Console Server 3200

User Manual

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Lightwave Communications
www.lightwavecom.com

1.0   Product Description

The ConsoleServer 3200 (also referred to as the CS 3200) is one of the most versatile network administration tools available today, allowing as many as 17 simultaneous users to access up to 32 connected devices via the RS-232C serial protocol. Pull-down menus help users navigate through all the functions of the ConsoleServer 3200, creating an easy-to-use way to access system resources.

The ConsoleServer 3200 consists of eight device card slots, two switch card slots, four terminal/network slots, one modem slot and one control slot. The power supply slot contains two independent power supplies for redundant operation. The basic system consists of the power supply module, two switch cards, and the control card. The remaining card slots are populated according to the application requirements.

All system parameters are stored in non-volatile data flash memory. This data flash memory is organized such that there is always a complete copy of all data. Typical stored information includes the users' identities, user passwords, port parameters (such as baud rate, device name, etc.) and other system information. The data flash memory allow for a maximum of 200 user profiles to be stored, along with the parameters for all cards. System parameters may be backed up and restored from a local serial connection. See 6.10.

An important feature of the ConsoleServer 3200 is the ability to re-configure the system hardware and software without turning off the power. The system boards have circuitry that allows them to be 'hot swapped' so the system may be expanded at any time while in use. In addition, from time to time, new features may be added to the system software. A direct connection to the system administrator port or a network connection to a tftp server allows all of the system programs to be updated. See Appendix B for details on flash updates.
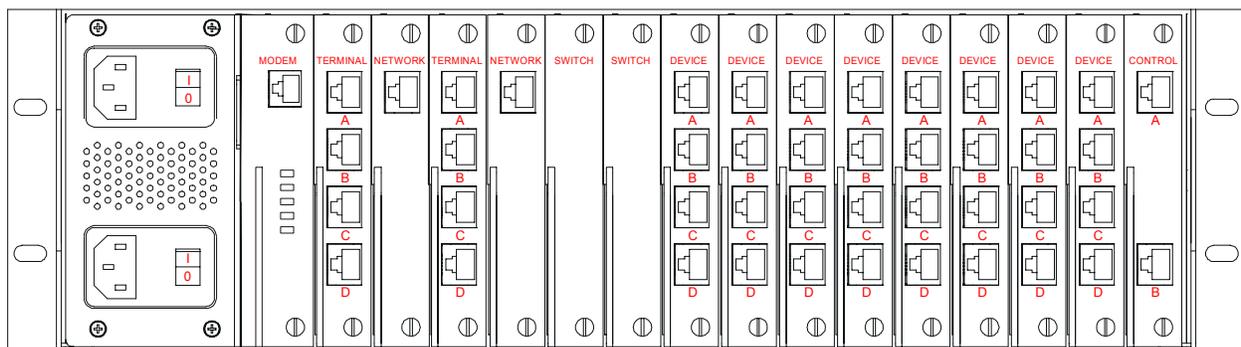
Fig. 1 Rear View of ConsoleServer 3200

1.1   Features

- Connect up to thirty-two RS-232C compatible console ports
- No break sent to attached servers at any time unless sent by a user
- 100 screens of buffered data storage per device
- Remote access via modem card
- Network access card
- Can be administered both locally and via network
- Can update system software via serial or network connection

2.0   System Overview

2.1   Connect Up to Thirty-two RS-232C Compatible Ports

The ConsoleServer 3200 is plug-compatible with any RS-232C device. These may be a variety of network servers, routers, or any other LAN/WAN computers on the network. Connections are made by routing the device signals through the switch cards to the appropriate user interface port.

2.2   64K FIFO Audit Trail

The ConsoleServer 3200 stores the equivalent of approximately 100 screens worth of data per device port in a FIFO buffer. This data is viewed 'off-line' at any time by users accessing the device port buffer.

2.3   Connections

With the maximum number of terminal and/or network cards installed, the system is capable of 16 simultaneous full-duplex connections to the connected devices. With the addition of a modem card, 17 full-duplex connections may be made. The administration functions may be accessed through a local serial connection or through a network connection. Each network card supports four users connections and one connection to the administration functions.

2.4   Security Passwords

Each user is assigned a unique password by the system administrator. The system forces the user to change the password the first time the user attempts to connect to any servers. After the users have changed their passwords, the system will not prompt for a change. The users change their passwords at whatever interval they feel is necessary.

2.5   Interface

Interfaces to the device and terminal cards are all RS-232C compliant. These ports are configured through the system administration port on the control card. Port 'A' on the control card is the system administration port. Each port has settings for baud rate, stop bits, parity, number of data bits, flow control, and port type (i.e., DTE or DCE). The communication settings for control card port A are configured using DIP switch settings on the control card surface (see section 4.5).

Interfaces to the network card must be done over a network using TCP/IP on 10-base T at 10 Mbits (no auto-negotiation). Each network card is assigned an IP address, a subnet mask, a default gateway, and an optional secondary destination path (see section 6.5 for more information) by the control card at start-up, and may be configured using port 'A' on the control card.

The modem card connects directly to an ordinary phone jack (RJ11) to interface with a telephone network. The sys admin may designate a modem initialization string, or may use the default modem initialization string, which allows auto-answering on one ring.

3.0   System Components

Each ConsoleServer 3200 consists of three major components: chassis, device cards, and access cards.

3.1   Chassis

The chassis contains a front-panel LCD for quick system information that is available at all times. Two front panel buttons allow display selection and paging through displays (see section 10.0 for more information). The second component of the chassis is the power supply module. This module contains two independent supplies, each capable of sustaining the system should one supply fail. The third and last component of the chassis is the switch and control card set. The switch cards connect the access cards to the device cards, with a maximum of 17 simultaneous connections using all available terminal, network, and modem ports.

3.1.1 Power Supply Module

The ConsoleServer 3200 may be equipped with either an AC power module or a DC power module. The power module may be changed if the available power source changes.

3.2   Device Cards

Each device card has four completely independent ports for attachment to servers or other devices with console ports. Eight device cards may be installed per unit, for a maximum of 32 device ports. The device ports do not send a break to the attached servers at any time unless specified by the user. There are no adjustments directly on the device cards. All parameters are set up through the system administrator port.

3.3   Access Cards

3.3.1 Terminal Cards
The terminal card provides a point of connection for a conventional terminal or a computer running a terminal emulation program. Users connected through a terminal card may connect to any of the device cards in the system, provided that their user profile has access rights for the port. There are four ports per terminal card. Each port's parameters are set up independently from the other ports. All parameters are set up through the system administrator port. There is no access to the administration functions through the terminal card.

3.3.2 Network Cards
The network card allows users to connect to the device cards from a telnet session over a network, and remote access to the administration functions. Each card supports four simultaneous user telnet connections and one administrator connection to the same IP

address. The network card must be connected to a network that uses TCP/IP. Devices connected to the network card must be at 10 Mbits (no auto–negotiation) on 10-base T.

3.3.3 Modem Card
The modem card allows dial-in access to the ConsoleServer 3200 and the servers attached to its device ports. The modem card supports baud rates up to 38.4 kbps, and will auto-detect the actual connection speed. Only one user at a time may access through the modem card, and only one modem card may be installed per unit. The system administration functions may not be accessed from the modem card.

4.0   Installation Instructions

4.1   Items in the Shipping Container

a) ConsoleServer 3200 user manual
b) User and Sys Admin Quick Reference Cards
c) AC power cord
d) Cable kit part number 200.0135 (four rubber feet included)
e) ConsoleServer 3200 chassis with installed cards

Additional adapters and cables may also be included in the shipping container if ordered. Large cable and adapter orders are usually shipped in separate containers.

4.1   Rack/Desktop Installation

The ConsoleServer 3200 is shipped with 19-inch rack mount 'ears' attached for installation in an EIA standard rack. If the unit is to be used in a desktop environment, the 'ears' may be removed and four small rubber feet may be installed on the bottom of the unit to prevent scratching the desktop and allow airflow through the unit. Alternate sizes of rack mount 'ears' are also available.

When mounting the ConsoleServer 3200 in a rack, be sure to allow sufficient space behind the unit for cables and adapters.

4.3   ConsoleServer 3200 Location and Cooling

The ConsoleServer 3200 will operate in a normal equipment room environment without any problems. The fan located on the power supply module provides airflow for the power supplies, while the majority of cooling relies on convection currents. It is therefore necessary to keep the bottom and top of the unit free from obstruction. Provisions for adequate ventilation should be made if the ConsoleServer 3200 is mounted in an enclosed rack.

The ConsoleServer 3200 generates 34.1 BTU/hr under normal operation. Be sure that the cooling plant for the machine environment can accommodate the additional heat load.

4.4   Power Requirements

The ConsoleServer 3200 may operate off AC or DC power, depending on the installed power supply module. The power supply module may be removed and exchanged to allow a different power source (AC or DC).

The AC power module is an auto-switching power supply, operating on 110/220 VAC at 50/60 Hz, and draws approximately 1 A at 110 VAC. An AC power cord is included with

the unit. Alternate power cords are available for all national connector standards. The standard AC power module has dual inputs.

The DC power module operates on –48 VDC, with 1.5 A maximum operating current, and 5 A maximum surge current. DC power must be externally protected against over-current. Each DC power module features dual power inputs.

See Appendix D for further specifications and instructions regarding DC power requirements and installation.

4.5   Connecting to the Sys Admin Port

The cable kit P/N 200.0135 contains the necessary adapters to interface the system administrator port on the control card to a laptop or a terminal. The control card can be removed from the system without turning off power if it is necessary to change the factory default settings of this port (however, the system will reboot once the control card is re-inserted). Using the adapters in the kit, follow the steps outlined below, and interface to the 'port A' on the control card to a laptop or terminal.

The factory default communications settings for the system administrator port are 9600 baud, one stop bit, no parity, eight data bits, and DCE (9600 8N1 DCE). The settings can be changed using the DIP switches shown in Figure 2.

NOTE: The administration functions may also be reached via telnet. However, it is first necessary to configure the network card through the direct serial connection.

1.   Turn on power to the terminal or computer. If using a computer, start the desired communication program. The terminal or communications program used must be in VT100 emulation mode. Note that the VT100 functions keys are not always mapped to the terminal or computer function keys; consult the appropriate documentation for further information.

2.   Ensure that the communications settings are correct. The factory defaults for the control card, which may only be changed by a hardware DIP switch, are 9600 baud, 8 data bits, 1 stop bit, and no parity (9600 8N1). If in doubt as to the current communication settings on the control card, check the DIP switches and refer to Figure 2, Control Card Layout with DIP Switch Settings.

3.   Locate the serial port on the terminal or computer and determine what type of connector is used. The cable kit included with the ConsoleServer 3200 contains each of the following: one RJ45 serial cable, an RJ45 to male DB9 adapter, an RJ45 to female DB9 adapter, an RJ45 to male DB25 adapter, and an RJ45 to female DB25 adapter. Select the appropriate adapter for the serial port on the terminal or computer.

4. Firmly seat the adapter in the serial port. Screw down the adapter to secure it to the serial port.

5. Insert one end of the serial cable into the adapter until a click is heard. Insert the other end of the serial cable into port "A" of the control card, again until a click is heard.

DEFAULT DIP SWITCH SETTINGS

SWITCH		Baud Rate
1	2	
OFF	OFF	38400
ON	OFF	19200
OFF	ON	9600
ON	ON	1200

SWITCH	Comm.
4	Setting
OFF	DCE
ON	DTE
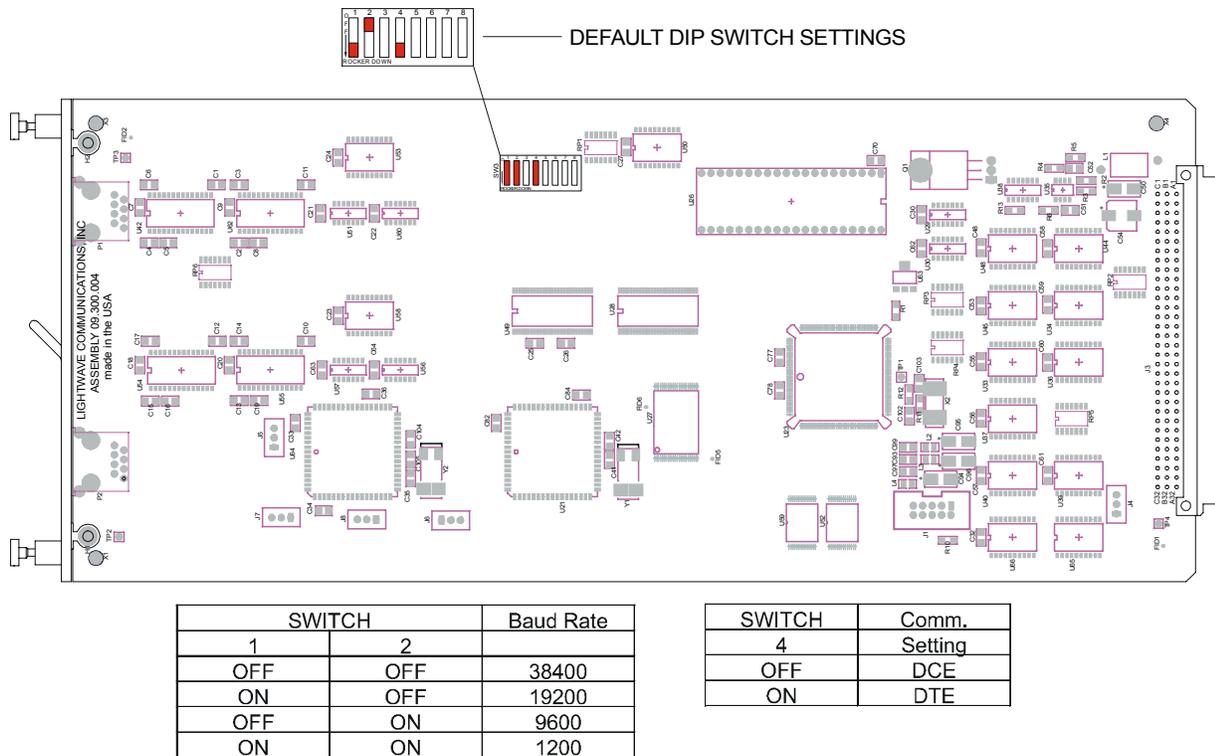
Fig. 2 Control Card Layout with DIP Switch Settings.

6. Press <ENTER> on the keyboard. The LCI3200>> prompt should appear. If not, check that the ConsoleServer 3200 is connected to the appropriate power outlet, the power switch is on, the control card is firmly seated, and that all cable connections are secure. If "garbage" characters appear on the screen, check that the communications settings are correct.

7. The system administrator may now login (as outlined in Section 6.0, System Administrator) into port "A" of the control card.

The system administrator may not access attached devices. To access attached devices, a user profile must be created (see section 6.2), and the user must log in through one of the user access cards (see section 3.3).

5.0   Connecting Equipment to the ConsoleServer 3200

When connecting devices to the ConsoleServer 3200, be sure to use Lightwave Communications cables and adapters to ensure the proper transmission of data signals. If a device has an RJ45 serial port, use the manufacturer's cable included with the equipment to convert the RJ45 serial connector to a DB9 or DB25 connector, and then use a Lightwave Communications adapter to convert back to RJ45 to attach to the device port. Directly connecting the RJ45 port on the ConsoleServer 3200 to the RJ45 port on a third-party device will not allow for the proper transmission of data signals.

ConsoleServer 3200 serial port default settings

Port Type	Baud Rate	Data Bits	Parity	Stop Bits	Port Configuration
Terminal	38400	8	None	1	DCE
Device	9600	8	None	1	DCE

See Appendix A for further details on connectors and pinouts.

5.1   Terminal Card

Terminal Card typical adapters and port configuration:

System Type	Adapter Part Number	Port Configuration
Wyse 50 / 60	200.0066	DCE
DEC VT330, PC (25pin)	200.0067	DCE
PC (9pin)	200.0070	DCE

Materials:
- ConsoleServer 3200 terminal port
- terminal or computer with RS-232 serial port
- RJ45-terminated Cat 5 cable (standard LAN cable)
- Lightwave adapter for terminal serial port

1.   Attach the Lightwave adapter to the terminal or computer serial port.

2.   Connect the Cat 5 cable to the adapter. Connect the other end to the ConsoleServer 3200 terminal port.

3.   Turn on the terminal or start the computer's communication program. Make sure that the communication parameters of the terminal or computer match those of the terminal port.

5.2 Network Card

The network card runs at 10 Mbits, half-duplex, with no auto-negotiation. The device used to connect the ConsoleServer to the network (i.e., a hub or switch) must support this configuration. It is essential that the network device does not attempt auto-negotiation; the ConsoleServer network card does not support this and will fail to establish a functioning link if auto-negotiation is used.

Materials:
- ConsoleServer 3200 network port
- network point-of-connection (i.e., a switch or hub)
- RJ45-terminated Cat 5 cable (standard LAN cable)

1.   Configure the ConsoleServer network parameters to the desired values as outlined in section 6.5.

2.   Configure the network point-of-connection. It must be manually set to 10 Mbits, half-duplex, with no auto-negotiation.

3.   Connect the ConsoleServer network port to the network using a standard LAN cable.

4.   Check the status lights at the network end of the connection. It should indicate a good link. Try reaching the IP address assigned to the ConsoleServer by using `PING` or `TELNET`. If there is a problem, check the network configuration on both ends.

5.3 Modem Card

Materials:
- ConsoleServer 3200 modem port
- Analog telephone line (POTS)
- RJ11 modular telephone cable

1.   Locate the modular jack for the telephone line to be used. Select a telephone cable with sufficient length to reach between the jack and the ConsoleServer.

2.   Connect one end of the telephone cable to the jack. Connect the other end to the ConsoleServer modem port.

3.   Make sure the ConsoleServer is powered. Dial the telephone number of the line connected to the ConsoleServer. The modem should automatically answer. If not, check the telephone line and connections.

5.4   Device Card

The ConsoleServer 3200 is designed so that the default device port communications settings will match the communications settings of most Sun® server and workstation console ports (9600 baud, 8 data bits, no parity, one stop bit). Other equipment types (i.e., Cisco®) frequently use similar communications settings; check the manuals included with the equipment for the correct settings. The table below lists the default serial port communications settings for the ConsoleServer 3200. Sections 6.3 and 6.4 outline the commands for changing the terminal and device port communications settings.

The following tables list the adapter part number and port configuration for some common equipment types that may be connected to the ConsoleServer 3200. Note that in some cases, an additional cable or adapter is included with the equipment to convert a proprietary pinout to an EIA-standard pinout. Also, note that **it is not possible to connect the RJ45 serial port of the ConsoleServer directly to the RJ45 serial port of any third-party equipment**. Sun Netra servers, Cisco switches, and other similar devices require a special adapter or cable to connect to the ConsoleServer. The adapter or cable is usually provided by the manufacturer of the equipment (e.g., Sun), or may need to be created by the user. The adapters and cables from the equipment manufacturer are usually designed to interface directly to a terminal, so the ConsoleServer device port must be configured as DTE rather than its default value of DCE. Lightwave Communications has pre-made adapters and kits for some common equipment types; contact Lightwave for information regarding your specific application.

The reference diagram on page 14 shows the proper cabling for some common equipment configurations.

Device Card typical adapters and 3200 port configuration:

System Type	Adapter Part Number	Port Configuration
SUN	200.0066	DCE
HP, SGI, PC (9pin)	200.0070	DCE
PC (25pin)	200.0067	DCE
Sun Netra t1/Cisco	200.0225	DCE

RJ45 to RJ45 Cables:

Part Number	Length
200.0062	2m
200.0063	5m
200.0064	10m
200.0065	15m

Standard DB9 or DB25 installation:

Materials:
- ConsoleServer 3200 device port
- device with RS-232-C serial console port
- RJ45-terminated Cat 5 cable (standard LAN cable)
- Lightwave adapter for serial console port

1. Attach the Lightwave adapter to the serial console port.

2. Connect the Cat 5 cable to the adapter. Connect the other end to the ConsoleServer 3200 device port.

3. Check that the device port and serial console port communications parameters match, and synchronize them if they do not match. See sections 6.3 and 6.7.4 for more information regarding the device port parameters.

Sun® Netra t1 installation:

Materials:

1. Connect a Cat 5 cable to the console port of the Netra. Connect the other end to the end of the ConsoleServer/Netra adapter (P/N 200.0225) marked "to Netra".

2. Connect another Cat 5 cable between the adapter end marked "ConsoleServer" and the ConsoleServer device port.

3. Check that the device port and serial console port communications parameters match, and synchronize them if they do not match. See sections 6.3 and 6.7.4 for more information regarding the device port parameters.

ConsoleServer 3200 Adapter Quick Checklist

PORT

CONFIG.

HP9000

SGI
(Origin,O2, Octane, Onyx2)

Adapter DB9-RJ45 200.0070 —— RJ45-RJ45 Cable —— **DCE**

OR

Terminal Cable **SGI Supplied** — Adapter DB25-RJ45 200.0067 — RJ45-RJ45 Cable — **DTE**

Sun

Adapter DB25-RJ45 200.0066 —— RJ45-RJ45 Cable —— **DCE**

OR

Terminal Cable **Sun Supplied** — Adapter DB25-RJ45 200.0067 — RJ45-RJ45 Cable — **DTE**

Netra RJ45

RJ45-RJ45 Cable — 200.0225 — RJ45-RJ45 Cable — **DCE**

DEC

Terminal Cable **DEC Supplied** — Adapter MMJ-DB25 200.0100 — Adapter DB25-RJ45 200.0066 — RJ45-RJ45 Cable — **DTE**

RS6000

Terminal Cable **IBM Supplied** — Adapter DB25-RJ45 200.0067 — RJ45-RJ45 Cable — **DTE**

Cisco Router/Hub

Terminal Cable **Cisco Supplied** — Adapter DB25-RJ45 200.0067 — RJ45-RJ45 Cable — **DTE DTE**

Cisco w/RJ45

RJ45-RJ45 Cable — 200.0025 — RJ45-RJ45 Cable — **DCE**

ConsoleServer 3200

RJ45 Connection to Switch

Included in cable kit 200.0135

RJ45-RJ45 Cable

Sys Admin Terminal

Control Card Port "A" Rj45 Connector

Depending on Sys Admin Terminal I/O port, adapter will be one of following:
200.0066 RJ45-DB25M
OR
200.0067 RJ45-DB25F
OR
200.0069 RJ45-DB9M
OR
200.0070 RJ45-DB9F

Note: Other adapters are available from Lightwave. Call for information and availability.
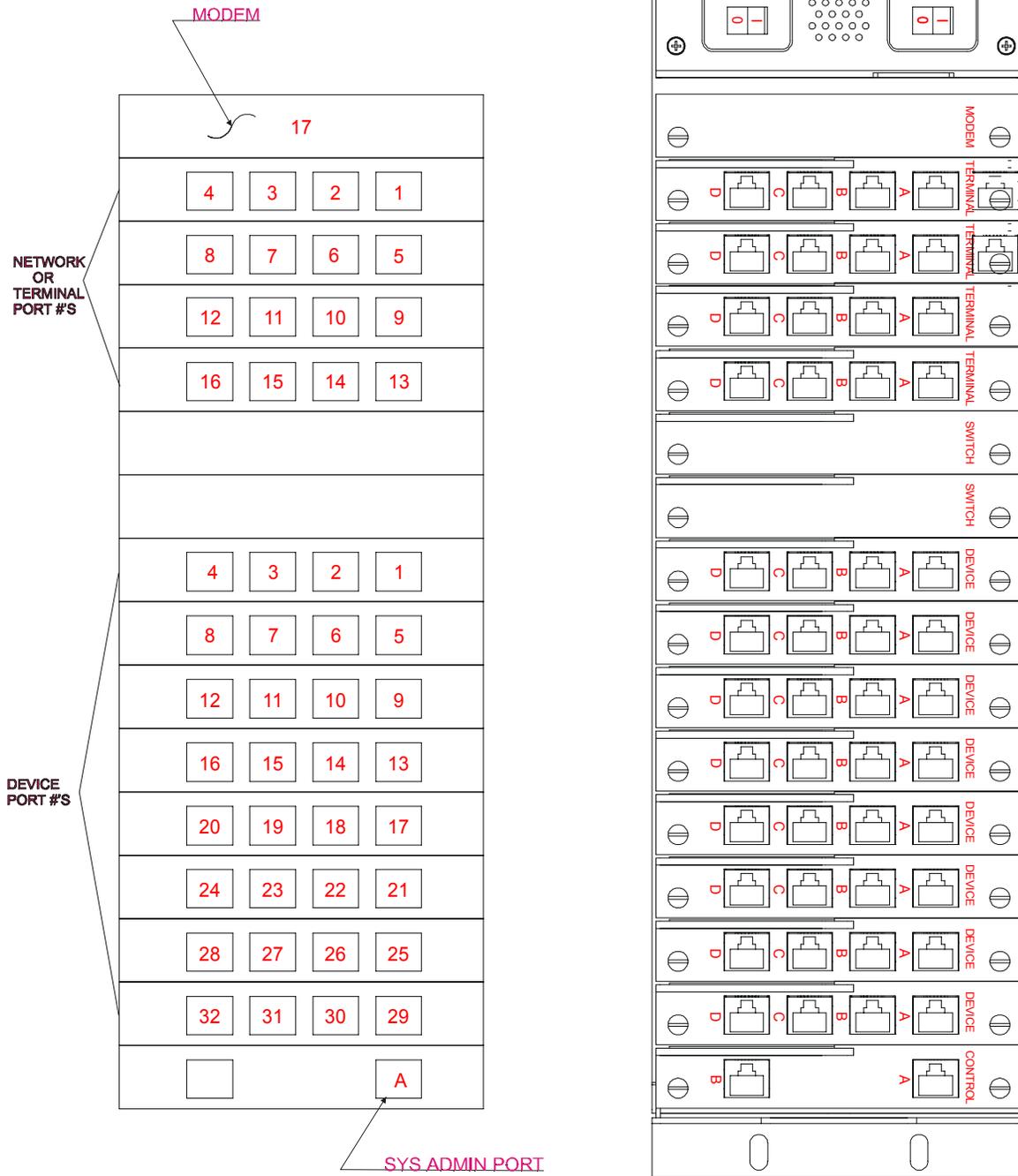
Fig. 3 General layout showing terminal port and device port numbers.

6.0   ConsoleServer 3200 Administration

The following section outlines the administration functions and commands. The administration functions and commands are designed to enable the administrator to configure the ConsoleServer 3200 to fit the needs of the system application. User IDs, devices, terminals and access rights may be configured using the administration commands. As new features are added to the product, the administration user will also be used to install new flash memory software updates (see section 6.12, Updating the ConsoleServer 3200 Software, and Appendix B). **The administrator may not access device ports; only users may access device ports (see section 7.0, User Access and Interface).**

Screen shots of interactive terminal sessions are shown in outlined boxes, while in-text command words and system responses are in `Lucida Console` font to differentiate them from normal text. All system commands require the <ENTER> key to respond, but are not case-sensitive unless otherwise specified.

Many commands may be abbreviated to one extent or another, but some may not be abbreviated at all. For example, the command `VERSION` may be abbreviated to `VER`, but `LCIUPDATE` may not be abbreviated. See Appendix E for more information regarding abbreviations.

NOTE: <ESC> <ESC> or <CTRL>+C will cancel an operation and return to the administrator prompt. Pressing <CTRL>+R at the `LCI3200>` or `sys admin>` prompt will discard the characters on the current command line, and retype the last command used; <ENTER> must still be pressed to execute the command. Pressing <CTRL>+U at either prompt erases the current command line back to the prompt.

6.1   Power-up Sequence and Basic Use of the Administrator Functions

When the ConsoleServer 3200 is first installed and powered up, it must be configured through the serial terminal port. Connect the terminal port to a terminal device or computer using a terminal emulation program (refer to section 3.4 for instructions on connecting to the terminal port). After the network interface has been configured (see section 4.4), the administration login may also be reached via telnet. All the functions available from a local serial connection (with the exception of `BACKUP` and `RESTORE`) are also available through telnet by connecting to port 5000 of a ConsoleServer's network IP address. Administration access via modem is not supported at this time.

The serial terminal will display the following text at power-up:

```
ConsoleServer3200 Boot V1.76
Copyright 2000 by Lightwave Communications, Inc.   All rights reserved.
Identify Flash
Flash ID OK
Verifying Flash Image
Starting system
Lightwave Communications, Inc. ConsoleServer3200
Please wait...system initializing
Checking non-volatile memory...
2048
Start checking and reading stored data
Reading User Start up .........

LCI3200>>
```

The power-on self-test may be skipped by pressing <ESC> <ESC> or <CTRL>+C, but the ConsoleServer 3200 should be allowed to complete the POST if possible (this check usually takes about three minutes). This information is not available on a network connection, as it is not possible to connect to the ConsoleServer via telnet until the power-on self-test is complete. At the completion of the power-up sequence, the administrator is logged out, as indicated by the LCI3200>> prompt. Some commands may be used from this prompt, but most are available only when logged in.

NOTE: The administrator may define the system prompt using the PROMPT command (see section 6.11), but the system default prompt (LCI3200>>) is used in this manual for clarity.

6.1.1 Logging In, Serial Connection

```
LCI3200>>login
Please enter password: ****
sys admin>>
```

To log in on the ConsoleServer through a local serial connection, type LOGIN at the LCI3200>> prompt. The system returns the prompt Please enter password:. The default administrator password is **PASS** (see section 6.1.5 to change the administrator password). The ConsoleServer will only echo stars when the password is entered. If the password is correct, the prompt will change to sys admin>>.

6.1.2 Logging In, Network Connection

```
UNIX_MACHINE# telnet 172.16.1.200 5000

Connecting to 172.16.1.200 port 5000...
Escape sequence is ^]

Welcome to the ConsoleServer3200 SysAdmin

LCI3200>>login
Please enter password: ****
sys admin>>
```

To log in on the ConsoleServer through a network connection, the network interface for the ConsoleServer first must be configured through the serial terminal (see section 6.5). Once the network interface is configured and functioning, telnet to port 5000 of the IP address assigned to the ConsoleServer. The ConsoleServer will display a welcome message and the LCI3200>> prompt. At the prompt, type LOGIN. The system will only prompt for the password. At the Please enter password: prompt, enter the administration password. The default administrator password is **PASS** (see section 6.1.5 to change the administrator password). The ConsoleServer will only echo stars when the password is entered. If the password is correct, the prompt will change to sys admin>>.

6.1.3 Logging Out

To log out from an administration session, enter the command LOGOUT or LOGOFF. If logging out from a network session, the ConsoleServer will disconnect the telnet session. If logging out from a direct serial session, the ConsoleServer will return to the LCI3200>> prompt.

6.1.4 System Help

To access the help screens, type <F1> H, ?, or HELP to display the help page. There are two different help screens to reflect the commands available if the administrator is logged in or logged out.

LOGGED OUT HELP SCREEN

```
LCI3200>>help

   ConsoleServer 3200 Sys Admin Command List
   [] - optional  <> - parameter must be specified
            | - OR
F1 - Display Help Screen (VT100 mode)
ABBREVIATIONS                    - Show list of command abbreviations
CONNECTIONS [/MONITOR]           - Show list of current connections
                                   (/monitor will auto-refresh)
INFO <slot letter>               - Report miscellaneous information
LISTCARDS                        - Show list of installed cards
LISTDEVICES                      - Show list of device names
POWERSTATUS                      - Show status of power supplies
VERSION [/ALL|slot letter]       - Report software version information
                                   (/ALL - return version for all cards)


LCI3200>>
```

LOGGED IN HELP SCREEN

```
sys admin>>help

   ConsoleServer 3200 Sys Admin Command List
   [] - optional  <> - parameter must be specified
            | - OR
F1 - Display Help Screen (VT100 mode)
ABBREVIATIONS                    - Show list of command abbreviations
ADDUSER [new user id]            - Add a new user
BACKUP                           - Backup internal database
                                   (db will be output using ASCII)
BREAK <terminal channel>         - Break connection
CHANGEPSWD                       - Change the sys admin password
CONNECTIONS [/MONITOR]           - Show list of current connections
                                   (/monitor will auto-refresh)
DELETEUSER [existing user id|/XX] - Delete a user by user id or number
      (use LISTUSERS to get the number in the first column which
       corresponds to the user you wish to delete)
DEVICES                          - Display device settings
DEVICES [/ALL|n|device name] (n can be 1 to 32) - change settings
EDITUSER [existing user id]   - Edit a user's settings
FORCELOGOUT <terminal channel>- Force a user off the system
FORCELOGOUT sysadmin <network slot letter> - Force logout a sys admin
    session on a network card.
    <network slot letter> - card slots B through E only.
INFO <slot letter>            - Report miscellaneous information
LCIUPDATE [/tftp][<subsystem>]- Start system update process
                                (requires update file(s))
    /tftp - used only at console port, when system updates are
            transfered using the network.
    [<subsystem>]- destination of image sent over network
         while facing the back of the 3200
        (where cards can be inserted or removed), the letters A-P are used
         to refer to the slots in the box.
         Starting from the left to right, A,B,C,D,,,,P
         A number after the letter tells which subsystem on the card to
program.
         Currently the only card which has two subsystems is the network card.
         Otherwise all other cards have only one subsystem.
         see the following examples:

         example: A1 for modem card
             B1 for a terminal card
             B1 and B2 for network card (netterminal and network files)
    Card type ranges:
    A1 - modem card
    B1 - E1 can hold either terminal cards or network cards
         if a network card is in one of the slots,
```

19

```
                1 will refer to the netterm subsystem and
                2 will refer to the network subsystem on the card
     F1 - G1 switch cards (do not require updating)
     H1 - O1 device cards
     P1 - control card
LINESPERPAGE [n]                  - Display/set number of lines before pause
                                    (n can be 0 to 99, 0 disables)
LISTCARDS                         - Show list of installed cards
LISTDEVICES                       - Show list of device names
LISTUSERS [user id|/ALL]          - Display list of users
LOG [/ENABLE|DISABLE]
                                  - Enable/disable system events
                                    and set destination of event info
LOGOUT,LOGOFF                     - Logout
MODEM [/DEFAULT]                  - Display/set modem init string
                                    /DEFAULT - set init string to default
MODEMTIMEOUT [t]                  - Display/set timeout for modem calls
                                    (t can be 0 to 30 minutes, 0 disables)
NETWORK [/ALL|slot letter]        - Set network parameters ('B' - 'E')
POWERSTATUS                       - Show status of power supplies
PROMPT [/CLEAR|/DEFAULT]          - Set/clear system prompt for logged-out state.
                                    or set prompt to factory default.
MODEM [/DEFAULT]                  - Display/set modem init string
                                    /DEFAULT - set init string to default
MODEMTIMEOUT [t]                  - Display/set timeout for modem calls
                                    (t can be 0 to 30 minutes, 0 disables)
NETWORK [/ALL|slot letter]        - Set network parameters ('B' - 'E')
POWERSTATUS                       - Show status of power supplies
PROMPT [/CLEAR|/DEFAULT]          - Set/clear system prompt for logged-out state.
                                    or set prompt to factory default.
More
RESTORE                           - Restore internal database
                                    (upload ASCII file)
TELNETTIMEOUT [t]                 - Display/set timeout for telnet sessions
                                    (t can be 0 to 30 minutes, 0 disables)
TERMINALS                         - Display terminal settings
TERMINALS [/ALL|n] (n can be 1 to 17) - change settings
tftp [/B|/C|/D|/E] [get] host:file - Modified tftp command, used to
                                    transfer new updates to this box
                                    (/B use network card B, /C use card C, etc.)
tftpkill                          - kill active tftp session.
TIMEOUT [t]                       - Display/set timeout on sys admin login
                                    (t can be 0 to 9 minutes, 0 disables)
VERSION [/ALL|slot letter]        - Report software version information
                                    (/ALL - return version for all cards)

sys admin>>
```

A listing of abbreviations for the administrator commands is also available when
connected to the administrator port. The ABBREVIATIONS command is only available
when logged in.

```
sys admin>ABBREVIATIONS
   ConsoleServer3200 Sys Admin Command Abreviations List
ABBREVIATIONS                     - A
ADDUSER                           - ADDU
                                    AU
BACKUP                            - (no abbreviation)
BREAK                             - (no abbreviation)
CHANGEPSWD                        - PASSWD
                                    PSWD
CONNECTIONS                       - C
DELETEUSER                        - DELETEU
DEVICES                           - DEV
EDITUSER                          - EDITU
                                    EU
FORCELOGOUT                       - (no abbreviation)
HELP                              - H, ?
```

```
INFO                          - (no abbreviation)
LCIUPDATE                     - (no abbreviation)
LINESPERPAGE                  - LINESPP
                                LINES
                                LPP
LISTDEVICES                   - LISTD
                                LD
LISTUSERS                     - LISTU
                                LU
LOGIN                         - LOGI
LOGOUT                        - LO
MODEM                         - (no abbreviation)
MODEMTIMEOUT                  - MODEMT
                                MT
NETWORK                       - NET
POWERSTATUS                   - PO
                                PS
REBOOT                        - (no abbreviation)
RESTORE                       - (no abbreviation)
TELNETTIMEOUT                 - TELNETT
                                TT
TIMEOUT                       - TIME
VERSION                       - VER
```

6.1.5 Changing the Administration Password

At the first login, the ConsoleServer 3200 will use the factory default password, PASS
(all upper case). This default password should be changed as soon as possible to
prevent access by anyone other than authorized personnel.

```
sys admin>>passwd
Please enter current root password >****
Please enter new root password >**********
Please re-enter new root password >**********

sys admin>>
```

To change the sys admin factory default password, type CHANGEPSWD or PASSWD at the
sys admin>> prompt. The new password may be up to ten alphanumeric characters
long and is case-sensitive. Be sure to record the password in a safe place.

6.2   Creating and Managing Users

6.2.1 Adding a User ID

The ADDUSER command creates user IDs and assigns initial privileges. The following
screen will be displayed when the command is used:

```
sys admin>>ADDUSER
Number of available user records: 200
Number of users defined: 0
Enter user id | USER ID >
```

Press <ENTER> after typing the user ID. The user name is not case-sensitive. The next
prompt asks for a password for the user ID. When the user logs in for the first time he
will be asked for this password. This password is case-sensitive and is pre-expired.
The user must change the password before accessing any of the ConsoleServer 3200
device ports. The user password may be up to 10 alphanumeric characters long, and
may not contain the "*" character. The ConsoleServer 3200 will echo only stars when
the sys admin enters the password and confirmation

```
Enter case sensitive password | PASSWORD > ****
Re-enter case sensitive password | PASSWORD > ****
0-17 | MAX CONCURRENT LOGINS: 1>17
```

This parameter limits the number of simultaneous logins a user may have. The sys
admin may select between 0 and 17 concurrent logins. A user with 0 logins will have
connect and listen permissions defined, but cannot login to access anything until a
number of logins greater than 0 is defined.

```
Allowed devices example: 1-5,10 | DEVICES 0 > 1,5,7,8,30
Allowed listen devices example: 1-5,10 | DEVICES 0 > 1-32
```

The sys admin is now prompted to define the device ports that the user will be allowed
to access for direct connections and listening connections. If more than one port is to
be allowed, then the individual ports must be separated by a comma. A range of ports
may be specified using the dash ("-").

Allowed devices determines which devices a user may select for direct access.
Allowed listen devices determines which devices a user may use listen access.
"Listening" is defined as being able to read from an existing device port connection
without write ability. This feature is useful for sharing information among multiple users
or for monitoring a user's session with an attached device.
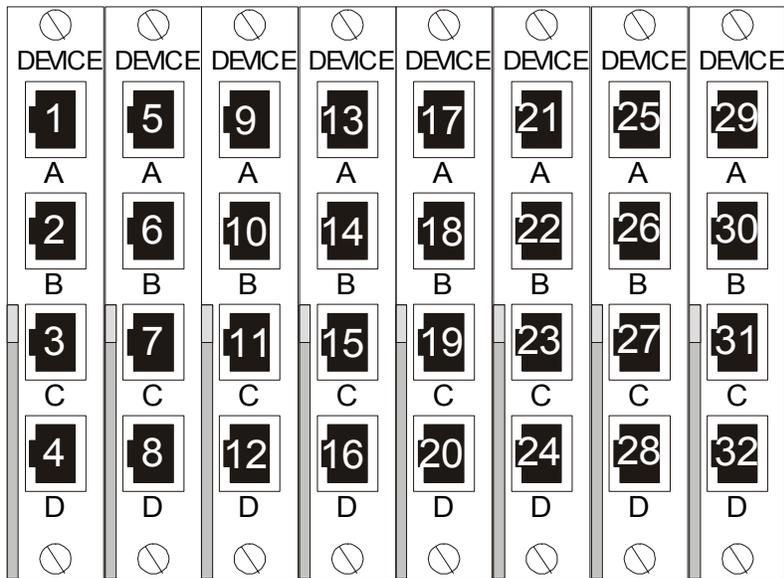
Fig. 4 Device Port Numbering

HELPFUL HINT: Make a diagram or spreadsheet of connections indicating connections between devices and the ConsoleServer 3200 device ports as numbered above.

The `Allow user to clear device buffer (Y/N) | YES >` option determines whether a user may use the `CLEAR` command to delete all the data stored in a device port FIFO buffer. The sys admin may want to inhibit this ability to preserve user accountability when accessing attached devices. Users are allowed to clear buffers by default. Pressing <ENTER> will allow the user to clear the buffer; typing `NO` and then pressing <ENTER> at the prompt when defining a user ID will disallow the user from clearing all device buffers.

The `Clear screen after a command (Y/N) | YES >` option determines if the screen clears when most commands are executed. Disallowing this screen behavior keeps the last few commands and responses on the terminal screen. The default value for this option is `YES`. Pressing <ENTER> will accept the default value; typing `NO` and then pressing <ENTER> disallows this screen behavior.

```
sys admin>>ADDUSER
Number of available user records: 200
Number of users defined: 0
Enter user id | USER ID > tom
Enter case sensitive password | PASSWORD > ****
Re-enter case sensitive password | PASSWORD > ****
0-17 | MAX CONCURRENT LOGINS: 1> 2
Allowed devices example: 1-5,10 | DEVICES 0 > 1-4
Allowed listen devices example: 1-5,10 | DEVICES 0 > 0
Allow user to clear device buffer (Y/N) | YES > n
Clear screen after a command (Y/N) | YES > n
Enter user id | USER ID >

Sys admin>>
```

The above procedure has defined one user. The ConsoleServer 3200 will prompt for
the next user ID to be defined. Repeat the set-up process until all users have been
entered. To return to the sys admin prompt, simply press <ENTER> at the USER ID>
prompt. More users may be added at any time by using the ADDUSER command. A
maximum of 200 users may be defined.

6.2.2 Editing a User ID

```
sys admin>>EDITUSER TOM
Enter accepts present value
Enter case sensitive password | PASSWORD >
0-17 | MAX CONCURRENT LOGINS: 2>6
Allowed devices example: 1-5,10 | DEVICES 1-4 >
Allowed listen devices example: 1-5,10 | DEVICES 0 >
Allow user to clear device buffer (Y/N) | YES > n
Clear screen after a command (Y/N) | NO > n

sys admin>>
```

To edit or change parameters for a particular user after defining that user ID, use the
EDITUSER command. For example, if the user 'Tom' needed to have more concurrent
login capabilities, the sys admin would type EDITUSER TOM on the command line. As
each line comes up, change the settings and press <ENTER>, or press <ENTER> to
accept the current setting.

NOTE: When editing any group of parameters, pressing the <ENTER> key will accept
the current value and move to the next parameter in the list.

6.2.3 Listing User IDs

To list the users that have been defined, use the LISTUSERS command. When used
alone, the command will display all user ID's. When a user ID is specified after the
command, the parameters for that user ID will be displayed. If the /ALL qualifier is
included after the LISTUSERS command, then the parameters for all users are
displayed.

```
sys admin>>LISTUSERS
1: User id > PETE
2: User id > KEVIN
3: User id > TONY

sys admin>>LISTUSERS /ALL
1: User id > PETE
Allowed devices > 1-32
Allowed listen devices > 1-32
Max logins > 17
Allow user to clear device buffer > YES
Clear screen after a command > YES
2: User id > KEVIN
Allowed devices > 1-32
Allowed listen devices > 1-32
Max logins > 17
Allow user to clear device buffer > YES
Clear screen after a command > YES
3: User id > TONY
Allowed devices > 1-32
Allowed devices > 1-32
Max logins > 17
Allow user to clear device buffer > YES
Clear screen after a command > YES

sys admin>>
```

6.2.4 Deleting a User ID

To delete a user, use the DELETEUSER command, followed by the user ID on the same
line. The LISTUSERS command will allow verification after deleting a user ID. The
following command sequence is an example of the use of DELETEUSER with
LISTUSERS:

```
sys admin>>DELETEUSER PETE
Delete user:pete                Yes or No (N):y

sys admin>>listusers
2: User id > KEVIN
3: User id > TONY

sys admin>>
```

User IDs may also be deleted by their record number. As each user ID is created, it is
assigned a sequential record number. This number is associated with the user ID and
will be displayed using the LISTUSER command.

```
sys admin>> deleteuser /3
Delete user:tony                Yes or No (N):y

sys admin>>
```

To delete a user ID using the record number, specify the number as a qualifier after the DELETEUSER command in the form DELETEUSER /N, where N is the user record number.

6.3   `Devices` Command

Device port parameters must be defined by the sys admin using the DEVICES command. If a single device port is to be changed, the port number must follow the DEVICES command. If the DEVICES command is entered by itself, the configuration of all device ports will be listed. To edit all possible device ports for a unit, enter the command DEVICES /ALL.

Programmable elements include: device name, baud rate, stop bits, parity, data bits, DCE/DTE, flow control and inhibit direct mode. Pressing <ENTER> accepts the parameter as is. If changes need to be made, each parameter may be edited as it comes up after each > prompt.

The device name may not contain the * character. If a name is entered with this character, the administrator will be asked to re-enter the name.

Four baud rates are offered: 9600, 19200, 38400, and 57600. Most devices use 9600 as the console/admin port baud rate, so the device port defaults to this value. Check the equipment documentation for the proper baud rate.

The format of the bit-wise transmission of data is determined by the stop bits, parity, and data bits parameters. The default settings are 1 stop bit, no parity, and 8 data bits. Check the equipment documentation for the proper settings.

Each device port may be separately configured as either DCE or DTE. The DCE setting is used when connecting to a DTE device such as a computer. The DTE setting is used when connecting to a DCE device such as a managed switch. The device ports are configured as DCE by default.

The device port flow control setting determines the method of flow control. The two most common settings are XON/XOFF (a.k.a. software) and RTS/CTS (a.k.a. hardware). DTR/DSR is used very infrequently. The default setting for the device ports is XON/XOFF. Check the equipment documentation for the correct flow control setting.

The INHIBIT DIRECT MODE setting allows the administrator to turn off port buffering while a user is connected to the device and is in direct mode. The device port buffer still collects data while not in direct mode when this setting is active. It may be desirable to disable direct mode buffering so sensitive data is not viewable by other users, but alert and panic messages from the attached device are still stored when nobody is connected. This setting is disabled by default, so buffer data is collected both in and out of direct mode.

```
sys admin>>terminal 1

Enter accepts present value
T1: 0=9600, 1=19200, 2=38400, 3=57600 | BAUD RATE: 9600>
T1: 0=1, 1=2                           | STOP BITS: 1>
T1: 0=None, 1=Odd, 2=Even             | PARITY: None>
T1: 0=8, 1=7, 2=6                      | DATA BITS: 8>
T1: 0=DCE, 1=DTE                       | EQUIP PORT TYPE: DCE>
T1: 0=XON/OFF, 2=RTS/CTS              | FLOW CONTROL: XON/XOFF>
Card installed, settings updated

sys admin>>
```

Device port location reference and device name template:

H	I	J	K	L	M	N	O
1	5	9	13	17	21	25	29
A	A	A	A	A	A	A	A
2	6	10	14	18	22	26	30
B	B	B	B	B	B	B	B
3	7	11	15	19	23	27	31
C	C	C	C	C	C	C	C
4	8	12	16	20	24	28	32
D	D	D	D	D	D	D	D

A list of device port names and their corresponding port number may be displayed by using the LISTDEVICES command.

6.4   Terminals Command

The sys admin defines terminal port parameters using the TERMINALS command in a manner similar to the DEVICES command. If the command is entered by itself, the terminal settings will display. If the terminal port number is specified after the command, then the settings for that terminal port may be altered. Programmable elements include: device name, baud rate, stop bits, parity, data bits, DCE/DTE, and flow control as in the example below.

```
sys admin>>TERMINALS 1
Enter accepts present value
T1: 0=9600, 1=19200, 2=38400, 3=57600 | BAUD RATE: 38400>
T1: 0=1, 1=2                           | STOP BITS: 1>
T1: 0=None, 1=Odd, 2=Even             | PARITY: None>
T1: 0=8, 1=7, 2=6                     | DATA BITS: 8>
T1: 0=DCE, 1=DTE                      | EQUIP PORT TYPE: DTE>
T1: 0=XON/OFF, 1=DTR/DSR, 2=RTS/CTS   | FLOW CONTROL: XON/XOFF>
Card installed, settings updated

sys admin>>
```

Terminal port connection location reference template:

6.5   Network Command

The NETWORK command will define a primary and secondary configuration for each card slot. The primary configuration will define the network card's IP address, local subnet mask, and default gateway. The secondary configuration allows the sys admin to define a routing path to reach a specific destination network via an alternate gateway that has a better route to that destination network. The network administrator for the ConsoleServer 3200 will determine if it is necessary to use this feature. If the secondary configuration will not be used, all fields for the secondary configuration should be set to 255.255.255.255 (which is the default setting).

The NETWORK command will either display the network settings of the installed network cards or change those settings depending on which command qualifier is used.

```
sys admin>>NETWORK
N-B: IP address                    | 000.000.000.000>
N-B: Subnet Mask                   | 255.255.255.255>
N-B: Enter Default Gateway address | 255.255.255.255>
N-B: Enter 2nd Dest. Network       | 255.255.255.255>
N-B: Enter 2nd Netmask             | 255.255.255.255>
N-B: Enter 2nd Gateway address     | 255.255.255.255>
N-B: BOOTP at startup?             | Y>
N-C: IP address                    | 000.000.000.000>
N-C: Subnet Mask                   | 255.255.255.255>
N-C: Enter Default Gateway address | 255.255.255.255>
N-C: Enter 2nd Dest. Network       | 255.255.255.255>
N-C: Enter 2nd Netmask             | 255.255.255.255>
N-C: Enter 2nd Gateway address     | 255.255.255.255>
N-C: BOOTP at startup?             | Y>
N-D: IP address                    | 000.000.000.000>
N-D: Subnet Mask                   | 255.255.255.255>
N-D: Enter Default Gateway address | 255.255.255.255>
N-D: Enter 2nd Dest. Network       | 255.255.255.255>
N-D: Enter 2nd Netmask             | 255.255.255.255>
N-D: Enter 2nd Gateway address     | 255.255.255.255>
N-D: BOOTP at startup?             | Y>
N-E: IP address                    | 000.000.000.000>
N-E: Subnet Mask                   | 255.255.255.255>
N-E: Enter Default Gateway address | 255.255.255.255>
N-E: Enter 2nd Dest. Network       | 255.255.255.255>
N-E: Enter 2nd Netmask             | 255.255.255.255>
N-E: Enter 2nd Gateway address     | 255.255.255.255>
N-E: BOOTP at startup?             | Y>

sys admin>>
```

When used without qualifiers, the NETWORK command will display the network settings assigned to each card slot. The IP address, subnet mask, default gateway, secondary route, and bootp settings are displayed for each slot. These parameters are assigned to the slots rather than the cards. If a network card is moved from one slot to another, it will have the parameters assigned to its new slot rather than those previously assigned to it.

```
sys admin>>NETWORK /ALL

Enter accepts present value
N-B: Enter IP address              | 000.000.000.000>
N-B: Enter Subnet Mask             | 255.255.255.255>
N-B: Enter Default Gateway address | 255.255.255.255>
N-B: Enter 2nd Dest. Network       | 255.255.255.255>
N-B: Enter 2nd Netmask             | 255.255.255.255>
N-B: Enter 2nd Gateway address     | 255.255.255.255>
N-B: BOOTP at startup?             | Y>
Save changes and update card? Yes or No: No>
N-C: Enter IP address              | 000.000.000.000> 172.16.1.2
N-C: Enter Subnet Mask             | 255.255.255.255> 255.255.255.0
N-C: Enter Default Gateway address | 255.255.255.255> 172.16.1.200
N-C: Enter 2nd Dest. Network       | 255.255.255.255>
N-C: Enter 2nd Netmask             | 255.255.255.255>
N-C: Enter 2nd Gateway address     | 255.255.255.255>
N-C: BOOTP at startup?             | Y>
Save changes and update card? Yes or No: No>y
Card installed, settings updated
N-D: Enter IP address              | 000.000.000.000> 172.16.1.3
N-D: Enter Subnet Mask             | 255.255.255.255> 255.255.255.0
N-D: Enter Default Gateway address | 255.255.255.255> 172.16.1.200
N-D: Enter 2nd Dest. Network       | 255.255.255.255>
N-D: Enter 2nd Netmask             | 255.255.255.255>
N-D: Enter 2nd Gateway address     | 255.255.255.255>
N-D: BOOTP at startup?             | Y>
Save changes and update card? Yes or No: No>y
Network card not installed in slot D
N-E: Enter IP address              | 000.000.000.000> 172.16.1.4
N-E: Enter Subnet Mask             | 255.255.255.255> 255.255.255.0
N-E: Enter Default Gateway address | 255.255.255.255> 172.16.1.200
N-E: Enter 2nd Dest. Network       | 255.255.255.255>
N-E: Enter 2nd Netmask             | 255.255.255.255>
N-E: Enter 2nd Gateway address     | 255.255.255.255>
N-E: BOOTP at startup?             | Y>
Save changes and update card? Yes or No: No>y
Network card not installed in slot E

sys admin>>
```

When used with the /ALL qualifier, the NETWORK command will allow the system administrator to change the network parameters for all the card slots in order. The sys admin will be prompted to enter the IP address, subnet mask, default gateway, secondary route, and bootp settings for each card slot. If <ENTER> is pressed at the prompt, the value displayed in the prompt will be used. After entering the parameters for each slot, the sys admin will be asked if the new parameters should be used. If NO is entered (or just <ENTER> is pressed), then the previously entered changes will be discarded and the system will move on to the next slot's parameters. If YES is entered, then the slot's network parameters will update in control card memory and the control card will send the new parameters immediately to the card in that slot. If the card is a network card, it will immediately acquire the new network parameters and disconnect all telnet sessions to that card. If a terminal card is in the slot, or if the slot is empty, the network parameter update is refused, but the network parameters for that slot will be saved to control card memory.

```
sys admin>>NETWORK B
Enter accepts present value
N-B: Enter IP address              | 000.000.000.000> 172.16.1.1
N-B: Enter Subnet Mask             | 255.255.255.255> 255.255.255.0
N-B: Enter Default Gateway address | 255.255.255.255> 172.16.1.200
N-B: Enter 2nd Dest. Network       | 255.255.255.255>
N-B: Enter 2nd Netmask             | 255.255.255.255>
N-B: Enter 2nd Gateway address     | 255.255.255.255>
N-B: BOOTP at startup?             | Y>
Save changes and update card? Yes or No: No>y
Card installed, settings updated

sys admin>>
```

When the NETWORK command is used with a card slot letter as a command qualifier, it will attempt to change the parameters only for that card slot. In all other aspects, the command behaves the same as if the /ALL qualifier was used.

If a bootp server is present on the same network as the ConsoleServer 3200 network card and bootp is enabled on the network card, then the network card will use the IP address and subnet mask assigned by the bootp server rather than those assigned by the sys admin.

Once a network card has been assigned an IP address either by a bootp server or by the sys admin, then the ConsoleServer may be accessed by telnet. Connecting to the default telnet port reaches the user login; connecting to port 5000 reaches the sys admin login.

6.6   Modem Command

The MODEM command allows manipulation of the modem card initialization string. When the command is entered, the sys admin is prompted for the new initialization string. Typing a new initialization string and pressing <ENTER> will create a new initialization string for the modem, while just pressing <ENTER> will accept the current value. After pressing <ENTER>, the sys admin is asked to confirm the changes to send the string to the modem. Typing YES and <ENTER> will send the initialization string immediately to the modem card, while typing NO and <ENTER> discards the entered initialization string and keeps the old string. If the modem card is not currently installed, the settings are not sent, but are kept in control card memory. The control card will send those settings in memory when a modem card is installed.

```
sys admin>>MODEM
Enter accepts present value
Init string | > ATB2H0
Save changes and update modem card?  Yes or No: No>yes
Modem card not installed in slot A, init string saved

Sys admin>MODEM /DEFAULT
Current modem init string is: ATB2H0
Set modem to factory default value of: ATH0S0=1
(write out YES) Yes or No: No>yes
Modem card not installed in slot A, init string saved

sys admin>>
```

The sys admin may also reset the initialization string to the default value by entering the command with the default qualifier in the form MODEM /DEFAULT. When using the /DEFAULT qualifier, the current initialization string is displayed, along with the factory default string. The sys admin is asked to confirm the use of the default modem string; typing YES and <ENTER> will send the default initialization string immediately to the modem card, while typing NO and <ENTER> keeps the old modem string.

It is recommended that the default modem initialization string be used unless the application requires that it be changed. The default initialization string is ATH0S0=1, which disconnects any active phone connections when the initialization string is sent, and sets the modem to auto-answer on one ring.

6.7   Status Commands

There are six commands which allow the sys admin to check the status of the ConsoleServer 3200: CONNECTIONS, LISTCARDS, VERSION, INFO, POWERSTATUS and LOG.

6.7.1 CONNECTIONS Command

The sys admin may monitor the status of connections made through the terminal cards by using the CONNECTIONS command. This command will display all the active connections and the mode of those connections as follows:

```
sys admin>>CONNECTIONS
 Terminal Connection List
01 KEVIN                    01 SERVER                   ( Monitor mode )
02                          00                          ( Channel present )
03                          00                          ( Channel present )
04                          00                          ( Channel present )
05                          00                          ( Channel present )
06                          00                          ( Channel present )
07                          00                          ( Channel present )
08                          00                          ( Channel present )
09                          00                          ( Channel present )
10                          00                          ( Channel present )
11                          00                          ( Channel present )
12                          00                          ( Channel present )
13                          00                          ( Channel present )
14                          00                          ( Channel present )
15                          00                          ( Channel present )
16                          00                          ( Channel present )
17 <not installed>

sys admin>>
```

The above example shows that user KEVIN is logged in on terminal port 01, is connected to device port 01 (which is named "Server" in the ConsoleServer 3200), and is in monitor mode. The list will display the user ID of any logged-in users, the device port to which they are connected, the device name assigned to that port, and the mode of that connection (see sections 7.8, 7.9, and 7.10 for an explanation of the various connection modes). If the user is not connected to any device, they shall simply be listed as "User Logged-In".

When used with the /MONITOR command line qualifier, the CONNECTIONS command updates the connection list on screen every time a user logs in or out or changes login level (i.e., goes into direct mode), rather than simply displaying the list once as occurs when the CONNECTIONS command is used alone. (See section 6.8, Sys Admin Session Management Commands).

The CONNECTIONS command will also tell the sys admin which terminal ports are present (in the list, they are referred to as "channels"). If the port is not functioning (i.e., the card is not present or there is a fault with the individual port), the port will be listed as "<not installed>". It will also list Telnet Active for an active Telnet session.

6.7.2 LISTCARDS Command

```
Sys admin>>LISTCARDS
Installed cards
Slot A : <card not installed>
Slot B : Terminal card installed
Slot C : Terminal card installed
Slot D : Terminal card installed
Slot E : Terminal card installed
Slot F : Switch card 1 installed
Slot G : Switch card 2 installed
Slot H : Device card installed
Slot I : Device card installed
Slot J : Device card installed
Slot K : Device card installed
Slot L : Device card installed
Slot M : Device card installed
Slot N : Device card installed
Slot O : Device card installed

sys admin>>
```

The LISTCARDS command will simply tell the sys admin which cards are plugged into the ConsoleServer 3200 chassis. It only lists the cards (by type) as present or not present, and does not indicate whether the cards are functioning properly.

6.7.3 VERSION Command

```
sys admin>>VERSION /ALL
ConsoleServer 3200
Slot B1: V2.15 10/01/99 Terminal Boot V1.62 (Sep 30 1999)  (14:33:12)
Slot C1: V2.15n 10/01/99 Net Terminal Boot V1.62 (Sep 30 1999)  (12:44:32)
Slot C2: V1.16 Build 7 09/29/99  Network Boot V1.62 (Sep 30 1999)  (14:45:52)
  Ethernet Address: 00-30-31-00-01-D5
Slot F1: V 1.03  Switch 1
Slot G1: V 1.03  Switch 2
Slot H1: V2.15 10/04/99 Device Boot V1.62 (Sep 30 1999)  (14:40:51)
Slot P1: V2.12 Build 15 10/01/99 Control Boot V1.62 (Oct 01 1999)  (11:13:06)

sys admin>>
```

By itself, the VERSION command lists the boot and flash software version for the control card. The version information for a single card other than the control card may be displayed by typing the card slot letter ID after the VERSION command. If the sys admin desires to list the software version for all cards, he should type VERSION /ALL at the command prompt. This will list the versions of the boot and flash software for all cards, listed by card slot letter designation. Each network card will display two sets of software versions: one set for the network portion of the card and one for the user terminal portion, while all other cards will only return one set of version information.

6.7.4 **INFO Command**

```
sys admin>>INFO A
Slot A1: Modem: No Active Call  Timeout = 1 mins.
Current Modem State: in command mode
Modem Init String: ATH0S0=1
Modem error: none

sys admin>INFO C
Slot C2: 0 Active Telnet Sessions   Timeout = 1 mins.
Ethernet Address: 00-30-31-00-00-4F
IP=172.16.1.31  SM=255.255.255.0  GW=172.16.1.151
2nd route: IP=255.255.255.255  SM=255.255.255.255  GW=255.255.255.255

sys admin>>INFO D
Slot D1:
Port  9(A) DCE  38400,N,8,1 Flow=XON/XOFF RTS=0 DTR=1
Port 10(B) DCE  38400,N,8,1 Flow=XON/XOFF RTS=0 DTR=1
Port 11(C) DCE  38400,N,8,1 Flow=XON/XOFF RTS=0 DTR=1
Port 12(D) DCE  38400,N,8,1 Flow=XON/XOFF RTS=0 DTR=1

sys admin>>
```

The `INFO` command allows the sys admin to list the properties of a card. The switch cards are incapable of returning information, and any request to view information from the switch cards will be refused.

The `INFO` command is used in the form `INFO <slot letter>`, where `<slot letter>` is the letter designation of the card slot in the ConsoleServer 3200 chassis. The modem card will always be in card slot A, while the network card may be in slots B, C, D, or E.

The modem card will return the following information:

- The slot letter and processor number (which will always be "A1")
- The connection status of the modem
- The current modem session timeout limit (see Section 6.9,Breaking User Connections)
- The current modem state, listed as either power-up mode or command mode
- The modem initialization string sent at startup
- Any miscellaneous modem error messages

The network card will return the following information:

- The slot letter and processor number (the number will always be "2")
- The amount of active telnet sessions
- The telnet session timeout limit
- Sys Admin sessions
- The unique hardware (MAC) address of the card, expressed as six groups of one-byte hexadecimal numbers
- IP source 3200, BootP, RARP

- The primary IP information, including: IP address, subnet mask, and gateway
- The secondary IP information, including: destination address, subnet mask, and gateway

The terminal and device cards will return the following information:

- The terminal or device port number
- The port letter as indicated on card label
- Equipment port type (DCE or DTE)
- Baud rate
- Parity; N=none, E=even, O=odd
- Data bits
- Stop bits
- Flow control type
- Status of RTS line; 0=off, 1=on
- Status of DTR line; 0=off, 1=on

The labels "RTS" and "DTR" do not change when the port type is changed from DCE to DTE. When the port type is changed, the label "RTS" indicates the status of the CTS line, and "DTR" indicates the status of the DSR line.

6.7.5 POWERSTATUS Command

```
sys admin>>POWERSTATUS
Power supply A is OK
Power supply B is OK

sys admin>>
```

The POWERSTATUS command displays the status of the two redundant power supplies in the ConsoleServer 3200 chassis. Power supplies will either be listed as OK or Failed. The ConsoleServer 3200 will continue to function with one failed power supply. Contact Lightwave for information regarding replacement if a power supply fails.

6.7.6 LOG Command

```
sys admin>>log /enable
```

The ConsoleServer 3200 can report current system activity through control card port B. The report is enable using the command LOG /ENABLE, and disabled using the command LOG /DISABLE.

The system will report user logins, logouts, device port selections, and entry/exit from direct mode. Note that there is no system clock on the ConsoleServer 3200, so there is

no time/date stamp on system activity. If a time/date stamp is required, it must be provided by the system capturing the data output.

Connection instructions for the logging port:

1. Turn on power to the terminal or computer. If using a computer, start the desired communication program. The terminal or communications program used must be in VT100 emulation mode

2. Ensure that the communications settings are correct. The factory defaults for the control card, which may only be changed by a hardware DIP switch, are 9600 baud, 8 data bits, 1 stop bit, and no parity (9600 8N1). If in doubt as to the current communication settings on the control card, check the DIP switches and refer to Figure 2, Control Card Layout with DIP Switch Settings, on page 9.

3. Locate the serial port on the terminal or computer and determine what type of connector is used. The cable kit included with the ConsoleServer 3200 contains each of the following: one RJ45 serial cable, an RJ45 to male DB9 adapter, an RJ45 to female DB9 adapter, an RJ45 to male DB25 adapter, and an RJ45 to female DB25 adapter. Select the appropriate adapter for the serial port on the terminal or computer.

4. Firmly seat the adapter in the serial port. Screw down the adapter to secure it to the serial port.

5. Insert one end of the serial cable into the adapter until a click is heard. Insert the other end of the serial cable into port "B" of the control card, again until a click is heard.

6. At the `sys admin>>` prompt, enter the command `LOG /ENABLE`. Log in as a user as outlined in chapter 7. Check for output on the logging port. If no output has appeared, check all cable connections. If "garbage" characters appear, check that all communications parameters match.

7. The ConsoleServer 3200 will continue to output logging information through the "B" port of the control card until the command `LOG /DISABLE` is entered at the `sys admin>>` prompt. Configure any text captures or scripts as needed to receive the logging data.

6.8   Sys Admin Session Management Commands

The ConsoleServer 3200 features two commands that allow the sys admin to manage properties of the control port terminal session.

6.8.1 LINESPERPAGE Command

```
sys admin>>LINESPERPAGE
Lines per page set to 22

sys admin>LINESPERPAGE 10
Lines per page set to 10

sys admin>>
```

The LINESPERPAGE command allows the sys admin to change the number of lines displayed per terminal page on the control card port before the MORE prompt is displayed. The number of lines to display per page is entered after the command. Entering the command without a number following will display the current amount of lines displayed per page. The default value is 22, which will work properly with a 24-line display.

6.8.2 TIMEOUT Command

```
sys admin>>TIMEOUT
Timeout set to 1 minutes

sys admin>>TIMEOUT 0
Timeout set to 0 minutes
0 disables the timeout from occurring

sys admin>>TIMEOUT 5
Timeout set to 5 minutes

sys admin>>
```

The TIMEOUT command allows the sys admin to define a time limit on how long an idle sys admin terminal may remain logged in. If there is no interaction for the defined amount of time, the control card will log out the sys admin. The time limit in minutes is entered as a command qualifier after the command, and must be entered as a whole number. Defining the time limit as 0 will disable this function. The default value is one minute.

6.9   Breaking User Connections

The sys admin has four commands available to forcibly break user connections to devices. The commands BREAK and FORCELOGOUT allow the sys admin to break any connection on demand, while TELNETTIMEOUT and MODEMTIMEOUT automatically break idle user sessions for the network or modem card.

6.9.1 BREAK Command

```
sys admin>>BREAK 1
Break this connection? (write out YES) Yes or No: No>yes

sys admin>>
```

The BREAK command allows the sys admin to disconnect a user from the device port to which they were connected if they are in monitor, listen, or direct mode. The user is still logged in after the connection is broken, but there is no longer any connection between the terminal port and the device port. The sys admin must specify the terminal port number (as listed with the CONNECTIONS command) of the connection to be severed when using the BREAK command. Pressing <ENTER> or typing NO at the confirmation prompt will abort the command. To execute the command, enter YES at the confirmation prompt.

6.9.2 FORCELOGOUT Command

```
sys admin>>FORCELOGOUT 1
Force this user off? (write out YES) Yes or No: No>yes

sys admin>>
```

The FORCELOGOUT command causes the forcible logout of a user at any level of connection. The user will be returned to the LCI3200> prompt after being forced off, and may login again unless their allowed logins are reduced to 0 before they can attempt another login. When using the FORCELOGOUT command, the sys admin must specify the terminal port number (as listed with the CONNECTIONS command) of the user to be forced off. Pressing <ENTER> or typing NO at the confirmation prompt will abort the command. To execute the command, enter YES at the confirmation prompt.

```
sys admin>>FORCELOGOUT SYSADMIN B

Force logout sys admin? (write out YES) Yes or No: No>yes

sys admin>>
```

The FORCELOGOUT command may also be used to disconnect a network sys admin session. The qualifiers SYSADMIN and the network card slot ID must be specified after the command.

6.9.3 TELNETTIMEOUT Command

```
sys admin>>TELNETTIMEOUT
Timeout set to 5 minutes

Sys admin>>TELNETTIMEOUT 0
Timeout set to 0 minutes
0 disables the timeout from occurring

sys admin>>TELNETTIMEOUT 2
Timeout set to 2 minutes

sys admin>>
```

The TELNETTIMEOUT command allows the sys admin to define the amount of time that a network card may have an idle telnet session before breaking the network connection. A telnet session is considered to be idle if no characters are sent from the user's terminal. Once the time limit has been reached, the user will be logged out and the network connection will be broken. The connection will be broken if there is no activity at any login level (from logged out up to direct mode). This is intended to prevent a "dead" session from tying up system resources. This command will define the idle time limit for all network cards present in the chassis.

To display the current system value for the idle telnet session time limit, type TELNETTIMEOUT at the command prompt. To change the time limit, the command is entered in the form TELNETTIMEOUT <t>, where <t> is the time limit in whole minutes. The valid range for <t> is 0 to 30, with the default value set as 1. If the value is set to 0, then the time limit is disabled.

6.9.4 MODEMTIMEOUT Command

```
Sys admin>>MODEMTIMEOUT
Timeout set to 5 minutes

Sys admin>>MODEMTIMEOUT 0
Timeout set to 0 minutes
0 disables the timeout from occurring

Sys admin>>MODEMTIMEOUT 2
Timeout set to 2 minutes

sys admin>>
```

The MODEMTIMEOUT command is identical to the TELNETTIMEOUT command, but causes the automatic disconnection of idle modem card sessions. The modem card will deselect any currently selected device port channel, log the user out, and disconnect the telephone connection once the idle session time limit has been reached. Entering the time limit in whole minutes after the command sets the idle time limit. Entering a value of 0 will disable the timeout. Entering the command by itself will display the current modem idle call time limit.

Any users listening to a connection that is broken by BREAK, FORCELOGOUT, TELNETTIMEOUT, or a MODEMTIMEOUT will lose the connection as well.

6.10   Saving and Restoring System Settings

The sys admin may save all the ConsoleServer 3200 system parameter settings (terminal port settings, device port settings, user IDs, etc.) and restore them at a later time using the BACKUP and RESTORE commands. To use this feature, the sys admin must be directly connected to control card port 'A' using a terminal or communications program capable of capturing the screen output from the ConsoleServer 3200 to a plain ASCII file to backup the system settings, and then sending the file as plain ASCII text to

the ConsoleServer 3200 to restore the system settings. It is not possible to use the BACKUP and RESTORE commands from a network sys admin session.

Before beginning either the backup or restore processes, make sure that there are no users logged in to the ConsoleServer 3200 by using the CONNECTIONS command. If there are any users logged in, notify them to log out immediately or forcibly log them out using the FORCELOGOUT command.

Once there are no users logged in, start the backup process by beginning the screen output capture. Send the output to an ASCII file with a descriptive name (i.e., 3200_backup.log). After the screen capture is set to run, begin sending the settings by entering the command BACKUP at the sys admin>> prompt. The ConsoleServer 3200 will begin to output its internal records to the screen as ASCII characters in a code for ConsoleServer 3200 internal use. The output may pause several times as the ConsoleServer parses the records. Once all records have been sent to the screen, the ConsoleServer 3200 will return to the sys admin>> prompt. Stop the screen capture to close the ASCII file once the prompt returns to the screen.

Do not attempt to modify or edit the text in the captured ASCII file; modifying the contents of the backup file will render the backup records invalid and unusable.

The last system records saved may be restored to the ConsoleServer 3200 using the RESTORE command. As with the BACKUP command, all users must be logged out before proceeding with the RESTORE process. To begin, enter the command RESTORE at the sys admin>> prompt. The ConsoleServer will wait for the plain ASCII file containing the system records (previously saved using the BACKUP command). Send the records file to the ConsoleServer 3200 using the communications program's ASCII file upload function. The ConsoleServer will exit the restore process and return to the sys admin>> prompt without altering the current system records if the wrong file is sent or if the file is somehow corrupted (i.e., through accident or attempted modification). The 3200 does not provide any feedback of the data being restored and since some Terminal Emulation Software i.e. Hypecterminal does not provide any indication of an ACSI upload, i.e. Dialog Status Box, no indication will display until the ConsoleServer completes the restore process. Once the records file has been transmitted to the ConsoleServer and the restore process is complete, the ConsoleServer 3200 will reboot and load the restored system settings.

6.11   Changing the System Prompt

The administrator may change the logged out system prompt for the ConsoleServer 3200. The prompt may not contain the "*" character, and can be up to 20 characters.

To change the system prompt, use the command PROMPT. Enter the new system prompt when indicated and press <ENTER>.

To change the system prompt to the default (`LCI3200>`), use the command `PROMPT` `/DEFAULT`.

6.12   Updating the ConsoleServer 3200 Software

As new features are added to the ConsoleServer 3200, new versions of the system software will become available. The sys admin may enter the ConsoleServer 3200 update mode using the command `LCIUPDATE` (which may never be abbreviated). It is not necessary to backup the ConsoleServer 3200 system settings using the `BACKUP` command before performing the software update, as all settings remain the same when the update is complete. Appendix B covers the procedure for using the `LCIUPDATE` command. The newest version of flash software is always available at the Lightwave Communication's FTP site (ftp://ftp.lightwavecom.com) accessible from any web browser or FTP client.

7.0   User Access and Interface

7.1   Terminal Card

Each terminal card has four (4) RJ45 connector ports to which a terminal may be attached, giving a maximum of 16 physically connected terminals per ConsoleServer 3200 unit. The terminal card may be installed in slots B, C, D, or E.

To access servers through the ConsoleServer 3200 terminal card, the user must have at least a text terminal capable of serial communication, a serial cable terminating in an RJ45 connector, and the proper serial communication settings as determined by the system administrator. The default communication settings are 38400, N, 8, or 1.

Once the hardware is properly connected and configured, the user may issue commands to the terminal card. Before entering any commands, the user should be sure that the terminal card is ready to accept commands by checking that there is a prompt on screen. This is best accomplished by pressing <ENTER> until a prompt appears on the screen (a prompt will not appear on the screen if the terminal port is in direct mode, or if the serial cable is not connected properly).

7.2   Network Card

The network card must be connected to a network that uses TCP/IP. Devices connected to the network card must be at 10 Mbits, half duplex, and no auto-negotiation on 10-base T (Cat 5) wiring. The network card may be installed in slots B, C, D, or E.

Network settings are entered via the Sys Admin port.

To connect to the ConsoleServer 3200 network card, the user should use a TCP/IP telnet client to telnet to the IP address assigned to the network card.

```
OCTANE_65 10# TELNET 172.16.1.31
Trying 172.16.1.31...
Connected to 172.16.1.31
Escape character is '^]'.

Welcome to the ConsoleServer 3200
You are connected to Port 5 via 172.16.1.31


LCI3200>
```

The user interface for the network card is exactly the same as that for the terminal card, with a few minor exceptions. When a user first connects to the network card, the card will display `welcome to the Console Server 3200`, the ConsoleServer 3200 terminal port number for the connection, and the IP address of the network card. Once at the `LCI3200>` prompt, the user interface behaves exactly the same as for the terminal cards.

43

At power-up, the network card does not respond to network connect requests until the control card has completed its system initialization. Once the power-up sequence is complete, the network card obtains its network parameters from the control card, and is ready to accept connections over the network. It is important to note that the network card does not retain its network parameters (i.e., IP address, subnet mask, gateway address) if moved from one card slot to another. The network parameters remain assigned to a card slot, and will be assigned to whatever network card is in that slot.

7.3   Modem Card

The modem card allows users to remotely access the servers attached to the ConsoleServer 3200 via a dial-up connection. The modem automatically detects the connection speed, and allows connections of up to 38.4K baud. The control card must complete its start-up initialization check before a user may access the ConsoleServer 3200 through the modem card.

The modem card must be installed in card slot "A" of the ConsoleServer 3200 chassis. The modem card will not function if it is inserted in any other card slot, nor will any other card type function in slot A. To connect the modem card to the telephone network, insert an ordinary telephone cable (RJ11) in the jack on the modem card, and insert the other end in a telephone network jack, as outlined in section 5.3. See section 6.6 for instructions on setting the modem initialization string.

The user interface for the modem card is identical to that found on the terminal card with the exception of one command, which is outlined below. Only one user at a time may connect to the modem card.

7.3.1 The Bye Command

A user may disconnect from the modem card and automatically log out from the ConsoleServer 3200 by sending the BYE command. This command will work at any login level that the user may send commands to the ConsoleServer 3200 (i.e., logged out, logged in, and monitor mode). When the command is received, the modem card disconnects the telephone connection, and then logs the user out from the ConsoleServer 3200. This command is unique to the modem card user interface.

7.4   Overview of Commands

Several levels of access are available to the user, from simple access of the ConsoleServer 3200 to direct access of servers attached to the ConsoleServer 3200. Many of the commands are sensitive to which level the user is in, and not all commands are available at all levels.

The first prompt the user should see after connecting to the ConsoleServer 3200 is the LCI3200> prompt (additional information may be on the screen as indicated in the

sections above). This indicates that the user is not currently logged in and that no servers may be reached through the ConsoleServer 3200. The prompt will change to reflect the level in which the user is, and in monitor mode, will also indicate which server is selected.

The help screens also change according to the user's login level. There are separate help screens for a logged out user, a logged in user, and a user in monitor (a.k.a. device) mode.

LOGGED OUT HELP:

```
F1 - Display Help Screen     (VT100 mode)
  F2 - Display Pull Down Menu (VT100 mode)
  TTY COMMANDS:(LOGGED OUT MODE)
  LOGIN                    - Login with ID and Password
  INFO                     - Display System Info
```

LOGGED IN HELP:

```
 F1 - Display Help Screen     (VT100 mode)
  F2 - Display Pull Down Menu (VT100 mode)
  TTY COMMANDS: (LOGGED IN MODE)
  LOGOUT,LOGOFF            - Logout
  SELECT [SERVER NAME\#]   - Select a server by name or number
  LISTEN [SERVER NAME\#]   - Listen to a server by name or number
  DISELECT[SERVER NAME\#] - Select a server and enter direct mode
  CHANGEPSWD or PASSWD     - Change user password
  CONNECTIONS             - Display connections list
  DEVLIST                 - Display installed devices list
  EDITESC                 - Edit direct mode escape sequence
  EDITBRK                 - Edit Break generation escape sequence
```

MONITOR (A.K.A. DEVICE) MODE HELP:

```
F1 - Display Help Screen    (VT100 mode)
F2 - Display Pull Down Menu (VT100 mode)
TTY COMMANDS: (MONITOR MODE)
LOGOUT,LOGOFF              - Logout
SELECT [SERVER NAME\#]  - Select a server by name or number
LISTEN [SERVER NAME\#]  - Listen to a server by name or number
DISELECT[SERVER NAME\#] - Select a server and enter direct mode
EXIT                      - Deselect from a server
DEVLIST                   - Display installed devices list
TOP                       - Go to begining of device buffer
BOTTOM                    - Go to end of device buffer
NEXT                      - Display next page of device data
PREVIOUS                  - Display previous page of device data
FORWARD [n LINES]         - Go forward n lines and display page
REVERSE [n LINES]         - Go reverse n lines and display page
CAT                       - Display entire contents of device buffer
CAFILTER                  - Display entire contents of device buffer with
                            filter
CLEAR                     - Clear device buffer
DIRECT                    - Enter direct mode
```

The user may see a complete list of available commands at any prompt by typing HELP, H, or ? and pressing <ENTER>, by pressing <F1>, or by selecting DISPLAY HELP SCREEN from a pull-down menu. To use the pull-down menu of commands available at each user level, the user may press <F2> or <CTRL>+D. By using the up and down arrow keys, the user may move the highlight bar to the desired command, and then press <ENTER> to select that command. The user may use the <F1> and <F2> keys only if the terminal or terminal emulation supports VT100 function keys. If the terminal or emulation program does not support VT100 function keys, then the user may press the <CTRL> and D key simultaneously to use the pull-down menu. To exit from a menu without selecting a command, press <ESC><ESC> or <CTRL>+C.

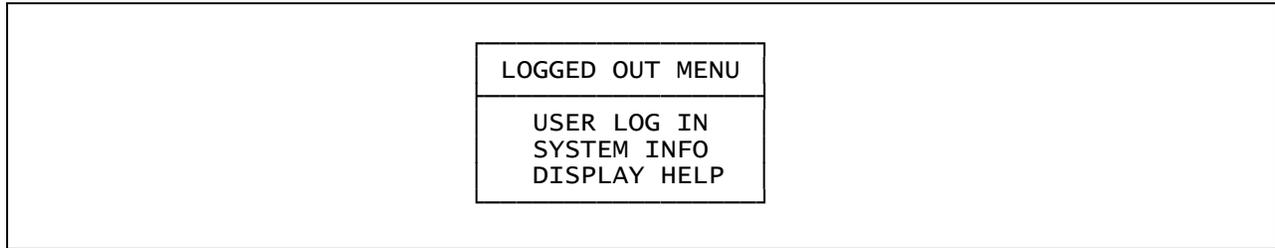Pressing <CTRL>+U (the control and U key simultaneously) will erase all typed commands on the current command line back to the system prompt. Pressing <CTRL>+R retypes the last command executed and waits for the user to hit <ENTER> to execute it.

Use <CTRL>+F for the down arrow and <CTRL>+E for the up arrow.

Most commands may be abbreviated to one extent or another. See Appendix E for allowed abbreviations.

7.5   Logging In and Changing Passwords

F2 PULL-DOWN MENU SHOWING INITIAL MENU CHOICES

```
              ┌─────────────────────┐
              │  LOGGED OUT MENU     │
              ├─────────────────────┤
              │    USER LOG IN       │
              │    SYSTEM INFO       │
              │    DISPLAY HELP      │
              └─────────────────────┘
```

To login, the user must type `LOGIN` at the `LOGGED OUT>` prompt or select `USER LOG IN` from the pull-down menu. The user ID may also be entered as a command qualifier after the login command.

```
LOGGED OUT>LOGIN
Please Enter User ID user_ID
Please Enter Password ****
```

- OR -

```
LOGGED OUT>login user_ID
Please Enter Password ****
```
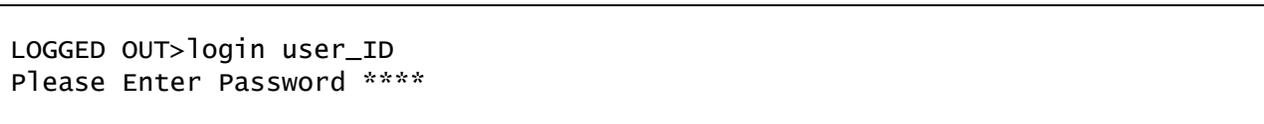
If using the pull-down menu or if no user ID was entered as a qualifier, the ConsoleServer 3200 will the prompt the user for their user ID by displaying `Please Enter User ID`. At this prompt, they should type the user ID assigned to them by the system administrator. After the user has entered their ID, they will be prompted for their password when the ConsoleServer 3200 displays `Please Enter Password`. On the first login, this will be a password assigned by the system administrator. The password is case sensitive, so the user must be sure to type the password exactly as it is in the system. The ConsoleServer 3200 will only echo stars for each character typed at the password prompt. Once the user has entered their password, the screen will clear, and a prompt displaying their user ID will appear, indicating that the ConsoleServer 3200 is ready for use. For example, a user with an ID of "GEORGE" will have a prompt of `GEORGE>` once they have logged in.

When a user profile is created by the sys admin, the password is pre-expired. The user must change the password assigned by the sys admin before selecting a device or listening to a device port for the first time.

To change the password, the user must use the command `CHANGEPSWD` or `PASSWD`. The ConsoleServer 3200 will first prompt the user for the old password by displaying `PLEASE ENTER OLD PASSWORD`. At this prompt, the user should enter the old

password and press <ENTER>. The ConsoleServer 3200 will then prompt the user for the new password by displaying the prompt PLEASE ENTER NEW PASSWORD. The user should enter the new password (which may be up to ten alphanumeric characters and is case-sensitive) at this prompt and press <ENTER>. After entering the new password, the user will be asked to verify the new password by the prompt PLEASE VERIFY PASSWORD. The user should enter the new password again at this prompt exactly as it was typed the first time and press <ENTER>. If both new password entries match, the ConsoleServer 3200 will display New password accepted. on the screen and return to the user prompt. If the new entries do not match, the message New and verify password mismatch is displayed, the new password is rejected, and the old password remains valid. The ConsoleServer 3200 will also reject a new password if the incorrect password is entered when prompted for the old password, or if the new password is the same as the old password.

7.6   Logging Out

A user may logout at any time that commands may be made to the ConsoleServer 3200 by typing LOGOUT, LOGOFF, or by selecting LOGOUT from a pull-down menu. When a user is connected to a server and they logout, the connection to that server will be broken and any other users that are listening to that session will lose their connection to that server as well.

7.7   Checking Connections

CONNECTION INFO SCREEN

```
                              CONNECTION INFO
   ────────────────────────────────────────────────────────────────
   01 – TEST                 00 –                    User logged-in
   02 –                      00 –                    Channel present
   03 –                      00 –                    Channel present
   04 –                      00 –                    Channel present
   05 –                      00 –                    Channel present
   06 –                      00 –                    Channel present
   07 –                      00 –                    Channel present
   08 –                      00 –                    Channel present
   09 –                      00 –
   10 –                      00 –
   11 –                      00 –
   12 –                      00 –
   13 –                      00 –
   14 –                      00 –
   15 –                      00 –
   16 –                      00 –
   17 –                      00 –


          Press Any Key To Continue ....
```
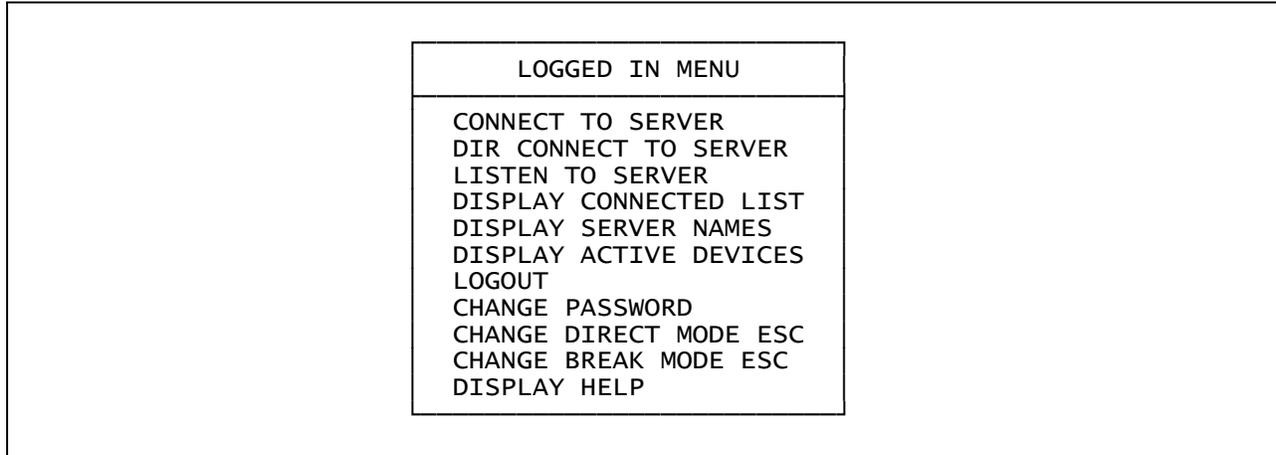
Only one user at a time may connect to a device on the ConsoleServer 3200, except when using listen mode (see Section 7.9, Listening to a Server Session for more details). Before attempting to select a device port, the user may desire to check if the device port is free. The CONNECTIONS command allows the user to list the users that

are logged in, which devices they have currently selected, and which mode they are in. Users may also view this information by selecting DISPLAY CONNECTED LIST from the pull-down menu when logged in.

7.8   Selecting a Device Port

F2 PULL-DOWN MENU TO SELECT A DEVICE PORT, PART 1

```
                    LOGGED IN MENU

              CONNECT TO SERVER
              DIR CONNECT TO SERVER
              LISTEN TO SERVER
              DISPLAY CONNECTED LIST
              DISPLAY SERVER NAMES
              DISPLAY ACTIVE DEVICES
              LOGOUT
              CHANGE PASSWORD
              CHANGE DIRECT MODE ESC
              CHANGE BREAK MODE ESC
              DISPLAY HELP
```

F2 PULL-DOWN MENU TO SELECT A DEVICE PORT, PART 2

```
                      SELECT SERVER

     01 – DEVICE_1              02 – DEVICE_2
     03 – DEVICE_3              04 – DEVICE_4
     05 –                       06 –
     07 –                       08 –
     09 –                       10 –
     11 –                       12 –
     13 –                       14 –
     15 –                       16 –
     17 –                       18 –
     19 –                       20 –
     21 –                       22 –
     23 –                       24 –
     25 –                       26 –
     27 –                       28 –
     29 –                       30 –
     31 –                       32 –
```
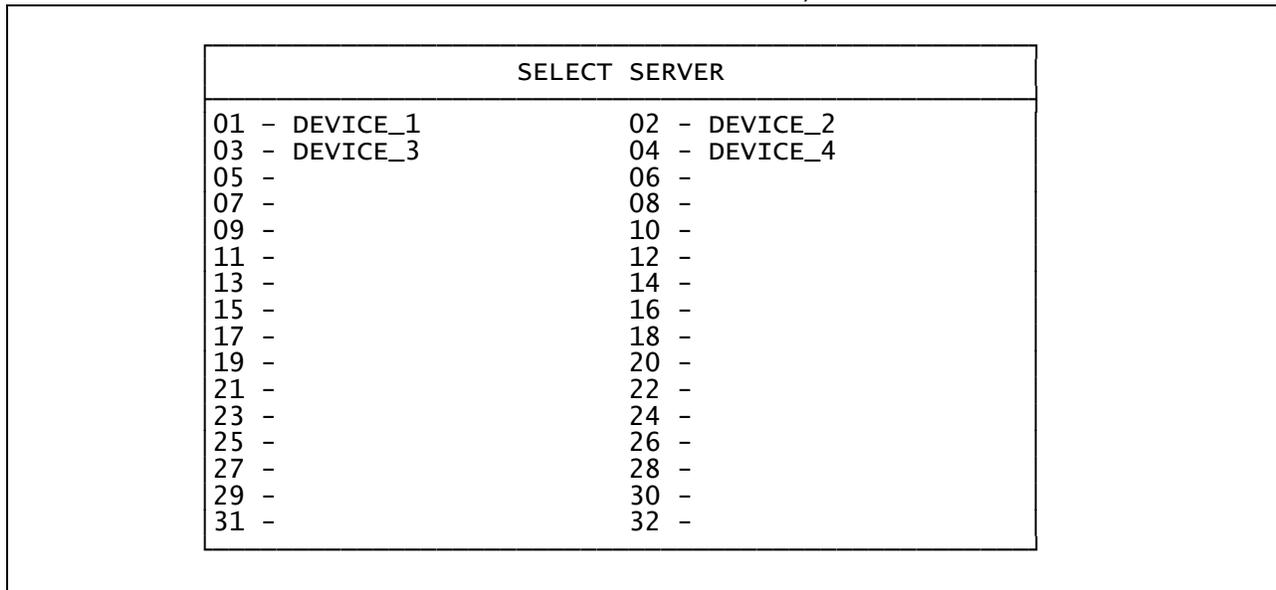
To select a device port, the user must type SELECT along with a device port name or number, or select CONNECT TO SERVER from the pull down menu, and then select the device port to be connected. The user must also have permission to connect to a device port as defined by the system administrator in their user profile. For example, to connect to a server named Alpha on device port 23, the user may either type SELECT Alpha, SELECT 23, or select CONNECT TO SERVER and then select Alpha from the next menu that appears. If the system administrator has determined that the user does

not have permission to access a server, the ConsoleServer 3200 will display the message NO ACCESS TO DEVICE CHANNEL, and the connection will not be made.
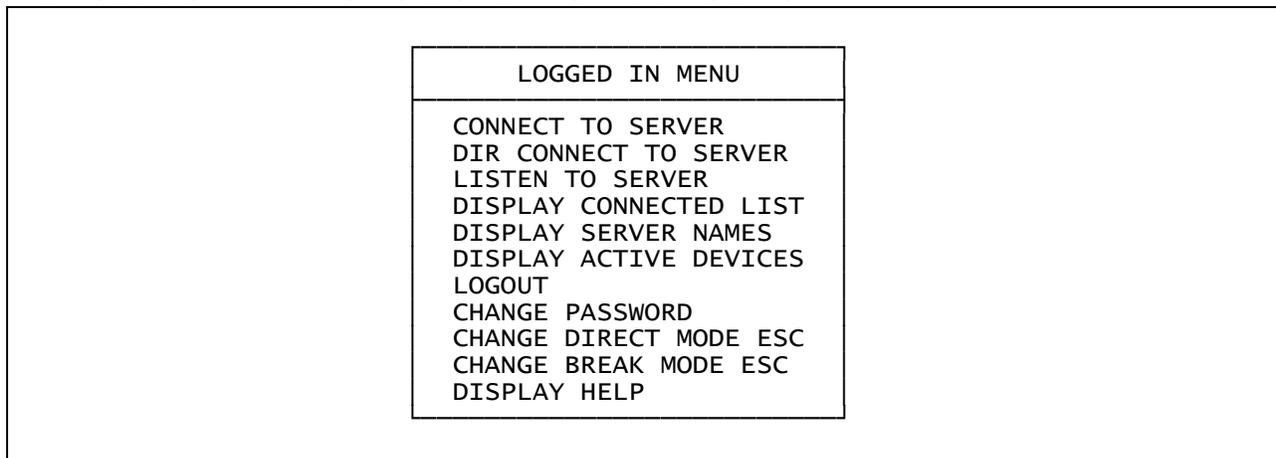
The user may exit from their current device port first by using the EXIT command or selecting EXIT FROM SERVER from the pull-down menu to free the device port for use by other users. A user may not select a server that is already selected by another user. When a server has been selected, the prompt will change to show which server has been selected by displaying the user ID, a dash, and then the server name in the general form USER_NAME-SERVER_NAME>. For example, if the user GEORGE selects Alpha, the prompt would read GEORGE-Alpha>.

When this prompt is displayed, the user is in monitor mode. There is no direct communication between the user and the server. Any output from the server is saved to a buffer that may be accessed by the user (see Section 7.11, Using the Buffer), but the user may issue no commands to the server. If the user desires to issue commands to the server, they must enter direct mode (see Section 7.10, Direct Mode).

Note that when selecting a server from a pull-down menu, only those device ports that are installed shall be displayed.

7.9   Listening to a Server Session

F2 PULL-DOWN MENU TO LISTEN TO A DEVICE PORT PART 1

```
              LOGGED IN MENU

         CONNECT TO SERVER
         DIR CONNECT TO SERVER
         LISTEN TO SERVER
         DISPLAY CONNECTED LIST
         DISPLAY SERVER NAMES
         DISPLAY ACTIVE DEVICES
         LOGOUT
         CHANGE PASSWORD
         CHANGE DIRECT MODE ESC
         CHANGE BREAK MODE ESC
         DISPLAY HELP
```

```
                       SELECT SERVER

     01 - DEVICE_1              02 - DEVICE_2
     03 - DEVICE_3              04 - DEVICE_4
     05 -                       06 -
     07 -                       08 -
     09 -                       10 -
     11 -                       12 -
     13 -                       14 -
     15 -                       16 -
     17 -                       18 -
     19 -                       20 -
     21 -                       22 -
     23 -                       24 -
     25 -                       26 -
     27 -                       28 -
     29 -                       30 -
     31 -                       32 -
```
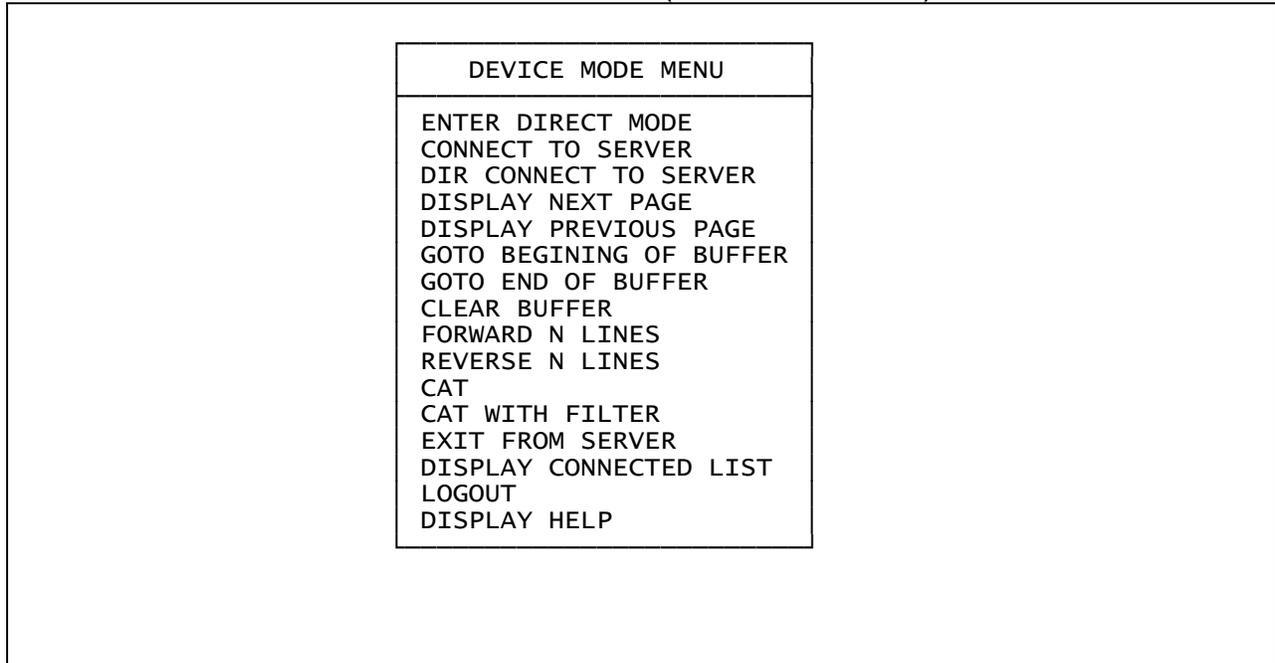
To monitor another user's server session, the user must type LISTEN followed by the device port name or number, or select LISTEN TO SERVER and a device port from the pull-down menu. There must be a connection between a user and a device port for another user to be able to listen to the connection. Also, the user must have permission to listen to the server as defined by the system administrator in their user profile. Any user that can log in and has listen permission for a device port may listen to a session on that device port. If the user does not have permission to listen to a server, the ConsoleServer 3200 will display the message NO ACCESS TO DEVICE CHANNEL.

When listen mode is entered, the screen will clear, and the message LISTEN MODE, PRESS ANY KEY TO EXIT.... will appear. To exit listen mode the user may press any key. The user will also exit listen mode if the connection between the other (interactive) user and the device port is broken.

Note that when selecting a server from a pull-down menu, only those device ports that are installed shall be displayed.

7.10   Direct Mode

F2 PULL-DOWN MENU SHOWING DEVICE (A.K.A. MONITOR) MODE OPTIONS

```
        ┌─────────────────────────────────┐
        │        DEVICE MODE MENU         │
        ├─────────────────────────────────┤
        │ ENTER DIRECT MODE               │
        │ CONNECT TO SERVER               │
        │ DIR CONNECT TO SERVER           │
        │ DISPLAY NEXT PAGE               │
        │ DISPLAY PREVIOUS PAGE           │
        │ GOTO BEGINING OF BUFFER         │
        │ GOTO END OF BUFFER              │
        │ CLEAR BUFFER                    │
        │ FORWARD N LINES                 │
        │ REVERSE N LINES                 │
        │ CAT                             │
        │ CAT WITH FILTER                 │
        │ EXIT FROM SERVER                │
        │ DISPLAY CONNECTED LIST          │
        │ LOGOUT                          │
        │ DISPLAY HELP                    │
        └─────────────────────────────────┘
```

If a user desires to interact directly with a server rather than only monitor its output, then they must enter direct mode. To enter direct mode using the DIRECT command, the user must first select a device port as outlined in Section 7.8, Selecting a Server. Then at the prompt, the user must use the command DIRECT or select the command ENTER DIRECT MODE from the pull-down menu. The user may also select a device port and enter direct mode in one step by using the DISELECT command or selecting DIR CONNECT TO SERVER from the pull-down menu. The DISELECT command must have either the device port number or the name assigned to the port as the command qualifier; if using the pull-down menu, a prompt box will appear to select the device port.

The user's terminal will then be directly connected to the server, and will act as if the terminal was physically connected to the server. The ConsoleServer 3200 displays the last page of the device buffer along with a system information message indicating which device port is selected as the user enters direct mode.

7.10.1 Direct Mode Escape Sequence

To escape from direct mode, the direct mode escape sequence must be used. The direct mode escape sequence is a series of two to five characters that allow the user to leave direct mode and return to monitor mode. The factory default for the direct mode escape sequence is <ESC> A (escape key, then uppercase "a"), but the user may change the sequence by using the command EDITESC or selecting CHANGE DIRECT MODE ESC from the pull-down menu at the user prompt. It is recommended that the user only change the escape sequence if it causes problems with the hardware or

software used. It is also recommended that the user avoid combinations of the <CTRL> key and other keys, as these combinations are usually reserved for sending and receiving special characters through the terminal. When the user changes the escape sequence, a window with the hexadecimal representation of the old escape sequence will appear. Pressing <ESC> to exit from the edit prompt will not work; it will add additional <ESC> characters (hexadecimal value 1B) to the direct mode escape sequence. If the user wishes to keep the old sequence, they need only to press <ENTER>. Otherwise, they should press backspace to delete the old characters, then enter the new sequence and press <ENTER>. If for some reason the selection is unacceptable, an error message will appear and the sequence will revert to the old character values. The escape sequence is stored with the user profile, therefore it is possible to have different sequences for different users. A hardcoded escape sequence is provided in the event that the programmed sequence is lost. It is semi-colon, exclamation, semi-colon, exclamation or ';!;!' none of these characters should echo and no <ENTER> is required.

Appendix F lists the hexadecimal codes for the ASCII character set.

7.11   Using the Buffer

F2 PULL-DOWN MENU FOR DEVICE (A.K.A. MONITOR) MODE

```
        ┌─────────────────────────────┐
        │      DEVICE MODE MENU        │
        ├─────────────────────────────┤
        │  ENTER DIRECT MODE           │
        │  CONNECT TO SERVER           │
        │  DIR CONNECT TO SERVER       │
        │  DISPLAY NEXT PAGE           │
        │  DISPLAY PREVIOUS PAGE       │
        │  GOTO BEGINING OF BUFFER     │
        │  GOTO END OF BUFFER          │
        │  CLEAR BUFFER                │
        │  FORWARD N LINES             │
        │  REVERSE N LINES             │
        │  CAT                         │
        │  CAT WITH FILTER             │
        │  EXIT FROM SERVER            │
        │  DISPLAY CONNECTED LIST      │
        │  LOGOUT                      │
        │  DISPLAY HELP                │
        └─────────────────────────────┘
```

Each device port saves the output of a server to a FIFO buffer. Each buffer can store up to 64K of data, giving approximately 100 text pages. However, the actual amount of pages may vary according to the data. The user must be in monitor mode to view or clear the data stored in the buffer.

```
user-DEVICE_1>TOP
```

When at the monitor mode prompt, the user may view the contents of the buffer using the commands `TOP`, `BOTTOM`, `NEXT`, `PREVIOUS`, `FORWARD`, and `REVERSE`, or by selecting the commands `DISPLAY NEXT PAGE`, `DISPLAY PREVIOUS PAGE`, `GOTO BEGINNING OF BUFFER`, `GOTO END OF BUFFER`, `FORWARD N LINES`, and `REVERSE N LINES` from the pull down menu. The monitor mode prompt will appear at the bottom of the displayed buffer data, and the user may enter commands normally at this prompt. The prompt is prefixed with the position of the currently displayed screen in the buffer; the top of the buffer is indicated by `TOP>`, the bottom of the buffer is indicated as `BOTTOM>`, and any other position is indicated as a percentage of the total buffer (e.g., `51%>`).

```
Connecting...

W.O.P.R.

LOGIN:GUEST
PASSWORD:*****

LOGIN FAILED

LOGIN:SFALKEN
PASSWORD:********

LOGIN FAILED

LOGIN:JOSHUA


Greetings Professor Falken

How are you today?
>

TOP>usr1-DEVICE_1>
```

The following table outlines the functions of the individual commands and pull down menu items.

COMMAND	MENU ITEM	FUNCTION
TOP	GOTO BEGINNING OF BUFFER	displays first 24 lines of buffer data
BOTTOM	GOTO END OF BUFFER	displays last 24 lines of buffer data
NEXT	DISPLAY NEXT PAGE	displays next 24 lines of buffer data
PREVIOUS	DISPLAY PREVIOUS PAGE	displays previous 24 lines of buffer data

| FORWARD | FORWARD N LINES | skip forward N lines in buffer |
| REVERSE | REVERSE N LINES | skip back N lines in buffer |

The commands FORWARD and REVERSE must be followed by the number of lines the user wants to move in the buffer. The command will not execute if the number of lines is omitted.

The user may also clear the buffer by using the command CLEAR or by selecting CLEAR BUFFER from the pull-down menu. All data stored in the device buffer will be erased and is not recoverable. The sys admin may inhibit this ability on a per-user basis by either creating the user ID without this ability or editing the user parameters after the user is created.
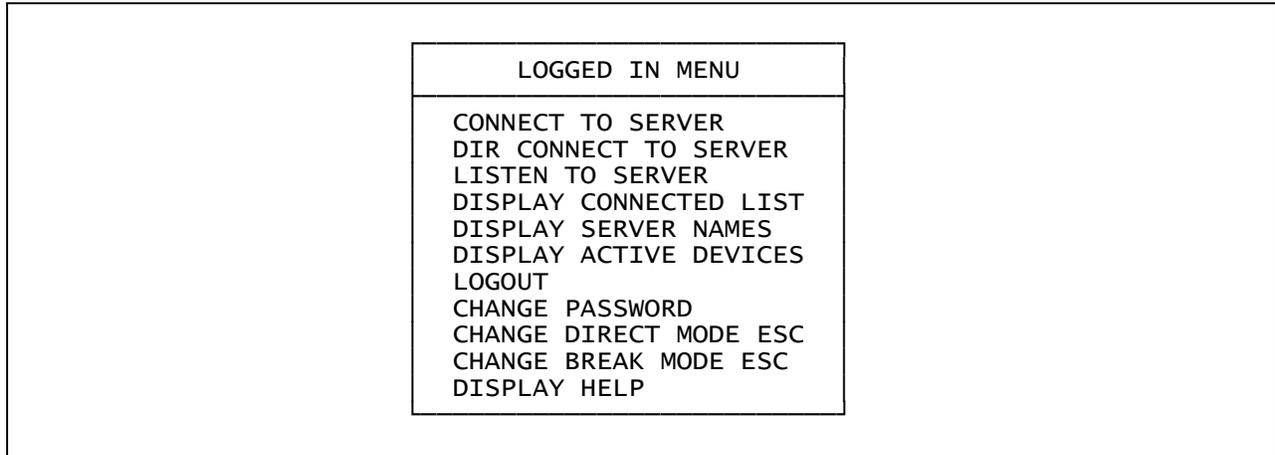
The CAT and CAT WITH FILTER commands allow a user to output the content of the device buffer to the screen. This allows a user to capture the contents of a device buffer by using the telnet client/terminal emulation software's texr capture capabilities.

CAT outputs the data in the buffer exactly as it was received without any additional formatting.

CAF outputs the data in the buffer by applying the same formatting that is used by the TOP, BOTTOM, NEXT, and PREVIOUS type commands. Characters are counted and a <CR><LF> is added after 80 characters if one is not found in the data. Due to the counting, escape sequences may not be preserved. Tabs are considered one character.

8.0   The Break Generation Sequence

F2 PULL-DOWN MENU TO CHANGE BREAK SEQUENCE
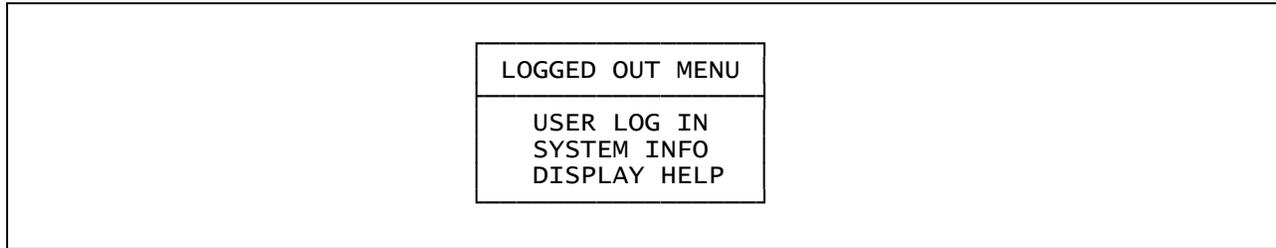
```
                    LOGGED IN MENU

              CONNECT TO SERVER
              DIR CONNECT TO SERVER
              LISTEN TO SERVER
              DISPLAY CONNECTED LIST
              DISPLAY SERVER NAMES
              DISPLAY ACTIVE DEVICES
              LOGOUT
              CHANGE PASSWORD
              CHANGE DIRECT MODE ESC
              CHANGE BREAK MODE ESC
              DISPLAY HELP
```

The user may find it necessary to send a break to the selected server. The break generation sequence is a two to five character sequence. The factory default break generation sequence is <ESC> B (the escape key, then uppercase "b").

The user may edit the break generation sequence in a manner similar to the direct mode escape sequence. The user may use the command EDITBRK or select CHANGE BREAK MODE ESC from the pull-down menu. It is recommended that the user only change the break generation sequence if it causes problems with the hardware or software used. It is also recommended that the user avoid combinations of the <CTRL> key and other keys, as these combinations are usually reserved for sending and receiving special characters through the terminal. When the user changes the break generation sequence, a window with the hexadecimal numerical equivalent of the old break generation sequence will appear. Pressing <ESC> to exit from the edit prompt will not work; it will add additional <ESC> characters (hexadecimal value 1B) to the break generation sequence. If the user wishes to keep the old sequence, they need only to press <ENTER>. Otherwise, they should press backspace or delete to remove the old characters, then type the new sequence and press <ENTER>. If for some reason the selection is unacceptable, an error message will appear and the sequence will revert to the old character values.

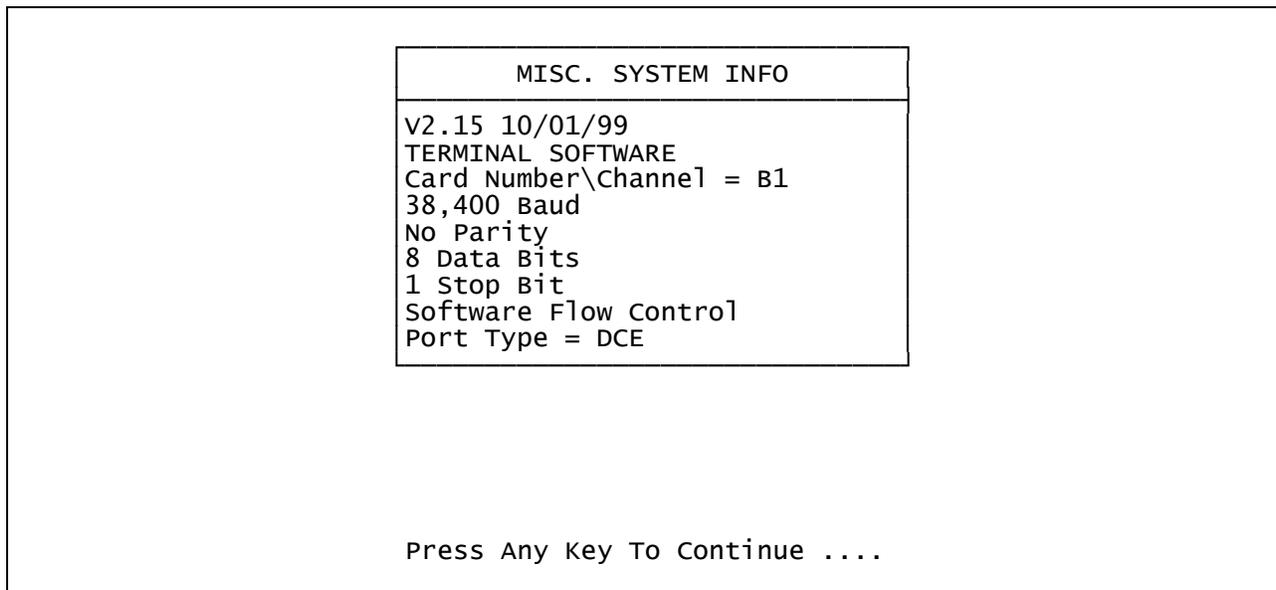Appendix F lists the hexadecimal codes for the ASCII character set.

9.0   Displaying System Information

F2 PULL-DOWN MENU TO DISPLAY SYSTEM INFO

```
           ┌─────────────────────────┐
           │     LOGGED OUT MENU      │
           ├─────────────────────────┤
           │       USER LOG IN        │
           │       SYSTEM INFO        │
           │       DISPLAY HELP       │
           └─────────────────────────┘
```

The user access cards are capable of displaying information about their software and communications settings. This information can be accessed only at the LCI3200> prompt by selecting SYSTEM INFO from the pull-down menu, or typing the command INFO or MISC at the prompt.
The command line INFO/MISC commands are also available at the user prompt USER>.

```
        ┌─────────────────────────────────┐
        │        MISC. SYSTEM INFO         │
        ├─────────────────────────────────┤
        │V2.15 10/01/99                    │
        │TERMINAL SOFTWARE                 │
        │Card Number\Channel = B1          │
        │38,400 Baud                       │
        │No Parity                         │
        │8 Data Bits                       │
        │1 Stop Bit                        │
        │Software Flow Control             │
        │Port Type = DCE                   │
        └─────────────────────────────────┘


              Press Any Key To Continue ....
```

The system information appears in a pop-up window. The first two lines show the version of the software in flash memory and the type of software. The third line shows the position of the terminal or network card in the ConsoleServer 3200 chassis. The next six lines show the current communication settings for the port. Pressing any key that sends a character through the terminal exits the window.

10.0 Front Panel Display Information:

The up/down arrow keys are used to scroll through multi-page displays.
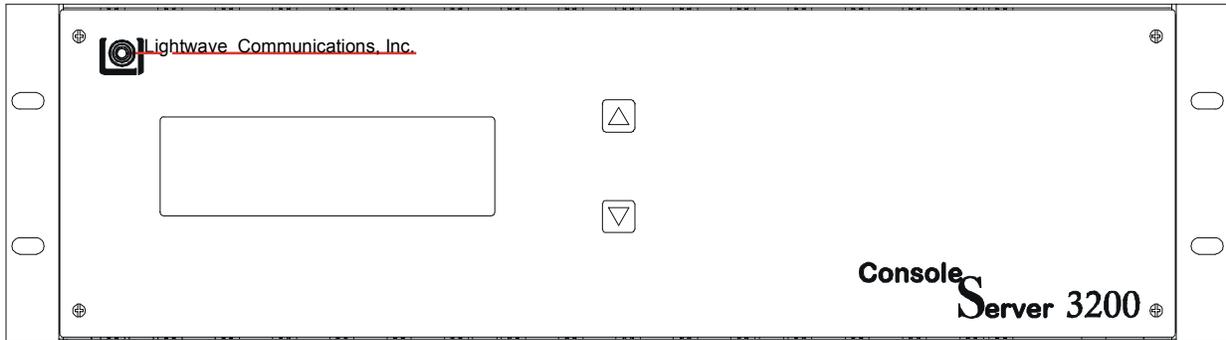

The LCD displays the panel below at power up time. This will be displayed for as long as five minutes while the ConsoleServer 3200 is in the initialize mode.


```
ConsoleServer 3200

Lightwave Communications, Inc.

Please wait...system initializing
```

After the ConsoleServer 3200 has gone through the initialization phase, the terminal connection list will automatically be displayed. To display the next panel in a function, press the down arrow on the ConsoleServer 3200. To display the previous panel, press the up arrow.

Panel 2 (press down)

```
Terminal Connection List 1/3
01
02
03
04
05
06
07
```
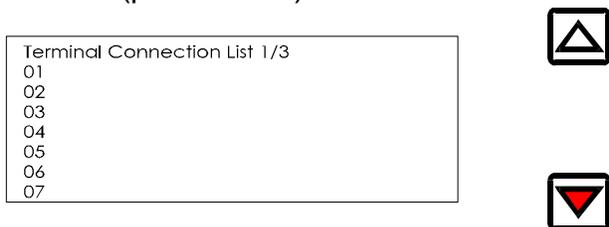
Panel 3 (press down)

```
Terminal Connection List 2/3
 08
 09
 10
 11
 12
 13
 14
```

Panel 4 (press down)

```
Terminal Connection List 3/3
 15
 16
 17 <not installed>
```

The next series of panel shows the port number along with the name of the device connected to that port.

Panel 5 (press down)

```
Server Names List 1/5
 01  DEVICE_1
 02  DEVICE_2
 03  DEVICE_3
 04  DEVICE_4
 05  DEVICE_5
 06  DEVICE_6
 07  DEVICE_7
```

Panel 6 (press down)

```
Server Names List 2/5
 08  DEVICE_8
 09  DEVICE_9
 10  DEVICE_10
 11  DEVICE_11
 12  DEVICE_12
 13  DEVICE_13
 14  DEVICE_14
```

Panel 7 (press down)

```
Server Names List 3/5
15  DEVICE_15
16  DEVICE_16
17  DEVICE_17
18  DEVICE_18
19  DEVICE_19
20  DEVICE_20
21  DEVICE_21
```

Panel 8 (press down)

```
Server Names List 4/5
22  DEVICE_22
23  DEVICE_23
24  DEVICE_24
25  DEVICE_25
26  DEVICE_26
27  DEVICE_27
28  DEVICE_28
```

Panel 9 (press down)

```
Server Names List 5/5
29  DEVICE_29
30  DEVICE_30
31  DEVICE_31
32  DEVICE_32
```

The next series of panels displays the inventory of cards that are installed in the chassis.

Panel 10 (press down)

```
Installed Cards 1/3
A    <card not present>
B    Terminal card found
C    Terminal card found
D    Terminal card found
E    Terminal card found
F    Switch card 1 found
G    Switch card 2 found
```

Panel 11 (press down)

```
Installed Cards 2/3
H    Device card found
I    Device card found
J    Device card found
K    Device card found
L    Device card found
M    Device card found
N    Device card found
```

Panel 12 (press down)

```
Installed Cards 3/3
O    Device card found
P    Control card found
```
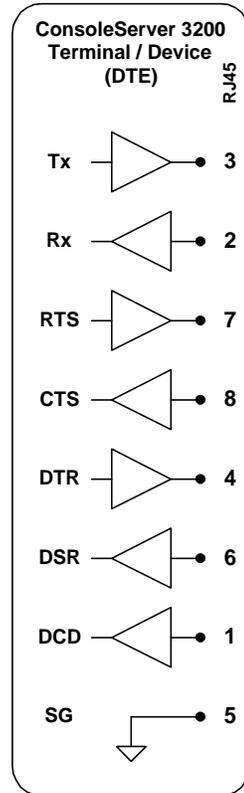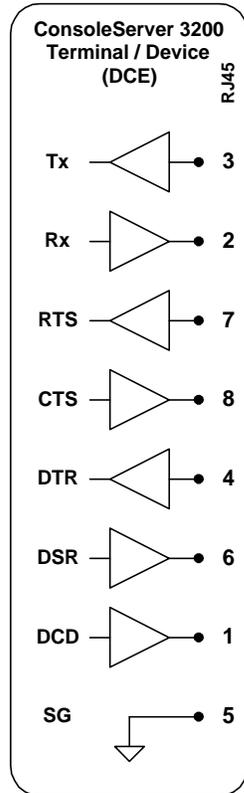
The last panel displays the status of the power supplies.

Panel 13 (press down)

```
Status 1/1
Power Supply A is OK
Power Supply B is OK
```
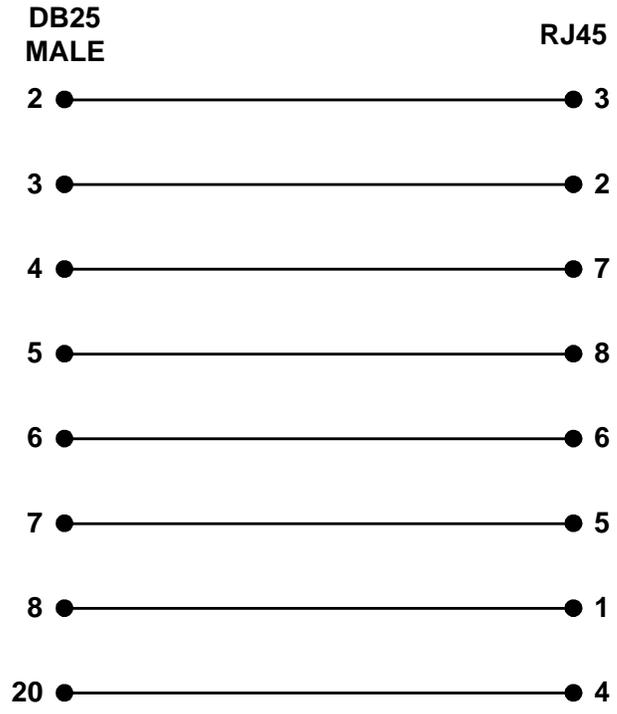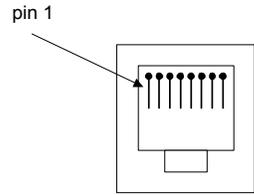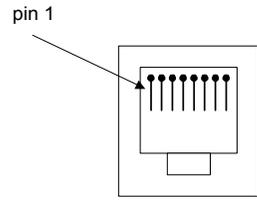
Appendix A – Adapter & Connector Pinouts

ConsoleServer 3200
Terminal / Device
(DCE)

RJ45

Tx	3
Rx	2
RTS	7
CTS	8
DTR	4
DSR	6
DCD	1
SG	5

ConsoleServer 3200
Terminal / Device
(DTE)

RJ45

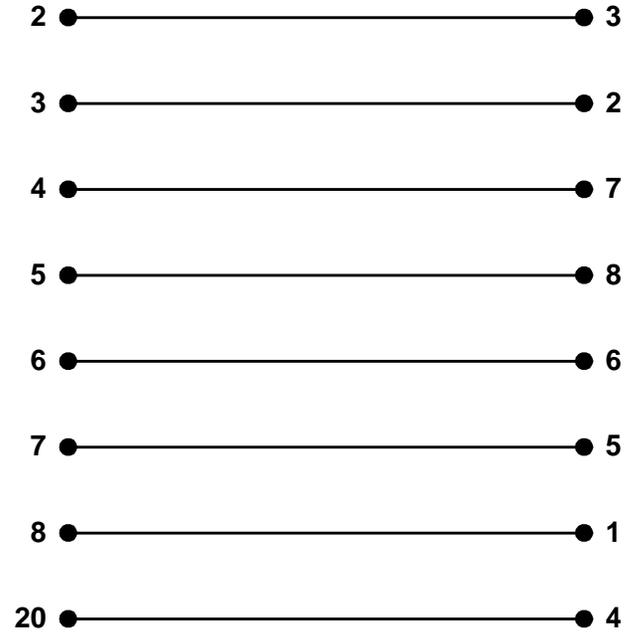|	
Tx	3
Rx	2
RTS	7
CTS	8
DTR	4
DSR	6
DCD	1
SG	5

pin 1
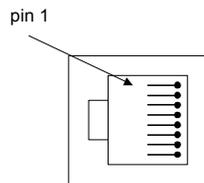
RJ-45 Connector
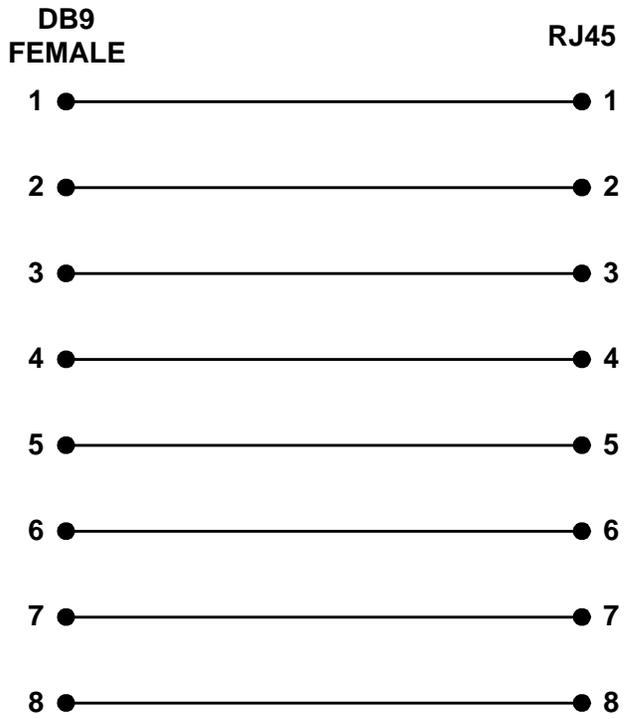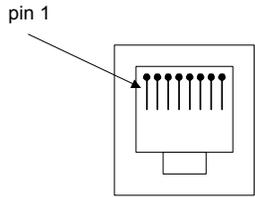
Lightwave Communications
100 Washington Street, Milford CT 06460
800 871-9838 * Fax 203 874-0157 * www.lightwavecom.com

Title:	Terminal / Device RJ45 Connector Pinouts			
Part Number				
Drawing Number				
Size: A	System: ConsoleServer 3200			Rev: A
File: 3200_term_dev.vsd	Sheet	01	of	01

pin 1

DB25
MALE

RJ45

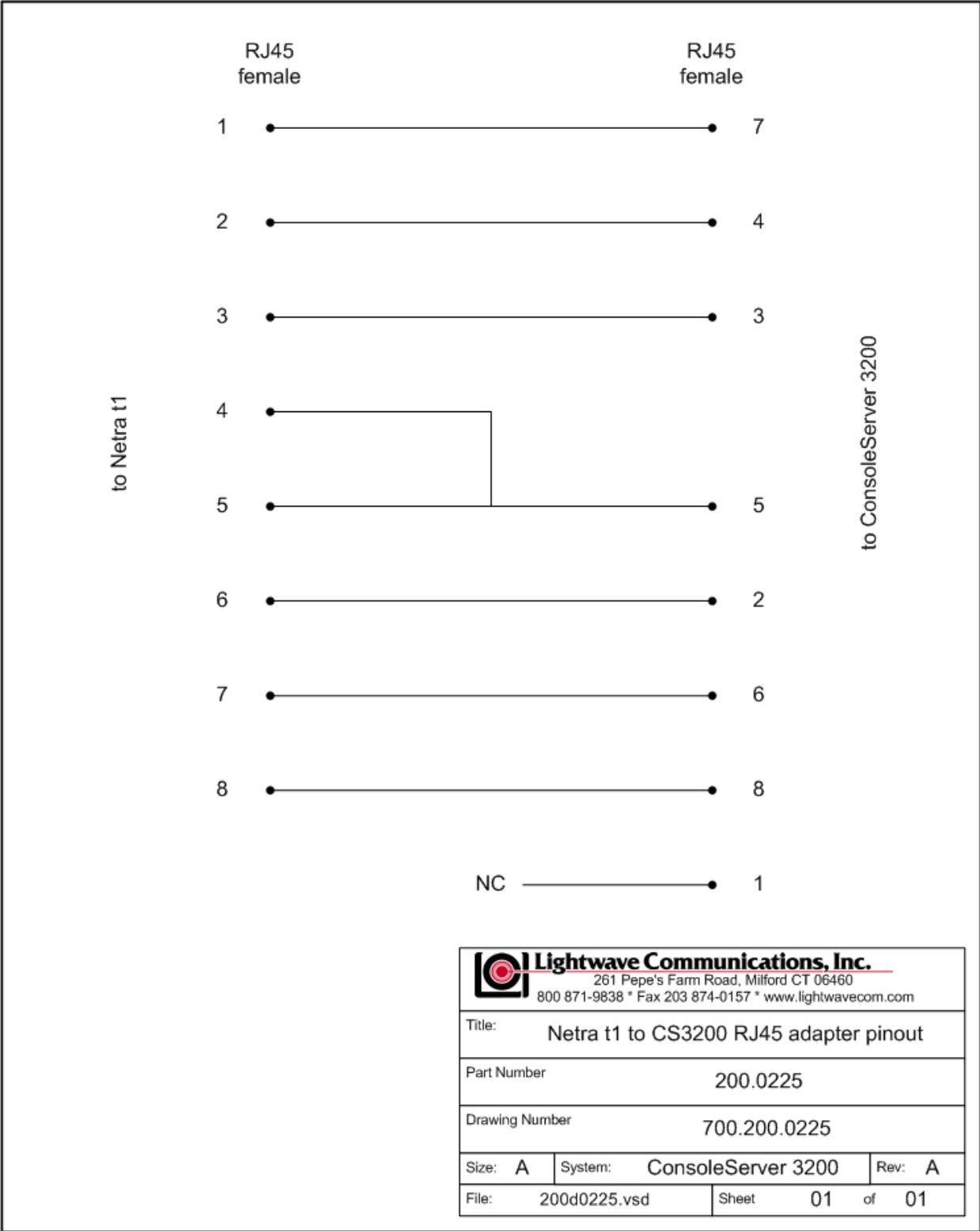| DB25 MALE	RJ45
2	3
3	2
4	7
5	8
6	6
7	5
8	1
20	4

Lightwave Communications
100 Washington Street, Milford CT 06460
800 871-9838 * Fax 203 874-0157 * www.lightwavecom.com

Title:	RJ45 Receptical to DB25M Adapter
Part Number	200.0066
Drawing Number	700.200.0066

Size: A	System: ConsoleServer 3200	Rev: A
File: 200d0066.vsd	Sheet 01	of 01

63

pin 1

DB25
FEMALE

RJ45

DB25 FEMALE		RJ45
2 ●━━━━━━━━━━━━━━━━━━● 3		
3 ●━━━━━━━━━━━━━━━━━━● 2		
4 ●━━━━━━━━━━━━━━━━━━● 7		
5 ●━━━━━━━━━━━━━━━━━━● 8		
6 ●━━━━━━━━━━━━━━━━━━● 6		
7 ●━━━━━━━━━━━━━━━━━━● 5		
8 ●━━━━━━━━━━━━━━━━━━● 1		
20 ●━━━━━━━━━━━━━━━━━━● 4		

Lightwave Communications
100 Washington Street, Milford CT 06460
800 871-9838 * Fax 203 874-0157 * www.lightwavecom.com

Title:	RJ45 Receptical to DB25F Adapter				
Part Number	200.0067				
Drawing Number	700.200.0067				
Size: A	System:	ConsoleServer 3200		Rev: A	
File: 200d0067.vsd	Sheet	01	of	01	

pin 1

DB9
FEMALE   **RJ45**

1 ●————————————————● 1

2 ●————————————————● 2

3 ●————————————————● 3

4 ●————————————————● 4

5 ●————————————————● 5

6 ●————————————————● 6

7 ●————————————————● 7

8 ●————————————————● 8

Lightwave Communications
100 Washington Street, Milford CT 06460
800 871-9838 * Fax 203 874-0157 * www.lightwavecom.com

Title:	RJ45 Receptical to DB9F Adapter		
Part Number	200.0070		
Drawing Number	700.200.0070		
Size: A	System: ConsoleServer 3200		Rev: A
File: 200d0070.vsd	Sheet 01	of	01

RJ45
female

RJ45
female

to Netra t1

to ConsoleServer 3200

1 ●————————————● 7

2 ●————————————● 4

3 ●————————————● 3

4 ●————————┐
                    │
5 ●————————┴——————● 5

6 ●————————————● 2

7 ●————————————● 6

8 ●————————————● 8

NC ————————————● 1

Lightwave Communications, Inc.
261 Pepe's Farm Road, Milford CT 06460
800 871-9838 * Fax 203 874-0157 * www.lightwavecom.com

Title:	Netra t1 to CS3200 RJ45 adapter pinout				
Part Number		200.0225			
Drawing Number		700.200.0225			
Size: A	System:	ConsoleServer 3200			Rev: A
File:	200d0225.vsd	Sheet	01	of	01

Appendix B – Field Update of Console Server 3200 Flash Memory

B.1   Introduction

The system administrator may desire to update the software held in flash memory. The modem, terminal, network, device, and control cards all have field-programmable flash memory. Switch cards are not programmable in the field.

The flash software may be updated by two means: through a direct serial connection, or via network.

B.2   Requirements

Direct Serial Connection:
- terminal or computer capable of communication with control card
- ability to upload binary files using kermit or Xmodem (see NOTE below)
- latest flash software files

Network Update:
- installed and configured network card
- latest flash software files
- tftp server
- network or direct serial connection to the sys admin login

The latest versions of software may always be obtained at Lightwave Communications' FTP site, ftp.lightwavecom.com , accessible from any web browser or FTP client program. The full URL to the latest ConsoleServer 3200 flash software updates, procedures and instructions is:

```
ftp://ftp.lightwavecom.com/pub/products/3200/software/
```

There are two hardware versions of the control, terminal, and device cards: those with a 40-pin ROM containing the boot code, and those with flash only. The easiest way to tell the difference is by looking at the card surface. If there is a large 40-pin ROM mounted in a socket on the card, then it is the ROM/flash version. There are two different versions of the flash update files corresponding to the two hardware versions. The files prefaced with an "f" are for the flash-only versions, while those prefaced with an "r" are for the ROM/flash versions of the cards. The ConsoleServer will reject the update if the incorrect file is sent. Simply send the other file version if the first file is rejected.

NOTE:
To determine if the control card is capable of receiving Kermit protocol uploads, enter the VERSION command at the sys admin> prompt. If the boot code version (not

application code version, which is listed first) is greater than 1.70, then Kermit may be used to transfer the binary update files; otherwise, Xmodem must be used.

B.3   Getting Started

Before initiating the flash update process, the system administrator must check that there are no active users on the ConsoleServer 3200 by using the CONNECTIONS command. If there are any users logged in, they should be notified to log out immediately or forcibly logged out by using the FORCELOGOUT command.

B.3.1 Communications Settings

The communications settings are slightly different for the serial flash update than for the normal operation mode. The baud rate, date bits, parity, and stop bits all remain the same between modes, but the flow control changes. In the flash update mode, the flow control changes to hardware flow control (RTS/CTS). Once the system returns to normal operating mode, software flow control (XON/XOFF) is used.

B.4   Update over Direct Serial Connection

The terminal or computer that will be used for the flash update must be connected to the control card port "A". All users must be logged out. The system administrator must log in before beginning the update. Commands that the sys admin should enter and text returned by the ConsoleServer 3200 are in Lucida Console font. All commands should be followed by <ENTER>.

```
sys admin>LCIUPDATE
Start system update, are you sure? (write out YES) Yes or No: No>YES
```

Once there are no users logged in, the system administrator must type LCIUPDATE to initiate the flash update process. The ConsoleServer 3200 will ask the system administrator if he is sure by displaying the prompt START SYSTEM UPDATE, ARE YOU SURE? (PLEASE TYPE OUT YES) YES OR NO: NO>. If the system administrator wants to proceed with the update, he should type out YES completely and press <ENTER>. Otherwise, NO or just N and <ENTER> will exit the process.

```
ConsoleServer 3200 Control Boot  V1.26  (Jun 15 1999)
Copyright 1999 by Lightwave Communications, Inc.   All rights reserved.
Slot (letter) Processor (number) Ex. C1  (exit to restart system):B1
B1 is ConsoleServer3200 Terminal Boot  V1.62  (Sep 30 1999)
Start XMODEM transfer of update...
CCCCCCCCCC
```

After typing YES, the ConsoleServer 3200 will return the prompt SLOT (LETTER) PROCESSOR (NUMBER) EX. C1 (EXIT TO RESTART SYSTEM). The system administrator should enter the letter ID of the card and number of the processor that is

to be updated at this prompt. See page XX for slot letter ID's. For most cards, the processor number will be 1; network cards have two processors: processor 1 is the user interface to the network card (use `netterm.bin`), while processor 2 is the network interface (use `network.bin`). After the system administrator enters the card ID, the ConsoleServer 3200 will return the prompt `YY IS CONSOLESERVER3200  CCCCCC BOOT VX.XX (DDD DD DDDD) START XMODEM TRANSFER OF UPDATE....`, where `YY` is the card ID, `CCCCCC` is the card type, `X.XX` is the boot ROM version number, and `DDD DD DDDD` is the date of the boot ROM version. When using XMODEM, this prompt will be followed by the letter "C", which will keep appearing on the screen, indicating the control card is ready to accept the download.

```
Received: V2.15 10/01/99  TERMINAL SOFTWARE
Continue with programming? (y/n) Y
Sending update to B1
Download Successful, starting to program.............................
Programming Successful

Slot (letter) Processor (number) Ex. C1  (exit to restart system):
```

The system administrator should begin the upload of the appropriate flash update from their computer at this point. Once the upload is complete, the ConsoleServer 3200 will return the prompt `RECEIVED VX.XX DD/DD/DD CCCCCC SOFTWARE CONTINUE WITH PROGRAMMING? (Y/N)`, where `X.XX` is the version number of the newly downloaded software, `DD/DD/DD` is the date of the software and `CCCCCC` is the card type. If the system administrator wishes to continue with the update, he should type `Y`; otherwise to end, he should type `N`, which will return the system administrator to the previous flash update prompt.

Once `Y` is selected, the message `SENDING UPDATE TO XX` (where XX is the card ID) will appear, which will be immediately be followed by `DOWNLOAD SUCCESSFUL, STARTING TO PROGRAM...........`and then `PROGRAMMING SUCCESSFUL`. The control card will then display the original update prompt. If the system administrator wishes to continue updating cards, he should enter the card ID at the prompt. When programming multiples of the same card type in one session, it is not necessary to download the flash update again. The ConsoleServer 3200 will ask the system administrator if the previously downloaded flash upgrade can be used again. If the system administrator wishes to upload the update again, they can decline to reuse the previously uploaded version and upload the update again as outlined above.

B.5   Update over Network

A flash update file download may be initiated from either a network sys admin session or a local serial sys admin session. If connected via network, only the network card used for the session may download from the tftp server. A local serial session may specify the network card slot to use for the update download as a qualifier after the command. In either case, no other sys admin session activity is allowed while the download in progress.

The tftp server must be specified by a numerical IP address. The file path and name on the server is specified after the IP address.

local serial connection:

```
sys admin>> tftp /b 172.16.1.1:fdevice.bin

Starting tftp download.................................................
......................................................................
........................

Download complete.

sys admin>>
```

In the example above, the sys admin is connected through a local serial connection. The tftp download is performed through slot b (/b qualifier) from the tftp server at 172.16.1.1, and the file fdevice.bin is retrieved.

network session:

```
sys admin>> tftp 172.16.1.1:fdevice.bin

Starting tftp download.................................................
......................................................................
........................

Download complete.

sys admin>>
```

In the example above, the sys admin is connected through a network session. The tftp download is performed through the same card to which the sys admin is connected.

```
sys admin>> tftpkill
```

If for some reason the tftp download must be halted, the command TFTPKILL can be entered at the sys admin>> prompt to stop any download in progress. This must be entered at the local serial connection or at a remote Sys Admin session to a network card other than that used by the tftp transfer.

```
sys admin>> lciupdate /tftp h1
```

Once a flash update file has been downloaded via tftp, it can be sent to the appropriate card using the LCIUPDATE command with the qualifier /TFTP. This sends the last downloaded file to the card processor specified.
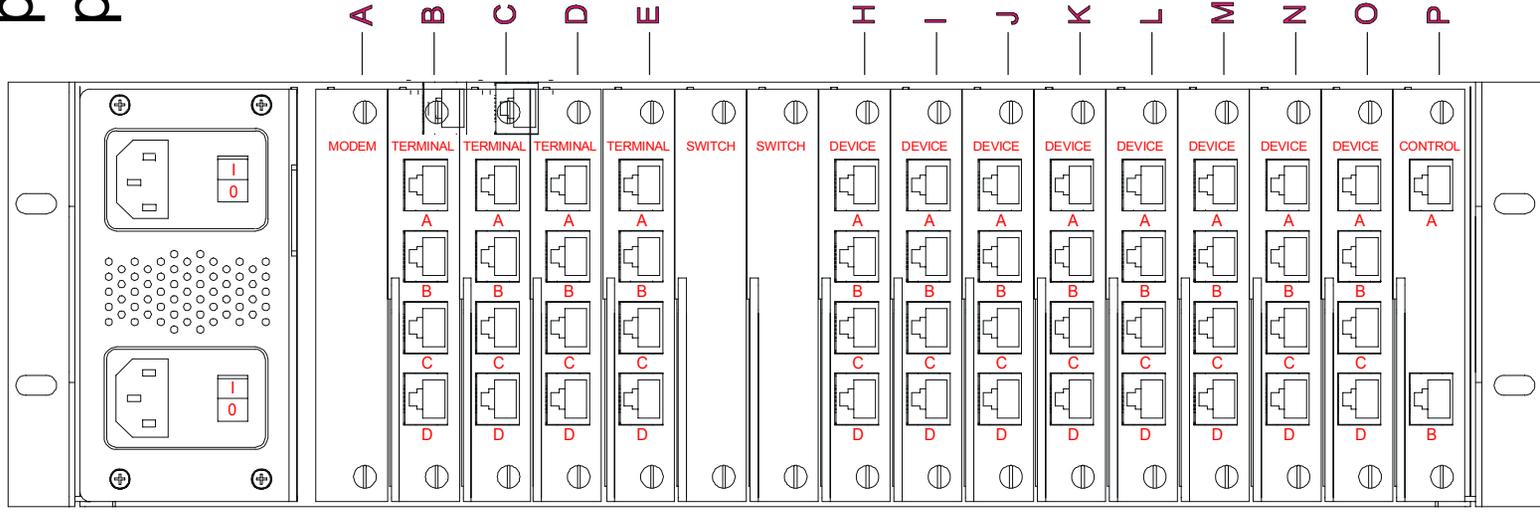
B.6 Ending the Flash Update

```
Slot (letter) Processor (number) Ex. C1  (exit to restart system): EXIT
Starting system

ConsoleServer 3200 Control Boot  V1.26  (Jun 15 1999)
Copyright 1999 by Lightwave Communications, Inc.   All rights reserved.
Starting system
Lightwave Communications, Inc. ConsoleServer 3200
Please wait...system initializing
Checking page 30
```

Once the flash update is completed for all selected cards, the system administrator must type EXIT at the update prompt. Once <ENTER> is pressed, the ConsoleServer 3200 will restart and the standard start-up messages will be displayed. Once the ConsoleServer 3200 has checked the memory pages (and reset those necessary), the LCI3200>> prompt will be displayed and the system administrator may login. On the first log in after the flash update, it recommended that the system administrator check the software versions by using the VERSION /ALL command. Once the LCI3200>> prompt appears on the control card, users may log back in and connect to servers as before the update.

Sots for
programming
purposes

72

A B C D E   H I J K L M N O P

MODEM TERMINAL TERMINAL TERMINAL TERMINAL SWITCH SWITCH DEVICE DEVICE DEVICE DEVICE DEVICE DEVICE DEVICE DEVICE CONTROL

I
0

I
0

A A A A A A A A A A A A A

B B B B B B B B B B B B B B

C C C C C C C C C C C C C

D D D D D D D D D D D D D

Appendix C – System Specifications

C.1 Physical

Width:	17.25 inches (43.82 cm)
Depth:	14.75 inches (37.47 cm)
Height:	5.25 inches (13.34 cm)
Rack size:	3u high, mounts in EIA-standard 19-inch rack
Weight fully loaded:	20 lbs. (9.08 kg)

C.2 Environmental

Operating temperature range:	32°F (0°C) to 125°F (52°C)
Operating humidity range:	30% to 90% RH, non-condensing
Storage temperature range:	-4°F (-20°C) to 158°F (70°C)
Storage humidity range:	10% to 90% RH, non-condensing
Heat generated in normal operation:	170.6 BTU/hr

C.3 Electrical

Both the AC and DC power versions of the ConsoleServer feature redundant power supplies.

C.3.1 AC Power

Universal input voltage, auto-switched AC power supplies, switch fused

Input voltage:	115/230 VAC
AC frequency:	50/60 Hz
Maximum power consumption:	65 W
Typical power consumption:	50 W

C.3.2 DC Power

48 volt only, externally fused

Input voltage:	-48 VDC
Maximum power consumption:	65 W
Typical power consumption:	50 W

C.4   Interface

C.4.1 Terminal and Device

Connector:	RJ45 with adapters for EIA-standard connectors (DB9 and DB25)
Specification:	EIA-232
Maximum baud rate:	38400
Minimum baud rate:	9600

C.4.2 Network

Connector:	RJ45
Protocol:	TCP/IP (version 4)
Maximum speed:	10 Mbits, half duplex
Auto-negotiation:	NOT SUPPORTED

C.4.3 Modem

Format:	analog POTS
Maximum speed:	38400 baud

C.5   Compliance and Certification

Entela Electrical Safety Certification (equivalent to UL 1950 and CSA 950)

Entela is a USA OSHA Nationally Recognized Testing Laboratory (NRTL), an accredited Certification Organization by the Standards Council of Canada (SCC), and an IECEE – CB Scheme National Certifications Body (NCB) & Certification Body Testing Laboratory (CBTL).

CE 61000-3-2, 61000-3-3, 55022, 55024, and 60950 (LVD)

AS/NZS 3548 (C-tick approved)

Conforms to FCC part 15, class A

Conforms to VCCI standards

Appendix D -DC Power

The DC power version of the ConsoleServer 800 must be installed in a *restricted access location*. Per the intent of the National Electrical Code, a restricted access location is an area intended for access by qualified or trained personnel only, with access controlled by some sort of locking mechanism, such as a key lock or access card system.

Installation:

Materials:
- small flat-blade screwdriver
- wire stripper
- ConsoleServer 800 DC power connector kit
- wires to 48 VDC power (see Appendix D for specifications)

1.   Turn off the circuit breaker to the DC power supply.

2.   Select a three-wire set (-48V, –48 Return, and Power Supply Ground) from the power supply.

3.   Strip 0.35 inches (89 mm) of insulation from each wire.

4.   Insert a small flat-blade screwdriver in the provided connector to depress the internal wire clamp.

5.   Insert the appropriate wire into the connector. Remove the screwdriver. Check that the clamp has captured the wire. Repeat steps 4 and 5 for all wires.

6.   Attach the provided strain relief to the connector. Be sure to use a tie-wrap to firmly attach the strain relief to the cable.

7.   Attach the connector to the socket on the back of the ConsoleServer. Repeat the above steps to attach the redundant power input.

Fan

48V Return
PSU Gnd
-48V DC

Power On/Off Switch

Feed Through Headers

75
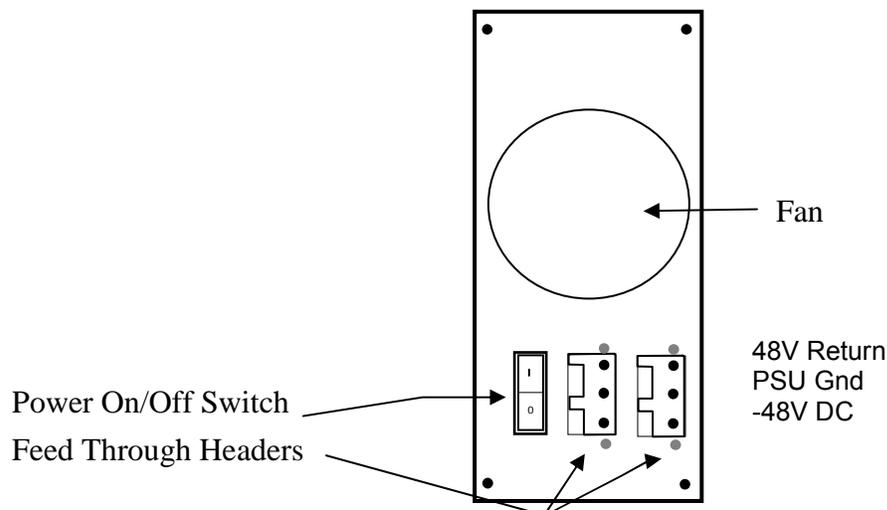
Input voltage:	-48 VDC
Minimum voltage:	-40 VDC
Maximum voltage:	-60 VDC
Maximum operating current:	1.5 A
Maximum input surge current:	5 A

The DC power source must be:
- electrically isolated from any AC source
- reliably connected to earth
- capable of providing up to 100 Watts of continuous power

D.2　Overcurrent Protection

Overcurrent protection requirements:
- 10 Amp trip
- double pole
- fast trip
- DC rated

- Overcurrent protection devices (e.g., circuit breakers) must be provided as part of each equipment rack, and are not included with the ConsoleServer.
- The device must be located between the DC power source and the ConsoleServer.

D.3　DC Supply Connector

The supply input connectors are provided with each ConsoleServer. However, the conductors are not. See below for conductor specifications.

Conductor material:	copper only
Wire gauge:	16 AWG
Insulation rating:	75°C minimum, low smoke fume, flame retardant
Branch circuit cable insulation color:	per applicable national electrical codes
Grounding cable insulation color:	green/yellow

The cable type should be one of the following:
- UL style 1028 or other UL 1581 (VW-1) compliant equivalent
- IEEE 383 compliant
- IEEE 1202-1991 compliant

Appendix E – Command Abbreviations

Most, but not all, commands available on the ConsoleServer 3200 may be abbreviated. The following list outlines the allowed maximum abbreviations for all commands. Command qualifiers for a command may be found immediately below that command.

Sys Admin Commands:

command	abbreviation
adduser	addu, au
backup	backup
break	break
changepswd	passwd, pswd
connections	c
/monitor	/m
deleteuser	deleteu
devices	dev
/all	/a
edituser	editu, eu
forcelogout	forcelogout
help	h, ?
info	info
lciupdate	lciupdate
/tftp	/tftp
linesperpage	linespp, lines, lpp
listcards	listc, lc
listdevices	listd, ld
listusers	listu, lu
/all	/a
login	logi
logout, logoff	lo
modem	modem
modemtimeout	modemt, mt
network	net
/all	/a
powerstatus	po, ps
telnettimeout	telnett, tt
terminals	term
/all	/a
timeout	time
version	ver
/all	/a

Terminal, Network, and Modem Commands:

command	abbreviation
bottom	bo
bye	bye
changepswd	ch
clear	cl
connections	co
devlist	de
direct	dir
diselect	dis
editbrk	editb
editesc	edite
exit	ex
forward	f
listen	li
login	logi
logout, logoff	logou, logof
next	n
passwd	pa
previous	pr
reverse	r
select	se
top	t

Appendix F – Hexadecimal ASCII Code

Equivalent characters in italics are non-printing characters or signals.

Hexadecimal Code	Equivalent Character	Hexadecimal Code	Equivalent Character
00	*NUL*	20	*SP*
01	*SOH*	21	!
02	*STX*	22	"
03	*ETX*	23	#
04	*EOT*	24	$
05	*ENQ*	25	%
06	*ACK*	26	&
07	*BEL*	27	'
08	*BS*	28	(
09	*HT*	29	)
0A	*NL*	2A	*
0B	*VT*	2B	+
0C	*NP*	2C	,
0D	*CR*	2D	-
0E	*SO*	2E	.
0F	*SI*	2F	/
10	*DLE*	30	0
11	*DC1*	31	1
12	*DC2*	32	2
13	*DC3*	33	3
14	*DC4*	34	4
15	*NAK*	35	5
16	*SYN*	36	6
17	*ETB*	37	7
18	*CAN*	38	8
19	*EM*	39	9
1A	*SUB*	3A	:
1B	*ESC*	3B	;
1C	*FS*	3C	<
1D	*GS*	3D	=
1E	*RS*	3E	>
1F	*US*	3F	?

Hexadecimal Code	Equivalent Character
40	@
41	A
42	B
43	C
44	D
45	E
46	F
47	G
48	H
49	I
4A	J
4B	K
4C	L
4D	M
4E	N
4F	O
50	P
51	Q
52	R
53	S
54	T
55	U
56	V
57	W
58	X
59	Y
5A	Z
5B	[
5C	\
5D	]
5E	^
5F	_

Hexadecimal Code	Equivalent Character
60	`
61	a
62	b
63	c
64	d
65	e
66	f
67	g
68	h
69	i
6A	j
6B	k
6C	l
6D	m
6E	n
6F	o
70	p
71	q
72	r
73	s
74	t
75	u
76	v
77	w
78	x
79	y
7A	z
7B	{
7C		
7D	}
7E	~
7F	*DEL*

Index