

SCON-20L/22L CONSOLE CONCENTRATOR

Hardware Reference Manual

P/N 707043-005

ISSUE/REVISION SCHEDULE		
Comments	Rev. No.	Date
Initial Release	707043-001	5/30/00
Visara Update	707043-002	10/30/00
Update	707043-003	3/15/01
Update	707043-004	9/05/02
Update	707043-005	9/21/05



Read This First

This is the SCON-20L/22L Hardware Reference Manual. Information on the LINCS Operating System can be ordered separately. Please visit our website, www.visara.com, to access all manuals online.

1. From your Internet browser type <http://www.visara.com>
2. Select Service Support
3. Select Product Manuals Online
4. Select one of the following:
 - *SCON-20L/22L Hardware Reference Manual*
 - *SCON-20L/22L/25L Configuration Manual*
 - *SCON-20L/22L/25L Installation Guide*
 - *1174 LINCS Features*
 - *1174 LINCS Problem Determination*
 - *1174 LINCS Configuration*
 - *1174 LINCS Central Control*

Product Safety

The SCON-20L/22L Console Concentrator complies with relevant product safety standards, such as the UL and CSA, and TUV-GS Rules and Regulations.

FCC and CDC Regulatory Statements

This equipment has been tested and found to comply with the limits for a Class A computing device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by using one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This equipment has been certified to comply with the limits for a Class A computing device, pursuant to FCC Rules. In order to maintain compliance with FCC regulations, shielded cable must be used with this equipment. Operation with nonapproved equipment or unshielded cables is likely to result in interference to radio and TV reception. The user is cautioned that changes and modifications made to the equipment without the approval of the manufacturer could void the user's authority to operate this equipment. The user may find the following booklet prepared by the Federal Communications Commission helpful:

How to Identify and Resolve Radio-TV Interference Problems

This booklet is available from the U.S. Government Printing Office, Washington DC 20402, Stock No. 004-000-00345-4.

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

Table of Contents

	<u>Page</u>
Read This First	iii
Product Safety	iv
FCC and CDC Regulatory Statements	iv
Chapter 1. Introduction	1-1
SCON-20L/22L General Description	1-1
SCON-20L/22L Hardware Components	1-1
Chapter 2. Installation	2-1
Installation Checklist	2-1
Printed Circuit	2-2
Unpacking Additional Printed Circuit Boards (PCBs)	2-2
Installing/Removing Printed Circuit Boards (PCBs) – by Authorized Service Personnel Only	2-2
Location Planning for the SCON-20L/22L	2-3
Environmental Parameters	2-3
Power Requirements	2-3
Supplied Cable Distance	2-4
Power Cable Requirements	2-6
Connections	2-6
ESCON Channel Interface	2-6
Indicators, Switches and Connectors	2-7
Attaching the ESC Interface to the Channel	2-7
10/100 Mbps Fast Ethernet (FET)	2-8
LED Descriptions	2-10
Coax Device Attachment	2-11
Dynamic Multiplexing	2-11
Device Attachment	2-11
Chapter 3. Board Population	3-1
Introduction	3-1
Printed Circuit Board Names	3-1
Slot Population and Identification	3-1
Physical Slot Identification	3-2
Slot Numbers and Logical Identifiers	3-3
Board ID Assignments	3-3
Chapter 4. Operation	4-1
Indicators	4-1
Operator Panel LEDs	4-1
Power Switch	4-2
Keypad	4-2
Copy Systems Disks	4-3
IML Procedure	4-3
Error Types	4-5
IML Errors (ERR __)	4-5
Exception Errors (XCP __)	4-6
Hardware Failures (FAIL __)	4-6
Online Errors	4-7

SCON-20L/22L Hardware Reference Manual

	<u>Page</u>
Error Indicators	4-7
Event Log	4-7
Status Line of Attached Terminal	4-7
Operator Panel Display	4-7
Operator Panel Check Light	4-7
Software Merge	4-8
Warning Messages	4-8
Failure Messages	4-9
Chapter 5. Assembly Installation/Removal/Replacement	5-1
Introduction	5-1
Assembly Drawing	5-1
Replaceable Assemblies	5-2
Covers	5-3
Circuit Board Assembly	5-3
Power Supply Assembly	5-4
Operator Panel	5-4
Floppy Disk Drive	5-5
Mother Board Assembly	5-6
New Hardware Installation Procedures	5-7
Second CDA Installation (SCON-22L Only)	5-7
Installation of FET Board	5-8
Index	Index-1

Chapter 1. Introduction

SCON-20L/22L General Description

The SCON-20L/22L Console Concentrator is a powerful platform for supporting and managing multiple logical partitions (LPARs) on mainframe hosts. The SCON-20L/22L attaches to mainframes via one ESCON adapter and is used to configure and monitor mainframe status. The SCON-20L supports communication with up to 3 LPARs. The SCON-22L supports 4 LPARs, expandable up to 16. The SCON-20L/22L Console Concentrator supports only LINC S software and is part of the Visara Communications Server hardware family.

Information presented in this manual includes procedures for hardware installation, basic operating instructions, and assembly removal and replacement instructions for the SCON-20L/22L Console Concentrator.

SCON-20L/22L Hardware Components

The following table includes hardware that may be installed in the SCON-20L/22L.

Hardware Item	Max # Installed	Function
Coax Device Adapter (CDA)	2*	Provides direct connection for up to 32 Coax-A type devices.
Common Memory	4 MB	Memory accessible by all bus master boards.
ESC	1	Provides communication interface to ESCON channel networks.
Fast Ethernet NIC (FET)	1	Provides physical communication interfacing to 10/100 Mbps ethernet networks
Floppy Disk Drive	1	Data storage.
Hard Disk Drive	1	Data storage.
Mother Board	1	Contains circuitry for SCP, MCC, and SHA functions.
Operator Panel	1	Provides local operator interface with the controller.
Power Supply	1	Provides stable power to the controller.

* 2nd Coax Device Adapter only available on SCON-22L

Chapter 2. Installation

Installation Checklist

The following is a brief checklist of typical installation tasks for the SCON-20L/22L. Detailed information is provided later in this chapter.

1. Check the shipping carton for any obvious shipping damage prior to unpacking.
2. Unpack the Console Concentrator per instructions provided with the shipping carton. This unit weighs approximately 50 lbs., so please take any necessary precautions such as seeking help with lifting.
3. Place the Console Concentrator in an appropriate location. Refer to “Environmental Parameters.”
4. Remove the cardboard protector (if present) from the disk drive. The unit should not be powered on with a cardboard protector in the disk drive or the disk drive may be damaged.
5. Inspect the unit for any physical damage.
6. Install (if required) and connect 3270 Coax, ESCON, Ethernet, and/or Token Ring cables as needed.
7. Ensuring that the Power switch on the front of the Console Concentrator is off, plug the Console Concentrator into an appropriate AC outlet.
8. Turn the Console Concentrator on (see Chapter 4, “*Operation*”). After a few seconds, messages will appear on the LCD of the Operator Panel. These messages will change as the unit proceeds through the various IML states until it has completed the boot up procedure. When the boot has completed, the word ‘CONFIGURATION’ should appear on the LCD. This initial boot process should take a few minutes (less than 10). If the boot process has not completed, or if you see a message that begins with ‘ERR’ or ‘XCP’, then a failure of the boot process has occurred. If a failure of the boot process occurs, you will want to contact your Service Provider or the Visara Intellicenter for assistance. Removal of the covers by unauthorized persons can void your warranty.
9. Configure the Console Concentrator for use (see the *SCON-20L/22L/25L/28L Configuration Manual*, *SCON-20L/22L/25L/28L Installation Guide*, and *LINCS Central Control* manual).

Printed Circuit

Some of the optional features require the installation of additional printed circuit boards.

WARNING

Due to electrical hazard, do not remove the system cover. Only qualified service personnel may remove the system cover for service or installation of circuit cards.

Unpacking Additional Printed Circuit Boards (PCBs)

Follow these steps when you receive the shipment:

1. Inspect the carton for physical damage prior to unpacking.
2. If your PCBs packaging appears to have been damaged in shipment, please do not open it. Rather, you should report the damage to the carrier upon delivery. If you determine that your PCBs have concealed damage when you open the package, report the damage to your carrier as soon as possible. In both situations, you should also call Visara Customer Service to report the problem. Call 1-888-334-4380 or 1-919-882-0200.
3. If you are unsure of who is providing your warranty or maintenance service, then call the Visara Intellicenter.
4. If your PCBs fails to work properly during its initial installation or within 48 hours, please call the Visara IntelliCenter to report the problem. Call 1-888-334-4380 or 1-919-882-0200.
5. If no damage is noted, carefully remove and unpack the package contents. Install the printed circuit board(s) as described below.

Installing/Removing Printed Circuit Boards (PCBs) – by Authorized Service Personnel Only

Each Circuit board assembly is plugged into connector slots on the Mother board and fastened to the chassis with a mounting screw.

1. Ensure power is off and disconnect AC power.
2. Remove the cover.
3. Remove the mounting screw and slot cover from the selected slot.
4. Slide the board into place and ensure the connector is seated properly.
5. Secure the board into place by installing the mounting screw (removed in Step 3).
6. Connect all required cables to the Circuit board installed.
7. Reinstall the cover.
8. Reconnect AC power and turn the unit on.

It is required that any empty slot have a slot cover installed to provide proper ventilation.

Location Planning for the SCON-20L/22L

Use the following environmental parameters, power requirements, and cable distance tables to aid in selecting a location for the 20L/22L.

Environmental Parameters

Environmental Parameters		SCON-20L/22L
Dimensions:	Width:	17.5" (44.5 cm)
	Depth:	20" (51cm)
	Height:	8" (20 cm)
Weight:		50 lb. (22.7 Kg)
Clearances:	Front:	24" (61 cm)
	Rear:	10 - 12" (25 - 30 cm)
	Top:	0" (0 cm)
	Left:	2" (5 cm)
	Right:	2" (5 cm)
Temperature Range:		50° to 105°F (10° to 40.6°C)
Relative Humidity:		8% to 80% with no condensation
Heat Output:	Base Unit:	310 BTU/hr
	Maximum:	600 BTU/hr

Power Requirements

Power Requirements	SCON-20L/22L
Phases:	1
Power:	Base Unit 130 VA Maximum 240 VA
Current Rating:	3.0A (115 VAC 60 Hz) 1.4A (230 VAC 50 Hz)
Voltage (+/-10%, +/- 1 Hz):	100V (at 50/60 Hz) 127V (at 60 Hz) 220V (at 50/60 Hz) 110V (at 50/60 Hz) 200V (at 50/60 Hz) 230V (at 50 Hz) 120V (at 60 Hz) 208V (at 60 Hz) 240V (at 50/60 Hz)

Supplied Cable Distance

The following table contains typical maximum distance information for some types of cable used with the Console Concentrator:

Cable Type	Supplied Distance
Power Cable	15 ft (4.57 m)
Coax Device Cables	See figure 2-1.
ESCON Fiber Optic Cable	Refer to the manuals listed below.

Use Figure 2-1 and the table on the following page to determine the typical maximum allowable cable distance between the Console Concentrator and an attached device. If your system has a multiplexer, you can install the maximum length of cable between the Console Concentrator and the multiplexer and again between the multiplexer and an attached device.

Additional information about cable types and distances is available in the following IBM Publications:

- Using the IBM Cabling System with Communication Products, GA27-3620*
- IBM Cabling System Planning and Installation Guide, GA27-3361*
- IBM System/360 and System/370 I/O Interface Channel to Control Unit Original Equipment Manufacturers' Information, GA22-6974*
- A Building Planning Guide for Communication Wiring, G320-8059*
- IBM Enterprise Systems Architecture/390, ESCON I/O interface, and Physical Layer Specification SA23-0394*

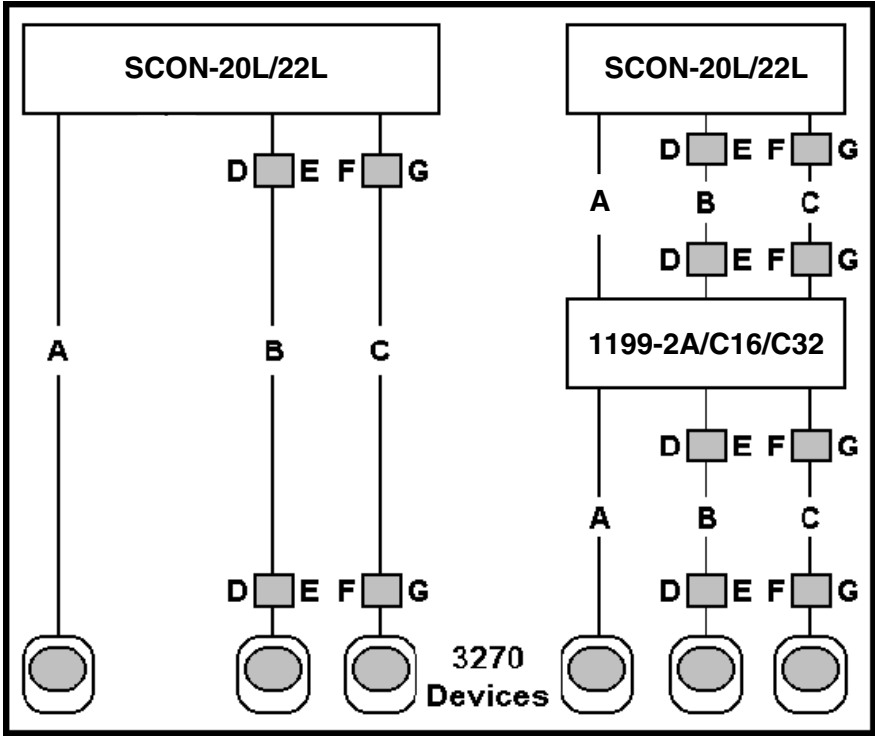


Figure 2-1. Coax Device Cable Types and Lengths

Code	Cable Media and/or Connector	Cable Length
A	Coaxial Cable	4920 ft (1500 m)
B	IBM Type 3 specified Media	100 ft (30.5 m) minimum 900 ft (275 m) maximum
C	IBM Cabling System Types 1, 2, and 9	Types 1 and 2: With 0 baluns - 4920 ft (1500 m) With 1 balun - 3280 ft (1000 m) With 2 baluns - 2000 ft (610 m) Type 9: With 0 baluns - 3280 ft (1000 m) With 1 balun - 2186 ft (667 m) With 2 baluns - 1333 ft (406 m)
D	3270 Coax-to-Twisted-Pair Adapter	18 ft (5.5 m)
E	IBM DPC Type 3 Connector	15 ft (4.5 m)
F	Coax Balun Assembly or Cable-less Coax Balun	8 ft (2.4 m) or 16 ft (4.9 m)
G	Dual Purpose Connector Attachment Cable	8 ft (2.4 m) or 30 ft (9 m)

Note: When using Type 3 media, a connector with a special actuator and filter (such as IBM’s DPC-T3) is required in order to connect devices equipped with a DPC. Otherwise, a Balun assembly is used.

The following limitations apply to the use of these devices:

1. (coax length) + (5 * twisted pair length) <= 4500 ft (1375 m)
2. (minimum twisted pair length) => 100 ft (30.5 m)

Power Cable Requirements

For units operating at 100-120V: The power cable required for domestic units is a UL listed, CSA certified, 18/3 AWG, type SJT, cable (15-foot [4.57-meter] maximum). It is terminated on one end by a 125V, 15A grounding type attachment plug. It is terminated at the other end by a 125V, 15A parallel blade, grounding type attachment plug.

For units operating at 200-240V: The power cable required for domestic units is a UL listed, CSA certified, 18/3 AWG, type SJT, cable (15-foot [4.57-meter] maximum). It is terminated on one end by a 250V, 15A grounding type attachment plug. It is terminated at the other end by a 250V, 15A tandem blade, grounding type attachment plug.

The power cable required for international units is an 18/3 AWG, type SJT, cable (15-foot [4.57-meter] maximum). It is terminated on one end by a 250V, 15A grounding type attachment plug body. It is terminated at the other end by a 250V, 15A grounding type cord connector. The cord set is marked HAR to signify appropriate safety approvals. The socket outlet must be nearby and easily accessible, per IEC 950 Sec. 1.7.2.

The installation site must provide a properly wired and grounded power outlet. Circuits connected to air conditioners and devices that generate significant transient electrical noise should be avoided.

Electrostatic discharge in the vicinity of the unit should be minimized by avoiding high resistance floor material and carpeting that does not have antistatic properties, avoiding the use of plastic seats and covers, and avoiding low humidity levels. The unit should be located away from areas that generate electromagnetic interference (for example, transformers, power distribution panels, and motors). The unit should not be installed where the atmosphere contains corrosive elements that may damage the unit.

Cable runs should avoid areas that produce electromagnetic interference (for example, near transformers, switching equipment, power distribution panels, and under carpets where vacuum cleaning is done). Also, heavy equipment should not be moved or rolled over the cable.

Connections

ESCON Channel Interface

An ESCON Controller (ESC), a PCI Feature Adaptor (PFA) board with a Luminex ESCON board permanently connected/mounted in place, provides a single ESCON Channel communications interface. The ESC provides a single channel attachment interface for connecting the 20L/22L Console Concentrator to an ESCON director or to a mainframe ESCON channel.

The fiber connection from the mainframe to the ESC shall be multimode 62.5/125 micron cable for distances up to 3 kilometers with no directors, or 9 to 26 kilometers with 2 ESCON directors in series. Multimode 50/125 micron cable may also be used for distances up to 2 kilometers with no directors, or 6 to 24 kilometers with 2 ESCON directors in series.

Indicators, Switches and Connectors

Indicators, switches and connectors are found on the front and top edge of the Board. See Figure 2-2 for a view of the ESC faceplate bracket.

Indicators

IRQ (amber) – This is the Interrupt Request LED. When the ESCON card generates an interrupt to the PFA PCI host card, this LED will be lit. When the PCI host acknowledges the interrupt, the LED is turned off.

ACTV(green) – This LED is lit when the Channel Fiber Optic Interface is actively communicating on the channel.

ONLN (green) – This is the ONLINE LED. This LED is lit when the Channel Interface is logically connected to the channel. The Channel Interface must be on-line to respond to selections by the mainframe. The Channel Interface cannot go on-line if the channel is disconnected or down.

FAIL/ERR (amber) – This is the FAIL LED. This LED is lit at power up, but goes off within 5 seconds if the Power-up Self-Test (POST) passes. During normal operation this LED is lit if the receive ESCON signal is not present or is invalid.

Switches

Debug SW – Recessed push-button switch. Pressing this switch causes the on-board code to enter a special debug mode (monitor). The debug mode should only be used under the direction of a Visara Engineer. If the debug mode is entered, the board will no longer operate normally on the channel. If the debug switch is accidentally pressed, the ESCON card should be reinitialized.

Note: Reinitializing the ESCON card may require the 20L/22L to be IML'ed.

Connectors

Fiber Optic Transceiver – This connector is used for attachment of ESCON fiber optic cable.

Attaching the ESC Interface to the Channel

Follow the steps below to connect an ESCON cable between the ESCON host channel and the 20L/22L:

1. Vary “offline” the host channel that will attach to this ESC. Refer to your mainframe operating system manuals for instructions.
2. Connect an ESCON fiber optic cable between the 20L/22L Console Concentrator and the host or ESCON Director.

3. Vary “online” the host channel.
4. A “505-01” connection code on the 20L/22L display indicates that proper communication is established. A “503-02” connection code on the 20L/22L display indicates that proper communication is **not** established. Connection problems may exist if the plug does not click when placed into the ESC receptacle. Ensure the ESCON plug is not loose.

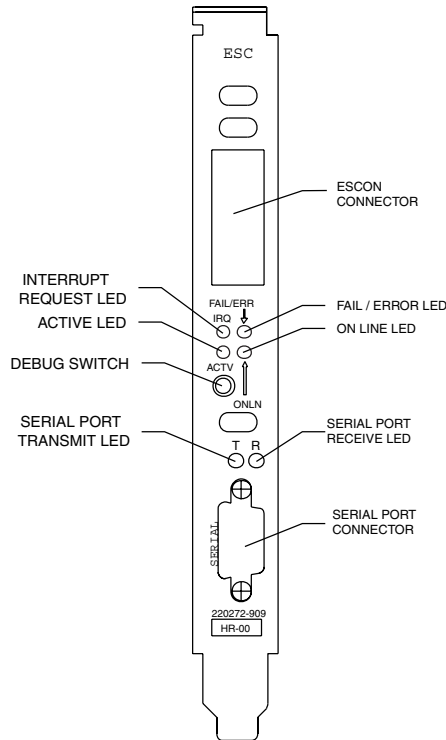


Figure 2-2. ESC Faceplate Bracket

10/100 Mbps Fast Ethernet (FET)

The single RJ-45 connector on the FET card supports 10 Mbps or 100Mbps speeds. NWAY auto-negotiation enables the 10/100Mbps Ethernet NICs to automatically run at the speed that the connected hub supports. The 10/100Mbps Ethernet NICs works with products that comply with IEEE 10BASE-T and 100 BASE-TX specifications.

10BASE-T Operation

10BASE-T is the Institute of Electrical and Electronics Engineers (IEEE) 802.3 standard for Ethernet signaling over unshielded twisted-pair wire at 10 Mbps.

10BASE-T Ethernet's characteristics include:

- A data rate of 10 Mbps.
- A broadcast architecture.
- A specific media-access control (MAC) scheme.

The 10BASE-T name indicates a signaling speed of 10 Mbps and twisted-pair wiring. Base stands for baseband, which denotes a technique for transmitting signals as direct-current pulses rather than modulating them onto separate carrier frequencies.

A wiring topology using 10BASE-T specifies a wiring hub, cable arranged in a star configuration, and unshielded twisted-pair cable. Each node has a separate cable run that must not exceed 100 meters (328 ft) from the node to the hub.

100BASE-TX Operation

100BASE-TX is the IEEE 802.3u standard for Fast Ethernet signaling over Category 5 UTP or STP wire at 100 Mbps.

Based on an extension to the IEEE 802.3 Ethernet specification, Fast Ethernet's characteristics include:

- A data rate of 100 Mbps.
- A broadcast architecture.
- A specific media-access control (MAC) scheme.

A wiring topology using 100BASE-TX specifies a wiring hub, cable arranged in a star configuration, and Category 5 UTP or STP wiring. Each node has a separate cable run that must not exceed 100 meters (328 ft) from the node to the hub.

Figure 2-3 shows the RJ-45 connector pin assignments for the 10/100 Mbps Ethernet NIC.

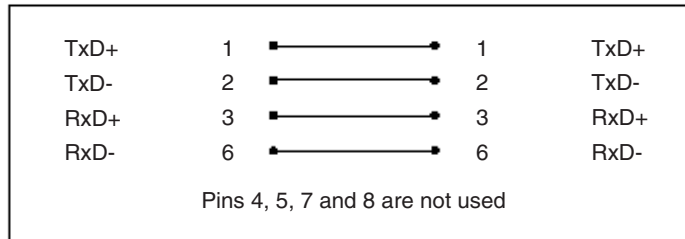


Figure 2-3. RJ-45 Connector Pin Assignments

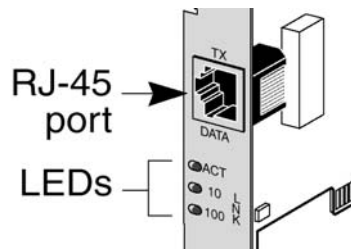


Figure 2-4. LEDS

LED Descriptions

LED	Description	Flashing	Steady	OFF
10 LNK	Green: LNK integrity	Reversed polarity	Good 10BASE-T connection between NIC and hub	No connection between NIC and hub
100 LNK	Green: LNK integrity	Reversed polarity	Good 100BASE-TX connection between NIC and hub	No connection between NIC and hub
ACT	Yellow: Port traffic for either speed	Network traffic present	Heavy network traffic	No traffic

Coax Device Attachment

Dynamic Multiplexing

Dynamic Multiplexing (see the *SCON-20L/22L Configuration Manual* and the *LINCS Central Control* manual) supports:

- 1199-type multiplexers (or direct device connections).
- Coax Device Adapter (CDA) board ports labeled 0 - 15 (maximum 2 boards).
- Configuration of 1 - 8 devices on each multiplexer.
- Assignment of logical port addresses twice so that users can access the same configuration of features from two stations (not at the same time).

If you are using Dynamic Multiplexing, you must enable the feature during configuration and assign port addresses on the Coax Port and Mux Assignments panel described in the *SCON-20L/22L Configuration Manual* and the *LINCS Central Control* manual.

If you are not using Dynamic Multiplexing, refer to the following for information about coax port addresses.

Device Attachment

Coax devices are attached to the Coax Device Adapter (CDA) board(s) on the back of the Console Concentrator.

If Dynamic Multiplexing is to be used in your network, you can change logical port assignments by completing the Dynamic Multiplexing Assignments panel described in the *SCON-20L/22L Configuration Manual*.

The SCON-22L may have one or two 18-port CDAs. The SCON-20L supports only one. To support more than 16 coax devices on the SCON-22L you must change the number of coax devices shown on the '1174-22L Product Definition' panel in configuration, to 32 (16 is the default setting).

18-Port CDA Board Connections

Figure 2-5 shows an SCON-22L with two 18-port CDA boards. They are referred to as the left and right CDAs. The SCON-20L will only have a CDA plugged into the right location.

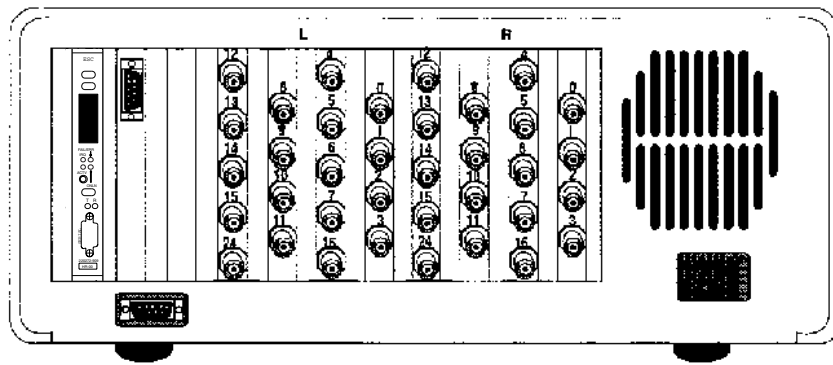


Figure 2-5. SCON-22L Coax Ports (Two 18-Port Boards)

The right CDA allows direct attachment to Ports 0 through 15. Ports 0 and 8 permit attachment directly to coax devices or attachment to a multiplexer. Ports 16 and 24 permit attachment only to a multiplexer, when installed in the 22L and configured to support 32 coax devices.

The left CDA (optional) allows only direct attachment to coax devices. Ports 16 and 24 are disabled.

Some CDA cards may only have 16 ports on them (no port 16 or 24).

Assigning Logical Ports

Logical ports are assigned in groups of eight devices. These groups are ports:

- 0 through 7
- 8 through 15
- 16 through 23
- 24 through 31

Chapter 3. Board Population

Introduction

This chapter presents SCON-20L/22L Console Concentrator board placement information to provide optimum performance. Information includes board names, identification (ID) descriptions, and slot population information.

Printed Circuit Board Names

The following lists the names for all the printed circuit boards that can be used in SCON-20L/22L Console Concentrators. Some of the boards are optional. The printed circuit boards are typically referred to by their abbreviated names.

CDA	Coax Device Adapter
ESC	ESCON Controller
FET	Fast Ethernet NIC
TRC II	Token Ring NIC
AIC	ASCII Interface Controller
ADA	ASCII Device Adapter

Slot Population and Identification

Many of the printed circuit boards for the Console Concentrator are located in partitions called slots, which are identified with numbers.

Use the following charts to determine the slot(s) in the Console Concentrator into which these boards may be installed. Dependent upon configuration parameters, circuit boards may only occupy certain physical slots. Some errors occur because of incorrect slot population.

The SCON-20L/22L allows most boards to be installed in any available slot. Presented herein are slot choices, which the circuit boards may occupy.

Board	First Choice through Last Choice		
	1	2	3
ESC	J06	J05	J04
FET	J04	J05	J06
CDA (first)	J3		
CDA (second)	J2		
TRC	J05	J04	J06
AIC	J09		
ADA	J2		

Physical Slot Identification

Figure 3-1 shows the locations of the SCON-20L/22L PCB physical slots. Slots J07, J08, and J09 are not typically used in the SCON-20L/22L. Slot J2 is not used on the SCON-20L.

Rear of Unit

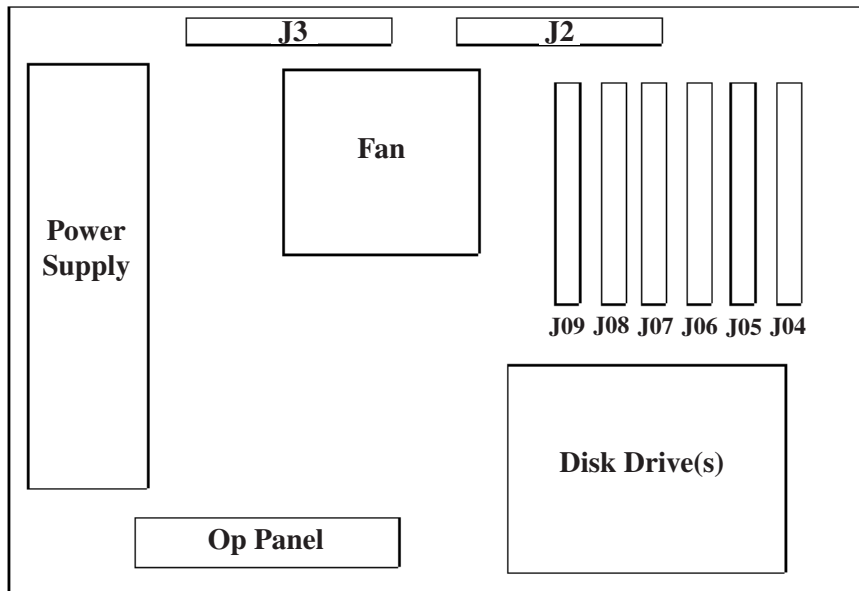


Figure 3-1. SCON-20L/22L Printed Circuit Board Slots

Slot Numbers and Logical Identifiers

Either their physical locations (J number) or their logical identifiers (ID) may identify the Console Concentrator board slots. These numbers are used in identifying boards that failed and will be reported on the control panel in the failure message as *Jnn* (where *nn* = J number). The following is a cross reference list between the board slot J numbers and the board slot logical IDs.

SCON-20L/22L		
J#	Slot ID	Description
04	00	Main board expansion slot
05	05	Main board expansion slot
06	04	Main board expansion slot
07	03	Main board expansion slot
08	02	Main board expansion slot
09	09	Main board expansion slot
(13)	0A	Main board MCC
(16)	0D	Main board SCP

Note: Slots designated within parentheses () have no physical connectors. These logically assigned slots with circuitry are located on the Mother board.

Board ID Assignments

The board ID is used in error determination. Each board type or circuit function has a particular identification number assigned. The board IDs have a general format of a 5-bit board type identifier and a 3-bit revision level indicator. To display the 3-bit revision level, execute Utility 12 or Utility 28. The format is as follows:

7 6 5 4 3 2 1 0
 ----- ID ----- --- Rev ---

The following lists the board identification and board name/type:

ID	Rev	Board Name
00		(No board installed)
10	3	SCP
40		MCC II
50		AIC
58	0	ESC
68	0	FET
70		TRC II
F8		MBR, Main board RAM
100		Floppy Drive A
120		Hard Drive C
140		Operator Panel
150		OPL II
160		ADA
200		Pseudo ID Common Memory

Chapter 4. Operation

Indicators

Operator Panel LEDs

Located on the operator panel are LEDs that indicate some of the operational states of the Console Concentrator. LEDs that may be found on the operator panel include the following:

Diag - Lights when the Console Concentrator is in Extended Diagnostics mode. Customer service representatives use this mode.

Config - Lights when the SCON-20L/22L has been IMLed in Configuration mode, or there is no “saved” configuration. It will remain on until the Console Concentrator is IMLed after configuration.

IML - Lights while the Console Concentrator is executing Basic Assurance tests and loading its operating program. When the IML light goes off, the operating program is loaded and the Console Concentrator is ready for service.

Check - Lights when an error or failure has occurred that requires corrective action.

Power - Lights to indicate that the Console Concentrator is powered on and that +5 volts are present.

HD-Act - Lights to indicate hard disk drive activity.

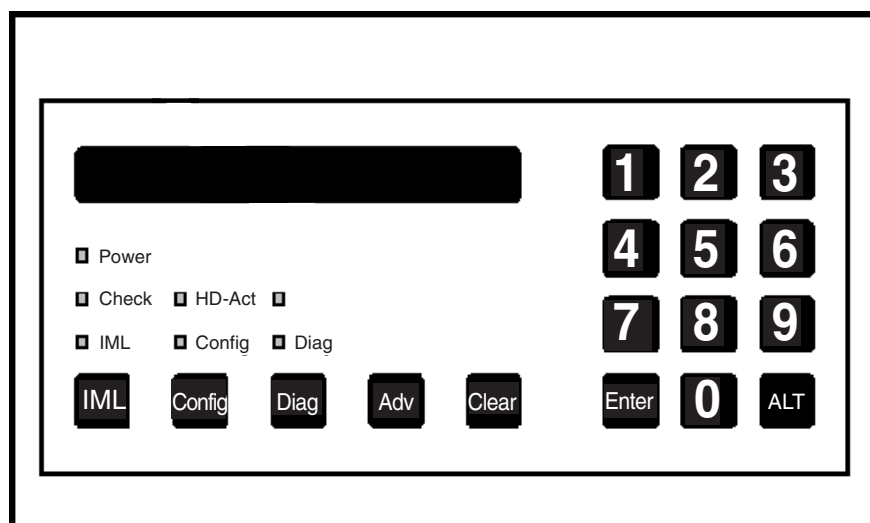


Figure 4-1. Operator Panel Controls

Power Switch

The SCON-20L/22L Console Concentrator Power switch is located near the front lower left corner of the unit. Set the switch to the On (I) position to turn on power, and set the switch to the Off (O) position to turn off power.

Keypad

Diag - Initiates the diagnostics facility.

Adv - The Adv (Advance) key advances the operator panel display.

Clear - Erases previously entered data, provided that the Enter key has not been pressed.

Numbers 0 through 9 - Used to enter parameters and perform other data entry functions.

Enter - Used to enter data. Press the Enter key after pressing a string of keys that represent parameters.

Alt - Used to initiate modes of operation such as diagnostics and configuration.

Alt, 1, Enter - Toggles ESCON channel 1 on-line or off-line.

IML - Pressing IML (Initial Machine Load) causes the Console Concentrator to perform its Basic Assurance tests (BATs), and displays a series of IML state codes.

Note: Disabled while online. Press and hold 0 key and then press IML key to IML while online.

The following are valid when IML 500 is displayed:

Adv - Continue IML with System Microcode. No extended BATs are executed. If an alternate drive and state have been entered (Enter options), then the specified System Microcode is loaded. Otherwise, the System Microcode in production on the first hard disk containing a System Disk subdirectory is loaded.

Alt, Adv - Same as Adv, but execute extended BATs during IML.

Diag - Enter Diagnostics mode.

Config - Load default Customization Data Objects instead of those defined on the System subdirectory allowing the Console Concentrator to IML with default customization parameters. This also loads the default configuration allowing entering the Configuration utility without entering a password.

Alt, Config - Same as Config, but execute extended BATs during IML.

Clear - Clear the System Microcode currently on hard disk and load a new System Microcode from floppy diskette.

Enter - Provides for additional selection of required input.

Copy Systems Disks

System disks can be copied to the hard disk using the Media Management utility in Configuration mode (refer to the *SCON-20L/22L Configuration Manual* and *LINCS Central Control* manual for details).

1. Perform a power-on IML. At IML State 500, select Configuration mode.
2. Using the Media Management utility, copy each system disk to the hard drive.
3. Follow the IML procedure below.

IML Procedure

The following describes the procedure to IML the Console Concentrator using LINCS software.

Power on or press IML.

The “mode prompt” appears on the LCD at state 500: **IML 500 M=**

At this state, the LINCS node will pause for five seconds waiting for input from the operator keypad illustrated below. If nothing is specified within five seconds, the IML will proceed.

Note: If no system customization has previously been performed, default customization data objects will automatically be loaded. The Config indicator will light to let you know that the default customization data object is being loaded.

- **ADV** – Continue IML with system microcode. No extended BATs are executed.
- **ALT, ADV** – Same as ADV, but executes extended BATs during IML.
- **DIAG** – Enters Diagnostics mode.
- **CONFIG** – Loads default customization data objects instead of the ones defined in the system subdirectory. This option is useful when a problem with the customization data affects the operation of the LINCS node. This option allows IML with default customization parameters without affecting the ones defined in the system subdirectory. Loading the default configuration also allows you to enter the Configuration utility without entering a password. Once the default customization data objects have been loaded and the LINCS node has IMLed, the data objects may be modified as desired.
- **ALT, CONFIG** – Same as CONFIG, but executes extended BATs during IML.

SCON-20L/22L Hardware Reference Manual

- **1** - Boots from trial (merge) directory.
- **2** - Boots from system (production) directory - default.
- **3** - Boots from backup directory.
- **ENTER** – Prompts will be displayed for entry of drive from which to IML, level of software, and mode of operation for IML state.

The following describes the parameter entries allowed.

Parameter	Description
d	Selects disk drive from which to IML (C=3).
l	Selects software (level or state) from which to IML. 1 - Production 2 - Back level 3 - Trial
m	Selects mode of operation for IML. Adv = Normal (normal IML bypassing BAT). Config = Config (IML into Configuration mode). Diag = Diag (IML into Diagnostics mode).

1. The first prompt displayed is IML 500 D=_. Enter the drive to be used for IML.
2. The second prompt is IML 500 L=_. Enter the software level.
3. The third prompt is IML 50X M=_, where X is the drive selected. Enter the type of IML mode.
4. Allow IML to complete.

Please refer to Visara's *LINCS Problem Determination* manual for an explanation of LINCS messages.

Error Types

This section describes the types of errors and failures that can occur while the Console Concentrator is operating.

There are four main types of errors or failures:

- IML errors
- Exception errors
- Hardware failures
- Online errors

Indicators that tell you that one of the above conditions has occurred are some or all of the following:

- Online Error log (Central Control Mode utility 7/3)
- Status line of attached terminal
- Operator panel LCD
- Operator panel check light
- Printed circuit board LEDs
- Box\$fail.txt file in system directory of hard drive

IML Errors (ERR ___)

Initial Machine Load (IML) occurs when the 20L/22L is turned on or when the IML key on the operator panel is pressed. During IML, the Console Concentrator executes a series of tests that checks the machine's ability to operate.

An IML error message looks like this on the operator panel:

ERR xxx* where:

ERR indicates the occurrence of an IML error.

xxx is the IML state in which the error occurred.

* indicates that additional messages are available that describe the error (not always present).

IML errors and possible recovery are described in the *LINCS Problem Determination* manual.

IML errors are logged into the box\$fail.txt file.

Exception Errors (XCP ___)

Exception errors are detected by a processor and occur during IML. Exception errors are nonrecoverable and require recording the error information and then IMLing the Console Concentrator to resume operation.

Exception error messages look like this on the operator panel:

XCP Jnn:bb:eee* where:

XCP indicates an exception error.

Jnn indicates the physical slot number of the board where the error occurred.

bb shows the board ID in hexadecimal format.

eee shows the type of exception error.

* indicates additional messages that give more information about the error (not always present).

The *LINCS Problem Determination* manual contains additional information about Exception errors.

If unable to correct the problem, prepare a dump disk of the error information, reference *LINCS Problem Determination* manual/“Utility 20” and then call the next level of technical support.

Exception errors are recorded into the box\$fail.txt file.

Hardware Failures (FAIL ___)

Hardware failures show specific hardware problems. They may occur during IML or testing mode. Code verification errors may also display as a hardware failure.

Error messages display on the operator panel as shown below:

Hardware - **FAIL Jnn:bb:Tnn***

Code Verification - **FAIL Jnn:bb:MOV*** where:

FAIL indicates a hardware error.

Jnn is the slot number of the failing board.

bb shows the board type ID in hexadecimal format.

T is the failing test type.

nn is the failing test number.

MOV indicates that the diagnostic code a processor board moved to its local memory does not match the code from where it was moved.

* indicates additional messages that give more information about the error.

The *LINCS Problem Determination* manual contains additional information about Hardware failures.

Online Errors

Online errors show problems that occur while the Console Concentrator is online with its host and attached devices. Online error numbers may appear on the operator panel (some 300- and 500-type errors only), preceded by an indication of which attached host system is involved, and may be displayed on an attached display's status line preceded by X. The *LINCS Problem Determination* manual describes Online errors and recovery procedures.

Online errors are recorded into the Central Control Mode Event Log (utility 7/1).

Error Indicators

Event Log

The Console Concentrator's Event Log records the Online errors described in *LINCS Problem Determination/EventLog*.

Status Line of Attached Terminal

The status line of attached terminals shows many of the Online errors that occur. The *LINCS Problem Determination* manual contains additional information about Online errors.

Operator Panel Display

The 16-character operator panel LCD display indicates a wide variety of Console Concentrator states and errors. The operator panel LCD display shows most error conditions except:

- An error occurring in IML before the operator panel is initialized.
- Certain Online errors.

Operator Panel Check Light

The operator panel Check Light is located on the operator panel. When it is lit, an error or failure has occurred that requires corrective action.

Software Merge

This procedure can be used to upgrade the Console Concentrators to the latest software support. See the LINC S Problem Determination Manual for additional information.

1. If you currently have a functioning unit, it is recommended that you back up your unit prior to proceeding through the merge process. You can back up the software to floppy using Media Management in Central Control Mode (utility 3/2), approximately 40 minute procedure. You can back up the current contents of the System Directory by copying the contents to a backup directory by using the Central Control Mode utility 3/7, approximately 3 minute procedure.
2. IML the unit.
3. At "IML 500 M=" press the Clear key.

Note: To abort the merge procedure before continuing, press the IML key. The merge procedure will overwrite existing microcode files of the same name, so it is not recommended to abort the procedure once the merge has started.

4. At the "Merge a: to c:" prompt, press the Enter key.
5. At the "Insert a:SYSn" prompt, insert the requested system diskette (by number n) in the source drive, close the drive door, then press the Enter key. A progress message "nn% Complete" is displayed while files are being copied.
6. At the "Merge Complete" message, remove the last diskette and press the IML key to start the original IML process.

Warning and failure messages may be displayed indicating problems during the merge. If the merge process fails, check the disk media and if it appears to be ok (you can view the file list on a PC), attempt the merge process again, from the beginning. If you are unable to successfully complete the merge process, and you backed up the current code into the backup directory (described in step 1), you may boot onto the backup directory by pressing the <3> key at IML state 500.

During the software merge, warning and failure messages may be displayed indicating problems during the merge.

Warning Messages

Message	Description
Wrong Disk	The diskette inserted into the source drive is not the requested systems disk. Press the Enter key to return to the Insert Disk message.
Wrong Level	The diskette inserted into the source drive is not of the same level as the previous systems diskettes. Press the Enter key to return to the Insert Disk message.

Failure Messages

Message	Description
FAIL Floppy	The merge requires a floppy drive as the source.
FAIL Hard	The merge requires a hard drive as the destination.
FAIL Disk x:ee	There was a disk error (x=drive, ee=error value).

Note: The floppy disks used for the merge routine must have the appropriate volume labels to be read by LINCS. These are:

System 1 - @@D@@@@@174

System 2 - @@H@@@@@174

System 3 - @@@A@@@@174

System 4 - @@@B@@@@174

Chapter 5. Assembly Installation/ Removal/Replacement

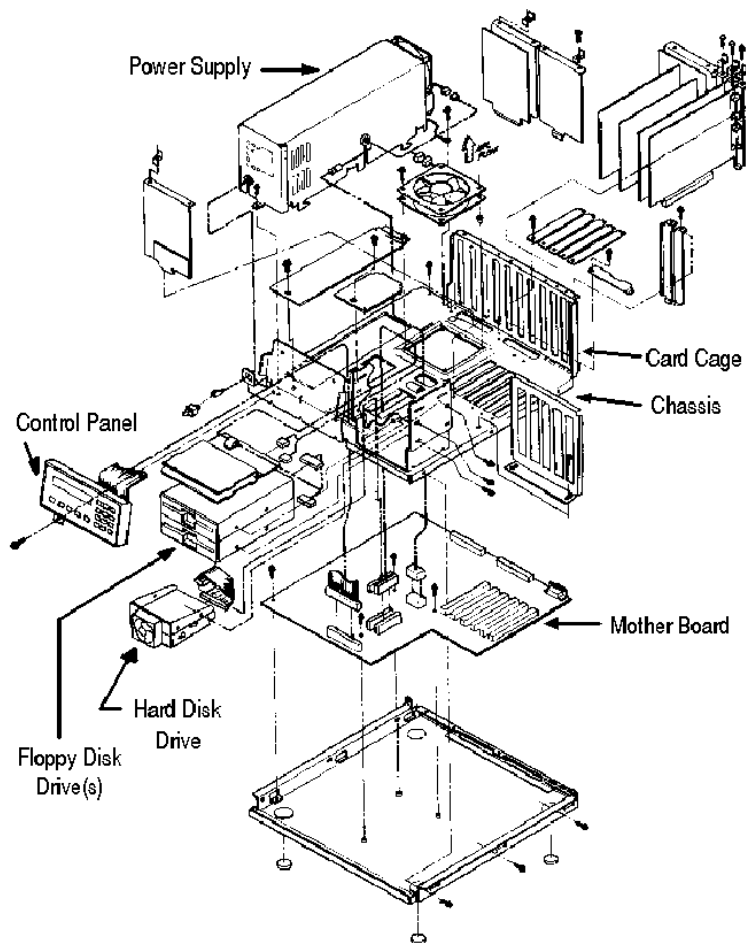
Introduction

Both members of the 20L/22L family utilize the same chassis. The following procedures describe the removal/replacement of assemblies that may be installed in the 20L/22L unit. Note that access under the covers by unauthorized persons or by persons not under supervision of authorized persons, may void any warranty of the unit.

Prior to any removal or replacement procedure, make sure the Console Concentrator is turned OFF and the power cord is disconnected from the AC wall outlet. Ensure all cabling is properly identified and marked before proceeding with any removal procedures.

WARNING: Due to electrical hazard, do not remove the system cover. Only qualified service personnel may remove the system cover for service or installation of circuit cards.

Assembly Drawing



Replaceable Assemblies

Description	P/N on Assm	FRU P/N	20L	22L	Notes
22L Mother Board	220224-222	220224-222	No	Yes	
20L Mother Board	220224-220	220224-220	Yes	No	
Power Supply	210652-002	210652-002	Yes	Yes	
SCSI Hard Disk Drive	210674-004				3
IDE Hard Drive with SCSI to IDE bridge adapter	221335-100	221335-100	Yes	Yes	
Hard Disk Cable, signal	206421-002	206421-002	Yes	Yes	
3.5" Floppy Disk Drive, black 5.25" bracket	221155-003	221155-003	Yes	Yes	
Floppy Disk Signal Cable	221329-001	221329-001	Yes	Yes	
Operator Panel	211700-005	211700-005	Yes	Yes	
ESC (ESCON) Board	220272-906 220272-916	967272-006	Yes	Yes	1
FET (10/100 Mbps Ethernet) Board	220273-906	967273-006	Yes	Yes	
TRC II (4/16 Mbps Token Ring) Board	206617-906	956005-006	No	Yes	
CDA, 18-port	210557-912 210557-952	953381-018	Yes	Yes	
CDA, 16-port	221567-916	953381-016	Yes	Yes	2
12v Fan, DC Brushless	221609-002	221609-002	Yes	Yes	
12v Fan, DC Brushless	221610-001	221610-001	Yes	Yes	
ESCON Plug	53553-001	53553-001	Yes	Yes	
AIC (ASCII Interface Controller) Board	210560-001	953386-001	No	Yes	
ADA (ASCII Device Adapter) Board	210561-001	953387-001	No	Yes	
Common Memory - 4 MB	955993-004	955993-004	Yes	Yes	

Notes:

- 1) ESC PCB 220272-916 can replace ESC PCB 220272-906 but requires LINCS 8.2 or higher be installed on the platform.
- 2) Replaces 210557-912, may have to reconfigure for Dynamic Multiplexing.
- 3) Replace with 221335-100 IDE drive with SCSI to IDE bridge adapter.

Covers

The back plate and main covers must be removed to gain internal access to the SCON-20L/22L.

Removal

1. Ensure power is off.
2. Mark all cables properly for reinstallation before removing covers.
3. Remove all cables from the back of the unit.
4. Remove 4 screws attaching the rear panel metal cover. Remove the rear panel cover.
5. Remove the 2 screws attaching the main cover to the unit chassis.
6. Slide the main cover toward the front of the unit to remove it from the chassis.

Replacement

1. Carefully slide the main cover towards the rear of the unit. There are two rails mounted to the inside of the cover that should be positioned above and slid along the horizontal lip of the chassis. When the cover is nearly in position, line up the power switch and floppy drive to the openings in the front bezel of the main cover. Finish sliding the cover into position.
2. Replace the two screws removed in removal step 5 above.
3. Position the rear cover and attach with the four screws removed in removal step 4 above.
4. Reattach all cables into their correct locations.

Circuit Board Assembly

Each Circuit board assembly is held in place by screws located at the top of the rear guide bracket.

Removal

1. Ensure power is off. Remove the main cover per procedure above.
2. Locate the Circuit board to be removed. For board slots J04-J09, loosen the fastening screws holding the front board guide bracket in place. Slide the bracket clear of the boards.
3. Loosen the screw attaching the board to the rear bracket (CDA boards and ADA boards have two screws).
4. Lift the board from its Mother board connector and slide it clear of the unit.

Replacement

1. Locate the correct slot in which the Circuit board is to be located.
2. Align the Circuit board onto its mounting track and slide the board into place. Ensure the board connector is properly seated. For FET and ESC cards, ensure that the daughter cards are properly seated into their sockets.
3. Replace and tighten the fastening screw(s) to the board bracket. If loosened, realign and tighten the front board guide bracket.
4. Replace the covers and cables.

Power Supply Assembly

The Power Supply assembly is held in place by a single screw.

Removal

1. Ensure power is off. Remove the cover.
2. Locate and disconnect all cables attached to the Power Supply Cable assembly.
3. Remove the screw located at the front of the assembly.
4. Lift the assembly from its mounting.

Replacement

1. Align the assembly onto its mounting place.
2. Install the fastening screw.
3. Connect all cables to the assembly and replace the cover.

Operator Panel

The operator panel is attached to the Console Concentrator with plastic guides.

Removal

1. Ensure power is off. Remove the covers.
2. Disconnect the operator panel cable.
3. Lift the panel clear of its mounting bracket. Take care when flexing the plastic tabs that hold the Operator Panel in place with the metal hardware. These plastic tabs are easily broken.

Replacement

1. Align the assembly guideposts into place on the mounting bracket.
2. Press the operator panel into place using great caution. The plastic tabs that hold the operator panel in place are very fragile and can easily be broken.
3. Connect the cable assembly.
4. Replace the covers.

Floppy Disk Drive

The following procedure describes removing the 3.5-inch diskette drive.

Removal

1. Ensure power is off. Remove the covers.
2. Locate and disconnect the drive control and power supply cables.
3. Remove the four screws attaching the disk drive to its bracket. There are two screws located on each side of the drive bracket.
4. Carefully slide the drive from its bracket.

Replacement

1. Align the disk drive into its mounting track.
2. Carefully slide the disk drive into its bracket.
3. Install the screws to attach the drive to the bracket.
4. Connect the drive control and power supply cables.
5. Replace the covers. If the drive does not match to the opening in the main cover, you may have to loosen the drive and reposition it, prior to remounting the top cover.

Hard Disk Drive

The hard disk drive with bracket is installed in the lower floppy drive bay. The following procedure describes removing the hard disk drive.

Removal

1. Ensure power is off. Remove the covers.
2. Locate and disconnect the drive control, fan, and power supply cables.
3. Remove the four screws attaching the disk drive to its bracket. There are two screws located on each side of the drive bracket.
4. Carefully slide the drive from its bracket.

Replacement

1. Align the disk drive into its mounting track.
2. Carefully slide the disk drive into its bracket.
3. Install the screws to attach the drive to the bracket.
4. Connect the drive control and power supply cables and DC fan power cable.

Note: Ensure the drive control cable is properly attached to J12 on the Mother board.

5. Replace the covers and cables.
6. Attempt to power the unit on. If it boots until the word 'CONFIGURATION' appears, then you will need to restore the configuration from a backup if available. If the unit fails at IML state 450 when booting, then there is no code to boot from on the hard drive.
7. Run Offline Utility 41 to format the new drive if necessary. Refer to the LINCS Problem Determination manual for reference..
8. Execute Offline Utility 36 to initialize the drive. Refer to the LINCS Problem Determination manual for reference.
9. Run the microcode merge utility as described in Chapter 4 of this manual.
10. IML the SCON-20L/22L. You will need to restore the configuration for this unit from backup.

Mother Board Assembly

The Mother Board contains nonvolatile memory which is used to hold information regarding the serial number and any feature bits installed from FADs. Care should be taken to record the serial number associated with the unit, and to remove the feature bits prior to replacement of the Mother Board if possible. The feature bits can be removed by using the online utility 1/9 if you have access to the original FAD disks or using utility 0/5 using a blank diskette, if the current Mother Board is functional. Once the new board is installed, you will need to restore the serial number and feature bit information. If the old Mother Board was not functional, you will have to use the original FADs to restore the feature bits. Reference the LINCS Central Control Mode manual for information regarding online utilities.

Removal

1. Ensure power is off. Remove the cables and covers.
2. Remove all Circuit boards attached to the board guide from the unit, taking note of position of each card.
3. Disconnect all cables attached to the Mother board, taking notes as necessary.
4. Remove the nine screws attaching the base to the chassis. There are three screws on each side and three on the back.

5. Carefully lift the base from the chassis.

Note: The power supply, operator panel, and disk drives are attached to the base.

6. Remove the five mounting screws attaching the Mother board to the chassis.
7. Lift the Mother board clear of its mounting.

Replacement

1. Reverse the procedure described above to install the Mother board.
2. Execute Offline Utility 04, 08, and 10 to reload the serial number, set the date, and set the time. You may also set date and time from online utility 2/1.
3. Reinstall feature bits from the original FADs using online utility 1/9 or from the floppy created using utility 0/5.

New Hardware Installation Procedures

The installation of new hardware features onto the SCON-20L/22L can be very similar to the replacement of existing hardware with a couple of notable exceptions. First you will be removing and discarding existing plates and brackets, and substituting feature boards in their place. Secondly, you will need to know where to place the new board, since the existing 20L/22L does not already have one installed. Finally, you may need to inform the software, through configuration, that the new hardware has been installed.

Optional Hardware Features

Description	Visara P/N
CDA, 18-Port (SCON-22L only)	210557-912/952
FET, 100/10 Mbps	220273-906

Second CDA Installation (SCON-22L Only)

1. Follow the procedures for removing the covers from the SCON-22L.
2. Locate the metal plate attached to rear bracket, covering 4 openings at the rear of the 22L. This metal plate is located next to the J2 location as shown in the Physical Slot Identification drawing (Figure 3-1)
3. Remove the two screws securing the metal plate to the rear bracket, and discard the bracket.
4. Use the two screws removed in step 3 to secure the CDA board into place, ensuring that the CDA is plugged into the J2 connector.
5. Reassemble the covers.
6. Using the SCON-20L/22L/25L Configuration Manual as a guide, verify that your configuration includes 32 coax ports (it may be configured for 16 coax ports only). Reconfigure as needed.

Installation of FET Board

1. Follow the procedures for removing the covers from the SCON-20L/22L.
2. Refer to the Slot Population and Identification table in Chapter 3, and locate the card that you are attempting to install.
3. Use the table to identify which slot the card is to be installed into (should be either slot J4 or J5).
4. Use the Physical Slot Identification diagram below the table to visually determine which slot the board will be installed into.
5. Locate the narrow metal insert covering the opening in the back of the 20L/22L, associated with the slot that the board will be installed into, and remove the screw holding it in place. Remove and discard the metal insert.
6. You will need to loosen the two screws that hold the front board guide bracket in place, and slide it forward out of the way.
7. Install the new board into the slot and secure it in place with the screw removed in step 5. Move the front board guide bracket back into place and secure it with the two screws loosened in step 6.
8. Reassemble the covers.
9. Using the SCON-20L/22L/25L Configuration Manual as a guide, you must reconfigure the 20L/22L to recognize the new card. This is done by incrementing the appropriate board type on the Product Definition panel of configuration. (Example below.) Continue to configure the new hardware in configuration as needed.

1174-22L Product Definition

LINCS C8.2 Central Control

Number of Coax Ports: 32
Number of ASCII Ports: 0
Number of ESC Boards: 1
Number of TRC Boards: 0
Number of FET Boards: 1

Feature Memory (megabytes): 1

PF: 1-Menu

7-Back

8-Forward

9-Default

10-Done

Symbols

10/100 Mbps Fast Ethernet (FET) 2-8

A

Attaching the ESC Interface to the Channel 2-7

B

Board ID Assignments 3-3

C

Coax Device Cables 2-4

Coax Ports 2-12

Connectors 2-7

Copy Systems Disks 4-3

D

Debug SW 2-7

E

Environmental Parameters 2-3

Error Types 4-5

ESCON

 Channel Interface 2-6

 Fiber Optic Cable 2-4

F

Failure Messages 4-9

FET Board Installation 5-8

Floppy Disk Drive 5-5

H

Hard Disk Drive 5-5

I

IML Procedure 4-3

Indicators 2-7, 4-1

 ACTV (green) 2-7

 FAIL/ERR (amber) 2-7

 IRQ (amber) 2-7

 ONLN (green) 2-7

Installation Procedures,

 FET Board 5-8

 Second CDA 5-7

Installation Task Checklist 2-1

Installing/Removing Printed Circuit Boards 2-2

K

Keypad 4-2

L

LED Descriptions 2-10

Logical Identifiers 3-3

M

Mother Board Assembly 5-6

N

New Hardware Installation Procedures 5-7 – 5-8

O

Operator Panel LEDs 4-1

 Check 4-1

 Config 4-1

 Diag 4-1

 HD-Act 4-1

 IML 4-1

 Power 4-1

Optional Hardware Features 5-7

P

Power Cable 2-4

Power Cable Requirements 2-6

Power Requirements 2-3

Power Supply Assembly 5-4

Power Switch 4-2

Printed Circuit Board Names

 CDA 3-1

 ESC 3-1

 FET 3-1

R

Replaceable Assemblies 5-2

RJ-45 Connector Pin Assignments 2-10

S

SCON-20L/22L

 General Description 1-1

 Hardware Components 1-1

Second CDA Installation 5-7

Slot Identification 3-2

Slot Numbers 3-3

SCON-20L/22L Hardware Reference Manual

Slot Population 3-1
Software Merge 4-8
Switches 2-7

U

Unpacking Printed Circuit Boards 2-2

W

Warning Messages 4-8