

SCON-25L/28L/3074 Console Concentrator 1174-25S Communications Server

Hardware Reference Manual

P/N 707028-007

ISSUE/REVISION SCHEDULE		
Comments	Rev. No.	Date
Initial Release	707028-001	9/17/99
Visara Update	707028-002	3/26/01
SCON-25L Addition	707028-003	9/12/02
Update/28L Addition	707028-004	9/15/04
Update	707028-005	8/18/05
SCON-3074 Addition	707028-006	5/12/06
Update	707028-007	9/25/07



Read This First

This is the Communications Server Hardware Reference Manual. For information on the LINCOS Operating System, please visit our website, www.visara.com.

1. From your Internet browser type <http://www.visara.com>
2. Select Service and Support
3. Select Manuals
4. Select 1174 LINCOS Manual Online
 - *SCON-25L/28L/3074/1174-25S Hardware Reference Manual*
 - *SCON-20L/22L/25L/28L Configuration Manual*
 - *SCON-3074 Configuration Manual*
 - *SCON-20L/22L/25L/28L/3074 Planning and Installation Manual*
 - *LINCOS Features*
 - *LINCOS Problem Determination*
 - *LINCOS Configuration*
 - *LINCOS Central Control*

Product Safety

The 25L/28L/25S/3074 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. Operating with unapproved 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.

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.

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-25L General Description	1-1
SCON-28L General Description	1-1
SCON-3074 General Description	1-1
1174-25S General Description	1-1
TN3270E Server	1-2
Communications Concentrator	1-2
Coax Terminal Server	1-2
LAN Printer Support	1-2
Additional LAN Device Support	1-2
IP Channel Bridge	1-2
Hardware Components	1-3
Standard Components	1-3
Feature Components	1-3
Chapter 2. Installation	2-1
Installation Checklist	2-1
Memory	2-2
Requirements	2-2
Additional Memory	2-2
Printed Circuit	2-3
Unpacking Additional Printed Circuit Boards (PCBs)	2-3
Installing/Removing Printed Circuit Boards (PCBs) -- by Authorized Service Personnel Only	2-3
Location Planning for the 25S/25L/28L/3074	2-4
Environmental Parameters	2-4
Power Requirements	2-4
Supplied Cable Distances	2-5
Power Cable Requirements	2-7
Serial 3270 Host Connection	2-8
Token Ring Connection	2-8
Ethernet Connection	2-8
10/100 Mbps Ethernet	2-8
10BASE-T Operation	2-8
100BASE-TX Operation	2-9
LED Descriptions	2-10
Local Channel Installation	2-10
Switches/Indicators	2-10
Cables	2-11
Preparing for Installation	2-11
Connecting to the Channel	2-11
Channel Board Installation	2-14
Bus/Tag Cable Interfacing Assembly	2-14
Setting the Priority on the BTC	2-15
BTC-C Cabling	2-15
Local Channel Bypass	2-16

	<u>Page</u>
ESCON Channel Interface	2-17
Indicators, Switches and Connectors	2-17
Attaching the ESC/ESX Interface to the Channel	2-18
RS232 Serial Interface	2-18
Serial Port	2-18
High Speed Communication Interface	2-19
Installation	2-19
Cabling	2-19
Slot Numbers	2-20
Slot Identification	2-21
Board Slot Population	2-21
Chapter 3. Operation	3-1
Controls	3-1
Operator Panel	3-1
Indicators	3-1
Keypad	3-2
IML	3-4
Error Types	3-5
IML Errors (ERR___)	3-6
Exception Errors (XCP___)	3-6
Hardware Failures (FAIL___)	3-7
Online Errors	3-7
Error Indicators	3-7
Software Merge	3-8
Chapter 4. Assembly Removal/Replacement	4-1
Introduction	4-1
Assembly Drawing	4-1
Field Replaceable Assemblies	4-2
Removal/Replacement Procedures	4-3
Main Cover	4-3
Circuit Board Assembly	4-4
Operator Panel	4-4
Floppy Disk Drive	4-5
Hard Disk Drive	4-5
Power Supply Assembly	4-6
Back Panel and Expansion Back Panel Assembly	4-7
New Hardware Installation Procedures	4-7
Selecting Location for the New Board	4-8
Board Installation Procedure	4-8
Index	Index-1

Chapter 1. Introduction

SCON-25L General Description

The SCON-25L Console Concentrator is a powerful platform for supporting and managing multiple logical partitions (LPARS) on mainframe hosts. The SCON-25L attaches to mainframes via one or two ESCON adapters and is used to configure and monitor mainframe status. Up to 16 LPARS and 256 sessions can be supported through each interface. The SCON-25L Console Concentrator supports LINCS software and is part of the Visara Communication Server Hardware family. Client types supported on the 25L include up to 128 Coax displays and printers, up to 512 TN3270E clients, and up to 256 Telnet and/or LAN printer clients.

SCON-28L General Description

The SCON-28L Console Concentrator is a powerful platform for supporting and managing multiple logical partitions (LPARS) on mainframe hosts. The SCON-28L attaches to a mainframe via one or two ESCON adapters, and is used to configure and monitor the mainframe status. Up to 64 LPARS and 256 sessions can be supported through each interface (20 LPARs/ESCON come standard). The SCON-28L Console Concentrator supports LINCS software and is part of the Visara Communication Server Hardware family. Client types supported on the 28L include up to 128 Coax displays and printers, up to 512 TN3270E clients, and up to 256 Telnet and/or LAN printer clients.

SCON-3074 General Description

The SCON-3074 Console Concentrator is a powerful platform for supporting and managing large numbers of LPARs on mainframe hosts. The SCON-3074 attaches to a mainframe via one or two ESCON adapters, and is used to configure and monitor the mainframe status. Up to 48 LPARs and 128 sessions can be supported through each interface. The SCON-3074 Console Concentrator supports LINCS software and is part of the Visara Communication Server Hardware family. Client types supported on the SCON-3074 are up to 128 TN3270E, TN3270, and TN3287 clients, connected through a pair of 10/100 Mbps Ethernet connections. Configuration and management of the SCON-3074 is through the network using a Telnet connection.

1174-25S General Description

The 1174-25S Communication Server provides a number of communication services to provide desktop to mainframe, mainframe to printer, and mainframe to server connections. A wide variety of communication options and device attachments allows the 25S to take on many roles. A few of the more common applications are described below. For more information describing the features mentioned below, refer to the LINCS Planning, Configuration, and Central Control Manuals.

TN3270E Server

The 1174-25S functions as a TN3270E server, providing user desktops with access to a 3270 mainframe. The number of sessions supported can be scaled from 32 - 4048. With the implementation of multiple 25S communication servers and the SMS feature, the TN3270E server function can be spread across multiple platforms, encompassing tens of thousands of users, and providing fault tolerance and load balancing as well.

Communications Concentrator

With the implementation of the SNA Gateway features, the 1174-25S can be used to gateway SNA communications across a variety of communication links including ESCON, Bus and Tag channel, 100/10 Mbps Ethernet, 16/4 MBPS Token Ring, and synchronous serial connections (RS232, V.35, X.21) up to T1/E1 speeds. Standard SNA as well as APPN is supported. Numerous card slots available in the 25S allow extremely dynamic and complex networks to be accommodated. Using the gateway functions provided by the 25S, it is easy to supplement and in some cases replace more expensive Front End Processors. Downstream connections include Token Ring, Ethernet, Frame Relay, and SDLC over a variety of serial connections and speeds.

Coax Terminal Server

The 25S supports up to 128 traditional fixed function coax terminals and printers, allowing up to 10 host sessions per terminal. Connections can be made using RG62AU coax or twisted pair. Host connections to SNA hosts can be over ESCON, Bus and Tag channel, Ethernet, Token Ring, SDLC, X.25 and Frame Relay. Non-SNA connections over ESCON, Bus and Tag channel, and BSC lines are also supported.

LAN Printer Support

Up to 256 LAN printers can be supported through the 1174-25S, providing mainframe to LAN printer connections. Traditional SNA printer definitions are converted to IP data streams which are then directed to the appropriate LAN printer, anywhere in the network. LPR/LPD protocol as well as the simpler socket connection method is supported.

Additional LAN Device Support

In addition to the device types listed above, the 25S can also support Telnet desktops (up to 256), and IPX desktops (up to 4048), providing desktop to mainframe application support.

IP Channel Bridge

The 1174-25S can be configured to provide high speed LAN to mainframe communications for IP traffic, using efficient bridging technology, and some filtering capabilities more commonly found in routers.

Hardware Components

The following includes hardware, which may be installed.

Standard Components

Item	Function
Op Panel	Provides operator interface with unit.
SCP PCB	System control processor.
Back Panel	Provides interconnection of installed boards, supplies 7 slots of which 2 are filled.
EBP-C	Expansion back panel to support additional feature boards (total of 6 slots).
VHP	Provides additional data processing power.
Hard Drive	Data file storage.
Floppy Drive	Data file storage.
Power Supply	Provides unit power.
ESC PCB	Provides communication interface to ESCON channel networks. 1 standard on SCON-25L only.
ESX PCB	Provides communication interface to ESCON channel networks. 1 Standard on SCON-28L and SCON-3074 only.
FET PCB	Provides TN3270, Telnet, and LAN printer client support through a single 10/100 Mbps Ethernet interface, Standard on SCON-28L, SCON-25L, and SCON-3074 (2 cards) platforms only.

Feature Components

Item	Function	Max. # Installed
BTC-C	* PCB and channel adapter cable provides connection between channel bus and tag cables and 2-board channel subsystem.	2
CHC/CHP PCB	* Two-board channel attachment subsystem.	2
FET PCB	Provides communication interface to 10 Mbs or 100 Mbs Ethernet networks.	7
ESC PCB	Provides communication interface to ESCON channel networks.	2
HSC PCB	* High speed remote communications interface to SDLC and Frame Relay networks. Provides up to 4 lines. (LINCS must be installed.)	7
SCC PCB	* Provides communication access to hosts/devices.	10
TRC PCB	* Provides communication interface to token ring.	9
MCC Multiplexer Coax Controller	Can be attached directly for support of up to four devices or multiplexed attachment supporting up to 32 devices.	4
VHP	Provides additional processor support. One VHP comes standard in 25S/25L base unit. Additional VHP required for APPN. (25S Only)	2
ESX PCB	* Provides communication interface to ESCON channel networks. May be installed on Model SCON-28L and SCON-3074 only.	2

* Not applicable to all models

Chapter 2. Installation

Installation Checklist

The following is a brief checklist of typical installation tasks. Detailed information is provided later in this chapter.

1. Check the shipping carton for any obvious shipping damage prior to unpacking.
2. Unpack the unit per instructions provided with the shipping carton. This unit weighs in excess of 50 lbs., so please take any necessary precautions such as seeking help with lifting.
3. Place the unit 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, Local Channel, Token Ring, RS232, V.35 and/or Ethernet cables as needed.
7. Ensuring that the Power switch on the front of the unit is off, plug the unit into an appropriate AC outlet.
8. Turn the unit on (see Chapter 3, “*Operation*”). After a few seconds, messages will appear on the LCD of the Operator Panel. These messages will change as the unit proceeds through 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 ‘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 unit for use (see the *LINCS Planning, Configuration, and Central Control Manuals*).

Memory

Requirements

The total amount of system addressable memory space across the bus is 27.5 Mb. The unit comes standard with a full compliment of 8 Mb of common memory. Each feature board installed contributes additional system memory. Configurations exceeding 27.5 Mb are not supported.

The amount of memory address space each feature board requires is:

Base Common Memory	8 MB
HSC	2 MB
Local Channel	2 MB
Token Ring	2 MB
MCC - 3270 Coax	0.5 MB
ESC - ESCON	4 MB
FET - Fast Ethernet	2/4 MB*
ESX - ESCON	4 MB

* The FET contributes either 2 MB or 4 MB of memory depending on the feature combination configured.

Additional Memory

Memory is installed on the SCP card (slot 1) using 4-Mb memory modules. Local memory is installed in J5, and 4 MB of Base Common memory in J6. Expansion Common memory J7 is not used (see Figure 2-1). The other 4 MB of Base Common memory is located on the VHP card, typically located in slot 2.

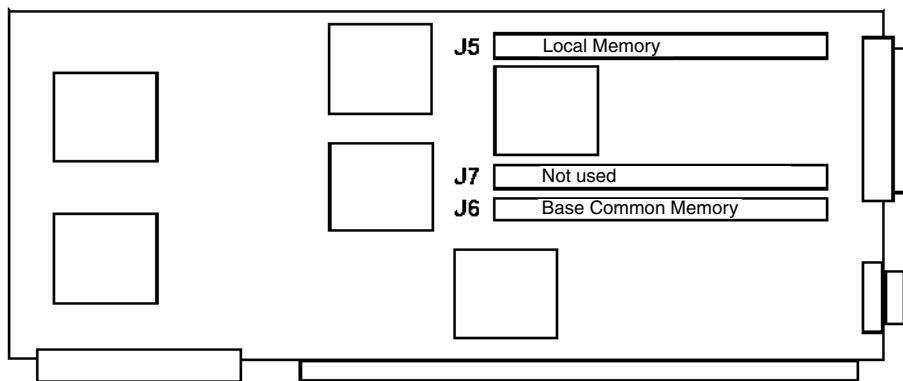


Figure 2-1. Memory Module Location, SCP Board

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 25S/25L/28L/3074

Use the following environmental parameters, power requirements, and cable distance tables to select a location for your 25S/25L/28L/3074.

Environmental Parameters

Dimensions	Width:	17.5 in (44.5 cm)
	Depth:	23.5 in (59.7 cm)
	Height:	9 in (22.9 cm)
Weight:		51.8 lb (23.5 Kg)
Clearances	Front:	24 in (61 cm)
	Rear:	10 - 12 in (25 - 31 cm)
	Top:	0 in (0 cm)
	Left:	4 in (10 cm)
	Right:	4 in (10 cm)
Temperature Range:		50° to 105°F (10° to 40.6°C)
Relative Humidity:		8% to 80% with no condensation
Heat Output:		341 BTU/hr (nominal)
		910 BTU/hr (maximum)

Power Requirements

Phases:	1
Power:	190 VA (base config)
	300 VA (maximum)
Current Rating:	6.0A (115 VAC 60 Hz)
	3.0A (230 VAC 50 Hz)
Voltage (/±10%):	100 (at 50/60 Hz /± 1 Hz)
	110 (at 50/60 Hz /± 1 Hz)
	120 (at 60 Hz /± 1 Hz)
	200 (at 50/60 Hz /± 1 Hz)
	208 (at 60 Hz /± 1 Hz)
	220 (at 50/60 Hz /± 1 Hz)
	230 (at 50 Hz /± 1 Hz)
240 (at 50/60 Hz /± 1 Hz)	

Supplied Cable Distances

The following table contains distance information for some types of cable:

Cable Type	Supplied Distance (all 25S models)
Power Cable	15 ft (4.57 m).
EIA - RS232 (For SCC)	10 ft, 20 ft, 30 ft, 40 ft. Use supplied cable only.
V.35 Cable (For SCC)	25 ft (7.6m). Use Company supplied cable only.
Channel Cables (Bus and Tag)	Refer to manuals listed.
Ethernet Cable	Refer to manuals listed.
3270 Coax Cables	Refer to manuals listed.
Token Ring Cable (node to Media Access Unit [MAU])	Refer to the manuals listed below.
EIA - RS232 (For HSC)	20 ft (6.1m). Use supplied cable only.
V.35 Cable (For HSC)	20 ft (6.1m). Use supplied cable only.

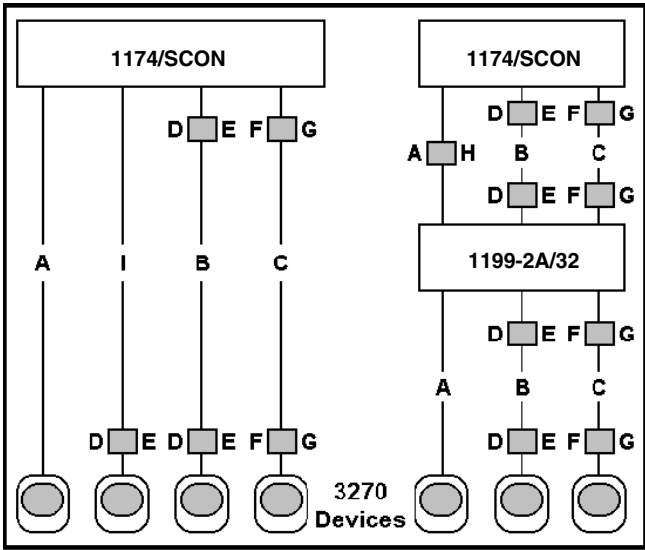


Figure 2-2. Coax Device Cable Types and Lengths

**SCON-25L/28L/3074 Console Concentrator
1174-25S Communications Server Hardware Reference Manual**

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)
H	Fiber Optic Cable (must have FDA installed in Communications Server) 62.5/125 micron, IBM Cabling System Type 5 100/140 micron or 50/125 micron	4920 ft (1500 m)
I	Twisted Wire (must have TWA installed in Communications Server)	

When using fiber optic cable, a Fiber Optic Device Adapter must be installed in the Communications Server. Note that 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)

Additional information about cable types and distances is available in the following 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 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*

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, SJT, cable (15-foot [4.6-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, SJT, cable (15-foot [4.6-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 [4.6-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.

Serial 3270 Host Connection

For each 3270 host-to-unit line, you must use one of the following special Company sourced cables:

Cable	Part Number	FRU Number
EIA RS-232	211128-010	No Longer Available
	211128-020	956660-020
	211128-030	No Longer Available
	211128-040	956660-040
V.35	211130-001	956661-001

WARNING

Failure to use specified cables may result in damage to the SCC board(s).

Token Ring Connection

The Token Ring Interface cable can be attached directly to the Token Ring Media Access Unit (MAU), or can be extended by attaching it to another cable that is attached to the MAU. The unit attachment point is at the TRC board using a 9-pin D connector.

Ethernet Connection

10/100 Mbps Ethernet

The single RJ-45 connector on the network cable 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 10/100 Mbps 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.

Ethernet, as the most widely used network protocol, uses 10BASE-T as its primary cabling scheme. 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.

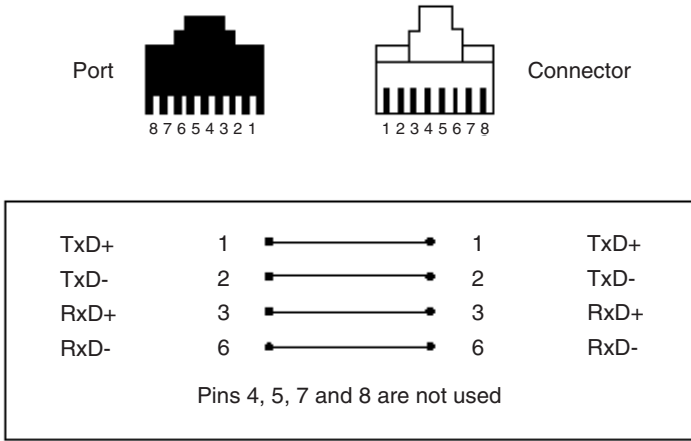


Figure 2.3 RJ-45 Connector Pin Assignments

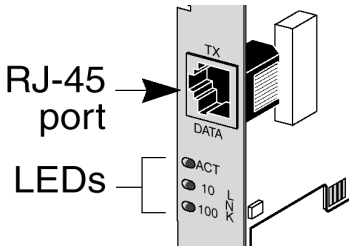


Figure 2.4 LEDS

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

Local Channel Installation

Switches/Indicators

Name	Function
Offline Indicator	<p>Indicates that the unit is logically disconnected from all host channels. A 3-key sequence from the operator panel toggles a channel Online or Offline. The indicator is lit when the unit is not connected to the channel; the indicator is off when the unit is connected to the channel.</p> <p>WARNING The unit should never be powered off when the Offline indicator is off.</p>
Priority Switch	<p>Used to specify the priority of the unit on the channel. The Priority switch is located on the BTC-C board. The switch may be set to select High Priority or Low Priority.</p> <p>The High Priority setting causes the control unit initiated selection to be controlled by the Select Out channel signal.</p> <p>The Low Priority setting causes the control unit initiated selection to be controlled by the Select In channel signal.</p>
Bypass Switch	<p>Use this switch before removing or installing a CHC board. The Bypass switch is located on the channel adapter cable (V-cable).</p> <p>The Bypass switch is used to reroute the channel select signals around the unit so the board can be removed for replacement. The bypass function is selected by setting the switch to the Bypass On (B) position. For normal operation, the Bypass switch should always remain in the select position (S).</p>

Cables

Cable	Part Number	Length
Channel Cable (Bus and Tag)	9701501	15 ft (4.57 m)
	9700067	20 ft (6.1 m)
	9701502	30 ft (9.1 m)
	9701157	50 ft (15.24 m)
	308779	100 ft (30.48 m)
Channel Adapter Cable (V-Cable)	29704-001	

Preparing for Installation

- Ensure that the following are available:
- Channel board(s)
 - CHC and CHP boards installed
 - BTC-C board
 - Channel Adapter Cable
 - Channel (Bus and Tag) Cables

Connecting to the Channel

- To connect the unit to the channel:
- Contact the customer’s System personnel to determine the required setting of the Priority switch. Set the Priority switch.
 - Install BTC-C board in rack if desired.
 - Connect Channel Adapter cable between the CHC board and the BTC-C.
 - Connect the Channel (Bus and Tag) cables.

Connect the Channel Cables

The two channel cables (Bus and Tag) provide the electrical connection of all data and control signals between the channel and the 25S.

Each cable has a light colored end and a dark colored end. The light colored end must be attached to Bus In or Tag In receptacles. The dark colored end must be attached to Bus Out or Tag Out receptacles.

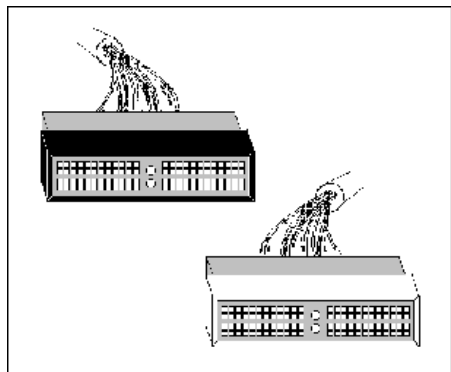


Figure 2-5. Bus/Tag Cable Ends

Prior to installing a new set of cables, you should label both ends of one cable **Bus** and both ends of the remaining cable **Tag** to ensure that you attach the cables to the proper receptacles.

The unit may be connected to the end of a channel, the middle of a channel, or replace an existing unit on a channel. Follow the instructions appropriate for your installation.

Connecting a Unit to the End of a Channel

Refer to Figure 2-6.

1. Ensure that the host processor/channel is in a stop state before disconnecting any channel cables or terminator blocks.
2. Label each end of one of the new channel cables Bus; label each end of the other new channel cable Tag.
3. Connect the light colored ends of the new Bus and Tag cables to the Bus In and Tag In receptacles on the BTC-C
4. Remove the terminator blocks from the existing unit at the end of the channel. Ensure that they are identified as Bus and Tag as they are removed so they will be reconnected in the correct receptacles.
5. Connect the dark colored ends of the new Bus and Tag cables to the Bus Out and Tag Out receptacles of the existing unit.
6. Connect the terminator blocks to the Bus Out and Tag Out receptacles of the BTC-C.

Note: If unit fails to communicate when positioned on the end of the channel, it is suggested that you try locating it in another position on the channel. Some non-Visara controllers that are positioned on the end of the channel utilize an internal channel terminator, and the channel signals are not propagated beyond itself.

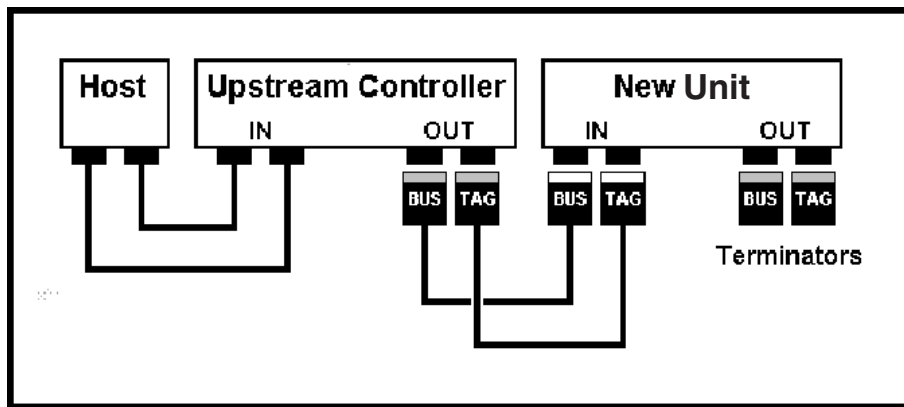


Figure 2-6. Connecting to the End of a Channel

Connecting to the Middle of a Channel

Refer to Figure 2-7.

1. Ensure that the host processor/channel is in a stop state before disconnecting any channel cables or terminator blocks.
2. Label each end of one of the new channel cables Bus; label each end of the other new channel cable Tag.
3. Connect the light colored ends of the new Bus and Tag cables to the Bus In and Tag In receptacles on the BTC-C.
4. Disconnect the existing Bus and Tag cables from the Bus Out and Tag Out receptacles of the existing unit upstream of the final location of the unit. Ensure that the cable ends are identified as Bus and Tag as they are removed so they will be reconnected in the correct receptacles.
5. Connect the dark colored ends of the new Bus and Tag cables to the Bus Out and Tag Out receptacles of the existing unit upstream of the final location of the unit.
6. Connect the existing Bus and Tag cables to the Bus Out and Tag Out receptacles of the BTC-C.

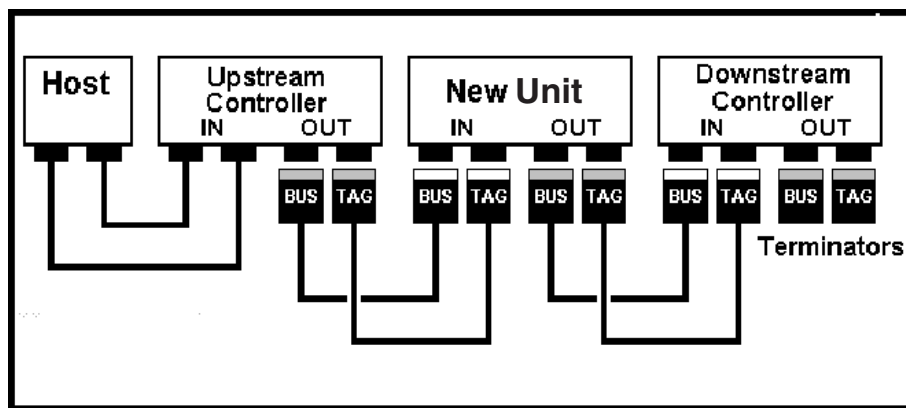


Figure 2-7. Middle/Replacement Connection to Channel

Replacing a Unit on a Channel

Refer to Figure 2-7.

1. Ensure that the host processor/channel is in a stop state before disconnecting any channel cables or terminator blocks.
2. Disconnect the existing Bus and Tag cables from the Bus Out and Tag Out receptacles of the existing unit. Ensure that the cable ends are identified as Bus and Tag as they are removed so they will be reconnected in the correct receptacles. These cables have dark colored ends.

3. Disconnect the existing Bus and Tag cables from the Bus In and Tag In receptacles of the existing unit. Ensure that the cable ends are identified as Bus and Tag as they are removed so they will be reconnected in the correct receptacles. These cables have light colored ends.
4. Connect the Bus and Tag cables removed in Step 3 to the Bus In and Tag In receptacles of the BTC-C. These cables will have light colored ends.
5. Connect the Bus and Tag cables removed in Step 2 to the Bus Out and Tag Out receptacles of the BTC-C. These cables will have dark colored ends.

Channel Board Installation

The CHC and CHP boards are installed in the card cage. A cable strain relief bracket is attached to the chassis. A BTC-Cabled (BTC-C) assembly is used for channel cable interfacing.

Bus/Tag Cable Interfacing Assembly

The BTC-Cabled board (BTC-C) assembly is a rack-mountable board providing channel cabling. A Channel Adapter cable (V-cable) for connection between the BTC-C and CHC is required. The V-junction connector of the cable is attached to the CHC. Each end of the V-cable is keyed to attach to the appropriate receptacle on the BTC-C.

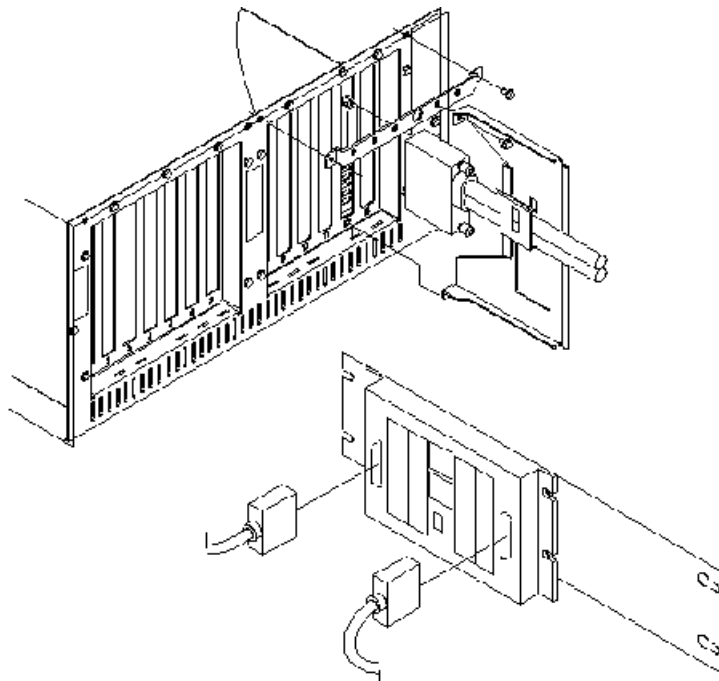


Figure 2-8. BTC-Cabled Board Installation

Setting the Priority on the BTC

Determine the priority for the unit and set the priority with the switch(es) located on the BTC-C. The priority of connection for each unit on the channel is determined by switch settings on the BTC-C and the physical position the unit occupies on the channel.

During normal network operation, the order of priority is (from highest to lowest):

- 1. All units set to High Priority, starting at the host processor and moving to the last unit on the channel, followed by
- 2. All units set to Low Priority, starting from the last unit on the channel and moving back to the mainframe.

Setting the priority to High allows the unit to attain connection to the channel before units set to Low priority (for control unit initiated channel sequences).

Setting the priority to Low causes the unit to attain connection to the channel after units set to High priority (for control unit initiated channel sequences).

Channel priority is set with a switch located on the BTC-C board. Set the switch on the BTC-C board to the appropriate position for the desired priority. Bypass is set using a switch located on the V-junction connector of the Channel Adapter cable. Refer to Figure 2-8.

BTC-C Cabling

Typical BTC-C and CHC/CHP board cabling is shown in Figure 2-9.

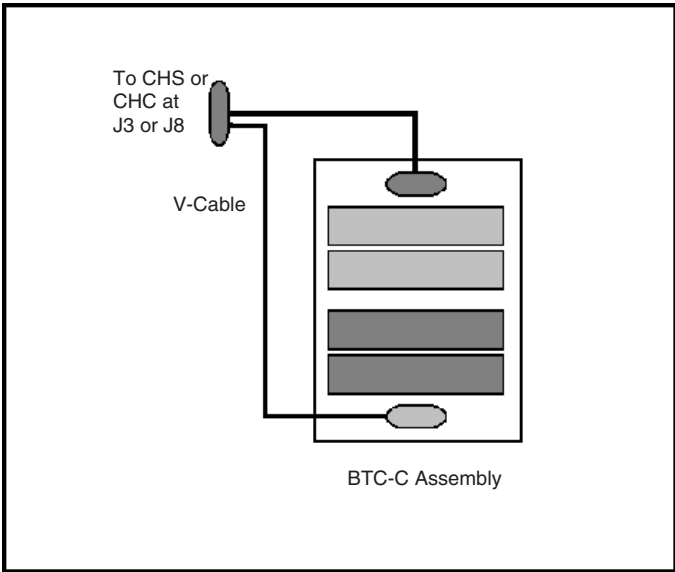


Figure 2-9. BTC-C Typical Cabling

Utilizing the BTC-C assembly, two channel adapter cables (V-cables), and two sets of channel boards provides a cabling option (Figure 2-10) for connecting the 25S to a single local channel configured for one of the following:

SNA and non-SNA protocols on the same channel

OR

Up to 64 ports configured on a non-SNA channel.

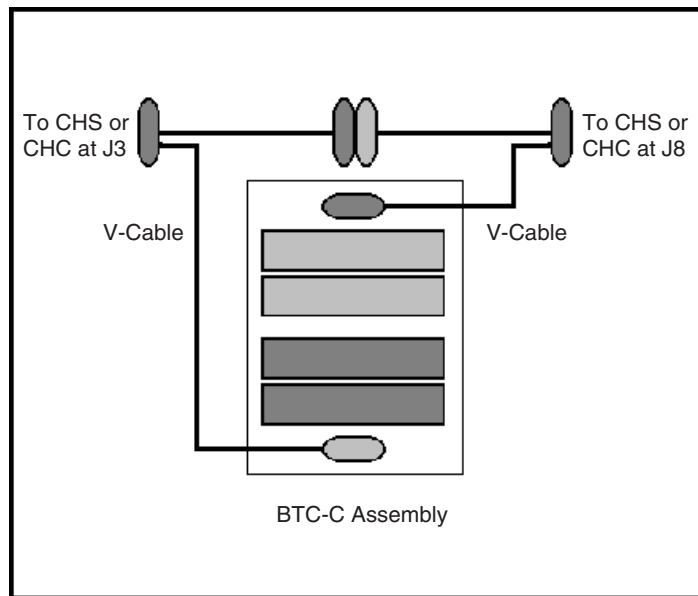


Figure 2-10. BTC-C Single Channel Cabling Option

Local Channel Bypass

Bypass is used to remove the unit from the local channel without interrupting the channel communication link to other units/hosts. The Bypass function allows local troubleshooting of the network unit without interfering with the local channel communication link.

Use the following procedure to set Bypass.

1. Place the unit offline (for each channel if a 2-channel configuration) by pressing the Shift key, followed by the Enter key, followed by the channel number (1 or 2).
2. Wait for the offline messages and indicators to light confirming an offline condition. Refer to Chapter 3, "Operation."

Note: Powering off the unit while either offline LED is not on may result in host system problems.

3. Ensure that the host processor/channel is in a stop state.
4. Set switches to Bypass to isolate the unit from the local channel. The Bypass switch for the BTC-C assembly is located on the V-junction connector of the Channel Adapter cable (Figure 2-8).

Note: The Bus/Tag cables must remain connected to the BTC-C for the communication link to remain intact.

5. The host processor/channel may now be removed from the stop state.
6. Local testing and/or service may be performed on the unit.

When testing or service is complete, use the following procedure to return the unit to service on the channel.

1. Place the host processor/channel in a stop state.
2. Reset the Bypass switch to normal state and set the priority.
3. Place the host processor/channel in a start state.
4. Follow normal power-on procedures.

ESCON Channel Interface

An ESCON Controller (ESC or ESX), 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 25S/25L Communication Servers to an ESCON director or to a mainframe channel. The ESX provides a single channel attachment interface for connecting 28L/3074 communication servers to an ESCON director or to a mainframe channel.

The fiber connection from the mainframe to the CARD 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. A view of the ESC/ESX faceplate bracket cutout is shown below.

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 (re-download software). Please note that reinitializing the ESCON card may require the 25S/25L/28L/3074 to be IMLed.

Connectors

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

Attaching the ESC/ESX Interface to the Channel

Follow the steps below, to connect an ESCON cable between the ESCON host channel and the 25S/25L/28L/3074:

1. Vary off-line 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 25S/25L/28L/3074 and the host.
3. Vary online the host channel.
4. A “505-01” connection code on the 25S/25L/28L/3074 display indicates that proper communication is established. Connection problems may exist if the plug does not click when placed into the ESC receptacle. Ensure the ESCON plug is not loose.

RS232 Serial Interface

Serial Port

A serial port is provided with the ESC, FET and VHP cards, but is not functional.

High Speed Communication Interface

The High Speed Communications (HSC) board provides a high-speed-remote communications interface to SDLC and Frame Relay Networks. Each HSC board provides up to four high speed channels.

Installation

Refer to Chapter 2, *Installing/Removing PCBs*.

WARNING

The 25S Communications Server must be powered off before connecting or disconnecting the HSC adapter cable or the PLIMs. Failure to do so may result in damage to the hardware.

Cabling

The HSC feature includes an HSC Adapter Cable (HAC). One end attaches to the HSC board, the other end splits into four connectors. Each connector provides a communication line capable of operating at full-duplex speeds up to 8 Mbps.

The physical layer interface type is selected using a physical layer interface module (PLIM) and one of four HSC communication cables. The PLIM1 supports either RS232 or V.35 communication protocol. The type cable used determines the protocol type. Any combination of PLIMs and/or cables may be connected to the HSC board.

Cables		
968711-020	RS232	DTE
968712-020	RS232	DCE
968713-020	V.35	DTE
968714-020	V.35	DCE
968715-020	X.21	DTE

Note: The cable assemblies supplied for use with the HSC board and PLIMs are proprietary cables that may include EMI suppression components. For correct operation and continued agency compliance do not substitute any other cables.

The DCE cables allow direct connection to DTE devices; no modem or modem eliminator is required. When a DCE interface is selected, the HSC should be configured to generate the transmit clock. Baud rates up to 1 Mbps are supported and configured on the HSC line panels.

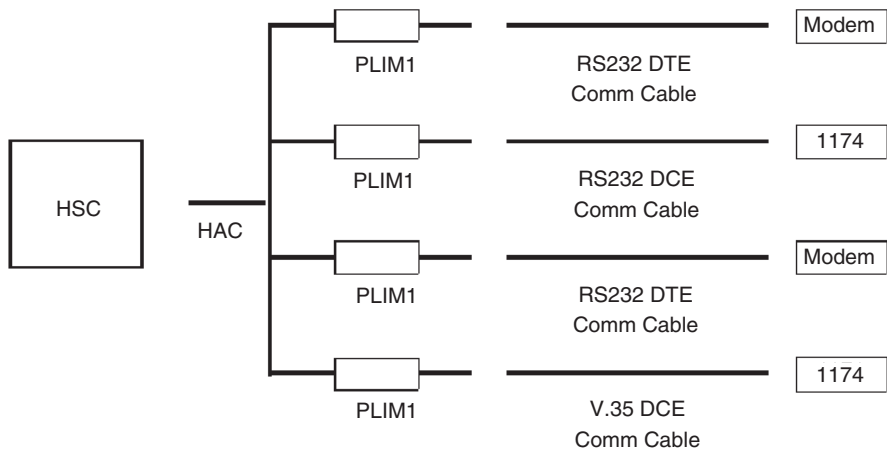


Figure 2-11. Sample HSC Installation

Slot Numbers

Many of the printed circuit boards for the unit are located in partitions called slots, which are identified with numbers. The slots are sometimes specified by error messages that permit the easy identification of a failing PCB. Figure 2-12 shows the locations of the physical slots.

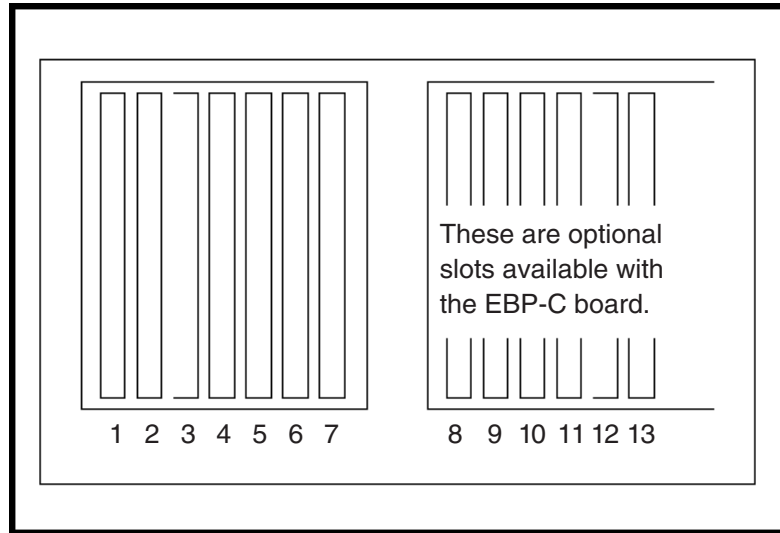


Figure 2-12. Printed Circuit Board Slots, Rear View

The following chart presents the physical J number slots used in the JSS member of failure messages.

Slot	Description
01-13	Back Panel slots
32	Hard disk
34	Floppy disk

Slot Identification

The unit board slots may be identified by either their physical locations (J number) or their logical identifiers (ID). These numbers are used in identifying boards that failed. The following is a cross reference list between the board slot J numbers and the board slot logical IDs.

J#	Slot ID		J#	Slot ID
01	0D		08	08
02	02		09	09
03	03		10	0A
04	04		11	0B
05	05		12	0C
06	06		13	01
07	07			

Board Slot Population

Board slots 2 - 9 in the 25S/25L/28L/3074 are 32-bit BUS slots capable of supporting either 16 bit or 32 bit boards. Slots 10 - 13 support 16 bit boards only. The following chart shows slot restrictions by board type.

Board	Slots
SCP	1
VHP	2, 3, 4, 5, 6, 7, 8, 9
FET	2, 3, 4, 5, 6, 7, 8, 9
HSC	2, 3, 4, 5, 6, 7, 8, 9
TRC	2, 3, 4, 5, 6, 7, 8, 9
SCC	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
MCC	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
ESC	2, 3, 4, 5, 6, 7, 8, 9
CHP*	11, 13
CHC*	10, 12
ESX	2, 3, 4, 5, 6, 7, 8, 9

* CHP and CHC cards should be in adjacent slot pairs of 13,12 or 11,10.

Chapter 3. Operation

Controls

The power switch is located below the operator panel. 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. See Figure 3-1.

The operator panel is used to enter, select, or change modes of operation.

The 25S/25L/28L/3074 unit contains a hard drive and floppy diskette drive for data storage.

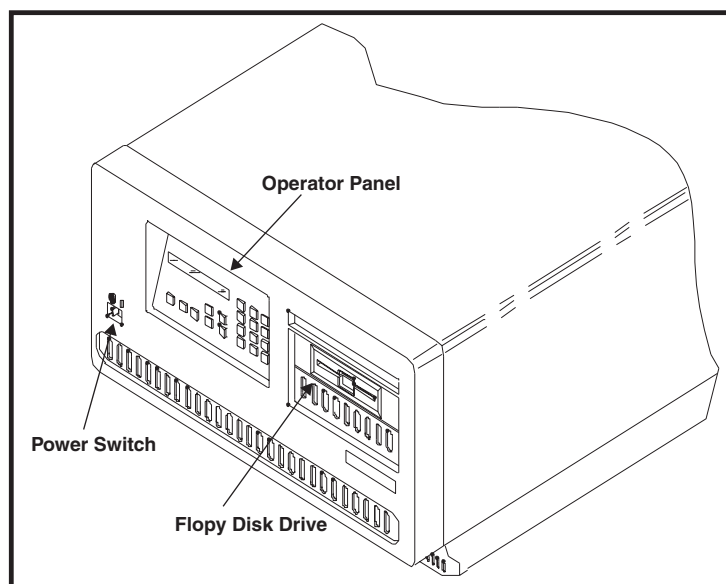


Figure 3-1. 25S/25L/28L/3074 Unit

Operator Panel

The operator panel is shown in Figure 3-2.

Indicators

Located on the operator panel are an LCD display and LEDs that indicate some of the operational states of the unit.

Diag - Lights when the controller is in Offline Diagnostics mode. Customer service representatives use this mode.

Config - Lights when the 25S/25L/28L/3074 is IMLed onto the default configuration, or if no saved configuration is present. This is the normal condition for a unit fresh from the factory, booted for the first time.

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

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

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

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

Off-line Indicator - Lights to indicate completion of off-line selection when Channel Interface selector is set to Off-line.

LCD - Displays operational and diagnostic status messages.

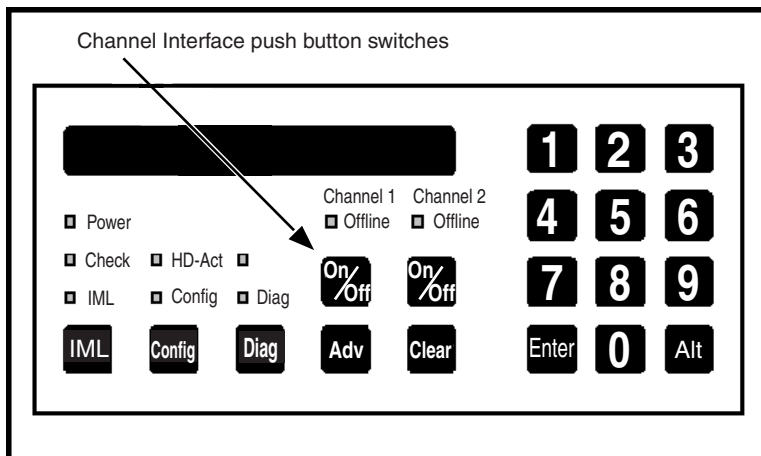


Figure 3-2. Operator Panel

Keypad

The following describes the keys and/or key sequences available from the keypad. Key sequences are separated by commas. When entering a multiple key sequence, you should press and release each key, one at a time.

Config - When IML 500 appears on the display after the 25S/25L/28L/3074 is powered on or the <IML> key is pressed, press the <Config> key to IML into the default configuration only. The Configuration and Central Control Manuals contain information about the Configuration mode.

Diag - Initiates the diagnostics facility.

Adv - The <Adv> (Advance) key advances the operator panel display while online or during error conditions.

Clear - Erases previously entered data, provided that the <Enter> key has not been pressed. In diagnostic mode pressing the <Clear> key at State 500 of IML initiates the software merge utility.

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. When pressed at State 500 of IML, it allows entering of additional commands.

Alt - Used to initiate basic assurance tests when pressed at IML State 500.

IML - Pressing IML (Initial Machine Load) causes the controller to perform a complete reload of software from disk. Note that this button has no affect if the unit is online with the host. To IML a unit that is online, you must first enter the offline sequence, then you may IML the unit.

The following are valid when IML 500 is displayed. Note that multiple key sequences may require that you enter the keys prior to actually reaching state 500. Keys entered while there is information on the LCD, but prior to state 500 will be cached and read in at state 500.

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 controller to IML with default customization parameters. With the default configuration loaded, you may enter 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.

Channel Interface Selector

When placed in the Online position, the controller is logically connected to the host channel. When placed in the Off-line position, the controller is disconnected from the host channel. The Off-line function is not complete until the Off-line indicator is turned on.

A two-key sequence is required to toggle a channel online/off-line state. Momentary push-button switches (as shown in Figure 3-2) are used for channel online/off-line selection. When toggling to the Off-line mode, a status line message (such as “A: Off-line Pend”) is displayed on the LCD upon recognition of the key sequence when currently online. Once disconnected from the channel, the message changes (such as “A: 503-01”).

- For single- and two-channel units, the selected channel button must be pressed, then the Enter key must be pressed to toggle the state.
- For units with more than two channels installed, press the Channel 1 button, then the desired channel number (1-8 on the keypad) is pressed to toggle the channel state.

For Bus and Tag interfaces, the channel online/off-line state is stored in nonvolatile memory. When the controller is powered off then on, the controller channel online/off-line state will be that when last powered off. The controller is shipped with both channels in the off-line state. For ESCON, the channel will always attempt to go online after power up.

IML

When the 25S/25L/28L/3074 is first powered on or the IML button is pressed (and the unit is offline) an IML occurs. The LCD on the operator panel displays messages indicating the progress of the IML.

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

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

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

Note: This only applies when Central Site Change Management is being used! Central Site Change Management requires downloading the back level and trial levels from a host application such as Netview Distribution Manager.

The following describes the parameter entries allowed.

Parameter	Description
d	Selects disk drive from which to IML
l	Selects Central Site Change Management software (level or state from which to IML> 1 - Production 2 - Back level 3 - Trial This only applies when Central Site Change Management is being used.
m	Selects Mode of operation for IML. Adv = Normal (normal IML bypassing BAT) Config = Config (IML into Configuration 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 unit is operating. Details of error codes and their interpretation can be found in the *LINCS Problem Determination Manual*.

The main types of errors or failures are IML errors, exception errors, hardware failures, and online errors.

Indicators showing an error condition has occurred include:

- 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 unit is turned on, or when the IML key on the operator panel is pressed. During IML, the unit executes a series of tests that checks the machine's ability to operate.

An IML error message displays as **ERR XXX*** on the operator panel, 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 States and Errors."

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 unit to resume operation.

Exception error messages look like this on the operator panel:

XCP JSS:BB:EEE*

where:

XCP indicates an exception error.

JSS indicates the physical slot number of the board where the error occurred or was identified.

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 (see the *LINCS problem Determination Manual*) 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 JSS:BB:TNN***
Code Verification - **FAIL JSS:BB:MOV***

where:

FAIL indicates a hardware error.

JSS 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 unit 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 unit's Event Log records the Online events and errors described in the *LINCS Problem Determination Manual*. See the *LINCS Problem Determination Manual* or the *LINCS Central Control Manual* for information on how to display the Event Log.

Status Line of Attached Terminal

The status line of attached terminals shows many of the Online errors and conditions that occur. These errors are normally recorded in the Event Log. 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 states and errors. The operator panel LCD display shows all error conditions except errors occurring in IML before the operator panel is initialized and certain online errors.

Software Merge

This procedure is required for software upgrading and initial installation of software on the 25S/25L/28L/3074. See the *LINCS 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 to proceed with the software merge.
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, press the IML key to initiate the IML process to boot on the new code.

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.

Warning Messages	
Message	Description
Wrong Disk	The diskette inserted into the source drive is not the requested system 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 system 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 4. Assembly Removal/ Replacement

Introduction

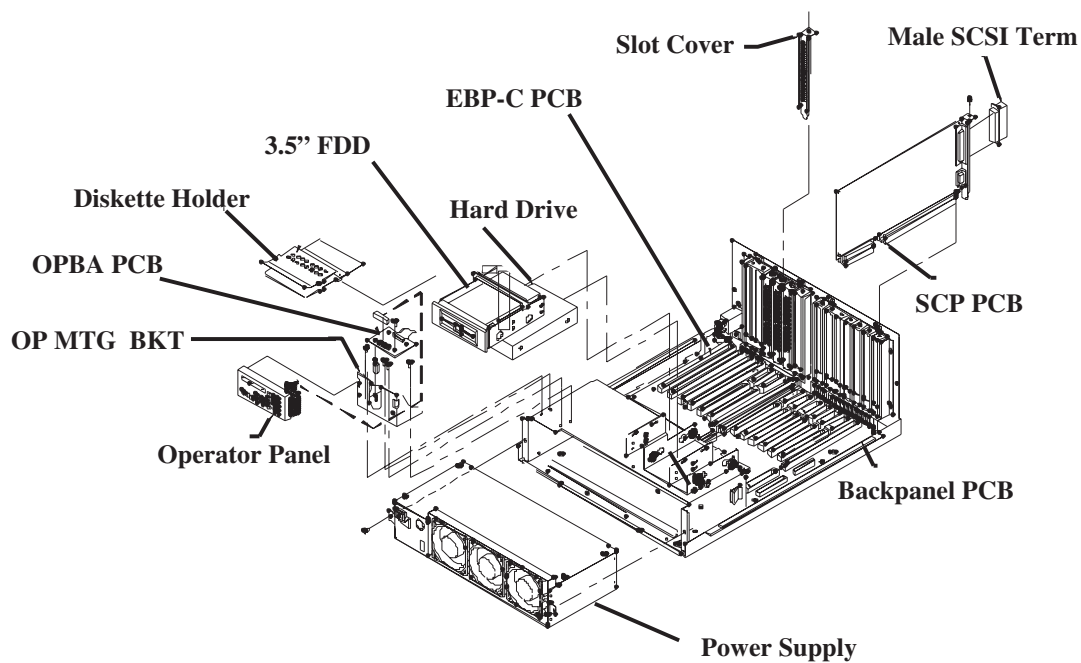
All members of the 25S/25L/28L/3074 family utilize the same chassis. The following procedures describe removal/replacement of assemblies that may be installed in the 25S/25L/28L/3074 unit.

Prior to any removal or replacement procedure, make sure the unit is turned OFF and the power cord is disconnected from the AC wall outlet.

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



Field Replaceable Assemblies

Description	P/N on Assm	FRU P/N	25L	28L	25S	3074	Notes
Back Panel	220251-001	220251-001	Yes	Yes	Yes	Yes	
Expansion Back Panel	220260-001	220260-001	Yes	Yes	Yes	Yes	
SCP (System Control Processor) PCB - 1174-25S	220253-900	220253-900	Yes	Yes	Yes	Yes	
PCB - 25L	220253-333	220253-333	Yes	No	No	No	
PCB - 28L	220253-444	220253-444	No	Yes	No	No	
PCB - 3074	220253-555	220253-555	No	No	No	Yes	
VHP (V. High Speed Processor) PCB	220271-909	220271-909	Yes	Yes	Yes	Yes	
ESC (ESCON) PCB	220272-909 220272-917	967272-009	Yes	No	Yes	No	1, 2
ESX (ESCON Extended) PCB	220272-964	967272-416	No	Yes	No	No	
ESX (ESCON Extended) PCB	220272-964	977410-001	No	No	No	Yes	
FET (10/100 Mbps Ethernet) PCB	220273-909	967273-009	Yes	Yes	Yes	Yes	
TRC II (4/16 Token Ring) PCB	206617-909	956005-009	Yes	Yes	Yes	No	
BTC-C (Bus & Tag Interface)	213428-900	213428-900	No	No	Yes	No	
CHC (Channel Controller) PCB	206613-909	206613-909	No	No	Yes	No	
CHP (Channel Processor) PCB	206612-909	206612-909	No	No	Yes	No	
MCC (Multiplexed Coax Controller) PCB	206606-001	956011-009	Yes	Yes	Yes	No	
SCC (Serial Communications Controller) PCB	210555-909	953377-009	No	No	Yes	No	
HSC (High Speed Serial Communications) PCB	220265-909	967265-009	No	No	Yes	No	
PLIM 1 (RS232, V.35)	968707-001	968707-001	No	No	Yes	No	
PLIM 2 (X.21)	968708-001	968708-001	No	No	Yes	No	
HAC (HSC Adapter Cable)	220210-001	220210-001	No	No	Yes	No	
Drive Power Cable	220203-002	220203-002	Yes	Yes	Yes	Yes	
Fan, Brushless DC	221609-002	221609-002	Yes	Yes	Yes	Yes	
Floppy Drive, 3.5" black, in 5.25" bracket, cable		895741-001	Yes	Yes	Yes	Yes	
SCSI Hard Drive	28041-459		No	No	Yes	No	3
HDD Signal Cable	220204-001	220204-001	Yes	Yes	Yes	Yes	
IDE Hard Drive with SCSI to IDE bridge adapter	221335-100	221335-100	Yes	Yes	Yes	Yes	
IDE Hard Drive, 40 GB (no adapter)	53639-040	53639-040	Yes	Yes	Yes	Yes	
'a' card (SCSI to IDE adapter)	53638-002	53638-002	Yes	Yes	Yes	Yes	
OPBA (Op Panel translator Adapter) PCB	221264-001	221264-001	Yes	Yes	Yes	Yes	
Op Panel	211700-004	211700-004	Yes	Yes	Yes	Yes	
Op Panel Cable	220202-001	220202-001	Yes	Yes	Yes	Yes	
Power Supply Assembly with Fans	221420-001	221420-001	Yes	Yes	Yes	Yes	
Power Supply without Casing	53447-001	53447-001	Yes	Yes	Yes	Yes	
RS232 Cable for SCC PCB	211128-020 211128-040	956660-020 956660-040	No	No	Yes	No	

Field Replaceable Assemblies cont'd

Description	P/N on Assm	FRU P/N	25L	28L	25S	3074	Notes
V.35 Cable for SCC PCB	211130-001	956661-001	No	No	Yes	No	
DTE RS232 Cable for HSC PCB	968711-020	968711-020	No	No	Yes	No	
DCE RS232 Cable for HSC PCB	968712-020	968712-020	No	No	Yes	No	
DTE V.35 Cable for HSC PCB	968713-020	968713-020	No	No	Yes	No	
DCE V.35 Cable for HSC PCB	968714-020	968714-020	No	No	Yes	No	
DTE X.21 Cable for HSC PCB	968715-020	968715-020	No	No	Yes	No	
ESCON Plug	53553-001	53553-001	Yes	Yes	Yes	Yes	

Notes:

1. ESC PCB 220272-917 can replace ESC PCB 220272-909 but requires LINCS 8.2 or higher be installed on the platform.
2. ESC FRU 967272-009 can not be used to install an additional ESC card on the SCON-25L. The SCON-25L also requires feature activation for additional LPAR support.
3. The SCSI Hard Drive only shipped originally on the 1174-25S, SCSI Hard Drives are replaced by installing a new IDE drive with the SCSI to IDE bridge (P/N 221335-100).

Removal/Replacement Procedures

Main Cover

Removal

1. Ensure power is off.
2. Remove the six screws attaching the main cover to the unit chassis.
3. Slide the main cover toward the front of the unit and lift clear to remove it from the chassis.

Replacement

Reverse the procedure to replace the cover. Be careful when moving the main cover towards the rear, so as not to snag any of the cables. Proper alignment of the main cover before pushing it into place is very important to avoid damaging the hardware. Pay particular attention to the position of the On/Off switch and the floppy disk drive with regards to their openings in the cover. When the main cover is in the correct position, the rear cover should make direct contact with it. (If it appears that you can not reinstall the screws without distorting the rear cover, then the main cover is not correctly positioned.)

Circuit Board Assembly

Removal

1. Ensure power is off. Remove the main cover.
2. Locate the Circuit board to be removed.
3. Disconnect all cables attached to the Circuit board.
4. Remove the screw securing the board to the rear entry panel.
5. Lift the board from its back panel connector and slide it clear of the unit.

Replacement

1. Install the new card by carefully inserting it into the slot vacated in removal step 5.
2. Use the screw removed in step 4 above to secure the newly installed board.
3. Use the Main Cover Replacement procedure described above.

Note: Replacement of the SCP Card should be by authorized support personnel only. The transfer of licensing information is required to make the board work properly.

Operator Panel

Removal

1. Ensure power is off. Remove the cover.
2. Remove the operator panel by carefully pushing out on one of the tabs on either side of the panel housing. These tabs are very fragile.
3. Lift the panel clear of the operator panel mounting bracket.
4. Disconnect the operator panel cable.

Replacement

1. Move the new operator panel into position, lining the tabs of the panel to the proper position in the mounting bracket. Very carefully press the panel into place. The mounting tabs are very fragile, and will easily break off if stressed.
2. Plug the operator cable into the corresponding socket, paying attention to the cable orientation and key.
3. Use the Main Cover Replacement procedure described above.

Floppy Disk Drive

Removal

1. Ensure power is off. Remove the cover.
2. Locate and disconnect the drive signal 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 signal and power supply cables.
5. Replace the cover carefully, using the Main Cover Replacement procedure described above. You may have to reposition the disk drive to align it with the cover properly.

Hard Disk Drive

The hard disk drive is installed below the floppy drive. Note that older platforms use a SCSI hard disk, while newer platforms use an IDE hard disk with a SCSI to IDE adapter mounted to it.

Removal

1. Ensure power is off. Remove the cover.
2. Remove the floppy disk drive assembly.
3. Remove the SCP and any other boards required to provide space for hard disk drive removal from the unit.
4. Locate and disconnect the hard disk drive signal, fan and power supply cables.
5. Remove the four screws attaching the hard disk drive to its bracket. There are two screws located on each side of the drive bracket.
6. 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 signal and power supply cables.

Note: Ensure the drive signal cable is properly attached to the back panel connector.

5. Reinstall any boards and floppy disk drive that were removed.
6. Replace the cover using the Main Cover Replacement procedure described above.
7. If the replacement drive does not have LINCS software on it already, you may have to format the drive (Offline Utility 41), then initialize the drive (Offline Utility 36), then perform a software merge of LINCS code. Information on how to run the Offline Utilities can be found in the *LINCS Problem Determination Manual*. Merging new code onto the drive can be found in Chapter 3 of this manual.

Power Supply Assembly

Removal

1. Ensure power is off and disconnect AC power. Remove the cover.
2. Disconnect the fan cables from the back panel. Please note that there are three separate connector locations!
3. Disconnect the AC input from the connector on the back of the power supply.
4. Remove the two screws attaching the power supply assembly to the chassis.
5. Slide the assembly from its mounting.

Replacement

1. Slide the new power supply assembly into position and secure with screws.
2. Reconnect the AC input and fan cables.
3. Reinstall the cover using the Main Cover replacement procedure described above.
4. Reattach the AC power and boot.

Back Panel and Expansion Back Panel Assembly

Removal

1. Ensure power is off and disconnect AC power.
2. Disconnect the cables attached to boards.
3. Remove the cover.
4. Remove all Circuit boards attached to the back panel and expansion back panel from the unit, using standard antistatic handling precautions.
5. Disconnect all cables attached to the back panel.
6. Disconnect fan cables from the power supply.
7. Disconnect the power supply assembly from the back panel.
8. Disconnect the power supply AC cable.
9. Remove the ten screws attaching the back panel, and the six screws attaching the expansion back panel to the chassis.
10. Carefully lift the back panel and expansion back panel from the chassis.
11. Separate the two back panels after removal from the chassis.

Replacement

1. Marry the back panel and expansion back panel, and install them into the chassis cavity by reinstalling the screws of step 9, taking care to line up the DC power connector of the power supply when putting the cards into position.
2. Reattach the power supply AC cable, fan cables, drive cables, etc.
3. Reinstall the circuit boards removed in step 4 above, and secure them with screws.
4. Reinstall the cover using the Main Cover replacement procedure above.
5. Reinstall cables including power cable and apply power.

New Hardware Installation Procedures

The installation of new hardware features onto the 25S/25L/28L/3074 is very similar to the replacement of existing hardware with a few 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 25S/25L/28L/3074 does not already have one installed. Positioning of the new hardware requires knowledge of how the 25S/25L/28L/3074 will react by numbering the cards. Finally, you will probably need to inform the software that the new hardware has been installed.

Selecting Location for the New Board

In general, the 25S/25L/28L/3074 will number the cards of a specific type going from lowest Slot ID to the largest Slot ID. Note that the Slot Number and the Slot ID are not the same in all cases. Specifically Slot 13 and Slot 1 have their Slot IDs swapped. You can avoid confusion by not using Slot 13 unless you have to.

If you must locate a new board of a type already installed, it is best if you can install the new board in a slot with a higher Slot ID than the others. If this can not be done, you may have to move the cabling associated with this board type, from one board to another to keep the numbering straight.

Board Installation Procedure

1. Follow the procedures for removing the covers from the 25S/25L/28L/3074.
2. Using the Board Slot Population chart as a guide, select the slot where you intend to locate the new board.
3. Locate the screw holding the bracket in place for the slot where you want to position the new board. Remove the screw.
4. Position the new board into the slot associated with the bracket that you just removed, and carefully plug it in.
5. Using the screw removed in step 2, secure the board bracket to the rear bracket.
6. Reassemble the covers.
7. Plug any cables associated with the new board, into the appropriate connectors.
8. Using the appropriate Configuration Manual as a guide, boot the 25S/25L/28L/3074 and adjust the values shown on the Product Definition panel in configuration to reflect the new hardware that was just installed.

Symbols

1174-25S General Description 1-1
3270 Coax Cables 2-5
3270 Host Connection 2-8

A

Assembly Drawing 4-1
Attaching the ESC Interface to the Channel 2-18

B

Back Panel & Expansion Back Panel Assembly
Removal 4-7
BTC-C 1-3
Bus/Tag Cable Interfacing 2-14

C

Cable Distances 2-5
Cables 2-11
Channel Board Installation 2-14
Channel Cables 2-5
Channel Interface Selector 3-4
CHC/CHP 1-3
Circuit Board Removal 4-4
Coax Terminal Server 1-2
Communications Concentrator 1-2
Connecting to the Channel 2-11
Controls 3-1

E

EIA - RS232
(for HSC) 2-5
(for SCC) 2-5
Environmental Parameters 2-4
Error Types 3-5
ESC 1-3
ESCON Channel Interface 2-17
ESX 1-3
Ethernet Cable 2-5
Ethernet Connection 2-8
Event Log 3-7
Exception Errors 3-6

F

FET 1-3
Field Replaceable Assemblies 4-2, 4-3
Floppy Disk Drive Removal 4-5

G

General Description 1-1
1174-25S 1-1
SCON-25L 1-1
SCON-28L 1-1

H

Hard Disk Drive Removal 4-5
Hardware Components 1-3
Hardware Failures 3-7
Hardware Installation Procedures 4-7
High Speed Communication Interface 2-19
HSC 1-3

I

IML 3-4
IML Errors 3-6
Indicators 3-1
Installing/Removing Printed Circuit Boards 2-3
IP Channel Bridge 1-2

K

Keypad 3-2

L

LAN Device Support 1-2
LAN Printer Support 1-2
LED Descriptions 2-10
Local Channel Bypass 2-16
Location Planning 2-4

M

Main Cover Removal 4-3
MCC 1-3
Memory Requirements 2-2

O

Online Errors 3-7
Operator Panel Display 3-8
Operator Panel Removal 4-4

P

Power Cable 2-5
Power Cable Requirements 2-7
Power Requirements 2-4
Power Supply Assembly Removal 4-6

R

RS232 Serial Interface 2-18

S

SCC 1-3

SCON-25L General Description 1-1

SCON-28L General Description 1-1

Serial Port 2-18

Setting the Priority on the BTC 2-15

Slot Identification 2-21

Software Merge 3-8

Switches/Indicators 2-10

T

TN3270E Server 1-2

Token Ring Cable 2-5

Token Ring Connection 2-8

TRC 1-3

U

Unpacking Printed Circuit Boards 2-3

V

V.35 Cable

(for HSC) 2-5

(for SCC) 2-5

VHP 1-3