>CMD:. If you see this prompt, someone has already prepared your line and you can skip the next section, Preparing LTS Lines.

If you do not see the <1>CMD: prompt when you turn on your terminal and press the carriage return key (CR, RETURN, or ENTER), you may need to prepare the line yourself.

## Preparing LTS Lines: Auto Speed Detect

Before you can use an LTS line, the LTS needs to know the operating speed (baud rate) of the terminal. The first person to use the line must set the baud rate by pressing the carriage return key (CR, RETURN, or ENTER) two or three times.

When the LTS receives the carriage return characters, it can determine the terminal's operating speed. The LTS then sets the baud rate parameter of your line so that it matches your terminal's baud rate. This function is called Auto Speed Detect (ASD).

From then on, the LTS uses that baud rate to communicate with your terminal, unless you or the administrator change the baud rate parameter. (Chapter 4, Setting Parameters, tells how to change the baud rate parameter.)

You need to perform Auto Speed Detect only once. Even if the LTS is reinitialized (restarted), it remembers your terminal's baud rate. (The administrator might reinitialize the LTS for network troubleshooting or repair.)

You can tell that Auto Speed Detect was successful if you see the LTS welcome banner and startup information followed by the command mode prompt. For example,

```
[LTS300 Rev n.nnn]
Copyright (c) 1988 Prime Computer, Inc.

<1>CMD:
```

The LTS also displays the welcome banner when you issue the BANNER command (covered in Chapter 5, Status Commands), or whenever someone reinitializes the LTS. If the welcome banner appears after you havé been using your terminal for awhile, it means that the LTS has been reinitialized. If you changed any LTS parameters, you may need to reset them. (Chapter 4, Setting Parameters, provides instructions.)

As soon as you see the prompt <1>CMD:, you can issue LTS commands. (If you do not get this response, ask your administrator for help.)

**Note**

LTS Auto Speed Detect can work correctly with the default settings on PT200, PST100, and PT45 terminals. If someone has changed the terminal settings, or if you are using some other type of terminal, set up the terminal as follows:

1. Set PT200, PST100, and PT45 terminals for seven bits per character with space parity or with parity ignored. (Seven bits per character with space parity or with parity ignored is the default setting for these terminals.) On these terminals, do not use the settings for eight-bit characters, because those settings are for special international character sets. For terminals made by other vendors, seven bits per character with space parity or with parity ignored should also work correctly.

2. The terminal must be using one stop bit.

3. The terminal must be operating at one of the following speeds:

| | |
|------|-------|
| 110  | 2400  |
| 300  | 4800  |
| 600  | 9600  |
| 1200 | 19200 |

After Auto Speed Detect is complete, you can change the baud rate, bits per character, parity, or number of stop bits to other settings if you need to. Changing these terminal characteristics is a two-step process:

1. Set the appropriate LTS parameter with the PORT or SET command. (For instructions, see Chapter 4, Setting Parameters.)

2. Change the terminal settings. Terminal settings are controlled by physical switches on some terminals and by software functions on others. For example, the PT45 terminal uses physical switches, the PST100 terminal uses physical switches and software functions, and the PT200 uses software functions only. If you do not know how to set your terminal's operating characteristics, check the manual that came with your terminal or ask your administrator for assistance.

# Correcting Typing Mistakes: The LTS Editing Characters

In LTS command mode, you communicate with the LTS by typing a command and then pressing the carriage return key. If you make a mistake while typing an LTS command, you can edit your mistakes before you press the carriage return (CR) key. The LTS editing characters include

- Erase character

- Line erase character

- Line display character

To delete something that you typed, use the LTS erase or line erase character. Use the line display character to redisplay an edited command line. Remember, you must use these editing characters *before* you press CR; once you press CR, the LTS tries to act upon your command.

You can use the default LTS editing characters, or you can define your own. If you want to define your own editing characters, read about the parameters for the editing characters in Chapter 3, LTS Parameters, and about the SET command in Chapter 4, Setting Parameters.

The LTS editing characters work only in LTS command mode. After you connect to a host computer and log in, your PRIMOS erase and line erase characters take over. Use the PRIMOS TERM command to define the PRIMOS erase and line erase characters. The –ERASE option defines the PRIMOS erase character, and the –KILL option defines the PRIMOS line erase character.

## The Erase Character

The LTS erase character (sometimes called the character delete character) deletes the last character you typed. The default LTS erase character is the backspace key. (The PRIMOS default erase character is the double quotation mark.)

For example, if you type CONNECD instead of CONNECT in LTS command mode, press the backspace key to move the cursor back over the D, and then type a T to complete the word CONNECT. Or, if you type CONNEXT, press the backspace key twice and then type the two correct characters, CT. When the command line is correct, press the carriage return key.

If you wish, you can change your LTS erase character from the backspace character to some other character. If you use a different erase character, it does not move the cursor backward on your screen as the backspace character does. Instead, the erase character appears on the command line along with the command characters. It does not visually erase anything.

For example, if you define an exclamation point as your erase character and you want to change CONNEXT to CONNECT, type two exclamation points and then the correct characters, CT. The command line then contains the prompt, the incorrect characters, the erase characters, and the correct characters.

        <1>CMD: *CONNEXT!!CT*

After you press CR, the LTS interprets this command correctly as CONNECT.

## The Line Erase Character

The line erase character (sometimes called the kill character) deletes all the characters on the command line. Use this editing character when it is easier to start the command over than to fix the mistakes. The default LTS line erase character is the question mark (?). (This is the same as the default PRIMOS kill character.)

The line erase character does not move the cursor or remove any characters from your screen display. Instead, a question mark appears on the command line, where it marks the start of a *new* line. The LTS acts on anything you type after the question mark, but it ignores anything before the question mark.

For example, if you want to enter the CONNECT command, but you type DONNECT instead, use the ? to eliminate all the characters you have typed so far. Then type CONNECT. The command line then contains the prompt, the incorrect characters, the line erase character, and the correct characters:

        <1>CMD: *DONNECT?CONNECT*

After you press carriage return, the LTS interprets this command correctly as CONNECT. Everything else is ignored.

You can change your line erase character to some character other than the question mark by changing the line erase character parameter. (Chapter 4, Setting Parameters, provides instructions.)

## The Line Display Character

When you press the line display character, the LTS displays all the active characters on your current command line. The default line display character is CONTROL-L. (To type this character, hold down the key labeled CONTROL or CTRL while you press the L key.)

When you use the line erase character, or when you use an erase character other than the backspace key, the command line can get confusing. When you make editing changes on your command line, the command line can contain erased characters, editing characters, and correct characters. Sometimes it is difficult to tell which characters are which. Use the line display character to display only the characters that the LTS will act upon. The following example shows an edited command line (with the exclamation point used as the erase character), and the results of pressing the line display character:

<1>CMD: *CONNEXT!!CT* ⬚Ctrl⬚ ⬚L⬚

CONNECT

You can tell at a glance whether your command line is now correct.

Like the other LTS editing characters, the line display character can be changed. (Chapter 4, Setting Parameters, provides instructions.)

# Choosing a Host: The LIST_HOSTS Command

When you are in command mode, you can request a connection to a 50 Series host computer. You can connect to any Prime host that meets the following criteria:

- The host is attached to the same LAN300 as your LTS.

- The administrator has configured the network so that your LTS can make connections to that host.

- The administrator has started NTS on the host.

- You know the name of the host. (The administrator defines host names.)

After you connect to a host, you need a user ID and a password to log in, and appropriate access rights to use the files and directories on the host.

To see what hosts are available on your LAN300, use the LIST_HOSTS command. When you issue the LIST_HOSTS command, your LTS checks to find out what host computers are currently active on its LAN300. The LTS then sends your terminal a list of those hosts.

Use this list to find out the correct names of LAN300 hosts or to find out which hosts are up and running NTS. Under normal circumstances, you can connect to any host on the list. (A host may fail to respond to a connect request for a number of reasons; see the section entitled CONNECT Error Messages later in this chapter.)

The syntax for the LIST_HOSTS command is

**LIST_HOSTS**
**LH**

When you issue the LIST_HOSTS command, the LTS sends you the names of the Prime hosts on your LAN300 that are currently running NTS. In other words, the LTS lists all the active NTS hosts. The display also indicates in parentheses the number of LHCs in each host that are running NTS on your LAN300, if the number is more than one. For example,

```
<1>CMD: LIST_HOSTS
```

| | | |
|---|---|---|
| ADMIN | ENG1 (4) | GROUP7 |
| GROUP3 | SYS36 (2) | SYS38 (3) |
| SYS39 | | |

If there are many hosts on the LAN, the list can require more than one screen. If so, you see a More? prompt at the bottom of the screen. To go to the next screen, enter Y or YES, or press CR. To cancel the rest of the display, enter N, NO, Q, or QUIT. If you do not enter one of these valid responses, the LTS reminds you of the available choices by displaying the message Please enter yes, no, quit, or just hit CR.

## Making Connections: The CONNECT Command

To connect to a host, use the CONNECT command. Its syntax is

**CONNECT** *host-name*
**C**

*host name* is defined by the System Administrator.

If you want to connect to a host named SYSA, enter one of the following commands:

```
<1>CMD: CONNECT SYSA
<1>CMD: C SYSA
```

### Note

Before entering the CONNECT command, enter the ESCAPE –ALL to check the escape character on the session that will be used for the connection. (For more information on the escape character and the ESCAPE –ALL command, see the section entitled Switching Modes: The LTS Escape Character, later in this chapter.) When you enter CONNECT, the LTS uses your current session if it is free. If your current session is active (you established a connection and then returned to command mode), the LTS uses the first free session, beginning with session 1. If you do not know the escape character on the session used for the connection, or if it is disabled, you cannot return to LTS command mode conveniently. Instead, you must leave the host application program you are using and enter the PRIMOS command NTS_LINE –CMD.

The LTS then tries to establish a connection over the LAN with SYSA. The LTS uses your current session if it is free. If your current session is active (you established a connection and then escaped to command mode), the LTS uses the first free session, starting at session 1. The LTS rejects the command and displays an error message if you have no free sessions. If the connection attempt is successful, the LTS informs you by displaying a message. For example, SYSA Connected.

If you receive a similar message, you are connected to the host computer and you are in data transfer mode. You can log in and begin to work. If your attempt to log in is unsuccessful (for example, if you do not enter a valid user ID), the connection is broken automatically. You can make a connection on each of your eight sessions. These connections can be to different hosts, or to the same host. For example, you might want to use a spreadsheet on one host and gather information from databases on the same host or other hosts around the network. By maintaining concurrent connections on your sessions, you can easily switch between them with the SWITCH command, described later in this chapter. When you return to a connection, it is exactly as you left it. In other words, you are returned to the same place in the file or application program you were using. While you cannot pick up information from one session and place it in another, you can make a note of the data and then type it into the target session.

**Note**

When you go back to a session, NTS returns you to the same place in the file or application program. However, NTS does *not* save the state of the terminal. Therefore, when you return to certain screen-oriented application programs, the cursor positioning and other features of the screen display may be different.

## CONNECT Error Messages

If the LTS cannot establish the connection you requested, it displays a message explaining the reason for the problem. Some of the messages indicate a typing error or some other mistake in the CONNECT command. Other messages indicate that you need assistance from the administrator or, in some cases, from Prime Customer Support.

The messages listed below are grouped according to the probable source of the problem: user mistakes, configuration problems, or network component malfunctions. The messages within each group are listed in alphabetical order.

**User Errors:** The following messages usually occur because you made a mistake when you entered the CONNECT command. If you receive one of these messages, try the CONNECT command again. If necessary, use the LIST_HOSTS command to find out the correct spelling of host names.

A command line delimiter was found where one was not allowed.
> No delimiters (commas, semicolons, or colons) are expected in the CONNECT command. Enter the command again, without any delimiters.

`Host name is too long.`

Host names cannot contain more than six characters. Enter the CONNECT command again, with a correctly spelled host name.

`Host name must start with a letter.`

Valid host names cannot begin with a number. Enter the CONNECT command again, with a correctly spelled host name.

`Invalid host name.`

The host name in your connect request is incorrect. Enter the CONNECT command again, with a correctly spelled host name.

`Must specify host name.`

You did not include a host name in the CONNECT command. Enter the command again and include the name of a host as part of the command.

`No connections available.`

Connections are established on all eight of your sessions. Use the DISCONNECT command (described later in this chapter) to disconnect one of the sessions, and then enter the CONNECT command again.

`Only alphanumeric, . / _ $ # & are allowable characters.`

You entered an illegal character (an exclamation point, for example) as part of the command. Enter the CONNECT command again, with a correctly spelled host name.

**Line is Assigned:** You cannot use your line to make connections if it has been assigned by another user. If the LTS displays the message below, contact your administrator to find out why your line has been associated and assigned. For more information on associated and assigned lines, see Chapter 6, NTS Assigned Lines.

`Connection request rejected - Assign line connect in progress.`

**Configuration Problems:** The following messages usually mean that there is a problem with the host or network configuration. Try the CONNECT command again. If you receive the same message, contact your administrator. Make sure you tell the administrator which message you received; the specific message can help the administrator locate and correct the problem.

`Connection request rejected - Host controller(s) not responding.`

`Connection request rejected - Host not responding.`

`Connection request rejected - LTS disallowed.`

```
Connection request rejected - NTS has not been started.

Connection request rejected - No NTS PRIMOS connections
available.

Connection request rejected - Version number mismatch.

No available connections at the requested host.

Unable to locate the requested host.
```

**Network Component Malfunctions:** The following messages can indicate a temporary problem somewhere on the network. Try the CONNECT command again. If you continue to receive one of these messages, some network component may not be operating correctly. Report the specific message to your administrator.

```
Connection request rejected by host controller(s).

Connection request rejected - NME could not log the connection.

Connection request rejected - No resources available.

Connection request rejected - Protocol error.

No buffers available to make the request.
```

# Checking Session Status: The STATUS Command

The STATUS command displays information about all of your active sessions; that is, the sessions on which you have a connection to a host. It also displays your current session and marks it with an arrow even if it is free. For each connection, STATUS tells you the host to which you are connected (node name is the same as host name), its LAN address, and the number of packets received and transmitted during the connection. (Note that no packets are received or transmitted while a session is inactive.) The LAN address and the number of packets are of little concern to you, but they might assist the administrator in troubleshooting. STATUS also indicates the state of each session: not active, connecting, connected, or disconnecting. For a complete description of these session states, refer to Chapter 5, STATUS Commands. If you enter STATUS when you have no connections established, the LTS displays No active connections. In the example below, the user enters the STATUS command on session 3, a free session.

```
<3>CMD: STATUS
     Session                                                    Packets
     Number  State           Host Name     Network Address    Transmitted/
     Received
        1    connected       PAUL          08-00-2F-01-18         141/18
        2    connected       PETER         08-00-2F-03-F1      23632/1384
      ->3    not active
        4    disconnecting   JOHN          08-00-2F-03-1D    5848393/25032
        5    connected       TOM           08-00-2F-04-32        503/487
        8    connected       DICK          08-00-2F-05-2C       9163/205
```

# Breaking Connections

You can end a session with a LAN300 host in one of three ways: by using LOGOUT, a PRIMOS command; by using DISCONNECT, an LTS command; or by turning off your terminal for at least ten seconds. (Turning off your terminal does not work if you disable the DCD connection control parameter. For information on DCD connection control, see Chapter 3, LTS Parameters.)

**Note**

At Rev. 22.0, the QUIT command is no longer supported. Use DISCONNECT –ALL instead.

## The LOGOUT Command

The PRIMOS command LOGOUT is the best way to break your connection to an NTS host when you are in data transfer mode. LOGOUT logs you out of the host computer and breaks your NTS connection in one step. After the connection is broken, the PRIMOS line you were using becomes available for other NTS users. In the following example, the user logs out of the host computer called SYSA. LO is an abbreviation for LOGOUT.

```
OK, LO
SYSA Disconnected on session 1.
<1>CMD:
```

Because logging out breaks a connection in only one step, you may find it more convenient than the LTS DISCONNECT command, which requires you to return to command mode before entering the command.

## The DISCONNECT Command

The DISCONNECT command breaks an NTS connection when you are in command mode. You can break the connection on your current session (the one whose number appears in your prompt), another session, or all sessions at once. Once a session is disconnected, it is free. You can then use it to make another connection. The DISCONNECT command has the following syntax:

$$\text{DISCONNECT} \atop \text{D} \qquad \left[ \left\{ {n \atop \text{-ALL}} \right\} \right]$$

After the connection is broken, PRIMOS automatically logs you out. However, because the connection is already broken, you do not receive any logout messages.

**Disconnecting Your Current Session:** When you enter DISCONNECT without a session number or the -ALL option, the LTS breaks the connection on your current session. In the following example, the user enters DISCONNECT to break the connection to the host BIXBY on the current session, session 2. The first part of the prompt indicates the session number. D is an abbreviation for DISCONNECT.

```
<2>CMD: D
BIXBY Disconnected.
```

**Breaking the Connection on a Specific Session:** To break the connection on a session that is not your current session, enter DISCONNECT followed by the number of the target session. To list the session numbers of all your connections, use the STATUS command, described in the section entitled Checking Session Status: The STATUS Command. Using this method saves you the trouble of having to first switch to the session and then break the connection. (For more information about switching see the section entitled Switching Between Sessions: The SWITCH Command.) For example, to break the connection on session 8 when session 2 is your current session, enter the following command:

```
<2>CMD: D 8
BOBO Disconnected.
<2>CMD:
```

**Breaking the Connections on All Sessions at Once:** To break the connections on all of your sessions at once, enter DISCONNECT -ALL. The LTS terminates all open connections and makes session 1 your current session. Using DISCONNECT -ALL saves you the trouble of breaking each connection individually when you are finished with your work. PRIMOS automatically logs you out as the connections are broken. In the following example, the user had three active connections before entering DISCONNECT -ALL.

```
<3>CMD: DISCONNECT -ALL
BIXBY Disconnected.
BOBO Disconnected.
ZIPPO Disconnected.
<1>CMD:
```

**DISCONNECT Error Messages:**   The DISCONNECT command can fail for the following reasons:

A command line delimiter was found where one was not expected.
   The DISCONNECT command does not accept delimiter characters.

No connection exists.
   You entered a disconnect request when you were not connected on the current session (DISCONNECT), or the target session *n* (DISCONNECT *n*).

No connections exist.
   You entered DISCONNECT –ALL when you were not connected on any sessions.

No resources available to make the disconnect request.
   The LTS cannot process your request because it is busy. Try the command again. If the problem persists, contact your administrator.

Option other than those allowed has been specified.
   You entered an option other than –ALL, the only one accepted by DISCONNECT.

The session number must be within the range 1-8.
   You entered a session number other than 1 through 8.

**Messages on Unrequested Disconnects:**   During normal operation, you stay connected to a LAN300 host until you break the connection. In special situations, however, the LTS may break a connection on its own. If you receive any of the following messages, the LTS has broken your connection. The messages are listed in alphabetical order.

Disconnecting because DCD disappeared.
   The LTS broke the connection because the Data Carrier Detect (DCD) signal from your terminal disappeared for more than 10 seconds. For information on this situation, see the section on DCD connection control in Chapter 3, LTS Parameters.

Disconnecting because the host is down.
   The LTS broke the connection because the other end of the connection, the LAN300 host, is no longer active.

`Disconnecting due to version number mismatch in configuration block.`
> The LTS broke the connection because the version of software running at the host (in the LHC) is not compatible with the version of software running in the LTS. Contact the administrator.

`Disconnecting due to protocol error.`
> The LTS broke the connection because of a communication failure between the LTS and the LHC at the other end of the connection. Try connecting again. If the problem recurs, contact the administrator.

## Turning Off Your Terminal

If the other methods fail, you can break a connection by turning your terminal off for at least 10 seconds. (This option does not work if you disable the DCD connection control parameter. For information on DCD connection control, see Chapter 3, LTS Parameters.)

# Switching Modes: The LTS Escape Character

To issue any LTS command, you must be in LTS command mode, not data transfer mode. You do not need to break a connection with a LAN300 host in order to return to LTS command mode. You can maintain the current connection and go back to command mode temporarily by typing the LTS escape character. This character tells the LTS to put you into command mode without breaking your connection.

## Using the LTS Escape Character

The default LTS escape character is ⌈Ctrl⌋ ⌊\⌋ (backslash). (To type this character, hold down the CONTROL key while you press the \ key.)

Any time you are in data transfer mode, typing the LTS escape character puts you into command mode. The LTS escape character does not need to be the first or only character on a line. For this reason, you need an escape character that you do not use during your normal work. Otherwise, you can switch to command mode when you have no intention of doing so.

If you type the LTS escape character by mistake, use the CONTINUE command to resume your session with the host. (The CONTINUE command is covered later in this chapter.)

Most of the time, you can probably use ⌈Ctrl⌋ ⌊\⌋, the default LTS escape character, without any problems. Sometimes, however, you may need to use ⌈Ctrl⌋ ⌊\⌋ as an ordinary character. For example, an application program can use ⌈Ctrl⌋ ⌊\⌋ to perform a function within that program. The LTS allows you to change the escape character to some other character, or to disable the LTS escape character entirely. Then you can use ⌈Ctrl⌋ ⌊\⌋ in the program. (To change or disable the LTS escape character, use the ESCAPE or SET command, which is covered in the next section.)

Examine each application program that you plan to use so that you can determine whether or not a particular LTS escape character is used to perform a function in the program. For example, the default LTS escape character, [Ctrl] [\], has a defined function in PRIMELINK™. If you use PRIMELINK, [Ctrl] [\] is not a safe escape character and you need to define another LTS escape character. In EMACS, on the other hand, [Ctrl] [\] has no predefined function and you would not normally type [Ctrl] [\] as part of an EMACS session. Therefore, [Ctrl] [\] is a safe LTS escape character for use with EMACS.

## Different Escape Characters for Each Session

You can define a different escape character and enable or disable it for each of your eight sessions. For an explanation of how to do this, see the section in this chapter entitled Defining Your Escape Character: The ESCAPE Command. For example, you could define an escape character that does not interfere with PRIMELINK for session 1, and then always use session 1 when connecting to the host where you use PRIMELINK. In this way, you can set up a set of convenient escape characters once and then use them simply by choosing the right session number for each connection.

## Displaying the LTS Escape Characters

If you forget which character is the escape character or whether it is enabled, you can enter the ESCAPE command. You can also enter ESCAPE −ALL to display the escape characters and their status (enabled or disabled) for all eight sessions.

**Displaying the Escape Character for a Specific Session:** To check the escape character and its status for a specific session, make the session your current one with the SWITCH command (described later in this chapter) and then enter the ESCAPE command. In the following example, the user checks the escape character for session 3. The escape character for session 3 is [Ctrl] [\], the default; it is enabled.

```
<1>CMD: SWITCH 3
<3>CMD: ESCAPE
SESSION #      ESCAPE CHARACTER      STATUS
    1                  ^\            enabled
```

**Displaying the Escape Characters for All Eight Sessions:** To display the escape characters and their status (enabled or disabled) for all eight of your sessions, enter ESCAPE −ALL. In the following example, all of the escape characters are enabled except for the one for session 4. All of them are the default escape character, [Ctrl] [\], except for the ones for sessions 2 and 7, which are # and ?. For information about changing, disabling, and reenabling escape characters, see the section entitled Defining Escape Characters: The ESCAPE Command.

```
<1>CMD: ESCAPE -ALL
SESSION #     ESCAPE CHARACTER     STATUS
    1               ^\             enabled
    2               #              enabled
    3               ^\             enabled
    4               ^\             disabled
    5               ^\             enabled
    6               ^\             enabled
    7               ?              enabled
    8               ^\             enabled
```

## What to Do When Problems Occur

Changing or disabling the LTS escape character takes care of most problems with the escape character. The only other problems occur in unusual conditions, when the network is so busy that network traffic slows down or stops. The potential problems, and the steps you can take to avoid or solve them, include the following:

**You typed the LTS escape character by mistake.**

Type CONTINUE to go back to your session with the host.

**You need to use the LTS escape character as an ordinary character.**

Define a different character as the LTS escape character using the ESCAPE command.

**You are using an application that requires the entire character set. There is no character you can use for an escape character.**

Disable the LTS escape character temporarily using the ESCAPE command or use the PRIMOS command NTS_LINE -CMD (explained later in this chapter).

**The host did not respond to the last few characters typed before you escaped to command mode.**

The host never received those characters. Because of heavy network traffic, the LTS was not able to forward your characters to the host immediately. When you typed the escape character, the LTS put you into command mode and discarded the characters it was waiting to send. To avoid this problem, do not type the LTS escape character until all the characters you type appear on your terminal screen. If the host echoes characters to your screen, you can be sure that the host received those characters.

**The characters you type do not appear on your screen and nothing happens when you type the LTS escape character.**

Network traffic is not moving at all. Your terminal is not forwarding any characters to the LTS. To escape to command mode in this situation, turn your terminal off, wait at least ten seconds, and turn it back on. The LTS breaks the connection and returns you to command

mode. (If you disabled the DCD connection control parameter, type the escape character again after you turn the terminal on. Then use the DISCONNECT command to break the connection.)

**Note**

For more detailed information on how network traffic can affect the LTS escape character, see the information on flow control in Chapter 3.

# Switching Modes: The NTS_LINE Command

You can use the PRIMOS NTS_LINE command as an alternative to the LTS escape character. If you have disabled the LTS escape character during a connection and you want to issue an LTS command, this command allows you to return to LTS command mode without breaking the connection.

From PRIMOS, enter the NTS_LINE command with the −CMD or −COMMAND option. This command returns you from data transfer mode to LTS command mode, where you can enter any LTS commands.

The syntax of this command is

$$\text{NTS\_LINE} \left\{ \begin{array}{l} \text{−COMMAND} \\ \text{−HELP} \end{array} \right\}$$

The −COMMAND (or −CMD) option returns you to command mode. Use the −HELP (or −H) option to display information about the NTS_LINE command.

The NTS_LINE −CMD command does not reenable your LTS escape character. The escape character remains disabled until you reenable it with the LTS ESCAPE or SET command.

## NTS_LINE Command Error Messages

If the NTS_LINE command does not succeed, PRIMOS displays one of the following messages. The messages are listed in alphabetical order.

```
Device output queue full. (NTS_LINE)
```
The host is busy. Try the command again. If the problem persists, call your administrator.

```
Invalid command syntax. (NTS_LINE)
```
You issued the NTS_LINE command without any options. You must include either −HELP or −CMD in an NTS_LINE command.

`Line not connected. (NTS_LINE)`
> You gave the command from a terminal that is not part of a LAN300.

`No other option allowed with -HELP. (NTS_LINE)`
> You gave the command with both the -HELP and -COMMAND options. Only one is allowed.

`No XCB available for request. (NTS_LINE)`
> This message usually indicates a software failure, either in PRIMOS or in the LAN Host Controller. Try the command again. If the problem persists, call your administrator.

# Resuming a Connection: The CONTINUE Command

After you escape to command mode, you need a way to get back to your session with the host. The LTS CONTINUE command returns you to the current connection exactly where you left off without repeating the login dialog.

The syntax of the CONTINUE command is

> **CONTINUE [n]**
> **CO**

You can continue your current session, or the session you indicate with *n*. The STATUS command, described earlier in this chapter, displays information about the connections you have established on each session.

## Resuming the Current Session

To return to the connection on your current session, enter CONTINUE without an argument. The following example shows how to establish a connection to a host named SYSA, return to command mode, and then continue the connection.

```
<1>CMD: CONNECT SYSA
SYSA Connected.

OK, LOGIN GEORGE
Password?

GEORGE (user 16) logged in Thursday, 3 July 88 14:33:56
Welcome to PRIMOS version xxx
Copyright (c) Prime Computer, Inc. 1988
```

```
OK,
  .
  .
  .

OK, COPY <DISK1>GEORGE  Ctrl   \
<1>CMD: ESCAPE -OFF

<1>CMD: CONTINUE

>MY_FILE <DISK1>LINDA>NEW_FILE

OK,
```

If you enter CONTINUE when you are not connected to a host on the current session, you receive the message No connection exists.

## Resuming a Different Session

To resume a connection on a session other than your current one, enter CONTINUE *n*, where *n* is the number of the target session. (The STATUS command, described earlier in this chapter, shows the host to which you are connected on each session.) This method is easier than switching to the target session and then entering CONTINUE. For example, if you are communicating with a host on session 1 and want to check something on another host on session 3, enter the following sequence of commands. (# is the escape character for session 1.)

```
OK, #
<1>CMD: CO 3
```

If you enter CONTINUE *n* when you are not connected to a host on session *n*, the LTS displays the message No connection exists. If you enter CONTINUE with an argument other than 1 through 8, the LTS displays the message

```
Session number must be within range 1 - 8
```

# Switching Between Sessions: The SWITCH Command

The SWITCH command switches you to another session; that is, it makes another session your current one. It has the following syntax:

SWITCH [*n*]

where *n* is number of the session you want to switch to. If you enter SWITCH without a session number, the LTS switches you to the next highest session number, or to session 1 if session 8 is your current session. For example,

```
<8>CMD: SWITCH
<1>CMD:
```

The STATUS command, described earlier in this chapter, shows the host to which you are connected on each session. If you enter a session number other than 1 through 8, the LTS displays the message Session number must be within range 1 - 8.

# Defining the Escape Character:
# The ESCAPE Command

The LTS ESCAPE command displays the current LTS escape character, changes the escape character, disables the escape character temporarily so that you can use all characters as data, or reenables the escape character. You can perform all of these functions for your current session, or for all eight sessions at once. (You can also change or disable the LTS escape character with the SET command, which is explained in Chapter 4, Setting Parameters.) Because the ESCAPE command is an LTS command, you must be in LTS command mode to use it. The ESCAPE command has the following format:

$$\begin{matrix} \text{ESCAPE } [\textit{escape-character}] \\ \text{ESC} \end{matrix} \left[ \left\{ \begin{matrix} \text{-ON} \\ \text{-OFF} \end{matrix} \right\} \right] \text{[-ALL] [-DEFAULT]}$$

## Changing Your LTS Escape Characters

You can define a new escape character for any of your eight sessions, or for all eight sessions at once.

**Changing the Escape Character for a Specific Session:** To change the escape character for one of your sessions, make the session your current one with the SWITCH command and then enter ESCAPE followed by the new escape character. For example, to change the escape character to $ on session 5, enter the following commands:

```
<2>CMD: SWITCH 5
<5>CMD: ESCAPE $
```

You can use any character as the LTS escape character, except for the following:

- The LTS reserved characters: carriage return, space character, semicolon, colon, comma.

- The LTS command mode editing characters: erase character, line erase character, line display character. The default editing characters are backspace, question mark, and ⌷Ctrl⌷ ⌷L⌷.

- XON or XOFF characters: ⌷Ctrl⌷ ⌷Q⌷, ⌷Ctrl⌷ ⌷S⌷.

A combination of [ Ctrl ] and any other character counts as only one character. So you can define [ Ctrl ] and another character as the LTS escape character. However, because they have other LTS functions, you cannot use [ Ctrl ] [ Q ], [ Ctrl ] [ S ], or [ Ctrl ] [ L ] (if that is your line display character).

**Note**

> If you are a NETLINK user, make sure that your LTS escape character is different from the NETLINK escape character. If the escape characters are the same, typing an escape character always returns you to LTS command mode. You cannot return to NETLINK command mode during a NETLINK session if the two escape characters are the same. The default NETLINK escape character is @.

[ Ctrl ] [ ^ ] is often a good substitute for the LTS default escape character [ Ctrl ] [ \ ].

**Changing the Escape Character for All Eight Sessions:**   The procedure for changing the escape character for all eight sessions at once is the same as for a single session (described above), except that you must use the –ALL option. To change the escape character to * for all eight of your sessions, enter the following command:

```
<2>CMD: ESCAPE * -ALL
```

It does not matter which session is your current one when you enter the command.

## Disabling and Reenabling the Escape Character

If you want to use the LTS escape character as an ordinary character, you can disable the escape character. For example, you might want to use a host application program that utilizes every character on the keyboard. You can disable or reenable the escape character for a specific session, or for all eight sessions at once.

**Note**

> After you disable the LTS escape character, you can still return to command mode during a connection.  Use the PRIMOS command NTS_LINE –CMD, explained in the next section.

**Disabling or Reenabling the Escape Character for a Specific Session:**   To   disable the LTS escape character for your current session, escape to command mode and enter the ESCAPE command with the –OFF option:

```
<1>CMD: ESCAPE -OFF
```

To reenable the LTS escape character, use the –ON option:

```
<1>CMD: ESCAPE -ON
```

To enable or disable the escape character for a session that is not your current session, first switch to that session with the SWITCH command (described later in this chapter), and then enter ESCAPE –ON or ESCAPE –OFF. For example, to enable the escape character on session 2 when your current session is number 1, enter the following commands.

```
<1>CMD: SWITCH 2
<2>CMD: ESCAPE -ON
```

You can change your escape character and enable or disable it at the same time. Enter ESCAPE, the new escape character, and then –ON or –OFF. For example, to define an exclamation point as the LTS escape character and turn off the escape character function in a single command, enter

```
<1>CMD: ESCAPE ! -OFF
```

**Disabling or Reenabling the Escape Character for All Eight Sessions:** To disable the escape character for all eight of your sessions, enter ESCAPE –OFF –ALL. To reenable the escape character for all eight sessions, enter ESCAPE –ON –ALL. You can also change the escape character and disable or reenable it at the same time:

```
<1>CMD: ESCAPE ^ -OFF -ALL
```

It does not matter which session is your current one when you enter the command.

## Saving Your Escape Information Permanently

If you use the –DEFAULT option when you define a new escape character, the LTS activates the new character for your current session and also saves the character in Electrically Alterable Read-only Memory (EAROM). Likewise, if you use the –DEFAULT option when disabling or reenabling the escape character, the LTS disables or reenables the escape character for your current session and also records in EAROM that the character is enabled or disabled. (You can perform the same function with the SET –DEFAULT command, described in Chapter 4, Setting Parameters.) For example, the following command changes the escape character to & for the current session and saves the new escape character in EAROM.
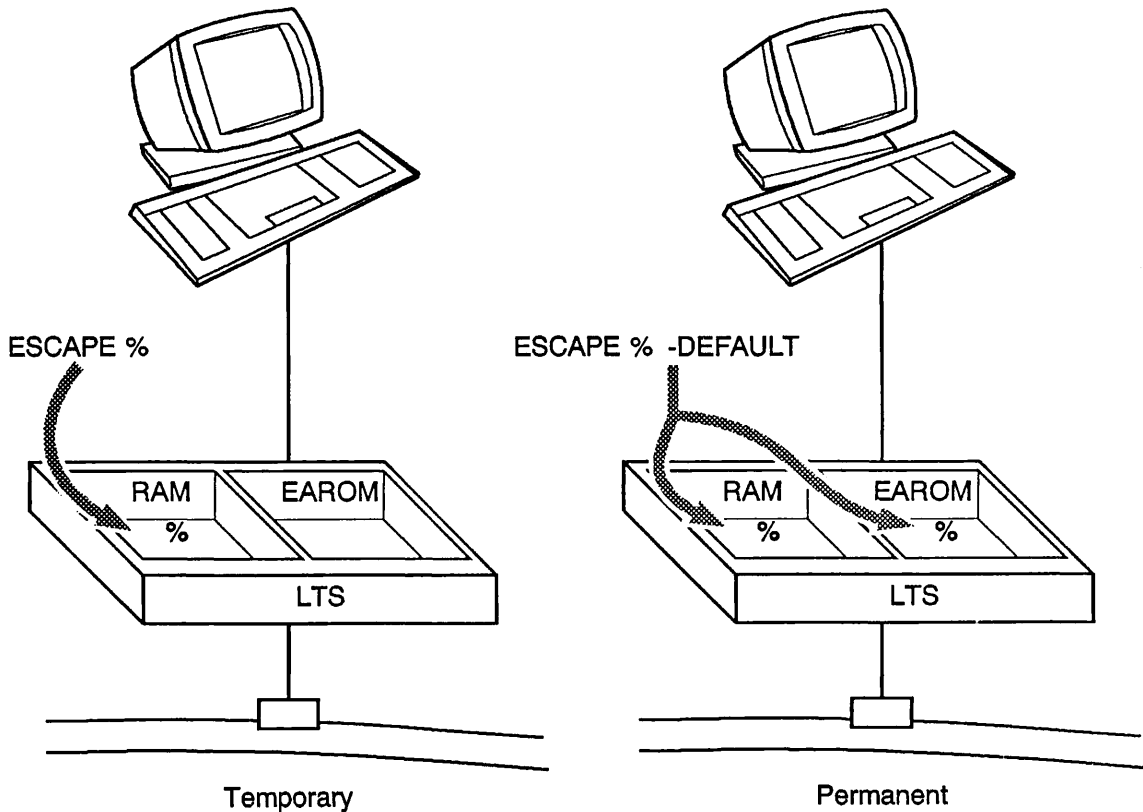
```
<2>CMD: ESCAPE & -DEFAULT
```

The following command performs the same functions, but it also disables the escape character, both for the current session and in EAROM.

```
<2>CMD: ESCAPE & -OFF -DEFAULT
```

You can save only one escape character and escape character status (disabled or enabled) in EAROM, not one for every session. If the LTS is powered off and then on again, anything stored in EAROM is still available. The LTS gives all eight sessions the escape character stored in EAROM and enables or disables the escape characters for all eight sessions, as indicated in EAROM.

Without the −DEFAULT option, however, the new escape character is stored in Random Access Memory (RAM) only. Unlike the contents of EAROM, RAM contents are lost when the LTS is powered off or reinitialized. When the LTS begins functioning again, it reactivates the factory default LTS escape character ( Ctrl  \ ) and enables it or, if you used the −DEFAULT option previously, whatever character and status (enabled or disabled) is stored in EAROM. (Chapter 4, Setting Parameters, contains more information about EAROM.) Figure 2-3 shows the ESCAPE command with and without the −DEFAULT option.

ESCAPE %                              ESCAPE % -DEFAULT

RAM      EAROM                    RAM      EAROM
%                                 %          %
LTS                                    LTS

Temporary                              Permanent

*QI0117-2LA-I2-3*

**Figure 2-3**
**Defining Temporary and Permanent Escape Characters**

## ESCAPE Command Error Messages

If your ESCAPE command does not execute, the LTS displays one of the following error messages. The messages are listed in alphabetical order.

A command line delimiter has been found where one was not expected.
You entered a comma, semicolon, or colon. The LTS does not allow you to use any of these characters as an escape character.

An escape character must be entered when the -DEFAULT option is used.
You used the -DEFAULT option but you forgot to define an escape character or enable or disable it. Try again.

Both the -ON and the -OFF options have been specified.
You cannot use the -ON and -OFF options at the same time. Give the command again, using -ON or -OFF, but not both.

Command option other than those permitted has been used.
You specified an option other than -ON, -OFF, or -DEFAULT. Enter the command again.

No resources available.
The LTS cannot process your command because it is busy. This condition should be temporary; try again. If the problem persists, notify your administrator.

The escape character cannot be set to the XON or XOFF characters.
You cannot use [Ctrl] [Q] (the XON character) or [Ctrl] [S] (the XOFF character) as the escape character.

The -OFF option has been specified twice.
Do not specify -OFF more than once.

The -ON option has been specified twice.
Do not specify -ON more than once.

## Changing the LTS Prompt: The PROMPT Command

The default prompt for LTS command mode is <n>CMD:, where n is the current session number. The PROMPT command allows you to change the text portion of the prompt. It also allows you to change back to the default prompt without entering any text. The command syntax is

PROMPT [*prompt-message*]

## Changing Your LTS Prompt

To change the text portion of your LTS prompt, enter the PROMPT command followed by the new text. You cannot change the first part of the prompt <*n*>, which indicates the number of your current session. Your new prompt text must be no longer than 16 characters and cannot contain any of the LTS reserved characters (space, comma, semicolon, or colon).

For example, to change the prompt to LTS>, enter the following command:

```
<1>CMD: PROMPT LTS>
<1>LTS>
```

The LTS automatically supplies one blank space after all prompts so that anything you type is separated from the prompt by one space.

When you change the prompt, the LTS does not save the new prompt in EAROM (in other words, there is no –DEFAULT option). When the LTS is reinitialized, it reactivates the default prompt, <1>CMD:.

To avoid confusion, make your LTS prompt different from your PRIMOS prompt. Otherwise, you may not be able to tell whether you are in command mode or data transfer mode. The default PRIMOS prompt is OK,. (During data transfer mode, you can change the PRIMOS prompt to a message of your choice using the PRIMOS RDY command with the –READY_BRIEF option.)

If you are a NETLINK user, define your LTS prompt so that it is different from your NETLINK prompts. Otherwise, you can easily lose track of whether you are in LTS or NETLINK command mode.

If you specify a prompt message over 16 characters long, the LTS sends you the error message Prompt message is too long.

## Changing Back to the Default Prompt

If you change the prompt and then want to reactivate the default prompt, <1>CMD:, enter the PROMPT command without any prompt message in the command. For example,

```
<1>LTS> PROMPT
<1>CMD:
```

# Summary of Common LTS and PRIMOS Commands for NTS Users

The LTS and PRIMOS commands covered in this chapter are summarized in Table 2-1. (A summary of all LTS commands is available in Appendix A, LTS Command Summary.)

**Table 2-1**
**Common LTS and PRIMOS Commands for NTS Users**

| LTS Commands (Command Mode) | PRIMOS Commands (Data Transfer Mode) | Function |
|---|---|---|
| CONNECT | | Making a connection |
| DISCONNECT [N] | LOGOUT | Breaking a connection |
| | [Ctrl] [\]* NTS_LINE −CMD | Escaping to LTS command mode |
| STATUS | | Displaying session status |
| CONTINUE [N] | | Continuing a session |
| SWITCH [N] | | Switching between sessions |
| [Backspace]* | [ ¨ ]* | Erasing a character |
| [?]* | [?]* | Erasing a line |
| [Ctrl] [L]* | | Displaying the command line |
| PROMPT message | RDY −READY_BRIEF message | Changing the prompt |
| ESCAPE [−ALL] | | Displaying the escape character |
| ESCAPE char [−ALL] | | Changing the escape character |
| ESCAPE $\left[\left\{ \begin{array}{c} \text{−OFF} \\ \text{−ON} \end{array} \right\}\right]$ [−ALL] | | Disabling or enabling the escape character |

\* Or whatever character you have defined for this function.

The commands and functions covered in this chapter are the only ones that many NTS users need. However, there are other NTS commands that you can use to customize your NTS line, to correct communication problems between your terminal and LTS, or to obtain status information. Chapter 3, LTS Parameters, covers the parameters you can change to customize your line. Chapter 4, Setting Parameters, covers the commands that change those parameters. Chapter 5, Status Commands, describes the commands available for obtaining status information.

# LTS Parameters

NTS allows you to define 23 parameters for your terminal's LTS line. This chapter provides an overview of parameter functions and includes a description of each parameter.

Although this chapter provides information about all of the parameters, you probably do not need to take any action on most of them. Instead, you can simply use the default settings, those that the LTS uses in the absence of specific instructions from you.

**Note**

Most users need to know about only a few LTS parameters. For example, you should know how to *use* the following parameters:

The escape character
The erase character
The line erase character
The line display character

Information on using these parameters is available in Chapter 2, Basic LTS Commands.

If you want to define a different character as the LTS escape character or disable the escape character, see the information in Chapter 2 on the ESCAPE command.

To define different editing characters, read about the appropriate parameters in this chapter and follow the directions for the SET command in Chapter 4, Setting Parameters.

## Introducing LTS Parameters

LTS parameters allow you to customize communication sessions at your terminal. For example, you can define the line's baud rate to match any of 16 terminal baud rates, change your LTS erase character, or set up different kinds of flow control between your terminal and LTS. Your terminal's LTS keeps track of the parameters for your terminal as well as the parameters for any other attached terminals.

Several options are available for changing these parameters. When you are in LTS command mode, you can use the LTS PORT, SET, and ESCAPE commands to change parameter settings. After you establish a connection to a LAN300 host and log in, you can change some of your LTS parameters from the PRIMOS side with the PRIMOS command SET_ASYNC. Your administrator can also change your LTS parameters by issuing SET_ASYNC commands. (Chapter 4, Setting Parameters, tells you how to use these commands.)

The sections that follow describe each of the 23 LTS parameters that you can change. Each parameter description includes a chart that lists the following information:

- Parameter name (the shorthand name used by the LTS)

- Parameter number

- Factory default setting

- Choices for parameter settings (including code numbers)

- Parameter set(s) of which the parameter is a member (for more information, see LTS Parameter Sets in Chapter 4)

- LTS commands that change the parameter setting

- PRIMOS commands that change the parameter setting

The parameter name, number, and code numbers are important when you use some of the LTS commands (the SET and SHOW commands, for example).

For quick reference, the same charts are also included in Appendix B, LTS Parameter Summary.

## Global Port Parameters

The global port parameters are baud rate, bits per character, DCD connection control, LTS messages, parity, and number of stop bits. These parameters are called global because whenever you set one of them (with PORT or SET as explained in Chapter 4, Setting Parameters) the setting affects command mode and all eight sessions. In other words, the settings of these parameters control the entire LTS port that your terminal is attached to. Therefore, they are described first because they are critically important. Each of these parameter settings must match the current settings of your terminal (settings activated by physical switches or terminal software). Otherwise, your terminal cannot communicate with the LTS. (The DCD connection control and LTS messages parameters generally do not have corresponding terminal switch or terminal software settings.)

Terminal settings are controlled by physical switches on some terminals and by software functions on others. For example, the PT45 terminal uses physical switches, the PST100 uses physical switches and software functions, and the PT200 uses software functions only. If you do not know how to set your terminal's operating characteristics, check the manual that came with your terminal or ask your administrator for help.

The default settings for these parameters work correctly with the default terminal settings for PT200, PST100, and PT45 terminals. If your terminal can communicate with your LTS and with PRIMOS, leave these parameters as they are, unless you have a special reason to change them.

## Baud Rate

The baud rate parameter tells the LTS what baud rate (transmission speed) to use when communicating with your terminal. The LTS supports the following baud rates, in bits per second:

| | | | |
|---|---|---|---|
| 50 | 150 | 1200 | 4800 |
| 75 | 200 | 1800 | 7200 |
| 110 | 300 | 2400 | 9600 |
| 134.5 | 600 | 3600 | 19200 |
| | | | Auto |

Auto Speed Detect is the setting for this parameter when the LTS leaves the factory. The first time an LTS line is used, someone types a series of carriage returns at an attached terminal. The LTS uses those characters to determine the transmission speed of the terminal. The LTS then changes the baud rate parameter to match the terminal's baud rate. The new parameter setting is saved in EAROM, so that it becomes the default setting until you change it, even if the LTS is reinitialized.

LTS Auto Speed Detect can work correctly with the default settings on PT200, PST100, and PT45 terminals. If someone has changed the terminal settings, or if you are using some other type of terminal, set up the terminal as follows:

1. Set PT200, PST100, and PT45 terminals for seven bits per character with space parity or with parity ignored. (Seven bits per character with space parity or with parity ignored is the default setting for these terminals.) On these terminals, do not use the settings for eight-bit characters, because those settings are for special international character sets. For terminals made by other vendors, seven bits per character with space parity or with parity ignored should also work correctly.

2. Ensure that the terminal is using one stop bit.

3. Ensure that the terminal is operating at one of the following speeds:

| | |
|---|---|
| 110 | 2400 |
| 300 | 4800 |
| 600 | 9600 |
| 1200 | 19200 |

After Auto Speed Detect is complete, you can change the baud rate, bits per character, parity, or number of stop bits to other settings if you need to. Follow these steps:

1. Change the appropriate LTS parameter with the PORT or SET command. (For instructions, see Chapter 4, Setting Parameters.)

2. Change the terminal settings.

**Baud Rate**

| | |
|---|---|
| Parameter name | BAUD |
| Parameter number | 11 |
| Default | Auto Speed Detect (32) |
| Choices | |

| | |
|---|---|
| 0 - 110 | 10 - 50 |
| 1 - 134.5 | 12 - 2400 |
| 2 - 300 | 13 - 4800 |
| 3 - 1200 | 14 - 9600 |
| 4 - 600 | 15 - 19200 |
| 5 - 75 | 30 - 3600 |
| 6 - 150 | 31 - 7200 |
| 7 - 1800 | 32 - Auto Speed Detect |
| 8 - 200 | |

| | |
|---|---|
| Parameter set | Global |
| LTS commands | PORT, SET |
| PRIMOS command | SET_ASYNC −SPEED |

**Note**

When you use the PORT command to change the baud rate parameter, you specify the actual baud rate (for example, 9600). When you use the SET command, you enter a code number (for example, 14) instead of the actual baud rate. For instructions on using the PORT and SET commands, see Chapter 4, Setting Parameters.

## Bits per Character

The bits per character parameter tells the LTS how many data bits your terminal uses for one character. This count does not include the parity bit or the start and stop bits.

**Bits per Character**

| | |
|---|---|
| Parameter name | BPC |
| Parameter number | 50 |
| Default | 8 |
| Choices | 5, 6, 7, or 8 |
| Parameter set | Global |
| LTS commands | PORT, SET |
| PRIMOS command | SET_ASYNC –CHAR_LENGTH |

## DCD Connection Control

The DCD connection control parameter determines whether the LTS will break an existing connection after the terminal's Data Carrier Detect (DCD) signal is lost for 10 seconds. DCD is one of the Electronic Industries Association (EIA) standard electrical signals sent over the physical wire from the terminal to the LTS.

You can tell the LTS to break the connection (the default) or not to break the connection.

This parameter does not necessarily have a corresponding physical switch or software setting on your terminal. Most people use the default setting. Usually, a 10-second loss of the DCD signal from the terminal means that the terminal has stopped functioning; someone has turned the terminal off or unplugged the power cord, or the terminal has malfunctioned. In most cases, it is a good idea to free the line by breaking the connection. With the default setting, the LTS breaks the connection automatically if it does not receive DCD from the terminal for 10 seconds.

However, you might want to keep a connection going if your terminal is accidentally turned off or the power cord is unplugged by mistake. By changing this parameter setting, you can tell the LTS to maintain the connection when DCD drops.

You might also want to change this parameter if your terminal is attached to a switch box, with one of the lines connected to the LTS. A switch box allows you to activate physical lines to different devices with physical switches. For example, one of the switch box lines could attach to an LTS, while others might attach to hosts that are not on the LAN300 (see Figure 3-1).

Switching from Line A to Line B causes DCD to drop on Line A. If you want to keep a connection on Line A while you temporarily activate Line B, you can change this parameter setting. Changing the parameter setting to 0 (do not break the connection when DCD drops) tells the LTS to maintain the connection, even in the absence of DCD from the terminal.

The DCD signal can also be used for flow control. If you enable EIA flow control, the LTS stops sending data to the terminal when DCD drops. (See the section on EIA flow control later in this chapter for more information.) You can use DCD for flow control or for connection control, but not for both. If you enable EIA flow control, that parameter takes precedence over the use of DCD for connection control. When DCD changes, the LTS starts or stops flow control instead of breaking connections. If you want to use DCD to control connections, make sure you disable EIA flow control.

This parameter is used for LTS functions only; it has no PRIMOS counterpart.

**DCD Connection Control**

Parameter name            DCD_DROP
Parameter number          63
Default                   Break the connection when DCD drops (1)
Choices                   0 - Do not break the connection when DCD drops
                          1 - Break the connection when DCD drops
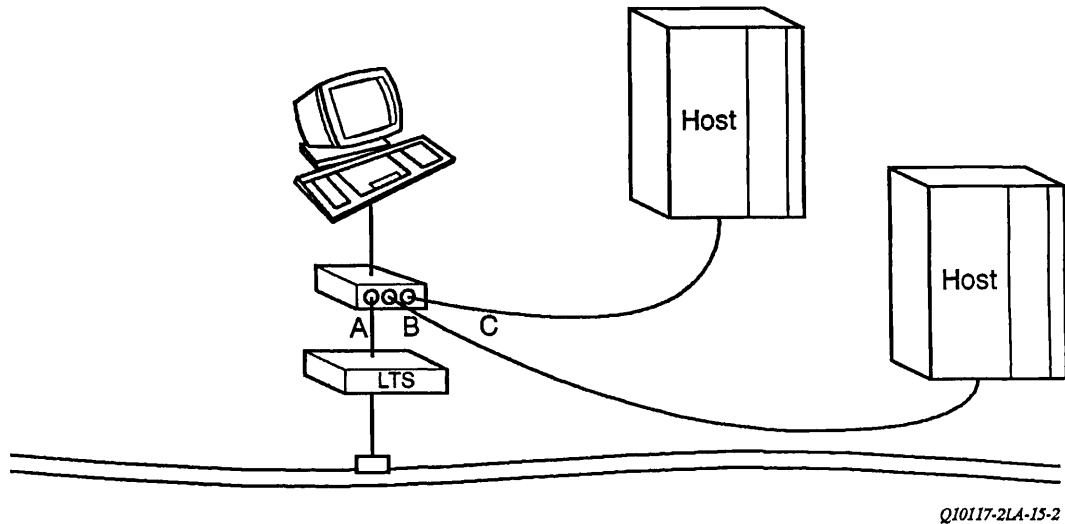Parameter set             Global
LTS command               SET



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**Figure 3-1**
**Terminal Attached to a Switchbox**

## LTS Messages

Ordinarily, you want the LTS to send its prompts and messages to your terminal screen. The prompts and messages make it easy for you to communicate with the LTS. Sometimes, however, you might want to suppress the LTS messages. The LTS messages parameter does not have a corresponding physical switch or software setting on your terminal. For example, if you are writing a file to disk during data transfer mode and you want to make sure that no extra data is recorded on the disk, you can tell the LTS to stop sending messages to your terminal. Later, you can reactivate the LTS prompts and messages.

To tell the LTS to stop sending messages to your terminal, you can set this parameter to stop all messages from the LTS. If you want the LTS to inform you of any errors, you can set the parameter to suppress the LTS prompt but transmit other messages.

**LTS Messages**

| | |
|---|---|
| Parameter name | SERVSGNL |
| Parameter number | 6 |
| Default | LTS transmits all messages (5) |
| Choices | 0 - LTS does not transmit any messages |
| | 1 - LTS transmits all but prompt messages |
| | 5 - LTS transmits all messages |
| Parameter set | Global |
| LTS command | SET |

## Parity Treatment

Some devices use an extra bit, the parity bit, to check for errors during transmission of a character. The LTS needs to know whether your terminal uses a parity bit and, if so, whether it uses even or odd parity.

The parity treatment parameter allows you to enable or disable parity (the default setting is parity disabled). If you enable parity, the LTS uses the high-order bit of each character for parity purposes.

**Parity Treatment**

| | |
|---|---|
| Parameter name | PARITY_TREATMENT |
| Parameter number | 21 |
| Default | Parity disabled (0) |
| Choices | 0 - Parity disabled |
| | 3 - Parity enabled |
| Parameter set | Global |
| LTS commands | PORT, SET |
| PRIMOS command | SET_ASYNC -PARITY |

## Parity Type

The choices for parity type are odd or even parity. In these parity types, the parity bit is set to 1 or 0 so that the total number of 1-bits in any character is an even number (even parity) or an odd number (odd parity).

For example, if you enable parity and select even parity, the LTS checks the number of 1-bits in every character it is preparing to transmit to the terminal. If the character contains an even number of 1-bits, the LTS sets the parity bit to zero. If the character contains an odd number of 1-bits, the LTS sets the parity bit to 1, so that the total number of 1-bits adds up to an even number.

Although the LTS uses two parity parameters, one to enable or disable parity and another to define the parity type, the PRIMOS SET_ASYNC command combines both functions in one option, -PARITY. The PRIMOS -PARITY options are none, odd, or even.

### Parity Type

| | |
|---|---|
| Parameter name | PARITY |
| Parameter number | 52 |
| Default | Odd parity (0) |
| Choices | 0 - Odd parity |
| | 1 - Even parity |
| Parameter set | Global |
| LTS commands | PORT, SET |
| PRIMOS command | SET_ASYNC –PARITY |

## Stop Bits

The stop bits parameter tells the LTS how many bits your terminal is using to identify the end of a character. Most terminals use one stop bit, so you probably do not need to change this parameter setting. However, devices running at 110 baud or less may need two stop bits; see the manual for your terminal.

### Stop Bits

| | |
|---|---|
| Parameter name | STOPBITS |
| Parameter number | 51 |
| Default | 1 stop bit |
| Choices | 1 - 1 stop bit |
| | 2 - 2 stop bits |
| Parameter set | Global |
| LTS commands | PORT, SET |
| PRIMOS command | SET_ASYNC –STOP_BITS |

# The Escape Character

The LTS escape character allows you to switch from data transfer mode to command mode without breaking your connection to a host computer. Chapter 2, Basic LTS Commands, explains how to use the ESCAPE command to change the LTS escape character and to turn the escape character function off and on. Two LTS parameters are related to switching modes. One enables or disables the escape character and the other specifies which character the LTS recognizes as the escape character.

You may find it convenient to set a different escape character for each of your eight sessions, as explained in Chapter 4, Setting Parameters. For example, you may use three or four different host applications, each of which assigns a meaning to certain sequences of characters. You could decide to always use a certain session number for a certain application, and then assign the session an escape character that is not used in the application. Perhaps Application One uses control characters for some function. You could decide to always use session 1 for that

application and set session 1's escape character to $, a character not used in the application. Each of your other sessions and their escape characters could also be tailored for a specific host application program.

## Enabling the Escape Character

You can enable or disable the LTS escape character using either the ESCAPE command with the –ON or –OFF option, or the SET command.

You may need to disable the escape character temporarily to run a program that utilizes all available characters. With the escape character disabled, you can transmit the escape character as an ordinary character.

If you wish to reenable the escape character, you must first get back to command mode. You can log out and break your connection with the host or, if you want to return to command mode without breaking the current connection, use the PRIMOS NTS_LINE command with the –CMD option.

Once you have returned to command mode, use the ESCAPE command with the –ON option or the SET command to reenable the escape character.

### Note

The NTS_LINE –CMD command does not reenable your LTS escape character. The escape character remains disabled until you reenable it with the ESCAPE or SET command.

**Enable Escape Character**

| | |
|---|---|
| Parameter name | ENTERCMD |
| Parameter number | 58 |
| Default | Escape character enabled (1) |
| Choices | 0 - Escape character disabled |
| | 1 - Escape character enabled |
| Parameter set | Session |
| LTS commands | ESCAPE, SET |

## Defining the Escape Character

You can define the character that the LTS recognizes as the escape character. Use the ESCAPE or SET command to specify the character you want.

You cannot use any of the characters that have special LTS functions (the XON or XOFF characters, for example) or any of the reserved LTS command mode characters (carriage return, space, semicolon, colon, or comma).

Because it is rarely used, ⌐Ctrl⌐ ⌐^⌐ is often a good substitute for the default escape character (⌐Ctrl⌐ ⌐\⌐).

### Note

If you are a NETLINK user, make sure that your LTS escape character is different from the NETLINK escape character. If the escape characters are the same, typing an escape character always returns you to LTS command mode. You cannot return to NETLINK command mode during a NETLINK session if the two escape characters are the same. The default NETLINK escape character is @.

### Define Escape Character

| | |
|---|---|
| Parameter name | ESC |
| Parameter number | 1 |
| Default | ⌐Ctrl⌐ ⌐\⌐ |
| Choices | Any single ASCII character |
| Parameter set | Session |
| LTS commands | ESCAPE, SET |

# Protocol

You can select one of five standard Prime communications protocols for your NTS line. These protocols define certain rules for data transmission on the line. When you establish a connection, the LTS tells the Prime host which protocol to use when communicating with your line. Since the protocol parameter is a member of both the command mode and the session parameter sets, it can have different settings in command mode and in each of the eight sessions. This allows you to tailor your port and sessions for each host and application program that you use. Chapter 4, Setting Parameters, explains how to set LTS parameters.

The protocols supported by the LTS include the following:

## TTY

Use the TTY protocol for most terminals. This protocol tells PRIMOS to echo data to the terminal (if the full-duplex/half-duplex mode parameter is set for full-duplex), add a linefeed to each carriage return when echoing, and force the high-order bit (parity bit) on for each character received from the terminal.

## TRAN

The TRAN (for transparent) protocol is generally not used for interactive terminals. Lines connected to printers or other noninteractive devices use the TRAN protocol because it does not echo input and it does not convert carriage returns to carriage return/linefeeds. Instead, it simply passes all characters (except flow control characters) to their destination.

If you are using an assigned line with a printer, the line uses the TRAN protocol. When you assign the line, PRIMOS automatically activates the TRAN protocol. (For information on assigned lines, see Chapter 6, NTS Assigned Lines.)

The TRAN protocol can also be useful for a terminal when you want to copy, file, or print a program that contains control characters.

## TT8BIT

Use the TT8BIT protocol for Arabic DM5E/PLUS terminals only. TT8BIT is the same as TTY except that it does not force the high-order bit (parity bit) on. You must set the parity parameter for odd parity when you use the TT8BIT protocol.

## TTYUPC

The TTY uppercase protocol tells the LTS to send only uppercase letters to the terminal. Otherwise, this protocol is the same as TTY. Use this protocol if you have a terminal that cannot display lowercase letters (or print them, if it is a hard-copy terminal).

## TTY8

Use the TTY8 protocol only for devices that support the Prime Extended Character Set (Prime ECS). TTY8 is the same as TTY except that it does not force the high-order bit on. This eighth bit is used as part of a character in Prime ECS.

### Note

You can override some aspects of these protocols by setting individual parameters. For example, if you use the TTY protocol and then set the parameter for half-duplex mode, the TTY protocol does not use full-duplex mode.

**Protocol**

| | |
|---|---|
| Parameter name | PROTOCOL |
| Parameter number | 53 |
| Default | TTY (0) |
| Choices | 0 - TTY |
| | 1 - TRAN |
| | 2 - TT8BIT |
| | 3 - TTYUPC |
| | 4 - TTY8 |
| Parameter sets | Command mode and session |
| LTS command | SET |
| PRIMOS command | SET_ASYNC -PROTOCOL |

# Flow Control

You can set up mechanisms to start and stop the flow of data with three LTS flow control parameters: XON/XOFF flowfrom, XON/XOFF flowto, and EIA flow control. Flow control allows you to temporarily halt the scrolling of data on your screen. Flow control also tells a transmitting device to stop sending data whenever the receiving device cannot process any more data (for example, if its storage buffers are full).

The flow control parameters determine whether characters or electrical signals are used for flow control. Since they are members of both the command mode and session parameter sets, they can have different settings in command mode and in each of the eight sessions. This allows you to tailor your port and sessions for each host and application program that you use. Chapter 4, Setting Parameters, explains how to set LTS parameters.

## XON/XOFF Flowfrom

The XON/XOFF flowfrom parameter enables and disables XON/XOFF flow control from the terminal to the LTS. XON and XOFF are special ASCII characters that devices send and receive in the same way as ordinary characters. If this parameter is enabled, the LTS stops transmitting characters to the terminal whenever it receives an XOFF character from the terminal (see Figure 3-2). Most people use the default setting, which enables XON/XOFF flow control from the terminal.

To send an XOFF character, press [ Ctrl ] [ S ]. Some devices automatically generate XOFF when their buffers start to fill up. (XOFF is the ASCII character DC3.)

To resume the flow of data to your terminal, press [ Ctrl ] [ Q ]. The terminal sends an XON character to the LTS, which then starts transmitting again. Devices that automatically generate XOFF also send out an XON character when they are ready to receive data again. (XON is the ASCII character DC1.)
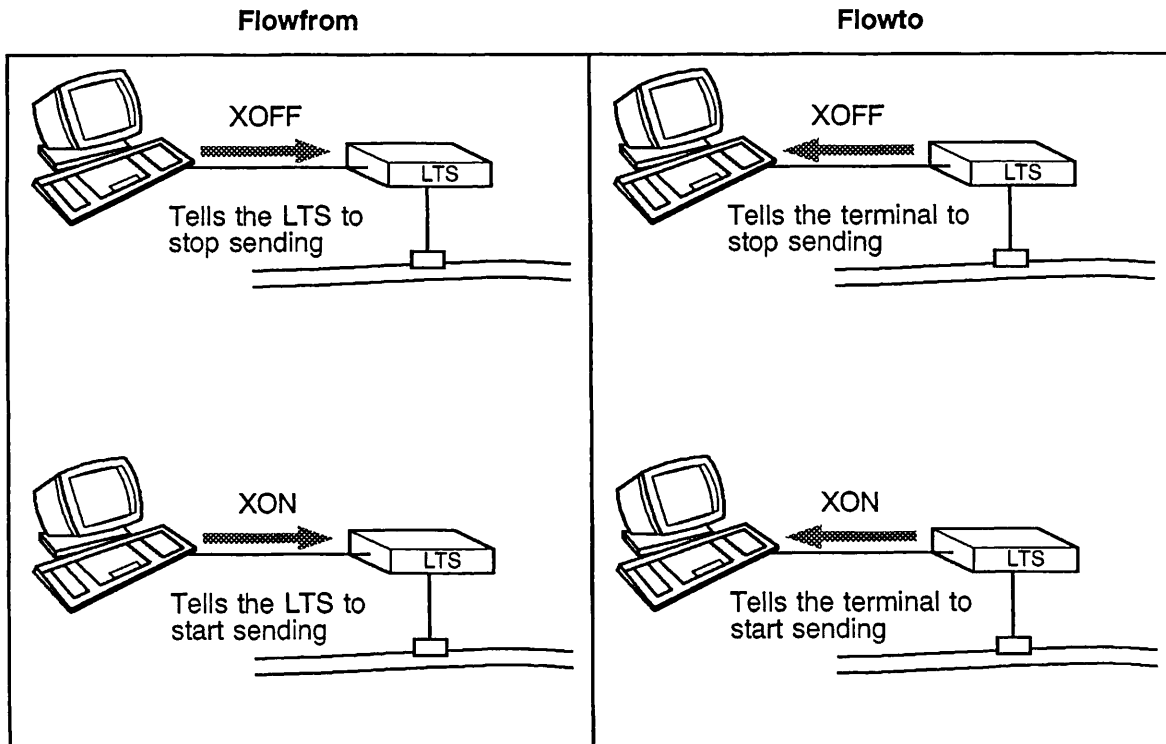
Flowfrom                                    Flowto

QI0117-2LA-16-1

**Figure 3-2**
**Flowfrom and Flowto Parameters**

### XON/XOFF Flowfrom

| Parameter name | FLOWFROM |
|---|---|
| Parameter number | 12 |
| Default | Enable character flow control from the terminal (1) |
| Choices | 0 - Disable character flow control from the terminal |
| | 1 - Enable character flow control from the terminal |
| Parameter sets | Command mode and session |
| LTS command | SET |
| PRIMOS commands | SET_ASYNC -XOFF |
| | SET_ASYNC -NO_XOFF |

## XON/XOFF Flowto

The XON/XOFF flowto parameter enables and disables flow control in the opposite direction, from the LTS to the terminal (see Figure 3-2). During periods of heavy network traffic when the LTS cannot gain access to the network cable, the LTS can run out of buffer space for data coming from your terminal. When this situation occurs, the LTS can send XOFF characters to the terminal to indicate that the terminal should stop transmitting data. When buffer space is available again, the LTS sends an XON character to the terminal to indicate that transmission can resume.

In full-duplex mode (when the LTS and the host are echoing characters to your terminal), you can tell that the terminal has stopped sending characters to the LTS if the characters you type do not appear on your terminal screen.

PT200, PST100, PT45, and many other terminals can recognize XON/XOFF characters and respond appropriately. If your terminal cannot recognize XON/XOFF characters, disable this parameter. Check the manual that came with your terminal.

### XON/XOFF Flowto

| | |
|---|---|
| Parameter name | FLOWTO |
| Parameter number | 5 |
| Default | Enable character flow control to terminal (1) |
| Choices | 0 - Disable character flow control to terminal |
| | 1 - Enable character flow control to terminal |
| Parameter sets | Command mode and session |
| LTS command | SET |
| PRIMOS commands | SET_ASYNC –REVERSE_XOFF |
| | SET_ASYNC –NO_REVERSE_XOFF |

## Flow Control and the Escape Character

When flow control is in effect, you can run into problems using the LTS escape character. Problems can occur in two special situations, when either the LTS or the terminal has responded to flow control instructions. (Brief instructions on how to get around these problems are included in Chapter 2, Basic LTS Commands. This section provides a more detailed explanation of the problems.)

**Flow Control From the Host to the LTS:** In the first case, a busy host can ask your LTS to wait before sending any more data to the host (in other words, the host sends a flow control request to the LTS). The LTS then starts saving characters from your terminal instead of transmitting them immediately to the host.

If you send the LTS an escape character during this waiting period, the LTS recognizes the escape character and puts you into command mode immediately. Any characters from your terminal that the LTS was saving are lost.

You can prevent the accidental loss of characters like these if the host is echoing to your terminal. Do not enter an LTS escape character until your terminal screen displays all of the characters you have typed at the keyboard. If you see all of your characters displayed on the screen, you know that the host received them; the LTS sent the characters to the host and the host echoed them back to your terminal. If any characters you typed have not yet appeared on your screen when you type the LTS escape character, you cannot tell whether the host received all your characters or not.

**Flow Control From the LTS to the Terminal:**   If you are waiting for the host to echo your characters before you type the LTS escape character but nothing appears on the screen, you may have run into the second special case. During periods of very heavy network traffic (or perhaps because of a problem at the host), traffic over the network can become backed up and stop. When the LTS cannot send any more data over the network, it starts saving data from your terminal instead of transmitting it. When the LTS runs out of storage space for data coming from your terminal, it asks the terminal to stop sending (if flow control is enabled).

If you type an LTS escape character in this situation, the LTS cannot receive it because your terminal has responded to the flow control request and stopped forwarding any characters to the LTS. If this problem occurs and you want to return to command mode, turn your terminal off, wait at least 10 seconds, and then turn the terminal on again. The LTS breaks your connection and returns you to command mode. The characters from your terminal that the LTS was saving are discarded, so some data is lost. But you are no longer locked into a connection.

**Note**

Turning off the terminal for 10 seconds causes the LTS to break a connection if the DCD connection control parameter is enabled (the default setting). If you have disabled DCD connection control, you can get back to command mode by turning the terminal off for a few seconds, turning it back on, and then typing the LTS escape character. The LTS can now act on the escape character and return you to command mode. You can then issue the DISCONNECT or QUIT command to break the connection.

## EIA Flow Control

Some devices use EIA RS-232-C control signals instead of characters for flow control. (RS-232-C is a standard interface defined by the Electronic Industries Association.) The EIA control signals are electrical signals that travel between the LTS and your terminal over the physical wires that connect them.

Some devices, especially printers, change the status of these control signals when their buffers begin to fill up. Some devices change the Data Carrier Detect (DCD) signal from high to low; others may change DCD from low to high. In either case, the signal change means *stop sending* (see Figure 3-3).

If you activate the EIA flow control parameter, the LTS responds to these signal changes by ending all transmission to the device until the DCD signal changes again, indicating that the device is ready to receive data again.

This type of flow control is different from XON/XOFF flow control, which uses specific ASCII characters to control the flow of data. Because most terminals do not use DCD for flow control, most users can accept the default flow control settings, XON/XOFF flow control enabled and EIA flow control disabled. If you do want to use EIA flow control, you must disable XON/XOFF flow control. This parameter applies to flow control in one direction only, from a device to the LTS. The LTS does not send EIA flow control signals to its attached devices.

*QI0117-2LA-18-1*
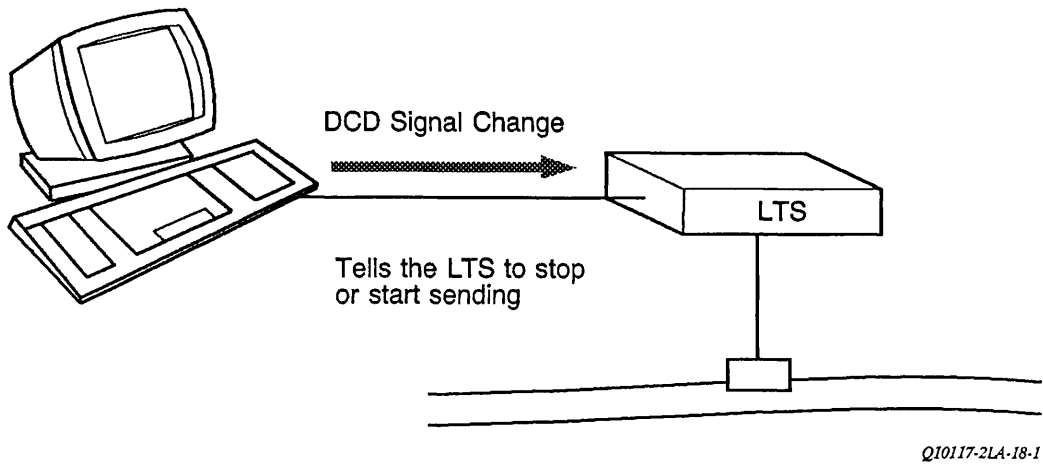
**Figure 3-3**
**EIA Flow Control**

The PRIMOS counterparts of these parameter settings are listed below. (Note that this type of flow control requires two SET_ASYNC options for one LTS parameter.)

| *LTS* | *PRIMOS* |
|---|---|
| Disable EIA flow control | SET_ASYNC –NO_DATA_SENSE_ENABLE |
| Enable EIA flow control on high to low DCD | SET_ASYNC –DATA_SENSE_ENABLE<br>SET_ASYNC –DATA_SET_SENSE_HIGH |
| Enable EIA flow control on low to high DCD | SET_ASYNC –DATA_SENSE_ENABLE<br>SET_ASYNC –DATA_SET_SENSE_LOW |

You can use DCD for flow control or for connection control, but not for both. (See the section on DCD connection control earlier in this chapter.) If you enable DCD for flow control, that parameter takes precedence over the use of DCD for connection control. If you want to use DCD to control connections, you must disable EIA flow control.

**EIA Flow Control**

| | |
|---|---|
| Parameter name | FLOWCONTROL |
| Parameter number | 54 |
| Default | Disable EIA flow control (0) |
| Choices | 0 - Disable EIA flow control |
| | 1 - Enable EIA flow control on high to low DCD |
| | 2 - Enable EIA flow control on low to high DCD |
| Parameter sets | Command mode and session |
| LTS command | SET |

PRIMOS commands          SET_ASYNC -NO_DATA_SENSE_ENABLE

SET_ASYNC -DATA_SENSE_ENABLE
SET_ASYNC -DATA_SET_SENSE_HIGH

SET_ASYNC -DATA_SENSE_ENABLE
SET_ASYNC -DATA_SET_SENSE_LOW

# Line Characteristics

You can control certain characteristics of your LTS line by defining parameters that affect character echo and connection control.

## Full-duplex/Half-duplex Mode

When a character that you type appears on your terminal screen, the source of that screen character is one of the following:

- The LTS — During command mode, the LTS can echo your characters back to the screen. The characters travel in both directions — from the terminal to the LTS and then from the LTS back to the terminal. This mode of operation is called full duplex.

- The Prime host — During data transfer mode, PRIMOS or a host application program can echo your characters back to the screen. The characters travel to the host and then back to the terminal. This is host full-duplex mode.

- The terminal — In either command mode or data transfer mode, the terminal itself can echo characters to the screen, if the terminal has this capability and if you adjust the terminal appropriately. If the terminal is echoing, instruct the LTS and the Prime host not to echo characters to your terminal. The characters travel in one direction only, from the terminal to the LTS and to the Prime host. This mode of operation is called half duplex.

Figure 3-4 shows what happens to a typed character in full-duplex and half-duplex modes.

Full-duplex operation is the default setting for the LTS, for PRIMOS, and for most terminals. Therefore, full duplex is the most convenient mode to use. Also, with full-duplex mode, you can confirm that your characters reached their destination when you see the characters on your screen. For terminals that do not perform character echoing, full-duplex mode is your only choice.

Half-duplex operation can be useful if a network is very busy. Because characters are transmitted in only one direction over the LAN in half-duplex mode, fewer characters travel over the network and network traffic is reduced.

**Full Duplex**  **Half Duplex**

Command Mode

Information goes
to the LTS; the
LTS echoes to the
screen.

LTS

Command Mode

Information goes
directly to the
screen; the LTS
does not echo.

LTS

Data Transfer Mode

Information goes
to the host; the
host echoes.

LTS

Host

Data Transfer Mode

Information goes
directly to the
screen; the host
does not echo.

LTS

Host
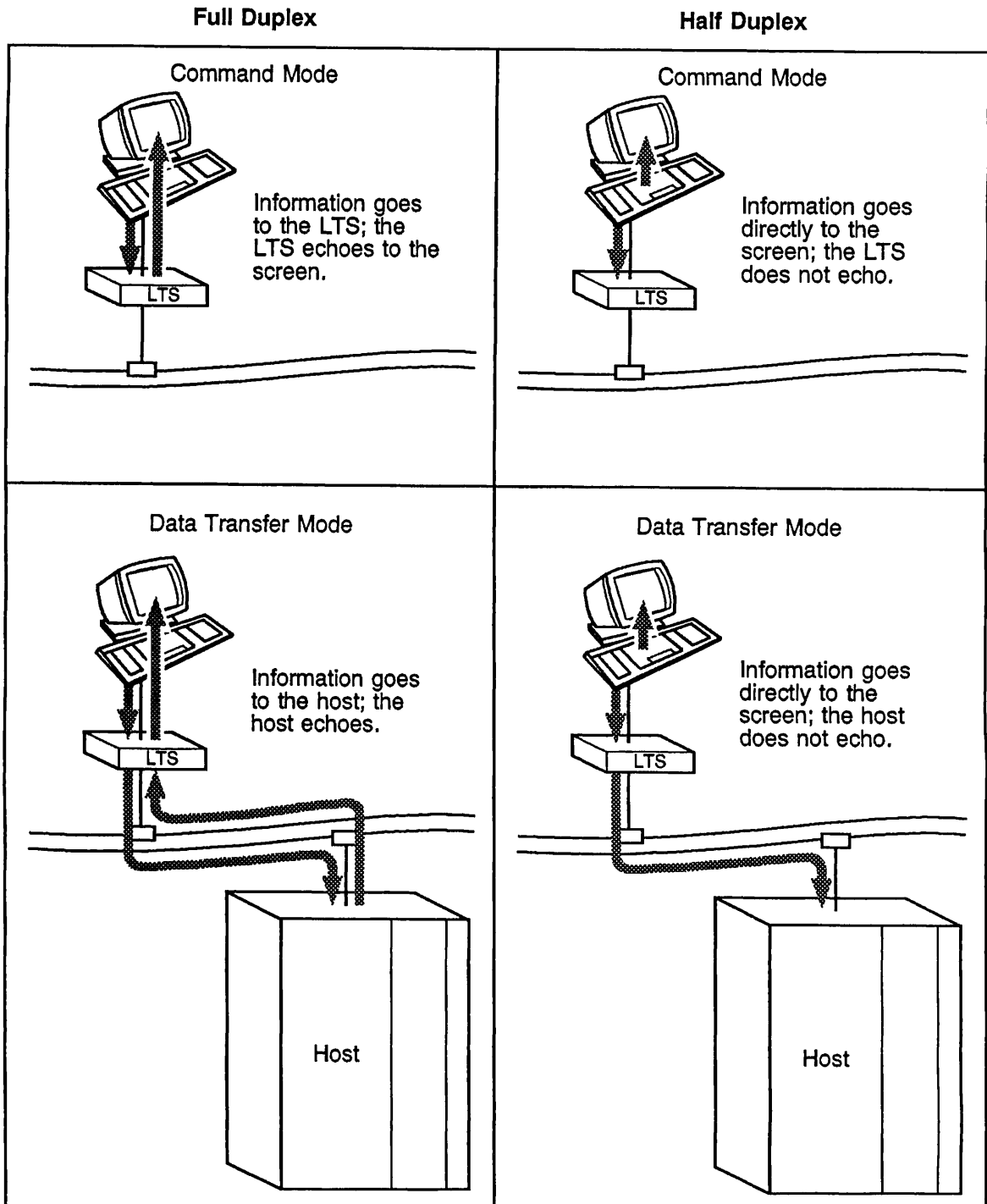
*Q10117-2LA-13-4*

**Figure 3-4**
**Full-duplex and Half-duplex Operation**

For whichever mode you use, you need to coordinate three items: the LTS, PRIMOS, and the terminal. Otherwise, the characters you type may either appear on your screen twice, or not appear at all. The next sections explain how to coordinate the LTS with PRIMOS and with your terminal.

**The LTS:**  The LTS full-duplex/half-duplex parameter controls whether the LTS echoes characters to your terminal during command mode.

For correct full-duplex operation, use the default setting, full duplex. However, if you want the terminal rather than the LTS to perform character echoing, set this parameter to half duplex.

**PRIMOS:**  During data transfer mode, the LTS does not perform character echoing; instead, it merely passes on any characters it receives. For full-duplex operation during data transfer mode, the Prime host is the source of character echo rather than the LTS.

The PRIMOS commands SET_ASYNC and TERM tell PRIMOS whether or not to echo characters to your terminal.

- To tell PRIMOS to echo all your characters, use SET_ASYNC −ECHO or TERM −FULL. These are the PRIMOS default settings.

- To tell PRIMOS not to echo any characters, use SET_ASYNC −NO_ECHO or TERM −HALF.

PRIMOS activates either command as soon as you enter it.

Some application programs perform their own echoing. For example, EMACS shuts off the PRIMOS echo and performs its own echoing as long as EMACS is running. If you use applications that echo characters independently of PRIMOS, you may not be able to use half-duplex mode.

**The Terminal:**  Many terminals have physical switches you can set to control whether the terminal echoes keyboard characters to the screen. For full-duplex mode, when the LTS or the Prime host is echoing, you do not want the terminal to echo. If the terminal echoes too, all the characters appear on the screen twice. On most terminals, the default setting is no terminal echo.

For half-duplex mode, when neither the LTS nor the host is echoing characters, you do want the terminal to echo. Otherwise, the characters you type cannot appear on the screen at all.

PST100 and PT45 terminals use physical switches to turn terminal echo on and off. PT200 terminals do not perform character echoing. The PST100 and PT45 switch settings are shown in Table 3-1.

**Table 3-1**
**Terminal Switches for Character Echo**

| Terminal Type | Switch Location | Switch Name | Terminal Echo Off | Terminal Echo On |
|---|---|---|---|---|
| **PST100** | Switch 1 in bank 1 | Send-receive switch | Switch down | Switch up |
| **PT45** | Switch 8 in bank 2 | Auto echo switch | Switch down | Switch up |

Figure 3-5 summarizes the requirements for correct full-duplex and half-duplex operation.
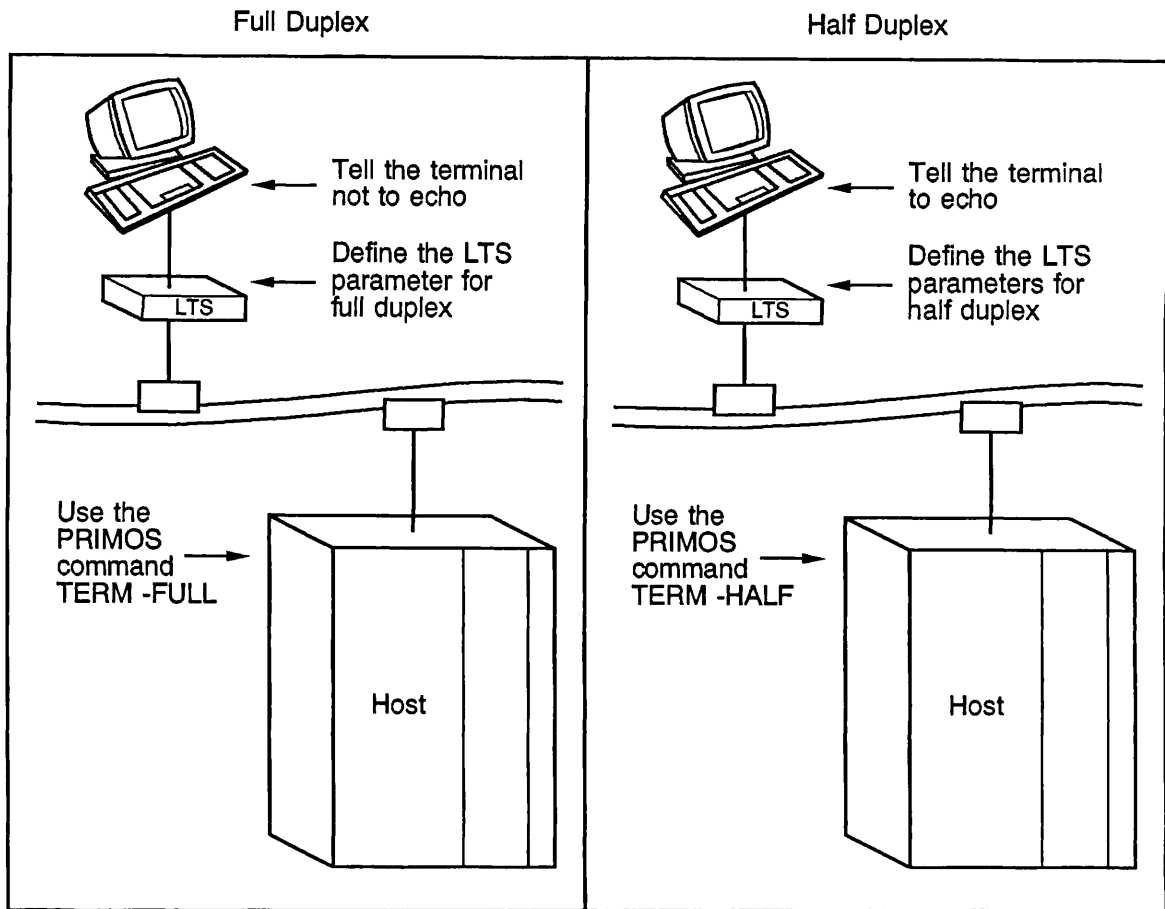


*QI0117-2LA-14-3*

**Figure 3-5**
**Setting Up Full-duplex or Half-duplex Operation**

### Full-duplex/Half-duplex Mode

| | |
|---|---|
| Parameter name | HALFDUPL |
| Parameter number | 57 |
| Default | Full-duplex mode (0) |
| Choices | 0 - Full-duplex mode |
| | 1 - Half-duplex mode |
| Parameter set | Command mode |
| LTS command | SET |

**Note**

The PRIMOS commands that control echoing (SET_ASYNC and TERM) are not listed as PRIMOS counterparts because the LTS full-duplex/half-duplex mode parameter is active only during LTS command mode. PRIMOS echoing is active in Table 3-1.

## Linefeed After Carriage Return

The linefeed after carriage return parameter tells the LTS whether to insert a linefeed character after a carriage return character.

When you press the carriage return key, you expect the cursor to move back to the left side of the terminal screen (carriage return) and down one line (linefeed). For most terminals, you can use the default setting, which tells the LTS to insert a linefeed. With the default setting, the LTS adds a linefeed whenever it echoes a carriage return back to your terminal screen.

Manual switches on some terminals, and software options on others, allow you to set up the terminal so that it adds the linefeed itself. If you set up the terminal to add the linefeed, instruct the LTS not to insert a linefeed. Otherwise, the cursor moves down two lines after a carriage return.

This parameter does not operate during data transfer mode. In data transfer mode, PRIMOS or the host application program is responsible for adding linefeeds. You can control linefeed insertion during data transfer mode by using the SET_ASYNC command. The –LINE_FEED or –NO_LINE_FEED options tell PRIMOS whether or not to insert a linefeed after each carriage return.

### Linefeed After Carriage Return

| | |
|---|---|
| Parameter name | LF_AFTER_CR |
| Parameter number | 13 |
| Default | Insert linefeed after carriage return (1) |
| Choices | 0 - Do not insert linefeed after carriage return |
| | 1 - Insert linefeed after carriage return |
| Parameter set | Command mode |
| LTS command | SET |

# Command Mode Editing Characters

The three LTS command mode editing characters (erase character, line erase character, and line display character) are LTS parameters that you can change with LTS commands. Because you use these characters only during communication between your terminal and the LTS, these parameters are active only in LTS command mode. All of the command mode editing characters are in the command mode parameter set, because they affect only command mode operation.

During data transfer mode, the PRIMOS erase and line erase characters are active. To define the erase and line erase characters for PRIMOS, use the TERM command.

## The Erase Character

The erase character (sometimes called the character delete character) deletes the last character you typed. The default LTS erase character is the backspace key. (The default PRIMOS erase character is a double quotation mark.)

**Erase Character**

| | |
|---|---|
| Parameter name | ERASE |
| Parameter number | 16 |
| Default | Backspace |
| Choices | Any single ASCII character |
| Parameter set | Command mode |
| LTS command | SET |

## The Line Erase Character

The line erase character (sometimes called the kill character) deletes an entire line of characters. The default LTS line erase character is the question mark (?). This is the same as the default PRIMOS kill character.

**Line Erase Character**

| | |
|---|---|
| Parameter name | LINE_ERASE |
| Parameter number | 17 |
| Default | ? |
| Choices | Any single ASCII character |
| Parameter set | Command mode |
| LTS command | SET |

## The Line Display Character

When you press the line display character, the LTS displays all the active characters in your current command line. You can see your command characters easily, because any erased characters or editing characters that you typed previously do not appear. The default line display character is Ctrl L.

PRIMOS has no counterpart for this editing character.

**Line Display Character**

| | |
|---|---|
| Parameter name | LINE_DISPLAY |
| Parameter number | 18 |
| Default | [ Ctrl ] [ L ] |
| Choices | Any single ASCII character |
| Parameter set | Command mode |
| LTS command | SET |

# Character Padding

Unless you are using a hard-copy terminal (instead of a video display terminal), you do not need to worry about the five parameters that control character padding. Some hard-copy terminals need to delay printing while the print head mechanism moves to a new position. The character padding parameters can provide the necessary delay time.

A carriage return, linefeed, form feed, or horizontal or vertical tab causes the print head to move more than a single character position. You do not want the print head to print the next character until it has finished moving. You can build in the extra time required by telling the LTS to transmit extra nonprinting characters after a linefeed, form feed, or horizontal or vertical tab.

The number of padding characters you need depends on a number of factors, such as the baud rate of the terminal, the carriage width, and the mechanical speed of the print head. All of the character padding parameters are in the command mode parameter set, because they affect only command mode operation.

## Carriage Return Padding

The carriage return padding parameter defines the number of characters that the LTS inserts following a carriage return when the LTS is echoing characters to the terminal in LTS command mode. Use the default (no padding characters) if you are using a video display terminal.

**Carriage Return Padding**

| | |
|---|---|
| Parameter name | CR_PADDING |
| Parameter number | 9 |
| Default | 0 |
| Choices | 0 through 255 characters |
| Parameter set | Command mode |
| LTS command | SET |

## Linefeed Padding

The linefeed padding parameter defines the number of characters that the LTS inserts following a linefeed when the LTS is echoing characters to the terminal in LTS command mode. Use the default (no padding characters) if you are using a video display terminal.

**Linefeed Padding**

| | |
|---|---|
| Parameter name | LF_PADDING |
| Parameter number | 14 |
| Default | 0 |
| Choices | 0 through 255 characters |
| Parameter set | Command mode |
| LTS command | SET |

## Form Feed Padding

The form feed padding parameter defines the number of characters that the LTS inserts following a form feed when the LTS is echoing characters to the terminal in LTS command mode. Use the default (no padding characters) if you are using a video display terminal.

**Form Feed Padding**

| | |
|---|---|
| Parameter name | FF_PADDING |
| Parameter number | 61 |
| Default | 0 |
| Choices | 0 through 255 characters |
| Parameter set | Command mode |
| LTS command | SET |

## Horizontal Tab Padding

The horizontal tab padding parameter defines the number of characters that the LTS inserts following a horizontal tab when the LTS is echoing characters to the terminal in LTS command mode. Use the default (no padding characters) if you are using a video display terminal.

**Horizontal Tab Padding**

| | |
|---|---|
| Parameter name | HT_PADDING |
| Parameter number | 59 |
| Default | 0 |
| Choices | 0 through 255 characters |
| Parameter set | Command mode |
| LTS command | SET |

## Vertical Tab Padding

The vertical tab padding parameter defines the number of characters that the LTS inserts following a vertical tab when the LTS is echoing characters to the terminal in LTS command mode. Use the default (no padding characters) if you are using a video display terminal.

**Vertical Tab Padding**

| | |
|---|---|
| Parameter name | VT_PADDING |
| Parameter number | 60 |
| Default | 0 |
| Choices | 0 through 255 characters |
| Parameter set | Command mode |
| LTS command | SET |

The next chapter explains how you can change the parameter settings for the parameters covered in this chapter. Appendix B, LTS Parameter Summary, contains summary charts on all the LTS parameters.

# Setting Parameters

This chapter explains how to change LTS parameter settings and describes the effects of those parameter settings.

Remember that you may not need to change any parameter settings. If you can connect to a host computer and perform the work you need to do, you probably do not need to worry about the LTS parameters. The default settings are designed to work correctly for most terminals.

The commands that change parameter settings include the following:

    PORT
    SET
    DEFAULT
    SET_ASYNC (a PRIMOS command)

The following commands help you keep track of parameter settings:

    HELP
    SHOW
    PORTS

## LTS Parameter Sets

The LTS parameters are divided into groups depending on whether they affect the entire terminal port, command mode operation, or data transfer mode operation. Four parameters apply to both command mode and data transfer mode; these parameters can have different settings in each mode. In addition, a set of parameters is stored in LTS EAROM memory. These default parameters are saved even if the LTS is powered down or reset. The sections that follow describe each of the parameter sets.

### Global Port Parameters

The global port parameters control the operation of your terminal's port on the LTS, regardless of whether you are in command mode or in data transfer mode. Be careful when changing any of these parameters, because an incorrect setting could disrupt all communication to your

terminal. You must set them to match the current settings of your terminal in order to communicate with the LTS. The global port parameters are listed in Table 4-1 and described in the section entitled Global Port Parameters in Chapter 3, LTS Parameters.

**Table 4-1**
**Global Port Parameters**

| Number | Parameter Name |
|--------|----------------|
| 6 | LTS Messages (SRVSGNL) |
| 11 | Baud Rate (BAUD) |
| 21 | Parity Treatment (PARITY_TREATMENT) |
| 50 | Bits per Character (BPC) |
| 51 | Stop Bits (STOPBITS) |
| 52 | Parity Type (PARITY) |
| 63 | DCD Connection Control (DCD_DROP) |

Whenever you change the setting of one of the global port parameters, the change affects command mode and all eight sessions, whether they are free or active. Figure 4-1 illustrates the effect of changing baud rate, one of the global port parameters.
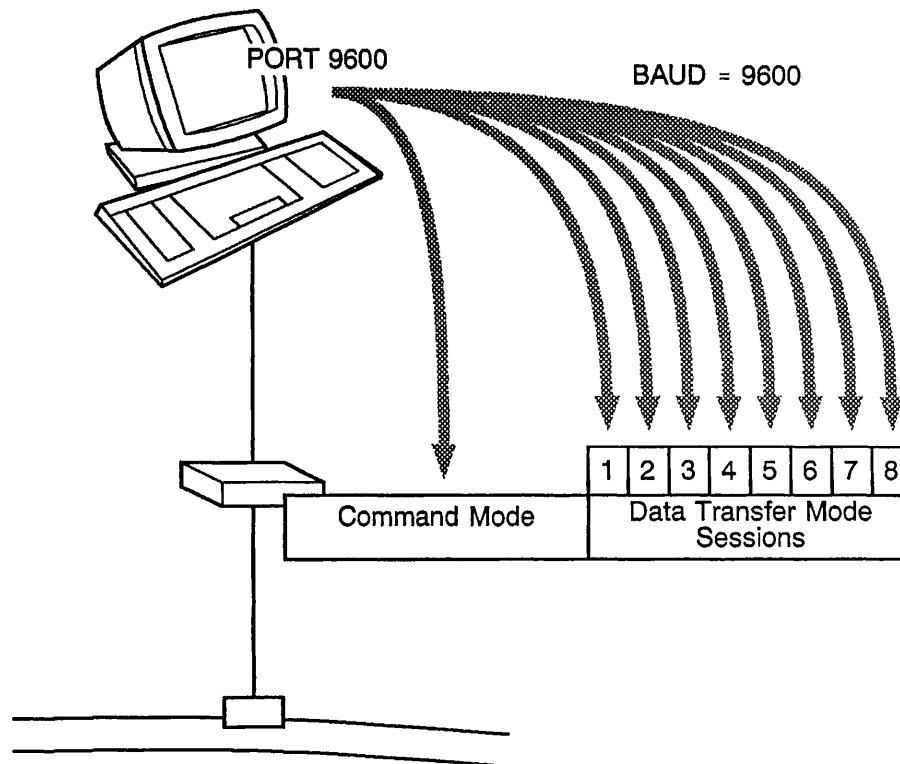


Q10117-2LA-22-2

**Figure 4-1**
**Changes to Global Port Parameters Affect Command Mode and All Eight Sessions**

## Command Mode Parameters

The command mode parameters control the operation of the LTS when you are in command mode; that is, when you are communicating directly with the LTS rather than transferring data to and from a remote host. The command mode parameters are listed in Table 4-2. These parameters affect only command mode operation, as illustrated in Figure 4-2.

**Table 4-2**
**Command Mode Parameters**

| | Number | Parameter Name |
|---|---|---|
| * | 5 | XON/XOFF Flowto (FLOWTO) |
| | 9 | Carriage Return Padding (CR_PADDING) |
| * | 12 | XON/XOFF Flowfrom (FLOWFROM) |
| | 13 | Linefeed After Carriage Return (LF_AFTER_CR) |
| | 14 | Linefeed Padding (LF_PADDING) |
| | 16 | Erase Character (ERASE) |
| | 17 | Line Erase Character (LINE_ERASE) |
| | 18 | Line Display Character (LINE_DISPLAY) |
| * | 53 | Protocol (PROTOCOL) |
| * | 54 | EIA Flow Control (FLOWCONTROL) |
| | 57 | Full-duplex/Half-duplex Mode (HALFDUPL) |
| | 59 | Horizontal Tab Padding (HT_PADDING) |
| | 60 | Vertical Tab Padding (VT_PADDING) |
| | 61 | Form Feed Padding (FF_PADDING) |

* Also in the session parameter set.

Four of the command mode parameters, which are indicated with asterisks in Table 4-2, are also members of the session parameter set, which controls the operation of the LTS in data transfer mode. These parameters can have one setting for command mode and different settings for the sessions. The four common parameters are discussed further in the section entitled Parameters Common to the Command Mode and Session Parameter Sets, later in this chapter.

## Session Parameters

The session parameters control the operation of your LTS port when you are in data transfer mode; that is, when you are communicating with a remote host. (See Figure 4-3.) The session parameters are listed in Table 4-3.

Four of the session parameters, which are marked with asterisks in Table 4-3, are also in the command mode parameter set. These parameters can have a command mode setting that differs from the session settings. The four common parameters are discussed further in the section entitled Parameters Common to the Command Mode and Session Parameter Sets, later in this chapter.
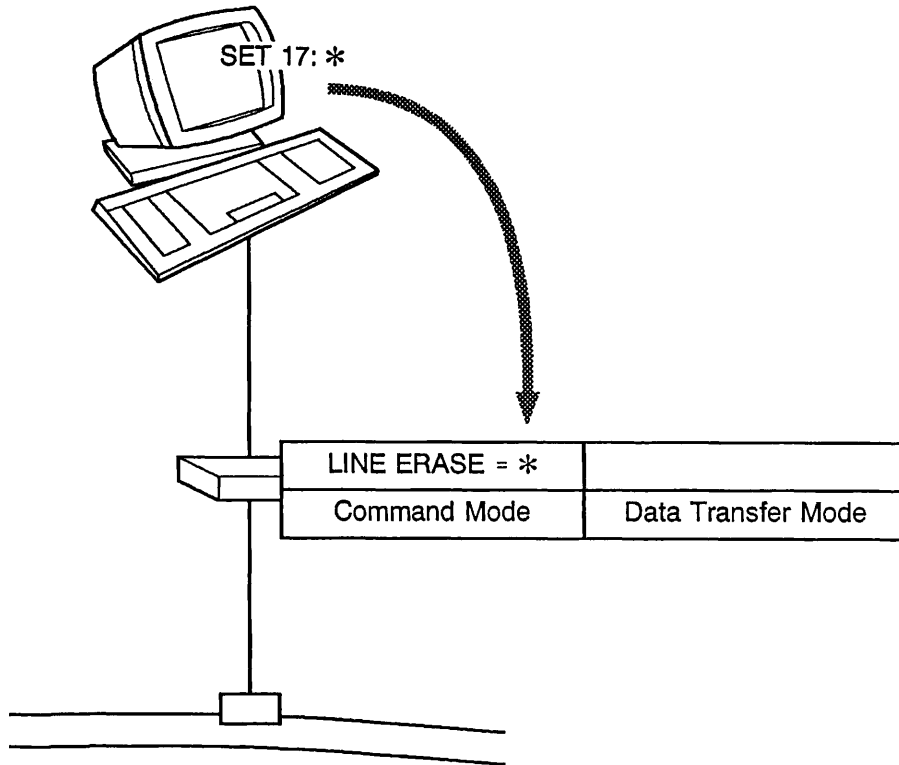
QI0117-2LA-23-3

**Figure 4-2**
**Changes to Command-mode-only Parameters Do Not Affect Data Transfer Mode**

**Table 4-3**
**Session Parameters**

| | Number | Parameter Name |
|---|---|---|
| | 1 | Define Escape Character (ESC) |
| * | 5 | XON/XOFF Flowto (FLOWTO) |
| * | 12 | XON/XOFF Flowfrom (FLOWFROM) |
| * | 53 | Protocol (PROTOCOL) |
| * | 54 | EIA Flow Control (FLOWCONTROL) |
| | 58 | Enable Escape Character (ENTERCMD) |

\* Also in the command mode parameter set.

You can define a separate set of session parameter settings for each of your eight sessions. For example, you might want to define a different escape character for session 5, because you customarily use that session for communication with a remote database application where the default escape character, [ Ctrl ] [ \ ], has a special meaning in the application. The section entitled The SET Command, later in this chapter, explains how to define a separate set of session parameters for each session.
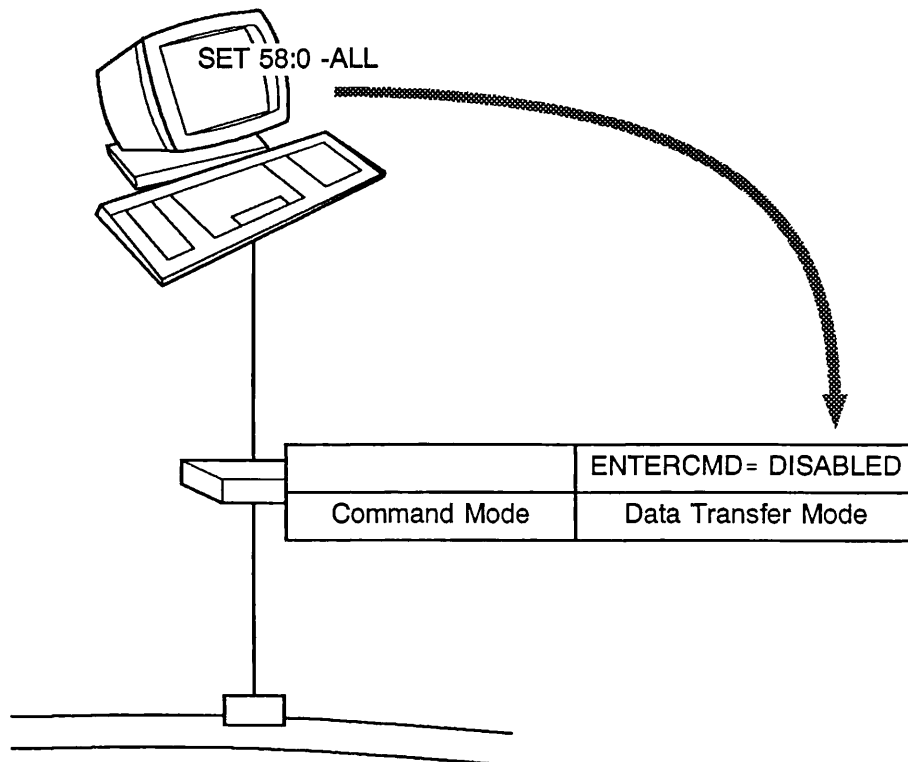


QI0117-2LA-27-1

**Figure 4-3**
**Changes to Session Parameters Do No Affect Command Mode**

## Parameters Common to the Command Mode and Session Parameter Sets

The four parameters listed in Table 4-4 are members of both the command mode and session parameter sets. These parameters have one setting for command mode operation and other settings for each of the eight sessions, which control LTS operation in data transfer mode. You establish these different settings with the SET command, described later in this chapter. Figure 4-4 illustrates how the SET command can be used to set different values for the protocol parameter in command mode and data transfer mode. (The SET command is fully described later in this chapter; the options to the protocol parameter are listed in Chapter 3, LTS Parameters.) In addition, each of the four common parameters has two default settings saved in EAROM, one for command mode and one for data transfer mode (the session parameter sets).

**Table 4-4**
**Parameters Common to the Command Mode and Session Parameter Sets**

| Number | Parameter Name |
|--------|----------------|
| 5 | XON/XOFF Flowto (FLOWTO) |
| 12 | XON/XOFF Flowfrom (FLOWFROM) |
| 53 | Protocol (PROTOCOL) |
| 54 | EIA Flow Control (FLOWCONTROL) |



SET 53:1 -ALL
SET 53:0 -COMMAND

LTS

| PROTOCOL = TTY | PROTOCOL = TRAN |
|----------------|-----------------|
| Command Mode | Data Transfer Mode |
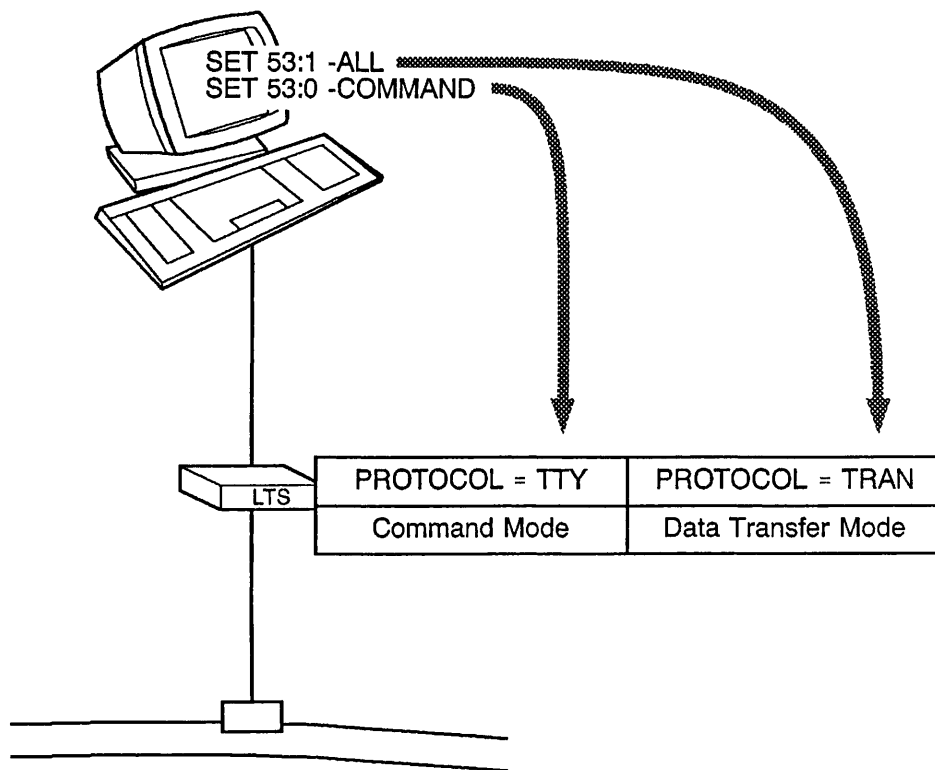
*Q10117-2LA-28-2*

**Figure 4-4**
**Settings of Common Parameters Can Vary in Each Mode**

## Default Parameters, RAM, and EAROM

When an LTS is initialized for the first time, the factory default settings for all parameters are read into LTS RAM and activated. Table 4-5 shows the factory default settings of the LTS parameters. If you change any of the parameters later, the LTS overwrites the parameter settings in RAM with your new settings.

**Table 4-5**
**Factory Default Parameter Settings**

| Number | Parameter Name | Factory Default Setting |
|--------|----------------|-------------------------|
| 1 | Define Escape Character (ESC) | ⎍Ctrl⎍ ⎍\⎍ |
| 5 | XON/XOFF Flowto (FLOWTO) | 1 - Enabled |
| 6 | LTS Messages (SRVSGNL) | 5 - Transmit all messages |
| 9 | Carriage Return Padding (CR_PADDING) | 0 |
| 11 | Baud Rate (BAUD) | 32 - Auto Speed Detect |
| 12 | XON/XOFF Flowfrom (FLOWFROM) | 1 - Enabled |
| 13 | Linefeed After Carriage Return (LF_AFTER_CR) | 1 - Insert linefeed |
| 14 | Linefeed Padding (LF_PADDING) | 0 |
| 16 | Erase Character (ERASE) | ⎍Backspace⎍ |
| 17 | Line Erase Character (LINE_ERASE) | ⎍?⎍ |
| 18 | Line Display Character (LINE_DISPLAY) | ⎍Ctrl⎍ ⎍L⎍ |
| 21 | Parity Treatment (PARITY_TREATMENT) | 0 - Parity Disabled |
| 50 | Bits per Character (BPC) | 8 |
| 51 | Stop Bits (STOPBITS) | 1 |
| 52 | Parity Type (PARITY) | 0 - Odd |
| 53 | Protocol (PROTOCOL) | 0 - TTY |
| 54 | EIA Flow Control (FLOW CONTROL) | 0 - Disabled |
| 57 | Full-duplex/Half-duplex Mode (HALFDUPL) | 0 - Full-duplex mode |
| 58 | Enable Escape Character (ENTERCMD) | 1 - Enabled |
| 59 | Horizontal Tab Padding (HT_PADDING) | 0 |
| 60 | Vertical Tab Padding (VT_PADDING) | 0 |
| 61 | Form Feed Padding (FF_PADDING) | 0 |
| 63 | DCD Connection Control (DCD_DROP) | 1 - Break connection |

**How Parameters Are Stored In EAROM:**   If you include the −DEFAULT option when you change a parameter with the ESCAPE, PORT, or SET commands (for example, PORT 4800 −DEFAULT), the LTS records the new setting in LTS EAROM. (Subsequent sections in this chapter explain how to use these commands.) You can save settings for all of the parameters in EAROM. For each of the four parameters that are common to the command mode and session parameter sets (5, 12, 53, and 54), you can save one setting for command mode and another for the sessions. You can save one value for all the sessions, not a separate value for each session.

**When the Parameters In EAROM Are Used:**   If someone turns off or resets the LTS, any parameter settings in RAM are lost. When the LTS is functional again, it activates any settings stored in EAROM (see Figure 4-5) and uses the factory default settings for any parameters that are not saved in EAROM.

The data transfer mode default settings for parameters 5, 12, 53, and 54 are used to reset a session's parameter set after a connection ends. Those parameters are reset to the default settings if they have been changed by the user or by a host application program prior to or during the session.

You can also use the DEFAULT command (described later in this chapter) to activate all of the settings stored in EAROM, except those of the global port parameters. The default values stored in EAROM for the global port parameters (6, 11, 21, 50, 51, 52, and 63) are used only when the LTS is reinitialized.



Q10117-2LA-21-1
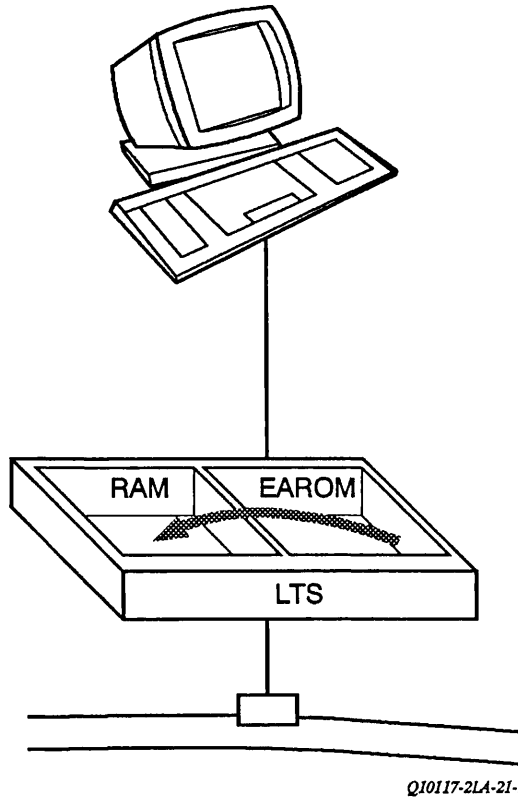
**Figure 4-5**
**Initializing the LTS — Parameters in EAROM Are Copied Into RAM**

Figure 4-6 illustrates the sets of LTS parameters for each port on the LTS. The default settings and command mode default settings are in LTS EAROM, while the global port parameters, command mode parameters, and session parameters are in LTS RAM. Each port has eight sets of session parameters.

Default Settings

| 1 | ESC |
|---|---|
| 5 | FLOWTO |
| 6 | SRVSGNL |
| 9 | CR_PADDING |
| 11 | BAUD |
| 12 | FLOWFROM |
| 13 | LF_AFTER_CR |
| 14 | LF_PADDING |
| 16 | ERASE |
| 17 | LINE_ERASE |
| 18 | LINE_DISPLAY |
| 21 | PARITY_TREATMENT |
| 50 | BPC |
| 51 | STOPBITS |
| 52 | PARITY |
| 53 | PROTOCOL |
| 54 | FLOWCONTROL |
| 57 | HALFDUPL |
| 58 | ENTERCMD |
| 59 | HT_PADDING |
| 60 | VT_PADDING |
| 61 | FF_PADDING |
| 63 | DCD_DROP |

Command Mode
Default Settings

| 5 | FLOWTO |
|---|---|
| 12 | FLOWFROM |
| 53 | PROTOCOL |
| 54 | FLOWCONTROL |

EAROM

Global Port Parameter
Settings

| 6 | SERVSGNL |
|---|---|
| 11 | BAUD |
| 21 | PARITY_TREATMENT |
| 50 | BPC |
| 51 | STOPBITS |
| 52 | PARITY |
| 63 | DCD_DROP |

Command Mode
Settings

| 5 | FLOWTO |
|---|---|
| 9 | CR_PADDING |
| 12 | FLOWFROM |
| 13 | LF_AFTER_CR |
| 14 | LF_PADDING |
| 16 | ERASE |
| 17 | LINE_ERASE |
| 18 | LINE_DISPLAY |
| 53 | PROTOCOL |
| 54 | FLOWCONTROL |
| 57 | HALFDUPL |
| 59 | HT_PADDING |
| 60 | VT_PADDING |
| 61 | FF_PADDING |

| 1 | ESC |
|---|---|
| 5 | FLOWTO |
| 12 | FLOWFROM |
| 53 | PROTOCOL |
| 54 | FLOWCONTROL |
| 58 | ENTERCMD |

Session 1 Settings

Session 2 Settings

Session 3 Settings

Session 4 Settings

Session 5 Settings

Session 6 Settings

Session 7 Settings

Session 8 Settings

RAM

Q10117-ILA-30-1

**Figure 4-6**
**LTS Parameter Sets for Each Port**

# The PORT Command

The PORT command displays or changes four of the global port parameters: baud rate, parity, bits per character, and number of stop bits.

## Displaying Parameter Settings With PORT

To display the current settings of the baud rate, parity, bits per character, and number of stop bits parameters, use the PORT command without any options or arguments. For example,

```
<1>CMD: PORT
Port #      Baud        Parity      BPC         Stopbits
2           9600        ODD         7           1
```

The number in the column labeled PORT # indicates which LTS port your terminal is attached to. LTS ports are numbered 0 through 7; in the example, the terminal is attached to port 2.

Find out which port your terminal is attached to. If you incorrectly define one of the crucial global port parameters (baud rate, parity, bits per character, or number of stop bits), knowing the port number for your terminal can help you fix the problem. (The section on the PORTS command later in this chapter contains instructions.)

If your LTS is close by, you can follow the physical cable from your terminal to the back of the LTS and find out which port the cable attaches to. However, network equipment like an LTS is often installed in areas with restricted access. You can use the PORT command to display your port number no matter where the LTS is located.

## Changing Parameter Settings With PORT

To change parameter settings with the PORT command, enter the new settings in the correct order, separated by semicolons. The syntax is

$$\text{PORT} \left[ \left\{ \begin{array}{l} \textit{baud-rate; parity; bits-per-character; stop-bits} \\ \text{AUTO} \end{array} \right\} \right] \text{[-DEFAULT]}$$

---

## Caution

Using the PORT command to change parameters can be dangerous. The parameters set with PORT must match the operating characteristics of your terminal. If they are different, you cannot communicate with the LTS or with a Prime host. Therefore, you cannot issue any LTS or PRIMOS commands to change the parameters back to correct settings. (If you do make a mistake and your terminal cannot talk to your LTS, see the section on the PORTS command later in this chapter.)

Also, since all of the parameters changed by PORT are global port parameters, any changes you make affect command mode and all eight sessions, whether they are free or active.

---

Figure 4-7 summarizes the choices available with the PORT command.

| Baud Rate | | | |
|---|---|---|---|
| 50 | 150 | 1200 | 4800 |
| 75 | 200 | 1800 | 7200 |
| 110 | 300 | 2400 | 9600 |
| 134.5 | 600 | 3600 | 19200 |
| | | | Auto |

| Parity |
|---|
| Even |
| Odd |
| None |

| Bits per Character |
|---|
| 5 |
| 6 |
| 7 |
| 8 |

| Stop Bits |
|---|
| 1 |
| 2 |
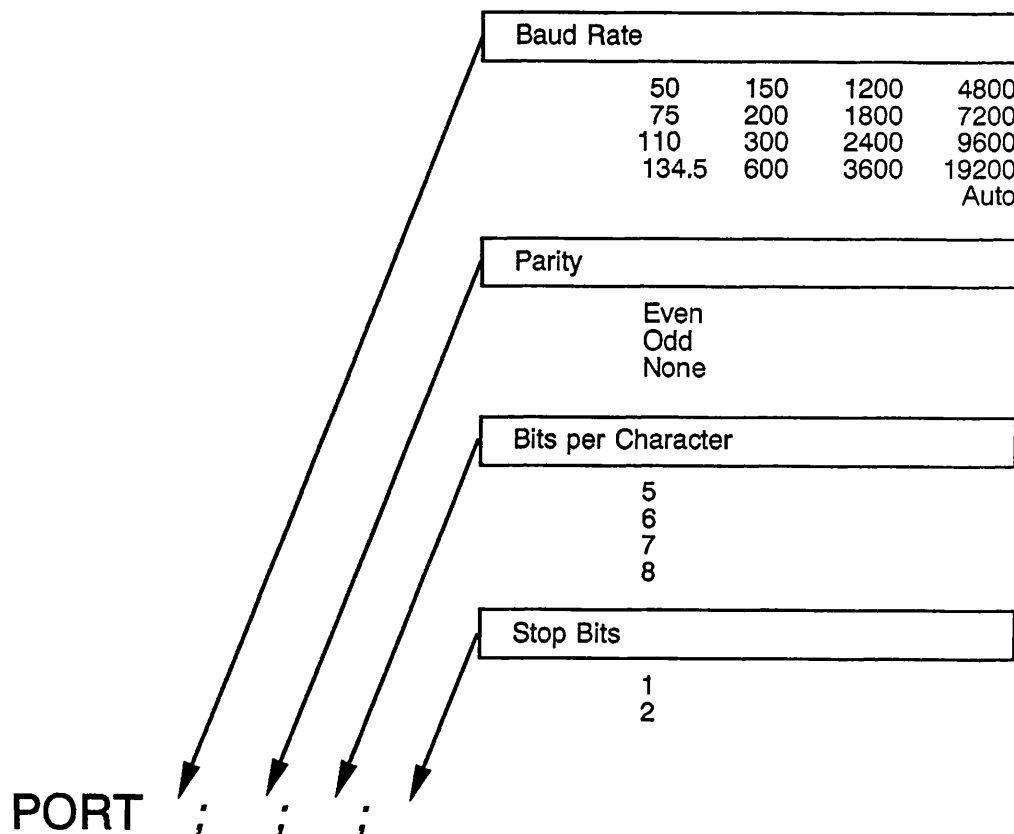
PORT ;   ;   ;

QI0117-2LA-19-0

**Figure 4-7**
**Choices and Syntax for the PORT Command**

If you do not want to change all four parameters, enter a semicolon for any parameter you are leaving unchanged, if that parameter precedes one that you are changing. For example, for a teleprinter terminal that runs at 110 baud and uses two stop bits, enter the following command:

```
<1>CMD: PORT 110;;2
```

Do not enter a semicolon for a parameter you are leaving unchanged if the unchanged parameter follows the parameters you are changing. For example, if you want to change the parity from odd to even, enter

```
<1>CMD: PORT ; EVEN
```

The PORT command requires only one entry for parity: even, odd, or none. The LTS can set both parity-related parameters (parity treatment and parity type) from your single entry. If you request even or odd parity, the LTS automatically sets the parity treatment parameter to enable parity. If you request no parity, the LTS automatically disables the parity treatment parameter. You do not need to worry about consistency between the two parameters.

## The PORT Command and Auto Speed Detect

You can use the PORT command to change the baud rate parameter to Auto Speed Detect. For example,

```
<1>CMD: PORT AUTO
```

When you specify AUTO in the command line, do not enter any of the other parameter settings. The LTS automatically sets the other terminal characteristics parameters to the following settings:

Parity disabled
Eight bits per character
One stop bit

If you try to specify any other settings, the LTS ignores those instructions and puts your terminal line into Auto Speed Detect with the settings listed above.

If you activate Auto Speed Detect, make sure your terminal is using the correct bits per character, parity, and stop bits. For PT200, PST100, and PT45 terminals, use seven bits per character with space parity or with parity ignored. (Seven bits per character with space parity or with parity ignored is the default setting for PT200, PST100, and PT45 terminals.) On these terminals, do not use the settings for eight-bit characters because those settings are for special international character sets. For terminals made by other vendors, seven bits per character with space parity or with parity ignored should also work correctly. All terminals must use one stop bit.

If you want to change any of those characteristics, wait until you complete the Auto Speed Detect function.

## Changing Terminal Settings

If you change any parameters with the PORT command, you must then make the appropriate changes to your terminal so that the parameters match your terminal's baud rate, parity, bits per character, and number of stop bits.

Some terminals (for example, the PT45 terminal) have physical switches that control the terminal's operating characteristics. Some terminals (for example, the PT200 terminal) have menus that allow you to change these characteristics through software. Other terminals (for example, the PST100 terminal) have both physical switches and software.

After you issue the PORT command, use the physical switches or the software to make the necessary changes to the terminal. Then, if necessary, restart the terminal to activate the new settings. If you are not sure how your terminal operates, ask your administrator for assistance. If you make a mistake, see the section on the PORTS command later in this chapter.

Make sure you follow this sequence:

1. Change the LTS parameter setting.

2. Change the terminal setting to match the parameter.

## Saving the Settings in EAROM: PORT −DEFAULT

If you want the changes to be permanent, use the −DEFAULT (or −DEF) option. PORT −DEFAULT saves the new parameter settings in LTS EAROM and also updates the current settings for command mode and all eight sessions, whether they are free or active. Unless you enter new settings in EAROM with the −DEFAULT option of PORT or SET, the original factory default settings or the last settings saved in EAROM are activated when the LTS is reinitialized. Parameter settings saved in EAROM with PORT −DEFAULT are activated *only* when the LTS is reinitialized. Unlike all of the other parameter settings, the settings of the global port parameters are *not* activated when you issue the DEFAULT command (described later in this chapter).

By saving these crucial global port parameters in EAROM, you ensure that the LTS can communicate correctly with your terminal even after a power failure or reinitialization.

## PORT Command Error Messages

If you enter a parameter setting that is not a valid choice, the LTS cancels the command and displays an error message. Because these parameters are so important, the PORT command is cautious; any mistakes in this command cause the LTS to reject the entire command.

All of the following messages indicate that LTS has rejected the PORT command. The messages are listed in alphabetical order.

A command line delimiter has been found where one was not expected.
    You entered a colon or a comma (not allowed), or you entered a semicolon in the wrong place.

```
Command option other than those permitted has been used.
```
The -DEFAULT option is the only option allowed for the PORT command.

```
The baud rate value has been specified incorrectly.
```
The only baud rates you can use are 50, 75, 110, 134.5, 150, 200, 300, 600, 1200, 1800, 2400, 3600, 4800, 7200, 9600, 19200, and AUTO.

```
The no. of bits per character has been specified incorrectly.
```
The choices for character size are 5, 6, 7, or 8 bits.

```
The no. of stop bits has been specified incorrectly.
```
The number of stop bits must be 1 or 2.

```
The parity has been specified incorrectly.
```
The choices for parity are odd, even, or none.


# The SET Command

The SET command can change any of the 23 definable LTS parameters. The syntax of the SET command is

$$\text{SET par-\#:par-val-1 [...par-\#:par-val-5]} \begin{bmatrix} \text{-ALL} \\ \text{-COMMAND} \\ \text{-DEFAULT} \end{bmatrix}$$

With the SET command, you identify the parameter you want to change by specifying a parameter number. To define the parameter setting, enter a character (for character parameters, like the escape character or the erase character) or a code number. Each parameter has its own identifying number and, for noncharacter parameters, a code number for each possible setting.

Table 4-6 lists parameters by number and shows the choices available for parameter settings with the SET command. For parameters that use code numbers, the code numbers are also listed. The default setting for each parameter is indicated by an asterisk. (This information is also available in Appendix B, LTS Parameter Summary.)

**Table 4-6**
**LTS Parameter Numbers and Valid Parameter Settings**

| Parameter Number | Parameter | Choices |
|---|---|---|
| 1 | Escape character | Any single ASCII character<br>( Ctrl \ is the default) |
| 5 | XON/XOFF flowto | 0 - Disabled<br>1 - Enabled* |
| 6 | LTS messages | 0 - No messages<br>1 - Transmit all but prompts<br>5 - Transmit all messages* |
| 9 | Carriage return padding | 0* through 255 |
| 11 | Baud rate | 0- 110    4- 600   8- 200    14- 9600<br>1- 134.5 5- 75    10- 50     15-19200<br>2- 300    6- 150 12-2400  30- 3600<br>3- 1200  7-1800 13-4800  31- 7200<br>32-AUTO* |
| 12 | XON/XOFF flowfrom | 0 - Disabled<br>1 - Enabled* |
| 13 | Linefeed after carriage return | 0 - Do not insert linefeed<br>1 - Insert linefeed* |
| 14 | Linefeed padding | 0* through 255 |
| 16 | Erase character | Any single ASCII character<br>( Backspace is the default) |
| 17 | Line erase character | Any single ASCII character<br>( ? is the default) |
| 18 | Line display character | Any single ASCII character<br>( Ctrl L is the default) |
| 21 | Parity treatment | 0 - Parity Disabled*<br>3 - Parity Enabled |
| 50 | Bits per character | 5<br>6<br>7<br>8* |
| 51 | Stop bits | 1*<br>2 |

* Default setting

Table 4-6
LTS Parameter Numbers and Valid Parameter Settings – Continued

| Parameter Number | Parameter | Choices |
|---|---|---|
| 52 | Parity type | 0 - Odd*<br>1 - Even |
| 53 | Protocol | 0 - TTY*<br>1 - TRAN<br>2 - TT8BIT<br>3 - TTYUPC<br>4 - TTY8 |
| 54 | EIA flow control | 0 - Disabled*<br>1 - Enabled on high to low DCD<br>2 - Enabled on low to high DCD |
| 57 | Full-duplex/half-duplex mode | 0 - Full-duplex mode*<br>1 - Half-duplex mode |
| 58 | Enable escape character | 0 - Disabled<br>1 - Enabled* |
| 59 | Horizontal tab padding | 0* through 255 |
| 60 | Vertical tab padding | 0* through 255 |
| 61 | Form feed padding | 0* through 255 |
| 63 | DCD connection control | 0 - Do not break the connection when DCD drops<br>1 - Break the connection when DCD drops* |

* Default setting

## Entering the Parameter Numbers and Values

To use the SET command, enter the parameter number, a colon, and then the character or code number for the parameter setting. For example, to change the LTS erase character, parameter 16, to a backslash, enter the following command:

```
<1>CMD: SET 16:\
```

To disable the XON/XOFF flowfrom parameter, parameter 12, enter the following command:

```
<1>CMD: SET 12:0
```

You can change as many as five parameters with a single SET command, provided that they are all members of the same parameter group. That is, they must all be global port parameters, data transfer mode parameters, or session parameters. Enter the parameters on the same command line, separated with spaces. For example, if you want to change your LTS erase character (parameter 16) to a backslash and change the line erase character (parameter 17) to an exclamation point, enter the following command:

```
<1>CMD:  SET 16:\ 17:!
```

You can enter parameter numbers in any order when you use the SET command.

## Setting the Global Port Parameters

To change as many as five global port parameters at once, enter their numbers and settings in a SET command. For example, the following command changes baud rate, parity treatment, bits per character, stop bits, and parity type:

```
<1>CMD:  SET 11:14 21:3 50:7 51:1 52:0
```

Because any change to a global port parameter automatically affects command mode and all eight sessions, the LTS rejects any SET command for a global port parameter if the command contains options. The LTS also displays an error message. For example, the LTS rejects the command SET 11:14 -ALL.

---

### Caution

Be careful not to change any of the crucial global port parameters (baud rate, parity treatment, bits per character, stop bits or parity type) by mistake. If you do, you may disable all communication between your terminal and the LTS. Watch out for the following parameter numbers:

11 - Baud rate
21 - Parity treatment
50 - Bits per character
51 - Stop bits
52 - Parity type

Also remember that when you set any of the global port parameters, the changes affect command mode and all eight sessions, whether they are free or active.

---

## The SET Command and Auto Speed Detect

You can use the SET command to change the baud rate to Auto Speed Detect. For example,

```
<1>CMD: SET 11:32
```

When you specify Auto Speed Detect, do not change the parity, bits per character, or number of stop bits. The LTS automatically changes those parameters to the following settings:

Parity disabled
Eight bits per character
One stop bit

If you try to change any of those parameters to some other setting in the same SET command, the LTS ignores your instructions and puts your terminal line into Auto Speed Detect with the settings listed above.

If you change the baud rate parameter to Auto Speed Detect, make sure your terminal is using the correct bits per character, parity, and stop bits. For PT200, PST100, and PT45 terminals, use seven bits per character with space parity or with parity ignored. (Seven bits per character with space parity or with parity ignored is the default setting for these terminals.) On these terminals, do not use the settings for eight-bit characters, because those settings are for special international character sets. For terminals made by other vendors, seven bits per character with space parity or with parity ignored should also work correctly. All terminals must use one stop bit.

If you want to change any of those characteristics, wait until you complete the Auto Speed Detect function.

## Setting a Specific Session's Parameters

Each of your eight sessions has six session parameters, as shown in Table 4-7. You can set these parameters to tailor the characteristics of the session to match those of the target host application program. To set a specific session's parameters, make the session your current one with the SWITCH command (described in Chapter 2, Basic LTS Commands) and then enter SET without an option. (The first part of the LTS prompt displays your current session number.) For example, to change the Protocol parameter (number 53) on session 2 to TRAN (code number 1) when your current session is session 1, enter the following sequence of commands:

```
<1>CMD: SWITCH 2
<2>CMD: SET 53:1
```

The changes that you make in this way affect only the current session. In the case of the parameters that are also in the command mode parameter set (5, 12, 53, and 54), the changes affect only the current session, not the command mode parameter set. (To change the command mode settings of the common parameters, enter SET –COMMAND, as described later in this chapter.) All changes take effect immediately. Parameters 5, 12, 53, and 54 are reset to the default values stored in EAROM when the session is disconnected. The parameters defining the

escape character and its operation, 1 and 58, are *not* reset to the default values upon disconnect. Thus, you can define an escape character and enable or disable it for each session, but changes to parameters 5, 12, 53, and 54 last only for the duration of the connection. For a full discussion of why you might want to establish a different escape character for each session, refer to the section entitled Switching Modes: The LTS Escape Character, in Chapter 2, Basic LTS Commands.

<div align="center">

**Table 4-7**
**Session Parameters**

</div>

| Number | Parameter Name |
|:---:|:---|
| 1 | Define Escape Character (ESC) |
| * 5 | XON/XOFF Flowto (FLOWTO) |
| * 12 | XON/XOFF Flowfrom (FLOWFROM) |
| * 53 | Protocol (PROTOCOL) |
| * 54 | EIA Flow Control (FLOWCONTROL) |
| 58 | Enable Escape Character (ENTERCMD) |

* Also in the command mode parameter set.

## Setting a Parameter for All Eight Sessions: SET –ALL

SET –ALL changes as many as five session parameters for all eight sessions at once. It works only with the session parameters listed in Table 4-7, above. The new parameter settings take effect immediately, whether the sessions are free or active. In the case of the parameters that are also in the command mode parameter set (5, 12, 53, and 54), changes made with SET –ALL affect only the sessions' parameter sets, not the command mode parameter set. For example, to change the XON/XOFF flowto parameter (number 5) to disabled (code number 0) for all eight sessions, enter the following command:

```
<1>CMD:  SET 5:0  -ALL
```

## Setting the Command Mode Parameters: SET –COMMAND

SET –COMMAND changes as many as five command mode parameters at once. Table 4-8 lists the command mode parameters. In the case of the parameters that are also in the session parameter set (5, 12, 53, and 54), changes made with SET –COMMAND affect only the command mode parameter set, not the session parameter sets. For example, to change parameter 53 (Protocol) to TTY (code number 0) for command mode only, enter the following command. (–CMD is an abbreviation for –COMMAND.)

```
<1>CMD:  SET 53:0  -CMD
```

Table 4-8
Command Mode Parameters

| | Number | Parameter Name |
|---|---|---|
| * | 5 | XON/XOFF Flowto (FLOWTO) |
| | 9 | Carriage Return Padding (CR_PADDING) |
| * | 12 | XON/XOFF Flowfrom (FLOWFROM) |
| | 13 | Linefeed After Carriage Return (LF_AFTER_CR) |
| | 14 | Linefeed Padding (LF_PADDING) |
| | 16 | Erase Character (ERASE) |
| | 17 | Line Erase Character (LINE_ERASE) |
| | 18 | Line Display Character (LINE_DISPLAY) |
| * | 53 | Protocol (PROTOCOL) |
| * | 54 | EIA Flow Control (FLOWCONTROL) |
| | 57 | Full-duplex/Half-duplex Mode (HALFDUPL) |
| | 59 | Horizontal Tab Padding (HT_PADDING) |
| | 60 | Vertical Tab Padding (VT_PADDING) |
| | 61 | Form Feed Padding (FF_PADDING) |

* Also in the session parameter set.

## Saving Parameter Settings in EAROM: SET -DEFAULT

SET -DEFAULT stores your parameter changes in LTS EAROM and also updates the current parameters in LTS RAM. The -DEFAULT option works with all 23 of the definable LTS parameters. Parameter settings saved in EAROM are retained even in the event of shutdown or reset. They are activated when the LTS is reinitialized. Unless you enter new parameter settings in EAROM with the -DEFAULT option of ESCAPE, PORT, or SET, the original factory default settings or the last settings saved in EAROM are activated when the LTS is reinitialized.

The data transfer mode default settings for parameters 5, 12, 53, and 54 are used to reset a session's parameter set after a connection ends. Those parameters are reset to the default settings if they have been changed by the user or by a host application program prior to or during the session.

The parameter settings stored in EAROM are also activated when you issue the DEFAULT command (described later in this chapter), except for those of the global port parameters, which are restored from EAROM only upon reinitialization.

**Saving Global Port Parameters:** When you save a global port parameter in EAROM with SET -DEFAULT, the change also affects the current setting for command mode and all eight sessions, whether they are free or active. (The global port parameters are 6, 11, 21, 50, 51, 52, and 63. See the section entitled Global Port Parameters earlier in this chapter for more information.) For example, the following command changes your baud rate to 19,200 in both RAM and EAROM; that is, the change takes effect immediately and is saved permanently:

<1>CMD: *SET 11:15 -DEFAULT*

**Saving Session Parameters:** Entering SET –DEFAULT for a session parameter changes its setting in both EAROM and in the current session's parameter set. (The session parameters are 1, 5, 12, 53, 54, and 58. See the section entitled Session Parameters earlier in this chapter for more information.) The settings for the session parameters that you save in EAROM with SET –DEFAULT become the data transfer mode defaults. There is one set of data transfer mode defaults for all eight sessions, not a separate set for each session. The values for parameters 5, 12, 53, and 54 are used to reset a session's parameter set when a session disconnects, in the case where they were changed before or during the session. The values for the escape character parameters, 1 and 58, are *not* reset upon disconnect.

For example, the following command changes the escape character to # in both EAROM and in the current session's parameter set. (Note that you can save only one setting for the escape character in EAROM, not one for every session.)

    <1>CMD: SET 1:# -DEFAULT

In the case of parameters 5, 12, 53, and 54, which are also in the command mode parameter set, the change does *not* affect the current command mode parameters or the command mode defaults in EAROM. For example, the following command changes the protocol parameter to TRAN in EAROM and in the current session parameter set, but not in the current command mode parameter set or in the command mode defaults.

    <1>CMD: SET 53:1 -DEFAULT

You can also use the –DEFAULT option together with the –ALL option to change session parameters both in EAROM and in all eight sessions. The changes take effect immediately. In the case of parameters 5, 12, 53, and 54, the changes do not affect the current command mode parameter set or the command mode defaults in EAROM. For example, the following command disables XON/XOFF flowto and XON/XOFF flowfrom in EAROM and in all eight sessions.

    <1>CMD: SET 5:0 12:0 -DEFAULT -ALL

**Saving Command Mode Parameters:** Entering SET –COMMAND –DEFAULT (or SET –CMD –DEF) for a command mode parameter changes its setting in both the command mode defaults in EAROM and in the current command mode parameter set. (The command mode parameters are 5, 9, 12, 13, 14, 16, 17, 18, 53, 54, 57, 59, 60, and 61. See the section entitled Command Mode Parameters earlier in this chapter for more information.) In the case of parameters 5, 12, 53, and 54, which are also in the session parameter set, changes made with SET –COMMAND –DEFAULT do *not* affect any of the session parameters in RAM or in EAROM. For example, the following command changes the protocol parameter to TTYUPC in the command mode defaults in EAROM and in the current command mode parameter set. It does not affect any of the session parameters anywhere.

    <1>CMD: SET 53:3 -CMD -DEF

## The SET Command Versus the PORT Command

Although you can use the SET command to change any LTS parameters, we recommend that you use the PORT command for changing the crucial global port parameters (baud rate, parity, bits per character, or number of stop bits).

In general, it is more difficult to make a mistake with the PORT command. For example, because you enter a real baud rate rather than a code number, you are less likely to accidentally request the wrong baud rate with the PORT command. Because these global port parameters are crucial for communication between your terminal and the LTS, use the PORT command if you want to change them.

## SET Command Error Messages

Because some mistakes in the SET command can prevent your terminal from communicating with the LTS, any errors in a SET command cause the LTS to reject the entire command. The following messages explain why the LTS rejected a SET command. They are listed in alphabetical order.

A space character is not allowed between the parameter and the parameter value. All parameter changes are ignored.
> Type a colon, but no spaces, between the parameter number and parameter value.

A space or a CR must follow a parameter value. All parameter changes are ignored.
> You typed something other than a space between a parameter value and the next parameter number.

Command option other than those permitted has been used.
> The only options for the SET command are -ALL, -COMMAND (or -CMD), and -DEFAULT (or -DEF).

Only 5 parameters can be changed with the SET command.
> You tried to change more than 5 parameters with one SET command.

Parameters and parameter values must be entered with the SET command.
> You tried to enter a SET command without any parameter numbers or parameter values.

Parameters must be entered before command line options. All parameter changes are ignored.
> You typed -ALL, -COMMAND (or -CMD), or -DEFAULT (or -DEF) before the parameter numbers and parameter values. The parameters must come first.

The *nth* parameter cannot be changed when -ALL is entered. Parameter is global.

> You used the -ALL option when attempting to set a global port parameter. The LTS rejects the command in case you have forgotten that changing a global port parameter affects command mode and all eight sessions, whether they are free or active.

The *nth* parameter cannot be changed. All parameter changes are ignored.

> You entered an incorrect parameter number. The *nth* parameter in your list is one of the LTS parameters that you cannot change (either the XON character, the XOFF character, or the LOOPBACK parameter).

The *nth* parameter cannot be changed when -COMMAND is entered. Parameter is global.

> You entered the -COMMAND option when attempting to set one of the global port parameters. The LTS rejects the command in case you have forgotten that changing a global port parameter affects command mode and all eight sessions, whether they are free or active.

The *nth* parameter cannot be set to the XON or the XOFF character. All parameter changes are ignored.

> You tried to define one of the character parameters (erase character, line erase character, line display character, escape character) as ⎡Ctrl⎤ ⎡S⎤, the character reserved for XOFF (ASCII DC3), or ⎡Ctrl⎤ ⎡Q⎤, the character reserved for XON (ASCII DC1).

The *nth* parameter is being changed twice in this command. This is illegal. All parameter changes are ignored.

> You tried to change the same parameter twice in the same command.

The *nth* parameter must be followed by a parameter value.

> You forgot to specify a parameter value for the *nth* parameter in your SET command.

The *nth* parameter must be valid in command mode in order to change.

> You entered the -COMMAND (or -CMD) option when attempting to set parameter 1 or 58, which are session parameters.

The *nth* parameter must be valid in data transfer mode in order to change.

> You attempted to change one of the command mode parameters without including the -COMMAND (or -CMD) option. When entered without an option, SET works upon only the session and global port parameters.

The _nth_ parameter must have a parameter value between 0 and 2.

The _nth_ parameter in your list must have a value of 0, 1, or 2. Either the parameter number or the parameter value is incorrect.

The _nth_ parameter must have a parameter value between 0 and 255. All parameter changes are ignored.

The _nth_ parameter in your list must have a value of a number from 1 through 255. Either the parameter number or the parameter value is incorrect.

The _nth_ parameter must have a parameter value between 0 and 4. All parameter changes are ignored.

The _nth_ parameter in your list must have a value of 0 through 4. Either the parameter number or the parameter value is incorrect.

The _nth_ parameter must have a parameter value between 5 and 8. All parameter changes are ignored.

The _nth_ parameter in your list must have a value of 5, 6, 7, or 8. Either the parameter number or the parameter value is incorrect.

The _nth_ parameter must have 3 or less digits. All parameter changes are ignored.

You entered a character instead of a number, or you entered more than three digits for the _nth_ parameter value (the highest possible number for any parameter value, 255, has only three digits).

The _nth_ parameter must have a parameter value of 0 or 1. All parameter changes are ignored.

The _nth_ parameter in your list must have a value of 0 or 1. Either the parameter number or the parameter value is incorrect.

The _nth_ parameter must have a parameter value of 0, 1, or 5. All parameter changes are ignored.

The _nth_ parameter in your list must have a value of 0, 1, or 5. Either the parameter number or the parameter value is incorrect.

The _nth_ parameter must have a parameter value of 0 - 8, 10, 12 - 15, or 30 - 32. All parameter changes are ignored.

You entered an illegal parameter value for the _nth_ parameter in your list. Either the parameter number or the parameter value is incorrect.

The *nth* parameter must have a value of 0 or 3. All parameter changes are ignored.

The *nth* parameter in your list must have a value of 0 or 3. Either the parameter number or the parameter value is incorrect.

The *nth* parameter must have a value of 1 or 2. All parameter changes are ignored.

The *nth* parameter in your list must have a value of 1 or 2. Either the parameter number or the parameter value is incorrect.

The *nth* parameter must have only one character as part of the parameter value. All parameter changes are ignored.

You tried to define multiple characters for a parameter that is limited to a single character (erase character, line erase character, line display character, or escape character).

The -CONN option is no longer supported. No option needed to change data transfer mode parameters.

You do not need to use the obsolete –CONN option to set session (data transfer mode) parameters. Simply enter SET followed by the the parameters to be changed.

The -DEFAULT option can only be used when parameters have been entered.

You tried to use the –DEFAULT option without entering a parameter number and value.


# The HELP Command

The LTS HELP command displays a list of the LTS commands and their options. The –PAR option lists the LTS parameters, along with their legal and default settings.


## Displaying LTS Command Information

To display a list of the LTS commands and their syntax, enter the HELP command without the option. The HELP command shows you the correct name of each command, any required information you must include, and the command options you can use. For example,

```
<1>CMD: HELP
BANNER
CONNECT name
CONTINUE [n]
DEFAULT [-ALL] [-COMMAND]
DISCONNECT [n]
ESCAPE [escape char] [-ON | -OFF] [-ALL] [-DEFAULT]
```

```
HELP [-PAR]
LIST_HOSTS
LTS_ADDR
PORT [baud;parity;bpc;stopbits/AUTO] [-DEFAULT]
PORTS
PROMPT [prompt]
SET <parameter>:<parameter_value>...(up to 5) [-ALL] [-COMMAND] [-DEFAULT]
SHOW <parameter>...(up to 5) [-DEFAULT]
STATUS
SWITCH [n]
TEST
```

## Displaying LTS Parameter Information

To get information about the LTS parameters, enter HELP -PAR. The LTS displays a list of all the LTS parameters by number, the number codes for the parameter settings, and the factory default settings, which are indicated with asterisks. For example,

        **<1>CMD:** ***HELP -PAR***

| | | |
|---|---|---|
| 1 - ESC | Any ascii character. | |
| 5 - FLOWTO | 0 - disabled   1 - enabled | |
| 6 - SERVSGNL | 0 - no messages   1 - all but prompts   5 - all messages | |
| 9 - CR_PADDING | Number of characters to fill after a CR (0 to 255). | |
| 11 - BAUD | 0 - 110   1 - 134.5   2 - 300   3 - 1200   4 - 600 | |
| | 5 - 75   6 - 150   7 - 1800   8 - 200   10 - 50 | |
| | 12 - 2400   13 - 4800   14 - 9600   15 - 19200   30 - 3600 | |
| | 31 - 7200   32 - AUTO | |
| 12 - FLOWFROM | 0 - disabled   1 - enabled | |
| 13 - LF_AFTER_CR | 0 - disabled   1 - enabled | |
| 14 - LF_PADDING | Number of characters to fill after a LF (0 to 255). | |
| 16 - CHAR_DELETE | Any ascii character. | |
| 17 - LINE_DELETE | Any ascii character. | |
| 18 - LINE_DISPLAY | Any ascii character. | |
| 21 - PARITY_TREATMENT | 0 - parity disabled   3 - parity enabled | |
| 50 - BPC | 5 - 5 bits   6 - 6 bits   7 - 7 bits   8 - 8 bits | |
| 51 - SBITS | 1 - 1 sbit   2 - 2 sbits | |
| 52 - PARITY | 0 - odd   1 - even | |
| 53 - PROTOCOL | 0 - TTY   1 - TRAN   2 - TT8BIT   3 - TTYUPC   4 - TTY8 | |
| 54 - FLOWCONTROL | 0 - NO EIA   1 - EIA-HIGH TO LOW   2 - EIA--LOW TO HIGH | |
| 55 - XOFF | (cannot be changed) | |
| 56 - XON | (cannot be changed) | |
| 57 - HALFDUPL | 0 - disabled   1 - enabled | |
| 58 - ENTERCMD | 0 - disabled   1 - enabled | |
| 59 - HT_PADDING | Number of characters to fill after a HT (0 - 255). | |

```
60 - VT_PADDING        Number of characters to fill after a VT (0 - 255).
61 - FF_PADDING        Number of characters to fill after a FF (0 - 255).
62 - LOOP              (cannot be changed)
63 - DCD_DROP          0 - do not break connection   1 - break connection
```

**Note**

The HELP –PAR command lists three parameters that you cannot change. The characters used for XON and XOFF (parameters 55 and 56) are [Ctrl] [S] (ASCII DC3) and [Ctrl] [Q] (ASCII DC1); these characters cannot be changed. The loopback parameter (parameter 62), which is used for network troubleshooting, can only be changed by the NTS software.

The HELP –PAR command shows you the choices you have for parameter settings, but it does not tell you the current setting for any of the parameters. To review the current parameter settings, use the SHOW command (described in the next section).

You can use the HELP –PAR command as a companion to the SET and SHOW commands because both SET and SHOW refer to LTS parameters by parameter numbers and to parameter settings by number codes. HELP –PAR is a quick way to find parameters by number and to determine what the number codes mean.

# The SHOW Command

The SHOW command displays the settings of the parameters for your LTS port. You can display the current settings or the default settings stored in EAROM. You can also display both the current and the default settings for as many as five specific parameters.

The LTS keeps track of two sets of parameters for each port. One set is for command mode and the other is for data transfer mode. Depending on what parameters you have changed, the two sets may differ. (For information on how parameter settings vary from one mode to the other, see the section earlier in this chapter entitled Parameters Common to the Command Mode and Session Parameter Sets.)

Because the output of the SHOW command uses parameter numbers and number codes for the parameter settings, you probably need the HELP –PAR command to interpret the results.

## Displaying the Current Settings

To display the current settings of the parameters for your LTS port, enter SHOW without an argument or option. The LTS displays the command mode settings and the settings for your current session. For example, to show the current settings for session 3, switch to that session and then enter SHOW.

```
<1>CMD: SWITCH 3
<3>CMD: SHOW
```

Parameters for session: 3

| Parameter Number | CURRENT Command Mode | Data Mode | Transfer | Parameter Number | CURRENT Command Mode | Data Mode | Transfer |
|---|---|---|---|---|---|---|---|
| 1 | | ^\ | | 51 | 1 | 1 | |
| 5 | 0 | 1 | | 52 | 0 | 0 | |
| 6 | 5 | 5 | | 53 | 1 | 0 | |
| 9 | 0 | | | 54 | 1 | 0 | |
| 11 | 14 | 14 | | 55 | ^S | ^S | |
| 12 | 0 | 1 | | 56 | ^Q | ^Q | |
| 13 | 1 | | | 57 | 0 | | |
| 14 | 0 | | | 58 | | 1 | |
| 16 | ^H | | | 59 | 0 | | |
| 17 | ? | | | 60 | 0 | | |
| 18 | ^L | | | 61 | 0 | | |
| 21 | 0 | 0 | | 62 | | 0 | |
| 50 | 8 | 8 | | 63 | 1 | 1 | |

## Displaying the Default Settings Stored in EAROM: SHOW -DEFAULT

To display the default settings for your port stored in EAROM, enter SHOW -DEFAULT. The LTS displays both the command mode default settings and the data transfer mode default settings. In the example below, note that parameter 53 (Protocol) is set to 0 (TTY) for command mode and 1 (TRAN) for data transfer mode. The parameter settings stored in EAROM are the factory default settings unless you have entered different settings with ESCAPE -DEFAULT, PORT -DEFAULT, or SET -DEFAULT.

```
<2>CMD: SHOW -DEFAULT
```

Parameters for session: 2

| Parameter Number | DEFAULT Command Mode | Data Mode | Transfer | Parameter Number | DEFAULT Command Mode | Data Mode | Transfer |
|---|---|---|---|---|---|---|---|
| 1 | | ^\ | | 51 | 1 | 1 | |
| 5 | 1 | 1 | | 52 | 0 | 0 | |
| 6 | 5 | 5 | | 53 | 0 | 1 | |
| 9 | 0 | | | 54 | 0 | 0 | |
| 11 | 32 | 32 | | 55 | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 12 | 1 | 1 | | 56 | | |
| 13 | 1 | | | 57 | 0 | |
| 14 | 0 | | | 58 | | 1 |
| 16 | ^H | | | 59 | 0 | |
| 17 | ? | | | 60 | 0 | |
| 18 | ^L | | | 61 | 0 | |
| 21 | 0 | 0 | | 62 | | 0 |
| 50 | 8 | 8 | | 63 | 1 | 1 |

## Displaying the Settings of Specific Parameters

To display the settings of as many as five specific parameters, enter SHOW followed by the numbers of the parameters you want to display. The LTS displays the current setting and the default setting stored in EAROM for both command mode and data transfer mode. In the example below, SHOW is used to display the settings of XON/XOFF flowto, XON/XOFF flowfrom, protocol, and EIA flowcontrol. These are the four parameters that are common to the command mode and the session parameter sets. Therefore, they can have a command mode setting that differs from the data transfer mode setting, as the following example shows.

```
<2>CMD: SHOW 5 12 53 54
```

Parameters for session: 2

| | CURRENT | | DEFAULT | |
|---|---|---|---|---|
| Parameter Number | Command Mode | Data Transfer Mode | Command Mode | Data Transfer Mode |
| 5 | 0 | 1 | 1 | 1 |
| 12 | 0 | 1 | 1 | 1 |
| 53 | 1 | 0 | 0 | 1 |
| 54 | 1 | 0 | 0 | 0 |

# The PORTS Command

The PORTS command displays the settings of the crucial global port parameters for any port (line) on the LTS. The crucial global port parameters are baud rate, parity, bits per character, and number of stop bits. You can display the current settings of these parameters for all eight LTS ports or for any particular port.

## Checking a Specific Port

To check the settings of the crucial global port parameters for a specific port, enter a PORTS command with the following syntax.

PORTS [n]

where *n* is the LTS port number of the port you want to check. LTS port numbers range from 0 through 7, as shown in Figure 4-8.



Q10117-2LA-10-0
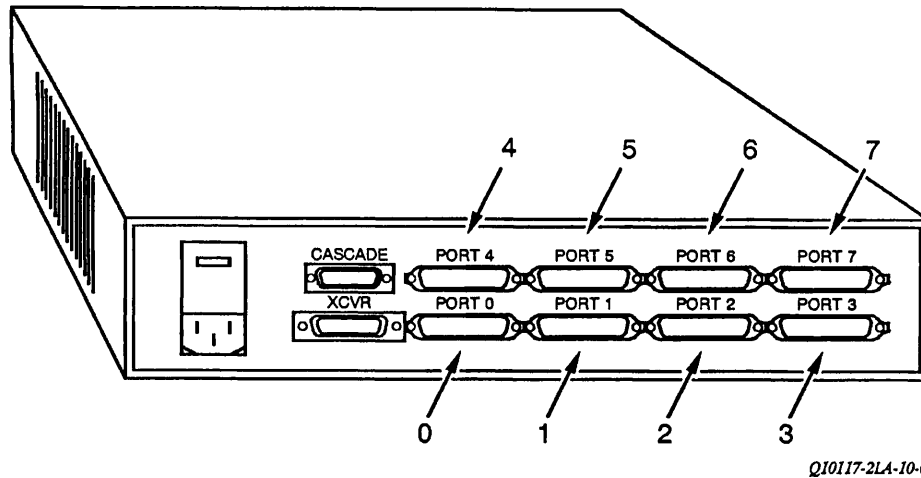
**Figure 4-8**
**LTS Port Numbers**

For example,

<1>CMD: *PORTS 3*

| Port # | Baud | Parity | BPC | Stopbits |
|--------|------|--------|-----|----------|
| 3 | 9600 | ODD | 7 | 1 |

## Checking All Ports on the LTS

To check the settings of the crucial port parameters for all ports on the LTS, enter PORTS without an argument. For example,

<1>CMD: *PORTS*

| Port # | Baud | Parity | BPC | Stopbits |
|--------|------|--------|-----|----------|
| 0 | 9600 | Odd | 7 | 1 |
| 1 | 4800 | None | 8 | 1 |
| 2 | Auto | None | 8 | 1 |
| 3 | 9600 | None | 8 | 1 |
| 4 | 9600 | Even | 7 | 1 |
| 5 | 9600 | None | 8 | 1 |

| 6 | 2400 | None | 8 | 1 |
| 7 | 9600 | Odd | 7 | 1 |

You may find this command useful if you define one of these parameters incorrectly for your own terminal. For example, suppose you try to use the SET command to define a baud rate of 4800 for your terminal, but as soon as you issue the command, your terminal can no longer communicate with the LTS. You may have specified some other baud rate by mistake, but you cannot find out because your terminal is now useless (see Figure 4-9).

Terminal is transmitting data
at 4800 bits per second.

LTS baud rate parameter
is set at 9600.



Data

LTS

*Q10117-2LA-20-1*
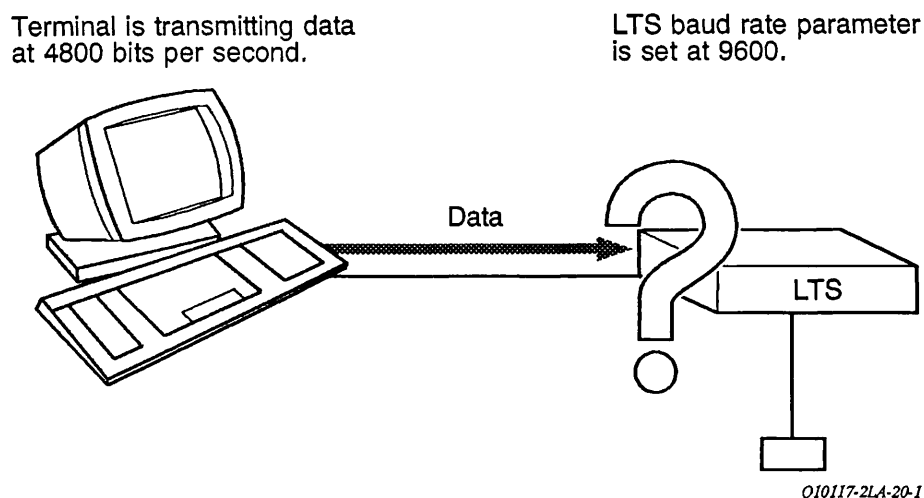
**Figure 4-9**
**Terminal Baud Rate Does Not Match LTS Baud Rate Parameter**
**Communication Fails**

If you know which LTS port your terminal is attached to, you can fix this problem.

1. Go to another terminal attached to your LTS.

2. Make sure the terminal is in LTS command mode.

3. Issue the PORTS command, entering the LTS port number for your terminal.

4. Find out your terminal's current baud rate parameter.

5. Go back to your terminal and use software or hardware switches to change its baud rate to match the LTS parameter. (On some terminals, you need to turn the terminal off, wait a few seconds, and then turn the terminal on again to activate the change; check the manual for your terminal.)

6. Try out an LTS command from your terminal (for example, HELP or LIST_HOSTS) to make sure communication is reestablished.

7. Use the PORT command to set the baud rate parameter to the setting you wanted in the first place.

8. Change your terminal baud rate to match the new parameter setting.

If this procedure does not correct the problem, ask your administrator for help.

# The DEFAULT Command

The DEFAULT command activates the default parameter settings stored in EAROM for your port. The default settings are the factory default settings unless you have saved different settings with ESCAPE −DEFAULT, PORT −DEFAULT, or SET −DEFAULT. The SHOW −DEFAULT command, described earlier in this chapter, displays the settings of the default parameters in EAROM. You can activate the default settings for the current session, for all sessions, or for command mode operation, as described in the following sections. The DEFAULT command is useful if you have been experimenting with parameter changes and you want to set the parameters back to a known state quickly.

If EAROM for your LTS line goes bad, you can still use the LTS. When you issue the DEFAULT command or when the LTS is reinitialized, the LTS checks EAROM to make sure it is good. If EAROM is not good, the LTS activates the factory default settings for all parameters. You can then make changes to the parameters, but you cannot save any changes permanently if EAROM is bad.

DEFAULT does *not* change the current settings for the global port parameters: LTS messages, baud rate, bits per character, parity treatment, parity type, number of stop bits, and DCD connection control. The default settings in EAROM for those parameters are activated only when the LTS is reinitialized.

## Activating Default Settings for a Specific Session

To activate the default settings for a specific session, switch to that session and then enter DEFAULT without an option. The LTS activates the data transfer default settings stored in EAROM for parameters 1, 5, 12, 53, 54, and 58. In the case of parameters 5, 12, 53, and 54, the LTS uses the data transfer mode default settings, not the command mode default settings. Note that there is one set of session parameters (called the data transfer mode defaults) stored in EAROM, not a separate set for every session. The default settings are activated immediately if the session is free, or upon disconnect if it is active. In the example below, the user activates the default settings for session 5 by first switching to that session and then entering DEFAULT.

```
<1>CMD: SWITCH 5
<5>CMD: DEFAULT
```

## Activating Default Settings for All Sessions: DEFAULT −ALL

To activate the data transfer mode default settings stored in EAROM for all sessions, enter DEFAULT −ALL. The default settings for parameters 1, 5, 12, 53, 54, and 58 are activated

immediately for all of the sessions, whether they are free or active. In the case of parameters 5, 12, 53, and 54, the LTS uses the data transfer mode default settings, not the command mode default settings. The example below shows the use of DEFAULT –ALL:

```
<1>CMD: DEFAULT -ALL
```

## Activating the Command Mode Default Settings: DEFAULT –COMMAND

To activate the command mode default settings stored in EAROM, enter DEFAULT –COMMAND (or DEFAULT –CMD). The LTS activates the default settings for all of the command mode parameters: 5, 9, 12, 13, 14, 16, 17, 18, 53, 54, 57, 59, 60, 61. In the case of parameters, 5, 12, 53, and 54, the LTS uses the command mode default settings, not the data transfer mode default settings. The example below shows the use of DEFAULT –COMMAND:

```
<1>CMD: DEFAULT -CMD
```

## Using the Options Together: DEFAULT –COMMAND –ALL

To activate the default settings stored in EAROM for command mode and all eight sessions, enter DEFAULT –COMMAND –ALL. The LTS immediately activates the command mode default settings and the data transfer mode default settings for all sessions. The LTS activates the default settings for any active sessions as soon as they disconnect. The following example shows the usage of DEFAULT –COMMAND –ALL:

```
<1>CMD: DEFAULT -CMD -ALL
```

# The SET_ASYNC Command

Whenever you are in LTS command mode (when you are not connected to a host computer or when you have established a connection and escaped to command mode), you can use the LTS commands described in this chapter to change your LTS parameters. When you establish a connection to a LAN300 host and log in, you can change some LTS parameters from the PRIMOS side using the PRIMOS SET_ASYNC command.

The SET_ASYNC command has 25 options for users and 8 more options that are available to operators and administrators only. (For complete information on SET_ASYNC options for users, see the *PRIMOS Commands Reference Guide*.)

Some of the SET_ASYNC options are counterparts to LTS parameters. For example, if you issue the following SET_ASYNC command,

```
OK SET_ASYNC -LINE 1026 -SPEED 4800
```

PRIMOS sends this information to the LTS, which changes the baud rate parameter for your line to 4800.

When you enter a SET_ASYNC command, you must include your PRIMOS line number (1026 in the example). PRIMOS line numbers for NTS users can change from one connection to the next. To find out your current PRIMOS line number during a connection, issue the STATUS ME command.

Table 4-9 lists the SET_ASYNC options available to you when you are communicating with PRIMOS during data transfer mode. Listed next to each option is its counterpart among the LTS parameters. The SET_ASYNC options that do not have LTS counterparts are not listed.

The default settings are indicated with asterisks.

**Table 4-9**
**PRIMOS SET_ASYNC Options and Corresponding LTS Parameters**

| SET_ASYNC Option | LTS Parameter | Notes |
|---|---|---|
| –PROTOCOL name | 53 PROTOCOL | The LTS supports fewer protocols |
| TTY* | 0 TTY* | than PRIMOS. If you select a |
| TRAN | 1 TRAN | PRIMOS protocol that the LTS |
| TT8BIT | 2 TTY8BIT | does not support, you receive an |
| TTYUPC | 3 TTYUPC | error message. |
| TTY8 | 4 TTY8 | |
| TTY8HS | | |
| TTYNOP | | |
| ASD | | |
| –SPEED value | 11 BAUD | SET_ASYNC speeds include |
| 50 | 50 | CLOCK, J1, J2, and J3. These |
| 75 | 75 | choices represent baud rates that |
| 110 | 110 | can vary from one Prime host to |
| 134.5 | 134.5 | another. Because NTS terminal |
| 150 | 150 | users can activate any of the 16 |
| 200 | 200 | available speeds with the LTS |
| 300 | 300 | PORT or SET command, you do |
| 600 | 600 | not need to use these SET_ASYNC |
| 1200* | 1200 | options for terminal lines. For infor- |
| 1800 | 1800 | mation on setting line speeds for |
| 2400 | 2400 | assigned lines, see Chapter 6, NTS |
| 3600 | 3600 | Assigned Lines. |
| 4800 | 4800 | |
| 7200 | 7200 | |
| 9600 | 9600 | |
| 19200 | 19200 | |
| CLOCK | AUTO* | |
| J1 | | |
| J2 | | |
| J3 | | |
| –STOP_BITS n | 51 STOPBITS | |
| 1* | 1* | |
| 2 | 2 | |

\* Default setting

**Table 4-9 — Continued**
**PRIMOS SET_ASYNC Options and Corresponding LTS Parameters**

| SET_ASYNC Option | LTS Parameter | Notes |
|---|---|---|
| –CHAR_LENGTH n<br>5<br>6<br>7<br>8* | 50 BPC<br>5<br>6<br>7<br>8* | |
| –PARITY value<br>None*<br>Odd<br>Even | 21 PARITY_TREATMENT<br>0 Parity disabled*<br>3 Parity enabled<br><br>52 PARITY<br>0 Odd*<br>1 Even | Note that the LTS uses two parameters for parity, while SET_ASYNC uses only one option. |
| –LINE_FEED*<br>–NO_LINE_FEED | 13 LF_AFTER_CR 0<br>13 LF_AFTER_CR 1* | The LTS default in command mode is to insert a line feed after a carriage return. In data transfer mode, however, PRIMOS inserts the line feed so the LTS does not. |
| –XOFF*<br>–NO_XOFF | 12 FLOWFROM 1*<br>12 FLOWFROM 0 | Flowfrom is XON/XOFF flow control from the terminal. |
| –REVERSE_XOFF<br>–NO_REVERSE_XOFF* | 5 FLOWTO 1*<br>5 FLOWTO 0 | Flowto is XON/XOFf flow control to the terminal. |
| –NO_DATA_SENSE_ENABLE*<br>–DATA_SENSE_ENABLE<br><br>–DATA_SET_SENSE<br>High*<br>Low | 54 FLOWCONTROL 0*<br>54 FLOWCONTROL 1 or 2<br><br><br>54 FLOWCONTROL 1<br>54 FLOWCONTROL 2 | This parameter is EIA flow control. The LTS uses a single parameter for this function. PRIMOS uses two SET_ASYNC options. |

*Default setting

In addition to similar parameters, some LTS commands work like some SET_ASYNC options as shown in Table 4-10.

## LTS and PRIMOS Parameters

When your terminal communicates with the LTS, the LTS relies on your line's parameter settings for accurate communication. PRIMOS needs some of the same information to communicate correctly with your terminal. For example, PRIMOS needs to know which protocol to use for your line.

As soon as you connect to a LAN300 host through your LTS, the LTS sends parameter information over the LAN to PRIMOS at the host. The LTS parameter settings become the active PRIMOS line characteristics, as if you had issued SET_ASYNC commands to activate the appropriate options. The same thing happens when you give the CONTINUE command to return

to a connection after you escaped to command mode. If you changed any parameters while you were in command mode, the LTS sends the new parameter information to PRIMOS. Figure 4-10 shows an example.

**Table 4-10**
**PRIMOS SET_ASYNC Options and Similar LTS Commands**

| *SET_ASYNC Option* | *LTS Command* |
|---|---|
| –DISPLAY<br>Displays the SET_ASYNC options that are currently active. | LTS SHOW Command<br>Displays the current settings for LTS parameters. |
| –DEFAULT<br>Sets all options to their PRIMOS default settings. These defaults *are not* all the same as the LTS defaults. Unless your terminal is running at 1200 baud, *do not* use this option because it sets the baud rate to 1200. | LTS DEFAULT Command<br>The LTS DEFAULT command changes parameter settings to the original defaults or, for those parameters stored in EAROM, to the EAROM settings. |
| –SYSTEM<br>Sets all options to whatever settings were active when you logged in. | (None) |



BAUD = 2400

BAUD = 2400

Host
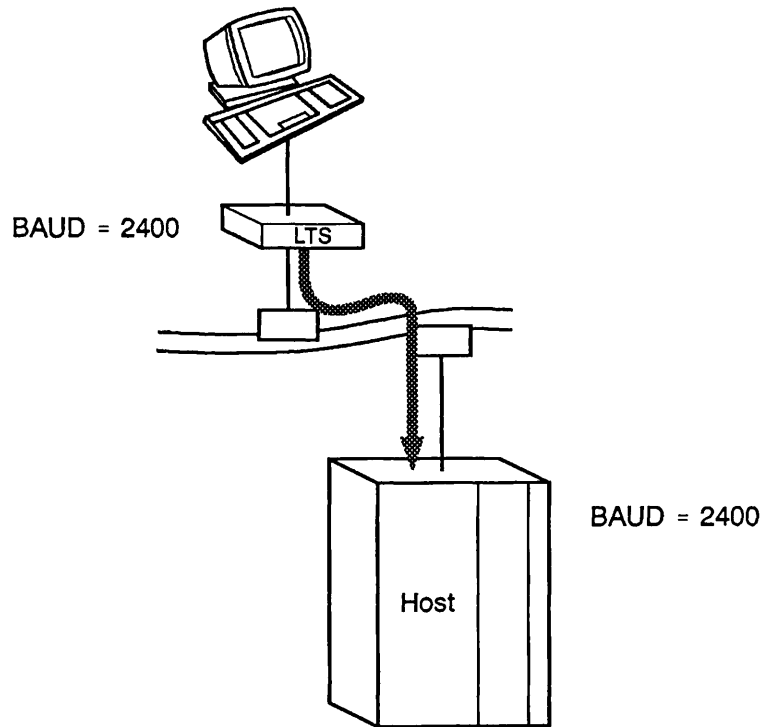
*QI0117-2LA-25-1*

**Figure 4-10**
**When a Connection Is Established or Continued,**
**the LTS Sends Parameters to PRIMOS**

You can, of course, change the settings later, using PRIMOS or LTS commands. The operator or administrator can also change the settings. So can some programs. However, the initial PRIMOS settings for your line always come directly from your LTS parameters.

You might need to regain control of your line's parameters, for example, if a program that changed parameters terminated prematurely, before the program could change the parameters back again. If this problem occurs, return to LTS command mode (use the escape character; or log out; or turn your terminal off, wait 10 seconds, and then turn it on again). Redefine any parameters that you need to change. When you continue your session with the host or reconnect to the host, the LTS sends your choice of parameters to PRIMOS, where they overwrite any other settings.

The next chapter covers commands that give you status information about your NTS line and other network components.

# Status Commands

Some LTS commands can help you determine the status of your NTS line and obtain information useful for troubleshooting network problems or for network configuration. Most network management information is available to the administrator from a supervisor terminal. However, some LTS information can be obtained only from a terminal attached to an LTS — a terminal like yours.

In many cases it is easier for the administrator to make a phone call and ask you for the information than to make a trip to the LTS. Although network configuration and troubleshooting are probably not your responsibilities, some of the information you obtain may be useful to the administrator.

This chapter covers the following commands:

    STATUS
    LTS_ADDR
    BANNER
    TEST

## The STATUS Command

The STATUS command helps you keep track of your sessions, as described in Chapter 2, Basic LTS Commands. STATUS shows the status of each active session, indicates your current session with an arrow, and displays the names of the hosts to which you are connected (see the example below). If you enter STATUS when you have no connections established, the LTS displays No active connections.

```
<3>CMD: STATUS
    Session                                                Packets
  Number  State           Host Name    Network Address   Transmitted/Received
    1     connected       TOM          08-00-2F-02-17           141/18
    2     connected       DICK         08-00-2F-02-F2          23632/1384
  ->3     not active
    4     disconnecting   HARRY        08-00-2F-02-1C        5848393/25032
    5     connected       PEGGY        08-00-2F-02-16           503/487
    8     connected       MOE          08-00-2F-01-2C           9163/205
```

Each session is in one of five states:

| | |
|---|---|
| `not active` | The session is free; that is, completely idle. This status is displayed only if your current session is free and you have other sessions that are active. |
| `connecting` | The LTS is attempting to establish a connection to a host and a response from the host is pending. The session remains in this state until the host accepts or rejects the connection request, or until a timer expires. No user action is required. |
| `connected` | A connection is established with the host. |
| `disconnecting` | The connection is being terminated, either at your request (LOGOUT or DISCONNECT command), or because of a forced logout by the host. No user action is required. |
| `disconnecting*` | The connection has been terminated, but there is information sent to your terminal that has not been displayed yet. This state occurs when a suspended session is terminated by an abnormal condition, such as a forced logout, a host crash, or a broken link to the host. The information that remains to be displayed is typically a message indicating the reason for failure, because host output is normally stopped once a session is suspended. |
| | The session remains in the disconnecting* state until you enter DISCONNECT or CONTINUE. To free up the session without displaying the buffered information, enter DISCONNECT. To display the waiting information, enter CONTINUE. The LTS displays the information on your screen and then frees the session. |

The STATUS command also displays other information that can assist the administrator in troubleshooting but is of little interest to you as a user.

During a connection, STATUS displays the name of the host that you are connected to and the LAN300 address of the LHC the host is using for your connection. The address is a unique identifying number assigned to each LHC at the factory. (The hyphens are not part of the address; they just make the address easier to read.) The administrator sometimes needs to know the address of an LHC. (The *Operator's Guide to Prime Networks* and the *NTS Planning and Configuration Guide* contain complete information about administering a LAN300 network.)

The STATUS command also displays the number of packets exchanged between your terminal and the host since the connection was established. On a LAN300, data is transmitted and received in units known as packets. The number of packets exchanged can sometimes help the administrator with network troubleshooting.

# The LTS_ADDR Command

The LTS_ADDR command tells you the LAN300 address and the name of the LTS that your terminal is physically attached to. The syntax is

**LTS_ADDR**

The administrator needs to know the address of each LTS in order to configure the NTS network. If your administrator asks for the address of your LTS, use the LTS_ADDR command. The LTS displays a 12-digit hexadecimal number, which is a unique identifying number that each LTS receives at the factory. For example,

```
<1>CMD: LTS_ADDR
LTS ADDRESS         LTS NAME
08-00-2F-F8-08-2B   LTS_P6
```

As in an LHC address, the hyphens in an LTS address are not really part of the address. They just make the address easier to read.

The LTS name is the name assigned by the administrator in the NTS configuration file on the host that initialized the LTS. LTS names, like host names, are easier to work with than network addresses. Terminal users do not need to know LTS names, but the information can be useful to the administrator.

If your administrator allows unconfigured LTSs on your LAN300, your LTS might not have a name. In that case, you see the message -unconfigured- in place of an LTS name.

# The BANNER Command

The BANNER command is another command that can help the administrator. The syntax is

**BANNER**

When the LTS receives this command, it sends your terminal the same welcome message that it displays whenever Auto Speed Detect is successful or whenever the LTS is reinitialized. The LTS also displays the name of the LAN300 host that booted (downline loaded the software to) the LTS and the PRIMOS pathname of the file the host used to boot the LTS. Likewise, the LTS indicates the name of the host that last upline dumped the LTS software and the PRIMOS pathname of the host file used to receive the dump. The upline dump is used to diagnose LTS software problems. For example,

```
<1>CMD: BANNER
[LTS300 Rev n.nnn]
Copyright (c) 1988 Prime Computer, Inc.

Booting host:      SYSA
Load file:         <SYSTEM2>DOWN_LINE_LOAD*>LTS.DL

Upline dump host:  SYSA
Upline dump file:  UPLINE_DUMP*>LAN300>LTS08_00_2F_F8_271087.1555
```

The version number in the welcome message (Rev *n.nnn*) tells you which version of software your LTS is using. If the version number is incompatible with the version of software in a LAN host controller you want to communicate with, network problems can result. The BANNER command can provide this important information quickly.

If the LTS has not been upline dumped since the last time it was force booted, the LTS displays the upline dump information shown below. (A force boot is a downline load of the LTS initiated by the host or by pressing certain front panel controls on the LTS.)

```
Upline dump host:   This LTS has not been upline dumped since the last force boot.
Upline dump file:   ULD information is not available.
```

If the LTS has an older PROM set (a set of memory chips) that does not support upline dumping, the LTS displays the upline dump information shown below. If you see the following message, ask your Prime Customer Support Center to upgrade your LTS PROM set.

```
Upline dump host:   PROM set out of date.
Upline dump file:   ULD information is not available.
```

# The TEST Command

If you have problems communicating with your LTS or with a LAN300 host, you may be able to narrow down the possible sources of the problem with the TEST command.

The syntax is

**TEST**

When the LTS receives this command, it starts sending identical lines of text to your terminal until you stop the test by pressing CR. Each test line contains the following 80 characters plus a carriage return and linefeed.

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ//1234567890//abcdefghijklmnopqrstuvwxyz//1234567890//
```

If the test lines that you receive match the example, you know that your terminal and the LTS are communicating correctly; any problems must be elsewhere on the network. If your test lines do not match the example, or if you do not receive any test results at all, you know that the problem is in your terminal, in the LTS, or in the cable or connectors between them.

Before you report problems to your administrator, try to use the TEST command. Let your administrator know the test results.

# PRIMOS Status Commands

Two PRIMOS commands, STATUS USERS and STATUS NTS, also provide information on NTS. Because these are PRIMOS commands, you must be connected to a LAN300 host and logged in before you can use them. (These commands are available to any terminal user logged into the host, not just to NTS terminal users.)

## The STATUS USERS Command

The STATUS USERS command lists all users and active processes on a Prime host. You can tell which users are NTS users by checking the column that contains PRIMOS line numbers. PRIMOS line numbers for NTS lines start at 1024 (decimal). For example,

```
OK, STATUS USERS
ENM> status users
```

|  | User No | Line No |  |
| --- | --- | --- | --- |
| User | (In Decimal) |  | Devices (AL in Decimal) |
| SYSTEM | 1 | asr | <OSGRP1> |
| BRUCE | 12 | 10 | <SYSS8> |
| BETTY | 14 | 1024 | <SYSS8> |
| CONNIE | 15 | 1025 | <SYSS8> <SYSS9> |
| BERTHA | 16 | 1026 | <SYSS8> |
| BERTHA | 75 | phant | <SYSS8> AL2342 |
| TEKMAN | 320 | rem | <OSGRP1> (from S62) |
| NTS_SERVER | 343 | ncm | <OSCRP1> |
| NETMAN | 344 | nsp | <OSGRP1> |
| BATCH_SERVICE | 345 | phant | <OSGRP1> |
| MAILER_DAEMON | 347 | phant | <OSGRP1> |
| LOGOUT_SERVER | 424 | kernel | <OSGRP1> (IDLE) |
| LOGIN_SERVER | 425 | LSr | <OSGRP1> (3) |
| ISC_NETWORK_SERVER | 426 | ISCNsr | <OSGRP1> (0) |
| TIMER_PROCESS | 427 | kernel | <OSGRP1> |
| DSMSR | 428 | DSM | <OSGRP1> |
| DSM_LOGGER | 429 | DSM | <OSGRP1> |
| SYSTEM_MANAGER | 430 | SMSr | <OSGRP1> |

In the example, three NTS users are logged in to the host: BETTY, CONNIE, and BERTHA. One of them, BERTHA, is also using an NTS assigned line, as indicated by AL2342 in the last column. (AL stands for assigned line.) Chapter 6, NTS Assigned Lines, explains how to assign NTS lines.

## The STATUS NTS Command

The STATUS NTS command tells you whether NTS has been started on the host and, if NTS has been started, the command tells you the name of the NTS configuration file on that host. For example,

```
OK, STATUS NTS

NTS is currently started
NTS config file <SYSS8>NTS*>NTS.CONFIG
```

If NTS has not been started, you cannot connect to that host from an NTS terminal, so you cannot use the STATUS NTS command. Users at directly attached (local) terminals can use this command when NTS is not running. For example,

```
OK, STATUS NTS

NTS is not currently started
```

# NTS Assigned Lines

This chapter provides information on NTS assigned lines. Using NTS assigned lines is different from using NTS user lines. The commands you use for NTS assigned lines include the following PRIMOS commands:

ASSIGN ASYNC
NTS_LIST_ASSOCIATE
SET_ASYNC
UNASSIGN ASYNC

## NTS Assigned Lines Versus NTS User Lines

The other chapters in this guide tell you how to use an NTS user line, which is a terminal line. However, not all NTS lines are used for terminals. Other asynchronous devices (printers, for example) can be attached to LTS ports.

Unlike a user terminal, a printer cannot initiate any NTS connection requests. Instead, connection requests are initiated from PRIMOS. Similarly, because a printer cannot define its line parameters, parameter information also comes from PRIMOS.

The administrator can make many types of lines assignable (for example, a line to a magnetic tape unit or card reader attached to a host). Assignable asynchronous lines can be NTS or local lines (lines connecting printers or other devices directly to the host). The ASSIGN ASYNC command gives a user control over the line, whether it is an NTS or a local line.

### Notes

You cannot assign an NTS line if any terminal (LTS to host) connections are established on it.

Likewise, when an NTS line is assigned, a terminal attached to the line cannot be used to make outbound (LTS to host) connections.

# The ASSIGN ASYNC Command

Terminal users can request exclusive use of NTS printers or other assignable devices with the PRIMOS ASSIGN ASYNC command. Both NTS users connected to a host and local terminal users (users at terminals wired directly to the host) can assign NTS assignable lines.

When you issue an ASSIGN ASYNC command, PRIMOS assigns the line to you, initiates an NTS connection to the device for you, and sends parameter information defined by the SET_ASYNC command to the device's LTS. You have exclusive use of the line until you unassign it. (The administrator can unassign any assigned line; you can unassign only your own assigned lines.)

### Note

Printers shared by many users are usually part of a host spooler subsystem. To print files on these printers, you do not need to assign the line. All you need to do is issue the PRIMOS SPOOL command. Printers to the spooler subsystem can use NTS assigned lines, but the host assigns the lines automatically.

Assigning an NTS line is similar to assigning a local asynchronous line. For information on assigning lines, see the *PRIMOS Commands Reference Guide*. For NTS lines, however, the administrator must first associate the NTS line with a specific PRIMOS line number. When you enter an ASSIGN ASYNC command, you must specify the PRIMOS line number of the line you want to assign. For example,

OK, *ASSIGN ASYNC -LINE 1214*

Your administrator has associated a PRIMOS line number with a specific LTS and a specific port on that LTS using an administrative command from the supervisor terminal. You must include that PRIMOS line number (a decimal number) when you issue the ASSIGN ASYNC command. If you try to assign a line that is not associated with a PRIMOS line number, PRIMOS rejects your command.

# The NTS_LIST_ASSOCIATE Command

You can ask PRIMOS for information about associated lines using the NTS_LIST_ASSOCIATE command. The syntax is

$$
\text{NTS\_LIST\_ASSOCIATE} \left[ \left\{ \begin{array}{l} \text{-LINE } \textit{PRIMOS-line-number} \\ \text{-LTS\_NAME } \textit{LTS-name} \text{ [-LTS\_LINE } \textit{LTS-port-number}] \\ \text{-HELP} \end{array} \right\} \right]
$$

If you enter the command without any options, PRIMOS displays a list of all associated line numbers for NTS assignable lines along with their corresponding LTS names and port numbers.

For example,

```
OK, NTS_LIST_ASSOCIATE
[NTS_LIST_ASSOCIATE Rev.21.0 (c) Prime Computer, Inc., 1988

    Primos                      LTS
    line #     LTS Name         line #

     1213      PAYROLL3          0
     1214      PAYROLL3          1
     1215      PAYROLL3          2
     1220      COPYROOM2         4
     1221      LAB               7
```

PRIMOS line numbers used for NTS lines are decimal numbers from 1024 through 1536. Other line numbers are reserved for other types of lines, such as local terminal lines or local assignable lines. The administrator assigns a name (a maximum of 16 characters) for each LTS in the NTS configuration file. (LTS names are easier to work with than LTS addresses, which are 12-digit hexadecimal numbers.) The LTS line numbers listed are the physical port numbers from 0 through 7 on the back of each LTS.

If you want to find out what NTS line is associated with a particular PRIMOS line number, you can specify the PRIMOS line number in the command. For example,

```
OK, NTS_LIST_ASSOCIATE -LINE 1221
[NTS_LIST_ASSOCIATE Rev.21.0 (c) Prime Computer, Inc., 1988

    Primos                      LTS
    line #     LTS Name         line #

     1221      LAB               7
```

PRIMOS displays the LTS name and port number associated with the PRIMOS line number that you specified.

You can request all PRIMOS line numbers associated with a particular LTS, or, if you also specify a port number, you can find out the PRIMOS line number for a specific NTS line. For example,

```
OK, NTS_LIST_ASSOCIATE -LTS_NAME Payroll3 -LTS_LINE 1
[NTS_LIST_ASSOCIATE Rev.21.0 (c) Prime Computer, Inc., 1988

    Primos                      LTS
    line #     LTS Name         line #

     1214      PAYROLL3          1
```

# The SET_ASYNC Command

When you assign an NTS line, PRIMOS sends configuration parameters to the LTS, which uses those parameter settings for as long as the line is assigned. For terminal lines, the original parameter settings move from the LTS to PRIMOS when a connection is established or continued; for assigned lines, parameter settings move in the opposite direction, from PRIMOS to the LTS. Figure 6-1 shows the source of parameters for both kinds of lines.
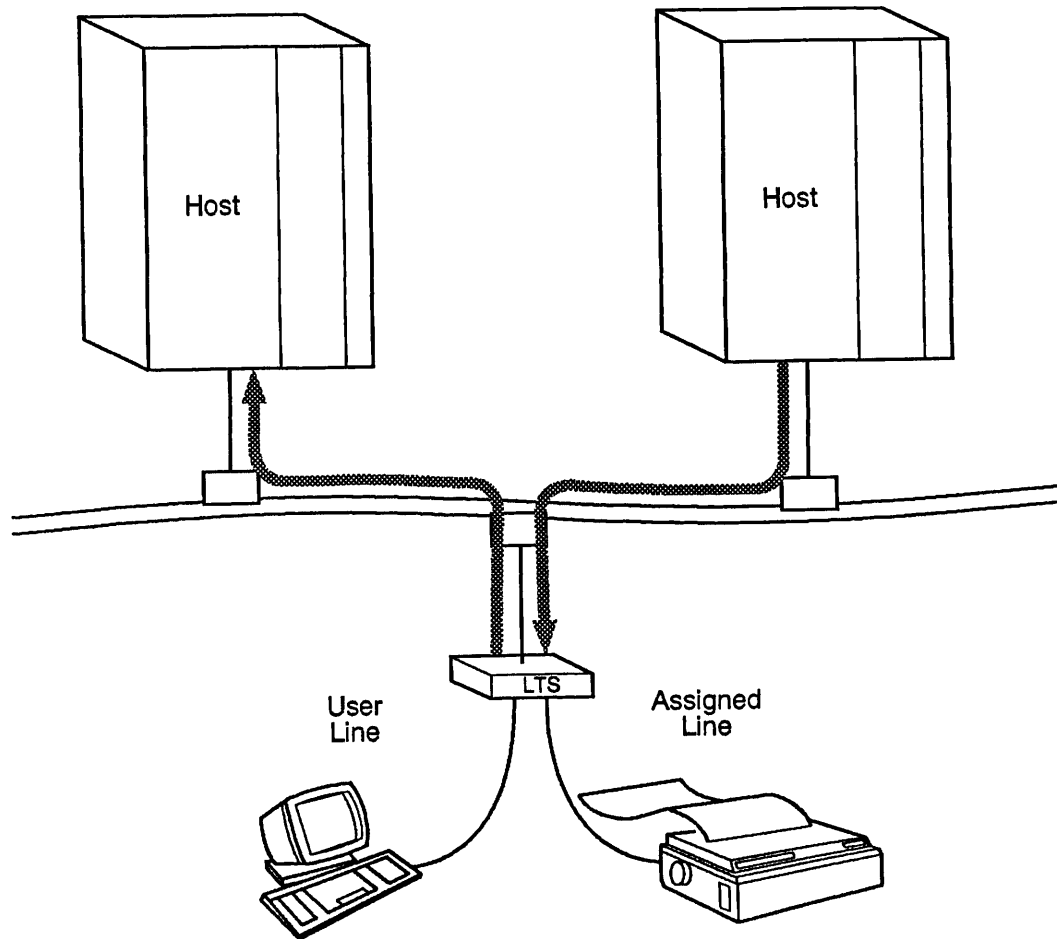
*Q10117-2LA-17-2*

**Figure 6-1**
**Parameter Sources for NTS User Lines and Assigned Lines**

Parameter information for NTS assigned lines comes from the SET_ASYNC options for those lines. The administrator configures assignable lines in the host configuration file, but you can change the parameters if you wish. To change parameters for an assignable line, make sure that NTS has been started and then use the SET_ASYNC command before you assign the lines.

The syntax is

**SET_ASYNC –LINE** *n* [*option*]

The line number is the decimal PRIMOS line number that the administrator has associated with the NTS line you are going to assign. The SET_ASYNC options that are mapped to LTS parameters are described in Chapter 4, Setting Parameters.

If you want to know the current settings for SET_ASYNC, use the –DISPLAY option. For example,

OK, *SET_ASYNC –LINE 1214 –DISPLAY*

PRIMOS lists the current settings for all the SET_ASYNC options for the line you specify. Because the administrator and other users can change these settings, check the current settings before you change parameters, and before you assign a line.

 To set the baud rate for a line you are going to assign, use the SET_ASYNC command with the –SPEED option. For example,

OK, *SET_ASYNC –LINE 1214 –SPEED 2400*

After you have changed the parameters to the settings you want, use the ASSIGN ASYNC command to assign the line. PRIMOS sends the current SET_ASYNC settings to the LTS, which activates those parameter settings. The LTS does not save any parameter information from PRIMOS in EAROM; the only way to save parameter settings in EAROM is with LTS commands from a LAN300 terminal.

# The UNASSIGN ASYNC Command

When you finish using an assigned line, use the UNASSIGN ASYNC command to make the line available to other users. For example,

OK, *UNASSIGN ASYNC –LINE 1214*

The line number is the PRIMOS line number associated with the NTS line you are using.

After you unassign a line, the administrator or another user can change the parameter settings with SET_ASYNC commands. If you log out before you unassign a line, PRIMOS unassigns the line automatically.

# Appendices

# LTS Command Summary

This appendix summarizes all the LTS commands. For more information on LTS commands, see the following chapters:

Chapter 2, Basic LTS Commands
Chapter 4, Setting Parameters
Chapter 5, Status Commands

The commands are listed in alphabetical order, with abbreviations placed immediately below the full form, and any arguments or options indicated. A brief description of each command's function is also included.

**BANNER**

**B**

Displays the LTS banner, which shows the version number of the LTS software, the name of the host that downline loaded the LTS, and the pathname of the downline load file. It also displays information about the last upline dump of the LTS software: the name of the host that received the dump, and the pathname of the upline dump file.

**CONNECT** *hostname*

**C**

Establishes a connection with *hostname*. The LTS uses the current session if it is free. Otherwise, it scans for the first free session, beginning at session 1.

**CONTINUE [*n*]**

**CO**

Tranfers you from command mode to an active but suspended session. A suspended session is one on which you established a connection and then escaped to command mode or switched to another session. The LTS continues the current session unless you specify another session number with the *n* argument.

**DEFAULT [–ALL] [–COMMAND]**

When entered without an option, updates the current session's parameters with the parameter settings stored in LTS EAROM memory. The changes take effect immediately if the current session is free, or upon disconnect if it is active. The –ALL option works the same way,

except that it affects all eight sessions. The –COMMAND option (abbreviated –CMD) acts upon only the command mode parameters.

DISCONNECT $\left[ \left\{ \begin{array}{c} n \\ -ALL \end{array} \right\} \right]$
D

Breaks a connection with a host. DISCONNECT breaks the connection on the current session unless you indicate a different session number with the *n* argument. The –ALL option breaks the connections on all eight sessions.

ESCAPE [*character*] $\left[ \left\{ \begin{array}{c} -ON \\ -OFF \end{array} \right\} \right]$ [–ALL] [–DEFAULT]
ESC

Displays the escape character when entered without an option, changes the escape character to *character*, enables (–ON), or disables (–OFF) the escape character. The –ALL option displays, changes, enables, or disables the escape character for all eight sessions, rather than just for the current session. The –DEFAULT option (abbreviated –DEF) acts on the escape character information stored in LTS EAROM memory.

HELP [–PAR]

Lists information on LTS commands. The –PAR option displays information on LTS parameters: parameter numbers, names, and valid settings.

LIST_HOSTS

LH

Displays the host computers that are active on your LAN300 network.

LTS_ADDR

Displays the address of your LTS and its name, if it has one.

PORT $\left[ \left\{ \begin{array}{l} \textit{baud-rate; parity; bits-per-character; stopbits} \\ \text{AUTO} \end{array} \right\} \right]$ [–DEFAULT]

Changes the port parameter settings for the command mode parameter set and for all eight sets of session parameters, whether they are free or active. When entered without an option, displays the current settings for your line's port parameters. The –DEFAULT option (abbreviated –DEF) stores the parameter settings in LTS EAROM memory in addition to changing the command mode and session settings.

PORTS [*port-number*]

Displays the settings of the port parameters for all of the ports on your LTS (the default), or for *port-number*. The port parameters are baud rate, parity treatment, bits per character, number of stop bits, and parity.

**PROMPT** [*new-prompt*]

Changes the text portion of your prompt to *new-prompt*. When entered without an argument or option, reactivates the default prompt, <*n*>CMD:, where *n* is the current session number.

$$
\text{SET } par\text{-}\#\text{:}par\text{-}val\text{-}1 \ [...par\text{-}\#\text{:}par\text{-}val\text{-}5] \begin{bmatrix} -\text{ALL} \\ -\text{COMMAND} \\ -\text{DEFAULT} \end{bmatrix}
$$

Changes the settings of as many as five parameters at once. The −ALL option affects all eight sessions whether free or active, rather than just the current session. The −COMMAND option (abbreviated −CMD) must be used to change a command mode parameter. It restricts the changes to the command mode parameter set in the cases where the parameters are relevant in both the command mode and the session parameter sets. The −DEFAULT option (abbreviated −DEF) changes the settings of the parameters stored in LTS EAROM memory and the current session's parameters. The options can be used together.

**SHOW** [*par-#-1... par-#-2*] [−DEFAULT]

When entered without an option or argument, displays the settings of the command mode parameter set and the current session's parameter set. You can enter a maximum of five parameter numbers to display the current and default (EAROM) settings of those parameters. The −DEFAULT option (abbreviated −DEF) displays the settings of the parameters stored in LTS EAROM memory.

**STATUS**

Displays the status of every active session, indicates the name of the host to which you are connected, the address of its LHC used for the connection, and the number of packets received from and sent to the host during the connection. Also displays the current session even if it is free and marks it with an arrow.

**SWITCH** [*n*]

**SW**

When entered without an option, switches you to the next highest session number; for example, from session 4 to session 5. The *n* argument indicates the session to switch to.

**TEST**

Instructs the LTS to send identical 80-character lines of test data to your terminal. To stop the test, press your carriage return key.

# LTS Parameter Summary

This appendix summarizes the LTS parameters. A chart of the LTS parameter sets is shown below, followed by an alphabetical listing of the parameters.

| GLOBAL PORT | COMMAND MODE | SESSION |
|---|---|---|
| 6 SERVSGNL | * 5 FLOWTO | 1 ESC |
| 11 BAUD | 9 CR_PADDING | * 5 FLOWTO |
| 21 PARITY_TREATMENT | * 12 FLOWFROM | * 12 FLOWFROM |
| 50 BPC | 13 LF_AFTER_CR | * 53 PROTOCOL |
| 51 STOPBITS | 14 LF_PADDING | * 54 FLOWCONTROL |
| 52 PARITY | 16 ERASE | 58 ENTERCMD |
| 63 DCD_DROP | 17 LINE_ERASE | |
| | 18 LINE_DISPLAY | * Common to command |
| | * 53 PROTOCOL | mode and session |
| | * 54 FLOWCONTROL | parameter sets |
| | 57 HALFDUPL | |
| | 59 HT_PADDING | |
| | 60 VT_PADDING | |
| | 61 FF_PADDING | |

* Common to command
mode and session
parameter sets

## Baud Rate

| | | |
|---|---|---|
| Parameter name | BAUD | |
| Parameter number | 11 | |
| Default | Auto Speed Detect (32) | |
| Choices | 0 - 110 | 10 - 50 |
| | 1 - 134.5 | 12 - 2400 |
| | 2 - 300 | 13 - 4800 |
| | 3 - 1200 | 14 - 9600 |
| | 4 - 600 | 15 - 19200 |
| | 5 - 75 | 30 - 3600 |
| | 6 - 150 | 31 - 7200 |
| | 7 - 1800 | 32 - Auto Speed Detect |
| | 8 - 200 | |
| Parameter set | Global | |
| LTS commands | PORT, SET | |
| PRIMOS command | SET_ASYNC -SPEED | |

## Bits per Character

| | |
|---|---|
| Parameter name | BPC |
| Parameter number | 50 |
| Default | 8 |
| Choices | 5, 6, 7, or 8 |
| Parameter set | Global |
| LTS commands | PORT, SET |
| PRIMOS command | SET_ASYNC -CHAR_LENGTH |

## Carriage Return Padding

| | |
|---|---|
| Parameter name | CR_PADDING |
| Parameter number | 9 |
| Default | 0 |
| Choices | 0 through 255 characters |
| Parameter set | Command mode |
| LTS command | SET |

## DCD Connection Control

| | |
|---|---|
| Parameter name | DCD_DROP |
| DCD_DROP parameter | |
| Parameter number | 63 |
| Default | Break the connection when DCD drops (1) |
| Choices | 0 - Do not break the connection when DCD drops |
| | 1 - Break the connection when DCD drops |
| Parameter set | Global |
| LTS command | SET |

## Define Escape Character

| | |
|---|---|
| Parameter name | ESC |
| Parameter number | 1 |
| Default | Ctrl \ |
| Choices | Any single ASCII character |
| Parameter set | Session |
| LTS commands | ESCAPE, SET |

## EIA Flow Control

| | |
|---|---|
| Parameter name | FLOWCONTROL |
| Parameter number | 54 |
| Default | Disable EIA flow control (0) |
| Choices | 0 - Disable EIA flow control |
| | 1 - Enable EIA flow control on high to low DCD |
| | 2 - Enable EIA flow control on low to high DCD |
| Parameter sets | Command mode and session |
| LTS command | SET |
| PRIMOS commands | SET_ASYNC –NO_DATA_SENSE_ENABLE |
| | |
| | SET_ASYNC –DATA_SENSE_ENABLE |
| | SET_ASYNC –DATA_SET_SENSE_HIGH |
| | |
| | SET_ASYNC –DATA_SENSE_ENABLE |
| | SET_ASYNC –DATA_SET_SENSE_LOW |

### Enable Escape Character

| | |
|---|---|
| Parameter name | ENTERCMD |
| Parameter number | 58 |
| Default | Escape character enabled (1) |
| Choices | 0 - Escape character disabled |
| | 1 - Escape character enabled |
| Parameter set | Session |
| LTS commands | ESCAPE, SET |

### Erase Character

| | |
|---|---|
| Parameter name | ERASE |
| Parameter number | 16 |
| Default | Backspace |
| Choices | Any single ASCII character |
| Parameter set | Command mode |
| LTS command | SET |

### Form Feed Padding

| | |
|---|---|
| Parameter name | FF_PADDING |
| Parameter number | 61 |
| Default | 0 |
| Choices | 0 through 255 characters |
| Parameter set | Command mode |
| LTS command | SET |

### Full-duplex/Half-duplex Mode

| | |
|---|---|
| Parameter name | HALFDUPL |
| Parameter number | 57 |
| Default | Full-duplex mode (0) |
| Choices | 0 - Full-duplex mode |
| | 1 - Half-duplex mode |
| Parameter set | Command mode |
| LTS command | SET |

## Horizontal Tab Padding

| | |
|---|---|
| Parameter name | HT_PADDING |
| Parameter number | 59 |
| Default | 0 |
| Choices | 0 through 255 characters |
| Parameter set | Command mode |
| LTS command | SET |

## Line Display Character

| | |
|---|---|
| Parameter name | LINE_DISPLAY |
| Parameter number | 18 |
| Default | ⌈Ctrl⌉ ⌈L⌉ |
| Choices | Any single ASCII character |
| Parameter set | Command mode |
| LTS command | SET |

## Line Erase Character

| | |
|---|---|
| Parameter name | LINE_ERASE |
| Parameter number | 17 |
| Default | ⌈?⌉ |
| Choices | Any single ASCII character |
| Parameter set | Yes |
| LTS command | SET |

## Linefeed After Carriage Return

| | |
|---|---|
| Parameter name | LF_AFTER_CR |
| Parameter number | 13 |
| Default | Insert linefeed after carriage return (1) |
| Choices | 0 - Do not insert linefeed after carriage return |
| | 1 - Insert linefeed after carriage return |
| Parameter set | Command mode |
| LTS command | SET |

## Linefeed Padding

| | |
|---|---|
| Parameter name | LF_PADDING |
| Parameter number | 14 |
| Default | 0 |
| Choices | 0 through 255 characters |
| Parameter set | Command mode |
| LTS command | SET |

## LTS Messages

| | |
|---|---|
| Parameter name | SERVSGNL |
| Parameter number | 6 |
| Default | LTS transmits all messages (5) |
| Choices | 0 - LTS does not transmit any messages |
| | 1 - LTS transmits all but prompt messages |
| | 5 - LTS transmits all messages |
| Parameter set | Global |
| LTS command | SET |

## Parity Treatment

| | |
|---|---|
| Parameter name | PARITY_TREATMENT |
| Parameter number | 21 |
| Default | Parity disabled (0) |
| Choices | 0 - Parity disabled |
| | 3 - Parity enabled |
| Parameter set | Global |
| LTS commands | PORT, SET |
| PRIMOS command | SET_ASYNC -PARITY |

## Parity Type

| | |
|---|---|
| Parameter name | PARITY |
| Parameter number | 52 |
| Default | Odd parity (0) |
| Choices | 0 - Odd parity |
| | 1 - Even parity |
| Parameter set | Global |
| LTS commands | PORT, SET |
| PRIMOS command | SET_ASYNC -PARITY |

## Protocol

| | |
|---|---|
| Parameter name | PROTOCOL |
| Parameter number | 53 |
| Default | TTY (0) |
| Choices | 0 - TTY |
| | 1 - TRAN |
| | 2 - TT8BIT |
| | 3 - TTYUPC |
| | 4 - TTY8 |
| Parameter sets | Command mode and session |
| LTS command | SET |
| PRIMOS command | SET_ASYNC –PROTOCOL |

## Stop Bits

| | |
|---|---|
| Parameter name | STOPBITS |
| Parameter number | 51 |
| Default | 1 stop bit |
| Choices | 1 - 1 stop bit |
| | 2 - 2 stop bits |
| Parameter set | Global |
| LTS commands | PORT, SET |
| PRIMOS command | SET_ASYNC –STOP_BITS |

## Vertical Tab Padding

| | |
|---|---|
| Parameter name | VT_PADDING |
| Parameter number | 60 |
| Default | 0 |
| Choices | 0 through 255 characters |
| Parameter set | Command mode |
| LTS command | SET |

## XON/XOFF Flowfrom

| | |
|---|---|
| Parameter name | FLOWFROM |
| Parameter number | 12 |
| Default | Enable character flow control from the terminal (1) |
| Choices | 0 - Disable character flow control from the terminal |
| | 1 - Enable character flow control from the terminal |
| Parameter sets | Command mode and session |
| LTS command | SET |
| PRIMOS command | SET_ASYNC -XOFF |
| | SET_ASYNC -NO_XOFF |

## XON/XOFF Flowto

| | |
|---|---|
| Parameter name | FLOWTO |
| Parameter number | 5 |
| Default | Enable character flow control to terminal (1) |
| Choices | 0 - Disable character flow control to terminal |
| | 1 - Enable character flow control to terminal |
| Parameter sets | Command mode and session |
| LTS command | SET |
| PRIMOS command | SET_ASYNC -REVERSE_XOFF |
| | SET_ASYNC -NO_REVERSE_XOFF |

# Glossary

**active session**

A session on which a connection to a host is established. An active session is not necessarily in data transfer mode, however; the user could have made the connection but not yet logged in to the host. The user could also have escaped to command mode or switched to another session, in which case the session is said to be active but suspended.

**address**

On a LAN300, a unique hexadecimal number assigned at the factory to each LAN Terminal Server (LTS) and LAN Host Controller (LHC).

**administrator**

The person responsible for setting up, managing, and troubleshooting a computer system or computer network. At your site, you may have a Network Administrator (for the LAN300), and one or more System Administrators (for the Prime hosts). Or one person may be responsible for the network and for the host systems.

**ASCII character**

A character whose bit pattern follows the American Standard Code for Information Interchange, a widely used code for data communications and data processing defined by the American National Standards Institute (ANSI).

**assigned line**

A PRIMOS line reserved for the exclusive use of one person. Users can assign lines to themselves with the PRIMOS ASSIGN command. The administrator decides which lines are assignable and, for NTS lines, associates a particular LTS port number with a PRIMOS line number. Assigned lines are often lines attached to printers.

**associated line**

A PRIMOS line number that is mapped to a particular NTS line by an administrator command.

**asynchronous terminal**

A computer terminal that transmits and receives data without any clocking mechanism to synchronize the receiver and sender. Instead, clocking is built into each character through start and stop bits. PT200, PST100, and PT45 terminals are asynchronous terminals.

**Auto Speed Detect**

On a LAN300, an LTS feature that sets the baud rate for the line. When someone enters a series of carriage returns at an attached terminal, the LTS can determine the baud rate of the terminal. The LTS then sets the baud rate parameter for that line to match the baud rate of the terminal.

**baud rate**

A measure of the signaling speed of a device. The baud rate refers to the number of signaling changes per second. On a LAN300, the baud rate is the number of bits per second transmitted by a device.

**bit**

An acronym for binary digit, a bit is the smallest unit of information that a computer recognizes. A bit can have a value of zero or one. Eight bits constitute a byte.

**bits per character**

The number of data bits in each character. Commonly used communications codes use 5, 6, 7, or 8 bits per character.

**buffer**

A temporary data storage area in a device.

**byte**

Eight bits of data. A character, for example, is one byte.

**command mode**

The LTS operating mode in which a user terminal communicates only with its LTS. The terminal sends LTS commands to the LTS, which interprets and acts on those commands. (*See* data transfer mode.)

**connection**

On a LAN300, a logical link between an LTS port and an LHC that enables communication between a terminal and a Prime host computer.

**current session**

The session on which communication is taking place (data transfer mode), or the session that can be initiated, continued, configured, or disconnected (command mode). The number of your current session is displayed in the first part of your LTS prompt, which is <1>CMD: by default. The STATUS command also indicates which session is the current one.

**Data Carrier Detect (DCD)**

One of the electrical signals defined by the Electronic Industries Association (EIA) for the RS-232-C standard interface between data communication devices. On a LAN300, an LTS can use the DCD signal for flow control or for connection control.

**data transfer mode**

The LTS operating mode in which a user terminal communicates with a Prime host through an LTS. The LTS passes all data from the terminal to the Prime host (except for the LTS escape character or the XON/XOFF characters). In the other direction, the LTS passes all data from the Prime host to the terminal. (*See* command mode.)

**DCD**

*See* Data Carrier Detect.

**default setting**

On a LAN300, the parameter setting that the LTS uses in the absence of other instructions from terminal users.

**delimiter**

A character that defines the boundary between units of data. For example, in the LTS PORT command, you use semicolons as delimiters between parameters.

**Distributed Processing Terminal Executive (DPTX)**

A Prime networking product that enables communication between Prime terminals and IBM computer systems.

**DPTX**

*See* Distributed Processing Terminal Executive.

**EAROM**

*See* Electrically Alterable Read-only Memory.

**echo**

To send a received character back to its source.

**EIA**

*See* Electronic Industries Association.

**Electrically Alterable Read-only Memory (EAROM)**

A type of computer memory that can be modified through software and that can store information permanently (even if the unit is turned off). This type of memory is often referred to as nonvolatile memory. (*See* random access memory.)

**Electronic Industries Association (EIA)**

The organization that publishes the RS-232-C standard for the electrical interface between data communication devices.

**EMACS**

A full-screen text editor available on Prime computer systems.

**even parity**

A parity-checking scheme in which the total of 1-bits in a correctly transmitted character is always an even number.

**File Transfer Service**

A PRIMENET utility that allows users to transfer files between PRIMENET host computers.

**flow control**

On a LAN300, the use of ASCII characters or EIA signals to stop and start the flow of data between network devices.

**free session**

A session on which no connection is established. (Contrast with active session.)

**full-duplex mode**

On a LAN300, an operating mode in which characters from a computer terminal travel in two directions: to the LTS or Prime host, and from the LTS or Prime host back to the terminal.

**gateway**

On a PRIMENET network, a host computer that routes data between two other computer systems that are not directly connected.

**half-duplex mode**

On a LAN300, an operating mode in which characters from a computer terminal travel in one direction only, to the LTS or Prime host. Neither the LTS nor the host echoes the characters back to the terminal.

**hard-copy terminal**

A computer terminal that prints characters on paper rather than displaying them on a video screen. (*See* video display terminal.)

**high-order bit**

The bit preceding the stop bit in an asynchronous character.

**host**

A 50 Series computer on a LAN300 network. The word *host* is used because users connect to the system and use its resources as *guests*, even though they are not directly attached.

**IEEE**

*See* Institute of Electrical and Electronics Engineers.

**IEEE 802.3**

A widely used standard for local area networks published by the Institute of Electrical and Electronics Engineers. Prime LAN300 products comply with this standard.

**Institute of Electrical and Electronics Engineers**

A United States organization that defines and publishes standards for computer networks.

**interactive device**

A device that can send and receive data; interactive devices can *converse* with a host computer.

**interface unit**

On a LAN300, a physical device that serves as the entryway to the network for host computers, terminals, and printers.

**LAN**

*See* Local Area Network.

**LAN Host Controller (LHC)**

A board in a Prime host computer that connects the host to the LAN300 cable.

**LAN Terminal Server (LTS)**

A small standalone unit that connects as many as eight terminals or printers to the LAN300 cable.

### LAN300

A Prime network that complies with the IEEE 802.3 standard for local area networks.

### LHC

*See* LAN Host Controller.

### Local Area Network (LAN)

A geographically limited network of computers and computer equipment. A local area network can be a subnetwork within a larger network.

### local terminal

A terminal attached directly to a host computer.

### LTS

*See* LAN Terminal Server.

### mark parity

A parity-checking scheme in which the parity bit in a correctly transmitted character is always one (mark).

### NETLINK

A PRIMENET command that allows local terminal users to access other PRIMENET hosts or hosts on a Packet Switched Data Network (PSDN).

### network

A collection of computers and computer equipment that can communicate locally (a LAN, for example) or across a large geographic area (a PSDN, for example). Large networks can contain one or more subnetworks.

### Network Terminal Service (NTS)

A Prime network product that enables communication between Prime host computers and asynchronous terminals and printers on a LAN300.

### NTS

*See* Network Terminal Service.

### odd parity

A parity-checking scheme in which the number of 1-bits in a correctly transmitted character is always an odd number.

**packet**

A group of data and control characters transmitted over a network as a single message.

**Packet Switched Data Network (PSDN)**

A type of public data network that offers wide-area communications to its subscribers.

**parameter**

In an LTS, a piece of information that tells the LTS how to function (for example, what baud rate to use). User commands can set LTS parameters to different values.

**parity bit**

An extra bit in a character used to check for errors in data transmission.

**port**

On a LAN Terminal Server, one of the eight connectors for attaching cables from terminals or printers.

**PRIMELINK**

Prime communications software that enables communication between IBM PCs, IBM-compatible PCs, and 50 Series computers.

**PRIMENET**

Prime communications software that enables communication between host computers: between Prime hosts, or between Prime and other hosts attached to a Packet Switched Data Network.

**PRIME/SNA**

A Prime network product that enables communication between Prime computers and IBM systems that use IBM Systems Network Architecture (SNA).

**protocol**

A set of mutually understood rules for communication between devices.

**PSDN**

*See* Packet Switched Data Network.

**RAM**

*See* Random Access Memory.

**Random Access Memory (RAM)**

A type of computer memory that can store information only as long as the unit remains turned on. When the unit is turned off, the information is lost. This type of memory is often referred to as volatile memory. (*See* Electrically Alterable Read-only Memory.)

**reinitialize**

Restart.

**remote file access**

Access to files on a remote computer; that is, a computer other than the one to which your terminal is directly attached.

**remote job entry emulation**

Prime communications software that allows users to submit jobs to other systems from Prime terminals.

**remote login**

Logging in to a remote computer, that is, a computer other than the one to which your terminal is directly attached or, on a LAN300, logging in to a computer other than the one to which you have established an NTS connection.

**RINGNET**

A Prime ring network.

**ring network**

A type of local area network in which data is transmitted in a circular manner, as around a ring.

**RS-232-C**

A standard for the electrical interface between data communication devices. The RS-232-C standard is published by the Electronic Industries Association.

**session**

A connection between an LTS terminal and a host. Each LTS terminal can have as many as eight concurrent sessions to the same or different hosts. Each session can be configured individually.

**space parity**

A parity-checking scheme in which the parity bit in a correctly transmitted character is always a zero (space).

**Spooler**

On a Prime computer system, the subsystem that controls printing on printers shared by multiple users.

**start bit**

In asynchronous communication, the bit that indicates the start of a new character.

**stop bit**

In asynchronous communication, the bit (or bits) that indicates the end of a character.

**supervisor terminal**

On a Prime computer system, the terminal that the administrator or operator uses to start, stop, and control the system.

**suspended session**

A session on which a user established a connection to a host and then escaped to command mode or switched to another session. The connection to the host remains open but no communication takes place.

**switch box**

A unit that attaches a computer terminal or other device switch from one line to another.

**syntax**

In computer commands, the required order of words, characters, numbers, or other symbols.

**video display terminal**

A computer terminal that displays characters on a video screen rather than printing them on paper. (*See* hard-copy terminal.)

**Workstation/System Interconnect 300 (WSI300)**

A Prime network product that enables communication between a 50 Series host and a workstation or system running the Transmission Control Protocol (TCP) and the Internet Protocol (IP) over a LAN300.

**WSI300**

*See* Workstation/System Interconnect 300.

**XON/XOFF**

Special ASCII characters that one device can send to another to ask that device to stop transmitting data (XOFF) or to resume transmission (XON).

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