Lantronix Remote Access Server Installation Guide

for LRS32F and LRS16 models

Contents

1 - Introduction

1.1 The Lantronix Remote Access Server

The Lantronix Remote Access Servers (LRS16 and LRS32F) allow packet traffic between your network and remote networks or computers. The servers use modems to offer attached devices as services to the network, and conversely, can provide connections to other devices on the network.

The LRS16 provides 16 asynchronous RJ45 serial ports. The LRS16 has an AUI connector, a UTP (10BASE-T) port, and a BNC (10BASE2) port for Ethernet connections. It supports the AppleTalk, IP, and IPX network protocols. The server supports baud rates between 300 and 115200 bits per second.

The LRS32F provides 32 asynchronous RJ45 serial ports. Each server has an AUI connector, a UTP (10/100BASE-T) port, and a BNC (10BASE2) port for Ethernet connections. It supports the AppleTalk, IP, and IPX network protocols. The server can support baud rates between 300 and 230400 bits per second.

NOTE: *The functionality, installation, and configuration of the LRS16 and the LRS32F are the same unless otherwise specified. Throughout the remainder of this manual the LRS16 and the LRS32F will be referred to as the "LRS" except in those instances where a distinction must be made between the models.*

1.1.1 Configuration

The EZCon configuration software (shipped with the LRS on the distribution CD-ROM) is the easiest way to configure the LRS. EZCon guides you through configuration via a point and click interface.

NOTE: *Instructions for using EZCon are included with the CD-ROM. EZCon is also available from the Lantronix FTP and BBS servers and from the Lantronix web site at http://www.lantronix.com. See the LRS Reference Manual for instructions on how to download the software.*

Although EZCon is the recommended way to configure the server, the unit may also be configured using any of the following methods:

- Via Telnet / Rlogin connections to the LRS
- Via BOOTP replies from a TCP / IP network host (IP address, loadhost, and download filename only)
- Via RARP replies from a TCP / IP host (IP address only)
- Via a terminal attached to the serial console port (RJ45 port 1)
- Via a configuration file downloaded from a TCP / IP or NetWare host at boot time

1.1.2 Software

The LRS stores its executable code in Flash (rewritable) ROM. It is only necessary to download host software to the LRS if you need to update the code in the Flash ROMs with a new version of the software.

NOTE: *For instructions on downloading new software into the LRS, see the Updating Software appendix of the LRS Reference Manual.*

1.2 About the Documentation

This manual explains how to install, initially configure, and start using the LRS. The appendices discuss technical support, troubleshooting, pinouts, and environmental and cabling restrictions.

The LRS Reference Manual explains detailed, conceptual LRS networking concepts. PostScript and browsable HTML versions of the LRS Reference Manual are available on the distribution CD-ROM. In addition, they are available at the Lantronix WWW site, **http://www.lantronix.com**. To obtain a printed copy of the LRS Reference Manual (part number 900-039), contact Lantronix or your Lantronix distributor.

2 - Installation

2.1 Overview

This chapter contains information that the system manager needs to install the LRS hardware. The use of industry standard connectors on the serial lines make wiring and connection simple. See Appendix C, for more information on the serial cables necessary to connect devices to the LRS.

2.2 LRS Components

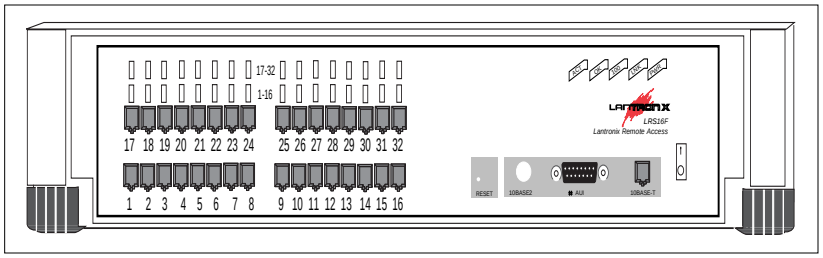
The front panel of the LRS16 has 16 RJ45 ports, a 10BASE-T port, a 10BASE2 port, and an AUI port for Ethernet connections. There is also a Reset button and a power switch on the unit. The RJ45 ports are designed to connect to modems and other serial devices. The first RJ45 port has the added functionality of being the serial console port; however, in most situations connecting a terminal to this port will not be necessary. Figure 2-1 shows the front panel of the LRS16.

Figure 2-1: LRS16 Front Panel

The LRS16 has 36 LEDS. Each LRS16 RJ45 serial port has two LEDs which indicate receive and transmit activity. There are 4 additional LEDs on the right side of the box: NET, OK, LNK, and PWR. The LEDs indicate network activity, general server status, a “good link” on the 10BASE-T port, and that the server is receiving power, respectively.

The front panel of the LRS32F has 32 RJ45 ports, a 10/100BASE-T port, a 10BASE2 port, and an AUI port for Ethernet connections. There is also a Reset button and a power switch on each unit. The RJ45 ports are designed to connect to modems and other serial devices. The first RJ45 port has the added functionality of being the serial console port; however, in most situations connecting a terminal to this port will not be necessary. Figure 2-2 shows the front panel of the LRS32F.

Figure 2-2: LRS32F Front Panel

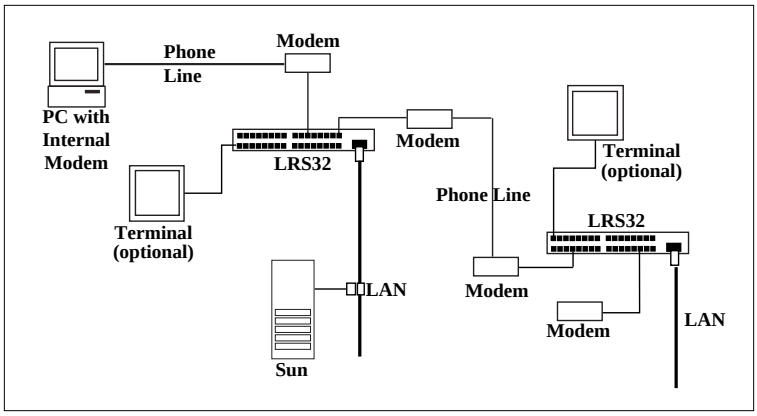


The LRS32F has 37 LEDS. Each LRS32F RJ45 serial port has a corresponding LED which indicates the activity for that port. There are 5 additional LEDs on the right side of the box: NET, OK, 100, LNK, and PWR. The LEDs indicate network activity, general server status, a 100BASE-T connection, a “good link” on the 10/100BASE-T port, and that the server is receiving power, respectively.

2.3 Installation

Figure 2-3 displays one example of an LRS installed in a network.

Figure 2-3: Sample LRS Layout

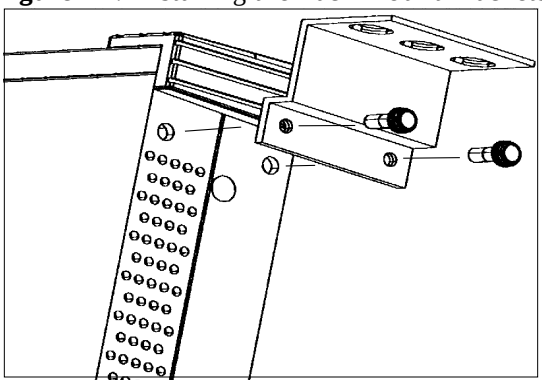


2.3.1 Selecting a Location for the LRS

Powering down the unit will terminate any active sessions; therefore, place the server in a secure location close to the devices that it will service. Also, place the unit so that it does not exceed the limitations described in Appendix D.

The following diagram shows how to attach a rack mount bracket to the LRS. (This is only necessary if you would like to mount the unit on a rack.)

Figure 2-4: Installing the Rack Mount Brackets



2.3.2 Connecting to the Ethernet

The LRS has a 10BASE2 (thinwire) port, a 10/100BASE-T port (10BASE-T port on the LRS16), and a AUI port for Ethernet connections. The LRS must be connected to an Ethernet to function correctly. If the LRS is not connected to the Ethernet, the server will give you the option to access the Boot> prompt and Boot mode command set (see *Entering Commands at the Boot Prompt* on page B-3). The LRS will not boot properly if more than one physical Ethernet port is used.

NOTE: *When power is supplied to the LRS, the unit will automatically select the active Ethernet port.*

NOTE: *Be sure to connect to an Ethernet before supplying power to the server.*

2.3.3 Connecting a Terminal (optional)

Connecting a terminal to the console port, typically port 1, is useful for viewing LRS functionality status reports.

NOTE: *The cable must have an RJ45 connector on one end. For more information on cables and adapters, see Appendix C.*

The console port is initially configured for 9600 baud, no parity, 8 data bits, and one stop bit.

2.3.4 Supplying Power

1. Attach the power cord to the LRS.

NOTE: *Before plugging the cord into an outlet, be sure that only one Ethernet port is connected.*

2. Plug the power cord into an outlet. Make sure that the power connections is secure
3. Turn the LRS on. (The power switch is located on the front of the server.)

   The PWR LED will light solid green. The LRS will perform the following steps to begin operation: (The LEDs will light in various patterns as the unit boots.)

A. The LRS will run through a set of power-up diagnostics for approximately 3 seconds. During boot-up, it tests RAM, Ethernet, Serial hardware, and NVRAM.

B. It will try to obtain TCP/IP configuration information via BOOTP and RARP. This will take approximately 30 seconds if no hosts answer the requests. This process can be disabled by the user.

NOTE: *The server sends out BOOTP and RARP queries before it boots; for information about these queries (and how to disable them), see the LRS Reference Manual.*

C. The LRS will then determine if the code in the Flash-ROMs is valid. If so, it will load that code and begin normal execution (The OK LED will blink slowly). If it is not valid, TFTP, NetWare, and MOP downloads will be attempted (The OK LED will blink rapidly).

2.3.5 Boot Troubleshooting

If the LRS does not appear to have booted properly, refer to the troubleshooting suggestions in the table below.

Table 2-1: Troubleshooting LRS Boot Procedure

Problem	Solution
The LEDs do not light.	Secure the power connection. If a message appears on the console terminal, note the error and cycle power on the unit. If the failure persists, refer to Appendix B.
A **Network Fault** message is displayed on the console terminal.	Secure all network connections and reboot the server.
The NET LED does not blink during the download process and/or the terminal displays a message indicating a download problem.	The network download has failed. Software will have to be re-downloaded to the LRS. See the *Updating Software* appendix of the LRS Reference Manual.

If you experience a problem that is not listed in this table, or if a suggested solution does not work, refer to Appendix B.

3 - Configuration

3.1 Overview

The LRS may be configured using either the EZCon configuration software or commands issued at the command line (Local>) prompt.

To configure the LRS when a problem has occurred (for example, the Boot> prompt appears), refer to Appendix B.

3.2 EZCon Configuration

The EZCon software, shipped with the LRS, is the easiest way to configure the server. EZCon's point-and-click interface can assist you with both general configuration and configuration for specific tasks.

UNIX, Macintosh, Windows / Windows NT, and Novell NetWare versions of EZCon are shipped on the distribution CD-ROM. To use the CD-ROM, refer to the instructions on the CD-ROM case. To install EZCon, refer to the appropriate EZCon README file.

NOTE: *To use EZCon, NetWare users must run the NetWare VLM Client software.*

NOTE: *If you are using a TCP/IP network, the LRS must have an IP address and subnet mask assigned before EZCon can be used.*

All instructions for using EZCon are listed in each README file. Once EZCon is running, refer to the EZCon on-line help for assistance.

3.3 Command Line Configuration

If you choose to configure the LRS using the command line interface (accessible from a Telnet / Rlogin session, via EZCon, or by connecting a terminal to the console port) rather than EZCon, see the *Command Reference* chapter of the LRS Reference Manual for a detailed list of commands.

NOTE: *SET commands make temporary changes on the server; they are lost once the server is rebooted. DEFINE commands permanently configure the server, but they only take place once the server is rebooted.*

3.4 Additional Configuration

This section describes how to configure the IP address, subnet mask, system passwords, incoming logins, and server clock and timezone.

3.4.1 Setting the LRS's IP Address

The following methods can be used to set the IP address: an ARP entry and the Ping command, a BOOTP or an RARP reply, or commands entered from a terminal connected to the console port.

All methods of setting the address are discussed in the following sections; choose the method that is most convenient for you.

3.4.1.1 Using an ARP Entry and the Ping Command

If the LRS has no IP address, it will set its address from the first directed IP ICMP (ping) packet it receives. To generate such a packet, create an entry in a UNIX host's ARP table. The entry should specify the intended LRS IP address and its current Ethernet address, located on the bottom of the unit.

NOTE: *Adding an ARP entry requires superuser privileges on the UNIX host and on Windows NT from DOS mode.*

Figure 3-1: Adding an Entry to the ARP Table

```
# arp -s 192.0.1.220 00:80:a3:xx:xx:xx
```

NOTE: *Command parameters may vary from host to host. Refer to the host documentation for more information.*

Then ping the server using the following command:

Figure 3-2: The Ping Command

```
unix% ping 192.0.1.220
```

When the LRS receives the ping packet, it will notice that its IP address is not currently set and will send out broadcasts to see if any other host is using the specified address. If no duplicates are found, the server will use this IP address and will respond to the ping packet. The LRS will not save this learned IP address permanently; it is intended as a temporary measure to enable EZCon to communicate with the server or to allow an administrator to Telnet to the remote console port.

Figure 3-3 shows a Telnet connection to the remote console port, designated as port 7000. The LRS will display the remote console port prompt (#). In order to successfully log into the port, the login password must be entered at this prompt. The default login password is **access**.

NOTE: *To change the login password, see page 3-6.*

Once logged in, the command **Define Server Ipaddress n.n.n.n** can be entered to make the address permanent.

Figure 3-3: Telnetting to the Remote Console Port

```
% telnet xxx.xxx.xxx.xxx
Trying xxx.xxx.xxx.xxx
Connected to xxx.xxx.xxx.xxx
Escape character is '^]'
# access (not echoed)
Lantronix LRS Version n.n/n (yymmdd)
Type Help at the 'Local>' prompt for assistance.
Enter Username> jim
Local> SET PRIVILEGED
Password> system (not echoed)
Local>> DEFINE SERVER IPADDRESS 192.0.1.220
```

3.4.1.2 Using a BOOTP or an RARP Reply

At boot time a host-based BOOTP or RARP server can respond to an LRS request for an available IP address. For information about configuring the BOOTP or RARP servers, see the host documentation. Keep in mind that many BOOTP daemons will not reply to a BOOTP request if the download filename in the configuration file does not exist. If this is the case, create a file with the same pathname specified in the configuration file.

By default, the LRS will attempt BOOTP and RARP queries. You can disable these queries by doing either of the following:

- Within EZCon, use the **Maintenance:Server Boot Parameters** menu.
- At the Local> prompt (accessible via EZCon, a Telnet/Rlogin, or by connecting a terminal to the serial console port), enter the **Define Server BOOTP Disabled** and **Define Server RARP Disabled** commands.

3.4.1.3 Using Commands Entered from the Console Port

To define the IP address from the console port (typically port 1), connect a terminal to the console port and press the Return key.

NOTE: *The default port parameters for the console port are set to 9600 baud, 8 bits, no parity, and 1 stop bit. To edit these parameters, see the Ports chapter of the LRS Reference Manual. See Appendix C for pinout information.*

If the LRS Boot> prompt appears, the LRS does not have enough information to boot. See Appendix B for a list of Boot Configuration commands which can be used at the Boot> prompt.

If the LRS has already completed booting when you press the Return key, a Username> prompt will be displayed. Once you enter your username, a Local> prompt will be displayed. Become the privileged user (see *Privileged Password* on page 3-5) and use the **Define Server Ipaddress** command to set the IP address:

Figure 3-4: Set/Define Server Ipaddress

```
Local>> DEFINE SERVER IPADDRESS 192.0.1.221
```

3.4.2 Setting a Subnet Mask

When the IP address is configured, a default subnet mask is chosen. If your network is divided into subnetworks, the default subnet mask will not be correct for your network; you must enter a custom subnet mask.

Use the **Define IP Subnet** command to set the subnet mask.

Figure 3-5: Setting Subnet Mask

```
Local>> DEFINE IP SUBNET 255.255.192.0
```

3.4.3 System Passwords

There are two important passwords on the LRS: the privileged password and the login password.

NOTE: *Passwords can be no more than 7 alphanumeric characters. For security purposes, you should use a mix of letters and numbers in each password.*

3.4.3.1 Privileged Password

Changing any server, site, or port setting requires privileged user status. EZCon will prompt you for the privileged password when it is needed. If you are not using EZCon, you will need to enter the **Set Privileged** command at the Local> prompt to become the privileged user. The default privileged password on the LRS is **system**.

Figure 3-6: Set Privileged Command

```
Local> SET PRIVILEGED
Password> system (not echoed)
Local>>
```

The prompt will change to reflect privileged user status. Only one user can be the privileged user at a time. If another user is currently logged into the LRS as the privileged user, use the Set Privileged Override command to forcibly become the privileged user.

To change the privileged password, use the **Set/Define Server Privileged Password** command. Figure 3-7 displays an example of this command.

Figure 3-7: Changing Privileged Password

```
Local> SET PRIVILEGED
Password> system (not echoed)
Local>> DEFINE SERVER PRIVILEGED PASSWORD “pie4me”
```

3.4.3.2 Login Password

The login password is required for remote console logins and for password-protected serial ports. The default login password is **access**. To change the login password, use the **Set/Define Server Login Password** command at the Local> prompt. Figure 3-8 displays an example.

Figure 3-8: Changing Login Password

```
Local> SET PRIVILEGED
Password> system (not echoed)
Local>> DEFINE SERVER LOGIN PASSWORD “82much”
```

3.4.4 Setting the Date and Time

The LRS can save the local time, coordinated Universal Time (UTC) (also known as Greenwich Mean Time), standard and Daylight Savings timezones, and the corresponding number of hours difference between UTC and the set timezone.

3.4.4.1 Setting the Clock

Use EZCon’s **Maintenance** feature to set the local date and time, or use the **Set/Define Server Clock** command at the Local> prompt. The following example shows how to use the Define Server Clock command.

Figure 3-9: Setting the Clock

```
Local>> DEFINE SERVER CLOCK 14:15:00 12/31/1995
```

3.4.4.2 Setting the Timezone

The LRS is configured to recognize a number of timezones. To display these timezones, use the **Show Timezone** command at the Local> prompt. If your timezone is not displayed, see the LRS Reference Manual for instructions on how to set it manually.

Set the timezone by using EZCon's **Maintenance** feature, or using the **Set/Define Server Timezone** command at the Local> prompt:

Figure 3-10: Setting the Timezone

```
Local>> DEFINE SERVER TIMEZONE US/PACIFIC
```

3.4.4.3 Configuring a Timeserver

The LRS regularly verifies and updates its time setting with the designated timeserver. A timeserver is a host which provides time of day information for nodes on a network. To specify a timeserver or backup timeserver, either use the **Set/Define IP Timeserver** or **Set/Define IPX Timeserver** command.

Figure 3-11: Set IP Timeserver Command

```
Local>> DEFINE IP TIMESERVER 193.0.1.50
Local>> DEFINE IP SECONDARY TIMESERVER 193.0.1.51
```

3.4.5 Rebooting the LRS

Rebooting is necessary for three reasons: to make parameters entered with the Define command command take effect immediately, to return the unit to factory defaults, and to reprogram the Flash ROM.

There are two ways to reboot the LRS:

- Within EZCon, click the **Reset** button. EZCon will prompt you to confirm the reboot; click **OK**.
- At the Local> prompt, use the **Initialize Server** command.

3.4.6 Restoring Factory Default Settings

To restore the LRS to its factory default configuration, enter the **Initialize Server Factory** command at the Local> prompt.

3.4.7 Reloading Flash ROM

Reloading the Flash ROM is necessary if a new version of software is released and you wish to upgrade your unit to this version. To reload the Flash ROM, see the *Updating Software* appendix of the LRS Reference Manual.

A - Technical Support

A.1 Overview

If the LRS detects a software error, it will attempt to display the cause and circumstances of the error on the terminal attached to the console port. If the error is not listed in Appendix B, *Troubleshooting*, or if you are unable to fix the error, contact your dealer or Lantronix Technical Support.

A.2 Lantronix Problem Report Procedure

If you are experiencing problems with the LRS or have suggestions for improving the product, please contact Lantronix Technical Support at (800) 422-7044 or (714) 453-3990. We are also reachable via email at support@lantronix.com.

If you are submitting a problem, please provide the following information:

- Your name, company name, address, and phone number
- Product name
- Unit serial number
- Software version (available by issuing the **Show Version** command)
- Network configuration including the output from a **Netstat** command
- Description of the problem
- **Debug** report (stack dump) if applicable
- Product status when the problem occurred; please try to include information on user and network activity at the time.

B - Troubleshooting

B.1 Introduction

This Appendix discusses the symptoms and diagnoses for many errors. If the Boot> prompt appears on your terminal during power-up, refer to *Entering Commands at the Boot Prompt* on page B-3.

B.2 Diagnosing the Error

To properly diagnose an error, connect a terminal to the console port. Take note of any error message displayed on the terminal. Table B-1 lists each error message, and problems that don't necessarily display a message. If the terminal displays an error message that isn't listed in the following table, try to match the message with one discussed in the table. If none match, contact your dealer or Lantronix Technical Support.

Table B-1: Error Messages

Problem	Error	Remedy
Terminal doesn't display information. Doesn't display a prompt.	The terminal's setup is incorrect or there is a connection error.	Check the terminal setup and physical connections. Try another terminal or cable, or try cycling power on the LRS.
Terminal displays a Boot> prompt rather than a Local> prompt	No network is present.	Check the cabling. If you are using the UTP port, check the hub.
	Init Noboot was issued at the Local> prompt.	Configure and reboot the LRS.
	The Ethernet address is invalid.	Use the **Set Server Hardware** *nn-nn-nn* command to set the correct address. Reboot the LRS.
Request BOOTP: no valid reply received	The BOOTP request has failed.	The unit will still boot. Check the BOOTP server's configuration. See page B-3 for more information.
Request RARP: no valid reply received	The RARP request has failed.	The unit will still boot. See your host man pages for RARPD information.

Table B-2: Error messages

Problem	Error	Remedy
Attempting NetWare boot: failed	The NetWare boot has failed.	Make sure that the LRS is using the proper fileserver name, and that the fileserver is running properly. Both devices must be on the same network. Make sure that the LRS is using the complete and correct loadfile pathname, including the drive name. Verify that the loadfile is in the login directory and is world-readable.
	The flash needs to be replaced.	Contact your dealer or Lantronix Technical Support for assistance.
File server *xxxxxx* not found	The NetWare boot has failed.	Make sure that the LRS is using the proper fileserver name, and that the fileserver is running properly. Both devices must be on the same network.
File not found	NetWare or TFTP could not locate the appropriate boot file.	Make sure that the LRS is using the complete and correct loadfile pathname, including the drive name. Verify that the loadfile is in the login directory and is world-readable.
Attempting TFTP boot: failed	The TFTP request has failed.	See the LRS Reference Manual for TFTP troubleshooting information.
	The flash needs to be replaced.	Contact your dealer or Lantronix Technical Support for assistance.

NOTE: *If your LRS will not save software in its Flash ROMs, contact your dealer or Lantronix technical support.*

B.2.1 BOOTP Troubleshooting

BOOTP failure does not disable the unit from booting. If the BOOTP request is failing and you have configured your host to respond to the request, there are a few areas you can check quickly:

- BOOTP must be an uncommented line in the **/etc/services** file as a real TCP / IP service.
- The LRS must be in the loadhost's **/etc/hosts/** file for the host to answer a BOOTP or TFTP request.
- The download file must be in the correct directory and be world-readable. Specify the full pathname for the download file in the BOOTP configuration file or, a default pathname may be added to the download filename.
- Some hosts do not allow BOOTP replies across IP networks. Either use a host running a different operating system, or put the LRS on the same IP network as the host.

B.3 Entering Commands at the Boot Prompt

If the Boot> prompt appears on the terminal (or pressing the Return key does not work), the unit does not have enough information to boot. If you do not get a prompt on the terminal, the network or flash boot has failed. Press the Return key. If pressing the Return key does not display a prompt and the server is in boot mode (the OK LED is flashing rapidly), check the cable connections.

NOTE: *If the message "Will attempt another download in x minutes" appears, press the Return key to display the Boot> prompt.*

A series of commands can be entered at the Boot> prompt (**Boot Configuration** mode) to configure the LRS. For example, a typical configuration might use the following commands:

Figure B-1: TCP/IP BCP Command Examples

```
Boot> SET SERVER IPADDRESS 192.0.1.220
Boot> SET SERVER SOFTWARE "/tftpboot/LRS32.SYS"
Boot> SET SERVER LOADHOST 192.0.1.188
Boot> SET SERVER SECONDARY 192.0.1.22
Boot> INIT 451
% Initialization begins in 5 seconds.....
```

Figure B-2: NetWare BCP Command Example

```
Boot>SETSERVERSOFTWARE"sys:\login\lrs32.sys"
Boot> SET SERVER NETWSERVER nwsrvr1
Boot> INIT 451
% Initialization begins in 5 seconds.....
```

B.3.1 Boot Configuration Program Commands

B.3.1.1 Flash

Forces the LRS to download its operational code into Flash ROM. This is necessary, if you wish to upgrade the software in the unit. If the server cannot download the file, the code in Flash ROM will still be usable.

B.3.1.2 Flush NVR

Restores the LRS's nonvolatile RAM to its factory settings. It will reset **everything** that is configurable on the server, therefore, you will need to reenter the server's IP address, loadhost addresses, and filename for TFTP booting, unless a BOOTP server will provide the information. The server can then be booted and reconfigured.

B.3.1.3 Init 451

Reboots the LRS after it has been configured. The unit will attempt to restart itself with full functionality. If there are errors, the Boot> prompt will be displayed.

B.3.1.4 Show Server

Displays the current settings of the server parameters.

B.3.1.5 Set Server *option*

TCP/IP users need to use the **Software** option to specify the name of the loadfile, the **Ipaddress** option to specify their own network address, and the **Loadhost** option to specify that of the loadhost.

B.3.1.5.1 BOOTP {Enabled, Disabled}

Controls the sending of BOOTP queries during the boot sequence.

B.3.1.5.2 Hardware *nn-nn-nn*

Specifies this server's Ethernet address, where *nn-nn-nn* represents the last three 2-digit numbers. The first three numbers will be supplied automatically.

NOTE: *The address is printed on the bottom of the unit.Setting an incorrect address could cause network problems. If the Ethernet address "disappears," contact Lantronix.*

B.3.1.5.3 Ipaddress *ip_address*

Specifies the IP address, using the standard numeric **n.n.n.n** format.

B.3.1.5.4 Loadhost *ip_address* and Secondary *ip_address*

Loadhost specifies the IP address of the TFTP host to attempt to load the file from. Secondary specifies a backup host to query if the primary host does not (or cannot) load the server. *ip_address* should be in the standard numeric n.n.n.n format; no text names are allowed.

B.3.1.5.5 Netwserver *fileserver*

Specifies a NetWare fileserver to download the software from at boot.

B.3.1.5.6 RARP {Enabled, Disabled}

Controls the sending of RARP queries at boot time.

B.3.1.5.7 Software *filename*

Specifies the name of the file to load. The LRS will automatically add ".SYS" to the filename you specify. All protocols must have a filename specified. The default are LRS16.SYS and LRS32F.SYS, respectively.

NetWare and TFTP loaders can specify the complete path name of the file (up to 31 characters) if the file is located in a directory other than the default. For TFTP, the case of the filename must match that of the filename loaded onto your host computer.

C - Pinouts

C.1 Overview

The LRS32F has 32 asynchronous RJ45 serial ports. The LRS16 has 16 asynchronous RJ45 serial ports. Pinout information for these ports is discussed in the following sections.

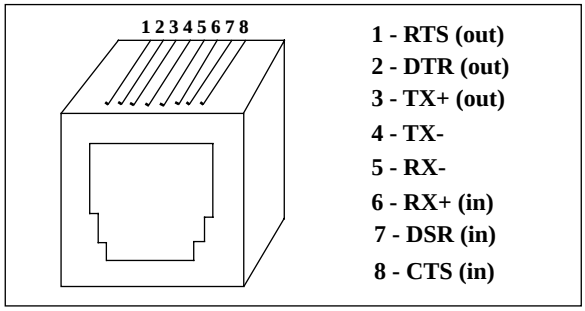
C.2 Serial Information

Lantronix servers are RS-423 compliant, and are thus limited by the equipment at the remote end of the serial line. If the LRS is connected to an RS-232 device, it is subject to the RS-232 limits shown below. If connected to an RS-423 device, it is subject to the RS-423 limitations.

RS-232 lines are limited to 15m (50 ft) in length at 9600 baud, and 2 m (6 ft) at 115.2K baud. RS-423 lines are limited to 300m (1000 ft) at 9600 baud, 85m (260 ft) at 115.2K baud, and 40m (120 ft) at 230.4K baud. They will generally work at longer lengths.

The pinout of the serial ports is displayed below.

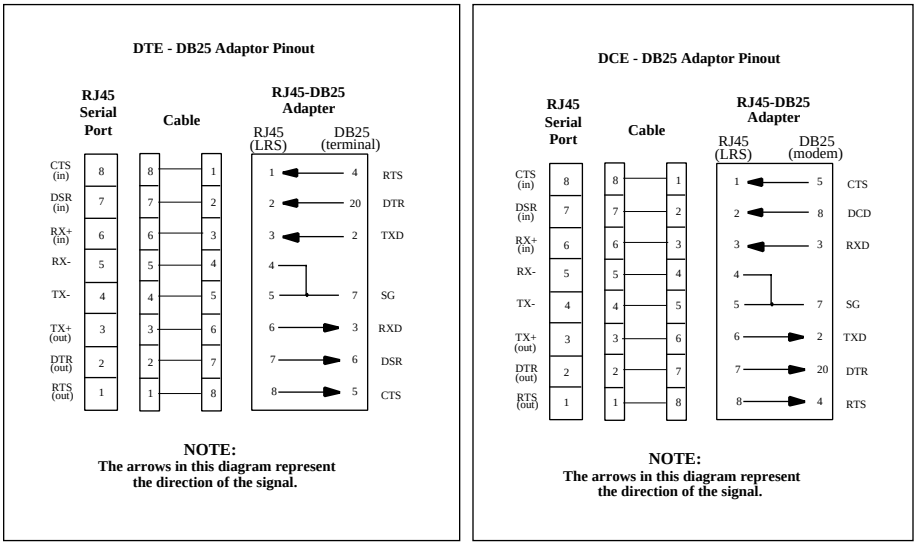
Figure C-1: Pinout of the RJ45 Serial Port



C.2.1 RJ45 to DB25

If you are connecting an RJ45 port to a DTE device (such as a terminal) that has a DB25 connector, you will need to use an RJ45- DTE DB25 adapter. To connect an RJ45 port to a DB25 connector on a DCE device (such as a modem), an RJ45-DCE DB25 adapter is required. The pinout information for these connections are displayed below.

Figure C-2: Pinouts of RJ45 - DB25 Connections

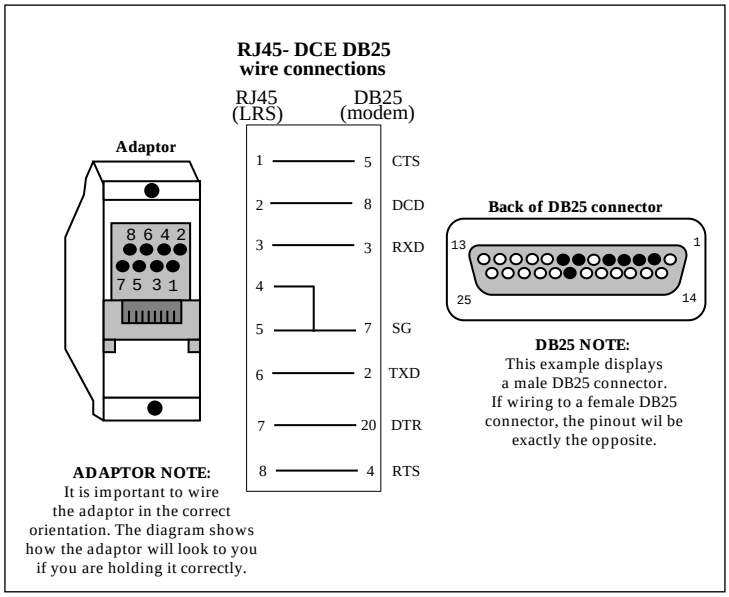


NOTE: *The pinouts in Figure C-2 assume that the 8-conductor cable connecting the LRS and the Adapter block is a swapped cable.*

Both the transmit and receive ground signals on the LRS connector are wired to the signal ground on a DB25 adapter.

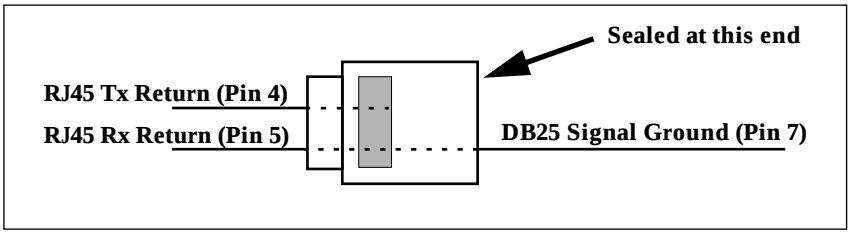
To wire the RJ45-DCE DB25 adapter, refer to the following diagram.

Figure C-3: RJ45-DCE DB25 Adapter



To connect the transmit and receive grounds from the RJ45 cable to the single signal ground on the DB25 connector, a wire “splicer” (such as the one displayed in Figure C-4) may be used. This splicer will internally splice the two wires together and provides one wire into the DB25 connector. It is used as shown below.

Figure C-4: Wire Splicer



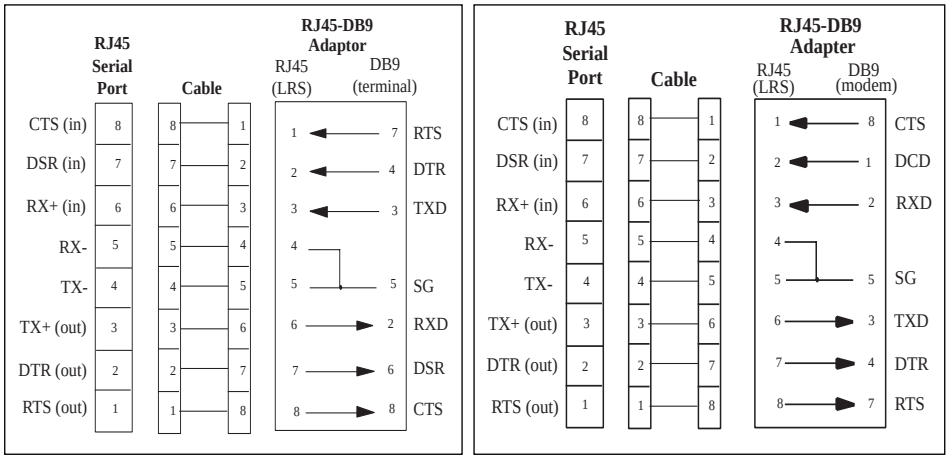
To splice the wires, cut off the end of the wire that does not extend through the connector and insert both wires into the connector. Make sure that the wire that does not extend through the connector is inserted as far as possible to ensure a solid connection. Make sure that the wire that does extend through the connector extends far enough on the other side to be inserted into the DB25 connector. Carefully squeeze the connector using a pair of pliers to ensure that it is fully latched.

C.2.2 RJ45 to DB9

If you're connecting an RJ45 serial port to a terminal or modem with a DB9 (IBM PC Standard) connector, you'll need to use an RJ45-DB9 adapter.

To wire this type of adapter, refer to the diagram below.

Figure C-5: Pinout of RJ45-DB9 Connection



Both the transmit and receive ground signals on the LRS connector are wired to the signal ground on the DB9 adapter.

D - Specifications

D.1 Power Specifications

Note that the unit can operate using either 120 or 220 Volts AC without switches or jumpers.

Voltage:	95-250 Volts AC 3-wire single phase, autoranging
Frequency:	47 to 63Hz
Operating Current:	0.5 Amps (maximum)
Power Consumption:	35 Watts

NOTE: *To reduce the risk of electric shock, in countries using an IT power system or where protective earth ground connection is not made, the ground conductor of the power cable should be connected to earth ground.*

D.2 Temperature Limitations

Operating range:	5° to 50°C (41° to 122°F)
Storage range:	-40° to 66°C (-40° to 151°F)
Maximum temperature change per hour:	20°C (36°F)

Do not operate the LRS near heating or cooling devices, large windows, or doors that open to the outdoors. Do not mount the unit on its side.

D.3 Altitude Limitations

Operating:	2.4 km (8000 ft)
Storage:	9.1 km (30,000 ft)

If you are operating the LRS above 2.4 km (8000 ft), decrease the operating temperature rating by 1°F for each 1000 ft.

D.4 Humidity Limitations

Operating:	10% to 90% (noncondensing) (40% to 60% normal recommended)
Storage:	10% to 90% (noncondensing)

Warranty Statement

Lantronix warrants for a period of FIVE YEARS from the date of shipment that each Lantronix **LRS16** or **LRS32F Remote Access Server** supplied shall be free from defects in material and workmanship.

During this period, if the customer experiences difficulties with a product and is unable to resolve the problem by phone with Lantronix Technical Support, a Return Material Authorization (RMA) will be issued. Following receipt of a RMA number, the customer is responsible for returning the product to Lantronix, freight prepaid. Lantronix, upon verification of warranty will, at its option, repair or replace the product in question, and return it to the customer freight prepaid.

If the product is not under warranty, Lantronix will contact the customer who then has the option of having the unit repaired on a fee basis or having the unit returned.

No services are handled at the customer's site under this warranty.

Lantronix warrants software for a period of sixty (60) days from the date of shipment that each software package supplied shall be free from defects and shall operate according to Lantronix specifications. Any software revisions required hereunder cover supply of distribution media only and do not cover, or include, any installation. The customer is responsible for return of media to Lantronix and Lantronix for freight associated with replacement media being returned to the customer.

Lantronix shall have no obligation to make repairs or to cause replacement required through normal wear and tear of necessitated in whole or in part by catastrophe, fault or negligence of the user, improper or unauthorized use of the Product, or use of the Product in such a manner for which it was not designed, or by causes external to the Product, such as, but not limited to, power or failure of air conditioning.

There are no understandings, agreements, representations or warranties, express or implied, including warranties of merchantability or fitness for a particular purpose, other than those specifically set out above or by any existing contract between the parties. Any such contract states the entire obligation of Lantronix. The contents of this document shall not become part of or modify any prior or existing agreement, commitment or relationship

The information, recommendation, description and safety notations in this or other documents supplied by Lantronix are based on general industry experience and judgment with respect to such hardware and software. THIS INFORMATION SHOULD NOT BE CONSIDERED TO BE ALL INCLUSIVE OR COVERING ALL CONTINGENCIES.

NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, OR WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE, ARE MADE REGARDING THE INFORMATION, RECOMMENDATIONS, DESCRIPTIONS AND SAFETY NOTATIONS CONTAINED HEREBY AND IN HARDWARE AND SOFTWARE SPECIFICATION DOCUMENTATION, OR INSTRUCTIONS SUPPLIED BY LANTRONIX. In no event will Lantronix be responsible to the user in contract, in tort (including negligence), strict liability or otherwise for any special, indirect, incidental or consequential damage or loss of equipment, plant or power system, cost of capital, loss of profits or revenues, cost of replacement power, additional expenses in the use of existing software, hardware, equipment or facilities, or claims against the user by its employees or customers resulting from the use of the information, recommendations, descriptions and safety notations supplied by Lantronix. Lantronix liability is limited (at its election) to (1) refund of buyer's purchase price for such affected products (without interest); (2) repair of such products, or (3) replacement of such products, provided however, that the buyer follows the procedures set forth herein

Warranty claims must be received by Lantronix within the applicable warranty period. A replaced product, or part thereof, shall become the property of Lantronix and shall be returned to Lantronix at the Purchaser's expense. ALL RETURN MATERIAL MUST BE ACCOMPANIED BY A RETURN MATERIAL AUTHORIZATION NUMBER ASSIGNED BY LANTRONIX.

Declaration of Conformity

(according to ISO/IEC Guide 22 and EN 45014)

Manufacturer's Name & Address:	Lantronix 15353 Barranca Parkway, Irvine, CA 92618 USA
	Declares that the product:
Product Name:	Communications Server
Model Name/Number:	LRS16 LRS32F
	Conforms to the following standards or other normative documents:
Safety:	EN60950:1988+A1, A2
Electromagnetic Emissions:	EN55022: 1998 (CISPR 22, Class A: 1993, A1: 1995, A2: 1996) IEC 1000-3-2/A14: 2000 IEC 1000-3-3: 1994
Electromagetic Immunity:	EN55024: 1998 Information Technology Equipment-Immunity Characteristics IEC 6100-4-2: 1995 Electro-Static Discharge Test IEC 6100-4-3: 1996 Radiated Immunity Field Test IEC 6100-4-4: 1995 Electrical Fast Transient Test IEC 6100-4-5: 1995 Power Supply Surge Test IEC 6100-4-6: 1996 Conducted Immunity Test IEC 6100-4-8: 1993 Magnetic Field Test IEC 6100-4-11: 1994 Voltage Dips & Interrupts Test (L.V.D. Directive 73/23/EEC)
Supplementary Information:	*The product complies with the requirements of the Low Voltage Directive 72/23/EEC and the EMC Directive 89/336/ EEC.* **Warning:** *This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.*
Manufacturer's Contact:	Director of Quality Assurance, Lantronix 15353 Barranca Parkway, Irvine, CA 92618 USA General Tel: 949/453-3990 Fax: 949/453-3995

The information in this guide may change without notice. The manufacturer assumes no responsibility for any errors which may appear in this guide.

DEC, thickwire, thinwire, VMS, VT100, and ULTRIX are trademarks of Digital Equipment Corporation. UNIX is a registered trademark of AT&T. Ethernet is a trademark of XEROX. NetWare is a trademark of Novell Corp. AppleTalk, Chooser, and Macintosh are trademarks of Apple Computer Corp. Windows NT and Windows for Workgroups are trademarks of Microsoft Corporation. Portions copyright 1989,1991,1992,1993 Regents of the University of California. All rights reserved. Used with permission. Portions derived from the RSA Data Security, Inc. MD5 Message-Digest Algorithm. Used with permission. Portions of this work are derived from the Standard C Library, copyright 1992 by P.J. Plauger, published by Prentice-Hall, and are used with permission.

The revision date for this manual is 26 June, 2001

Part Number: 900-123
Rev. B

WARNING

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against such interference when operating in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with this guide, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause interference in which case the user, at his or her own expense, will be required to take whatever measures may be required to correct the interference.

Warning: Changes or modifications to this device not explicitly approved by Lantronix will void the user's authority to operate this device.

Cet appareil doit se soumettre avec la section 15 des statuts et règlements de FCC. Le fonctionnement est subjecté aux conditions suivantes:

(1) Cet appareil ne doit pas causer une interférence malfaisante.
(2) Cet appareil doît accepter n'importé quelle interférence reìue qui peut causer une opération indésirable.

The plug on the power cord is the disconnect device. The socket-outlet shall be installed near the equipment and shall be easily accessible.

Das Geraet wird durch austecken des Stromkabels abgeschaltet. Die Anschluss-Steckdose sollte nah am Geraet und leicht zugaenglich sein.