

Volume

3



The SpeedlinkTM System

Acceptance Testing

DIAMOND LANE COMMUNICATIONS CORPORATION PROPRIETARY DATA

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Speedlink Documentation

Introduction Speedlink documentation provides complete detailed instructions on how to install, test, and turn-up a Speedlink System. This documentation complies with all requirements in Bellcore Technical Reference TR-TSY-000454 *Supplier Documentation for Network Elements* and IP 0260 *Standards for Task Oriented Practices (TOPS)* requirements.

Target Audience Speedlink documentation volumes are written at different levels of detail based on the reader's needs. Below is a list of the various volumes and the intended target audience for each.

VOLUME	TITLE	TARGET AUDIENCE
Volume 1	General	Anyone with a need to understand more about the Speedlink System and planning requirements.
Volume 2	Installation	Installation and Testing Technicians, and Engineers (Detailed Level Procedures)
Volume 3	Acceptance Testing	Testing Technicians and Engineers (Detailed Level Procedures)
Volume 4	Provisioning	Provisioning Technicians and Engineers (Detailed Level Procedures)
Volume 5	Maintenance and Testing	Maintenance and Testing Technicians and Engineers (Detailed Level Procedures)
Volume 6	DiamondView	Network Management Technicians (Tutorial and Reference Manual for DiamondView)
Volume 7	DiamondCraft	Testing and Installation Technicians and Engineers (Tutorial and Reference Manual for DiamondCraft)

**Information
Mapping Style**

All documents are written in Information Mapping style, which presents information in small units or blocks. Each information block is identified by a “subject label” in the left margin and is separated from the next information block by a horizontal line. “Subject labels” make the document easy for the reader to scan and to find information.

Each Detailed Level Procedure states the required equipment and tools to perform the job, provides step by step instructions, with integrated graphics, to help the reader perform each task.

SECTION 1 CARD PLACEMENT

Chapter 1 MCS Card Installation

Introduction The Master Control Shelf (MCS) is designed for placement of 20 printed circuit board cards. The MCS card bay is designed with 20 card guides, bottom and top, to align cards into their correct position.

All cards used in the Speedlink Multiplexer are designed with top and bottom locking tabs on the outside edge of the card. These tabs lift up during placement and lock down into place to secure the card in its MCS slot.

Each MCS card is “keyed” to its matching backplane connectors to prevent cards from being inserted in the wrong slot. The figure on the following page diagrams MCS card placement.

**Required
Equipment and
Tools**

To begin this task you must have the following equipment and tools:

- Electrostatic Discharge Strap (ESD)¹ (DLCC P/N: 85-00012)
- 1 - Network Management Processor (NMP) card (DLCC P/N: 60-0009-800)
- 2 - Master Control Processor cards (DLCC P/N: 60-0008-800)
- 2 - DS3T trunk cards² (DLCC P/N: 60-0007-800)
OR
2 - OC3T trunk cards (DLCC P/N: 60-0027-600)
- 1 to 12 - Master Line Card Adapter (MLA) cards (DLCC P/N: 60-0010-800)

¹ ESD Discharge Strap included in the MCS/ACSIP Installation Kit (DLCC Part Number: 50-0060).

² Two trunk cards are required for redundant protection.

MCS Card
Layout

Place MCS cards into the Master Control Shelf in the following order, from left to right:

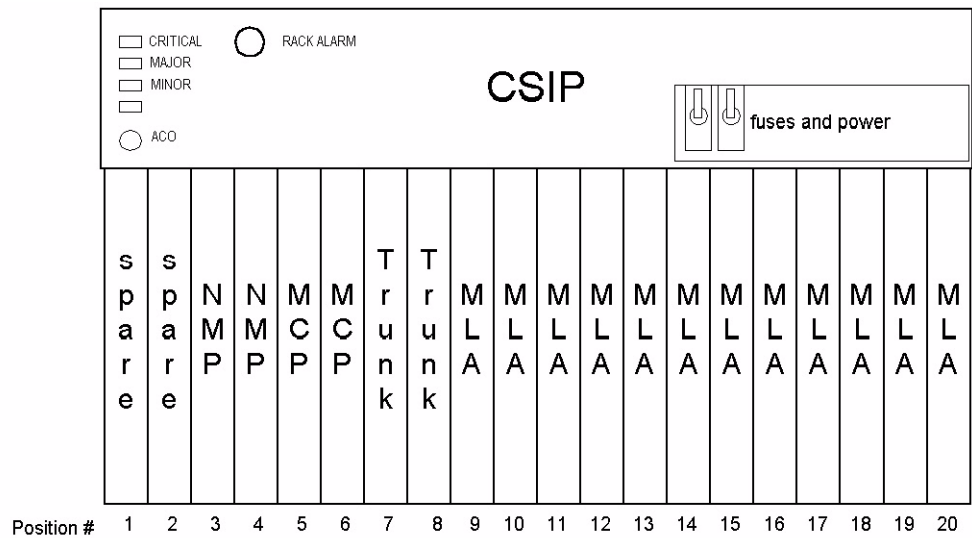


Figure 1: Master Control Shelf Card Layout

Position #

- 1 spare card slot
- 2 spare card slot
- 3 optional Network Management Processor (NMP) card for I/O extension³
- 4 Network Management Processor (NMP) card
- 5 Master Control Processor (MCP) card
- 6 Master Control Processor (MCP) card
- 7 DS3T trunk card or OC3T trunk card
- 8 DS3T trunk card or OC3T trunk card
- 9 Master Line Adapter (MLA) card(s)
- through
- 20 Master Line Adapter (MLA) card(s)

NOTE: One MLA card is required for each Line Card Shelf (LCS). A total of twelve MLA cards are required to support 12 LCSs.

IMPORTANT: All procedures in Volume 2—*Installation* (Chapters 1 through 13) must be completed before proceeding with Master Control Shelf Card Installation.

³ Planned for future release.

**MCS Card
Placement**

Follow the steps listed below to install each MCS card into the Master Control Shelf:

Table 1: MCS Card Placement

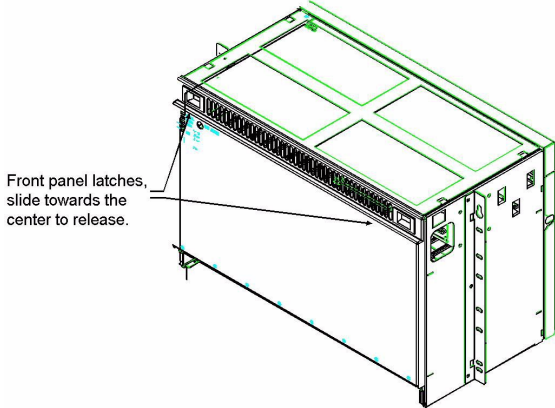
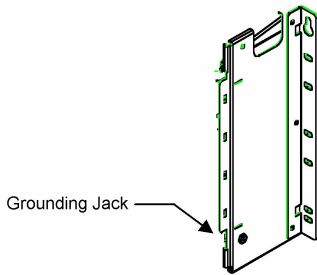
STEP	PROCEDURE
1	<p>Unlatch and lower the front panel to access the MCS card bay and Common Systems Interface Panel (CSIP). The latches are located at the top of the panel. Slide both latches inward to release and lower the panel.</p>  <p>Figure 2: MCS Front Panel Release Latches</p>
2	<p>MCS card packaging contains IMPORTANT WARNINGS and INSTRUCTIONS on how to correctly handle cards. Follow these warnings and procedures carefully to prevent any electrostatic damage during installation.</p>
3	<p>WEAR AN ELECTROSTATIC DISCHARGE (ESD) STRAP <u>at all times</u> during card installation to prevent possible damage to the MCS cards. Plug the discharge strap wire into the grounding jack before handling cards. The grounding jack is located on the side of the Master Control Shelf assembly.</p>  <p>Figure 3: Grounding Jack Location—Side View of MCS Assembly</p>

Table 1: MCS Card Placement (continued)

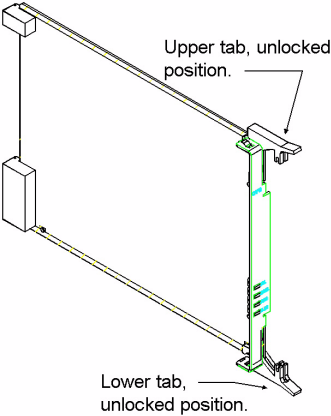
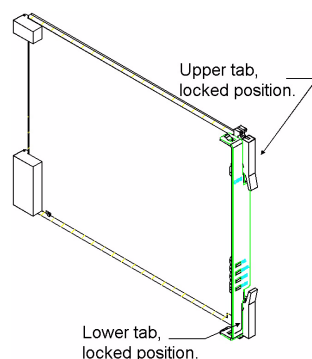
STEP	PROCEDURE
4	Carefully remove the Network Management Processor (NMP) card from its packaging.
5	<p>Flip and hold the locking tabs (located on the outside edge of the card) in their up or unlocked position.</p> <div data-bbox="792 590 1120 1003"></div> <p>Figure 4: MCS Card with Locking Tabs in the Unlocked Position</p>
6	<p>Slide the NMP card in its guide (card slot #4) until it plugs into the backplane connector. Each card is “keyed” so it will only plug into its correct position on the backplane.</p> <p>CAUTION: DO NOT force the card into position. If the card does not plug in easily, slide the card back out and verify you are placing it in the correct position and that the guides are aligned. Check for any obstructions or bent pins on the connectors that might prevent the card from sliding easily into place.</p>

Table 1: MCS Card Placement (continued)

STEP	PROCEDURE
7	<p>Flip the locking tabs down until you hear an audible “click.” The “click” indicates the card is locked into position.</p>  <p>Figure 5: MCS Card with Locking Tabs in Locked Position</p>
8	<p>Repeat Steps 3 through 7 for all cards in the Master Control Shelf:</p> <p>Slot #5 Master Control Processor (MCP) card</p> <p>Slot #6 Master Control Processor (MCP) card</p> <p>Slot #7 DS3T trunk card or OC3T trunk card</p> <p>Slot #8 DS3T trunk card or OC3T trunk card</p> <p>Slot #9 - #20 Master Line Card Adapter (MLA) cards</p>
9	<p>Lift the MCS front panel back into position. Slide the latches toward the center and release to lock into place.</p>
10	<p>The MCS Card Installation procedure is complete.</p>

SECTION 1 CARD PLACEMENT

Chapter 2 LCS Card Installation

The Line Card Shelf (LCS) is designed for placement of 26 printed circuit board cards. The LCS card bay is designed with 26 card guides, bottom and top, to align cards into their correct position.

Introduction All cards used in the Speedlink Multiplexer are designed with top and bottom locking tabs on the outside edge of the card. These tabs lift up during placement and lock down into place to secure the card in its LCS slot.

Each LCS card is “keyed” to its matching backplane connectors to prevent cards from being inserted in the wrong slot. The figure below diagrams LCS card placement.

Required Equipment and Tools To begin this task you must have the following equipment and tools:

- Electrostatic Discharge Strap (ESD)¹ (DLCC Part Number: 85-0012)
- 1 - 24 line cards according to your cabling plan:
 - CAP2 Dual ADSL line card(s) (DLCC Part Number: 60-0005-801)
 - CAP4 Quad ADSL line card(s) (DLCC Part Number: 60-0080-801)
 - DMT4 Quad ADSL line card(s) (DLCC Part Number: 60-0066-801)
 - SDSL8 Octal SDSL line card(s) (DLCC Part Number: 60-0044-801)
 - IDSL8 Octal SDSL line card(s) (DLCC Part Number: 60-0054-801)
- 1 – LSM2 card (DLCC Part Number: 60-0037-801)

¹ ESD Discharge Strap included in the LCS/LPFS Installation Kit (DLCC Part Number: 50-0070)

LCS Card
Layout

Place LCS cards into the Line Card Shelf in the following order, from left to right, according to your cabling plan:

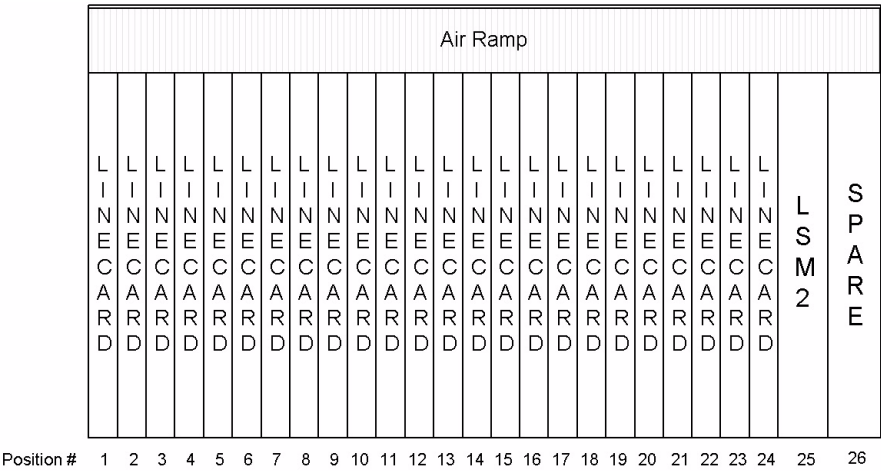


Figure 6: Line Card Shelf Card Layout

Position #

- 1 Line card (CAP2, CAP4, DMT4, SDSL8, or IDSL8)
- through
- 24 Line card (CAP2, CAP4, DMT4, SDSL8, or IDSL8)
- 25 Line Card Shelf Multiplexer (LSM2) card
- 26 Spare slot for future use

Each Line Card Shelf can support up to 48 Dual ADSL lines, 96 Quad ADSL lines, or 192 Octal SDSL or IDSL lines.

The Line Card Shelf connects to the Master Control Shelf via the LSM2 card. The LSM2 card connects to one Master Line Card Adapter (MLA) card in the Master Control Shelf.

Line Card Specifications

Release 3.0 supports 5 different line card types:

- CAP2 (Dual ADSL)
- CAP4 (Quad ADSL)
- DMT4 (Quad ADSL)
- SDSL8 (Octal SDSL)
- IDSL8 (Octal IDSL)

Line Card Shelf cabling must match the requirements of the line card layout.

CAP4 and DMT4 cards can be supported on the same Line Card Shelf with SDSL8 and IDSL8 line cards, when each card type is placed within its own six pack (i.e., all CAP4 cards in one six pack, all IDSL8 cards in one six pack, etc.). These cards all operate on an LCS backplane provisioned at 25 MHz.

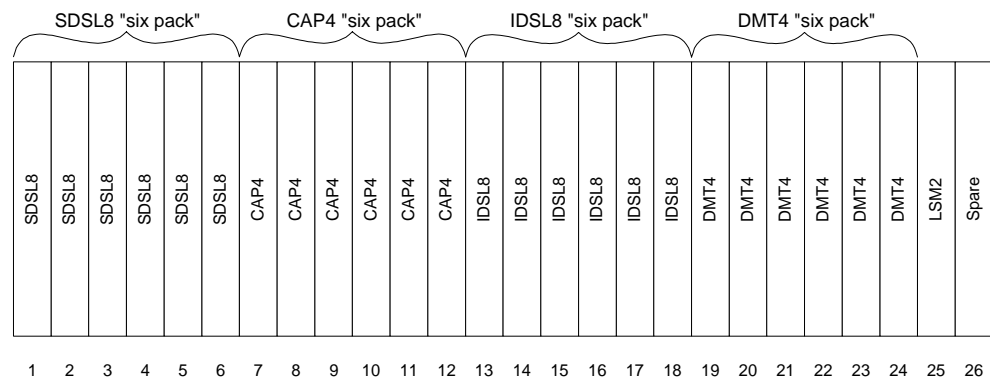


Figure 7: Line Card Shelf with SDSL8, CAP4, IDSL8, and DMT4 Line Cards

The portion of the LCS backplane supporting CAP2 cards must be provisioned at 12.5 MHz. CAP2 cards can be supported on the same Line Card Shelf with CAP4, DMT4, SDSL8, and IDSL8 cards, in one of the following configurations:

- all CAP2 cards in slots 1-12 (at 12.5 MHz), and 6-pack combinations of CAP4, DMT4, SDSL8, and IDSL8 cards in slots 13-24 (at 25 MHz), OR
- 6-pack combinations of CAP4, DMT4, SDSL8, and IDSL8 cards in slots 1-12 (at 25 MHz), and all CAP2 cards in slots 13-24 (at 12.5 MHz)

ACCEPTANCE TESTING
Card Placement
Line Card Specifications

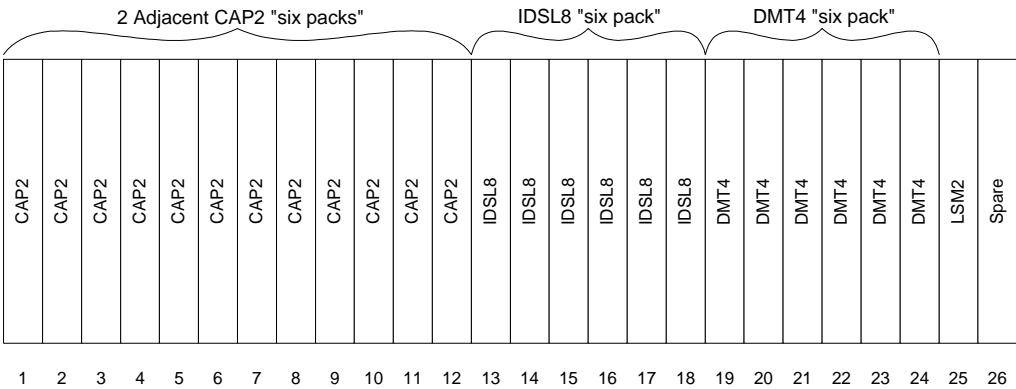


Figure 8: Line Card Shelf with CAP2, IDSL8, and DMT4 Line Cards

IMPORTANT: All procedures in the previous volume, Volume 2—*Installation* (Chapters 1 through Chapter 13), must be completed before proceeding with Line Card Installation.

**LCS Card
Placement**

Follow these steps to install each LCS card into the Line Card Shelf:

Table 2: LCS Card Placement

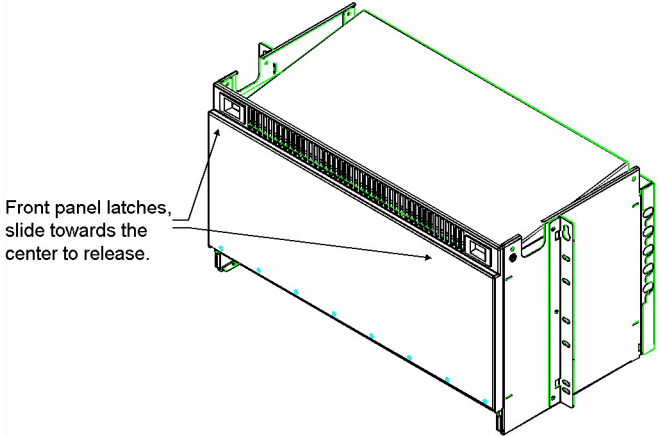
STEP	PROCEDURE
1	<p>Unlatch and lower the front panel to access the LCS card bay. The latches are located at the top of the front panel. Slide both latches inward to release and lower the panel.</p>  <p>Figure 9: LCS Front Panel Release Latches</p>
2	<p>LCS card packaging contains IMPORTANT WARNINGS and INSTRUCTIONS on how to correctly handle cards. Follow these warnings and procedures carefully to prevent any electrostatic damage during installation and adjustment.</p>

Table 2: LCS Card Placement (continued)

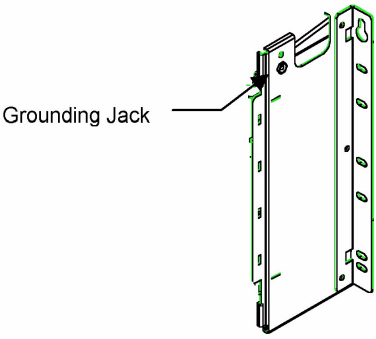
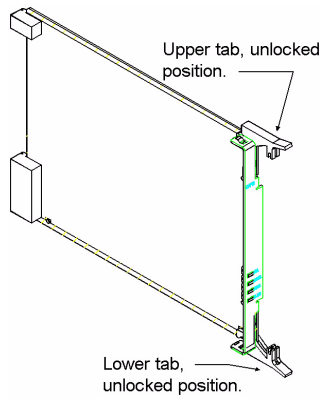
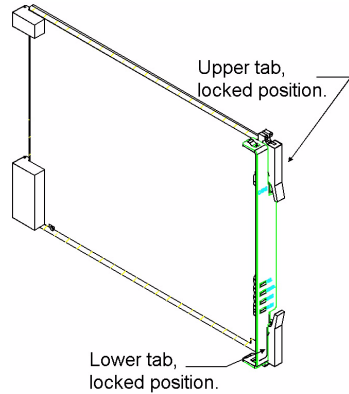
STEP	PROCEDURE
3	<p>WEAR AN ELECTROSTATIC DISCHARGE (ESD) STRAP <u>at all times</u> during card installation to prevent possible damage to the LCS cards. Plug the discharge strap wire into the grounding jack before handling cards. The grounding jack is located on the side of the Line Card Shelf assembly.</p> <div data-bbox="771 619 1144 955"></div> <p>Figure 10: Grounding Jack Location—Side View of LCS Assembly</p>
4	<p>Carefully remove the line card from its packaging.</p>
5	<p>Flip and hold the locking tabs (located on the outside edge of the card) in their up or unlocked position.</p> <div data-bbox="795 1165 1112 1564"></div> <p>Figure 11: Line Card with Locking Tabs in the Unlocked Position</p>

Table 2: LCS Card Placement (continued)

STEP	PROCEDURE
6	<p>Slide the line card in its guide (card slot #1) until it plugs into the backplane connector. Each card is “keyed” so it will only plug into its correct position on the backplane.</p> <p>CAUTION: DO NOT force the card into position. If the card does not plug in easily, slide the card back out and verify you are placing it in the correct position and that the guides are aligned. Check for any obstructions or bent pins on the connectors that might prevent the card from sliding easily into place.</p>
7	<p>Flip the locking tabs down until you hear an audible “click.” The “click” indicates the card is locked into position.</p>  <p>Figure 12: Line Card with Locking Tabs in the Unlocked Position</p>
8	<p>Continue placing line cards following Steps 3 through 7 based on the number of line cards and Line Card Shelves (1 through 12) engineered for the Speedlink system.</p> <p>Slot #2 through Slot #24 CAP2, CAP4, DMT4, SDSL8, or IDSL8 line cards Slot #25 LSM2 (Line Card Shelf Multiplexer) card Slot #26 (Spare slot for future use)</p>
9	<p>Lift the LCS front panel back into position. Slide the latches toward the center and release to lock into place.</p>
10	<p>The LCS Card Installation procedure is complete.</p>

SECTION 1 CARD PLACEMENT

Chapter 3 LPFS Card Installation

Introduction

A Low Pass Filter Shelf (LPFS) is required if the Speedlink system Multiplexer is engineered for ADSL voice plus data applications. This procedure provides detailed instructions on how to install LPFS cards. If you are installing a system designed for data only, skip to Chapter 4—“MCS to LCS Cabling” on page 19.

The Low Pass Filter Shelf (LPFS) is designed for placement of 24 printed circuit board cards. The LPFS card bay is designed with 24 card guides, bottom and top, to align cards into their correct position.

The LPFS supports the following LPFS cards:

- LPF2 - for use with CAP2 ADSL line cards
- LPF4 - for use with CAP4 ADSL line cards
- LPF4D - for use with DMT4 ADSL line cards

LPFS cards are designed with a bottom locking tab on the outside edge of the card. This tab lifts up during placement and locks down to secure the card in its LPFS slot. Each LPFS card is “keyed” to its backplane connector. The figure on the next page diagrams LPFS card placement.

Required Equipment and Tools

To begin this task you must have the following equipment and tools:

- 1 - 24 LPFS cards:
 - LPF2 card (DLCC Part Number: 60-0016-801)
 - LPF4 card (DLCC Part Number: 60-0016-802)
 - LPF4D card (DLCC Part Number: 60-0016-803)

LPFS Card
Layout

LPFS card layout is as follows:

Place LPFS cards into the Low Pass Filter Shelf in the following order, from left to right:

- Position #**
- 1 LPFS card (LPF2, LPF4, or LPF4D)
 - through
 - 24 LPFS card (LPF2, LPF4, or LPF4D)

NOTE: Each Low Pass Filter Shelf can support up to 48 ADSL lines with LPF2 cards, or 96 ADSL lines with LPF4 or LPF4D cards.

	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Position #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	

Figure 13: Low Pass Filter Shelf Card Layout

IMPORTANT: All procedures in Volume 2—*Installation* (Chapters 1 through 13) must be completed before proceeding with Low Pass Filter Card Installation.

LPFS Card
Placement

Follow these steps to install each LPFS card into the Low Pass Filter Shelf:

Table 3: LPFS Card Placement

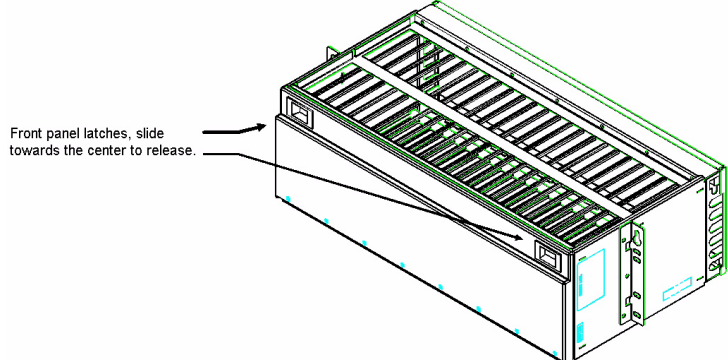
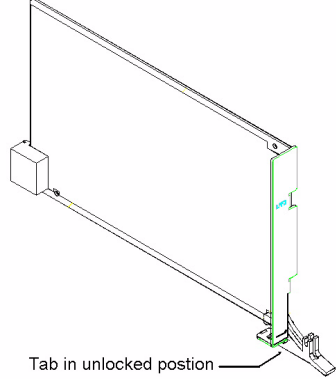
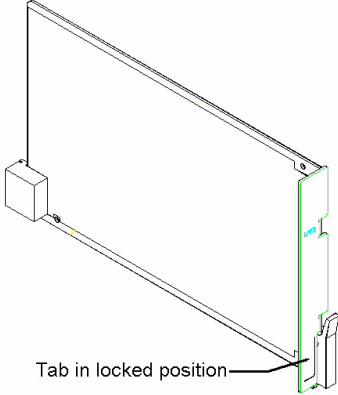
STEP	PROCEDURE
1	<p>Unlatch and lower the front panel to access the LPFS card bay. The latches are located at the top of the front panel. Slide both latches inward to release and lower the panel.</p>  <p>Front panel latches, slide towards the center to release.</p> <p>Figure 14: LPFS Assembly—Front View</p>
2	<p>LPFS card packaging contains IMPORTANT WARNINGS and INSTRUCTIONS on how to correctly handle cards. Follow these warnings and procedures carefully to prevent any electrostatic damage during installation.</p>
3	<p>Carefully remove the card from its packaging.</p>
4	<p>Flip and hold the locking tab (located at the bottom of the card) in its up or unlocked position.</p>  <p>Tab in unlocked position</p> <p>Figure 15: LPFS Card with Locking Tab in the Unlocked Position</p>

Table 3: LPFS Card Placement (continued)

STEP	PROCEDURE
5	<p>Slide the card in its guide until it plugs into the backplane connector. Each card is “keyed” so it will only plug into its correct position on the backplane.</p> <p>CAUTION: DO NOT force the card into position. If the card does not plug in easily, slide the card back out and verify you are placing it in the correct position and that the guides are aligned. Check for any obstructions or bent pins on the connectors that might prevent the card from sliding easily into place.</p>
6	<p>Flip the locking tab down until you hear an audible “click.” The “click” indicates the card is locked into position.</p> <div data-bbox="792 884 1127 1276">A technical diagram showing a perspective view of an LPFS card installed in a backplane. The card is a long, thin rectangular unit. On the right side, there are two locking tabs. The bottom tab is shown in a downward position, indicated by a green arrow and the text 'Tab in locked position'. The top tab is also shown in a downward position. The card is connected to a backplane on the left side.</div> <p>Figure 16: LPFS Card with Locking Tabs in the Locked Position</p>
7	<p>Continue placing LPFS cards based on the number of LCS Line Cards installed.</p>
8	<p>Lift the LPFS front panel back into position. Slide the latches toward the center and release to lock into place.</p>
9	<p>The LPFS Card Installation procedure is complete.</p>

SECTION 2 FIBER OPTIC CABLING

Chapter 4 MCS to LCS Fiber Optic Cabling

Introduction Line Card Shelves are connected to the Master Control Shelf via the Line Card Shelf Multiplexer (LSM2) card. Each LSM2 card connects to a Master Line Card Adapter (MLA) card in the Master Control Shelf. The LSM2 and MLA cards exchange signals at OC-3c rate over optical fiber. The LSM2 card receives the signal from its MLA card and then multiplexes and demultiplexes ATM cell streams for up to 24 line cards.

This chapter provides detailed instructions on how to make the fiber optic cable connections between the LSM2 card in a Line Card Shelf and its MLA card in the Master Control Shelf.

Required Equipment and Tools To begin this task you must have the following equipment and tools:

- Duplex fiber optic cables (62.5 mm diameter) with SC duplex connectors (3 meter cable; DLCC Part Number: 70-0003-030)

One duplex fiber optic cable with duplex connectors is required for each LSM2 card.

Fiber Optic
Cable
Connection—
MCS to LCS

Fiber optic cabling is fully connectorized. Duplex fiber optic cables (62.5µm diameter), with SC duplex connectors at both ends, are provided for each LCS or LSM2 card shipped with the Speedlink system.

Follow these steps to connect fiber optic cable from the LSM2 card in the Line Card Shelf to its MLA card in the Master Control Shelf:

Table 4: Fiber Optic Cable Connection MCS to LCS

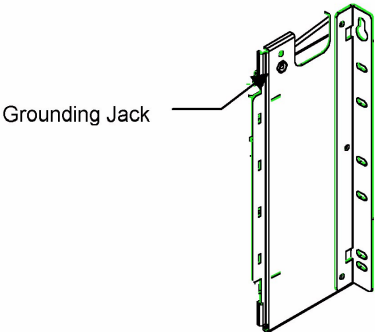
STEP	PROCEDURE
1	Unlatch and lower the LCS1 front panel to access the card cage. Latches are located at the top of the panel. Slide both latches inward to release and lower the panel.
2	<p>WEAR AN ELECTROSTATIC DISCHARGE (ESD) STRAP <u>at all times</u> during card installation to prevent possible damage to the cards. Plug the discharge strap wire into the grounding jack before handling cards. The grounding jack is located on the side of the Line Card Shelf assembly.</p> 
3	<p>Select a 3 meter duplex fiber optic cable for LCS1. Clean connectors at both ends of the cable following local practices^a.</p> <p>IMPORTANT: Be careful when handling and routing fiber optic cabling. Do not make any bends or coil the cabling in less than a 2” diameter loop. The cabling is fragile and kinks or sharp bends can cause signal distortion.</p> <p>IMPORTANT: Follow all standard safety procedures when using fiber optic cabling and equipment to prevent eye damage.</p>

Table 4: Fiber Optic Cable Connection MCS to LCS (continued)

STEP	PROCEDURE
4	Clean the transmit and receive connectors located on the card fronts of the LSM2 and MLA cards following local procedures. See drawing in STEP 5.
5	<p>Connect the duplex fiber optic cable to the transmit and receive connectors on the LSM2 card in LCS 1. Position the SC duplex connector so the small tabs are on the left. Push in on the connector until it locks into position.</p> <p>NOTE: The MLA “transmit” (front) fiber connection must be connected to the LSM2 “receive” (back) connector, and the MLA “receive” fiber connection must be connected to the LSM2 “transmit” connector. The duplex fiber optic cables with SC duplex connections ensure that these connections are made correctly.</p> <div data-bbox="597 919 1421 1302"> <p>The figure consists of two side-by-side perspective drawings of a card's edge. Each drawing shows a vertical edge with two ports. The left port is labeled 'Receive' and the right port is labeled 'Transmit'. The ports are SC duplex connectors. The left drawing shows the 'Receive' port at the top and the 'Transmit' port at the bottom. The right drawing shows the 'Receive' port at the top and the 'Transmit' port at the bottom.</p> </div> <p>Figure 17: “Transmit” and “Receive” Connector Locations</p>

Table 4: Fiber Optic Cable Connection MCS to LCS (continued)

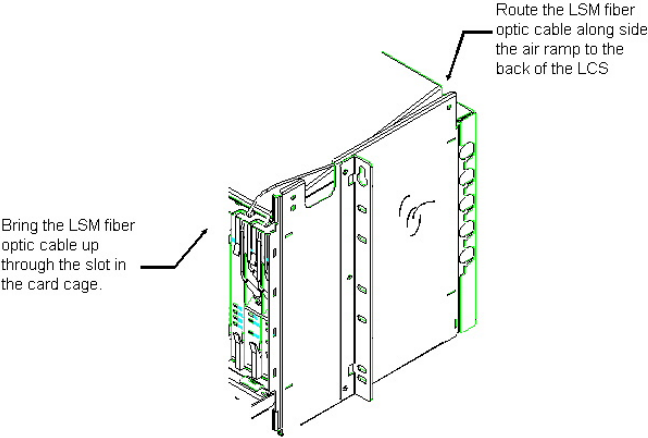
STEP	PROCEDURE
6	<p>Route the fiber optic cable up through the slot at the top of the card cage, into the channel along the air ramp, and out to the back of the LCS.</p> <p>IMPORTANT: Be careful when handling and routing fiber optic cable. Do not make any bends or coil the cable in less than a 2” diameter loop. The cable is fragile and kinks or sharp bends can cause signal distortion.</p> <div><p>Bring the LSM fiber optic cable up through the slot in the card cage.</p><p>Route the LSM fiber optic cable along side the air ramp to the back of the LCS</p></div> <p>Figure 18: LCS Fiber Optic Cabling</p>
7	<p>Lift the LCS front panel up into position. Slide both latches towards the center and release to lock in place.</p>

Table 4: Fiber Optic Cable Connection MCS to LCS (continued)

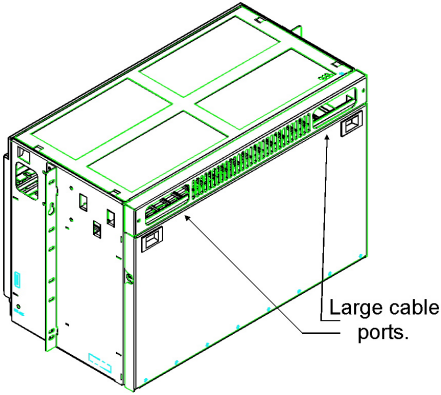
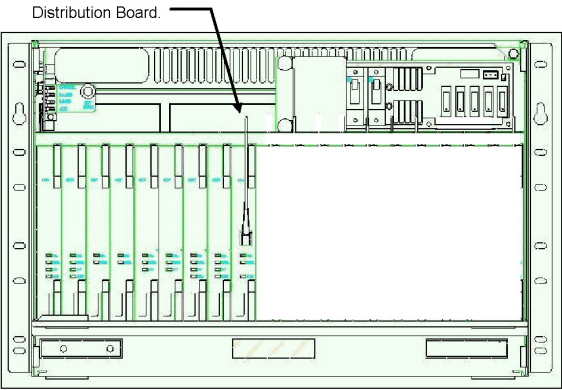
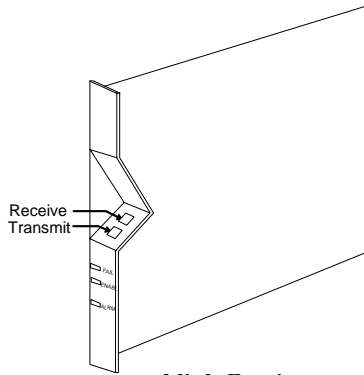
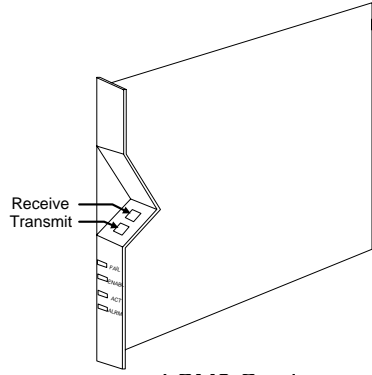
STEP	PROCEDURE
8	<p>Go to the back of the LCS. Route the fiber optic cable up the relay rack rails to the back of the Master Control Shelf. Push the cables through one of the large cable ports at the back of the MCS.</p>  <p>Figure 19: Master Control Shelf Assembly—Back View</p>
9	<p>Unlatch and lower the MCS front panel. Latches are located at the top of the front panel. Slide both latches inward and release and lower the panel.</p>
10	<p>Pull the fiber optic cable through to the front of the MCS and to the left of the CSIP Power and Distribution Board^b.</p>  <p>Figure 20: Master Control Shelf—MLA Fiber Optic Cabling</p>
11	<p>Route the cable through the clip and down through the slot at the top of the MCS card cage to the first MLA card; see drawing in STEP 10.</p>

Table 4: Fiber Optic Cable Connection MCS to LCS (continued)

STEP	PROCEDURE
12	Loosely coil any slack in the fiber optic cable and lay it on top of the MCS card cage along side the CSIP. You may loop and tie fiber optic cable outside the MCS back panel if the area above the MCS card cage becomes too congested. Again, <u>do not</u> coil the cable in less than a 2" diameter loop.
13	<p>Connect the duplex fiber optic cable to the transmit and receive connectors on the first MLA card. Position the SC duplex connector so the small tabs are on the left. Push in on the connector until it locks into position.</p> <p>NOTE: The MLA “transmit” (front) connector must be connected to the LSM2 “receive” (back) connector and the MLA “receive” connector must be connected to the LSM2 “transmit” connector. The duplex fiber optic cables with SC duplex connectors ensure that these connections are made correctly.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>MLA Card</p> </div> <div style="text-align: center;">  <p>LSM2 Card</p> </div> </div> <p style="text-align: center;">Figure 21: “Transmit” and “Receive” Connector Locations</p>
14	Lift the MCS front panel back into position. Slide the latches toward the center and release to lock into place.
15	Repeat Steps 1 through 14 for each LCS installed in the Speedlink system. Connect each LSM2 card to its corresponding MLA card. The Master Control Shelf holds a maximum of twelve MLA cards for connection to the LSM2 cards in twelve LCSs.
16	The MCS to LCS Fiber Optic Cabling procedure is complete.

-
- ^a Suggested fiber connection cleaning materials include oil-free compressed air, lint-free wipes, isopropyl alcohol, cotton swabs, and lint-free pipe cleaners.
- ^b Route fiber optic cabling from LCSs 1-5 to the *left* of the CSIP Power Distribution Board. Route fiber optic cabling for LCSs 6-12 *under* the CSIP.

SECTION 2 FIBER OPTIC CABLING

Chapter 5 ATM NETWORK FIBER OPTIC CABLING

Introduction The interface between the ATM Network and the Speedlink system is made at the Master Control Shelf (MCS) trunk interface card. The Speedlink system supports three different ATM trunk interface cards:

- DS3T (45 Mbps)
- OC3T (155 Mbps)

This chapter provides detailed instructions on how to connect the ATM network fiber optic cabling to a Speedlink system with OC3T trunk cards.

Required Equipment and Tools

To begin this task you must have the following equipment and tools:

- Duplex fiber optic cabling (62.5 mm diameter) with SC duplex connectors

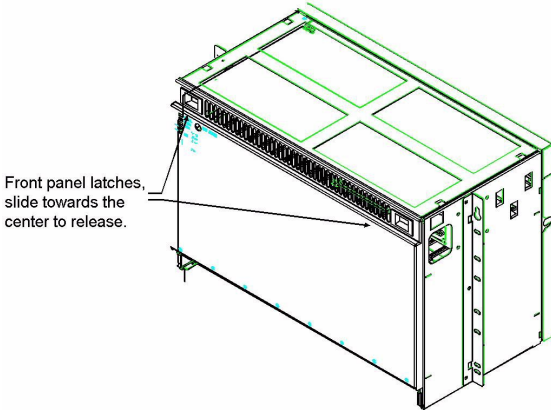
NOTE: One duplex fiber optic cable with duplex connectors is required for each OC3T trunk card installed.

Fiber Optic Trunk Cable Connection

“Transmit” and “receive” fiber optic trunk cabling is connected to and run from the central office Optical Distribution Frame (ODF) across the horizontal cable racks to the Speedlink by the network service provider or a Speedlink Technician. Refer to Volume 2—*Installation*, Chapter 8—“OC3 MCS to ATM Network Cabling.” This trunk cabling is connected to the Speedlink at the faceplate of the OC3T trunk card.

Follow these steps to connect fiber optic cabling from the central office Optical Distribution Frame (ODF) to the OC3T trunk card¹ in the Master Control Shelf:

Table 5: Fiber Optic Trunk Connection

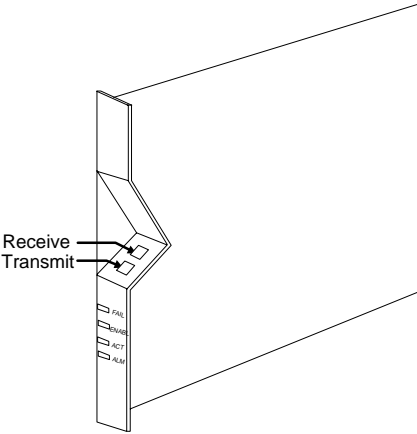
STEP	PROCEDURE
1	<p>Unlatch and lower the front panel to access the MCS card bay. The latches are located at the top of the panel. Slide both latches inward to release and lower the panel.</p>  <p>Figure 22: MCS Front Panel Release Latches</p>
2	<p>Fiber optic cabling runs from the central office Optical Distribution Frame (ODF) to the Speedlink through the clip(s) above slot 7 and slot 8 in the Master Control Shelf (MCS).</p> <p>Has this cabling been done?</p> <ul style="list-style-type: none"> ■ If YES, proceed to STEP 2. ■ If NO, refer to Volume 2—<i>Installation</i>, Chapter 8—“OC3 MCS to ATM Network Cabling” for fiber optic cabling from the ODF to the MCS.
3	<p>If the cabling is tucked inside the top of the MCS, remove the MCS top screen: pull out on the release pin in the top right corner of the MCS and slide the top screen out.</p>

¹ A second OC3T card can be installed in slot 8 for redundant protection.

Table 5: Fiber Optic Trunk Connection

STEP	PROCEDURE
4	<p>Pull the cabling out and down to the OC3T trunk card.</p> <p>IMPORTANT: Be careful when handling and routing fiber optic cabling. Do not make any bends or coil the cabling in less than a 2” diameter loop. The cabling is fragile and kinks or sharp bends can cause signal distortion.</p> <p>IMPORTANT: Follow all standard safety procedures when using fiber optic cabling and equipment to prevent eye damage.</p>
5	<p>Clean the connectors on the end of the fiber optic cabling following local procedures.^a</p>
6	<p>Clean the transmit and receive connectors located on the card front of the OC3T trunk card following local procedures. See drawing on page 30.</p>

Table 5: Fiber Optic Trunk Connection

STEP	PROCEDURE
7	<p>Connect the duplex fiber optic cabling to the “transmit” and “receive” connectors on the OC3T trunk card. Position the SC duplex connector so the small tabs are on the left. Push in on the connector until it locks into position.</p> <p>If a second OC3T trunk card has been installed, connect the second cable to the “transmit” and “receive” connectors on the second card.</p> <p>NOTE: The ODF “transmit” fiber connection must be connected to the OC3T “receive” (back) connector, and the ODF “receive” fiber connection must be connected to the OC3T “transmit” (front) connector. The duplex fiber optic cabling with SC duplex connections ensures that these connections are made correctly.</p>  <p>Figure 23: OC3T Trunk Card “Transmit” and “Receive” Connector Locations</p>
8	Slide the MCS top screen back into position and push in on the release pin to secure.
9	Lift the MCS front panel back into position. Slide the latches toward the center and release to lock into place.
10	The ATM Network Fiber Optic Cabling procedure is complete.

^a Suggested fiber connection cleaning materials include oil-free compressed air, lint-free wipes, isopropyl alcohol, cotton swaps, and lint-free pipe cleaners.

SECTION 3 TEST AND TURN-UP

Chapter 6 Speedlink Test and Turn-up

Introduction The Speedlink system installation, cabling and card placement procedures are now complete. This chapter provides detailed instructions on how to turn up the Speedlink system and determine its operational condition.

Required Equipment and Tools To begin this task you must have the following equipment and tools:

- 15 amp GMT fuses (DLCC Part Number: 73-0002-015¹)

Power Up the Speedlink Follow these steps to “power up” the Speedlink system:

Table 6: Power Up the Speedlink

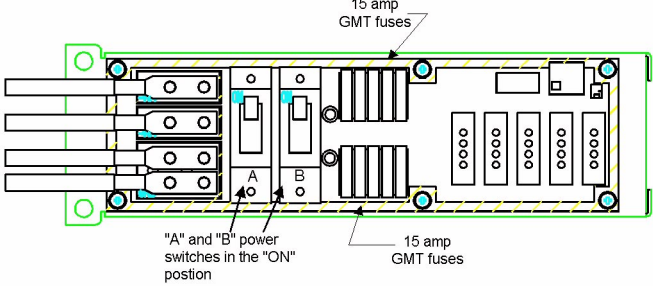
STEP	PROCEDURE
1	WEAR AN ELECTROSTATIC DISCHARGE STRAP (ESD) <u>at all times</u> to prevent any electrostatic damage during Test and Turn-up procedures.

¹ 15 amp fuses are also included in the MCS/ACSIP Installation Kit (DLCC Part Number: 50-0060).

Table 6: Power Up the Speedlink (continued)

STEP	PROCEDURE
2	<p>Remove the Master Control Shelf and Line Card Shelf front panels during Test and Turn-up procedures. Removing the front panels makes it easier to observe indicator lights at the CSIP Power and Distribution Board, Alarm Board, MCS and LCS cards.</p> <p>Unlatch and lower the front panel so it is level with the bottom of the card cage. Hold the panel on both sides and slide to the left about ¼ inch. Pull the panel towards you and release it from the holding clips.</p> <p>IMPORTANT: The front panels must be replaced and closed after all Test and Turn-up Procedures are completed. This is important to ensure proper air flow through the Speedlink system.</p>
3	<p>IMPORTANT: At the Master Control Shelf CSIP Power and Distribution Board^a check to make sure the “A” and “B” power switches are set in the “OFF” or “Down” position.</p> <div data-bbox="594 974 1268 1283"> <p>The diagram shows a top-down view of the CSIP Power and Distribution Board. On the left, there are two vertical columns of power switches labeled 'A' and 'B'. Arrows point to these switches with the text: '"A" and "B" power switches in "OFF" position'. To the right of the switches are two sets of five fuse holders each, labeled 'FX2A' and 'FX2B'. Arrows point to these fuse holders with the text: 'Fuse Holders for five 15 Amp GMT Fuses'.</p> </div> <p>Figure 24: CSIP—"A" and "B" Power Switches in the "OFF" Position</p>
4	<p>The CSIP has fuse “A” and “B” holders for the first 5 shelves in the Speedlink system: one MCS and up to four LCSs. Fuse holders are set up as follows:</p> <ul style="list-style-type: none"> ■ Fuse 1: Master Control Shelf ■ Fuse 2-5: Line Card Shelves 1 through 4 <p>Install the 15 amp GMT fuses that are shipped with the Master Control Shelf and Line Card Shelves. Install fuses with the metal “tang” down.</p> <p>IMPORTANT: Only place fuses for the MCS and installed LCSs. <u>DO NOT</u> place fuses in all five fuse holder positions unless you are installing an MCS and four LCSs.</p>

Table 6: Power Up the Speedlink (continued)

STEP	PROCEDURE
5	<p>Set “A” and “B” power switches to the “ON” or “Up” position.</p>  <p>Figure 25: CSIP power switches in the “ON” position</p>
6	<p>The Speedlink system will take 3 to 4 minutes to boot up.</p>

^a The CSIP Power and Distribution Board will be referred to as the CSIP throughout this procedure.

Indicator Lights

While the Speedlink is going through the boot-up process, a number of different indicator lights will come on and off. The following procedure explains what these lights indicate and any recommended action.

Table 7: Indicator Lights

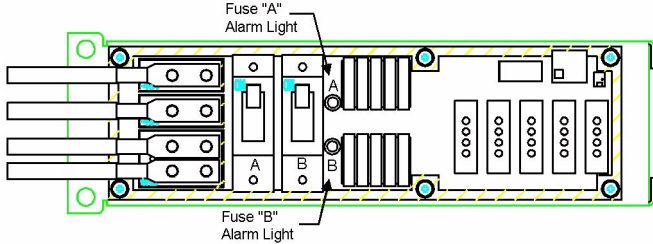
STEP	PROCEDURE
1	<p>Check the CSIP “A” and “B” fuse alarm indicator lights. The alarm lights are located to the left of the fuse holders.</p>  <p>Figure 26: CSIP Fuse “A” and “B” Alarm Indicator Lights</p>

Table 7: Indicator Lights (continued)

STEP	PROCEDURE
2	<p>Is a Fuse Alarm indicator light on?</p> <ul style="list-style-type: none"> ■ If YES, replace the blown fuse. A blown fuse is indicated by an exposed colored tip on the metal “tang”. ■ If NO, all fuses are good. Continue to STEP 3.
3	<p>The Bay Alarm indicator light is located in the upper left of the Master Control Shelf. It will stay on until the Speedlink Master Control Processor (MCP) card completes its initialization process. This takes approximately 3 to 4 minutes.</p> <div data-bbox="568 787 1312 1222" data-label="Image"> <p>The diagram illustrates the front view of a Master Control Shelf (MCS) rack. It features a top shelf with various components and a lower section with multiple vertical slots. A label 'Bay Alarm Indicator Light' with a leader line points to a small, circular indicator light located on the left side of the top shelf. The rack is shown with its front panel, and the internal components are visible through the open slots.</p> </div> <p>Figure 27: Front View of MCS—Bay Alarm Indicator Light</p>
4	<p>The front panel of each card in the Master Control Shelf and Line Card Shelf has LED indicator lights. These lights come on solid during power-up and then go through a sequence of flashing on and off during initialization. All “FAIL” and “ALM” indicator lights go out and the “ENABL” indicator lights stay on solid once the initialization process is complete.</p> <p>The Bay Alarm indicator light will go off once the green “ENABL” lights come on.</p> <p>The Speedlink system—Visual Status Check procedure beginning on page 35 provides more detail on LED indicator lights.</p>

**Speedlink
System—Visual
Status Check**

The front panel of each card in the Master Control Shelf (MCS) and the Line Card Shelves (LCSs) has LED indicator lights. The purpose of these LEDs is to provide “limited” information and conditions about the Speedlink system.

Visual Status Check procedures for each MCS and LCS card begin on the next page. Some of the Visual Status Check procedures require the use of DiamondCraft to check the conditions for a particular card. Instructions on how to use DiamondCraft for Test and Turn-up begin on page 43.

Front Panel LED indicators are defined in Appendix C on page 107 for each MCS and LCS card.

IMPORTANT: The Speedlink takes approximately 3 to 4 minutes to boot up. Make sure you wait until this initialization process is complete before proceeding with the visual status check.

“FAIL” Indicator

Follow these steps to visually check the status of all Master Control Shelf cards (NMP, MCP, DS3T, OC3T, MLA) and all Line Card Shelf cards (LSM2, CAP2, CAP4, DMT4, SDSL8, and IDSL8):

Table 8: “FAIL” Indicator

STEP	PROCEDURE
1	Is the <u>red</u> “FAIL” indicator light OFF? <ul style="list-style-type: none"> ■ If YES, the card is functional. Continue to the next procedure: “ENBL” Indicator on page 36. ■ If NO, continue to STEP 2.
2	Is the <u>red</u> “FAIL” indicator light steady ON? <ul style="list-style-type: none"> ■ If YES, use DiamondCraft to check the condition of the card. See Chapter 7—“Using DiamondCraft for Test and Turn-up” beginning on page 43. Follow the recommended action listed in Appendix B—Conditions and Recommended Action beginning on page 69. ■ If NO, continue to STEP 3.

Table 8: “FAIL” Indicator (continued)

STEP	PROCEDURE
3	<p>Is the <u>red</u> “FAIL” indicator light FLASHING?</p> <ul style="list-style-type: none"> ■ If YES, and it is flashing on and off at ½ second intervals, then either the card’s software is newer than that of the active MCP, or the slot is provisioned for a different card (i.e., a CAP2 card is in a slot provisioned for an SDSL8 card). Use DiamondCraft to check the condition of the card. See Chapter 7—“Using DiamondCraft for Test and Turn-up” beginning on page 43. Follow the recommended action listed in Appendix B—Conditions and Recommended Action beginning on page 69. <p>NOTE: The “FAIL” indicator light will flash on and off at 2 second intervals during download of a new code.</p> <ul style="list-style-type: none"> ■ If NO, continue to the next procedure: “ENABL” Indicator.

“ENABL” Indicator

Follow these steps to visually check the status of all Master Control Shelf cards and all Line Card Shelf cards:

Table 9: “ENABL” Indicator

STEP	PROCEDURE
1	<p>Is the <u>green</u> “ENABL” indicator light steady ON?</p> <ul style="list-style-type: none"> ■ If YES, this card has initialized all its hardware and software, the card is “unlocked,” and it is providing or can provide service. Do not unplug this card. Continue to one of the following procedures: <ul style="list-style-type: none"> - for the NMP card: there are no additional LEDs to check - for MCP, DS3T, OC3T or LSM2 cards: “ACT” Indicator on page 38 - for MLA cards: “ALM” Indicator on page 39 - for line cards: “ALM” Indicator on page 40 ■ If NO, continue to STEP 2.

Table 9: “ENABL” Indicator (continued)

STEP	PROCEDURE
2	<p>Is the <u>green</u> “ENABL” indicator light FLASHING?</p> <ul style="list-style-type: none"> ■ If YES, the card is initializing. <ul style="list-style-type: none"> 1) The “ENABL” indicator light will flash on and off at 1 second intervals while the boot code is loading. 2) The “ENABL” indicator light will flash on and off at ½ second intervals while the operational system is loading. Wait approximately 1 to 2 minutes for this process to be completed and for the light to stop flashing. <p>The “ENABL” indicator light will continue to flash on and off at 2 second intervals until the cards are “unlocked”. Follow the procedure in Chapter 7—“Using DiamondCraft for Test and Turn-up” beginning on page 43, to “unlock” cards.</p> <p>If the card is an MCP or DS3 trunk card, continue to STEP 3.</p> <p>If the card is <i>not</i> an MCP or DS3 trunk card, skip to STEP 4.</p> ■ If NO, continue to STEP 3.
3	<p>Is the card an MCP, DS3T, or OC3T trunk card?</p> <ul style="list-style-type: none"> ■ If YES, the card is in “hot” standby status and being updated with configuration information from the active card. The flashing will stop once the synchronization process is complete. ■ If NO, continue to STEP 4.
4	<p>Is the <u>green</u> “ENABL” indicator light OFF?</p> <ul style="list-style-type: none"> ■ If YES, the card is not providing service, this may indicate a failure. See Chapter 7—“Using DiamondCraft for Test and Turn-up” beginning on page 43. Follow the recommended action listed in Appendix B—Conditions and Recommended Action beginning on page 69. Continue to STEP 5. ■ If NO, continue to STEP 5.
5	<p>Continue to one of the following procedures:</p> <ul style="list-style-type: none"> - for MCP, DS3T, OC3T or LSM2 cards: “ACT” Indicator on page 38 - for MLA cards: “ALM” Indicator on page 39 - for line cards: “ALM” Indicator on page 40

“ACT” Indicator

Follow these steps to visually check the status of the MCP, DS3T, OC3T, and LSM2 cards:

Table 10: “ACT” Indicator

STEP	PROCEDURE
1	<p>Is the <u>yellow</u> “ACT” indicator light steady ON?</p> <ul style="list-style-type: none"> ■ If YES, the card is the “active” card of a protection pair and is providing or can provide service. DO NOT unplug this card. Continue to the next procedure: “ALM” Indicator—DS3T, OC3T, MLA, and LSM2 Cards on page 39. ■ If NO, continue to STEP 2.
2	<p>Is the <u>yellow</u> “ACT” indicator light OFF?</p> <ul style="list-style-type: none"> ■ If YES, the protection card is synchronized with the active card and in “standby” status, normal status for the protection card. ■ If NO, continue to STEP 3.
3	<p>Is the <u>yellow</u> “ACT” indicator light FLASHING?</p> <ul style="list-style-type: none"> ■ If YES, the protection card is synchronizing itself with the active card and is not ready to take over operations. The card is in “hot” standby status. Wait approximately 3 minutes for the indicator light to stop flashing. ■ If the “ACT” light continues to flash, use DiamondCraft to check the condition of the card. See Chapter 7—“Using DiamondCraft for Test and Turn-up” beginning on page 43. Follow the recommended action listed in Appendix B—Conditions and Recommended Action beginning on page 69. ■ If NO, continue to the next procedure: “ALM” Indicator on page 39.

“ALM” Indicator—DS3T, OC3T, MLA, and LSM2 Cards

Follow these steps to visually check the status of the DS3T, OC3T, MLA, and LSM2 cards:

Table 11: “ALM” Indicator—DS3T, OC3T, MLA, and LSM2 Cards

STEP	PROCEDURE
1	Is the <u>red</u> ALM indicator light ON? <ul style="list-style-type: none"> ■ If YES, continue to STEP 2. ■ If NO, continue to the next procedure: “ALM” Indicator—Line Cards on page 40.
2	Is the card a trunk card (DS3T or OC3T)? <ul style="list-style-type: none"> ■ If YES, continue to STEP 3. ■ If NO, skip to STEP 4.
3	Is the trunk card connected to an ATM Network Element (router or ATM switch)? <ul style="list-style-type: none"> ■ If YES, verify the near end network equipment connection. Use DiamondCraft to verify that the network equipment is sending a signal. This may indicate a Loss of Signal (LOS) or Loss of Frame (LOF) problem. See Chapter 7—“Using DiamondCraft for Test and Turn-up” beginning on page 43. Follow the recommended action listed in Appendix B—Conditions and Recommended Action beginning on page 69. ■ If NO, the ALM indicator light will remain ON until a network equipment connection is made. <p>IMPORTANT: The trunk card must be connected to a router or ATM switch to completely test and turn up the system.</p>
4	Is the card an MLA or LSM2 card? <ul style="list-style-type: none"> ■ If YES, the fiber optic connections may be dirty, reversed or defective. Use DiamondCraft to check the condition of the card, this may indicate a loss of signal problem. See Chapter 7—“Using DiamondCraft for Test and Turn-up” beginning on page 43. Follow the recommended action listed in Appendix B—Conditions and Recommended Action beginning on page 69. ■ If NO, continue to the next procedure: “ALM” Indicator—Line Cards on page 40.

“ALM” Indicator—Line Cards

Follow these steps to visually check the status of the line cards (CAP2, CAP4, DMT4, SDSL8, and IDSL8):

Table 12: “ALM” Indicator—Line Cards

STEP	PROCEDURE
1	<p>Is the <u>red</u> “ALM” indicator light ON?</p> <ul style="list-style-type: none"> ■ If YES, one or more of the ports configured for “managed service” is unable to perform its function. It may mean a loss of synchronization or loss of signal. This is not an equipment failure, continue to STEP 2. ■ If NO, no alarm condition exists. Line card ports are either “locked” and not configured for service, or are “unlocked” and are providing service to end user equipment. Line cards themselves can also be locked or unlocked. Continue to the next procedure, “SYNC” Indicator—Line Cards on page 41.
2	<p>Use DiamondCraft to determine if the line card ports are connected to end user equipment and configured for service. See Chapter 7—“Using DiamondCraft for Test and Turn-up” beginning on page 43. Follow the recommended action listed in Appendix B—Conditions and Recommended Action beginning on page 69.</p> <p>Are the line card ports connected to end user equipment at the end of the local loop?</p> <ul style="list-style-type: none"> ■ If YES, continue to STEP 3. ■ If NO, use DiamondCraft to determine if line card ports are locked or unlocked. See Chapter 7—“Using DiamondCraft for Test and Turn-up” beginning on page 43. Follow the recommended action listed in Appendix B—Conditions and Recommended Action beginning on page 69. The ALM indicator light will remain ON if line card ports are unlocked and not connected to end user equipment. Continue to the next procedure: “SYNC” Indicator—Line Cards on page 41.

Table 12: “ALM” Indicator—Line Cards (continued)

STEP	PROCEDURE
3	<p>Use DiamondCraft to determine if the ports are “unlocked.” Are the ports unlocked?</p> <ul style="list-style-type: none"> ■ If YES, verify the far end network connection. Use DiamondCraft to verify that the end user’s equipment is sending a signal; this is a possible Loss of Signal (LOS), Loss of Power (LPR), or Loss of Frame (LOF) problem. See Chapter 7—“Using DiamondCraft for Test and Turn-up” beginning on page 43. Follow the recommended action listed in Appendix B—Conditions and Recommended Action beginning on page 69. <p>End user equipment may be turned off—the ALM indicator light will remain ON until end user equipment is turned back on.</p> <ul style="list-style-type: none"> ■ If NO, continue to the next procedure: “SYNC” Indicator—Line Cards.

^a Will not generate an alarm event unless the service is provisioned for “managed service”. If the service is provisioned for “managed service” an alarm is generated.

“SYNC” Indicator—Line Cards

Follow these steps to visually check the status of the line cards (CAP2, CAP4, DMT4, SDSL8, and IDSL8):

Table 13: “SYNC” Indicator—Line Cards

STEP	PROCEDURE
1	<p>Is the <u>yellow</u> “SYNC” indicator light steady ON?</p> <ul style="list-style-type: none"> ■ If YES, the card is synchronized and one or more ports on this line card is connected to equipment on the other end of the local loop. This card may be providing service, <u>DO NOT</u> unplug this card. Continue to STEP 4. ■ If NO, continue to STEP 2.

Table 13: “SYNC” Indicator—Line Cards (continued)

STEP	PROCEDURE
2	<p>Is the <u>yellow</u> “SYNC” indicator light FLASHING?</p> <ul style="list-style-type: none"> ■ If YES, the card is either in “testing” mode, or is establishing a connection with end user equipment at the end of the local loop, this may take about 15 seconds. When the connection is established the “SYNC” indicator light will go to steady ON condition. Continue to STEP 4. <p>NOTE: On the SDSL8 and IDSL8 cards, the “SYNC” light may not begin flashing for up to 30 seconds.</p> <ul style="list-style-type: none"> ■ If NO, continue to STEP 3.
3	<p>Is the <u>yellow</u> “SYNC” indicator light OFF?</p> <ul style="list-style-type: none"> ■ If YES, the line card is not synchronized and none of the ports are connected to end user equipment on the other end of the local loop. This light will stay off until one or more of the ports are connected to end user equipment on the other end of the local loop. ■ If NO, continue to STEP 4.
4	<p>The Speedlink Test and Turn-up procedure is complete.</p>

SECTION 3 TEST AND TURN-UP

Chapter 7 Using DiamondCraft for Test and Turn-up

Introduction	DiamondCraft is a stand-alone craft interface application. It is used for initial installation of a Speedlink Multiplexer, to complete initial test and turn-up procedures, to set up communications with DiamondView, and for on-site diagnosis of a hardware or local network problem. DiamondCraft communicates directly with the Speedlink Multiplexer through a serial port or Ethernet connection using Point-to-Point Protocol (PPP). It operates on a PC laptop or desktop, using Windows NT operating system.
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DiamondCraft Reference Documents	<p>This procedure assumes you are familiar with both chapters contained in Volume 7—<i>DiamondCraft</i>:</p> <ul style="list-style-type: none">■ Chapter 1—“Principles of Operation” - contains information on how to install DiamondCraft and Simple Network Management Protocol (SNMP) and Remote Access Service (RAS) software, and how to navigate in the application.■ Chapter 2—“DiamondCraft Reference Manual” - contains information on menus, toolbars, on-line help and object views.
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Refer to these documents as necessary while completing this procedure.

DiamondCraft On-Line Help	DiamondCraft has Windows NT and DiamondCraft application help available via the Help menu.
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For more information refer to Volume 7—*DiamondCraft*, Chapter 2—“DiamondCraft Reference Manual”.

**Required
Equipment and
IP Information**

To begin this task you must have the following equipment and tools:

- A laptop PC to support Windows NT, Simple Network Management Protocol (SNMP), Remote Access Service (RAS), and DiamondCraft software.
- A standard serial port cable with a 9 pin RS-232-C (DB-9) male connector on one end—to connect directly to the Speedlink Multiplexer¹—and a 9 pin or 25 pin RS-232-C (DB-9) female connector on the other end—to match the serial port connector on your PC².
- Contact the local Network Administrator to get Speedlink system IP Address information for the DiamondView and DiamondCraft In Band and 10Base-T Ethernet connections:
IP Address, for example: 192.168.1.4
IP Mask, for example: 255.255.255.0
Gateway, for example: 192.168.1.251
VPI/VCI (In Band only), for example: 40, 70

**Set up PC
Interface with
the Speedlink**

Follow these steps to set up DiamondCraft on your PC and connect to the Speedlink:

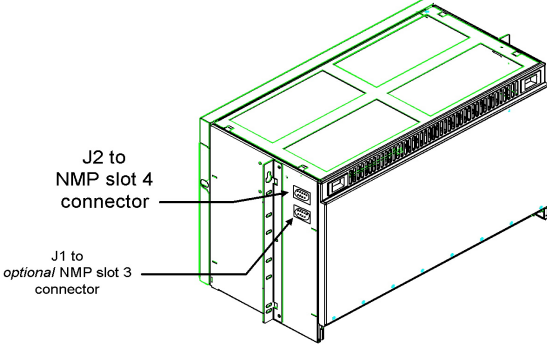
Table 14: Set up PC Interface with the Speedlink

STEP	PROCEDURE
1	Install Windows NT according to the manufacturer's instructions.
2	Install Remote Access Services (RAS) and Simple Network Management Protocol (SNMP) following the instructions in Volume 7— <i>DiamondCraft</i> , Chapter 1—"Principles of Operation", the sections titled, "Add Remote Access Service (RAS)" and "Installing SNMP".
3	Install DiamondCraft software following the instructions in Volume 7— <i>DiamondCraft</i> , Chapter 1—"Principles of Operation", the section titled "Installing DiamondCraft Application Software". IMPORTANT: Windows NT service packs that were previously installed will need to be reinstalled at this point.

¹ If your Speedlink has a male J2 serial port connector, you will need to connect a gender changer device between the serial cable and the Speedlink, or use a serial cable with two female ends.

² To make the Ethernet connection from DiamondCraft to the Speedlink, see "DiamondCraft Ethernet 10Base-T Connection" on page 65.

Table 14: Set up PC Interface with the Speedlink (continued)

STEP	PROCEDURE
4	Connect the serial port cable to your PC's 9 pin or 25 pin serial port connector.
5	<p>Connect the other end of the serial port cable to the J2 serial port connector on the left side of the Speedlink's MCS.</p> <p>The Speedlink has two - 9 pin serial ports located on the back of the Master Control Shelf Alarm Board—the J2 port connects to the Network Management Processor slot 4 card, the J1 port connects to the <i>optional</i> NMP slot 3 card^a. These serial ports are accessed through serial port connectors on the left side of the MCS assembly.</p>  <p>Figure 28: Master Control Shelf Assembly—Side View</p>
6	Continue to the next procedure: Establish Communication with the Speedlink.

^a Planned for future release.

Establish
Communication
with the
Speedlink

Table 15: Establish Communication with the Speedlink

STEP	PROCEDURE
1	<p>To start the DiamondCraft application:</p> <ul style="list-style-type: none"> Click the Start button (usually located at the lower left corner of the PC screen). Select Programs ⇒ DiamondCraft. <p>or if you have installed the DiamondCraft icon on your desktop:</p> <ul style="list-style-type: none"> Double-click the DiamondCraft icon.
2	<p>DiamondCraft displays the Connection Dialogue window:</p> <ul style="list-style-type: none"> Choose Serial Cable. Click OK.
3	<p>After a few moments, DiamondCraft displays the Main screen and the System window.</p> <p>In the Main menu bar:</p> <ul style="list-style-type: none"> Select Tools ⇒ Initialize System...
4	<p>DiamondCraft displays the System Initialization window for setting up the connection between the Speedlink and DiamondView.</p> <p>Are you setting up an Ethernet connection, or the In Band Management connection?</p> <ul style="list-style-type: none"> If you are setting up an Ethernet connection, continue to STEP 5. If you are setting up the In Band Management connection, skip to STEP 6. <p>NOTE: Both the Ethernet connection and the In Band Management connection can be set up on the same Speedlink system.</p> <p>NOTE: The In Band Management connection can be used to access the Speedlink system through both DiamondView and Diamond-Craft.</p>

Table 15: Establish Communication with the Speedlink (continued)

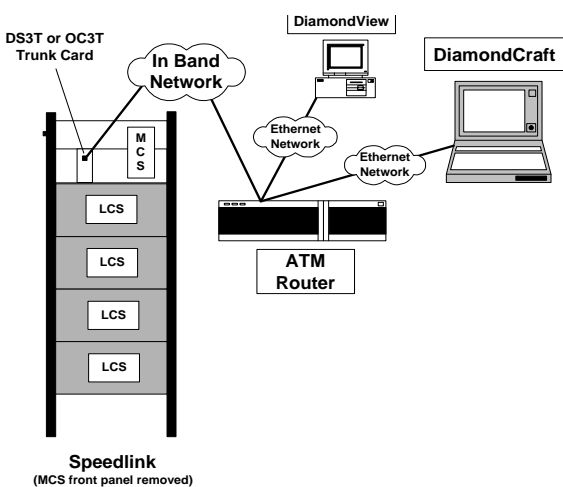
STEP	PROCEDURE
5	<p>To set up an Ethernet connection:</p> <ul style="list-style-type: none"> ■ Enter the IP Address and IP Mask information in the NMP Slot 4^a Ethernet box. ■ Enter the Gateway IP Address information. ■ Click OK. <p>IMPORTANT: The IP Address must be established via DiamondCraft so DiamondView and/or DiamondCraft can communicate with the Speedlink over a TCP/IP data network.</p> <p>See “DiamondView Ethernet 10Base-T Connection” instructions on page 61 and “DiamondCraft Ethernet 10Base-T Connection” instructions on page 65 for Ethernet physical connections.</p> <p>Skip to STEP 8.</p>
6	<p>IMPORTANT: Before you can set up the In Band Management connection, you must verify with the Network Administrator that the DS3 or OC3 network router or switch has been set up and provisioned as follows^b:</p> <ul style="list-style-type: none"> ■ The VPI/VCI information matches the In Band settings to be entered through DiamondCraft. ■ The VPI/VCI bandwidth configuration does not exceed a maximum of 128 Kbps.  <p>The diagram illustrates the network setup for in-band management. On the left is a vertical rack labeled 'Speedlink (MCS front panel removed)'. It contains a 'DS3T or OC3T Trunk Card' at the top, followed by four 'LCS' (Line Card Slots) and an 'MCS' (Main Control Slot) at the bottom. To the right of the rack is an 'In Band Network' cloud. This cloud is connected to an 'ATM Router' below it. The 'In Band Network' cloud is also connected to two 'Ethernet Network' clouds. One 'Ethernet Network' cloud is connected to a 'DiamondView' computer icon, and the other is connected to a 'DiamondCraft' computer icon.</p> <p>Figure 29: In Band Management Network Connection</p>

Table 15: Establish Communication with the Speedlink (continued)

STEP	PROCEDURE
7	<p>To set up the In Band Management connection:</p> <ul style="list-style-type: none"> Enter the IP Address, IP Mask, VPI, and VCI information in the NMP Slot 4^a In Band Management box. Enter the Gateway IP Address information. Click the Create Conn button in the In Band Management box. The system assigns a connection ID number and displays it in the Connection ID box. <p>NOTE: The Create Conn button becomes the Edit Conn button. You can click it to check the status of the connection, and lock or unlock the connection's Administrative State.</p> <ul style="list-style-type: none"> Click OK.
8	<p>DiamondCraft will display the System window.</p> <ul style="list-style-type: none"> Click the System tab page. In the MCP Synchronization dialog box, click the Yes option button. Click the SAVE^c command button to permanently save IP Address information in the Speedlink's Management Information Base (MIB). Click Yes in the box that appears, stating that the procedure may take several minutes. <p>The System window may be left open.</p>
9	<p>The Establish Communication with the Speedlink procedure is complete.</p> <p>Continue to the next procedure: NMP and MCP Cards—Unlock Administrative Status/Check Conditions.</p>

^a The NMP Slot 3 card is planned for a future release. IP Address, Mask, and Gateway information are not required until the card is installed.

^b The In Band Management connection box is not active until the DS3 or OC3 network router or switch set-up and provisioning is complete.


^c The SAVE command saves all transactions in the MIB in case the NMP or MCP cards fail or in case of a power failure. Use the SAVE command periodically during your DiamondCraft session.

NMP and MCP Cards—Unlock Administrative Status/Check Conditions

NMP and MCP
Cards—Unlock
Administrative
Status/Check
Conditions

Follow these steps to “unlock” the Administrative Status and check the operational conditions of Master Control Shelf NMP and standby MCP³ cards:

Table 16: NMP and MCP Cards—Unlock Administrative Status/Check Condition

STEP	PROCEDURE
1	Display the Equipment Locator group graphic by clicking View in the Main toolbar and selecting Rack .
2	Display the Master Control Shelf (MCS) locator by clicking View in the Main toolbar and selecting MCS . NOTE: The MCS locator does not display Master Control Shelf slots 1 and 2. The first slot in the MCS locator is Master Control Shelf slot 3; it reads “NMP”. References to slot numbers will be according to their actual location in the Master Control Shelf.
3	In the MCS equipment locator, click on the NMP card in slot 4 to display the NMP slot 4 ^a object view window. NOTE: To see all the items in the object view window, you may need to drag it into view, or move or close other opened windows.
4	Click the Status tab in the NMP window to view the NMP’s Administrative State.
5	Click the Unlocked option button in the Administrative State dialog box to “unlock” the NMP card.
6	Click the Refresh ^b  icon in the toolbar to “refresh” the data in the Conditions list box.
7	The Conditions box shows the Operational State and Availability Status for the NMP card. Refer to Appendix B—“NMP and MCP Conditions and Recommended Action” tables on page 69. Follow the Recommended Action listed for the condition. You may now close the NMP object view window or leave it open.

³ The active MCP card comes up “unlocked” in either slot 5 or slot 6.

Table 16: NMP and MCP Cards—Unlock Administrative Status/Check Condition (continued)

STEP	PROCEDURE
8	<p>Repeat Steps 3 through 7 to “unlock” the Administrative State and check conditions for the standby MCP card (slot 6).</p> <p>NOTE: The active MCP card (slot 5) comes up in the “unlocked” state.</p>
9	<p>The NMP and MCP Cards—Unlock Administrative Status and Check Conditions procedure is complete.</p> <p>Continue to the next procedure: Trunk Cards/Ports—Unlock Administrative Status/Check Conditions and Configuration.</p>


^a NMP slot 4 is the main NMP card, NMP slot 3 is an optional card planned for a future release.

^b DiamondCraft automatically refreshes the data in the Conditions list box. The Refresh icon forces a “refresh” command; this is an optional step.

Trunk Cards/
Ports—Unlock/
Check
Conditions and
Configuration

Follow these steps to “unlock” the Administrative Status and to check the operational conditions and default configuration for Master Control Shelf DS3T or OC3T trunk cards and ports:


**Table 17: Trunk Cards/Ports—Unlock Administrative Status/
Check Conditions and Configuration**

STEP	PROCEDURE
1	<p>Click the first trunk card (slot 7) in the Equipment Locator to open the slot 7^a trunk card object view window.</p> <p>NOTE: The MCS locator does not display Master Control Shelf slots 1 and 2. The first slot in the MCS locator is Master Control Shelf slot 3; it reads “NMP”. References to slot numbers will be according to their actual location in the Master Control Shelf.</p> <p>NOTE: To see all the items in the object view window, you may need to drag it into view, or move or close other opened windows.</p>
2	Click the Status tab to view the trunk card Administrative State.
3	Click the Unlocked option button in the Administrative State dialog box to “unlock” the trunk card.
4	Click the Refresh ^b  icon in the toolbar to “refresh” the data in the Conditions list box.
5	<p>The Conditions box shows the Operational State and Availability Status for the trunk card.</p> <p>Refer to Appendix B—“DS3T Trunk Conditions and Recommended Action” tables on page 73, or “OC3T Trunk Conditions and Recommended Action” tables on page 79. Follow the Recommended Action listed for the condition.</p>
6	Ports are depicted in the Equipment Locator as small circle “ports” on the cards. Click the port on the first trunk card.
7	<p>Is the trunk card a DS3T card, or an OC3T card?</p> <ul style="list-style-type: none"> ■ If the trunk card is a DS3T card, click the DS3T tab and continue to STEP 8. ■ If the trunk card is an OC3T card, click the OC3 tab and skip to STEP 9.

**Table 17: Trunk Cards/Ports—Unlock Administrative Status/
Check Conditions and Configuration (continued)**

STEP	PROCEDURE
8	<p>For a DS3T card, verify the <u>DS3T</u> configuration settings:</p> <ul style="list-style-type: none"> ■ Line Type: click the setting you need: Direct Mapping CBit, Direct Mapping M23, PLCP CBit, or PLCP M23. ■ Line Timing: click the Loop option button. ■ Line Build Out: click the Low^c or High option button. ■ Cell Scrambling: click the Disable or Enable option button. ■ HEC Coset: click the Disable or Enable option button. ■ Click Apply Changes. <p>NOTE: Default settings are in bold.</p> <p>IMPORTANT: The Line Type, Cell Scrambling, and HEC Coset settings must match those at the other end of the DS3 connection (router or ATM switch).</p> <p>Skip to STEP 10.</p>
9	<p>For an OC3T card, verify the <u>OC3</u> configuration settings:</p> <ul style="list-style-type: none"> ■ Facility Type: click the SONET or SDH option button. ■ Timing Option: click the Loop option button. ■ Condition Variables: <ul style="list-style-type: none"> - Enter the appropriate setting for Error rate for signal fail condition (default is 3). - Enter the appropriate setting for BER threshold for signal degrade condition (default is 6). ■ Path RDI: <ul style="list-style-type: none"> - Mode: click Default. - Loss of Cell Delineation: click the Enable or Disable option button. - Payload Label Mismatch: click the Enable or Disable option button. - Trace Identifier Mismatch: click the Enable or Disable option button. ■ Click Apply Changes. <p>NOTE: Default settings are in bold.</p>

**Table 17: Trunk Cards/Ports—Unlock Administrative Status/
Check Conditions and Configuration (continued)**

STEP	PROCEDURE
10	Click the Status tab to view the port's Administrative State.
11	Click the Unlocked option button in the Administrative State dialog box to “unlock” the port.
12	Click the Refresh  icon in the toolbar to “refresh” the data in the Conditions list box.
13	<p>The Conditions box shows the Operational State and Availability Status for the port.</p> <p>Refer to Appendix B—“DS3T Trunk Conditions and Recommended Action” tables on page 73, or “OC3T Trunk Conditions and Recommended Action” tables on page 79. Follow the Recommended Action listed for the condition.</p> <p>You may now close both trunk card object view windows or leave them open.</p>
14	Repeat Steps 1 through 12 to “unlock” the Administrative State and check the configuration settings and conditions for the slot 8 (standby) trunk card and port.
15	<p>The Trunk Card/Port—Unlock and Check Conditions and Configuration procedure is complete.</p> <p>Continue to the next procedure: MLA Cards/Ports—Unlock Administrative Status/Check Conditions.</p>

^a The first unlocked trunk card becomes the active trunk card; in this case, the trunk card in slot 7.

^b DiamondCraft automatically refreshes the data in the Conditions list box. The Refresh icon forces a “refresh” command; this is an optional step.

^c The DS3T trunk Line Interface Unit (LIU) supports two levels of line build out (this is the length of the coax cable from the MCS backplane to the central office DSx3 panel):
 Low = Coax cables shorter than 50 feet; this is the default setting.
 High = Coax cables between 50 and 450 feet.
 Line build out is not applicable to the OC3T trunk card.

MLA Cards/
Ports—Unlock
Administrative
Status/Check
Conditions

Follow these steps to “unlock” the Administrative Status and to check the operational conditions for Master Control Shelf MLA cards and ports:

Table 18: MLA Cards/Ports—Unlock Administrative Status/Check Conditions


STEP	PROCEDURE
1	Click the MLA1 card in the Equipment Locator to open the MLA1 card object view window. NOTE: To see all the items in the object view window, you may need to drag it into view, or move or close other opened windows.
2	Click the Status tab to view the MLA card Administrative State.
3	Click the Unlocked option button in the Administrative State dialog box to “unlock” the MLA card.
4	Click the Refresh  ^a icon in the toolbar to “refresh” the data in the Conditions list box.
5	The Conditions box shows the Operational State and Availability Status for the MLA card. Refer to Appendix B—“MLA Conditions and Recommended Action” tables on page 87. Follow the Recommended Action listed for the condition.
6	Ports are depicted in the Equipment Locator as small circle “ports” on the cards. Click the port on the MLA1 card.
7	Click the Status tab to view the port’s Administrative State.
8	Click the Unlocked option button in the Administrative State dialog box to “unlock” the port.
9	Click the Refresh icon in the Tools menu to “refresh” the data in the Conditions list box.

Table 18: MLA Cards/Ports—Unlock Administrative Status/Check Conditions


STEP	PROCEDURE
10	<p>The Conditions box shows the Operational State and Availability Status for the MLA port.</p> <p>Refer to Appendix B—“MLA Trunk Conditions and Recommended Action” tables on page 87. Follow the Recommended Action listed for the condition.</p> <p>You may now close both MLA object view windows or leave them open.</p>
11	<p>Repeat Steps 1 through 10 to “unlock” the Administrative State and check the conditions for each installed MLA card and port.</p>
12	<p>The MLA Card/Port—Unlock Administrative Status/Check Conditions procedure is complete.</p> <p>Continue to the next procedure: Provisioning the Line Card Shelf Backplane.</p>

^a DiamondCraft automatically refreshes the data in the Conditions list box. The Refresh icon forces a “refresh” command; this is an optional step.

Provisioning the
Line Card Shelf
Backplane

Follow these steps to provision the LCS backplane for the line cards:

Table 19: Provisioning the Line Card Shelf Backplane

STEP	PROCEDURE
1	Click LCS1 in the Rack View Equipment Locator to open the LCS1 object view window. NOTE: To see all the items on an object view window, you may need to close, move, or readjust other opened windows.
2	Click the Config tab to view the LCS Clock Rate Provisioning options.
3	Select the appropriate configuration by clicking its option button: <ul style="list-style-type: none"> ■ “All 12Mhz” for CAP2 cards in all 24 slots ■ “All 25Mhz” for non-CAP2 cards in all 24 slots ■ “Lower 12Mhz, Upper 25Mhz” for all CAP2 cards in slots 1-12 and all other cards in slots 13-24 ■ “Lower 25Mhz, Upper 12Mhz” for all non-CAP2 cards in slots 1-12 and all CAP2 cards in slots 13-24
4	Click the Refresh ^a  icon in the toolbar to “refresh” the data in the Conditions list box. You may now close the LCS1 window or leave it open.
5	Repeat Steps 1 through 4 for each installed LCS.
6	The Provisioning the Line Card Shelf Backplane procedure is complete. Continue to the next procedure: LSM2 Card and Port—Unlock Administrative Status/Check Conditions.

^a DiamondCraft automatically refreshes the data in the Conditions list box. The Refresh icon forces a “refresh” command, this is an optional step.

LSM2 Card and Port—Unlock Administrative Status/Check Conditions

LSM2 Card and Port—Unlock Administrative Status/Check Conditions

Follow these steps to “unlock” the Administrative Status and to check the operational conditions for the LSM2 card and port:

Table 20: LSM2 Card and Port—Unlock Administrative Status/Check Conditions



STEP	PROCEDURE
1	<p>Display the LCS1 Equipment Locator group graphic by clicking View in the Main toolbar and selecting LCS1.</p> <p>NOTE: To see all the items in the object view window, you may need to drag it into view, or move or close other opened windows.</p>
2	<p>Click LC25 in the LCS1 equipment locator to open the LCS1 LC25 object view window.</p> <p>NOTE: The LSM2 card appears “grayed out” at initial start-up. Each card installed in the LCS needs to be “created” before it will appear in DiamondCraft. Continue with the following procedures to “create” the LSM2 card in DiamondCraft.</p>
3	Click the Status tab to view the LSM2 card Administrative State.
4	At the bottom of the tab, click Create .
5	<p>In the drag down window, select LSM2.</p> <p>Click OK.</p> <p>NOTE: The card changes color from gray to black after the “create” function is completed.</p>
6	<p>Click the Unlocked option button in the Administrative State dialog box to “unlock” the LSM2 card.</p> <p>The card changes color from black to dark blue^a after it is “unlocked.”</p>
7	<p>Click the Refresh  icon in the toolbar to “refresh” the data in the Conditions list box.</p>

Table 20: LSM2 Card and Port—Unlock Administrative Status/Check Conditions (continued)


STEP	PROCEDURE
8	<p>The Conditions box shows the Operational State and Availability Status for the LSM2 card.</p> <p>Refer to Appendix B—“LSM2 Card Conditions and Recommended Action” tables on page 92. Follow the Recommended Action listed for the condition.</p> <p>You may now close the LSM2 card object view window or leave it open.</p>
9	<p>Ports are depicted in the Equipment Locator as small circle ports on the cards. To unlock the LSM2 card port:</p> <ul style="list-style-type: none"> Click the port located at the bottom of the LSM2 card in the equipment locator. Click the Status tab to view the LSM2 card port Administrative State. Click Unlocked in the LSM2 Administrative State box.
10	<p>Click the Refresh  icon in the toolbar to “refresh” the data in the Conditions list box.</p>
11	<p>The Conditions box shows the Operational State and Availability Status for the LSM2 card.</p> <p>Refer to Appendix B—“LSM2 Conditions and Recommended Action” tables on page 92. Follow the Recommended Action listed for the condition.</p> <p>You may now close the LSM2 port object view window or leave it open.</p>
12	<p>Repeat Steps 1 through 11 for each LCS in the Rack locator.</p>
13	<p>The LSM2 Card and Port—Unlock Administrative Status and Check Conditions procedure is complete.</p> <p>Continue to the next procedure: Line Cards—Unlock Administrative Status/Check Conditions.</p>

^a You can “create” and “unlock” line cards in DiamondCraft before physically placing them in the LCS. The line cards will appear dark blue after the “create” and “unlock” Steps 4, 5, and 6 are completed.

**Line Cards—
Unlock
Administrative
Status/Check
Conditions**

Follow these steps to “unlock” the Administrative Status and to check the operational conditions for line cards:

**Table 21: Line Cards—Unlock Administrative Status/
Check Conditions**

STEP	PROCEDURE
1	<p>Display the LCS1 Equipment Locator group graphic by clicking View in the Main toolbar and selecting LCS1.</p> <p>NOTE: To see all the items in the object view window, you may need to drag it into view, or move or close other opened windows.</p>
2	<p>Click LC1 in the LCS1 equipment locator to open the LCS1 LC1 object view window.</p> <p>NOTE: Line cards appear “grayed out” at initial start-up. Each card installed in the LCS needs to be “created” before it will appear in DiamondCraft. Continue with the following procedures to “create” line cards in DiamondCraft.</p>
3	Click the Status tab to view the line card Administrative State.
4	At the bottom of the tab, click Create .
5	<p>In the drag down window, select the card type: CAP2, CAP4, DMT4, IDSL, or SDSL.</p> <p>Click OK.</p> <p>NOTE: Cards change color from gray to black after the “create” function is completed.</p>
6	<p>Click the Unlocked option button in the Administrative State dialog box to “unlock” the line card.</p> <p>Line cards change color from black to dark blue^a after they are “unlocked.”</p>
7	<p>Click the Refresh^b  icon in the toolbar to “refresh” the data in the Conditions list box.</p>

**Table 21: Line Cards—Unlock Administrative Status/
Check Conditions (continued)**

STEP	PROCEDURE
8	<p>The Conditions box shows the Operational State and Availability Status for the line card.</p> <p>Refer to Appendix B—“Line Card Conditions and Recommended Action” tables on page 97. Follow the Recommended Action listed for the condition.</p> <p>You may now close the line card object view window or leave it open.</p>
9	<p>IMPORTANT: Do not unlock line card ports until the port is provisioned and connected to end user equipment. Unlocking a line card port before provisioning will cause an “alarm” condition.</p> <p>Ports are depicted in the Equipment Locator as a small circle port on each card. Clicking the port on a line card displays Ports 1 and 2 for Dual cards, Ports 1-4 for Quad cards, and Ports 1-8 for Octal cards.</p> <p>NOTE: A black line card port indicates a “locked” Administrative State. The line card port turns green once the port is unlocked and “synched up” with end user equipment.</p>
10	<p>Repeat Steps 2 through 8 to “create” line cards, and to “unlock” the Administrative State and check the condition of each line card in the LCS.</p>
11	<p>Are there additional Line Card Shelves?</p> <ul style="list-style-type: none"> ■ If YES, repeat all the steps from the previous section and this section for the LSM2 card and line cards on each LCS. ■ If NO, the Line Cards—Unlock Administrative Status/Check Conditions procedure is complete. <p>Continue to the next procedure: DiamondView Ethernet 10Base-T Connection.</p>

^a You can “create” and “unlock” line cards in DiamondCraft before physically placing them in the LCS. The line cards will appear dark blue after the “create” and “unlock” Steps 4, 5, and 6 are completed.

^b DiamondCraft automatically refreshes the data in the Conditions list box. The Refresh icon forces a “refresh” command, this is an optional step.

**DiamondView
Ethernet
10Base-T
Connection**

DiamondView communicates with the Speedlink over a TCP/IP data network⁴ or an In Band Management connection⁵. The physical interface between the Speedlink and the TCP/IP network is an Ethernet 10Base-T port (RJ-45 female connector) located on the Master Control Shelf backplane. This RJ-45 connector connects DiamondView to the Network Management Processor (NMP) slot 4 card.

Follow these directions to make the DiamondView Ethernet connection:

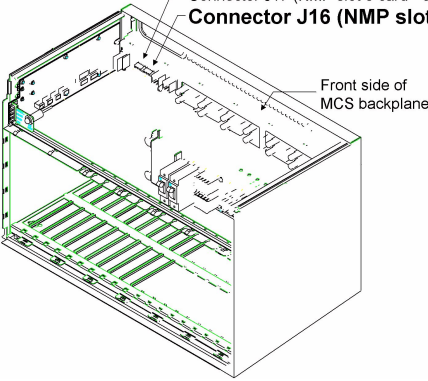
Table 22: DiamondView Ethernet 10Base-T Connection

STEP	PROCEDURE
1	Make arrangements with the local Network Administrator to run cabling for a DiamondView Ethernet 10Base-T network connection.
2	Route the Ethernet cable down from the horizontal cable rack, along the relay rack rails to the Speedlink following local procedures.
3	Push the Ethernet cable through one of the large cable ports at the back of the Master Control Shelf (MCS).
4	Go to the front of the MCS and remove the top screen by pulling out on the release pin and sliding the screen out.
5	Pull the Ethernet cable through to make the connection on the front side of the MCS backplane.

⁴ Unlike the Ethernet connection, the In Band Management connection does not require any additional cabling. It is a channel setup through the DS3T or OC3T trunk card and is configured through DiamondView or DiamondCraft.

⁵ See the "Establish Connection with the Speedlink" procedure, STEP 7 on page 48, for In Band Management set-up.

Table 22: DiamondView Ethernet 10Base-T Connection (continued)

STEP	PROCEDURE
6	<p>Locate the J16 RJ-45 connector mounted on the MCS backplane.</p> <div><p>RJ-45 Ethernet Connectors: Connector J17 (NMP slot 3 card - optional) Connector J16 (NMP slot 4 card)</p><p>Front side of MCS backplane</p><p>Figure 30: Front of the MCS Backplane (Top Screen Removed)</p></div>
7	Connect the Ethernet cable to the J16 connector.
8	Slide the MCS top screen back into position and push in on the release pin to secure.
9	The DiamondView Ethernet Connection procedure is complete.

Replace MCS
and LCS Front
Panels

IMPORTANT: Replace Master Control Shelf and Line Card Shelf front panels after you have completed all Acceptance Testing Procedures. This is critical to ensure proper air flow through the Speedlink system.

Lift the front panel so it is level with the bottom of the card cage. Hold the panel on both sides and slide it between the holding clips on the card cage. Push in and slide it to the right about ¼ inch to lock in place.

DiamondCraft
Ethernet
10Base-T
Connection

DiamondCraft can access the Speedlink system in 3 ways:

OPTION 1: Through a serial port connection, via an RS-232 cable from the host PC to the J2 serial port on the Speedlink’s Master Control Shelf (refer back to the diagram and Steps 4 and 5 on page 45). In this arrangement, DiamondCraft has a direct connection to the Speedlink system.

OPTION 2: Through an Ethernet 10Base-T connection, via an Ethernet cable from the host PC to an Ethernet network hub. In this arrangement, DiamondCraft can access any Speedlink on the network.

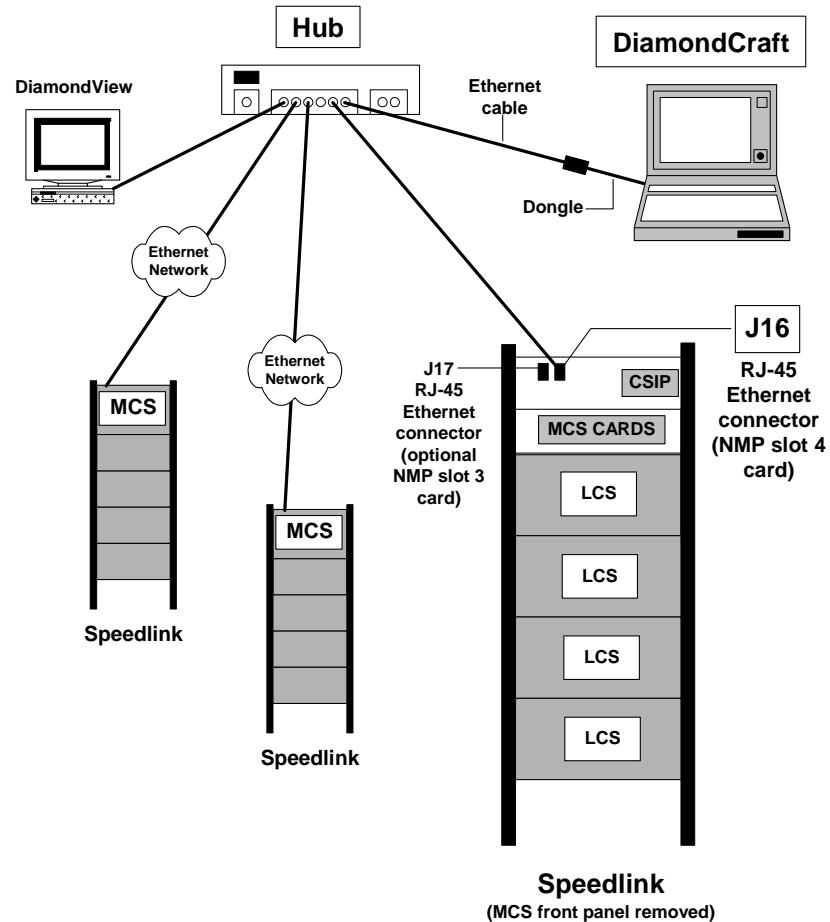


Figure 31: Option 2—Diamondcraft Ethernet Hub Connection to the Network

OPTION 3: Directly through an Ethernet 10Base-T connection, via an Ethernet cable from the host PC to the J16 RJ-45 Ethernet connector inside the Speedlink's Master Control Shelf.

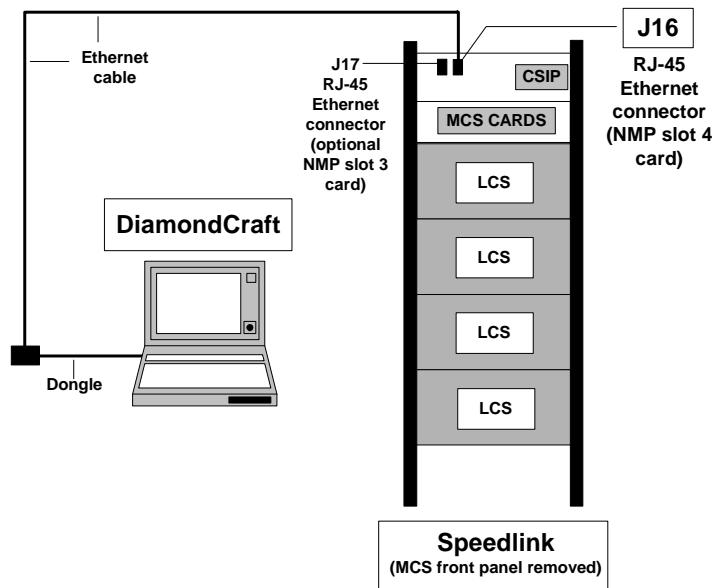


Figure 32: Option 3—DiamondCraft Direct Ethernet Connection to the Speedlink

IMPORTANT: Setting up DiamondCraft to access a Speedlink system through an Ethernet connection is best done with Option 2, where DiamondCraft communicates with the Speedlink as part of an Ethernet network. Option 3 does not allow DiamondCraft to communicate with multiple Speedlink systems, or DiamondView to access the Speedlink system connected to DiamondCraft.

**Required
Equipment and
IP Information**

To set up the DiamondCraft Ethernet connection to the Speedlink, you must have the following equipment and information:

- A laptop PC with Windows NT, Simple Network Management Protocol (SNMP), and DiamondCraft software installed.
- An Ethernet LAN PC card.
- A PC card modem dongle with an RJ-45 female plug.
- An Ethernet cable with RJ-45 male plugs on both ends.
- An open port on an Ethernet hub connected to your network (Option 2 only).
- IP Address, Mask and Gateway information for each Speedlink to be accessed.

DiamondCraft Ethernet 10Base-T Connection

Follow these directions to set up a DiamondCraft Ethernet connection:

Table 23: DiamondCraft Ethernet Connection Setup

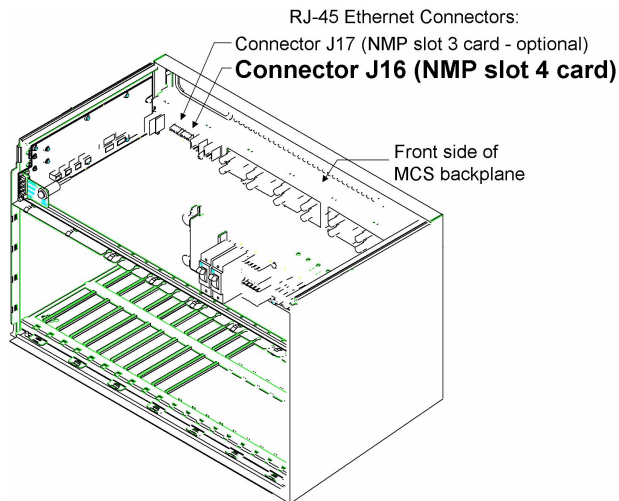
STEP	PROCEDURE
1	Insert the Ethernet LAN PC card into the card port on the PC.
2	Connect the dongle to the PC card.
3	Connect one end of the Ethernet cable to the dongle.
4	<p>Are you connecting DiamondCraft to a network hub?</p> <ul style="list-style-type: none"> ■ If YES, connect the other end of the Ethernet cable to the network hub, and skip to STEP 6. ■ If NO, continue to STEP 5.
5	<p>To connect DiamondCraft directly to the Speedlink:</p> <ul style="list-style-type: none"> ■ Go to the front of the MCS and remove the top screen by pulling out on the release pin and sliding the screen out. ■ Push the Ethernet cable through one of the large cable ports at the back of the MCS. ■ Connect the Ethernet cable to the J16 RJ-45 connector. <div data-bbox="695 1142 1310 1640"> <p>RJ-45 Ethernet Connectors:</p> <p>Connector J17 (NMP slot 3 card - optional)</p> <p>Connector J16 (NMP slot 4 card)</p> <p>Front side of MCS backplane</p>  </div> <p>Figure 33: Front of the MCS Backplane (Top Screen Removed)</p> <ul style="list-style-type: none"> ■ Slide the MCS top screen back into position and push in on the release pin to secure.
6	Power up the PC.

Table 23: DiamondCraft Ethernet Connection Setup (continued)

STEP	PROCEDURE
7	<p>To start the DiamondCraft application:</p> <ul style="list-style-type: none"> Click the Start button (usually located at the lower left corner of the PC screen). Select Programs ⇒ DiamondCraft. <p>or if you have installed the DiamondCraft icon on your desktop:</p> <ul style="list-style-type: none"> Double-click the DiamondCraft icon.
8	In the Connection Dialog box, click on Ethernet .
9	<p>Enter the IP Address for the Speedlink system you want to access.</p> <p>NOTE: DiamondCraft can only access one Speedlink at a time.</p>
10	<p>Click OK.</p> <p>After a few moments, the screen displays the Speedlink components and the Tool bar.</p>
11	<p>When you have finished with the Speedlink:</p> <ul style="list-style-type: none"> Select File ⇒ Exit. <p>DiamondCraft is now closed.</p>
12	<p>Do you want to access another Speedlink?</p> <ul style="list-style-type: none"> If YES, repeat Steps 7 – 10. If NO, continue to STEP 13.
13	<p>The DiamondCraft Ethernet Connection procedure is complete.</p> <p>See Appendix A, “DiamondCraft Trouble-Shooting Tips” on page 67 for additional help with installing and running DiamondCraft.</p> <p>See Appendix B, “Conditions and Recommended Action” on page 69 to use DiamondCraft to correct error conditions within the Speedlink system.</p>

SECTION 4 APPENDICES

Appendix A DiamondCraft Troubleshooting Tips

DiamondCraft Troubleshooting Tips

Follow the Recommended Actions listed below to correct error conditions or problems for installing and running DiamondCraft:

Table 24: DiamondCraft Troubleshooting Tip

#	IF THE CONDITION IS THIS...	THEN DO THIS...
1	“MgmtApi.dll not found” error dialog appears immediately on running DiamondCraft.	In Windows NT, turn on SNMP services in Network Services.
2	“Remote Access Services are not turned on....”	In Windows NT, turn on RAS services in Network Services.

Table 24: DiamondCraft Troubleshooting Tip (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
3	“Error connecting to Speedlink” in error window of DiamondCraft.	<ul style="list-style-type: none"> ■ Check all settings (baud rate, stop bits, etc.) against installation details. See Volume 7—<i>DiamondCraft</i>, Chapter 1—“Principles of Operation”, the section titled “Check Port Settings.” ■ Check modem settings against installation details. See Volume 7—<i>DiamondCraft</i>, Chapter 1—“Principles of Operation”, the section titled “Add a Modem.” ■ Check that cable is properly attached to serial port connector, and/or try another cable. ■ Reboot NMP by pulling/resetting NMP. ■ Test serial port with oscilloscope. Contact the manufacturer if problem continues. ■ Reinstall latest Windows NT service packs.
4	“Connected” then timeout messages appear in the error window of DiamondCraft (and no data is shown).	<ul style="list-style-type: none"> ■ Reinstall latest Windows NT service packs. ■ Reboot NMP by pulling/resetting the NMP.

SECTION 4 APPENDICES

Appendix B Conditions and Recommended Action

NMP and MCP Conditions and Recommended Action

Follow the Recommended Actions listed below to correct error conditions received for a Network Management Processor (NMP) or Master Control Processor (MCP) card:

NOTE: The Condition column indicates if an event is generated in DiamondView.

Table 25: NMP and MCP Conditions and Recommended Action

#	IF THE CONDITION IS THIS...	THEN DO THIS...
1	<p>Diagnostic Test Failure: this exists when a card fails the diagnostic test.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Failed: failed (not removed or unreachable).</p>	<p>Hardware diagnostic:</p> <ul style="list-style-type: none"> ■ Verify that the card is properly seated and locked in place. ■ Replace bad NMP or MCP card if diagnostic test failure condition continues.
2	<p>Software Diagnostic Failure: This occurs when a transaction from the MCP to the database has failed.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Failed: failed (not removed or unreachable).</p>	<p>Software diagnostic, replace bad MCP card.</p>
3	<p>Loss of Signal (LOS): This exists when a port detects a loss of signal.</p>	<p>Not applicable.</p>

ACCEPTANCE TESTING
Conditions and Recommended Action
NMP and MCP Conditions and Recommended Action

Table 25: NMP and MCP Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
4	Loss of Power (LPR): This exists when a valid “dying gasp” is received from the CPE prior to LOS. Indicates that the CPE (i.e., computer, etc.) has been turned off.	Not applicable.
5	Loss of Frame (LOF): This exists when a port detects a loss of frame.	Not applicable.
6	Bit Error Rate (BER): This indicates the BER condition on the port.	Not applicable.
7	Overflow: This indicates that the system is running out of resource (memory, etc.).	Not applicable.
8	AIS: Alarm Indication Signal	Not applicable.
9	RDI: Remote Defect Indicator	Not applicable.
10	LCD rate: This indicates a loss of cell delineation.	Not applicable.
11	Rate degraded: This indicates that the line card port has a rate drop.	Not applicable.
12	Loopback: This indicates that loopback is activated on the interface.	Not applicable.
13	<p>Unequipped: This indicates the card is not in the slot.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Departed: equipment has been removed.</p>	<ul style="list-style-type: none"> ■ Place an NMP card in slot #4 or ■ Place an MCP card in slots #5 and #6.
14	<p>Failed: This indicates a failure with the card.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Failed: failed (not removed or unreachable).</p>	Replace bad NMP or MCP card.
15	Dependent resource disabled: This exists when a resource has a dependency on another resource that is disabled.	Not applicable.

NMP and MCP Conditions and Recommended Action

Table 25: NMP and MCP Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
16	<p>Standby from a protection group: This indicates that the card in the protection group meets the operation/availability criteria for fulfilling the standby role.</p> <p>Operational State: Enabled.</p> <p>Availability Status: Operational: fully capable of providing service.</p>	<ul style="list-style-type: none"> ■ Not applicable for NMP card. ■ No action required, normal reading for the “standby” MCP card.
17	<p>Primary service provider: This indicates that the card in the protection group is fulfilling the role of the primary service provider.</p> <p>Operational State: Enabled.</p> <p>Availability Status: Operational: fully capable of providing service.</p>	<p>No action required:</p> <ul style="list-style-type: none"> ■ Normal reading for NMP card. ■ Normal reading for “primary” MCP card.
18	<p>Attribute fail condition: This indicates that the system attributes recorded by the equipment reveal a fatally flawed parameter value.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Failed: failed (not removed or unreachable).</p>	<p>Replace bad NMP or MCP card.</p>
19	<p>Attribute incomplete: This indicates that the equipment has not completed updating the system attributes.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Unknown.</p>	<p>Replace bad NMP or MCP card if condition does not clear within 2 to 3 minutes. May be a hardware problem or indicate NMP or MCP software is not the latest version.</p>
20	<p>Attribute Down Revisioned: This indicates that the NMP card or standby MCP card has an older software version than the active MCP card.</p> <p>Operational State: Enabled.</p> <p>Availability Status: Temporarily Inoperable.</p>	<p>No action required, this condition should not affect service permanently. The older software will be upgraded by the active MCP card. Service will be interrupted for a few minutes after the upgrade to allow the system to reboot (except in the case of the standby MCP card).</p>

Table 25: NMP and MCP Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
21	<p>Attribute Mismatch: This exists when the analysis of system attributes results in software or hardware incompatibility (i.e., incorrect card type, card with newer software than active MCP card, or damaged card).</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable.</p>	<p>Examine the card to determine which problem exists, then insert an NMP or standby MCP card as necessary.</p>
22	<p>Uninitialized: This indicates that the operational state, availability state and other status are not yet initialized.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Unknown.</p>	<p>Check NMP or MCP card configuration using DiamondCraft. Are all attributes listed?</p> <ul style="list-style-type: none"> ■ If YES, wait for initialization to complete. Replace the NMP or MCP card if it can not complete initialization. ■ If NO, replace the bad NMP or MCP card.
23	Bad Provisioning Data.	Not applicable.
24	<p>Standby MCP Synch Pending: This indicates that the standby MCP is synchronizing its database and MIB with the active MCP.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Temporarily Inoperable.</p>	<p>No action required, this condition will clear after several minutes, when the two MCPs have synchronized. If the condition does not clear, abort synchronization by locking the standby MCP card in DiamondView, and then unlock again and re-attempt synchronization.</p>

**DS3T Trunk
Conditions and
Recommended
Action**

Follow the Recommended Actions listed below to correct error conditions received for a DS3T trunk card:

NOTE: The Condition column indicates if an event is generated in DiamondView.

Table 26: DS3T Trunk Conditions and Recommended Action

#	IF THE CONDITION IS THIS...	THEN DO THIS...
1	Diagnostic Test Failure: this exists when a card fails the diagnostic test. Operational State: Disabled. Availability Status: Failed: failed (not removed or unreachable).	Hardware diagnostic: <ul style="list-style-type: none">■ Verify that the card is properly seated and locked in place.■ Replace bad DS3 trunk card if diagnostic test failure condition continues.
2	Software Download Failure: This exists when a card experiences an invalid software download. Operational State: Disabled. Availability Status: Failed: failed (not removed or unreachable).	Software diagnostic, replace bad DS3 trunk card.

Table 26: DS3T Trunk Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
3	<p>Loss of Signal (LOS): This exists when a port detects a loss of signal.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<p>LOS indicates a physical connection failure:</p> <ul style="list-style-type: none"> ■ Check DS3 interface Tx/Rx reversal at the MCS backplane by reversing the coax cable connections. ■ If the condition clears, then the connections were reversed. ■ If the condition does not clear, then connect a coax cable jumper between the Tx and Rx connections on the backplane. Set DS3 Line Timing parameter from “Loop” to “Internal”. ■ If the LOS condition clears, then the DS3 Tx and Rx are working, the problem is in the ATM Network (router or network). Report as appropriate and coordinate with an ATM Network Technician to isolate and fix the problem. ■ If the LOS condition does not clear, there is a problem with the DS3 card. Replace the DS3 card and test the connections again.
4	<p>Loss of Power (LPR): This exists when a valid “dying gasp” is received from the CPE prior to LOS. Indicates that the CPE (i.e., computer, etc.) has been turned off.</p>	Not applicable.
5	<p>Loss of Frame (LOF): This exists when a port detects loss of frame.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<ul style="list-style-type: none"> ■ Check DS3 interface connections at the MCS backplane and DS3 cross connect panel. ■ If DS3 connections are good, then there is an ATM Network (router or network) problem. Report as appropriate and coordinate with an ATM Network Technician to isolate and fix the problem.
6	<p>Bit Error Rate (BER): This indicates the BER condition on the port.</p>	Not applicable.

DS3T Trunk Conditions and Recommended Action

Table 26: DS3T Trunk Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
7	Overflow: This indicates that the system is running out of resource (memory).	Not applicable.
8	<p>AIS: Alarm Indication Signal.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<ul style="list-style-type: none"> ■ Indicates a problem on the far end of the DS3 trunk. ■ Report as appropriate and coordinate with an ATM Network Technician to isolate and fix the problem.
9	<p>RDI: Remote Defect Indicator.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<ul style="list-style-type: none"> ■ Indicates a far-end problem on the “transmit” side of the DS3 trunk or a Speedlink “transmit” problem. ■ Report as appropriate and coordinate with an ATM Network Technician to isolate and fix the problem.
10	<p>LCD rate: This indicates a loss of cell delineation.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<p>Indicates a DS3 line type mismatch. The line type at the Speedlink and at the other end of the DS3 signal must be set the same (ATM Cell Mapping or PLCP Cbit Parity). Use DiamondCraft to re-check the DS3 port line type. Follow instructions in Volume 3—<i>Acceptance Testing</i>, Chapter 7—“Using DiamondCraft for Test and Turn-up” for DS3 configuration settings.</p>
11	Rate degraded: This indicates that the line card port has a rate drop.	Not applicable.
12	<p>Loopback: This indicates that loopback is activated on the interface.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<p>Not an error condition.</p> <p>Use DiamondCraft to remove the loopback mode from the DS3 trunk port and put the card back in service.</p>

Table 26: DS3T Trunk Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
13	<p>Unequipped: This indicates the card is not in the slot.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Departed: equipment has been removed.</p>	Place a DS3 trunk card in slot #7 (standby) and slot #8 (active).
14	<p>Failed: This indicates a failure with the card.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Failed: failed (not removed or unreachable).</p>	<ul style="list-style-type: none"> ■ Hardware Diagnostic: ■ Verify that the card is properly seated and locked in place. ■ Replace bad DS3 trunk card if failed condition continues.
15	Dependent resource disabled: This exists when a resource has a dependency on another resource that is disabled.	Not applicable.
16	<p>Standby from a protection group: This indicates that the card in the protection group meets the operation/availability criteria for fulfilling the standby role.</p> <p>Operational State: Enabled.</p> <p>Availability Status: Operational: fully capable of providing service.</p>	No action required. Normal reading for the “standby” DS3 trunk card.
17	<p>Primary service provider: This indicates that the card in the protection group is fulfilling the role of the primary service provider.</p> <p>Operational State: Enabled.</p> <p>Availability Status: Operational: fully capable of providing service.</p>	No action required. Normal reading for the “active” or “primary” DS3 trunk card.

DS3T Trunk Conditions and Recommended Action

Table 26: DS3T Trunk Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
18	<p>Attribute fail condition: This indicates that the system attributes recorded by the equipment reveal a fatally flawed parameter value.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Failed: failed (not removed or unreachable).</p>	Replace bad DS3 trunk card.
19	<p>Attribute incomplete: This indicates that the equipment has not completed updating the system attributes.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Unknown.</p>	Replace bad DS3 trunk card if condition does not clear within 2 to 3 minutes. May be a hardware problem or indicate DS3 trunk card software is not the latest version.
20	<p>Attribute Down Revisioned: This indicates that the DS3 card has an older software version than the active MCP card.</p> <p>Operational State: Enabled.</p> <p>Availability Status: Temporarily Inoperable.</p>	No action required, this condition should not affect service permanently. The older software will be upgraded by the active MCP card. Service will be interrupted for a few minutes after the upgrade to allow the system to reboot.
21	<p>Attribute Mismatch: This exists when the analysis of system attributes results in software or hardware incompatibility (i.e., incorrect card type, card with newer software than active MCP card, or damaged card).</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable.</p>	Examine the card to determine which problem exists, then insert a DS3 card as necessary.
22	<p>Uninitialized: This indicates that the operational state and other status are not initialized yet.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Unknown.</p>	<p>Check DS3 trunk card configuration using DiamondCraft. Are all attributes listed?</p> <ul style="list-style-type: none"> ■ If YES, wait for initialization to complete. Replace the DS3 trunk card if it can not complete initialization. ■ If NO, replace the DS3 trunk card.

Table 26: DS3T Trunk Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
23	Bad Provisioning Data.	Not applicable.
24	Standby MCP Synch Pending.	Not applicable.

**OC3T Trunk
Conditions and
Recommended
Action**

Follow the Recommended Actions listed below to correct error conditions received for an OC3T trunk card:

NOTE: The Condition column indicates if an event is generated in DiamondView.

Table 27: OC3T Trunk Conditions and Recommended Action

#	IF THE CONDITION IS THIS...	THEN DO THIS...
1	<p>Diagnostic Test Failure: this exists when a card fails the diagnostic test.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Failed: failed (not removed or unreachable).</p>	<p>Hardware diagnostic:</p> <ul style="list-style-type: none"> ■ Verify that the card is properly seated and locked in place. ■ Replace bad OC3 trunk card if diagnostic test failure condition continues.
2	<p>Software Download Failure: This exists when a card experiences an invalid software download.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Failed: failed (not removed or unreachable).</p>	<p>Software diagnostic, replace bad OC3 trunk card.</p>

Table 27: OC3T Trunk Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
3	<p>Loss of Signal (LOS): This exists when a port detects a loss of signal.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<p>LOS indicates a physical connection failure:</p> <ul style="list-style-type: none"> ■ Check for reversed fiber optic cable. Always use Duplex fiber optic cables with SC duplex connections to ensure connections are not reversed. ■ If the condition clears, then the connections were reversed. ■ If the condition does not clear, then connect a fiber optic jumper between the Tx and Rx connections on the OC3 trunk card. Set the OC3 Line Timing parameter from “Loop” to “Internal”. ■ If the LOS condition clears, then the OC3 Tx and Rx is OK, the problem is in the ATM Network (router or network). Report as appropriate and coordinate with an ATM Network Technician to isolate and fix the problem. ■ If the LOS condition does not clear, there is a problem with the OC3 card. Replace the OC3 card and test the connections again.
4	<p>Loss of Power (LPR): This exists when a valid “dying gasp” is received from the CPE prior to LOS. Indicates that the CPE (i.e., computer, etc.) has been turned off.</p>	Not applicable.
5	<p>Loss of Frame (LOF): This exists when a port detects loss of frame.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<ul style="list-style-type: none"> ■ Check the fiber optic interface connection at the face plate of the trunk card and at the Optical Distribution Frame (ODF). ■ If OC3 connections are good, then there is an ATM Network (router or network) problem. Report as appropriate and coordinate with ATM Network Technician to isolate and fix the problem.

OC3T Trunk Conditions and Recommended Action

Table 27: OC3T Trunk Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
6	<p>Bit Error Rate (BER): This indicates the BER condition on the port.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<ul style="list-style-type: none"> ■ Check the Near Sonet Performance window in DiamondView. The problem may be a Signal Failure or Signal Degrade condition. ■ Use DiamondCraft to re-check OC3 port timing source, should be set to "Loop". Follow instructions in Volume 3—<i>Acceptance Testing</i>, Chapter 7—"Using DiamondCraft for Test and Turn-up" for OC3 configuration settings. ■ Check the fiber optic interface connection at the face plate of the trunk card and at the Optical Distribution Frame (ODF). Be sure the fiber optic cable is single-mode. ■ If OC3 connections are good, then there is an ATM Network (router or network) problem. Report as appropriate and coordinate with ATM Network Technician to isolate and fix the problem.
7	<p>Overflow: This indicates that the system is running out of resource (memory).</p>	Not applicable.
8	<p>UNEQ-P/PLM-P</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<ul style="list-style-type: none"> ■ Check sender side of ATM switch or router. Be sure it is configured for ATM payload.
9	<p>Trace Identifier Mismatch—Path</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<ul style="list-style-type: none"> ■ Check receive path trace data and expected path trace data in DiamondView. Verify that the path trace is accurate.
10	<p>Trace Identifier Mismatch—Section</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<ul style="list-style-type: none"> ■ Check receive section trace data and expected section trace data in DiamondView. Verify that the section trace is accurate.

Table 27: OC3T Trunk Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
11	<p>Loss of Pointer, Path</p> <p>Operational State: Operational State: Enabled.</p> <p>Availability Status: Availability Status: Operational: fully capable of providing service</p>	<ul style="list-style-type: none"> Check both the Speedlink and the ATM switch router OC3 facility provisioning. Both should have the same facility type either: SONET or sdh.
12	<p>AIS-L: Alarm Indication Signal, Line.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<ul style="list-style-type: none"> Indicates a problem on the far end of the OC3 trunk. Report as appropriate and coordinate with ATM Network Technician to isolate and fix the problem.
13	<p>AIS-P: Alarm Indication Signal, Path.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<ul style="list-style-type: none"> Indicates a problem on the far end of the OC3 trunk. Report as appropriate and coordinate with ATM Network Technician to isolate and fix the problem.
14	<p>RDI-L: Remote Defect Indicator, Line.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<ul style="list-style-type: none"> Indicates a far-end problem on the “transmit” side of the OC3 trunk or a Speedlink “transmit” problem. Report as appropriate and coordinate with ATM Network Technician to isolate and fix the problem.
15	<p>RDI-P: Remote Defect Indicator, Path.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<ul style="list-style-type: none"> Indicates a far-end problem on the “transmit” side of the OC3 trunk or a Speedlink “transmit” problem. Report as appropriate and coordinate with ATM Network Technician to isolate and fix the problem.

OC3T Trunk Conditions and Recommended Action

Table 27: OC3T Trunk Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
16	<p>AIS: Alarm Indication Signal.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<ul style="list-style-type: none"> ■ Indicates a problem on the far end of the OC3 trunk. ■ Report as appropriate and coordinate with ATM Network Technician to isolate and fix the problem.
17	<p>RDI: Remote Defect Indicator.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<ul style="list-style-type: none"> ■ Indicates a far-end problem on the “transmit” side of the OC3 trunk or a Speedlink “transmit” problem. ■ Report as appropriate and coordinate with ATM Network Technician to isolate and fix the problem.
18	<p>LCD rate: This indicates a loss of cell delineation.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<p>Indicates an OC3 facility type mismatch. The facility type at the Speedlink and at the other end of the OC3 signal must be set the same (SONET or sdh). Use DiamondCraft to re-check the OC3 port line type. Follow instructions in Volume 3—<i>Acceptance Testing</i>, Chapter 7—“Using DiamondCraft for Test and Turn-up” for OC3 configuration settings.</p>
19	<p>Rate degraded: This indicates that the line card port has a rate drop.</p>	<p>Not applicable.</p>
20	<p>Loopback: This indicates that loopback is activated on the interface.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<p>Not an error condition.</p> <p>Use DiamondCraft to remove the loopback mode from the OC3 trunk port and put the card back in service.</p>

Table 27: OC3T Trunk Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
21	<p>Unequipped: This indicates the card is not in the slot.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Departed: equipment has been removed.</p>	<p>Place a OC3 trunk card in slot #7 (standby) and slot #8 (active).</p>
22	<p>Failed: This indicates a failure with the card.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Failed: failed (not removed or unreachable).</p>	<p>Hardware Diagnostic:</p> <ul style="list-style-type: none"> ■ Verify that the card is properly seated and locked in place. ■ Replace bad OC3 trunk card if failed condition continues.
23	<p>Dependent resource disabled: This exists when a resource has a dependency on another resource that is disabled.</p>	<p>Not applicable.</p>
24	<p>Standby from a protection group: This indicates that the card in the protection group meets the operation/availability criteria for fulfilling the standby role.</p> <p>Operational State: Enabled.</p> <p>Availability Status: Operational: fully capable of providing service.</p>	<p>No action required. Normal reading for the “standby” OC3 trunk card.</p>
25	<p>Primary service provider: This indicates that the card in the protection group is fulfilling the role of the primary service provider.</p> <p>Operational State: Enabled.</p> <p>Availability Status: Operational: fully capable of providing service.</p>	<p>No action required. Normal reading for the “active” OC3 trunk card.</p>

OC3T Trunk Conditions and Recommended Action

Table 27: OC3T Trunk Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
26	<p>Attribute fail condition: This indicates that the system attributes recorded by the equipment reveal a fatally flawed parameter value.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Failed: failed (not removed or unreachable).</p>	<p>Replace bad OC3 trunk card.</p>
27	<p>Attribute incomplete: This indicates that the equipment has not completed updating the system attributes.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Unknown.</p>	<p>Replace bad OC3 trunk card if condition does not clear within 2 to 3 minutes. May be a hardware problem or indicate OC3 trunk card software is not the latest version.</p>
28	<p>Attribute Down Revisioned: This indicates that the OC3 card has an older software version than the active MCP card.</p> <p>Operational State: Enabled.</p> <p>Availability Status: Temporarily Inoperable.</p>	<p>No action required, this condition should not affect service permanently. The older software will be upgraded by the active MCP card. Service will be interrupted for a few minutes after the upgrade to allow the system to reboot.</p>
29	<p>Attribute Mismatch: This exists when the analysis of system attributes results in software or hardware incompatibility (i.e., incorrect card type, card with newer software than active MCP card, or damaged card).</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable.</p>	<p>Examine the card to determine which problem exists, then insert an OC3 card as necessary.</p>
30	<p>Uninitialized: This indicates that the operational state and other status are not initialized yet.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Unknown.</p>	<p>Check OC3 trunk card configuration using DiamondCraft. Are all attributes listed?</p> <ul style="list-style-type: none"> ■ If YES, wait for initialization to complete. Replace the OC3 trunk card if it can not complete initialization. ■ If NO, replace the OC3 trunk card.

Table 27: OC3T Trunk Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
31	Bad Provisioning Data.	Not applicable.
32	Standby MCP Synch Pending.	Not applicable.

**MLA Conditions
and
Recommended
Action**

Follow the Recommended Actions listed below to correct error conditions received for a Master Line Card Adapter (MLA) card:

NOTE: The Condition column indicates if an event is generated in DiamondView.

Table 28: MLA Conditions and Recommended Action

#	IF THE CONDITION IS THIS...	THEN DO THIS...
1	<p>Diagnostic Test Failure: this exists when a card fails the diagnostic test.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Failed: failed (not removed or unreachable).</p>	<p>Hardware diagnostic:</p> <ul style="list-style-type: none"> ■ Verify that the card is properly seated and locked in place. ■ Replace bad MLA card if diagnostic test failure condition continues.
2	<p>Software Download Failure: This exists when a card experiences an invalid software download.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Failed: failed (not removed or unreachable).</p>	<p>Software diagnostic, replace bad MLA card.</p>
3	<p>Loss of Signal (LOS): This exists when a port detects a loss of signal.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<p>The MLA card is not receiving a signal from the LSM2 card:</p> <ul style="list-style-type: none"> ■ Check fiber optic connections. Clean fiber connections following local procedures^a. ■ Check for reversed fiber optic cable. Always use Duplex fiber optic cables with SC duplex connections to ensure connections are not reversed. ■ Check for defective fiber optic cable, connections or bad LSM2 card. Follow the “Test LSM2 Transmit and MLA Receive” procedure on page 103.
4	<p>Loss of Power (LPR): This exists when a valid “dying gasp” is received from the CPE prior to LOS. Indicates that the CPE (i.e., computer, etc.) has been turned off.</p>	<p>Not applicable.</p>

Table 28: MLA Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
5	<p>Loss of Frame (LOF): This exists when a port detects loss of frame.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<p>There is a problem with the MLA “receive” connector, or the LSM2 “transmit” connector, or the fiber optic cable between them. Refer to the “Test LSM2 Transmit and MLA Receive” procedure on page 103, and the “Test LSM2 and MLA Tx/Rx without Optical Meter” procedure on page 105.</p>
6	<p>Bit Error Rate (BER): This indicates the BER condition on the port.</p>	<p>Not applicable.</p>
7	<p>Overflow: This indicates that the system is running out of resource (memory).</p> <p>Operational State: Enabled.</p> <p>Availability Status: Degraded.</p>	<p>This condition should not appear during test and turn-up procedures.</p> <p>Indicates that the “ingress” threshold is exceeded, severe buffering congestion.</p>
8	<p>AIS: Alarm Indication Signal.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Failed: failed (not removed or unreachable).</p>	<p>Replace bad LSM2 card.</p>
9	<p>RDI: Remote Defect Indicator.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<ul style="list-style-type: none"> ■ Check fiber optic connections. Clean fiber connections following local procedures^a. ■ Check for reversed fiber optic cable. Always use Duplex fiber optic cables with SC duplex connections to ensure connections are not reversed. ■ Check for defective fiber optic cable connections, or bad LSM2 card. Follow the “Test LSM2 Transmit and MLA Receive” procedure on page 103.

Table 28: MLA Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
10	<p>LCD rate: This indicates a loss of cell delineation.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<p>Indicates a problem in either the MLA card or the LSM2 card. Replace one of these cards (i.e., the MLA card) to see if the condition is corrected. If not, replace the other card (i.e., the LSM2 card).</p>
11	<p>Rate degraded: This indicates that the line card port has a rate drop.</p>	<p>Not applicable.</p>
12	<p>Loopback: This indicates that loopback is activated on the interface.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<p>Not an error condition. Use DiamondCraft to remove the loopback mode from the MLA port and put the card back in service.</p>
13	<p>Unequipped: This indicates the card is not in the slot.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Departed: equipment has been removed.</p>	<ul style="list-style-type: none"> ■ Place an MLA card in slot #9 through #20 as required based on the number of Line Card Shelves (LSM2 cards). ■ Make “transmit” and “receive” fiber optic cable connections to corresponding LSM2 card(s).
14	<p>Failed: This indicates a failure with the card.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Failed: failed (not removed or unreachable).</p>	<p>Replace bad MLA card.</p>
15	<p>Dependent resource disabled: This exists when a resource has a dependency on another resource that is disabled.</p>	<p>Not applicable.</p>
16	<p>Standby from a protection group: This indicates that the card in the protection group meets the operation/availability criteria for fulfilling the standby role.</p>	<p>Not applicable.</p>

Table 28: MLA Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
17	<p>Primary service provider: This indicates that the card in the protection group is fulfilling the role of the primary service provider.</p> <p>Operational State: Enabled.</p> <p>Availability Status: Operational: fully capable of providing service.</p>	No action required, normal reading for MLA card.
18	<p>Attribute fail condition: This indicates that the system attributes recorded by the equipment reveal a fatally flawed parameter value.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Failed: failed (not removed or unreachable).</p>	Replace bad MLA card.
19	<p>Attribute incomplete: This indicates that the equipment has not completed updating the system attributes.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Unknown.</p>	Replace bad MLA card if condition does not clear within 2 to 3 minutes. May be a hardware problem or indicate MLA card software is not the latest version.
20	<p>Attribute Down Revisioned: This indicates that the MLA card has an older software version than the active MCP card.</p> <p>Operational State: Enabled.</p> <p>Availability Status: Temporarily Inoperable.</p>	No action required, this condition should not affect service permanently. The older software will be upgraded by the active MCP card. Service will be interrupted for a few minutes after the upgrade to allow the system to reboot.
21	<p>Attribute Mismatch: This exists when the analysis of system attributes results in software or hardware incompatibility (i.e., incorrect card type, card with newer software than active MCP card, or damaged card).</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable.</p>	Examine the card to determine which problem exists, then insert an MLA card as necessary.

Table 28: MLA Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
22	Uninitialized: This indicates that the operational state and other status are not initialized yet. Operational State: Disabled. Availability Status: Unknown.	Indicates a communication path problem: <ul style="list-style-type: none"> ■ Verify that the card is properly seated and locked in place. ■ Call Technical Support, may need to replace the card if initialization can't complete.
23	Bad Provisioning Data.	Not applicable.
24	Standby MCP Synch Pending.	Not applicable.

^a Suggested fiber connection cleaning materials include oil-free compressed air, lint-free wipes, isopropyl alcohol, cotton swabs, and lint-free pipe cleaners.

LSM2
Conditions and
Recommended
Action

Follow the Recommended Actions listed below to correct error conditions received for a Line Card Shelf Multiplexer (LSM2) card

NOTE: The Condition column indicates if an event is generated in DiamondView.

Table 29: LSM2 Conditions and Recommended Action

#	IF THE CONDITION IS THIS...	THEN DO THIS...
1	<p>Diagnostic Test Failure: this exists when a card fails the diagnostic test.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Failed: failed (not removed or unreachable).</p>	<p>Hardware diagnostic:</p> <ul style="list-style-type: none"> ■ Verify that the card is properly seated and locked in place. ■ Replace bad LSM2 card if diagnostic test failure condition continues.
2	<p>Software Download Failure: This exists when a card experiences an invalid software download.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Failed: failed (not removed or unreachable).</p>	<p>Software diagnostic, replace bad LSM2 card.</p>
3	<p>Loss of Signal (LOS): This exists when a port detects a loss of signal.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<p>The LSM2 card is not receiving a signal from the MLA card:</p> <ul style="list-style-type: none"> ■ Check fiber optic connections. Clean fiber connections following local procedures^a. ■ Check for reversed fiber optic cable. Always use Duplex fiber optic cables with SC duplex connections to ensure connections are not reversed. ■ Check for defective fiber optic cable. Follow the “Test MLA Transmit and LSM2 Receive” procedure on page 104, and the “Test LSM2 and MLA Tx/Rx without Optical Meter” procedure on page 105.
4	<p>Loss of Power (LPR): This exists when a valid “dying gasp” is received from the CPE prior to LOS. Indicates that the CPE (i.e., computer, etc.) has been turned off.</p>	<p>Not applicable.</p>

Table 29: LSM2 Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
5	<p>Loss of Frame (LOF): This exists when a port detects loss of frame.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<p>There is a problem with the LSM2 “receive” connector, or the MLA “transmit” connector, or the fiber optic cable between them. Refer to the “Test MLA Transmit and LSM2 Receive” procedure on page 104.</p>
6	<p>Bit Error Rate (BER): This indicates the BER condition on the port.</p>	<p>Not applicable.</p>
7	<p>Overflow: This indicates that the system is running out of resource (memory).</p> <p>Operational State: Enabled.</p> <p>Availability Status: Degraded.</p>	<p>This condition should not appear during test and turn-up procedures.</p> <p>Indicates that the “ingress” threshold is exceeded, severe buffering congestion.</p>
8	<p>AIS: Alarm Indication Signal</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<p>Replace bad MLA card.</p>
9	<p>RDI: Remote Defect Indicator</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<ul style="list-style-type: none"> ■ Check fiber optic connections. Clean fiber connections following local procedures^a. ■ Check for reversed fiber optic cable. Always use Duplex fiber optic cables with SC duplex connections to ensure connections are not reversed. ■ Check for defective fiber optic cable. Follow the “Test MLA Transmit and LSM2 Receive” procedure on page 104.

Table 29: LSM2 Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
10	<p>LCD rate: This indicates a loss of cell delineation.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<p>Indicates a problem in either the LSM2 card or the MLA card. Replace one of these cards (i.e., the LSM2 card) to see if the condition is corrected. If not, replace the other card (i.e., the MLA card).</p>
11	<p>Rate degraded: This indicates that the line card port has a rate drop.</p>	<p>Not applicable.</p>
12	<p>Loopback: This indicates that loopback is activated on the interface.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<p>Not an error condition. Use DiamondCraft to remove the loopback mode from the LSM2 port and put the card back in service.</p>
13	<p>Unequipped: This indicates the card is not in the slot.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Departed: equipment has been removed.</p>	<ul style="list-style-type: none"> ■ Place an LSM2 card in LCS slot #25. ■ Make “transmit” and “receive” fiber optic cable connection to corresponding MLA card.
14	<p>Failed: This indicates a failure with the card.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Failed: failed (not removed or unreachable).</p>	<p>Replace bad LSM2 card.</p>

Table 29: LSM2 Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
15	<p>Dependent resource disabled: This exists when a resource has a dependency on another resource that is disabled.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Unreachable: resource cannot be accessed due to failure or removal of a resource on which it is dependent.</p>	<p>Use DiamondCraft to check condition status at the LSM2 “port” level.</p> <p>A dependent resource condition at the LSM2 port level indicates that the LSM2 cannot communicate with the MLA port. Follow the “Test MLA Transmit and LSM2 Receive” procedure on page 104 to check for bad fiber optic cable connections or to determine if the MLA card is bad.</p>
16	<p>Standby from a protection group: This indicates that the card in the protection group meets the operation/availability criteria for fulfilling the standby role.</p>	Not applicable.
17	<p>Primary service provider: This indicates that the card in the protection group is fulfilling the role of the primary service provider.</p> <p>Operational State: Enabled.</p> <p>Availability Status: Operational: fully capable of providing service.</p>	No action required, normal reading for LSM2 card.
18	<p>Attribute fail condition: This indicates that the system attributes recorded by the equipment reveal a fatally flawed parameter value.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Failed: failed (not removed or unreachable).</p>	Replace bad LSM2 card.
19	<p>Attribute incomplete: This indicates that the equipment has not completed updating the system attributes.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Unknown.</p>	Replace bad LSM2 card if condition does not clear within 2 to 3 minutes. May be a hardware problem or indicate LSM2 card software is not the latest version.

Table 29: LSM2 Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
20	<p>Attribute Down Revisioned: This indicates that the LSM2 card has an older software version than the active MCP card.</p> <p>Operational State: Enabled.</p> <p>Availability Status: Temporarily Inoperable.</p>	<p>No action required, this condition should not affect service permanently. The older software will be upgraded by the active MCP card. Service will be interrupted for a few minutes after the upgrade to allow the system to reboot.</p>
21	<p>Attribute Mismatch: This exists when the analysis of system attributes results in software or hardware incompatibility (i.e., incorrect card type, card with newer software than active MCP card, or damaged card).</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable.</p>	<p>Examine the card to determine which problem exists, then insert an LSM2 card as necessary.</p>
22	<p>Uninitialized: This indicates that the operational state and other status are not initialized yet.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Unknown.</p>	<p>Indicates communication path problem:</p> <ul style="list-style-type: none"> ■ Verify that the card is properly seated and locked in place. ■ Call Technical Support, may need to replace the card if initialization can't complete.
23	Bad Provisioning Data.	Not applicable.
24	Standby MCP Synch Pending.	Not applicable.

^a Suggested fiber connection cleaning materials include oil-free compressed air, lint-free wipes, isopropyl alcohol, cotton swabs, and lint-free pipe cleaners.

**Line Card
Conditions and
Recommended
Action**

Follow the Recommended Actions listed below to correct error conditions received for a line card

NOTE: The Condition column indicates if an event is generated in DiamondView.

Table 30: Line Card Conditions and Recommended Action

#	IF THE CONDITION IS THIS...	THEN DO THIS...
1	<p>Diagnostic Test Failure: this exists when a card fails the diagnostic test.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Failed: failed (not removed or unreachable).</p>	<p>Hardware diagnostic:</p> <ul style="list-style-type: none"> ■ Verify that the card is properly seated and locked in place. ■ Replace bad line card if diagnostic test failure condition continues.
2	<p>Software Download Failure: This exists when a card experiences an invalid software download.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Failed: failed (not removed or unreachable).</p>	<p>Software diagnostic, replace bad line card.</p>
3	<p>Loss of Signal (LOS): This exists when a port detects a loss of signal not preceded by a valid “dying gasp”.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<p>Bad connection at end user equipment (NIC or modem). Possible causes:</p> <ul style="list-style-type: none"> ■ Subscriber^a may have powered off CPE; CO or CPE does not support “dying gasp”. ■ Bad end user equipment. ■ Problem in the local loop; i.e. cable cut.
4	<p>Loss of Power (LPR): This exists when a valid “dying gasp” is received from the CPE prior to LOS. Indicates that the CPE (i.e., computer, etc.) has been turned off.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<p>No action required, service will resume when customer turns on CPE.</p> <p>Applicable to CAP4 and DMT4 only.</p>

Table 30: Line Card Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
5	<p>Loss of Frame (LOF): This exists when a port detects loss of frame.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<p>Bad connection at end user equipment (NIC or modem). Possible causes:</p> <ul style="list-style-type: none"> ■ Subscriber^a may have powered off CPE; CO or CPE does not support “dying gasp”. ■ Bad end user equipment. ■ Problem in the local loop; i.e. cable cut.
6	<p>Error Rate: This indicates a high bit error rate (BER) on the port.</p>	<p>The provisioned Error Rate alarm threshold is exceeded. Do one or more of the following:</p> <ul style="list-style-type: none"> ■ Increase the Error Rate alarm threshold. ■ Increase the provisioned noise Margin. ■ Reduce the data rate ■ Check the quality of the loop, and adjust provisioning if necessary. <p>NOTE: Applicable to CAP4 and DMT4 only.</p>
7	<p>Overflow: This indicates that the system is running out of resource (memory).</p> <p>Operational State: Enabled.</p> <p>Availability Status: Degraded.</p>	<p>This condition should not appear during test and turn-up procedures.</p> <p>Indicates that the “egress” threshold is exceeded, severe buffering congestion.</p>
8	<p>AIS: Alarm Indication Signal</p>	<p>Not applicable.</p>
9	<p>RDI: Remote Defect Indicator</p>	<p>Not applicable.</p>

Table 30: Line Card Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
10	<p>LCD rate: This indicates a loss of cell delineation.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<p>Bad connection at end user equipment (NIC or modem). Possible causes:</p> <ul style="list-style-type: none"> ■ Subscriber^a may have powered off CPE; CO or CPE does not support “dying gasp”. ■ Bad end user equipment. ■ Problem in the local loop; i.e. cable cut. <p>NOTE: Applicable to CAP4 and DMT4 only.</p>
11	<p>Rate degraded: This indicates that the line card port has a rate drop.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Enabled.</p> <p>Availability Status: Operational.</p>	<p>The actual upstream or downstream data rate is below the minimum rate provisioned for the subscriber.</p>
12	<p>Loopback: This indicates that loopback or test is activated on the interface.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable: incapable of providing service.</p>	<p>Not an error condition. Use DiamondCraft to remove the loopback mode from the line card port and put the card back in service.</p> <p>Applicable to CAP4 and DMT4 only.</p>
13	<p>Unequipped: This indicates the card is not in the slot.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Departed: equipment has been removed.</p>	<p>Place a line card in LCS slot 1 through 24 as required.</p>

Table 30: Line Card Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
14	<p>Failed: This indicates a failure with the card.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Failed: failed (not removed or unreachable).</p>	Replace bad line card.
15	<p>Dependent resource disabled: This exists when a resource has a dependency on another resource that is disabled.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Unreachable: resource cannot be accessed due to failure or removal of a resource on which it is dependent.</p>	<p>Use DiamondCraft to check condition status at the LSM2 “port” level.</p> <p>A dependent resource condition at the line card port level indicates that the line card cannot communicate with the LSM2 port.</p>
16	<p>Standby from a protection group: This indicates that the card in the protection group meets the operation/availability criteria for fulfilling the standby role.</p>	Not applicable.
17	<p>Primary service provider: This indicates that the card in the protection group is fulfilling the role of the primary service provider.</p>	Not applicable.
18	<p>Attribute fail condition: This indicates that the system attributes recorded by the equipment reveal a fatally flawed parameter value.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Failed: failed (not removed or unreachable).</p>	Replace the bad line card.
19	<p>Attribute incomplete: This indicates that the equipment has not completed updating the system attributes.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Unknown.</p>	Replace bad line card if condition does not clear within 2 to 3 minutes. May be a hardware problem or indicate line card software is not the latest version.

Line Card Conditions and Recommended Action

Table 30: Line Card Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
20	<p>Attribute Down Revisioned: This indicates that the line card has an older software version than the active MCP card.</p> <p>Operational State: Enabled.</p> <p>Availability Status: Temporarily Inoperable.</p>	<p>No action required, this condition should not affect service permanently. The older software will be upgraded by the active MCP card. Service will be interrupted for a few minutes after the upgrade to allow the system to reboot.</p>
21	<p>Attribute Mismatch: This exists when the analysis of system attributes results in software or hardware incompatibility (i.e., incorrect card type, card with newer software than active MCP card, or damaged card).</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable.</p>	<p>Examine the card to determine which problem exists, then insert a line card as necessary.</p>
22	<p>Uninitialized: This indicates that the operational state and other status are not initialized yet.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Unknown.</p>	<p>Indicates communication path problem:</p> <ul style="list-style-type: none"> ■ Verify that the card is properly seated and locked in place. ■ Call Technical Support, may need to replace the card if initialization can't complete.

Table 30: Line Card Conditions and Recommended Action (continued)

#	IF THE CONDITION IS THIS...	THEN DO THIS...
23	<p>Bad Provisioning Data: This indicates that invalid setup information has been passed to the line card.</p> <p>NOTE: An event is generated in DiamondView.</p> <p>Operational State: Disabled.</p> <p>Availability Status: Inoperable.</p> <p>For the IDSL8 card only: indicates one of the following:</p> <ul style="list-style-type: none"> ■ more than one PPP connection ■ a mix of PPP and Frame Relay connections ■ more than 24 connections 	<p>Set valid provisioning information for the line card. See Volume 4—<i>Provisioning</i>:</p> <ul style="list-style-type: none"> ■ for CAP2 cards, Chapter 1—“CAP2 ADSL Provisioning.” ■ for CAP4 cards, Chapter 2—“CAP4 ADSL Provisioning.” ■ for DMT4 cards, Chapter 3—“DMT ADSL Provisioning.” ■ for SDSL8 cards, Chapter 4—“SDSL Provisioning.” <p>Set valid provisioning information for the IDSL8 card. See Volume 4—<i>Provisioning</i>, Chapter 5—“IDSL Provisioning.”</p>
24	Standby MCP Synch Pending.	Not applicable.
25	<p>Error Rate Alarm: This indicates that the Near End or Far End errored frames per second threshold for Data mode has been exceeded.</p> <p>Operational State: Enabled.</p> <p>Availability Status: Operational.</p>	Check Near End or Far End errored frames threshold.

^a LOS condition will not generate an alarm event unless the service is provisioned for “managed service”. If the service is provisioned for “managed service” an LOS condition will generate an alarm event.

**Test LSM2
Transmit and
MLA Receive**

Follow these steps to determine cause of “loss of signal” at an MLA card.

Table 31: Test LSM2 Transmit and MLA Receive

STEP	PROCEDURE
1	Disconnect the fiber optic cable from the MLA connectors.
2	Connect an optical meter to the end of the LSM2 “transmit” connector.
3	Set the optical meter to dBm and wavelength setting to 1300 nm.
4	Is the output signal between -14 and -20 dBm? <ul style="list-style-type: none"> ■ If YES, the LSM2 signal is good to the end of the fiber optic cable. Replace bad MLA card. ■ If NO, go to STEP 5 to determine if the fiber optic cable or LSM2 card is bad.
5	Disconnect the fiber optic cable from the LSM2 connectors.
6	Connect a fiber optic jumper in the LSM2 “transmit” connector to verify the output power signal at the LSM2 transmitter.
7	Connect an optical meter to the end of the fiber optic jumper. Use the same meter settings as in STEP 3.
8	Is the output signal between -14 and -20 dBm? <ul style="list-style-type: none"> ■ If YES, replace bad fiber optic cable. ■ If NO, replace bad LSM2 card.
9	The Test LSM2 Transmit and MLA Receive procedure is complete.

Test MLA
Transmit and
LSM2 Receive

Follow these steps to determine cause of “Loss of Signal” or “Dependent Resource Disabled” condition at an LSM2 card.

Table 32: Test MLA Transmit and LSM2 Receive

STEP	PROCEDURE
1	Disconnect the fiber optic cable from the LSM2 connectors.
2	Connect an optical meter to the end of the MLA “transmit” connector.
3	Set the optical meter to dBm and wavelength setting to 1300 nm.
4	Is the output signal between -14 and -20 dBm? <ul style="list-style-type: none"> ■ If YES, the MLA signal is good to the end of the fiber optic cable. Replace bad LSM2 card. ■ If NO, go to STEP 5 to determine if the fiber optic cable or MLA card is bad.
5	Disconnect the fiber optic cable from the MLA connectors.
6	Connect a fiber optic jumper in the MLA “transmit” connector to verify the output power signal at the MLA transmitter.
7	Connect an optical meter to the end of the fiber optic jumper. Use the same meter settings as in STEP 3.
8	Is the output signal between -14 and -20 dBm? <ul style="list-style-type: none"> ■ If YES, replace bad fiber optic cable. ■ If NO, replace bad MLA card.
9	The Test MLA Transmit and LSM2 Receive procedure is complete.

Test LSM2 and MLA Tx/Rx without Optical Meter

Test LSM2 and
MLA Tx/Rx
without Optical
Meter

Follow these steps to determine the cause of a “Loss of Signal” condition at the LSM2 or MLA “transmit” and “receive” connectors:

Table 33: Test LSM2 and MLA Tx/Rx without Optical Meter

STEP	PROCEDURE
1	Disconnect the fiber optic cable from the MLA connectors.
2	Connect a fiber optic jumper to the MLA “transmit” and “receive” connectors.
3	Does the LOS condition clear at the MLA card? <ul style="list-style-type: none"> ■ If YES, the MLA transceivers are functioning. Continue to STEP 4. ■ If NO, the MLA transceivers are bad. Replace the MLA card.
4	Disconnect the fiber optic cable from the LSM2 connectors.
5	Connect the fiber optic jumper to the LSM2 “transmit” and “receive” connectors.
6	Does the LOS condition clear at the LSM2 card? <ul style="list-style-type: none"> ■ If YES, the LSM2 transceivers are functioning. Continue to STEP 7. ■ If NO, the LSM2 transceivers are bad. Replace the LSM2 card.
7	If the LOS condition clears, then the fiber optic cable is bad. Replace the fiber optic cable.
8	The Test LSM2 and MLA Tx/Rx without Optical Meter procedure is complete.

SECTION 4

APPENDICES

Appendix C

Card Front Panel LED Indicators

Card Front
Panel LED
Indicators

The front panel of each card in the Master Control Shelf (MCS) and Line Card Shelf (LCS) has LED indicator lights. The purpose of these LEDs is to provide “limited” information and conditions about the Speedlink System. These LED indicators are defined in the tables below for each MCS and LCS card.

Table 34: Red LED “FAIL” Indicator—All Cards

Steady ON	Flashing	OFF
Card Failure Card failure detected during power-up self test or during operation.	Card Type Mismatch Card software is more recent than the MCP’s, or the slot’s provisioning is not for this card.	Card is Operational The card passed all internal diagnostics and is operational.

Table 35: Green LED “ENABL” Indicator—All Cards

Steady ON	Flashing	OFF
<p>Card is Enabled</p> <p>The card is enabled and may be providing service, <u>DO NOT</u> unplug this card.</p> <p>Indicates that the card has initialized all its hardware and software and can provide at least partial service.</p>	<p>Card is Initializing</p> <p>The card is powered up and going through initialization, wait for it to stop flashing.</p> <p>MCP and Trunk Cards: For protection group cards the flashing green light indicates “hot” standby status. The card is being updated with configuration information from the active card.</p> <p>The flashing will stop once the synchronization process is complete. The card is in “standby” status ready to take over when the green LED is steady “ON”.</p>	<p>Card is Disabled</p> <p>The card is totally disabled and NOT providing service. It does not indicate a failure, only that the card is not providing service. You may unplug this card.</p>

Table 36: Yellow LED “ACT” Indicator—MCP, Trunk, and LSM2 Cards

Steady ON	Flashing	OFF
Card is Active This card is the active card of a protection pair and is providing service, <u>DO NOT</u> unplug.	Card is Synchronizing The protection card is synchronizing with the active card and is not ready to take over operations; it is in “hot” standby status.	Card is in Standby Mode Indicates “standby” status for a protection card. This card is synchronized with the active card and is ready to take over operations. Standby status for a protection card is also indicated by steady “ON” green light.

Table 37: Yellow LED “SYNC” Indicator—Line Cards

Steady ON	Flashing	OFF
Card is Synchronized One or more ports on this line card are connected to equipment on the other end of the outside loop; i.e. CPE equipment, a NIC card, or a modem. This line card may be providing service, <u>DO NOT</u> unplug.	Card is in Test or Training mode, flashing at 0.5 Hz. Flashing at other than 0.5 Hz: card is in Training mode, it is establishing a connection to equipment on the other end of the outside loop; i.e., CPE equipment, a NIC card or a modem.	Card is not Synchronized None of the ports on this line card are connected to equipment on the other end of the outside loop.

Table 38: Red LED “ALM” Indicator—Trunk, MLA, and LSM2 Cards

Steady ON	OFF
<p>Card is in Alarm: A near end or far end alarm condition exists on one or more ports.</p> <p><u>Trunk Cards</u> The trunk port connects to the ATM network with Tx/Rx coaxial cabling (DS3 trunk) or Tx/Rx fiber optic cabling (OC3 trunk). The ALM indicator will stay on if the “transmit” and “receive” cable connections are <u>reversed</u> between the DS3T or OC3T card and the ATM network.</p> <p>Disconnect and flip the coaxial cable connection at the MCS backplane (for DS3) or the fiber optic cable connectors at the OC3T card faceplate (for OC3) to correct this condition.</p> <p><u>MLA and LSM2 Cards</u> The MLA and LSM2 ports connect to each other with fiber optic cabling. The MLA “transmit” connector connects to the LSM2 “receive” connector, and the MLA “receive” connector connects to the LSM2 “transmit” connector. The ALM indicator will stay on if the “transmit” and “receive” connections are <u>reversed</u> between the MLA and LSM2.</p> <p>Disconnect and flip the MLA/LSM2 fiber optic connections at the card faceplate to correct this condition.</p>	<p>No alarm exists.</p>

Table 39: Red LED “ALM” Indicator—Line Cards

Steady ON	OFF
<p>Card is in Alarm: An alarm condition exists on one or more ports. Indicates that one or more of the ports configured for “managed service” is unable to perform its function.</p> <p>An alarm condition may mean loss of synchronization, not an equipment failure.</p> <p>Line card ports connect to equipment on the other end of the outside loop, i.e., CPE equipment, a NIC card, or a modem.</p>	<p>No alarm exists, or the card is not provisioned for managed service.</p>

SECTION 4 APPENDICES

Appendix D Speedlink Component Part Numbers

Part Numbers
Table

Table 40: Speedlink Component Part Numbers

PART NAME	PART NUMBER
SPEEDLINK MULTIPLEXER ASSEMBLIES	
Master Control Shelf Kit (includes Fan Tray)	50-0010
Line Card Shelf Kit (includes Fan Tray)	50-0020
Low Pass Filter Kit	50-0030
ADSL Link ID Kit	50-0106
Auxiliary CSIP Assembly Kit	50-0040
Fan Tray (included in MCS and LCS Kits)	30-0005
CABLE ASSEMBLIES	
LCS Power Cable	40-0002-004
Cable Assembly - female	40-0014
Cable Assembly - male	40-0015
Cable Assembly R LCS-LPFS	40-0011-001
Cable Assembly R LCS-LPFS	40-0011-002
Cable Assembly L LCS-LPFS	40-0012-001
Cable Assembly L LCS-LPFS	40-0012-002
3 Meter Duplex Fiber Optic Cable	70-0003-030
ADSL Link ID Telco Signal cable	40-0016-002
ADSL Link ID Power cable	40-0002-002
ADSL Link ID to CSIP Alarm cable - 48 inches	40-0018-001
ADSL Link ID to LCS Alarm cable - 36 inches	40-0018-002
INSTALLATION KITS	

ACCEPTANCE TESTING
Speedlink Component Part Numbers
Part Numbers Table

Table 40: Speedlink Component Part Numbers (continued)

PART NAME	PART NUMBER
MCS/ACSIP Installation Kit	50-0060
LCS/LPFS Installation Kit	50-0070
MASTER CONTROL SHELF CARDS	
Master Control Processor card	60-0008-800
Master Line Card Adapter card	60-0010-800
Network Management Processor card	60-0009-800
DS3T Trunk Interface card	60-0007-800
OC3T Trunk Interface card	60-0027-801
LINE CARD SHELF CARDS	
Line Card Shelf Multiplexer (LSM2) card	60-0037-801
CAP2 card (Dual ADSL)	60-0005-801
CAP4 card (Quad ADSL)	60-0080-801
DMT4 card (Quad ADSL)	60-0066-801
SDSL8 card (Octal SDSL)	60-0044-801
IDSL8 card (Octal IDSL)	60-0054-801
LOW PASS FILTER SHELF CARDS	
LPF2 card (for CAP2 LCS cards)	60-0016-801
LPF4 card (for CAP4 LCS cards)	60-0016-802
LPF4D card (for DMT4 LCS cards)	60-0016-803
TEST CARDS	
Complimentary Analysis Module (CAM) card	60-0039-800
Pair Analysis Module (PAM) card	60-0038-800
ALARM BOARDS PARTS	
2 position vertical (180°) 5mm pluggable terminal blocks	84-0043-002
3 position vertical (180°) 5mm pluggable terminal blocks	84-0043-003
84 inch fuse alarm relay rack wire	40-0005-002
110 inch fuse alarm relay rack wire	40-0005-003
136 inch fuse alarm relay rack wire	40-0005-004
2 position IDC socket connector	84-0080-002
MISCELLANEOUS ITEMS	
Speedlink System Software	50-0002
DiamondView Software	50-0003
DiamondCraft Software	50-0004
Standalone Remote Low Pass Filter NID	30-0004
Retrofit Remote Low Pass Filter NID	30-0006
Thread Forming Screws (total of 4)	61-0065
2 hole copper barrel lugs (total of 4)	85-0009-002

Table 40: Speedlink Component Part Numbers (continued)

PART NAME	PART NUMBER
15 amp GMT fuses	73-0002-015
Electrostatic Discharge Strap	85-0012

Diamond Lane Communications

Glossary and Acronyms

Asymmetric Digital Subscriber Line (ADSL)

Asymmetrical data signals for Internet access that share twisted pairs with POTS and that use modern signal modulation techniques to accomplish the data communications task.

Alarm

A signal used to indicate that an abnormality, a fault, or a failure has been detected. Alarms may be distinguished by type and by the severity of the event that caused the alarm.

Alarm Indication Signal (AIS)

A downstream signal in a digital network that replaces the normal traffic signal when a maintenance alarm indication has been activated (indicating an upstream failure detection – error or alarm on the network). It is used in the OSI network management model.

ATM Adaptation Layer (AAL)

ATM Adaptation Layer is located above ATM and converts non-ATM bit streams into ATM cells. The AAL protocol supports higher-layer service requirements.

Asynchronous Transfer Mode (ATM)

A multiplexed information transfer and switching process (cell-switched technology) in which data is organized into fixed length (53 octet) cells and transmitted according to each application's requirement. ATM is generally deployed in enterprise networks, which often connect LANs over wide areas that require large amounts of data to be transported over great distances.

Auxiliary Common Systems Interface Panel (CSIP)

Each Auxiliary CSIP connects and distributes central office power to up to four Line Card Shelves (LCS). Auxiliary CSIPs are required for Speedlink Systems with over five Line Card Shelves.

Bit Error Rate (BER)

A measurement of transmission quality expressed as a ratio (ratio of error bits to the total number of bits transmitted – erroneous bits per million). The BER indicates how many bits are incorrectly transmitted in a given bit stream. The BER depends on the type and length of transmission.

CAP2

Carrierless Amplitude and Phase (CAP) ADSL line card, 2 ports per line card.

CAP4

Carrierless Amplitude and Phase (CAP) ADSL line card, 4 ports per line card.

CBR (Constant Bit Rate)

Data that are transmitted at a constant rate on an ATM network.

CELL

In general, fast packet-switching technologies—such as ATM (Asynchronous Transfer Mode). The ATM Cell has a 5-byte header and contains 48 bytes of payload.

Central Office (CO)

The Local Exchange switch that terminates individual local telephone subscriber lines for switching and connection to the public network (locally and long distance).

Common Management Information Protocol (CMIP)

An OSI network management/service interface protocol created and standardized by ISO. Based on the basic data storage concept in which management information is collected and stored for subsequent retrieval by a management application. Provides for the transmission of event notifications and the transmission of operations directed toward managed objects.

Common Systems Interface Panel (CSIP) Power and Distribution Board

The CSIP Power and Distribution Board is located in the Master Control Shelf (MCS). Central office power is terminated at the CSIP and is distributed to the Master Control Shelf and up to four Line Card Shelves.

Common Systems Interface Panel (CSIP) Alarm Board

All Speedlink alarm connections are made at the CSIP Alarm Board; central office visual, audible, remote Bay Alarm and remote input alarms. The Alarm Board has LEDs to display Speedlink alarm status.

Constant Bit Rate (CBR)

Applications or services in a digital network that are to be the same bandwidth for the duration of the call.

CPE (Customer Premise Equipment)

Refers to telephone and related equipment located on the customer's premises (office or home).

Customer Network Management (CNM)

A feature of ATM, Frame Relay and SMDS which allows customers to directly view and manage their public data service (communications networks) in the same way they view and manage their local area networks.

Digital Loop Carrier (DLC)

Network transmission equipment used to provide a pair gain function. DLC equipment is deployed in situations in which the cost of the equipment is more than offset by the savings in copper distribution accomplished by eliminating need for as many copper pairs. Digital loop carrier systems consist of two parts—a Central Office Terminal (COT) and a Remote Terminal. The COT provides the multiplexing/demultiplexing function of individual voice signals to the composite multiplexed signal at the interface between the switching equipment and the DLC. The Remote Terminal provides the multiplexing/demultiplexing function at the interface between the individual subscriber pairs and the DLC equipment.

DiamondCraft™

DiamondCraft is the Speedlink's stand-alone craft interface application. It communicates directly with a Speedlink through a serial port connection using Point-to Point Protocol (PPP).

DiamondView™

DiamondView is the Speedlink's Element Management System (EMS). It is a HP Open View® application and operates on a UNIX workstation.

DS1 (Digital Signal Level One)

1.544 Mb/s digital signal.

DS3 (Digital Signal Level Three)

44.736 Mb/s digital signal – equivalent of 28 T-1 channels (also referred to as T-3).

DS3T

The DS3 trunk card provides the interface between ATM backbone facility and the Speedlink. It multiplexes and de-multiplexes up to 12 broadband ATM cell streams from the MLA cards and sends this “payload” out over the ATM network. The Speedlink has two DS3T cards in a 1:1 protection group.

DSLAM (Digital Subscriber Line Access Multiplexer)

An ATM access mux/concentrator that grooms traffic from multiple low rate lines into a high rate trunk (DS1, DS3, OC3, OC12).

Egress

Outgoing direction to a network or network device, as opposed to the ingress (or entrance).

Element Management Systems (EMS)

Software used to manage and monitor components of a telecommunication system at the lower levels of the Telecommunications Management Network.

Graphical User Interface (GUI)

A generic name for the computer interface that substitutes graphics for characters. The GUI permits users to directly manipulate graphical objects displayed on the monitor.

HDSL (High bit rate Digital Subscriber Line)

HDSL provides a DS1 on two copper wire pairs (without the loop engineering and repeaters required for a standard T1 system).

HEC (Header Error Control)

An 8-bit field (the last byte) of the ATM-cell header, whose purpose is to allow a receiver to detect, and possibly correct, transmission errors in the cell header. It is used for checking integrity only.

IEEE (Institute of Electrical and Electronics Engineers)

An international engineering organization that defines standards related to networking and other areas.

IETF (Internet Engineering Task Force)

One of two technical engineering bodies of the Internet Architecture Board. The IETF is responsible for solving short-term engineering needs and standards of the Internet.

Ingress

Incoming direction to a network or network device, as opposed to the egress (or exit).

IP (Internet Protocol)

A component of the TCP/IP protocol suite. IP operates at the Layer 3 of the OSI Reference model.

ISO (International Standards Organization)

The International Standards Organization is an international organization founded in 1946 to facilitate the development of international data communication standards.

ITU (International Telecommunications Union)

An organization established by the United Nations. The ITU sets telecommunications standards and allocates frequencies to various uses worldwide.

LAN (Local Area Network)

A privately owned and administered network for data communications, usually within a building or campus environment, used to connect computers and peripheral devices. Communication is typically accomplished by broadcasting on a connectionless basis over a shared medium.

Line Card

A line card serves as the interface between a line and a communications device.

Line Card Shelf (LCS)

The Speedlink System is made up of one Master Control Shelf and up to twelve Line Card Shelves. Each LCS has 24 mounting slots for line cards, a Line Card Shelf Multiplexer (LSM or LSM2) card, and an optional LSM or LSM2 card for Remote Line Card Shelf protection group application.

Line Card Shelf Multiplexer (LSM or LSM2) card

The LSM or LSM2 card communicates with the Master Line Card Adapter (MLA) card over multi-mode optical cable at OC-3 rates. The LSM or LSM2 multiplexes and demultiplexes ATM cell streams for up to 24 line cards in a Line Card Shelf.

Low Pass Filter Shelf (LPFS)

Data plus voice frequency signals are received from the customer at the Low Pass Filter Shelf. the LPF card “splits” the low frequency voice signal from the high frequency ADSL signal. The voice signal is sent onto the voice switch unimpeded; while data signal is received by the CAP2 line card.

LOF (Loss of Frame)

A condition that can occur in digital transmissions when the receiving equipment loses frame alignment data (used to determine channel assignments and channel boundaries).

LPF2

Low Pass Filter card, 2 ports per card.

LPF4

Low Pass Filter card, 4 ports per card.

Master Control Shelf (MCS)

The MCS contains the central control and communication functions for the Speedlink System and serves as the ATM network interface.

Master Control Processor (MCP) card

The MCP card is the central control and communications for the Speedlink, it stores program and provisioning database information. The Speedlink has two MCP cards in a 1:1 protection group.

Master Line Card Adapter (MLA) card

Each MLA card provides the broadband interface to one Line Card Shelf at OC-3 rates over optical fiber. There are up to twelve MLA cards in a Master Control Shelf providing the broadband interface for up to twelve Line Card Shelves and up to 288 line cards.

Management Information Base (MIB)

The MIB contains all the provisioning information for the Speedlink Multiplexer. (The MIB contains data available to a network management program. The network manager queries the MIB.)

Multiplexer

Equipment that aggregates two or more channels onto a single transmission channel.

NEBS (Network Equipment Building System)

NEBS is the Network Equipment Building System specification authored by Bellcore. NEBS compliance is required by many carrier customers; the Speedlink System shipping today is already NEBS-compliant.

NIC (Network Interface Card)

An electronic circuitry board that usually fits into an expansion slot of a PC whose purpose is to connect to a Local Area Network. A NIC is designed to comply with both a specific LAN Medium Access Control procedure (CSMA/CD for Ethernet) and a specific physical medium (e.g. twisted pair wire, coax, or multi-mode fiber). Associated with the NIC is a unique address called the MAC address. It works with the network software and computer operating system to transmit and receive messages on the network.

NID (Network Interface Device)

The Diamond Lane NID ADSL Splitter divides the ADSL and POTS signals and works in conjunction with the router at the subscriber end. The splitter installs on the outside of a home or building, and is enclosed in a weatherproof wall mount enclosure. It features primary lightning and AC power fault protection, and is a passive device, requiring no power or management from the central office or subscriber.

Network Management Processor (NMP) card

The NMP card controls the Speedlink's network management interfaces and provides the protocol support for communication for DiamondView and DiamondCraft.

OC-1 (Optical Carrier Level-1)

A SONET line rate of 51.840 Mb/s. Direct electrical-to-optical mapping of the STS signal with frame synchronous scrambling.

OC-3 (Optical Carrier Level-3)

A SONET line rate of 155.520 Mb/s. 3 x OC-1. Direct electrical-to-optical mapping of the STS signal with frame synchronous scrambling.

OC-12

Sonet channel of 622.08 Mbps.

OSI (Open System Interconnection Reference Model)

An internationally accepted set of standards for communication between various systems manufactured by different vendors. The OSI Reference Model is a seven-layer model developed by the ISO (International Standardization Organization) to describe how to connect any combination of devices to communicate.

PCI (Peripheral Component Interconnect)

Bus of an Intel PC. PCI transfers data between the PC's main microprocessor and peripherals at up to 132Mbps.

PCR (Peak Cell Rate)

PDR (Protocol Data Unit)

In data communication protocols, a unit of data created by a given protocol layer at one place and logically transferred to the same layer at another place called a peer. This is the OSI terminology for "packet".

PLCP (Physical Layer Convergence Protocol)

The part of the physical layer that adapts the transmission facility to handle DQDB functions as defined in IEEE 802.6-1990.

POP (Point-of-Presence)

The physical place within a LATA (the long distance carrier's local office) where the IEC provides services to the LEC, and perhaps directly to end-users.

POTS (Plain Old Telephone Service)

A term used to describe analog, voice-only basic telephone service. All POTS lines work on loop start signaling.

PPP (Point-to-Point Protocol)

A layer 2 protocol (relative to the OSI reference model) that allows a computer to use TCP/IP with a standard telephone line and a high-speed modem.

PVC (Permanent Virtual Circuit)

A permanent association between two DTEs established by configuration (established administratively via a service order process). A PVC uses a fixed logical channel to maintain a connection between the DTEs. After a PVC is defined, it requires no setup operation before data is sent and no disconnect operation after. The concept of a PVC is included in Networks supporting X.25, Frame Relay and ATM.

QoS (Quality of Service)

In ATM networks, a set of parameters for describing a transmission. These parameters include values such as allowable cell loss. The parameters apply to virtual channel connections and virtual path connections.

Remote Line Card Shelf (RLCS)

A RLCS allows customers served off of long loops — beyond 18,000 ft from the central office — access to xDSL service. The RLCS is located remotely from the central office in an outside cabinet and connected to the central office Master Control Shelf via fiber optic extensions.

Remote Low Pass Filter (RLPF)

The RLPF is a remote passive low pass filter “splitter” device. It splits the high frequency ADSL data signal from the voice signal at the customer end just like the Low Pass Filter card in the central office. There are two types of RLPF – a retrofit RLPF available a standard Network Interface Device housing and a standalone RLPF.

RFC (Request for Comments)

In the Internet community, a series of documents that contain protocol and model descriptions, experimental results, and reviews. All Internet standard protocols are written up as RFCs.

SDSL (Symmetric Digital Subscriber Line)

Also referred to as Single-Line Digital Subscriber Line, SDSL supports symmetrical T1/E1 transmissions. It uses a single copper-pair wire and has a maximum operating range of 10,000 feet. It is capable of accommodating applications that require identical downstream and upstream speeds, such as video conferencing.

Serial Port

A hardware input/output port in which only one pin is available for data transmission in a given direction – bits are transmitted in sequence (one bit at a time). The wiring for a port is associated with a particular physical interface (i.e., RS-232). A serial port is most commonly used for a modem or a mouse.

Service Provider

A service provider is an organization or individual that provides telephone access to a network or to another service, such as the Internet.

SNMP (Simple Network Management Protocol)

The network management protocol used within TCP/IP-based internets. Defines the protocol for managers (clients) to communicate with agents (servers). The agent interfaces directly with the networking layers on the monitored network device to obtain the network management information. An agent is installed on every network device that will be managed or monitored. A client is a application program that is installed at the network operations center. It communicates with the SNMP agents to collect information in the form of MIB variables. SNMP is a request/reply protocol that uses the operations of Set or Get on data items in a agents MIB.

SNR (Signal-to-Noise Ratio)

In a transmission, SNR is the ratio between the signal and noise levels at a given point, usually at the receiving end of the transmission. The SNR value is generally expressed in decibels (dB). The SNR can be used to determine how long a cable segment can before the signal loss is unacceptably high. The SNR also helps determine whether a particular type of cable is appropriate for the intended use.

SOHO (Small Office – Home Office)

SONET (Synchronous Optical NETWORK)

SONET is a high-speed, fiber-optic system, which provides an interface and mechanism for optical transmission of digital information. At the interface, signals are converted from electrical to optical form (and back to electrical form at the destination). SONET is an ANSI standard. Transmission rates range from 51.84Mbps to 13.22Gbps.

Speedlink Multiplexer

The Speedlink Multiplexer is classified as a Digital Subscriber Line Access Multiplexer (DSLAM). The Speedlink Multiplexer uses Digital Subscriber Line (xDSL) and Asynchronous Transfer Mode (ATM) technologies to deliver high speed data rates over the exiting copper network.

SVC (Switched Virtual Circuit)

A virtual connection set up on demand via a signaling protocol connection that is established for a communications session that is terminated after the session is over. This is in contrast to a permanent virtual circuit (PVC), which is a connection that is always established.

T1

DS1 rate electrical signal (two pair). T1 is suited for voice, data and image transmissions. T1 has a bandwidth of 1.544 megabits per second (Mbps), which comes from two dozen 64 kilobit per second (Kbps) channels, together with one 8Kbps framing channel.

TCP/IP (Transmission Control Protocol / Internet Protocol)

TCP/IP is a suite of several networking protocols developed for use on the Internet.

Telnet

Telnet is the terminal-remote host protocol developed for ARPAnet in 1974. On the Internet, it is a service program that allows you to connect to other computers at another site permitting you to interact with applications as if by a local terminal.

Trap

A method used to isolate an abnormal condition or operation.

TMN (Telecommunications Management Network)

A concept where all Operation and Maintenance Centers are linked together to form a network.

UBR (Unspecified Bit Rate)

In ATM networks, a UBR connection transmits at variable rates.

UNI (User-to-Network Interface)

In ATM networks, one of three levels of interface. A UNI specification which defines Layer 1 and Layer 2 protocols required for CPE and carrier equipment to interoperate. UNI specifications provide physical media and line rate implementation options.

VBR (Variable Bit Rate)

In ATM networks, a VBR connection transmits in bursts, at variable speeds.

VDSL (Very-high-speed Digital Subscriber Line)

VDSL provides DSL service at a data rate in excess of 10Mbps (up to 52Mbps). VDSL has a maximum operating range from 1,000 feet to 4,500 feet on 24-gauge wire.

VPI (Virtual Path Identifier)

An identifier (value) in an ATM cell that identifies the data of one Virtual Path connection from the data of another connection.

WAN (Wide Area Network)

A WAN is a network of computers and related communications equipment whose elements may be in dispersed sites with distances great enough to require common carrier provided communication lines.

xDSL (all forms of Digital Subscriber Lines)

The “x” represents the various types of digital subscriber lines: ADSL, RADSL, SDSL, HDSL, or VDSL.

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