RS/6000

Adapters, Devices, and Cable Information for Multiple Bus Systems

SA38-0516-06

Seventh Edition (October 1998)

Contents

Laser Safety Information

The 4X and 8X CD-ROM drives contain an optical laser. They have a label that identifies their classification. The label, located on the drive, is shown below.

CLASS 1 LASER PRODUCT
LASER KLASSE 1
LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT
APPAREIL À LASER DE CLASSE 1
EN 60825

The 4X and 8X drives are certified to conform to the requirements of the U.S. Department of Health and Human Services 21 Code of Federal Regulations (DHHS 21 CFR) Subchapter J for Class 1 laser products. Elsewhere, the drive is certified to conform to the requirements of the International Electrotechnical Commission (IEC) 825 (1st edition 1984) and CENELEC EN 60 825:1991 for Class 1 laser products.

CAUTION:
A class 3 laser is contained in this device. Do not attempt to operate the drive while it is disassembled. Do not attempt to open the covers of the drive as it cannot be serviced and is replaced as a unit.

Class 1 laser products are not considered to be hazardous. The optical laser contains internally a Class 3B gallium-arsenide laser that is nominally 30 milliwatts at 830 nanometers. The design incorporates a combination of enclosures, electronics, and redundant interlocks such that there is no exposure to laser radiation above a Class 1 level during normal operation, user maintenance, or servicing conditions.

About This Book

The information contained in this book is common to all open bus system units. Care needs to be exercised in that not all adapters and devices apply to all system units. Any information or procedure that is specific to a certain system unit or device is in the service guide for that system unit or device.

How This Book is Organized

This book provides information about adapters, devices and cables attached to or used within a system unit. Also included are removal procedures for stuck tapes for some of the tape drives.

How to Use This Book

This book can be used to help identify an adapter, to aid in the servicing of some devices and designing or servicing cabling layouts for a system.

ISO 9000

ISO 9000 registered quality systems were used in the development and manufacturing of this product.

Related Publications

The following publications are available:

- The *RS/6000 Diagnostics Information for Multiple Bus Systems* order number SA38-0509 contains common diagnostic procedures, error codes, and adapters and device service information. This manual is intended for trained service personnel.
- The System Unit Service Guide that came with your system, contains maintenance information and service procedures for trained service personnel.
- The System Unit User's Guide that came with your system, contains information to help set up, install options, configure, modify and solve minor problems.
- *AIX Versions 3.2 and 4 Asynchronous Communications Guide* order number SC23-2488. This publication has information on installing asynchronous communications hardware and software.

- *Site and Hardware Planning Information* order number SA38-0508. This publication has information on physical characteristics of many machine types and cable planning.
- *SP Planning Volume 1, Hardware and Physical Environment* order number GA22-7280. This publication has information on SP System environment for system planning.
- *PCI Adapter Placement Reference* order number SA38-0538. This publication has information regarding PCI adapter placement in your system unit.

Ordering This Publication

To order additional copies of this book, contact your sales representative and use order number SA38-0516.

Chapter 1. Adapter Information

This chapter contains information to aid in identifying adapters and service data for the adapters installed within a system unit.

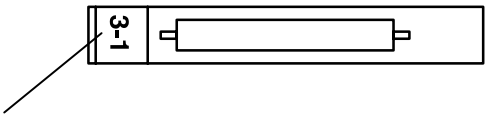
How to Use the Adapter Information

The adapter information contained in this book is used during non-directed service activities. The information in this chapter is used to:

- Identify an adapter.
- Find specific technical information about an adapter.
- Show signal names for the output pins of the adapter connectors.
- Where applicable, show the settings for switches or jumpers.

Some of the adapters are labeled to identify the adapter type. If you know the adapter type number, use the Adapter Identification Label Cross-Reference List on the following page to find the name of the adapter. You can also use the About Your Machine listing shipped with your system unit to identify an adapter.

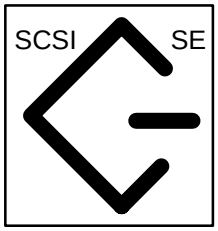
This drawing shows how an adapter is labeled.



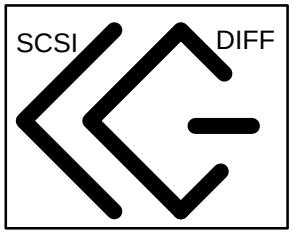
Adapter Type Label

Notes:

- The end brackets of non-OEM SCSI-2 differential adapters also carry the label, "Differential".
- OEM SCSI-1 or SCSI-2 single-ended and SCSI-2 differential adapters may carry one of the following ANSI icons:



Single-Ended



Differential

CSU/CE Feature Installation

Attention: The following information indicates which features on various RS/6000 systems/models are intended to be installed by the customer and which features are to be installed by a Customer Engineer/Customer Service Representative (CE/CSR) as part of a Miscellaneous Equipment Specification (MES). This information is for RS/6000 systems/models available as of 10/98.

Notes:

1. The acronym CSU means Customer Set-Up.
2. For description of Feature Codes listed below see page 1-3.
3. 7013 J30 was announced as CSU. US practice has been for CE install.

Machine Type	Model	System CSU [1]	Features/Options [2]	
			CE Install	Customer Install
7006	(ALL)	YES	ALL FEATURES	NONE
7007	(ALL)	YES	ALL FEATURES	NONE
7008	(ALL)	YES	ALL FEATURES	NONE
7009	(ALL)	YES	ALL FEATURES	NONE
7010	(ALL)	YES	ALL FEATURES	NONE
7011	(ALL)	YES	ALL FEATURES	NONE
7012	(ALL)	YES	ALL FEATURES	NONE
7013	(ALL) [3]	NO	ALL FEATURES	NONE
7015	(ALL)	NO	ALL FEATURES	NONE

Machine Type	Model	System CSU [1]	Features/Options [2]	
			CE Install	Customer Install
7017	(ALL)	NO	ALL FEATURES	NONE
7024	(ALL)	YES	FC 6309	ALL OTHER FEATURES
7025	(ALL)	YES	FC 2856, 6309, 6549	ALL OTHER FEATURES
7026	(ALL)	NO	ALL OTHER FEATURES	FC 2901,2911, 2913, 3071, 3072, 3083
7027	(ALL)	NO	ALL OTHER FEATURES	FC 2616, 3080,3083, 3084, 3090, 6142, 6147, 3133, 3134, 3137, 3138, 6153, 6294, 6295
7043	(ALL)	YES	FC 2856 & 6309	ALL OTHER FEATURES
7236	(ALL)	NO	ALL FEATURES	NONE
7248	(ALL)	YES	FC 2856	ALL OTHER FEATURES
7317	(ALL)	NO	ALL FEATURES	NONE
7318	(ALL)	NO	ALL FEATURES	NONE
7319	(ALL)	NO	ALL FEATURES	NONE

Feature Code	Feature Code Description
2616	INTERNAL CD-ROM2/4X/TRAY LOADING, 600KB/S
2856	PCI/SHORT/32BIT/3.3 OR 5V, 7250 ATTACH ADAPTER
2901	4.5GB F/W ULTRA SCSI DASD MODULE
2911	9.1GB F/W ULTRA SCSI DASD MODULE
2913	9.1GB F/W ULTRA MODULE, 1" HIGH
3071	4.5GB SSA DASD MODULE, 1" HIGH
3072	9.1GB SSA DASD MODULE, 1.6" HIGH
3080	4.5GB F/W SCSI DASD MODULE
3083	2.2GB F/W SCSI DASD MODULE
3084	4.5GB F/W SCSI DASD MODULE
3090	9.1GB F/W SCSI DASD MODULE
3133	CABLE SCSI, 3M, TO F/W MC SCSI ADAPTER (SE OR DIFF)
3134	CABLE SCSI, 6M, TO F/W MC SCSI ADAPTER (SE OR DIFF)
3137	CABLE SCSI/DIFF, 12M, TO F/W MC SCSI ADPTR
3138	CABLE SCSI/DIFF, 18M, TO F/W MC SCSI ADPTR
6142	INTERNAL 4MM 4/8GB TAPE
6147	8MM 5/10GB VDAT TAPE
6153	4MM TAPE DRIVE + AUTOLOADER, HORIZONTAL
6294	OPTIONAL AC POWER SUPPLY FOR 7027 SCSI DRAWERS
6295	OPTIONAL BIFURCATED (Y-cable) POWER CORD FOR 7027 SCSI DRAWERS
6309	DIGITAL TRUNK QUAD ADAPTER, PCI/LONG/32BIT/5V
6549	ADDITIONL POWER SUPPLY FOR 2ND AND 3RD 6-PKS ON MODEL F40

Adapter Identification Reference List for IHV Supplied Adapters

Note: These adapters are arranged by adapter type. These adapters are from Independent Hardware Vendors (IHVs). They are presented here as a service aid.

Type Label	Description	FRU Part Number
9-N	Eicon ISDN DIVA PRO 2.0 PCI S/T Adapter for PowerPC Systems	93H5839
*	3Com Fast Etherlink XL PCI 10/100 Ethernet (PCI)	93H1845
*	Syskonnect SK-NET FDDI-LP SAS (PCI)	73H3504
*	Syskonnect SK-NET FDDI-LP DAS (PCI)	73H3401
*	Syskonnect SK-NET FDDI-UP SAS (PCI)	73H3418
*	MVP POWER Multi-Monitor Adapter (PCI)	93H5107

Note: Adapters shown with an adapter type of * do not have an assigned adapter type.

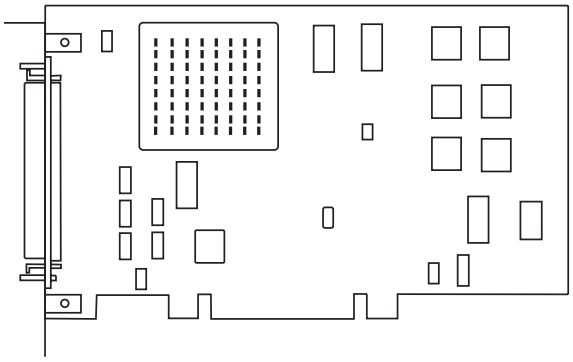
Adapter Identification Label Cross Reference List

Note: This chapter is arranged by adapter type.

Type Label	Description	Page
1-H	POWER GXT1000 Graphics Accelerator Attachment PCI	1-6
1-I,and 1-J	POWER GXT500P and POWER GXT550P 3D Graphics PCI	1-9
1-K	POWER GXT800P 3D Graphics PCI	1-14
1-M,and 1-N	POWER GXT250P and POWER GXT255P High-Performance Graphics PCI	1-18
1-P	GXT120P 2D Video Accelerator Graphics PCI	1-20
1-R	POWER GXT3000P 3D Graphics Adapter PCI	1-22
3-8	8-Port Asynchronous EIA-232 ISA	1-26
3-9	128-Port Async Controller ISA	1-30
3-A	8-Port Asynchronous EIA-232E/RS-422A ISA	1-32
3-B	8-Port Asynchronous EIA-232E/RS-422A PCI	1-36
3-C	128-Port Async Controller PCI	1-40
4-A, 4_A, 4-E	PCI SCSI-2 Single Ended Fast/Wide	1-53
4-B, 4_B, 4-F	PCI SCSI-2 Differential Fast/Wide	1-58
4-H	PCI SCSI-2 Fast/Wide RAID	1-61
4-J	PCI SSA 4-Port RAID	1-65
4-K	PCI Single-Ended Ultra SCSI Adapter	1-68
4-L	PCI Differential Ultra SCSI Adapter	1-73
4-N	PCI SSA Multi-Initiator/RAID EL Adapter	1-76
4-S	Gigabit Fiber Channel Adapter for PCI Bus	1-79
5-5	S/390 ESCON Channel PCI Adapter	1-81
6-B	Digital Trunk Quad PCI Adapter	1-83
6-E	IBM ARTIC960RxD Quad Digital Trunk PCI Adapter	1-84
6-F	SP System Attachment Adapter	1-87
7-9	Ultimedia® video Capture Adapter PCI	1-88
8-T	PCI Auto LANstreamer® Token-Ring Adapter	1-91
8-Y	Ethernet T2 PCI	1-96
8-Z	Ethernet T5 PCI	1-96
9-F	TURBOWAYS® 155 PCI MMF ATM Adapter	1-98
9-J	TURBOWAYS 155 PCI UTP ATM Adapter	1-99
9-L	2-Port Multiprotocol PCI	1-101
9-O	PCI Token-Ring Adapter	1-103
9-P	10/100 Ethernet Tx PCI Adapter	1-108
9-R	IBM ARTIC960Hx 4-Port Selectable PCI Adapter	1-110
9-S	IBM ARTIC960Hx 4-port T1/E1 PCI Adapter	1-114
9-T	IBM ARTIC960Hx DSP Resource PCI Adapter	1-118
9-U	Gigabit Ethernet-SX PCI Adapter	1-120
*	X.25 Interface Co-Processor ISA	1-122
*	Co-Processor Multiport, Model 2 ISA	1-130
*	S15 Graphics PCI	1-138
*	GXT110P Video Accelerator Graphics PCI	1-141
*	TURBOWAYS 25 ATM PCI	1-143

Note: Adapters shown with an adapter type of * do not have an assigned adapter type.

FC(2856) POWER GXT1000 Graphics Accelerator Attachment Adapter Type (1-H)

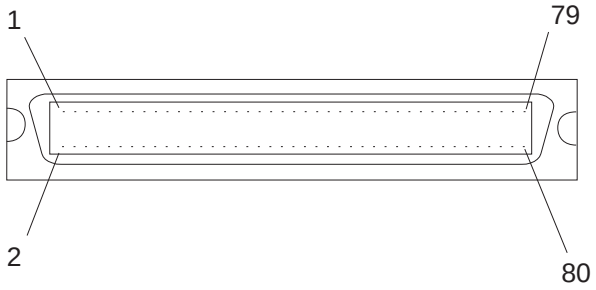


The attachment adapter feature allows connection of the system unit to a 7250 POWER GXT1000 Graphics Accelerator.

POWER GXT1000 Graphics Accelerator Attachment Adapter Specifications

Item	Description
FRU Number	7250 POWER GXT1000 Graphics Accelerator Attachment Adapter 93H2399
Resolution	N/A
Colors	N/A
Busmaster	Yes
I/O Bus	PCI
Adapter form factor	PCI Short
Attachment adapter callout	908
Connectors	80 pin
Adapter Cable	Length 2m (6.5 ft) 65G4892

POWER GXT1000 Graphics Accelerator Attachment Adapter Connector

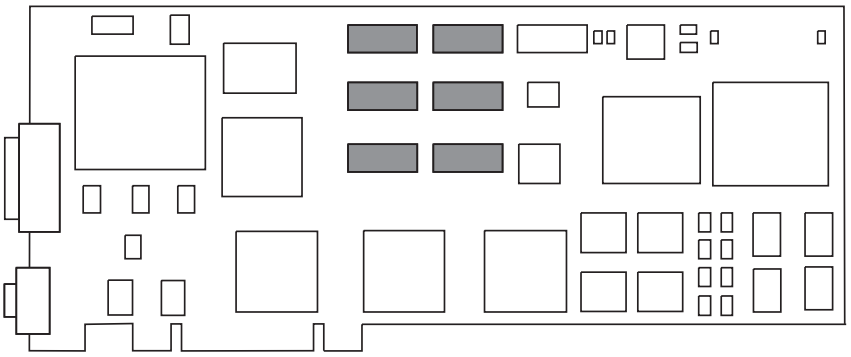


Position	Signal Name	Position	Signal Name
1	addr00	41	-req
2	addr01	42	-ccmrom
3	addr02	43	trans64/32
4	addr03	44	cpdmatc0
5	addr04	45	sedmatc0
6	addr05	46	-breq
7	addr06	47	-rdy
8	addr07	48	avail
9	addr08	49	data00
10	addr09	50	data01
11	addr10	51	data02
12	addr11	52	data03
13	addr12	53	data04
14	addr13	54	data05
15	addr14	55	data06
16	addr15	56	data07
17	addr16	57	data08
18	addr17	58	data09
19	addr18	59	data10
20	addr19	60	data11
21	addr20	61	data12
22	addr21	62	data13
23	addr22	63	data14
24	addr23	64	data15
25	addr24	65	data16
26	addr25	66	data17

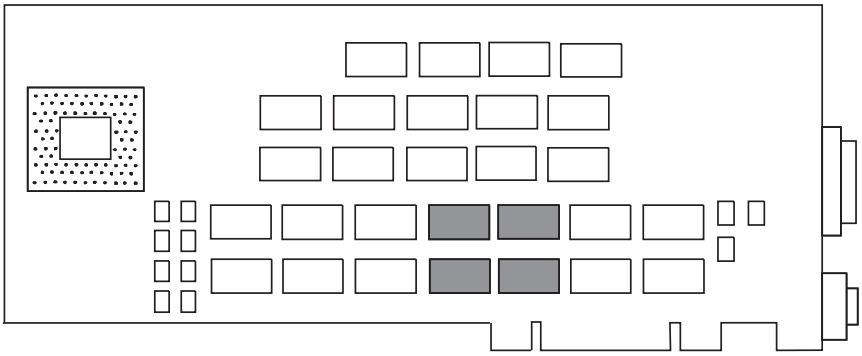
Position	Signal Name	Position	Signal Name
27	addr26	67	data18
28	addr27	68	data19
29	addr28	69	data20
30	addr29	70	data21
31	addr30	71	data22
32	addr31	72	data23
33	-reset	73	data24
34	-busy	74	data25
35	-int	75	data26
36	poweron	76	data27
37	-chchk	77	data28
38	rw	78	data29
39	-strobe	79	data30
40	-bgnt	80	data31

FC(2854, 2855) POWER GXT500P and POWER GXT550P Graphics Accelerator Adapters (Type 1-I and 1-J)

The POWER GXT500P and POWER GXT550P graphics adapters are single card adapters that attach to your system unit in a PCI bus graphics slot. These adapters provide 3D graphics acceleration.



(GXT550P Top View; GXT500P does not include shaded technology)



(GXT550P Bottom View; GXT500P does not include shaded technology)

POWER GXT500P and POWER GXT550P Graphics Accelerator Adapter Specifications General

Item	Description	
FRU numbers	MT 7043 Model 140 GXT500P	93H1710
	MT 7043 Model 140 GXT550P	93H1705
	MT 7043 Model 240 GXT500P	40H4956
	MT 7043 Model 240 GXT550P	40H4962
	MT 7025 Model F40 GXT500P	40H4956
	MT 7025 Model F40 GXT550P	40H4962
Bus architecture	PCI	
Bus width	32-bit	
Maximum number	1	
Number of colors supported	24-bit, 16.7 million	
Screen resolutions:	1024x768 at 60 - 85 Hz vertical refresh	
	1280x1024 at 60 - 85 Hz vertical refresh	
Display Power Management	Supports Video Electronics Standards Association (VESA), Display Power Management Signalling (DPMS).	
Connectors	13W3 13-pin D-shell connector	
	9-pin D-shell connector	

The POWER GXT500P Adapter Supports:

- 8 and 12 bit double-buffered color
- 24 bit single-buffered (true) color
- 8 bit single-buffered alpha
- 8 bit single-buffered overlay
- 8 bits of window ids
- 24 bit Z-buffer
- 4 bit stencil
- OpenGL, PEX, graPHIGS, and GL 3.2 API's
- 3D Acceleration:
  - Depth Buffering
  - Antialiasing
  - Gouraud shading
  - Fog and Atmospheric effects
  - Stencil test
  - Alpha test
  - Blending
  - Dithering
- Display resolution: 1280x1024 and 1024x768

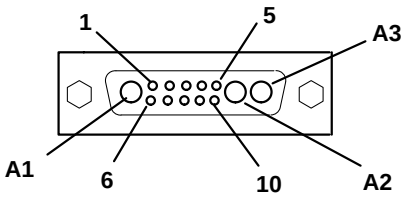
  (including monitors that comply with ISO 9241, Part 3 Std.)
- Stereo viewing

The POWER GXT550P Adapter Supports:

- 8, 12, or 24 bit double-buffered color
- 8 bit double-buffered alpha
- 8 bit single-buffered overlay
- 8 bits of window ids
- 24 bit Z-buffer
- 4 bit stencil
- OpenGL, PEX, graPHIGS, and GL 3.2 API's
- 3D Acceleration:
  - Depth Buffering
  - Antialiasing
  - Gouraud shading
  - Fog and Atmospheric effects
  - Stencil test
  - Alpha test
  - Blending
  - Dithering
- Display resolution: 1280x1024 and 1024x768

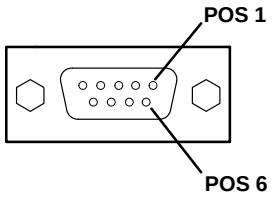
(includes monitors that comply with ISO 9241, Part 3 Std.)
- Stereo viewing

POWER GXT500P and POWER GXT550P Graphics Accelerator Adapter 13W3 13-Position Connector



Position	Signal Name
A1	Red
A2	Green
A3	Blue
1	Monitor ID Bit 2
2	Monitor ID Bit 3
3	(No Connection)
4	IO GND
5	HSYNC
6	Monitor ID Bit 0
7	Monitor ID Bit 1
8	(No Connection)
9	VSYNC
10	IO GND

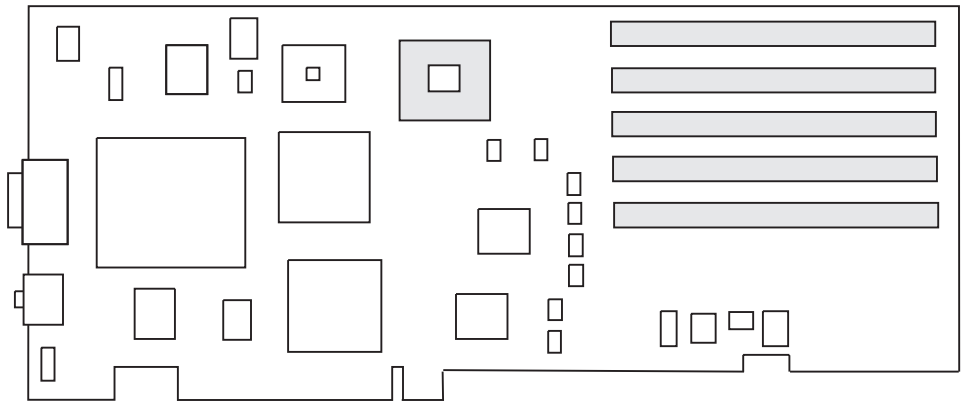
POWER GXT500P and POWER GXT550P Graphics Accelerator Adapter 9-pin D-Shell Connector



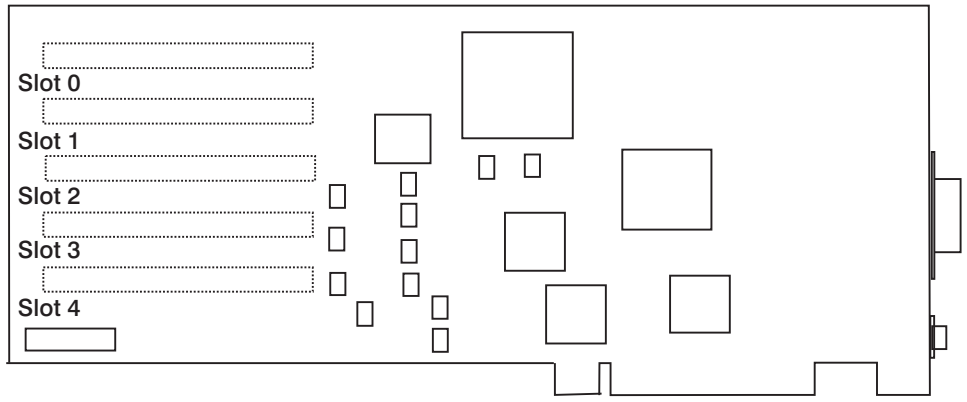
Position	Signal Name
1	N/C
2	N/C
3	N/C
4	N/C
5	N/C
6	+12 Volt supply
7	12 Volt return
8	Stereo Signal
9	N/C

FC(2853, 2859) POWER GXT800P and POWER GXT800P W/Texture Memory 3D Graphics Adapters (Type 1-K)

The POWER GXT800P graphics adapters (POWER GXT800P (FC2853) with base memory / POWER GXT800P (FC2859) with base and texture memory) are single card adapters that attach to your system unit in a PCI bus graphics slot. Both adapters provide 3D graphics acceleration. The POWER GXT800P with base and texture memory, also provides texture acceleration.



(GXT800P Top View)



(GXT800P Bottom View)

Note: The memory (DIMMS) stands about two inches above the card. See illustration on page 1-15

The Side View of the Adapter With Metal Shield Housing.

POWER GXT800P Video Accelerator Adapter Specifications

Item	Description
FRU number	GXT800P base card for the MT 7043 Model 140 93H2028 GXT800P base card for the MT 7043 Model 240 and the MT 7025 Model F40 39H8700
Memory	DIMM 1 39H8702 DIMM 2 39H8706
Bus architecture	PCI
Bus width	32-bit
Maximum number	1
Number of colors supported	24-bit, 16.7 million
Screen resolutions	1024x768 at 60 - 85 Hz vertical refresh 1280x1024 at 60 - 75 Hz vertical refresh
Display Power Management	supports Video Electronics Standards Association (VESA). Display Power Management Signalling (DPMS).
Connectors	15-pin D-shell (HD-15) connector 3.5 mm Stereo Jack

The POWER GXT800P Adapter With Base Memory Supports:

- 8 and 24 bit double-buffered color
- 8 bit double-buffered alpha
- 8 bit single-buffered overlay
- 8 bits of window ids
- 24 bit Z-buffer
- 4 bit stencil
- OpenGL, PEX, graPHIGS, and GL 3.2 API's
- 3D Acceleration:
  - Depth Buffering
  - Antialiasing
  - Gouraud shading
  - Fog and Atmospheric effects
  - Stencil test
  - Alpha test
  - Blending
  - Dithering.
- Display resolution: 1280x1024 and 1024x768

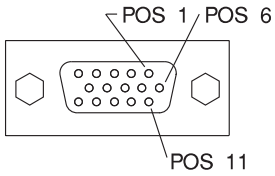
  (includes monitors that comply with ISO 9241, Part 3 Std.)
- Stereo viewing

The POWER GXT800P Adapter With Base and Texture Memory Supports:

- 8 and 24 bit double-buffered color
- 8 bit double-buffered alpha
- 8 bit single-buffered overlay
- 8 bits of window ids
- 24 bit Z-buffer
- 4 bit stencil
- OpenGL, PEX, graPHIGS, and GL 3.2 API's
- 3D Acceleration:
  - Depth Buffering
  - Antialiasing
  - Gouraud shading
  - Fog and Atmospheric effects
  - Stencil test
  - Alpha test
  - Blending
  - Dithering.
- Display resolution: 1280x1024 and 1024x768

(includes monitors that comply with ISO 9241, Part 3 Std.)
- Stereo viewing
- The POWER GXT800P with base and texture supports HW acceleration of trilinear mipmapped textures up to 512 x 512.

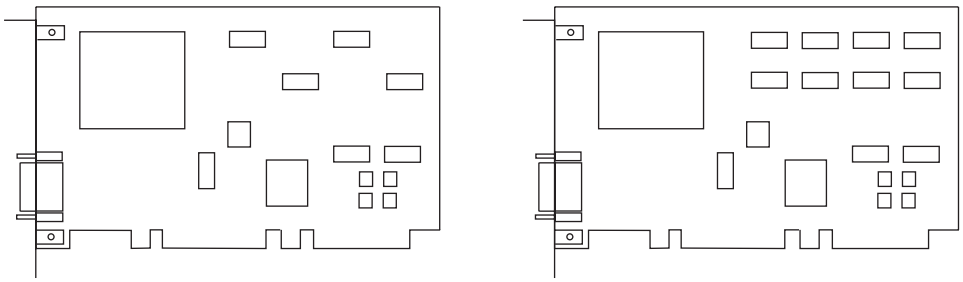
POWER GXT800P Graphics Adapter 15-Pin D-Shell (HD-15) Connector



Position	Signal Name
1	RED
2	GREEN
3	BLUE
4	F_MONITOR_ID (2)
5	IOGND (ground)
6	RED_RTN
7	GREEN_RTN
8	BLUE_RTN
9	IOGND (ground)
10	IOGND (ground)
11	F_MONITOR_ID (0)
12	F_MONITOR_ID (1)
13	H_SYNC
14	V_SYNC
15	F_MONITOR_ID (3)

FC(2851, 2852) POWER GXT250P, and POWER GXT255P High-Performance Graphics Adapters (Types 1-M and 1-N)

The POWER GXT250P and POWER GXT255P Adapters are high-performance PCI graphics adapters. They are designed to operate in any computer that supports the Peripheral Component Interconnect (PCI) bus interface.

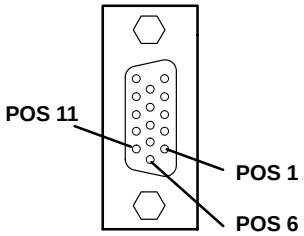


Note: In the illustration above, the GXT250P is on the left side and the GXT255P is on the right. The GXT255P has more modules in the upper right quadrent of the adapter.

POWER GXT250P and POWER GXT255P High-Performance Graphics Adapters Specifications

Item	Description
FRU number	GXT250P 93H2437 GXT255P 93H2438
Bus architecture	PCI
Bus width	32-bit or 64-bit
Interrupt level	Int A
Maximum number	Can be put in all slots
Number of colors supported	GXT250P - 8-bit color supports up to 1280x1024 monitor resolutions. GXT255P - 8, 16, and 24-bit color supports up to 1280x1024 monitor resolutions.
Screen resolutions	1024x768 at 60 - 85 Hz vertical refresh 1280x1024 at 60 - 85 Hz vertical refresh
Display Power Management	Supports Video Electronics Standards Association (VESA) Display Power Management Signalling (DPMS).
Connector	15-pin D-shell (HD-15) connector

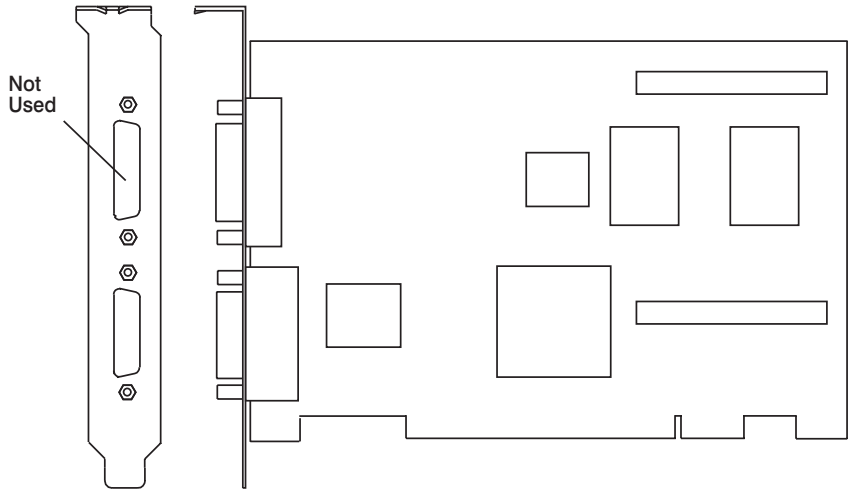
POWER GXT250P and POWER GXT255P Graphics Adapter 15-Pin D-Shell (HD-15) Connector



Position	Signal Name
1	Red
2	Green
3	Blue
4	Monitor ID Bit 2
5	Test (ground)
6	Red Video Return
7	Green Video Return
8	Blue Video Return
9	No Connection
10	SYNC Return (ground)
11	Monitor ID Bit 0
12	Monitor_ID Bit 1
13	HSYNC
14	VSYNC
15	Monitor_ID Bit 3

FC(2838) POWER GXT120P 2D Video Accelerator Adapter PCI (Type 1-P)

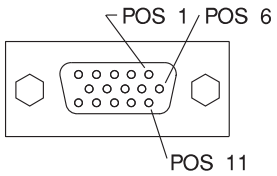
The POWER GXT120P 2D Video Accelerator Adapter is a high-performance PCI graphics adapter. It is designed to operate in any computer that supports the Peripheral Component Interconnect (PCI) bus interface.



POWER GXT120P 2D Video Accelerator Adapter Specifications

Item	Description
FRU number	93H2534
Bus architecture	PCI
Bus width	32-bit
Interrupt level	Int A
Maximum number	2
Number of colors supported	8-bit
Screen resolutions	640x480 at 60 - 85 Hz vertical refresh 800x600 at 60 - 85 Hz vertical refresh 1024x768 at 60 - 85 Hz vertical refresh 1280x1024 at 60 - 85 Hz vertical refresh
Display Power Management	Supports Video Electronics Standards Association (VESA) Display Power Management Signalling (DPMS)
Connector	15 pin HD-15 D-shell connector 15 pin D-shell connector (Not Used)

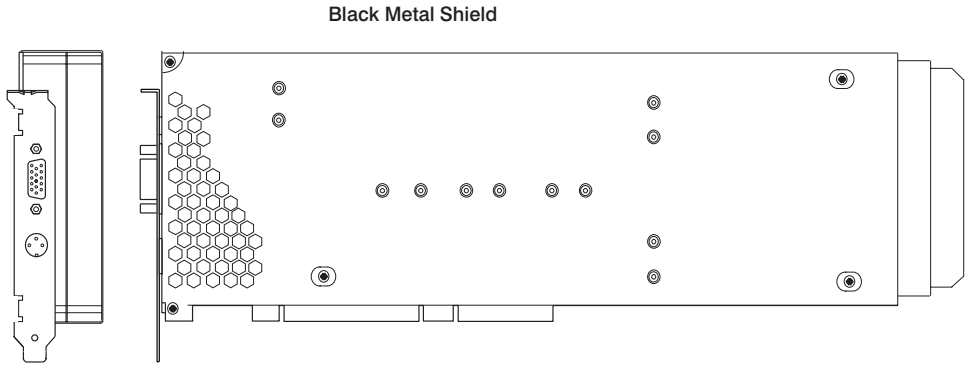
POWER GXT120P Video Accelerator Adapter 15-Pin (HD-15) D-Shell Connector



Position	Signal Name
1	Red
2	Blue
3	Green
4	Reserved
5	DDC Return (ground)
6	Red Video Return
7	Green Video Return
8	Blue Video Return
9	Not Used
10	SYNC Return
11	Reserved
12	Bi-directional Data
13	HSYNC
14	VSYNC
15	Data Clock

FC(2825) POWER GXT3000P 3D Graphics Adapter PCI (Type 1-R)

The POWER GXT3000P 3D graphics adapter PCI is a mid-range single card adapter that attaches to your system unit in a PCI bus 64 or 32 bit slot. This adapter provides 3D graphics acceleration. The illustration below is the top view of the GXT3000P.



POWER GXT3000P 3D Graphics Adapter PCI Specifications

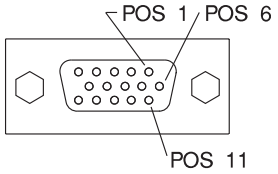
Item	Description
FRU number	24L0030
GXT3000P used on	MT 7043 Model 260 MT 7025 Model F50 MT 7043 Model 150
Bus architecture	PCI
Bus width	32 or 64-bit
Maximum number	1 per system
Number of slots	Requires 2 slots
Number of colors supported	24-bit, 16.7 million
Screen resolutions	1024x768 at 75 - 120 Hz vertical refresh 1280x1024 at 60 - 85 Hz vertical refresh
Display Power Management	supports Video Electronics Standards Association (VESA). Display Power Management Signalling (DPMS).
Connectors	15-pin D-shell (HD-15) connector 3-pin mini-DIN Stereo Jack

The POWER GXT3000P Adapter Supports:

- 16-bit utility planes
- 8 and 24 bit double-buffered color
- 8 bit double-buffered alpha
- 8 bit single-buffered overlay
- 8 bits of window ids
- 24 bit Z-buffer
- 8 bit stencil
- OpenGL, graPHIGS, and API's
- 32 MB Texture Memory
- Separate Gamma Correction Table
- Video Support
  - Point Sampling and Bilinear Scaling
  - Color Space Conversion
- Scissor Registers
- 3D Acceleration:
  - Depth Buffering
  - Antialiasing
  - Gouraud shading
  - Fog and Atmospheric effects
  - Stencil test
  - Alpha test
  - Blending
  - Dithering.
- Display resolution: 1280x1024 and 1024x768

  (includes monitors that comply with ISO 9241, Part 3 Std.)
- Stereo viewing
- The POWER GXT3000P supports hardware acceleration of trilinear mipmapped textures up to 512 x 512.

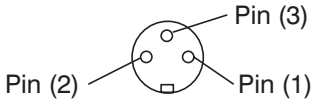
POWER GXT3000P Graphics Adapter 15-Pin D-Shell (HD-15) Connector



Position	Signal Name
1	RED
2	GREEN
3	BLUE
4	Not Used
5	DDC Return
6	RED_RTN
7	GREEN_RTN
8	BLUE_RTN
9	Not Used
10	Sync return
11	Not Used
12	DDC Data
13	H_SYNC
14	V_SYNC
15	DDC Clock

POWER GXT3000P Graphics Adapter 3-Pin mini-DIN Stereo Jack

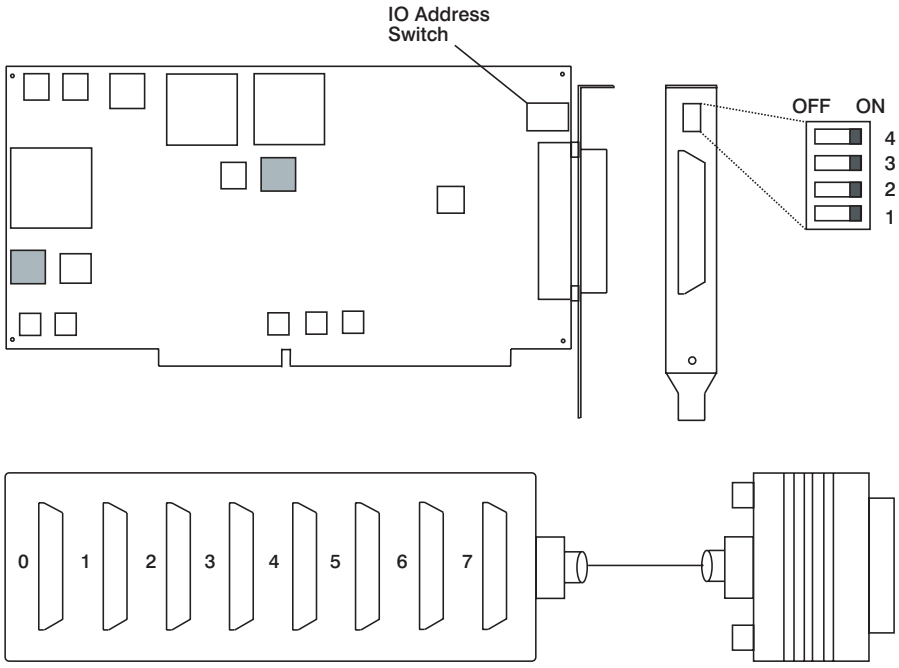
Stereo Connector



Position	Signal Name
1	+5 vdc
2	GND
3	TTL out

FC(2931) 8-Port Asynchronous EIA-232 ISA Adapter (Type 3-8)

The 8-Port Asynchronous ISA adapter is a multi-channel intelligent serial communications feature which supports speeds of 115Kbps for each asynchronous port and is run by a 32-bit, 16MHz,IDT 3041 processor.



8-Port Asynchronous ISA Adapter Specifications

Item	Description
FRU Number	Part number 11H5969
I/O addresses	Set via DIP switches 0x104, 0x114, 0x124, 0x204, 0x224, 0x304, 0x324
I/O Bus	ISA
Interrupt levels	3, 5, 7, 10, 11, 12, 15, or disabled (set by the program)
Bit rate	50 - 115200 (set by the program)
Bits per character	5, 6, 7, 8 (set by the program)
Busmaster	No
Maximum Number	7

Connector	78-position, D-shell female
Wrap plug	EIA-232D 25-position, part number 6298964
Cable	8-Port DB-25 connector box FRU part number 11H6011or 07L9001 included with adapter.
Modem Cable	EIA-232 modem cable part number 6323741, feature code 2936, length 3 meters or 10 feet long.
Terminal/Printer Cable	EIA-232 terminal/printer cable part number 12H1204, feature code 2934, length 3 meters or 10 feet long.

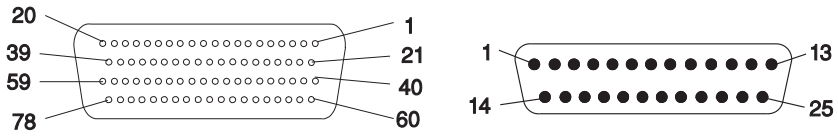
8-Port Asynchronous ISA Adapter Switch Settings

I/O addresses are set with the switches at the rear of the adapter. The following table contains a description of the different switch settings.

Hex Addr	Address Switch			
	1	2	3	4
104	Off	Off	On	On
114	Off	On	Off	On
124	Off	On	On	On
204	On	Off	Off	On
224	On	Off	On	On
304	On	On	Off	On
324	On	On	On	On

8-Port EIA-232-D Adapter 78-Position and 25-Position Connectors

The 8-Port Asynchronous EIA-232 ISA adapter is shipped with a connector box that provides eight EIA-232 standard connectors.



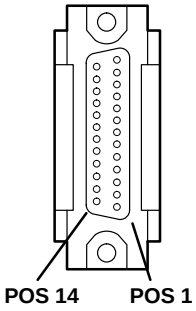
Mnemonic	I/O	Port 0	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	25-Position Connector
TxD	O	30	50	11	10	40	02	63	64	02
RxD	I	55	17	37	56	28	08	46	27	03
RTS	O	51	31	12	14	21	41	62	60	04
CTS	I	16	53	59	57	25	04	09	45	05
DCD	I	35	33	39	18	43	23	48	06	08
DTR	O	49	32	13	52	22	03	61	01	20
DSR	I	54	34	58	38	05	42	29	26	06
RI	I	36	15	20	19	44	24	47	07	22
SGND*	--	--	--	--	--	--	--	--	--	07
FGND*										01 Cable Shield

Note: * Pins 65 through 78 are ground.

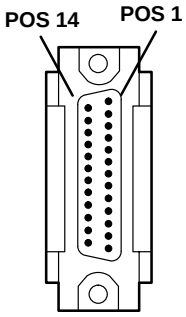
Asynchronous Cable Connectors

All of the asynchronous cables described below have the same connectors. In each case the end that goes to the system has a 25-pin D-shell with sockets (female). The end that goes to the device has a 25-pin D-shell with pins (male). The figure below shows the ends of the 25-pin connectors.

System End

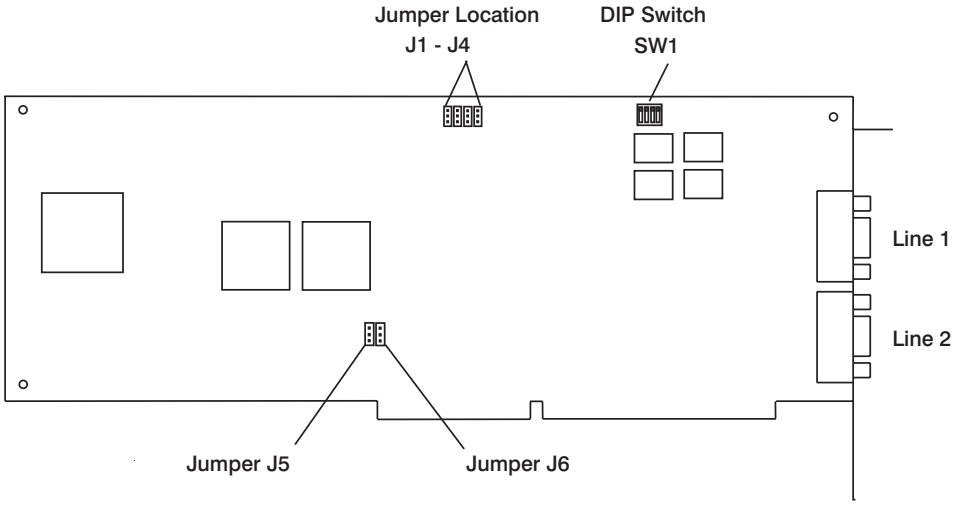


Device End



FC(2933) 128 Port Async Controller ISA (Type 3-9)

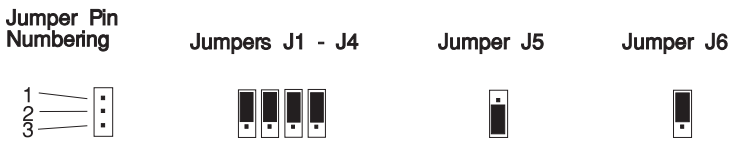
This adapter provides the control function and connectors to attach eight 16-port remote async nodes (RANs). When all eight nodes are attached, this combination provides 128, EIA-232-D communication ports. The remote async nodes are described in the following topic. More information pertaining to the 128-Port Async Controller can be found in the publication, *AIX Versions 3.2 and 4 Asynchronous Communications Guide* order number SC23-2488.



Jumpers and Switches

The following sections show the jumpers and switches on the 128-port async adapter.

128-Port Jumpers: There are six jumpers on the adapter. These jumpers are set at the factory, and must not be changed. The correct settings are:



128-Port Bus I/O Address Switch: The I/O address switch is used to set the I/O address range that is used by each 128-port adapter. If more than one 128-port adapter is used in one system, they must each have a different address range.

Bus I/O Address	Address Switch 1	2	3	4
0x108	OFF	OFF	ON	ON
0x118	OFF	ON	OFF	ON
0x128	OFF	ON	ON	ON
0x208	ON	OFF	OFF	ON
0x228	ON	OFF	ON	ON
0x308	ON	ON	OFF	ON
0x328	ON	ON	ON	ON

128-Port Async Controller Specifications

Item	Description
FRU Number	73H3384
Memory addresses	512k bytes of continuous non-shared memory space
Interrupt levels	3, 4, 5, 7, 10, 11, 12, 15
Bit rate	75 to 57,600 bps (set by the program)
Bits per character	5, 6, 7, 8 (set by the program)
Parity	Odd, even, or none
Stop bits	1, 2
I/O bus architecture	ISA
Maximum number	7
Connectors	Two, HD-15 connectors
Terminator plugs	Pair, HD-15, part number 43G0938
Cables	0.2 m (9 inches) controller cable, part number 43G0936, 4.6 m (15 feet) controller cable, part number 43G0937

15-Position HD-15 Controller Connector

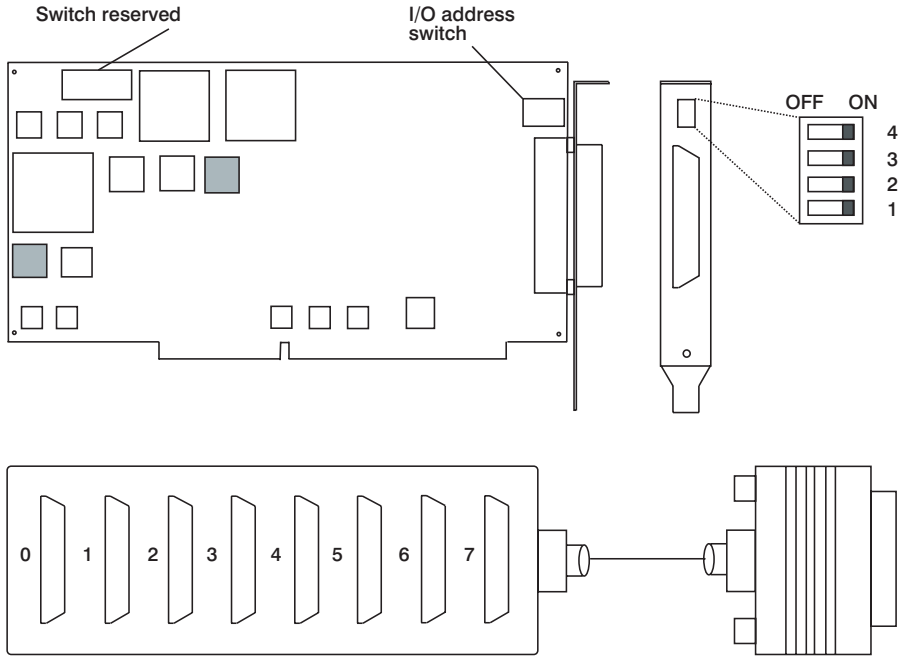
For information on the 15-Position HD-15 Controller Connector, see “15-Position HD-15 Controller Connector” on page 1-41.

Remote Async Nodes

For information on Remote Async Nodes (RANs) see “Remote Async Nodes” on page 1-42.

FC(2932) 8-Port Asynchronous EIA-232E/RS-422A ISA Adapter (Type 3-A)

The 8-Port Asynchronous EIA-232E/RS-422A ISA adapter is a multi-channel intelligent serial communications feature which supports speeds of 115Kbps for each asynchronous port and is run by a 32-bit, 16MHz IDT 3041 processor.



8-Port Asynchronous EIA-232E/RS-422A ISA Adapter Specifications

Note: The eight (8) bit switch does not need to be set manually. The functions are set by software, which overrides the switch settings.

Item	Description
FRU Number	40H6632
I/O addresses	Set via DIP switches 0x104, 0x114, 0x124, 0x204, 0x224, 0x304, 0x324
I/O Bus	ISA
Interrupt levels	3, 5, 7, 10, 11, 12, 15, or disabled (set by the program)
Bit rate	50 - 115200 (set by the program)
Bits per character	5, 6, 7, 8 (set by the program)
Busmaster	No
Maximum Number	7

Connector	78-position, D-shell female
Wrap plug	EIA-232 25-position, part number 6298964 This wrap plug tests all of the adapter functions for both EIA-232 and RS-422.
Cable	8-Port DB-25 connector box FRU part number 11H5967 included with adapter.
Modem Cable	EIA-232 modem cable part number 6323741, feature code 2936, length 3 meters or 10 feet long. RS-422 modem cable customer supplied (must meet RS-422 requirements).
Terminal/Printer Cable	EIA-232 terminal/printer cable part number 12H1204, feature code 2934, length 3 meters or 10 feet long. RS-422 terminal/printer cable part number 30F8966, feature code 2945, length 20 meters or 265.5 feet long.

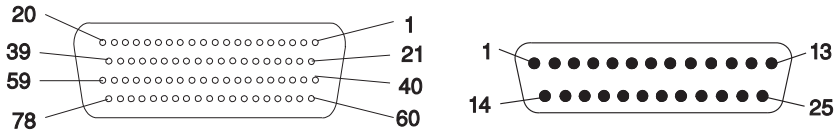
8-Port Asynchronous ISA Adapter I/O Address Switch Settings

I/O addresses are set with the switches at the rear of the adapter. The following table contains a description of the different switch settings.

Hex Addr	Address Switch			
	1	2	3	4
104	Off	Off	On	On
114	Off	On	Off	On
124	Off	On	On	On
204	On	Off	Off	On
224	On	Off	On	On
304	On	On	Off	On
324	On	On	On	On

8-Port EIA-232E/RS-422 Adapter 78-Position and 25-Position Connectors

The 8-Port Asynchronous EIA-232E/RS-422A ISA adapter is shipped with a connector box that provides eight 25 pin D-Shell standard connectors.



Mnemonic EIA-232E/ RS-422A	I/O	Port 0	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	25-Position Connector
TxD/TxDb	O	30	50	11	10	40	02	63	64	02
RxD/RxDb	|	55	17	37	56	28	08	46	27	03
RTS/TxDa	O	51	31	12	14	21	41	62	60	04
CTS/RxDa	|	16	53	59	57	25	04	09	45	05
DCD/DCD	|	35	33	39	18	43	23	48	06	08
DTR/DTR	O	49	32	13	52	22	03	61	01	20
DSR/DSR	|	54	34	58	38	05	42	29	26	06
RI/NA*	|	36	15	20	19	44	24	47	07	22
SGND**	--	--	--	--	--	--	--	--	--	07
FGND										01 Cable Shield

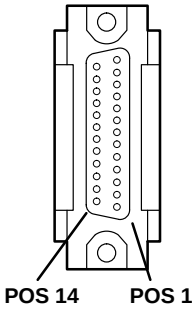
Note:

- * RTS is wrapped internally to CTS and RI for each port in RS-422.
- ** Pins 65 through 78 are ground.

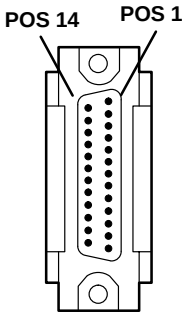
Asynchronous Cable Connectors

All of the asynchronous cables described below have the same connectors. In each case, the end that goes to the system has a 25-pin D-shell with sockets (female). The end that goes to the device has a 25-pin D-shell with pins (male). The figure below shows the ends of the 25-pin connectors.

System End

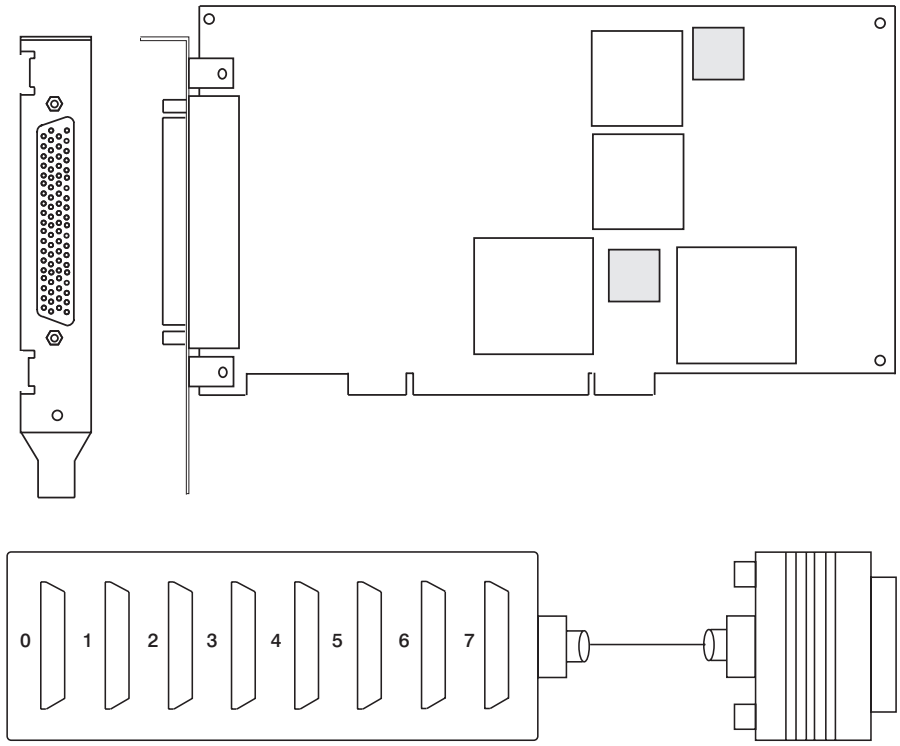


Device End



FC(2943) 8-Port Asynchronous EIA-232E/RS-422A PCI Adapter (Type 3-B)

The 8-Port Asynchronous EIA-232E/RS-422A PCI adapter is a multi-channel intelligent serial communications feature which supports speeds of up to 230 Kbps for each asynchronous port and is run by a 32-bit, 20MHz,IDT 3041 processor.



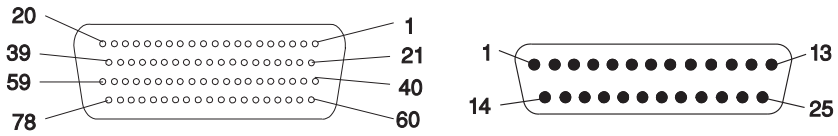
8-Port Asynchronous EIA-232E/RS-422A PCI Adapter Specifications

Item	Description
FRU Number	93H6541
I/O Bus	PCI
Bit rate	50 - 230,000 (set by the program)
Bits per character	5, 6, 7, 8 (set by the program)
Busmaster	No
Maximum Number	8
Connector	78-position, D-shell female
Wrap plug	EIA-232 25-position, part number 6298964 This wrap plug tests all of the adapter functions for both EIA-232 and RS-422.

Cable	8-Port DB-25 connector box FRU part number 11H5967 included with adapter.
Modem Cable	EIA-232 modem cable part number 6323741, feature code 2936, length 3 meters or 10 feet long. RS-422 modem cable customer supplied (must meet RS-422 requirements).
Terminal/Printer Cable	EIA-232 terminal/printer cable part number 12H1204, feature code 2934, length 3 meters or 10 feet long. RS-422 terminal/printer cable part number 30F8966, feature code 2945, length 20 meters or 265.5 feet long.

8-Port EIA-232E/RS-422A Adapter 78-Position and 25-Position Connectors

The 8-Port Asynchronous EIA-232E/RS-422A PCI adapter is shipped with a connector box that provides eight 25 pin D-Shell standard connectors.



Mnemonic EIA-232E/ RS-422A	I/O	Port 0	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	25-Position Connector
TxD/TxDb	O	30	50	11	10	40	02	63	64	02
RxD/RxDb	|	55	17	37	56	28	08	46	27	03
RTS/TxDa	O	51	31	12	14	21	41	62	60	04
CTS/RxDa	|	16	53	59	57	25	04	09	45	05
DCD/DCD	|	35	33	39	18	43	23	48	06	08
DTR/DTR	O	49	32	13	52	22	03	61	01	20
DSR/DSR	|	54	34	58	38	05	42	29	26	06
RI/NA*	|	36	15	20	19	44	24	47	07	22
SGND**	--	--	--	--	--	--	--	--	--	07
FGND										01 Cable Shield

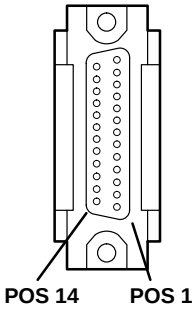
Note:

- * RTS is wrapped internally to CTS and RI for each port in RS-422.
- ** Pins 65 through 78 are ground.

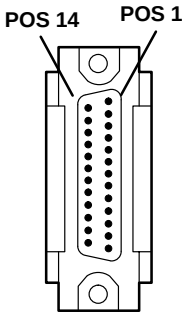
Asynchronous Cable Connectors

All of the asynchronous cables described below have the same connectors. In each case, the end that goes to the system has a 25-pin D-shell with sockets (female). The end that goes to the device has a 25-pin D-shell with pins (male). The figure below shows the ends of the 25-pin connectors.

System End

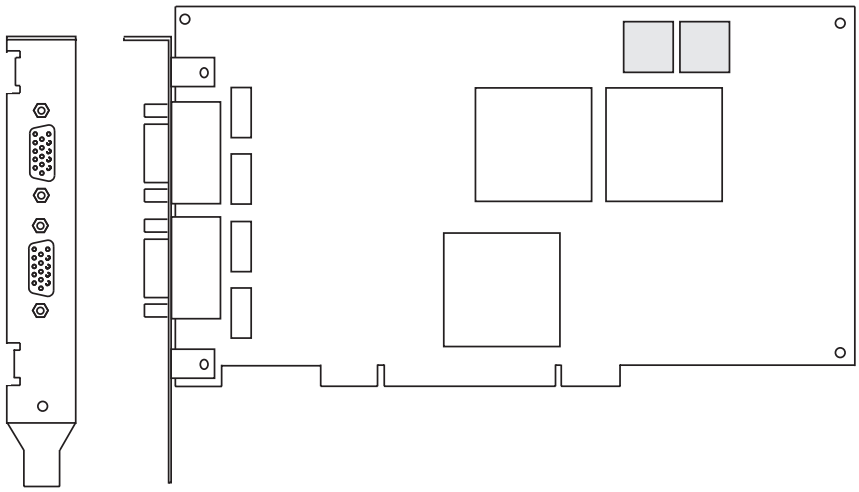


Device End



FC(2944) 128-Port Async Controller PCI (Type 3-C)

This adapter provides the control function and connectors to attach eight 16-port remote async nodes (RANs). When all eight nodes are attached, this combination provides 128, EIA-232 or RS-422 communication ports. The remote async nodes are described in the following topic. More information pertaining to the 128-Port Async Controller can be found in the publication, *AIX Versions 3.2 and 4 Asynchronous Communications Guide* order number SC23-2488.

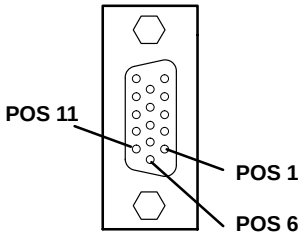


128-Port Async Controller PCI Specifications

Item	Description
FRU Number	93H6545
Memory	1 M byte memory on card
Bit rate (synchronous)	75 to 57,600 bps (set by the program)
Bits per character	5, 6, 7, 8 (set by the program)
Parity	Odd, even, or none
Stop bits	1, 2
I/O bus architecture	PCI
Maximum number	8
Connectors	Two, HD-15 connectors
Terminator plugs	Pair, HD-15, part number 43G0938
Cables	0.2 m (9 inches) controller cable, part number 43G0936, 4.6 m (15 feet) controller cable, part number 43G0937

15-Position HD-15 Controller Connector

The signals and connector position numbers are the same for each of the controller connectors.



Controller Connector (female)

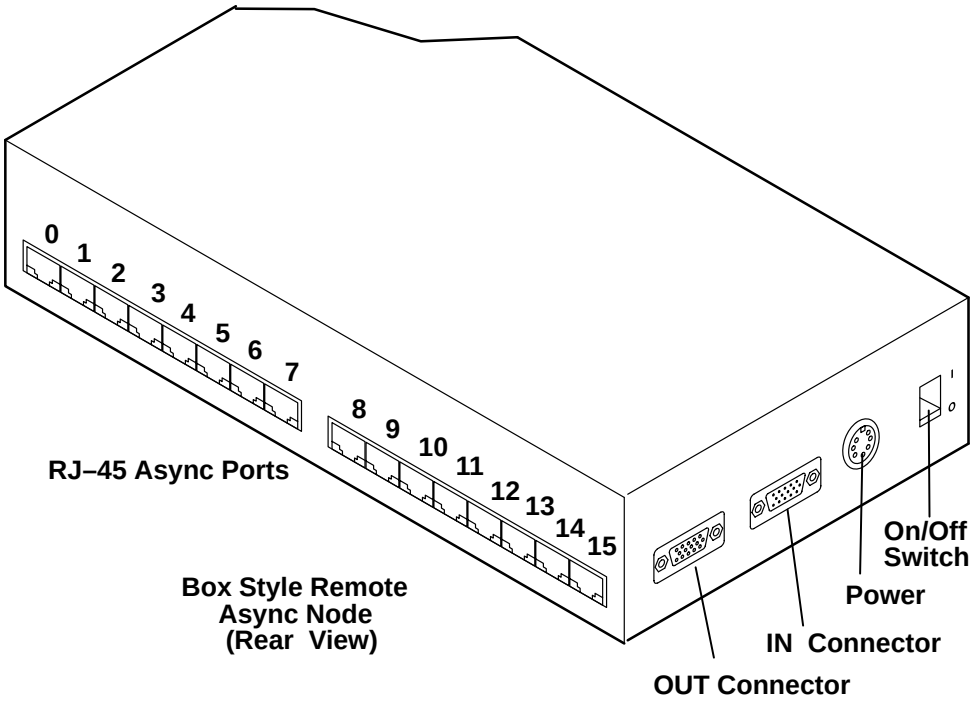
Position	Mnemonic
1	RxD-
2	RxD+
3	Reserved
4	RxC-
5	RxC+
6	TxD-
7	TxD+
8	Reserved
9	TxC-
10	TxC+
11	Reserved
12	GND (chassis)
13	Reserved
14	Reserved
15	Reserved

Remote Async Nodes

The 16-port original or enhanced remote async node (RAN) attaches to a 128-port async controller. Eight remote async nodes can be attached to a single 128-port async controller. This combination provides a total of 128 communications ports. The original async nodes and enhanced RANs can be used in any combination. For RAN to device data rates when mixing original RANs and Enhanced RANs. See "Cabling the Two Adapters and the Four Different Remote Async Nodes" on page 5-23. When the RJ-45 to DB-25 converter cable is attached to a port, the port is an RS-422 or EIA-232 compatible connection. More information pertaining to the remote async nodes can be found in the publication, *AIX Versions 3.2 and 4 Asynchronous Communications Guide* order number SC23-2488.

The last 16-port remote async node on a controller line can be located up to 300 meters (1000 feet) from the controller when configured at the maximum controller line data rate. Distances up to 1200 meters (3930 feet) are supported at lower controller line data rates. See controller line data rates table in "Line Length, 8-Wire" on page 5-25. Remote async nodes may also be remotely located via either RS-422 or EIA-232 synchronous modems.

FC (8130, 8137, and 8138) Remote Async Nodes 16-Port Box Style



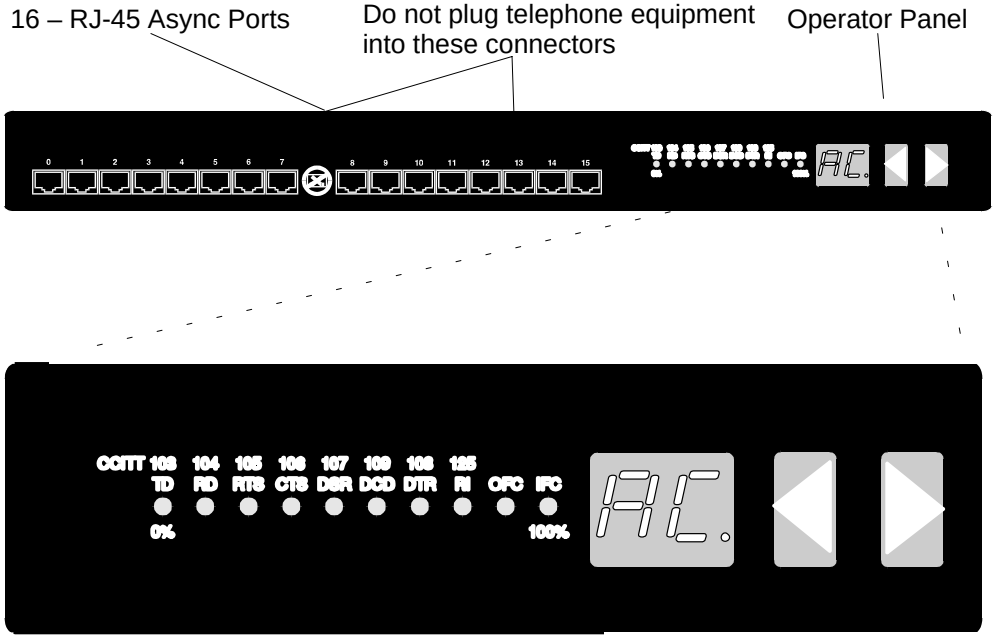
Feature code	RAN Description
8130	EIA-232 original
8137	EIA-232 enhanced
8138	RS-422 enhanced

FC (8136) Remote Async Node 16-Port EIA-232 Rack Style

The 16 Ports of EIA-232 on the rack style RAN have the same characteristics as those of the box style RAN. The operator panel on the rack style is the same and is used the same as the one on the box style. Also, the cabling of the box and rack styles is the same. The main difference between the box style RAN and the rack style is the form factor and the power supply. The physical shape is seen to be different. The box style is powered by a transformer that supplies low voltage to the RAN while the rack style is powered directly from the wall AC outlet at 100 or 200 volts AC.

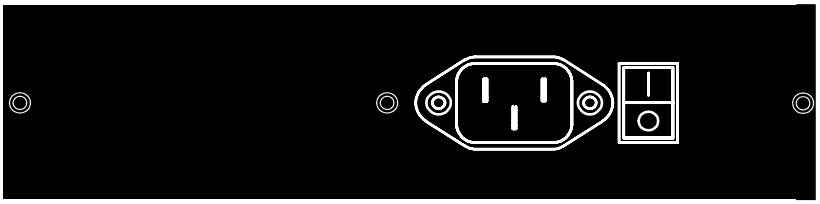
The rack style of RAN comes with brackets (not shown) to enable mounting the unit in a rack. The rack style RAN is one EIA unit high. The front of the rack has the 16 EIA-232 RJ-45 connectors and the operator panel.

Front of Rack Style Remote Async Node

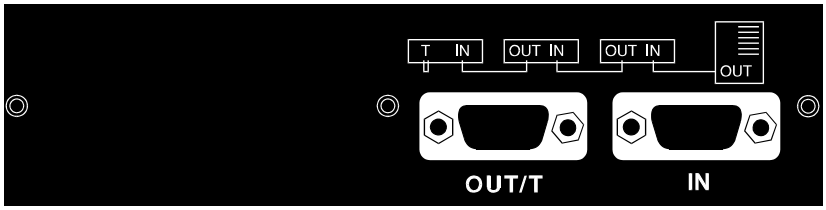


Operator Panel Detail

The back of the rack style unit has the AC power connector and switch and also the connectors for cabling the adapter and RANs together.



Power Connector and Power Switch



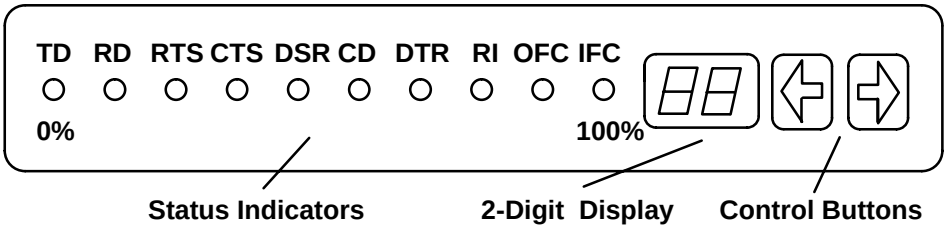
Connectors for Cabling Adapter and RANs Together

16-Port Remote Async Node Specifications

Item	Definition
FRU number	
Box Style	FC (8130) 88G3842
	FC (8137) 93H6549
	FC (8138) 93H6563
FRU number	
Rack Style	FC (8136) 40H2589
Connectors	Sixteen,10 position RJ-45 connectors
	One 15-position male HD-15 connector
	One 15-position female HD-15 connector
Wrap plug	RJ-45, part number 43G0928
Terminator	HD-15, part number 43G0926
Cables	See “FC (2933, 2944) 128-Port Async Controllers” on page 3-23.

Remote Async Node Front Panel

The front panel is used to monitor system activity and to program the Remote Async Node with a unique node number. This node number is used by the 128-Port Async Controller to identify each Remote Async Node on a controller line.



During Boot, the Following Actions Occur:

- Status indicators and the two-digit display are cycled, indicating that the remote async node POST is in progress.
- P0 in the two-digit display indicates the final POST stages.
- P1 in the two-digit display indicates POST is complete.
- P4 in the two-digit display indicates that microcode is being received.

Following a successful boot, system activity is displayed and the status indicators cycle at a rate proportional to async traffic. The following display modes can be viewed in the two-digit display by using the left and right arrow buttons on the front panel:

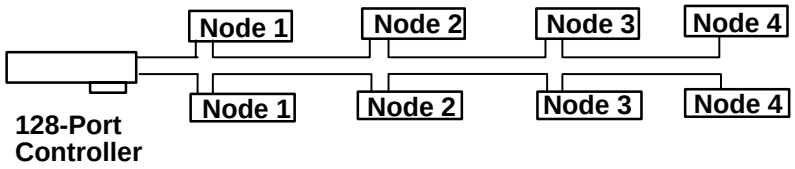
Two-Digit Display/Mode	Description
AC	Activity; status indicators cycle proportionally to async traffic.
0-15	Port monitor; two-digit displays shows current async port being monitored; status indicators operational (OFC shows output flow control active; IFC shows input flow control active).
PC	Packet count; status indicators show binary representation of total packets transmitted or received.
EC	Error count; status indicators show binary representation of error counts on the controller line.
PU	Processor utilization; status indicators act as bar graph showing percentage of time that the remote async node microprocessor is being used.
LU	Line utilization; status indicators act as bar graph showing percentage of time that the controller line is being used.
Ed	RAN Error, RAN is Defective

Two-Digit Display/Mode	Description
1n, 2n, ...8n	Node number; two-digit display shows the node number currently programmed into the remote async node.

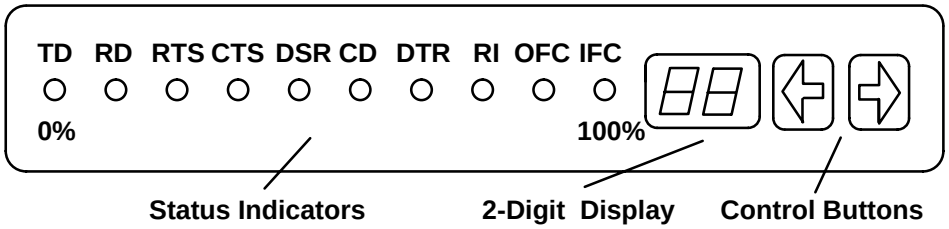
Programming the Remote Async Node

Each remote async node must be programmed with a "Node Number" prior to system IPL. The remote async node front panel is used to perform the following programming steps.

Note: Only four remote async nodes can be attached to each connector on the controller; only node numbers 1 through 4 are valid.



1. Perform a system shutdown, and then power-off the system.
2. Power-on the remote async node; the Power-On Self Test (POST) begins. During the POST, the characters PO appear in the two-digit display.
3. When the POST is complete, P1 appears in the two-digit display and the remote async node is ready for the following programming steps:



   a. Press the left arrow button to enter the programming mode. The current node number appears in the two-digit display.

   b. Press the right arrow button repeatedly until the desired node number is displayed. Continued pressing of this button cycles the two-digit display through 8 and back to 1.

      Note: Node numbers should be assigned in ascending order on each controller line, beginning with the remote async node closest to the controller. That is, the remote async node closest to each controller

connector would be assigned number 1. Numbers greater than 4 are not configured.

c. Press the left arrow to select the node number entered in the previous step. Pn appears momentarily in the two-digit display, meaning that the node has been successfully programmed. The display then returns to P1 and awaits microcode download from the controller.

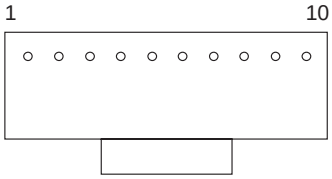
4. The system IPL may be performed now. The characters AC in the two-digit display indicate that IPL is complete and remote access node programming successfully completed without error.

5. If En appears in the two-digit display, the remote async node has been improperly programmed in one of the following ways:

   - The remote async nodes have not been programmed in ascending order. That is, the remote async node displaying the En has been programmed to a lower number than the preceding node.
   - Two or more remote async nodes have been programmed assigned the same number. The remote async node displaying the En has been programmed to the same number as another node on the same controller connector.

16-Port Remote Async Node 10-Position RJ-45 Input and Output Connectors

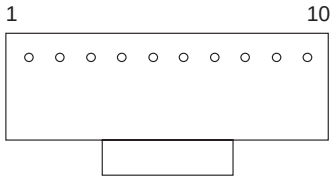
For EIA-232 Remote Async Nodes: The connector positions and signals for each RJ-45 connector on the Remote Async Node are the same (see table below). Chapter 5 "Cable Assembly and Pin-outs" contains the information to build converter cables (Cable NK) and cables that can go directly from the Remote Async Node to EIA-232 devices (cables NL and NM). See “Remote Async Node-to-Device Cables” on page 5-34.



This is the rear view.

Positions	Mnemonic (Signal Name)
1	RI (ring indicator)
2	DSR (data set ready)
3	RTS (request to send)
4	GND (chassis ground)
5	TxD (transmit data)
6	RxD (receive data)
7	SG (signal ground)
8	CTS (clear to send)
9	DTR (data terminal ready)
10	DCD (data carrier detect)

For RS-422 Remote Async Nodes: The connector positions and signals for each RJ-45 connector on the Remote Async Node are the same (see table below). Chapter 5 "Cable Assembly and Pin-outs" contains the information to build converter cables and cables that can go directly from the Remote Async Node to RS-422 devices (cable NP). See “Cable NP” on page 5-40. Six wires are required to connect the RAN to a RS-422 device.

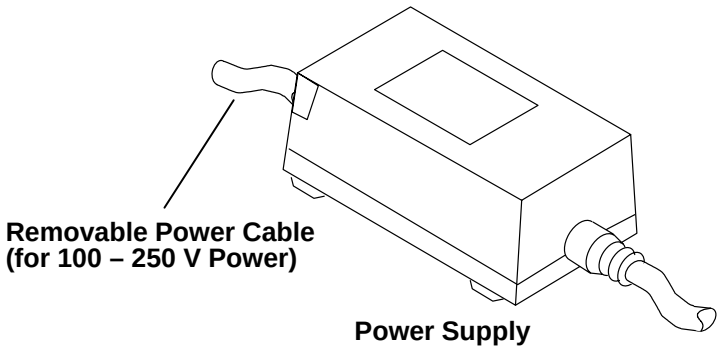


This is the rear view.

Positions	Mnemonic (Signal Name)
1	Reserved
2	Reserved
3	TxD + (+ transmit data)
4	GND (chassis ground)
5	TxD - (- transmit data)
6	RxD - (- receive data)
7	SG (signal ground)
8	RxD + (+ receive data)
9	Reserved
10	Reserved

16-Port Remote Async Node Power Supplies

Box Style Power: The box style remote async nodes use a transformer as shown below.

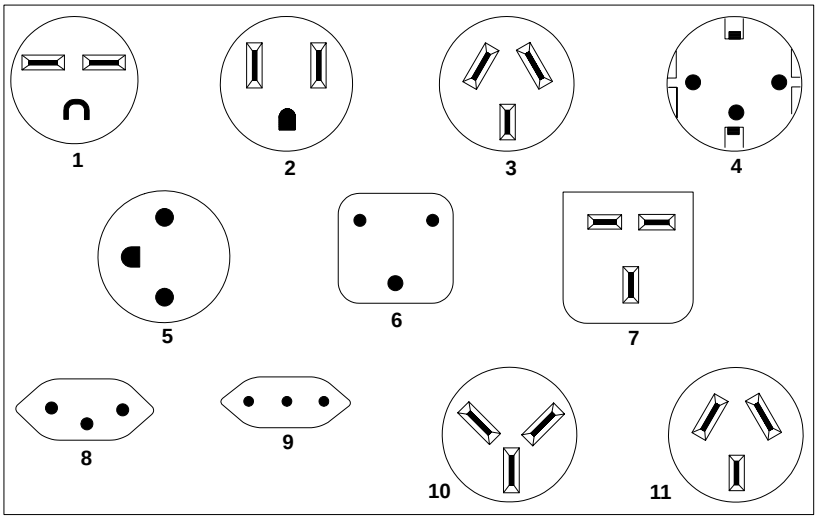


The following table lists the power supply and the table on the next page lists the removable power cables for the 16-port remote async node.

Feature Code	Voltage Range and Frequency	Removable Power Cable	Power Supply Part Number
8130	100 - 250 V ac at 50 or 60Hz	Yes	40H3611/93H7091
8137	100 - 250 V ac at 50 or 60Hz	Yes	93H7091
8138	100 - 250 V ac at 50 or 60Hz	Yes	93H7091

Rack Style Power: The rack style remote async nodes use a removable power cable and are powered directly by 100 - 250 V ac at 50 or 60Hz.

16-Port Remote Async Node Removable Power Cables

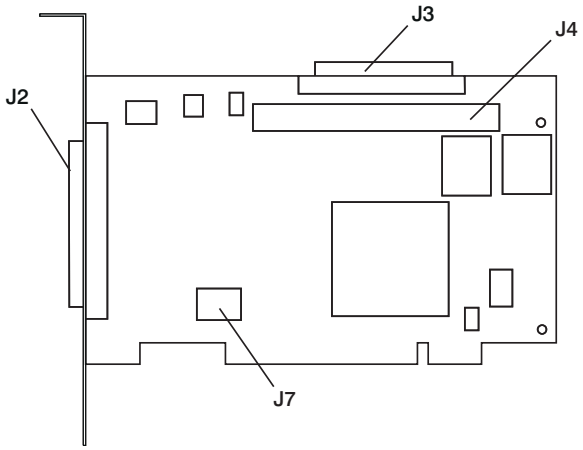


Power Plug Table

Index	Part Number	Country
1	1838574	Bahamas, Barbados, Bolivia, Canada, Costa Rica, Dominican Republic, El Salvador, Ecuador, Guatemala, Honduras, Jamaica, Japan, Netherlands Antilles, Panama, Peru, Trinidad, Philippines, Taiwan, Thailand, Venezuela
2	6952300	Bolivia, Dominican Republic, Ecuador, Guyana, Honduras, Jamaica, Japan, Korea, Netherlands Antilles, Philippines, Surinam, Taiwan, U.S.A. (except Chicago), Venezuela, Canada
	62X1045	Chicago, U.S.A.
3	6952311	Argentina, Australia, New Zealand
4	6952320	Austria, Belgium, Botswana, Egypt, Finland, France, Korea, West Germany
5	6952329	Denmark
6	6952347	Bangladesh, Burma, India, Pakistan, South Africa, Sri Lanka
7	6952356	Bahrain, Bermuda, Brunei, China, Ghana, Hong Kong, Iraq, Ireland, Jordan, Kenya, Kuwait, Malawi, Macao, Malaysia, Nigeria, Oman, Qatar, Singapore, Tanzania, Uganda, United Arab Emirates, U.K., Zambia
8	6952365	Switzerland
9	6952374	Chile, Ethiopia, Italy
10	6952383	Israel
11	6952291	Colombia, Uruguay

FC(2408/6208) PCI SCSI-2 Single-Ended Fast/Wide Adapter (Type 4-A or 4_A)

The PCI SCSI-2 Fast/Wide Adapter enables you to use internal and external small computer system interface (SCSI) devices with computers containing the Peripheral Component Interconnect (PCI).



Jumper Settings and Multi-Adapter Configurations

The table below shows the default configuration for jumper block J7 on the SCSI adapter. The adapter is shipped with the jumpers in this configuration. This configuration is used for a single adapter on a SCSI chain. It allows the adapter to sense whether it is at the end of a SCSI chain or in the middle of a SCSI chain. The adapter then enables or disables its built-in SCSI terminators as required.

Default Position of Jumper Block J7
For Automatic Termination selection

Jumper J7 settings			
s4	s3	s2	s1
out	out	out	out

PCI SCSI-2 Fast/Wide Adapter Specifications

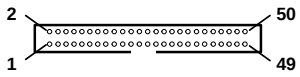
Item	Description
FRU number	93H7421 or 93H8406
Microcode	No microcode required
I/O bus architecture	PCI
Interrupt level	PCI interrupt A
Maximum number	A controller may be installed in any/all available 32 or 64 bit, 33MHZ PCI bus slots
Connector information	External 68-position high-density micro D-Shell Internal 68-position high-density plastic D-Shell Internal 50-pin header (2x25) connector
SCSI bus overcurrent protection device	Positive temperature coefficient (PTC) resistor

Note: Early ship versions of 73H3562 may have type label 4-E instead of 4_A.

PCI SCSI-2 Single Ended Fast/Wide Adapter Connectors

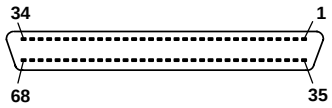
Note: Only one internal connector can have a cable attached at a time.

The following table shows the pinout for the internal 50-position SCSI bus connector.



Signal Name	Pin	Pin	Signal Name
Ground	1	2	-DB(0)
Ground	3	4	-DB(1)
Ground	5	6	-DB(2)
Ground	7	8	-DB(3)
Ground	9	10	-DB(4)
Ground	11	12	-DB(5)
Ground	13	14	-DB(6)
Ground	15	16	-DB(7)
Ground	17	18	-DB(P)
Ground	19	20	Ground
Ground	21	22	CPRSNT
Reserved	23	24	Reserved
Open	25	26	TERMPWR
Reserved	27	28	Reserved
Ground	29	30	Ground
Ground	31	32	-ATN
Ground	33	34	Ground
Ground	35	36	-BSY
Ground	37	38	-ACK
Ground	39	40	-RST
Ground	41	42	-MSG
Ground	43	44	-SEL
Ground	45	46	-C/D
Ground	47	48	-REQ
Ground	49	50	-I/O

The following table shows the pinout for the internal and external 68-Pin 16-Bit SCSI connectors.



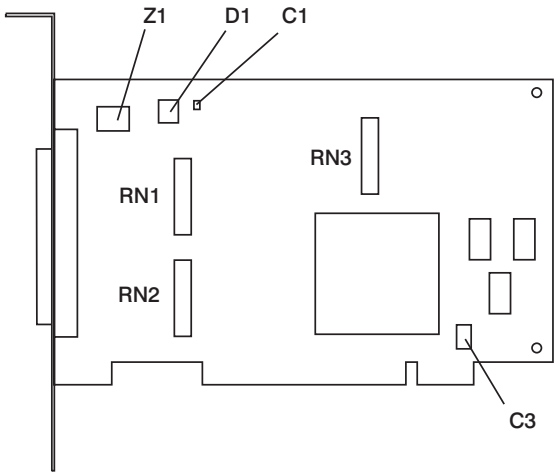
Signal Name	Pin	Pin	Signal Name
Ground	1	35	-DB(12)
Ground	2	36	-DB(13)
Ground	3	37	-DB(14)
Ground/CPRNST_16*	4	38	-DB(15)
Ground	5	39	-DB(P1)
Ground	6	40	-DB(0)
Ground	7	41	-DB(1)
Ground	8	42	-DB(2)
Ground	9	43	-DB(3)
Ground	10	44	-DB(4)
Ground	11	45	-DB(5)
Reserved*	12	46	-DB(6)
Ground	13	47	-DB(7)
Ground	14	48	-DB(P)
Ground	15	49	Ground
Ground	16	50	CPRNST
TERMPWR	17	51	TERMPWR
TERMPWR	18	52	TERMPWR
Reserved	19	53	Reserved
Ground	20	54	Ground
Ground	21	55	-ATN
Ground	22	56	Ground
Ground	23	57	-BSY
Ground	24	58	-ACK
Ground	25	59	-RST
Ground	26	60	-MSG
Ground	27	61	-SEL
Ground	28	62	C/D
Ground	29	63	-REQ
Ground	30	64	-I/O

Signal Name	Pin	Pin	Signal Name
Ground	31	65	-DB(8)
Ground	32	66	-DB(0)
Ground	33	67	-DB(10)
Ground	34	68	-DB(11)

Note: * = External Connector Only

FC(2409/6209) PCI SCSI-2 Differential Fast/Wide Adapter (Type 4-B or 4_B)

The PCI SCSI-2 Differential Fast/Wide Adapter enables you to use external differential small computer system interface (SCSI) devices with computers containing the Peripheral Component Interconnect (PCI). The adapter conforms to the American National Standards Institute (ANSI) SCSI-2 standard and the PCI local specification, revision 2.0.



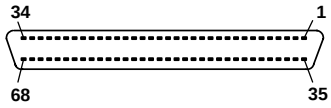
PCI SCSI-2 Differential Fast/Wide Adapter Specifications

Item	Description
FRU number	93H7422 or 93H8407
Interrupt level	Int A
Microcode	No microcode required
I/O bus architecture	PCI
Maximum number	A controller may be installed in any/all available 32 or 64 bit, 33MHz PCI bus slots
Connector information	External 68-position high-density micro D-Shell
SCSI bus overcurrent protection device	Positive temperature coefficient (PTC) resistor

Note: Early ship levels of 73H3568 may have type label 4-F instead of 4_B.

PCI SCSI-2 Fast/Wide SCSI-Bus Adapter Connector

The following table shows the pinout for the external 68-pin 16-bit SCSI connector.

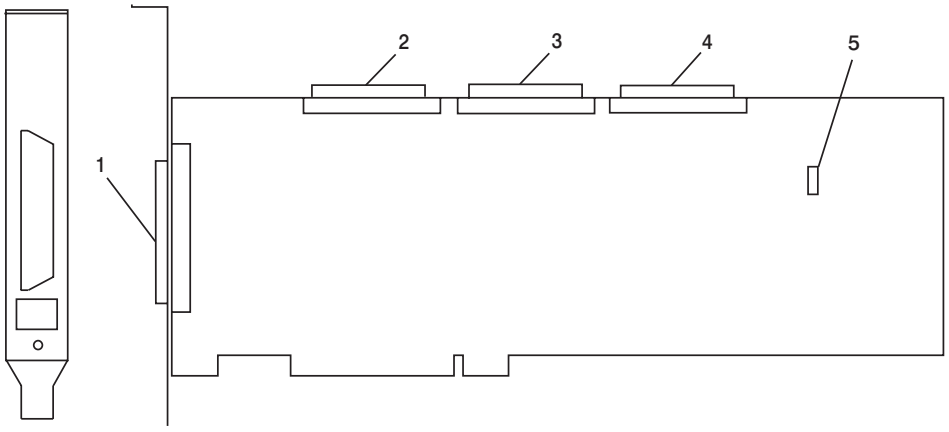


Signal Name	Pin	Pin	Signal Name
+DB(12)	1	35	-DB(12)
+DB(13)	2	36	-DB(13)
+DB(14)	3	37	-DB(14)
+DB(15)	4	38	-DB(15)
+DB(P1)	5	39	-DB(P1)
Ground	6	40	Ground
+DB(0)	7	41	-DB(0)
+DB(1)	8	42	-DB(1)
+DB(2)	9	43	-DB(2)
+DB(3)	10	44	-DB(3)
+DB(4)	11	45	-DB(4)
+DB(5)	12	46	-DB(5)
+DB(6)	13	47	-DB(6)
+DB(7)	14	48	-DB(7)
+DB(P)	15	49	-DB(P)
DIFFSENS	16	50	Ground
TERMPWR	17	51	TERMPWR
TERMPWR	18	52	TERMPWR
Reserved	19	53	Reserved
+ATN	20	54	-ATN
Ground	21	55	Ground
+BSY	22	56	-BSY
+ACK	23	57	-ACK
+RST	24	58	-RST
+MSG	25	59	-MSG
+SEL	26	60	-SEL
+C/D	27	61	-C/D
+REQ	28	62	-REQ

Signal Name	Pin	Pin	Signal Name
+I/O	29	63	-I/O
Ground	30	64	Ground
+DB(8)	31	65	-DB(8)
+DB(9)	32	66	-DB(9)
+DB(10)	33	67	-DB(10)
+DB(11)	34	68	-DB(11)

FC(2493) PCI SCSI-2 F/W RAID Adapter Type (4-H)

The PCI SCSI-2 F/W RAID Adapter allows you to use internal and external small computer system interface (SCSI) devices with computers containing the Peripheral Component Interconnect (PCI) in RAID configurations.



1 J11 (Channel 0) See 1 on page 1-62.

2 J10 (Channel 0) See 1 on page 1-62.

3 J9 (Channel 1)

4 J8 (Channel 2)

5 J6, boot block enable jumper

PCI SCSI-2 F/W RAID Adapter Specifications

Item	Description
FRU number	07L9287
Microcode	Provided on adapter
I/O bus architecture	PCI
Interrupt	PCI interrupt A
Maximum number	Two controllers may be installed in any available 32 or 64 bit, 33MHz PCI bus slots
Connector information	External 68-position high-density micro D-Shell Internal 68-position high-density micro D-Shell
SCSI bus overcurrent protection device	Positive temperature coefficient (PTC) resistor

Notes:

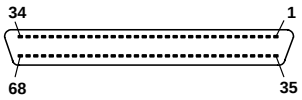
1. For information on configuring disk arrays attached to this adapter, see *SCSI-2 F/W PCI RAID Adapter Reference Guide*, Order Number SC23-1889.
2. Only supported disk drives can be connected to the adapter. Other SCSI devices cannot be connected to the SCSI bus.
3. The adapter SCSI-2 connectors J11 and J10 are physically connected within the adapter. You can attach an internal cable and disks to J10, or an external cable and disks to J11, but not at the same time.

Jumper Settings

Use jumper J6 in those rare instances when you update the adapter boot initialization code. Under normal conditions, you should not use jumpers when you update the adapter runtime firmware or while the adapter is operating. When you download adapter boot initialization code, you must place a jumper on J6. Remove the jumper following the update operation.

Internal/External 68-Pin 16-Bit SE High-Density SCSI Connector

The following table shows the pinout for the internal and external 68-pin SCSI connectors.



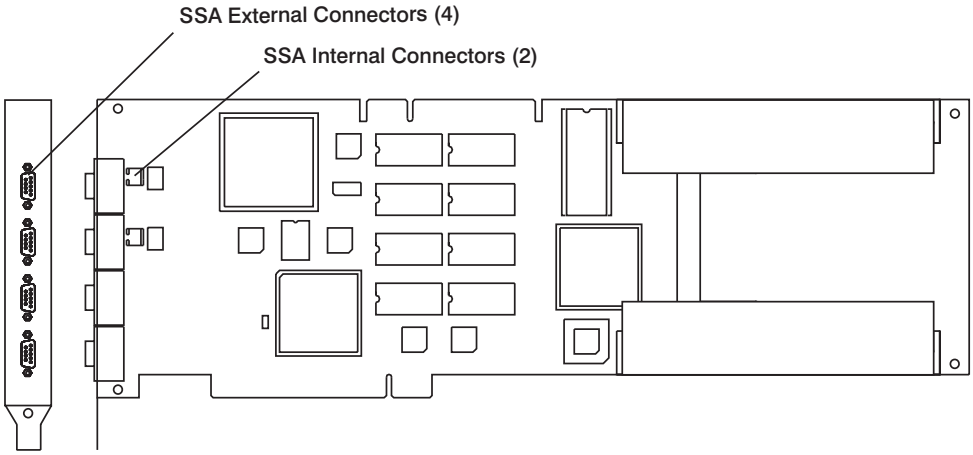
Signal Name	Pin	Pin	Signal Name
Ground	1	35	-DB(12)
Ground	2	36	-DB(13)
Ground	3	37	-DB(14)
Ground/CPRNST_16*	4	38	-DB(15)
Ground	5	39	-DB(P1)
Ground	6	40	-DB(0)
Ground	7	41	-DB(1)
Ground	8	42	-DB(2)
Ground	9	43	-DB(3)
Ground	10	44	-DB(4)
Ground	11	45	-DB(5)
Reserved*	12	46	-DB(6)
Ground	13	47	-DB(7)
Ground	14	48	-DB(P)
Ground	15	49	Ground
Ground	16	50	CPRNST
TERMPWR	17	51	TERMPWR
TERMPWR	18	52	TERMPWR
Reserved	19	53	Reserved
Ground	20	54	Ground
Ground	21	55	-ATN
Ground	22	56	Ground
Ground	23	57	-BSY
Ground	24	58	-ACK
Ground	25	59	-RST
Ground	26	60	-MSG
Ground	27	61	-SEL

Signal Name	Pin	Pin	Signal Name
Ground	28	62	C/D
Ground	29	63	-REQ
Ground	30	64	-I/O
Ground	31	65	-DB(8)
Ground	32	66	-DB(0)
Ground	33	67	-DB(10)
Ground	34	68	-DB(11)

Note: * = External Connector Only

FC (6218) PCI SSA 4-Port RAID Adapter (type 4–J)

The PCI SSA 4-Port RAID Adapter provides support for two SSA loops. Each loop can contain only one pair of adapter connectors and a maximum of 48 disk drives. For more information see the *PCI SSA 4-Port RAID Adapter, Technical Reference*.



PCI SSA 4-Port RAID Adapter Specifications

Item	Description
FRU numbers	Base card without DRAM 32H3836 DRAM card 73G3233
Bus architecture	PCI
Bus width	32
Maximum Number	The maximum number of PCI SSA 4-Port adapters allowed is one half of maximum number of PCI slots available in the system unit.
Bus architecture	PCI
Busmaster	Yes
Adapter Type	long
Data transfer rate	20 MB/second per loop
Connector	9-position, subminiature D
Cables	Serial link

SSA 4-Port RAID Adapter Information

The adapter card has four SSA connectors that are arranged in two pairs. Connectors A1 and A2 are one pair; connectors B1 and B2 are the other pair.

The SSA links must be configured as loops. Each loop is connected to a pair of connectors at the SSA adapter card. These connectors *must* be a valid pair (that is, A1 and A2 or B1 and B2); otherwise, the disk drive modules on the loop are not fully configured, and the diagnostics fail. Operations to all the disk drive modules on a particular loop can continue if that loop breaks at any one point.

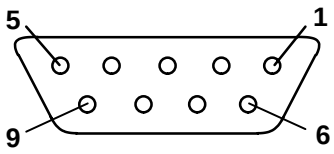
This adapter also contains *array management software* that provides RAID-5 functions to control the *arrays* of the RAID subsystem. An array can have from 3 to 16 *member disk drives*. Each array is handled as *one large disk* by the operating system. The array management software translates requests to this large disk into requests to the member disk drives. Although this adapter is a RAID adapter, it can be configured so that all, some, or none of the disk drives that are attached to it are member disks of arrays.

Lights of the SSA 4-Port RAID Adapter

Each pair of connectors has a green light that indicates the operational status of its related loop:

Status of Light	Meaning
Off	Both SSA connectors are inactive. If disk drive modules or other SSA adapters are connected to these connectors, either those modules or adapters are failing, or their SSA links are not active.
Permanently on	Both SSA links are active (normal operating condition).
Slow Flash	Only one SSA link is active.

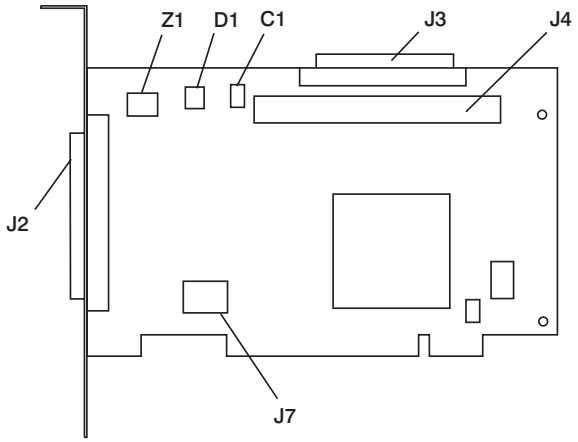
SSA 4-Port RAID Adapter 9-Position Connector



Position	Signal Name
1	Ground
2	- Line Out
3	Ground
4	- Line in
5	Ground
6	+ Line Out
7	Reserved
8	+ 5 V
9	+Line In

FC(6206) PCI Single-Ended Ultra SCSI Adapter (Type 4-K)

The PCI Single-Ended Ultra SCSI Adapter enables you to use internal and external small computer system interface (SCSI) devices with computers containing the Peripheral Component Interconnect (PCI).



Jumper Settings and Multi-Adapter Configurations

The table below shows the default configuration for jumper block J7 on the SCSI adapter. The adapter is shipped with the jumpers in this configuration. This configuration is used for a single adapter on a SCSI chain. It allows the adapter to sense whether it is at the end of a SCSI chain or in the middle of a SCSI chain. The adapter then enables disables its built-in SCSI terminators as required.

Default Position of Jumper Block J7
For Automatic Termination selection

Jumper J7 settings			
s4	s3	s2	s1
out	out	out	out

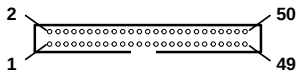
PCI Single-Ended Ultra SCSI Adapter Specifications

Item	Description
FRU number	93H3809
Microcode	No microcode required
I/O bus architecture	PCI
Interrupt level	PCI interrupt A
Maximum number	A controller may be installed in any/all available 32 or 64 bit, 33MHZ PCI bus slots
Connector information	External 68-position high-density micro D-Shell Internal 68-position high-density plastic D-Shell Internal 50-pin header (2x25) connector
SCSI bus overcurrent protection device	Positive temperature coefficient (PTC) resistor

PCI Single-Ended Ultra SCSI Adapter Connectors

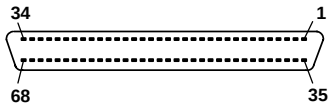
Note: Only one internal connector can have a cable attached at a time.

The following table shows the pinout for the internal 50-position SCSI bus connector.



Signal Name	Pin	Pin	Signal Name
Ground	1	2	-DB(0)
Ground	3	4	-DB(1)
Ground	5	6	-DB(2)
Ground	7	8	-DB(3)
Ground	9	10	-DB(4)
Ground	11	12	-DB(5)
Ground	13	14	-DB(6)
Ground	15	16	-DB(7)
Ground	17	18	-DB(P)
Ground	19	20	Ground
Ground	21	22	CPRSNT
Reserved	23	24	Reserved
Open	25	26	TERMPWR
Reserved	27	28	Reserved
Ground	29	30	Ground
Ground	31	32	-ATN
Ground	33	34	Ground
Ground	35	36	-BSY
Ground	37	38	-ACK
Ground	39	40	-RST
Ground	41	42	-MSG
Ground	43	44	-SEL
Ground	45	46	-C/D
Ground	47	48	-REQ
Ground	49	50	-I/O

The following table shows the pinout for the internal and external 68-pin 16-bit SCSI connectors.



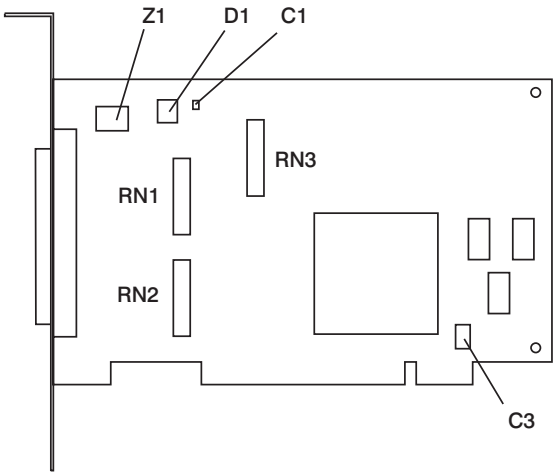
Signal Name	Pin	Pin	Signal Name
Ground	1	35	-DB(12)
Ground	2	36	-DB(13)
Ground	3	37	-DB(14)
Ground/CPRNST_16*	4	38	-DB(15)
Ground	5	39	-DB(P1)
Ground	6	40	-DB(0)
Ground	7	41	-DB(1)
Ground	8	42	-DB(2)
Ground	9	43	-DB(3)
Ground	10	44	-DB(4)
Ground	11	45	-DB(5)
Reserved*	12	46	-DB(6)
Ground	13	47	-DB(7)
Ground	14	48	-DB(P)
Ground	15	49	Ground
Ground	16	50	CPRNST
TERMPWR	17	51	TERMPWR
TERMPWR	18	52	TERMPWR
Reserved	19	53	Reserved
Ground	20	54	Ground
Ground	21	55	-ATN
Ground	22	56	Ground
Ground	23	57	-BSY
Ground	24	58	-ACK
Ground	25	59	-RST
Ground	26	60	-MSG
Ground	27	61	-SEL
Ground	28	62	C/D
Ground	29	63	-REQ
Ground	30	64	-I/O

Signal Name	Pin	Pin	Signal Name
Ground	31	65	-DB(8)
Ground	32	66	-DB(0)
Ground	33	67	-DB(10)
Ground	34	68	-DB(11)

Note: * = External Connector Only

FC(6207) PCI Differential Ultra SCSI Adapter (Type 4-L)

The PCI Differential Ultra SCSI Adapter enables you to use external differential small computer system interface (SCSI) devices with computers containing the Peripheral Component Interconnect (PCI).

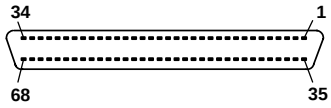


PCI Differential Ultra SCSI Adapter Specifications

Item	Description
FRU number	40H6595
Microcode	No microcode required
Interrupt level	Int A
I/O bus architecture	PCI
Maximum number	A controller may be installed in any/all available 32 or 64 bit, 33MHZ PCI bus slots
Connector information	External 68-position high-density micro D-Shell
SCSI bus overcurrent protection device	Positive temperature coefficient (PTC) resistor

PCI Differential Ultra SCSI Adapter Connector

The following table shows the pinout for the external 68-pin 16-bit SCSI connector.

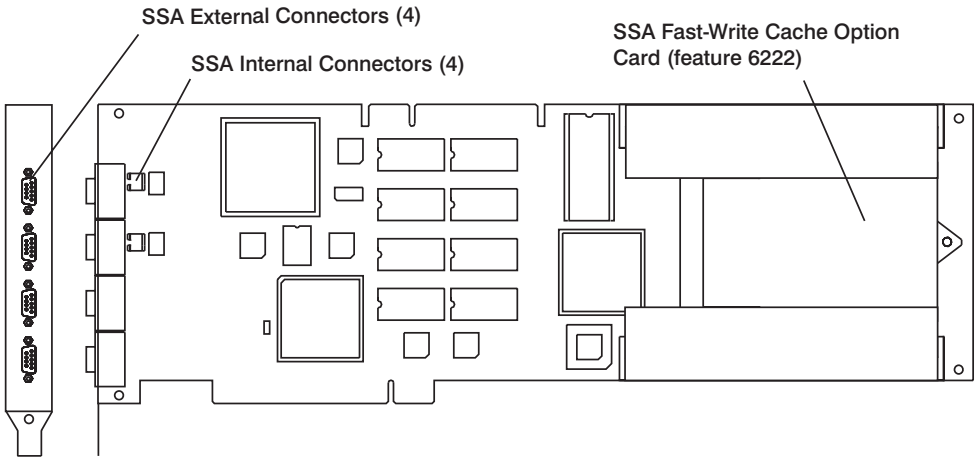


Signal Name	Pin	Pin	Signal Name
+DB(12)	1	35	-DB(12)
+DB(13)	2	36	-DB(13)
+DB(14)	3	37	-DB(14)
+DB(15)	4	38	-DB(15)
+DB(P1)	5	39	-DB(P1)
Ground	6	40	Ground
+DB(0)	7	41	-DB(0)
+DB(1)	8	42	-DB(1)
+DB(2)	9	43	-DB(2)
+DB(3)	10	44	-DB(3)
+DB(4)	11	45	-DB(4)
+DB(5)	12	46	-DB(5)
+DB(6)	13	47	-DB(6)
+DB(7)	14	48	-DB(7)
+DB(P)	15	49	-DB(P)
DIFFSENS	16	50	Ground
TERMPWR	17	51	TERMPWR
TERMPWR	18	52	TERMPWR
Reserved	19	53	Reserved
+ATN	20	54	-ATN
Ground	21	55	Ground
+BSY	22	56	-BSY
+ACK	23	57	-ACK
+RST	24	58	-RST
+MSG	25	59	-MSG
+SEL	26	60	-SEL
+C/D	27	61	-C/D
+REQ	28	62	-REQ

Signal Name	Pin	Pin	Signal Name
+I/O	29	63	-I/O
Ground	30	64	Ground
+DB(8)	31	65	-DB(8)
+DB(9)	32	66	-DB(9)
+DB(10)	33	67	-DB(10)
+DB(11)	34	68	-DB(11)

FC (6215, 6222) PCI SSA Multi-Initiator/RAID EL Adapter (Type 4–N) and SSA Fast-Write Cache Option Card

The PCI SSA Multi-Initiator/RAID EL Adapter provides support for two SSA loops. Each loop can contain a maximum of 48 disk drives. If the fast-write cache or RAID functions of the adapter are used, no other adapter can be connected in an SSA loop with this adapter. If those functions are not used, a second PCI SSA Multi-Initiator/RAID EL Adapter (or a Micro Channel® SSA Multi-Initiator/RAID EL Adapter) can be connected in the loop. To use the fast-write cache function, an SSA Fast-Write Cache Option Card (feature 6222) must be installed on the adapter card. For more information see the *PCI SSA RAID Adapters Technical Reference*.



PCI SSA Multi-Initiator/RAID EL Adapter Specifications

Item	Description
FRU numbers	Base card (without Cache Option) 96H9938 Cache Option card 74G7719 16M DRAM SIMM 89H5651
Bus architecture	PCI
Bus width	32
Maximum Number	The maximum number of PCI SSA Multi-Initiator/RAID EL adapters and PCI SSA 4-Port adapters allowed is one half of maximum number of PCI slots available in the system unit.
Bus architecture	PCI
Busmaster	Yes
Adapter Type	long
Data transfer rate	20 MB/second per loop
Connector	9-position, subminiature D
Cables	Serial link

PCI SSA Multi-Initiator/RAID EL Adapter Information

The adapter card has four SSA connectors that are arranged in two pairs. Connectors A1 and A2 are one pair; connectors B1 and B2 are the other pair.

The SSA links must be configured as loops. Each loop is connected to a pair of connectors at the SSA adapter card. These connectors *must* be a valid pair (that is, A1 and A2 or B1 and B2); otherwise, the disk drive modules on the loop are not fully configured, and the diagnostics fail. Operations to all the disk drive modules on a particular loop can continue if that loop breaks at any one point.

This adapter also contains *array management software* that provides RAID-5 functions to control the *arrays* of the RAID subsystem. An array can have from 3 to 16 *member disk drives*. Each array is handled as *one large disk* by the operating system. The array management software translates requests to this large disk into requests to the member disk drives. Although this adapter is a RAID adapter, it can be configured so that all, some, or none of the disk drives that are attached to it are member disks of arrays.

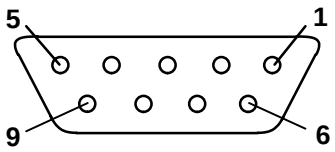
Other software in the adapter controls the Fast-Write Cache Option Card. This card provides 4MB of cache, which can improve performance for jobs that include many write operations. The fast-write cache card has a standard PCMCIA connector.

Lights of the PCI SSA Multi-Initiator/RAID EL Adapter

Each pair of connectors has a green light that indicates the operational status of its related loop:

Status of Light	Meaning
Off	Both SSA connectors are inactive. If disk drive modules or other SSA adapters are connected to these connectors, either those modules or adapters are failing, or their SSA links are not active.
Permanently on	Both SSA links are active (normal operating condition).
Slow Flash	Only one SSA link is active.

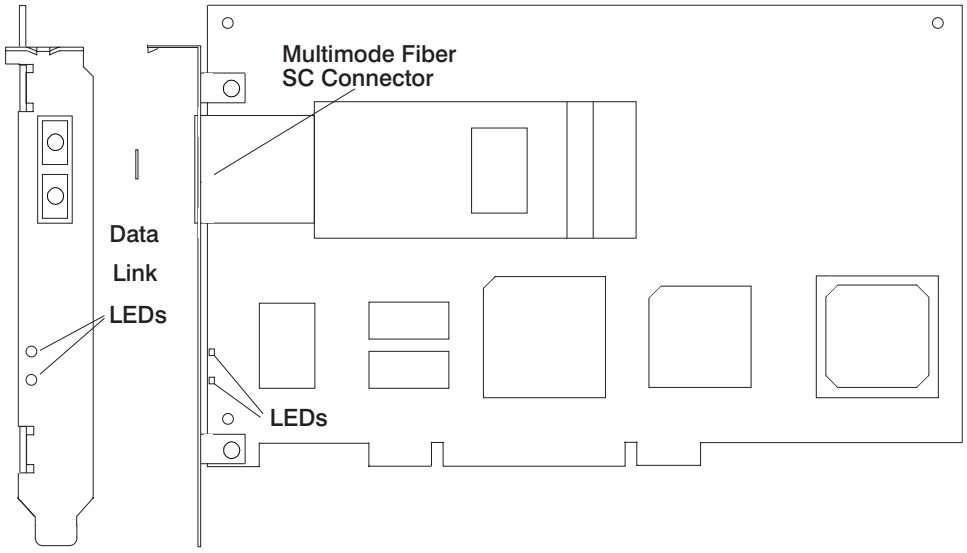
PCI SSA Multi-Initiator/RAID EL Adapter 9-Position Connector



Position	Signal Name
1	Ground
2	- Line Out
3	Ground
4	- Line in
5	Ground
6	+ Line Out
7	Reserved
8	+ 5 V
9	+Line In

FC (6227) Gigabit Fiber Channel Adapter for PCI Bus (Type 4-S)

The Gigibit Fiber Channel Adapter for PCI Bus provides attachment of external storage using the Fiber Channel Arbitrated Loop protocol. The protocol is sent over a shortwave (multimode) fiber optic cable. The Gigabit Fiber Channel Adapter for PCI Bus features on-board protocol engine and buffers. The adapter is FC-PH and PCI 2.1 compliant.



Gigabit Fiber Channel Adapter for PCI Bus Specifications

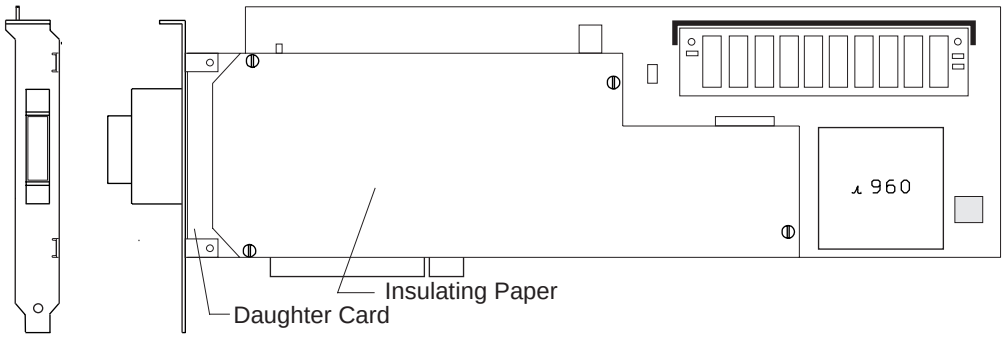
Item	Description
FRU Number	24L0023
Bus architecture	PCI 2.1
Card Type	Half
Maximum number	One adapter per PCI bus. For the maximum number of adapters allowed in your system, see HONE.
Connector	ANSI Specified SC duplex
Wrap Plug	Shipped with assembly or 16G5609
Cables	50 or 62.5 micron multi-mode Fiber-optic, customer provided

Gigabit Fiber Channel Adapter for PCI Bus LEDs

The Gigabit Fiber Channel Adapter has two LEDs: green and yellow located near the SC connector. These can be used to determine the state of the adapter.

Green LED	Yellow LED	State
OFF	OFF	wakeup failure (adapter is defective)
OFF	ON	POST failure (adapter is defective)
OFF	slow blink (1HZ)	wakeup failure
OFF	fast blink (4HZ)	failure in POST
OFF	flashing (irregularly)	POST processing in progress
ON	OFF	failure while functioning
ON	ON	failure while functioning
ON	slow blink (1HZ)	Normal - inactive
ON	fast blink (4HZ)	Normal - busy
ON	flashing (irregularly)	Normal - acitve
slow blink	OFF	Normal - link down or not yet started
slow blink	slow blink (1HZ)	off-line for download
slow blink	fast blink (4HZ)	restrictred off-line mode (waiting for restart)

FC (2751) S/390 ESCON Channel PCI Adapter (Type 5-5)



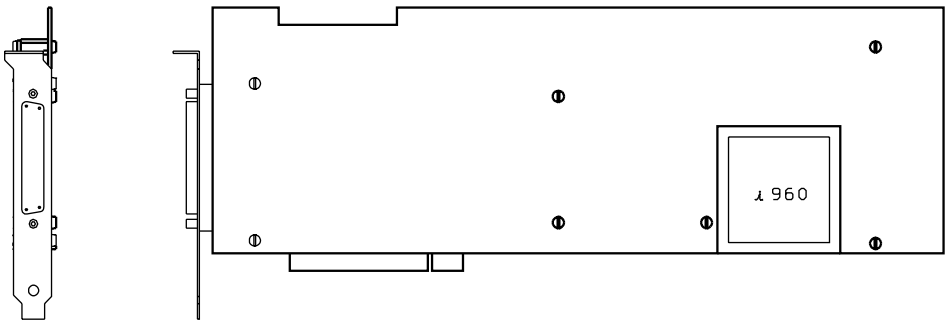
S/390 ESCON Channel PCI Adapter Specifications

Item	Description
FRU Number	S/390 ESCON Channel PCI Adapter 51H8700
Busmaster	Yes
Bus architecture	PCI
Maximum number	S70 - 4 per system - slot restrictions - Slots 10 and 14 on drawers 0 and 1 F50, H50 - Maximum 3 per system in combination with DTQA FC 6309. -Slots 1, and 2 - maximum 1 -Slots 3, 4, and 5 - maximum 2 -Slots 6, 7, 8, and 9 - maximum 1
Microcode Filenames	
Functional Microcode	esconCU.00.00 esconCU.3088.n.00 esconCU.3088.r.00 esconCU.3088.s.00 esconCU.CLAW.n.00 esconCU.CLAW.r.00 esconCU.CLAW.s.00 esconCU.mcm.con esconCU.mcm.dmp esconCU.mcm.exe esconCU.mcm.por
Diagnostic Microcode	ec8fd.00.03 (base IBM ARTIC diagnostics) 00d00000d.00.01 (IBM ARTIC TU-23)

Connector	Standard ESCON duplex connector
Fiber Cables	Installation dependent Must have an ESCON duplex connector at adapter Refer to *Planning for Fiber Optic Channel Links*, order number, GA23-0367.
Wrap Plug	Wrap Plug - FRU number 5605670

FC(6309) Digital Trunk Quad PCI Adapter (Type 6-B)

The Digital Trunk Quad PCI Adapter provides attachment of the 9295 or 9291 Digital Trunk Processor subsystem to telphone company T1 or E1 digital trunks.

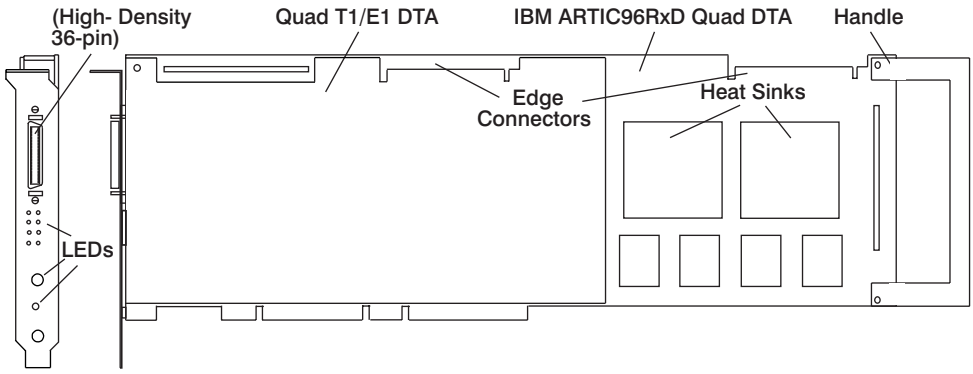


Digital Trunk Quad PCI Adapter Specifications

Item	Description
FRU number base	87H3451
FRU number daughter	10J2272
FRU number memory SIMM	70F9973
I/O bus architecture	PCI
Busmaster	Yes
Interrupt levels	Zero to 15
I/O address	0x0-0xffffff00,0x100
Adapter type	full length, full height, full width
Maximum number	Up to two
Cables	Supplied with adapter
FRU Quad cable kit (includes wrap plug)	51H4325
FRU SCBus cable	10J2253

FC(6310) IBM ARTIC960RxD Quad Digital Trunk PCI Adapter (Type 6-E)

The IBM ARTIC960RxD Quad Digital Trunk PCI Adapter provides attachment to telephone company T1 or E1 digital trunks.



IBM ARTIC960RxD Quad Digital Trunk PCI Adapter Specifications

Item	Description
FRU number	
IBM ARTIC960RxD Quad DTA	87H3734
Quad T1/E1 DTA	09J8829
I/O bus architecture	PCI 2.1 compliant
Busmaster	Yes
Interrupt levels	Zero to 15
I/O address	0x0-0xffffff00,0x100
Adapter type	full length, full height, full width
Maximum number	Up to four - These adapters must be in adjacent slots.
Systems Supported	MT 7025 Model F50 MT 7026 Model H50 MT 7043 Model 140.
Wrap Plug	87H3502

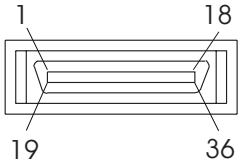
Cables	Separately orderable, depending on the application T1, RJ-48: Cable FC - 2709 E1, RJ-48: Cable FC - 2710 T1, 100 Ohm Balanced: Cable FC - 2871 T1, 100 Ohm Extension: Cable FC - 2872 E1, 120 Ohm Balanced: Cable FC - 2873 E1, 120 Ohm Extension: Cable FC - 2874 E1, 75 Ohm Unbalanced/Grounded: Cable FC - 2875 E1, 75 Ohm Unbalanced/UnGrounded: Cable FC - 2876 H.100, 4-Drop Cable FC - 2877 SC-Bus, 5-Drop Cable FC - 2878 H.100, 4-Drop Cable with SC-Bus Converter FC - 2879 *

Note: * This cable is referred to as the Four-Drop, H.100 Cable with SC-Bus Converter in other publications associated with this cable.

Jumpers: All jumpers are set at the factory. These jumpers are NOT to be moved by anyone.

IBM ARTIC960RxD Quad Digital Trunk PCI Adapter 36-pin D-Shell Connector

The individual signals for all ports connect to the Quad DTA adapters through the 36-pin connector at the rear of the card. The following illustration shows the male 36-pin connector.



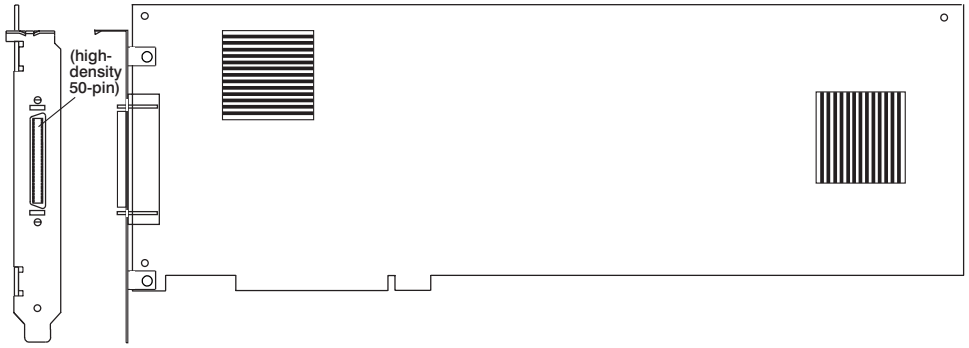
Note: The pinout for this 36-pin connector is completely defined in chapter 5 of *IBM ARTIC960RxD Quad Digital Trunk PCI Adapter Installation and User's Guide*., which came with your system or your adapter. The 36-pin cable connector uses AMP part numbers 2-175677-5 and 176793-5' (needed with the pinout if custom cables are required e.g. other combinations of the coax grounded/ungrounded cable).

IBM ARTIC960RxD Quad Digital Trunk PCI Adapter 68-pin (H.100) Card Edge Connector

The Quad DTA adapters have an internal bus that uses a 68-pin H.100 card edge connector. Multi-drop cable assemblies are used to connect the internal busses on the IBM ARTIC960RxD Quad Digital Trunk PCI Adapters. These internal cables are just long enough to cable up to four adapters in adjacent slots. One cable (F/C 2877) connects Quad DTA adapters together when there are no SC-bus adapters in the same machine. Two cables (F/C 2878 and F/C 2879) are used as a pair to connect Quad DTAs together and to SC-bus adapters (e.g. F/C 6309) in the same machine. See “IBM ARTIC960RxD Quad Digital Trunk PCI Adapter Internal Cabling” on page 3-52.

FC (8396) SP System Attachment Adapter (Type 6-F)

The SP System Attachment Adapter is for attaching a MT 7017 Model S70 or a MT 7017 Model S7A system to the SP switch fabric for use as a node in an SP system. The SP System Attachment Adapter plugs on to the system PCI bus. The PCI bus is PCI 2.1 compliant.



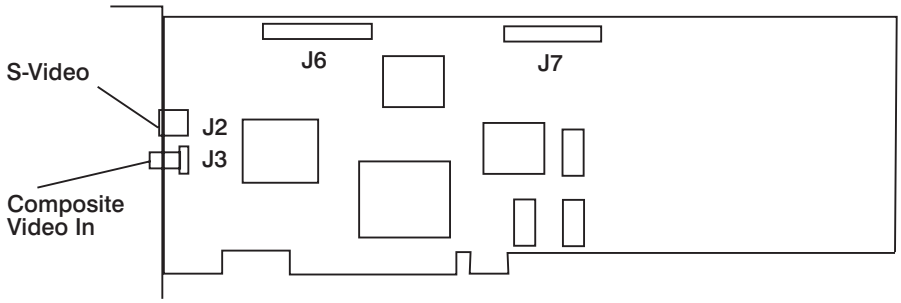
SP System Attachment Adapter Specifications

Item	Description
FRU Number	08L0398
Bus architecture	PCI 2.1
Bus master	Yes
Card Type	Full Size
Maximum number	One adapter per system. The adapter requires 3 (three) PCI slots. The SP System Attachment Adapter must be plugged into slot 10 (ten) of the primary I/O drawer on a MT 7017 Model S70 or a MT 7017 Model S7A. Slots 9 (nine) and 11 are required to be left empty for clearance and heat dissipation of components on the adapter.
Connector	50-pin high density
Wrap Plug	77G0818
Cables	Customer provided

FC(2638) Ultimeda Video Capture Adapter Style A Type (7-9)

Note: If your adapter does not match the style A below, see Style B on page 1-89.

The Ultimeda Video Capture Adapter supports the commonly required video functions of video capture composite video (NTSC, PAL, and SECAM), S-video, and high quality video scaling. The Ultimeda Video Capture Adapter also provides video to existing graphics subsystems through the system PCI bus.



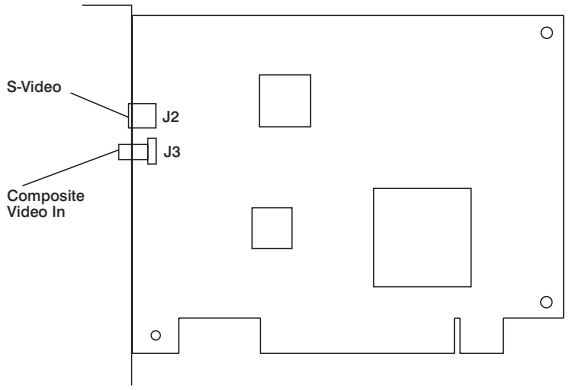
The Ultimeda Video Capture Adapter allows connection of the system unit to various video equipment.

Ultimeda Video Capture Adapter Style A Specifications

Item	Description
FRU Number	93H5248
Bus architecture	PCI
Busmaster	Yes
Bus width	32-bit
Adapter form factor	PCI Long
Interrupt level	Int. A
Maximum Number	1
Connectors	S-video 4-pin mini-din Video in RCA jack
Screen Resolution	Captures single field or full motion video from 80x60 pixels to 720x576 pixels.
Accepted video standards	NTSC, PAL, and SECAM

FC(2638) Ultimeda Video Capture Adapter Style B Type (7-9)

The Ultimeda Video Capture Adapter Style B is a full function Digital-Media Video Capture PCI adapter. The adapter supports all of the standard video capture capabilites. It provides inputs for standard composite video (NTSC, PAL, and SECAM), S-video. The video scaler supports digitally filtered vertical and horrizontalscaling of the digitized video. Continually variable scale factors in both direstions. The specific device drivers may only support a subset of the scaling options. Current AIX® operating system drivers support four, 640X480, 320X240, 180X160, and 80X60.



The Ultimeda Video Capture Adapter allows connection of the system unit to various video equipment.

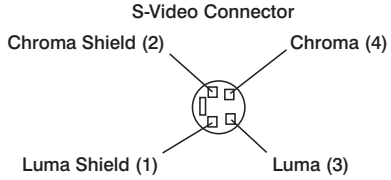
Ultimeda Video Capture Adapter Style B Specifications

Item	Description
FRU Number	93H8542
Bus architecture	PCI
Busmaster	Yes
Bus width	32-bit
Adapter form factor	PCI Short
Interrupt level	Int. A
Maximum Number	1
Number of colors supported	N/A
Connectors	S-video 4-pin mini-din Video in RCA jack
Screen Resolution	Captures single field or full motion video from 80x60 pixels to 720x576 pixels.
Accepted input video standards	NTSC, PAL, and SECAM
Display Power Management	N/A

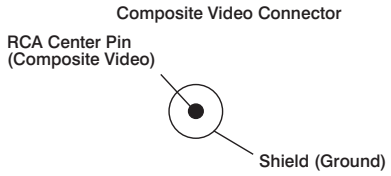
Ultimeda Video Capture Adapter Connectors

The following connectors are on the Ultimeda Video Capture Adapter

Ultimeda Video Capture Adapter S-video Connector



Ultimeda Video Capture Adapter RCA Connector

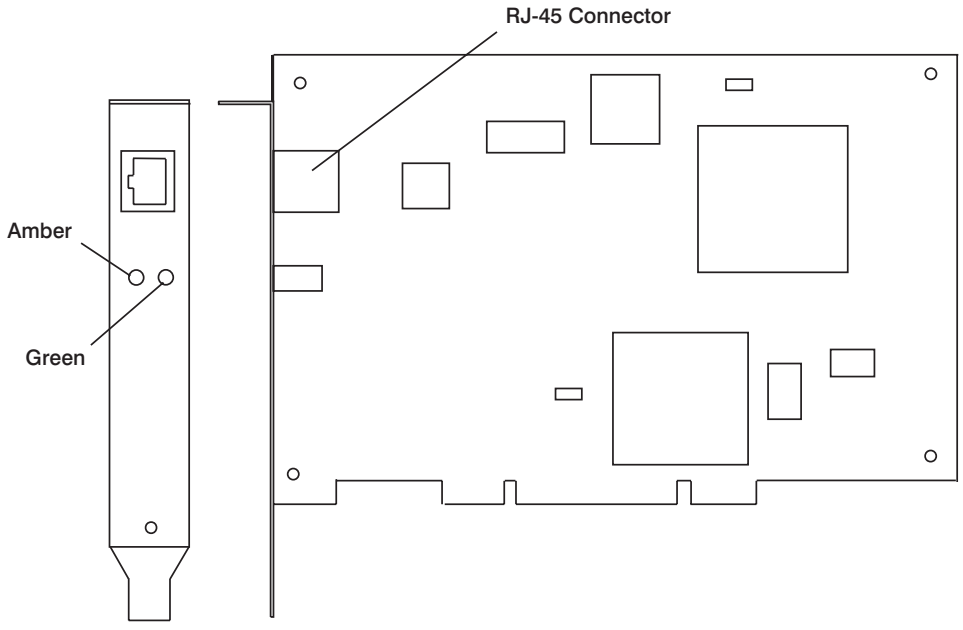


FC(2979) PCI Auto LANstreamer Token-Ring Adapter (Type 8-T)

The PCI Auto LANstreamer Token-Ring Adapter is a high-performance, token-ring local area network (LAN) adapter designed to operate in systems that support the Peripheral Component Interconnect (PCI) bus interface.

Considerations for Token-Ring applications are found in the following:

- IEEE 802.5 requirements
- *Token-Ring Network Introduction and Planning Guide (GA27-3677)*
- *A Building Planning Guide for Communication Wiring (G320-8059)*
- *Cabling System Planning and Installation Guide (GA27-3361)*
- *Using the Cabling System with Communication Products (GA27-3620)*



PCI Auto LANstreamer Token-Ring PCI Adapter Specifications

Item	Description
FRU number	04H8098
I/O bus architecture	PCI 2.0
Bit rate	4Mbps or 16Mbps set manually or automatically sensed
Modes	Half or full duplex
Busmaster	Yes
Connector information	RJ-45
Cables	Token-Ring RJ-45 STP Adapter Cable (P/N 60G1063) or Token-Ring 9-pin D-Shell Network Adapter Cable (P/N 6339098) with Conversion Token-Ring cable (P/N 93H8894) supplied with adapter

Interpreting the Adapter LEDs

The PCI Auto LANstreamer Token-Ring adapter's LEDs provide information for monitoring its status and for problem determination. If the green LED is on and the amber LED is off, the adapter is operating correctly. If the amber LED is blinking and the green LED is steady, the adapter has detected a potential problem. In the table below, the first four LED states indicate the sequence that is displayed when power is first applied to the computer and the adapter reaches the open state successfully. Some of these states may be too brief to observe. The last three LED states listed in the table indicate adapter faults. See "Definitions of Terms" on page 1-94.

Amber	Green	Explanation
Blinking	Blinking	The adapter is waiting for initialization.
Off	Off	The adapter initialization is in progress, or the computer is powered off.
Off	Blinking	The adapter did not detect any problems during its self-diagnostic tests and is waiting to open.
		If this LED state occurs after the adapter is open, this state indicates that the adapter has closed.
Off	On	The adapter is open and operating correctly.
On	Off	The adapter self-diagnostic tests failed or there is a problem with the adapter.
Blinking	Off	The adapter is closed. One of the following conditions exists:
		The adapter open failed.
		The adapter detected a wire fault.
		The adapter failed the auto-removal test.
Blinking	On	The adapter has detected beaconing or a hard error.
On	On	The adapter has failed.

Definitions of Terms

See “Interpreting the Adapter LEDs” on page 1-93.

Auto-removal is a state in which a token-ring adapter removes itself from the network to perform self-tests to determine whether it is the cause of a hard error. If the tests are successful, the adapter reattaches itself to the network.

Beaconing is a state that a token-ring adapter enters after it detects a hard error. The adapter reports the error condition to the other devices on the network. Beaconing can result in the adapter removing itself from the network (auto-removal) to determine whether it is the cause of the hard error.

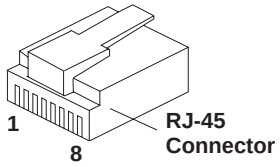
Hard error is an error condition on a network that requires removing the source of the error or reconfiguring the network before the network can resume reliable operation.

Initialization is an action during which the adapter is prepared for use after its computer is booted. During initialization, the adapter runs its self-diagnostic tests.

Open is a state in which the adapter has established connection with other devices on the ring.

Wire fault is an error condition caused by a break or a short-circuit in the cable segment that connects the adapter to its access unit.

PCI Auto LANstreamer Token-Ring Adapter RJ-45 Connector



Position	Signal Name
1	No Connect
2	No Connect
3	Ring Out A
4	Ring in B
5	Ring in A
6	Ring Out B
7	No Connect
8	No Connect

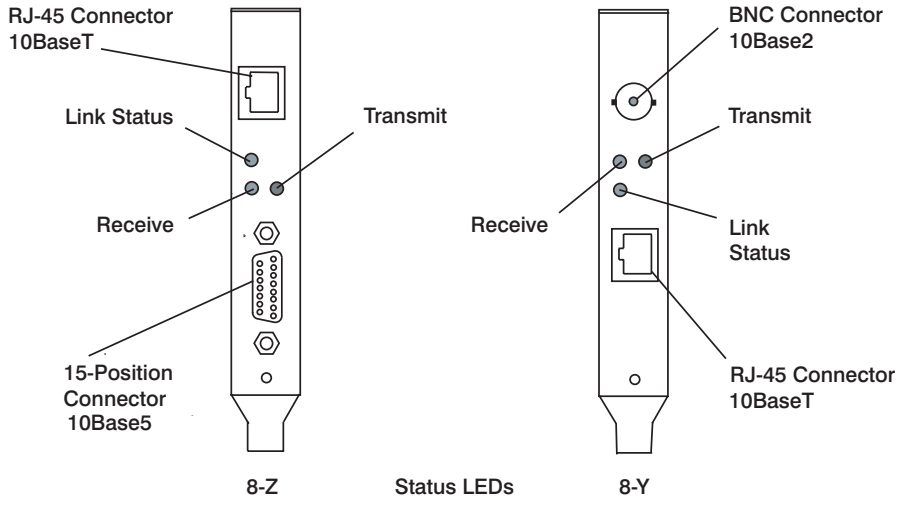
FC(2985, 2987) Ethernet PCI Adapter (Type 8-Y and 8-Z)

The Ethernet PCI Adapter provides attachment to a carrier sense multiple access/collision detection (CSMA/CD) ethernet local area network (LAN) for systems designed to operate with the Peripheral Component Interconnect (PCI) bus interface. It uses the IEEE-802.3 standard for communications.

Card type 8-Y supports connections to 10Base2 networks through a BNC connector or 10BaseT unshielded twisted pair networks through a RJ-45 connector.

Card type 8-Z supports connections to 10Base5 networks through a 15-pin D-shell connector or 10BaseT unshielded twisted pair networks through a RJ-45 connector.

Only one connector can be used at a time.



Viewing the LEDs

The adapter features three LEDs that provide information on the status of the card's operation. The LEDs are visible through the card's mounting bracket and indicate the following conditions when lit.

- Receive LED (yellow) - Indicates packets are being received from the network
- Transmit LED (yellow) - Indicates packets are being transmitted over the network
- Link Status LED (green) - Indicates a valid network connection (10BaseT networks only)

Ethernet - T2 PCI Adapter Specifications

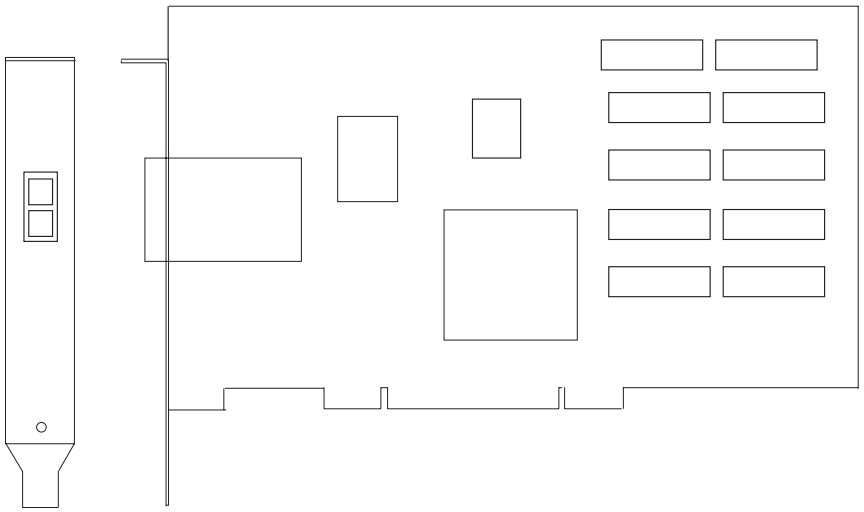
Item	Description
FRU number	93H1902
I/O bus architecture	PCI
Busmaster	Yes
Connector information	BNC coaxial, 8-postion RJ-45
Cables	Customer supplied (use Y type connection), BNC
Wrap plugs	Thin BNC, part number 02G7433, twisted-pair (8-position RJ-45), part number 00G2380

Ethernet - T5 PCI Adapter Specifications

Item	Description
FRU number	11G8130
I/O bus architecture	PCI
Busmaster	Yes
Connector information	15-position D-shell, 8-position RJ-45
Cables	Customer supplied
Transceiver	Thin, part number 02G7437
Transceiver cables	Adapter-to-transceiver, thick and thin, part number 02G7434
Wrap plugs	Thick - 15-position D-shell, part number 71F1167 Thin - BNC, part number 02G7433 Twisted-pair -(8-position RJ-45) part number 00G2380

FC (2988) TURBOWAYS 155 PCI MMF ATM Adapter (Type 9-F)

The TURBOWAYS 155 PCI Multi-Mode Fiber (MMF) Asynchronous Transfer Mode (ATM) Adapter provides the interface between the ATM 155 Mbit/sec fiber-optics network and the PCI Bus in your system.



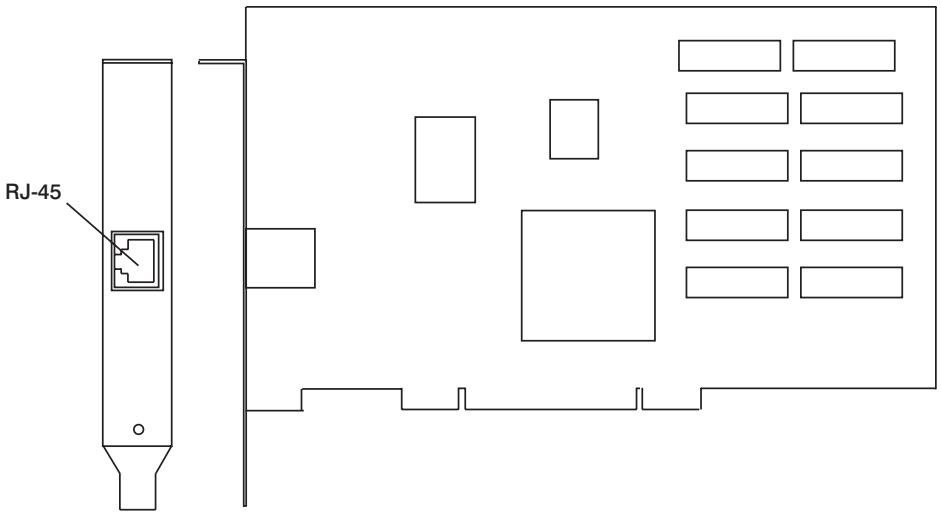
TURBOWAYS 155 PCI MMF ATM Adapter Specifications

Item	Description
FRU Number	21H3890
Bus architecture	PCI 2.1
Card Type	Half
Maximum number *	For the maximum number of adapters allowed in your system, see HONE.
Connector	ANSI Specified SC duplex
Wrap Plug	21H3547 Shipped with assembly or 16G5609
Cables	62.5 micron multi-mode Fiber-optic, customer provided

* The maximum number of TURBOWAYS 155 PCI adapters must include both the TURBOWAYS 155 PCI MMF ATM Adapters and the TURBOWAYS 155 PCI UTP ATM Adapters.

FC (2963) TURBOWAYS 155 PCI UTP ATM Adapter (Type 9-J)

The TURBOWAYS 155 PCI Unshieldded Twisted Pair (UTP) Asynchronous Transfer Mode (ATM) Adapter provides the interface between the ATM 155 Mbit/sec unshielded twisted pair network and the PCI Bus in your system.

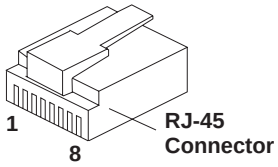


TURBOWAYS 155 PCI UTP ATM Adapter Specifications

Item	Description
FRU Number	99G9547
Bus architecture	PCI 2.1
Card Type	Half
Maximum number *	For the maximum number of adapters allowed in your system, see HONE.
Wrap plug	Supplied with adapter
Connector information	RJ-45
Cables	The cable can be Unshielded Twisted Pair (UTP) or Shielded Twisted Pair (STP), up to 100 meters long.

* The maximum number of TURBOWAYS 155 PCI adapters must include both the TURBOWAYS 155 PCI MMF ATM Adapters and the TURBOWAYS 155 PCI UTP ATM Adapters.

TURBOWAYS 155 PCI UTP ATM Adapter Connector

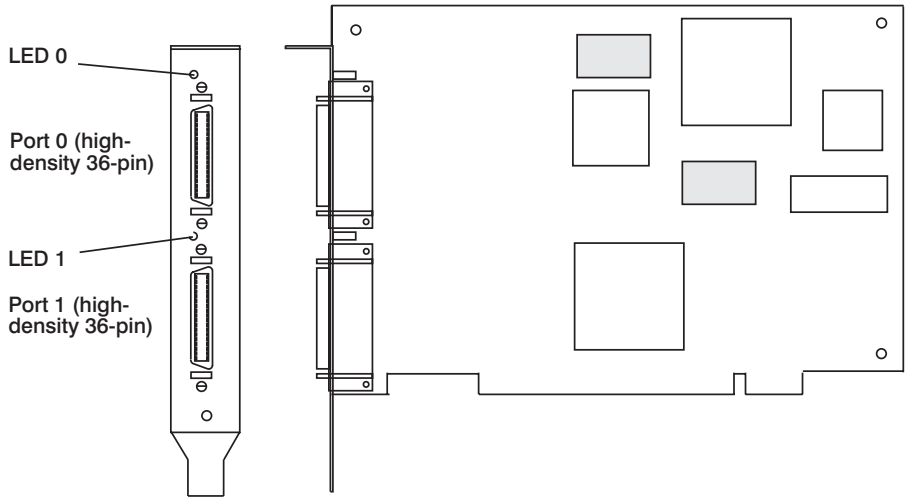


Position	Signal Name
1	Transmit A
2	Transmit B
3	No Connection
4	No Connection
5	No Connection
6	No Connection
7	Receive A
8	Receive B

FC(2962) 2-Port Multiprotocol PCI Adapter (Type 9-L)

The 2-Port Multiprotocol PCI Adapter is used to make high speed connections between stand alone system units on a Wide Area Network (WAN).

For more information on the 2-Port Multiprotocol Adapter see the 2-Port Multiprotocol PCI Adapter Installation and User's Guide which is a Customer Installable Option booklet.



2-Port Multiprotocol PCI Adapter Specifications

Item	Description
FRU number	93H6086
I/O bus architecture	PCI
Bit rate	2.048 Mbits maximum per port
Busmaster	No
Maximum Number	up to maximum number of slots
Wrap Plug	part number 93H5270
Connector information	36-pin High Density (male)
Cables	V.24 part number 93H5263 V.35 part number 93H5264 V.36/EIA-449 part number 93H5265 X.21 part number 93H5267

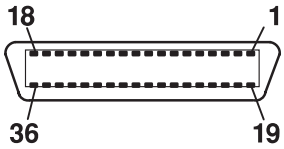
Interpreting the Adapter LEDs (Connection Status Indicators)

The green LED next to each port on the 2-Port Multiprotocol PCI Adapter indicates the port connection status. See the end view of the adapter on page 1-101.

LED status explanations follow:

LED State	Connection Status	Remedy
Off	The port is not loaded (the configuration file describing protocol and interface parameters was not read by the device driver on the system unit.)	Consult your networking software for instructions to load a configuration file and to start a connection.
Flash	The connection is up and data is being transmitted or received.	
On	The port is active and the connection is good.	

2-Port Multiprotocol PCI Adapter Connector



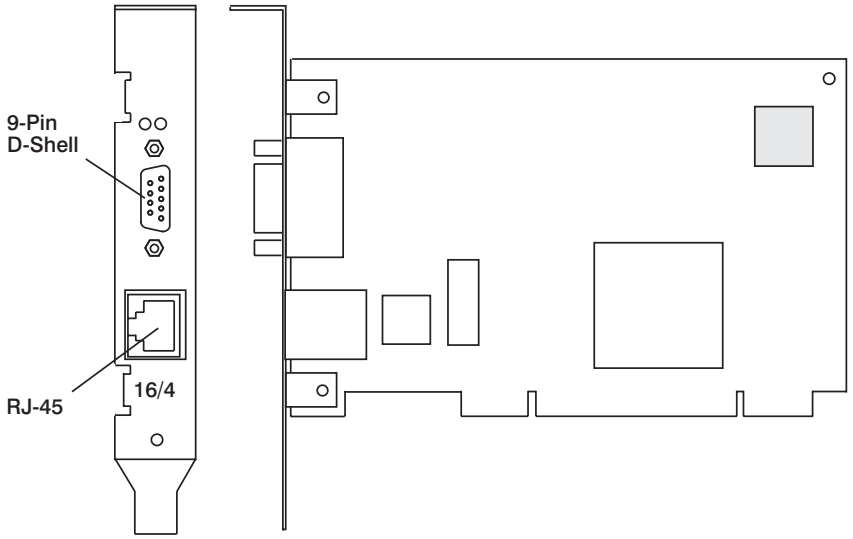
Each port on this adapter supports several different interfaces. See the 2-Port Multiprotocol PCI Adapter section in “2-Port Multiprotocol PCI Adapter” on page 5-41.

FC(2920) PCI Token-Ring Adapter (Type 9-O)

The PCI Token-Ring Adapter is a high-performance, 32-bit bus master, adapter designed to operate in systems that incorporate the Peripheral Component Interconnect (PCI) bus interface. Featuring an enhanced system interface for higher throughput and lower system utilization, coupled with RJ-45 and DB9 connectors, this adapter is equipped to handle the LAN environment requirements of today's servers and high-end workstations running I/O intensive applications on the network.

Considerations for Token-Ring applications are found in the following:

- IEEE 802.5 requirements
- Token-Ring Network Introduction and Planning Guide (GA27-3677)
- A Building Planning Guide for Communication Wiring (G320-8059)
- Cabling System Planning and Installation Guide (GA27-3361)
- Using the Cabling System with Communication Products (GA27-3620).



PCI Token-Ring Adapter Specifications

Item	Description
FRU number	93H6594
I/O bus architecture	PCI
Bit rate	4Mbps or 16Mbps set manually or automatically sensed
Modes	Half or full duplex
Busmaster	Yes
Connector information	RJ-45 and 9-pin D-Shell
Cables	
For STP	Token-Ring RJ-45 STP Adapter Cable (P/N 60G1063) or Token-Ring 9-pin D-Shell Network Adapter Cable, (P/N 6339098).
For UTP	Standard UTP adapter cable with an RJ-45 connector on one end for the adapter and the appropriate connector for the wall outlet on the other end.

Interpreting the Adapter LEDs

The PCI Token-Ring adapter's LEDs provide information for monitoring its status and for problem determination. If the green LED is on and the amber LED is off, the adapter is operating correctly. If the amber LED is blinking and the green LED is steady, the adapter has detected a potential problem. In the table below, the first four LED states indicate the sequence that is displayed when power is first applied to the computer and the adapter reaches the open state successfully. Some of these states may be too brief to observe. The last three LED states listed in the table indicate adapter faults. See “Definitions of Terms” on page 1-106.

Amber	Green	Explanation
Blinking	Blinking	The adapter is waiting for initialization.
Off	Off	The adapter initialization is in progress, or the computer is powered off.
Off	Blinking	The adapter did not detect any problems during its self-diagnostic tests and is waiting to open.
		If this LED state occurs after the adapter is open, this state indicates that the adapter has closed.
Off	On	The adapter is open and operating correctly.
On	Off	The adapter self-diagnostic tests failed or there is a problem with the adapter.
Blinking	Off	The adapter is closed. One of the following conditions exists:
		The adapter open failed.
		The adapter detected a wire fault.
		The adapter failed the auto-removal test.
Blinking	On	The adapter has detected beaconing or a hard error.
On	On	The adapter has failed.

Definitions of Terms

See “Interpreting the Adapter LEDs” on page 1-105.

Auto-removal is a state in which a token-ring adapter removes itself from the network to perform self-tests to determine whether it is the cause of a hard error. If the tests are successful, the adapter reattaches itself to the network.

Beaconing is a state that a token-ring adapter enters after it detects a hard error. The adapter reports the error condition to the other devices on the network. Beaconing can result in the adapter removing itself from the network (auto-removal) to determine whether it is the cause of the hard error.

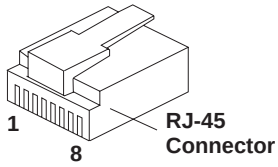
Hard error is an error condition on a network that requires removing the source of the error or reconfiguring the network before the network can resume reliable operation.

Initialization is an action during which the adapter is prepared for use after its computer is booted. During initialization, the adapter runs its self-diagnostic tests.

Open is a state in which the adapter has established connection with other devices on the ring.

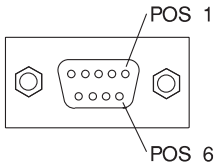
Wire fault is an error condition caused by a break or a short-circuit in the cable segment that connects the adapter to its access unit.

PCI Token-Ring PCI Adapter RJ-45 Connector



Position	Signal Name
1	No Connect
2	No Connect
3	Ring Out A
4	Ring in B
5	Ring in A
6	Ring Out B
7	No Connect
8	No Connect

PCI Token-Ring Adapter 9-Pin D-shell Connector

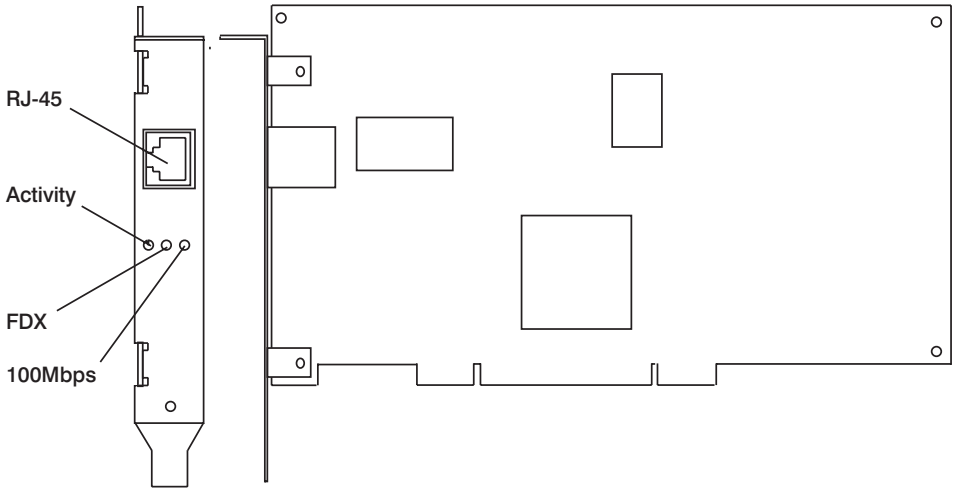


Position	Signal Name
1	Ring Out A
2	Gnd
3	+5v
4	Gnd
5	Ring In B
6	Ring Out B
7	Gnd
8	Gnd
9	Ring In A

FC(2968) 10/100 Ethernet Tx PCI Adapter (Type 9-P)

The 10/100 Ethernet Tx PCI Adapter provides attachment at 10Mbps or 100Mbps to a carrier sense multiple access/collision detection (CSMA/CD) ethernet local area network (LAN) for systems designed to operate with the Peripheral Component Interconnect (PCI) bus interface. It uses the IEEE-802.3u standard for communications.

The adapter supports connections to 10BaseT or 100BaseTx on unshielded twisted pair networks through a RJ-45 connector.



10/100 Ethernet - 10/100 PCI Adapter Specifications

Item	Description
FRU number	91H0397
I/O bus architecture	PCI
Busmaster	Yes
Connector information	8-postion RJ-45
Cables	Customer supplied (use Y type connection),
For 10Mbps	use catagory 3, 4, or 5 unshielded twisted pair
For 100Mbps	use catagory 5 only unshielded twisted pair
Wrap plug	Twisted-pair, part number 00G2380

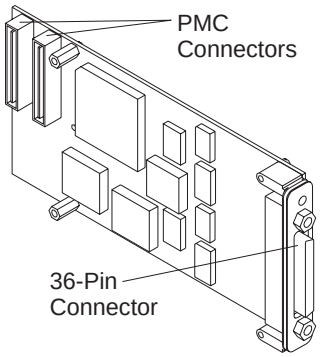
Viewing the LEDs

The adapter features three LEDs that provide information on the status of the card's operation. The LEDs are visible through the card's mounting bracket and indicate the following conditions when lit.

- 100 LED (yellow) - indicates 100 Mbps operation
- FDX LED (green) - Indicates full duplex operation
- Activity LED (green) - Indicates transmit or receive activity

FC(2947) IBM ARTIC960Hx 4-Port Selectable PCI Adapter (Type 9-R)

The IBM ARTIC960Hx 4-Port Selectable PCI Adapter consists of an IBM ARTIC960Hx Base PCI Adapter, an IBM ARTIC960Hx 4-Port Selectable PMC, and an 8MB DRAM Memory card. The IBM ARTIC960Hx 4-Port Selectable PCI Mezzanine Card (PMC) is an optional PCI mezzanine card that is used with the IBM ARTIC960Hx base adapter. See “IBM ARTIC960Hx Base PCI Adapter” on page 1-113.



The IBM ARTIC960Hx 4-Port Selectable PMC connects to the IBM ARTIC960Hx base adapter by two 64-pin connectors. See “PMC Connector” on page 1-113. Interface signals exit the 4-Port Selectable PCI Mezzanine Card through the 120-pin connector at the rear of the card. The IBM ARTIC960Hx base adapter and the attached 4-Port Selectable PMC occupy a single 32-bit expansion slot.

IBM ARTIC960Hx 4-Port Selectable PCI Adapter Specifications

Item	Description
FRU Number	
Base Adapter	87H3427
4-Port Selectable Mezzanine Card	87H3413
DRAM Memory	See “IBM ARTIC960Hx Base PCI Adapter Specifications” on page 1-113
I/O Bus	PCI
Connectors	120-pin D shell Two 64-pin for PMC
Wrap Plugs	See “ Wrap Plugs.”
Cables	EIA-232 (ISO 2110)cable EIA-530 (ISO 2110)cable V.35 DTE (ISO 2593) cable RS 449 (ISO 4902) cable X.21 (ISO 4903) cable

Wrap Plugs

Description of Wrap Plug	FRU Number
120-pin connector	87H3311
25-pin wrap plug (EIA-232 (ISO 2110) or EIA-530 (ISO 2110))	87H3439
34-pin wrap plug (V.35 DTE (ISO 2593) 34-pin male block)	87H3442
37-pin wrap plug (RS-449 (ISO 4902))	87H3440
15-pin wrap plug (X.21 (ISO 4903))	53G0638

Port Speeds

When clocks are supplied by an external device (all interfaces except EIA-232), the 4-Port Selectable PMC supports four ports running simultaneously at a maximum data rate of 2.048M bits per second (bps), duplex, and synchronous. The following table shows the maximum speed supported for each electrical interface.

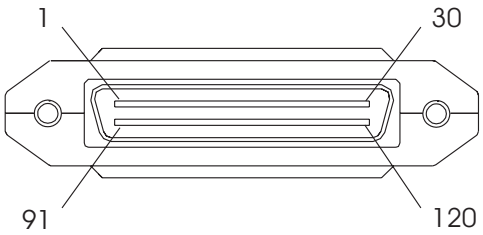
Electrical Interface	Maximum Speed (per port)
EIA-232 (ISO 2110)	38.4K bps (U.S. only) 19.2K bps (EMEA only)
EIA-530 (ISO 2110)	2.048M bps
V.35 DTE (ISO 2593)	2.048K bps (US only) 64K bps (EMEA only)
RS 449 (ISO 4902)	2.048M bps
X.21 (ISO 4903)	2.048M bps

Clocks supplied by a Dual Universal Serial Communications Controller (DUSCC) on the 4-Port Selectable PMC provide synchronous data rates up to 230.4K bps, duplex. In addition, an on-card clock generator can provide data rates of either 1.544M bps or 2.048M bps for each port. Selection of the clock frequency is programmable.

IBM ARTIC960Hx 4-Port Selectable PCI Mezzanine Card 120-Pin Connector

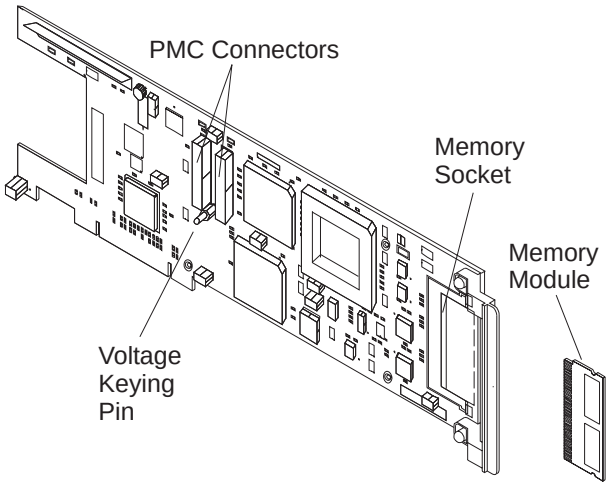
The individual signals for all ports connect to the 4-Port Selectable PMC through the 120-pin connector at the rear of the card.

Each cable has a single 120-pin, male, D-shell connector that branches into four individual cables, each of which provides access to one of four independent ports. The 120-pin D-shell connector is shown below.



IBM ARTIC960Hx Base PCI Adapter

The IBM ARTIC960Hx Base PCI Adapter provides high-function control of I/O operations and serves to off-load input/output tasks from the system microprocessor. It has a memory connector that supports 8MB of Extended-data output (EDO) Dynamic random-access memory (DRAM). It also has a PMC connector to attach a PCI Mezzanine Card (PMC). See “PMC Connector.”



IBM ARTIC960Hx Base PCI Adapter Specifications

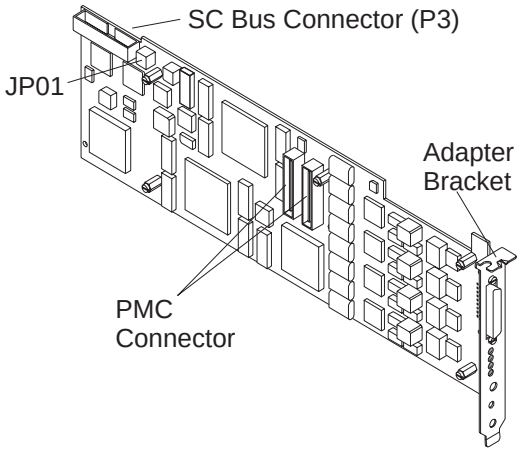
Item	Description
FRU number base adapter without memory	87H3427
FRU number memory module 8MB memory	87H3621
I/O bus architecture	PCI
Busmaster	Yes
Bus Size	32 bit
Connectors	Two 64-pin PMC. See PMC Connector below.
Cable	None supplied with Base PCI Adapter

PMC Connector

The PMC connector provides a 32-bit PCI interface for attaching a single, or single-extended, PCI Mezzanine Card (PMC). A PCI mezzanine card provides a high-function, application-specific interface that expands the capability of a base adapter like the IBM ARTIC960Hx Base PCI Adapter.

FC(2948) IBM ARTIC960Hx 4-Port T1/E1 PCI Adapter (Type 9-S)

The IBM ARTIC960Hx 4-Port T1/E1 PCI Adapter consists of an IBM ARTIC960Hx Base PCI Adapter, an 4-Port T1/E1 Mezzanine Card, and an 8MB DRAM Memory card. The IBM ARTIC960Hx 4-Port T1/E1 Mezzanine Card is an optional PCI mezzanine card (PMC) that is used with the IBM ARTIC960Hx base adapter. See "IBM ARTIC960Hx Base PCI Adapter" on page 1-113.



This IBM ARTIC960Hx 4-Port T1/E1 Mezzanine Card connects to the IBM ARTIC960Hx Base PCI Adapter by two 64-pin connectors. See "PMC Connector" on page 1-113. The interface signals exit the 4-Port T1/E1 Mezzanine Card through the 36-pin connector at the rear of the card. The IBM ARTIC960Hx Base PCI Adapter and the attached 4-Port T1/E1 Mezzanine Card occupy a single full-size 32-bit PCI expansion slot.

IBM ARTIC960Hx 4-Port T1/E1 PCI Adapter Specifications

Item	Description
FRU Number	
Base Adapter	87H3427
4-Port T1/E1 Mezzanine Card	84H3428
DRAM Memory	See “IBM ARTIC960Hx Base PCI Adapter Specifications” on page 1-113
I/O Bus	PCI
Connectors	36-pin D-Shell 26-pin SC-Bus
Wrap Plugs	36-pin, part number 87H3502 RJ-48, part number 87H3588
Cables	4-port T1 RJ-48: Cable FC - 2709 4-port E1 RJ-48: Cable FC - 2710
IBM ARTIC960Hx Surge Protection FRU Number	
RJ-48 cable	87H3651

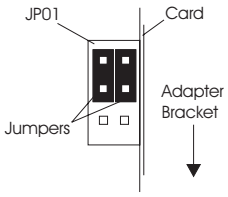
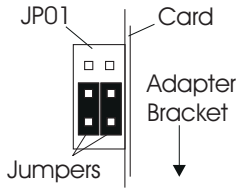
Port Speeds

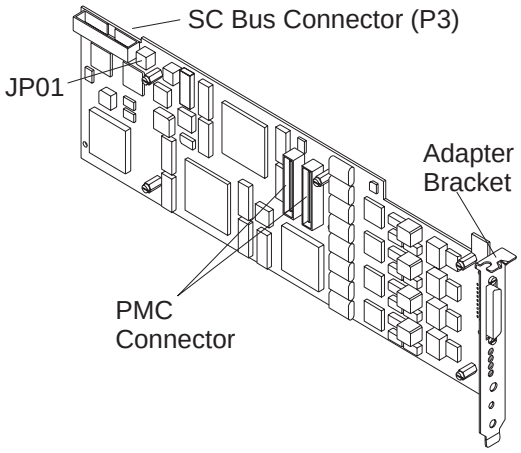
The 4-Port T1/E1 mezzanine card supports four ports running simultaneously at a maximum data rate of 2.048Mbps (million bits per second) duplex. The following table shows the maximum port speed supported for each electrical interface.

Electrical Interface	Maximum Speed (per port)
T1	1.544Mbps
E1	2.048Mbps

IBM ARTIC960Hx 4-Port T1/E1 PCI Adapter Jumpers

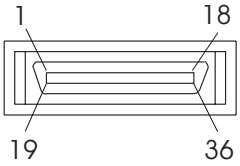
The jumpers at JP01 should be positioned based on the following conditions.

Jumper Positions	Condition
	If no cable will be connected to the SC bus connector (P3), or if the card will be connected to the end of the SC bus cable, ensure that the two jumpers at JP01 are installed, parallel with the card surface, on the pins that are farthest from the adapter bracket.
	Otherwise, install the jumpers on the JP01 pins that are closest to the adapter bracket.



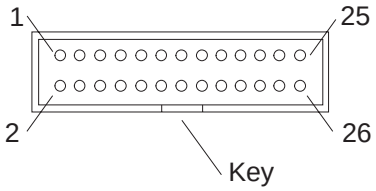
IBM ARTIC960Hx 4-Port T1/E1 PCI Adapter 36-pin D-Shell Connector

The individual signals for all ports connect to the mezzanine card through the 36-pin connector at the rear of the card. The following shows the male 36-pin connector at one end of the cable.



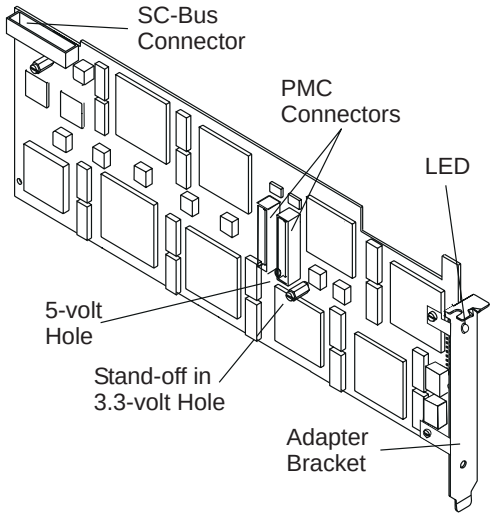
IBM ARTIC960Hx 4-Port T1/E1 PCI Adapter 26-pin Connector

The 26-pin SC-Bus connector allows the mezzanine card to connect to the SC busses on similarly-capable neighboring adapters in the system unit. The mezzanine card SC-bus conforms to the Signal Computing System Architecture (SCSA) hardware model for real-time computer telephony.



FC(2949) IBM ARTIC960Hx DSP Resource PCI Adapter (Type 9-T)

The IBM ARTIC960Hx DSP Resource PCI Adapter Consists of an IBM ARTIC960Hx Base PCI Adapter, an IBM ARTIC960Hx DSP Resource Mezzanine Card, and an 8MB DRAM Memory card. The IBM ARTIC960Hx DSP Resource PCI Adapter is an optional PCI mezzanine card that is used with the IBM ARTIC960Hx base adapter. See “IBM ARTIC960Hx Base PCI Adapter” on page 1-113.



The IBM ARTIC960Hx DSP Resource PCI Adapter connects to the ARTIC960Hx Base Adapter by two 64-pin connectors. See “PMC Connector” on page 1-113. The interface signals exit the DSP Resource PCI Adapter through the 26-pin Signal-computing bus (SC-bus) connector at the top of the PCI Adapter. The IBM ARTIC960Hx base adapter and the attached DSP Resource Adapter occupy a single full-size 32-bit PCI expansion slot.

IBM ARTIC960Hx PCI Adapter With DSP Resource PCI Adapter Specifications

Item	Description
FRU Number	
Base Adapter	87H3427
DSP Resource PCI Adapter	87H3701
DRAM Memory	See “IBM ARTIC960Hx Base PCI Adapter Specifications” on page 1-113.
I/O Bus	PCI
Busmaster	Yes
Adapter form factor	PCI Long
Connector	26 pin SC-bus
Adapter Cable	Optional internal SC-bus ribbon cable

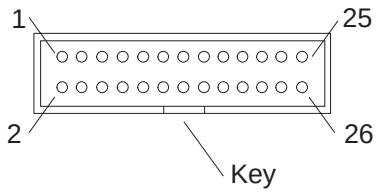
Status LED

The DSP Resource PCI Adapter has a two color LED located at the rear of the card and visible through an opening in the adapter bracket.

The color of the LED depends on the condition or status of the SC-bus. The LED is green when the SC-bus is active and synchronized. The LED is yellow when the SC-bus is inactive or it is not synchronized.

SC-Bus Connector 26-Pin

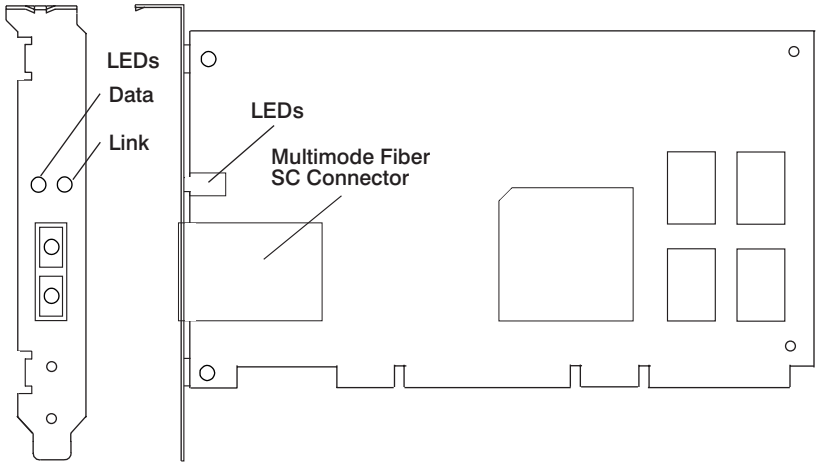
The 26-pin SC-Bus connector allows the DSP Resource PCI Adapter to connect to the SC buses on similarly-capable neighboring adapters in the system unit. The DSP Resource PCI Adapter SC-bus conforms to the Signal Computing System Architecture (SCSA) hardware model for real-time computer telephony.



FC(2969) Gigabit Ethernet-SX PCI Adapter (Type 9-U)

The Gigabit Ethernet-SX PCI Adapter provides attachment at 1000Mbps to an Ethernet local area network (LAN). It is designed to operate on systems with 32 or 64-bit Peripheral Component Interconnect (PCI) bus interface. See “Gigabit Ethernet-SX PCI Adapter Specifications” on page 1-121 for details. It uses the IEEE-802.3z standard for communications.

The adapter supports connections at 1000Mbps with full-duplex operation on fiber optic networks through an SC connector.



Gigabit Ethernet-SX PCI Adapter Specifications

Item	Description
FRU number	07L8918
I/O bus architecture	PCI 2.1 compliant
Busmaster	Yes
Maximum number	
MT 7025 Model F50	2 - 32-bit only, 1 per PCI bus
MT 7026 Model H50	2 - 32-bit only, 1 per PCI bus
MT 7043 Model 260	2 - 64-bit only PCI Slots
MT 7017 Model S70	64-bit only, 1 per PCI bus, 4 per I/O drawer, 8 per system
MT 7017 Model S7A	64-bit only, 1 per PCI bus, 4 per I/O drawer, 8 per system
Adapter size	PCI Short form
Connector information	SC Fiber optic
Wrap plug	SC Fiber optic, PN - 21H3547
Cables	Customer supplied, see “Gigabit Ethernet-SX PCI Adapter, Cable Length”

Viewing the LEDs

The adapter features two LEDs that provide information on the status of the adapter's operation. The LEDs are visible through the card's mounting bracket and indicate the following conditions when lit.

- Link LED (green) - On - Indicates link is up
  - Blinking - Port is disabled by software
- Data LED (yellow) - On - Indicates transmit or receive activity

Gigabit Ethernet-SX PCI Adapter, Cable Length

The 1000Mbps adapter uses multimode fiber optic cable. The following table shows the allowable cable length from the adapter to the local switch:

Fiber Type	Modal bandwidth (MHZ-km)	Range (meters)
62.5 μm MMF	160	2 to 220
62.5 μm MMF	200	2 to 275
50 μm MMF	400	2 to 500
50 μm MMF	500	2 to 500

Note: Multimode Fiber (MMF)

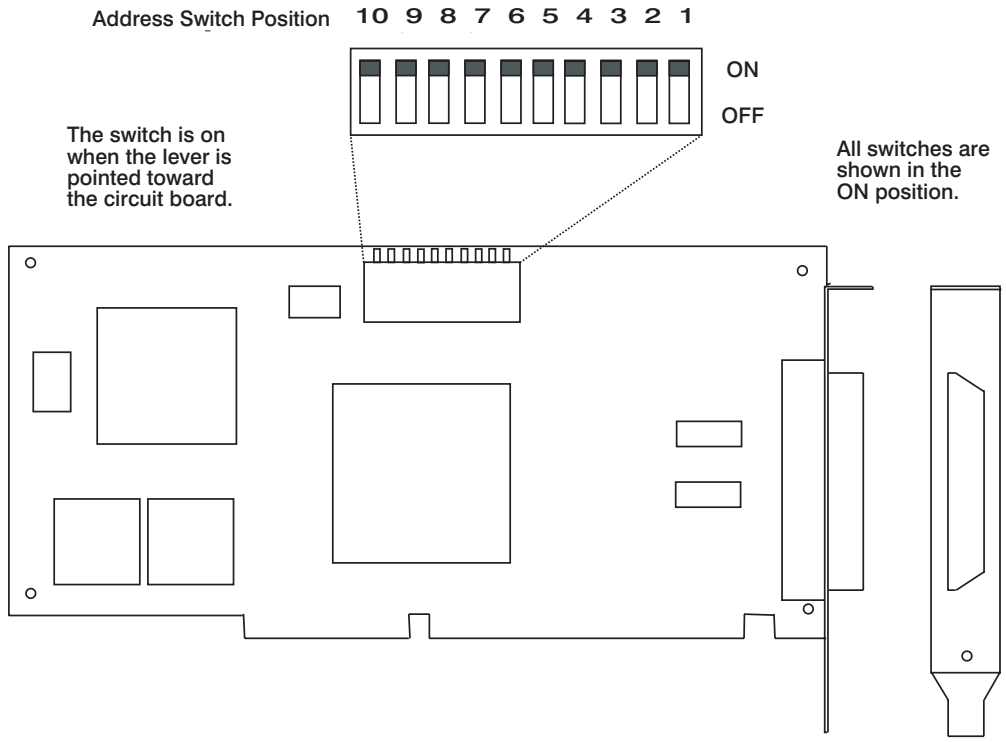
FC(2961) X.25 Interface Co-Processor ISA Adapter (Type *)

Note: * This adapter does not have an assigned Card Type.

The X.25 Interface Co-Processor, with supporting software, enables the attachment of an ISA-bus-compatible (AT-bus) personal computer system to an X.25 packet-switched network so that the computer system can operate as a packet terminal.

The X.25 Interface Co-Processor adapter has its own microprocessor and memory, allowing it to perform communications functions.

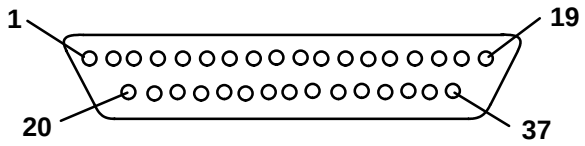
The X.25 Interface Co-Processor adapter's 10-position option switch is shown with all of the switches set to the ON position.



X.25 Interface Co-Processor Adapter Specifications

Item	Description
FRU Part Number	71G6458
I/O bus architecture	ISA
Busmaster	No
Maximum Number	5
Connector	37-pin D-shell
Wrap Plugs	X.25 Adapter Wrap Plug, part number 07F3132
	X.21 Cable Wrap Plug, part number 07F3153
	V.24 Cable Wrap Plug, part number 07F3163
	V.35 Cable Wrap Plug, part number 07F3173
Cables	X.21 3m Cable, part number 07F3151
	X.21 6m Cable, part number 53F3926
	V.24 3m Cable, part number 07F3161
	V.24 6m Cable, part number 53F3927
	V.35 3m Cable, part number 07F3171
	V.35 6m Cable, part number 53F3928

X.25 Interface Co-Processor 37-Pin Connector



Position	Signal Name (Mnemonic)	Position	Signal Name (Mnemonic)
1	Reserved	21	Remote loopback test [RLBT]
2	Transmitted data [TXD]	22	Call indicate [CI]
3	Received data [RXD]	23	Reserved
4	Request to send [RTS]	24	Transmit clock [TX CLK]
5	Clear to send [CTS]	25	Test indicate [TI]
6	Data set ready [DSR]	26	Receive clock [RX CLK]
7	Signal ground [GND]	27	Local loopback test [LLBT]
8	Carrier detect [CD]	28	Transmitted data (B) [T (B)]
9	Cable ID 0 [ID0]	29	Control (B) [C (B)]
10	Transmitted data (A) [T (A)]	30	Received data (B) [R (B)]
11	Control (A) [C (A)]	31	Indication (B) [I (B)]
12	Received data (A) [R (A)]	32	Transmit clock (B) [S (B)]
13	Indication (A) [I (A)]	33	Reserved
14	Transmit clock (A) [S (A)]	34	Receive clock (A) [RX CLK (A)]
15	Cable ID 1 [ID1]	35	Transmitted data (A)
16	Receive clock (B) [RX CLK (B)]	36	Transmit clock (A) [TX CLK (A)]
17	Transmitted data (B) [TXD (B)]	37	Received data (A) [RXD (A)]
18	Transmit clock (B) [TX CLK (B)]		
19	Received data (B) [RXD (B)]		
20	Data terminal ready [DTR]		

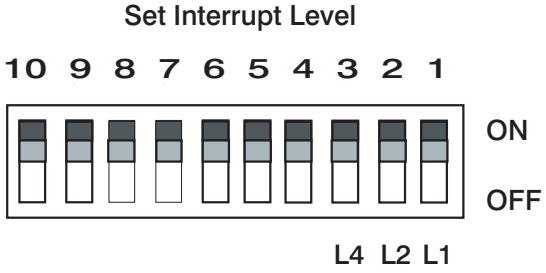
X.25 Interface Co-Processor Adapter's 10-position Option Switch

This section contains a description of setting the switches on the X.25 Interface Co-Processor.

Setting the Interrupt Level: Switch positions 1, 2, and 3 (L1, L2, and L4, as shown in the illustration) configure the X.25 adapter for any one of eight interrupt priority levels if the expansion slot that holds the adapter is a two-edge connector. If the expansion slot that holds the adapter is a one-edge connector, the valid interrupt levels are 3, 4, 7, and 2.

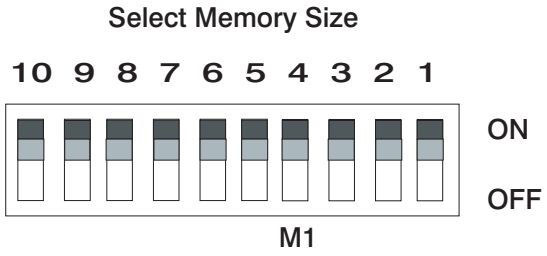
Note: For an explanation of edge connectors, see the note under "Setting the Edge Connector (ED)" on page 1-128.

The X.25 Interface ISA Co-Processor Adapter Installation Guide has additional information that is useful when setting the interrupt level. It explains how to find out what interrupt levels are in use using the *lsresource* command.



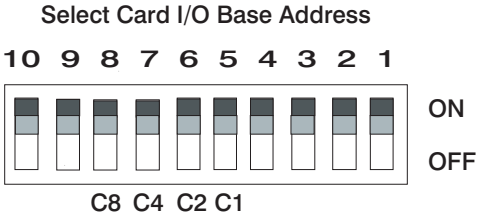
Switch Settings			Interrupt Level
L4	**L2**	**L1**	
ON	ON	ON	3
ON	ON	OFF	4
ON	OFF	ON	7
ON	OFF	OFF	2 or 9
OFF	ON	ON	10
OFF	ON	OFF	11
OFF	OFF	ON	12
OFF	OFF	OFF	15

Verifying the Memory-Size-Switch Position: Switch position 4 (M1, as shown in the following illustration) is factory set to indicate the size of the RAM installed on the X.25 adapter. Verify that switch position 4 is set to ON to indicate that 512K bytes of RAM is installed on the X.25 adapter.



Switch Setting	Memory Size
M1	
ON	512KB
OFF	Reserved

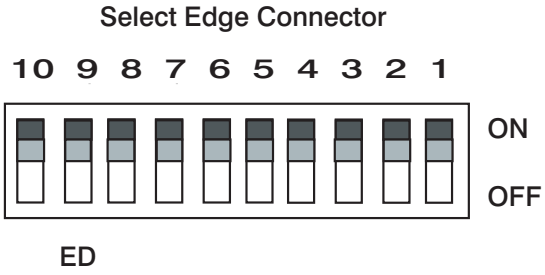
Setting the Card I/O Base Address: Set switch positions 5, 6, 7, and 8 (C1, C2, C4, and C8) as indicated below.



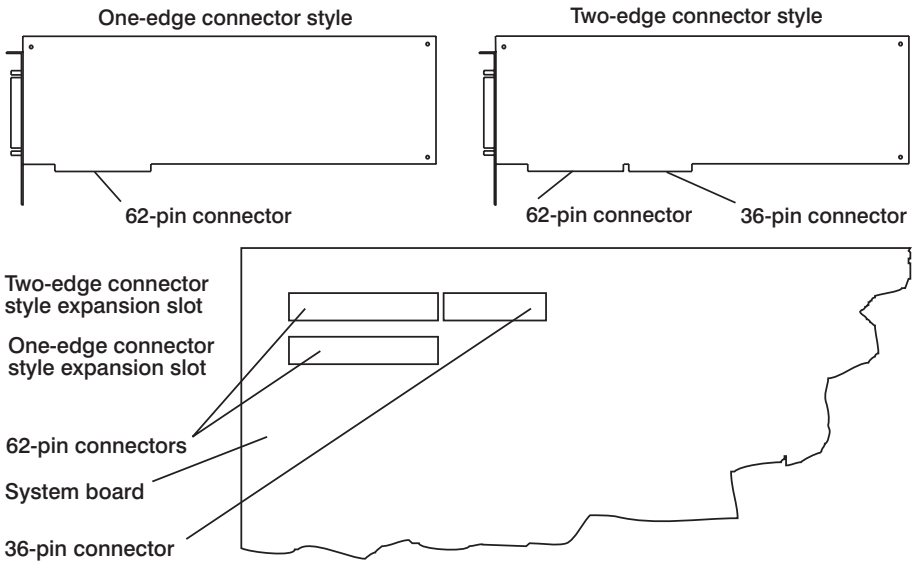
Switch Settings				Base Address (hex)	Physical Card Designation
C8	**C4**	**C2**	**C1**		
ON	ON	ON	ON	2A0	0
ON	ON	ON	OFF	6A0	1
ON	ON	OFF	ON	AA0	2
ON	ON	OFF	OFF	EA0	3
ON	OFF	ON	ON	12A0	4
ON	OFF	ON	OFF	16A0	5
ON	OFF	OFF	ON	1AA0	6
ON	OFF	OFF	OFF	1EA0	7
OFF	ON	ON	ON	22A0	8
OFF	ON	ON	OFF	26A0	9
OFF	ON	OFF	ON	2AA0	10
OFF	ON	OFF	OFF	2EA0	11
OFF	OFF	ON	ON	32A0	12
OFF	OFF	ON	OFF	36A0	13
OFF	OFF	OFF	ON	3AA0	14
OFF	OFF	OFF	OFF	3EA0	15

Setting the Edge Connector (ED): Switch position 9, the edge connector switch (ED, as shown in the following illustration), indicates whether a one-edge (62-pin) connector or a two-edge (62-pin and 36-pin) connector is in the expansion slot that holds your X.25 adapter.

Note: The edge connector switch should be set to ON for use with your system.



Switch Setting	Edge Connector
ED	
OFF	Co-Processor is in a one-edge connector expansion slot.
ON	Co-Processor is in a two-edge connector expansion slot.

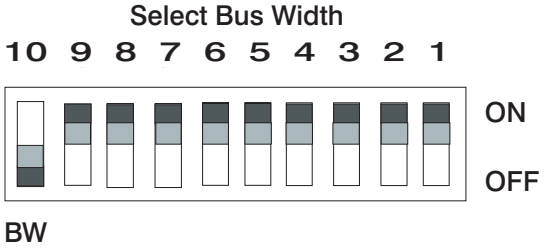


Setting the Bus Width (BW): Switch position 10 (BW, as shown in the following illustration) sets the bus width. If the expansion slot that holds your X.25 adapter has one edge connector, (a 62-pin connector) set BW for an 8-bit bus width. If the expansion slot has two edge connectors, a 62-pin and a 36-pin connector, BW can be set for an 8-bit or 16-bit bus width, depending on the application.

Notes:

a. For an explanation of edge connectors, see the note under "Setting the Edge Connector (ED)" on page 1-128.

b. The bus width switch should be set to OFF (16-bit bus) for use with your system.

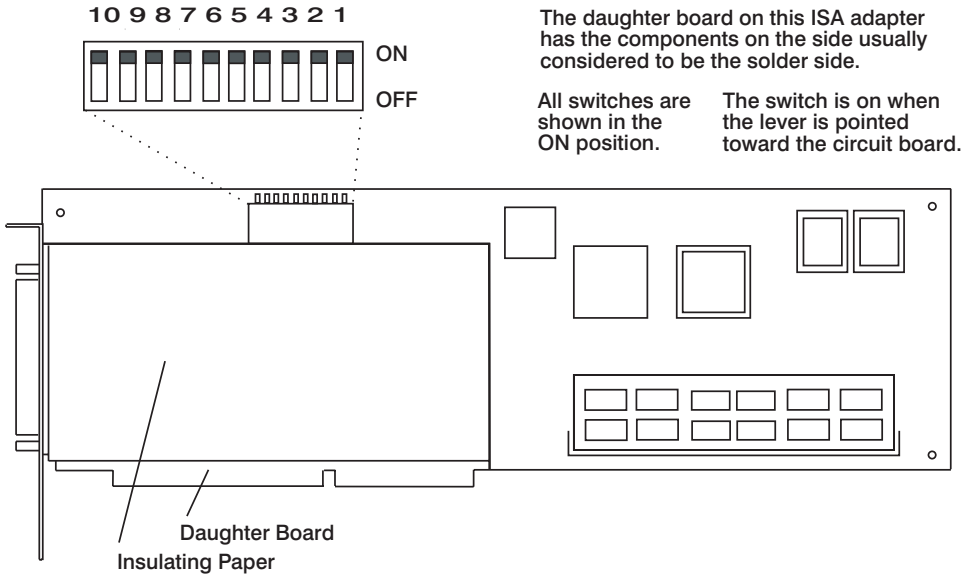


Switch Setting	Bus Width Connector
BW	
ON	8-bit bus
OFF	16-bit bus

FC(2701) Co-Processor Multiport Adapter, Model 2 ISA (Type *)

Note: * This adapter does not have an assigned Card Type.

The Co-Processor Multiport Adapter (is the same as the 4-Port Multi-Protocol Communications Controller) is a high-performance adapter designed to operate with any computer that supports the ISA bus interface.



Note: The 10-posttion switch on this adapter is labled "Open" and "Closed". This publication uses "on" and "off" to indicate the state of the switch. Open and Closed are defined as follows:

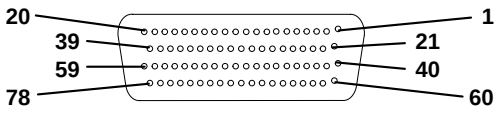
- Closed = on
- Open = off

Co-Processor Multiport Adapter Specifications

Item	Description
FRU number Base, 0MB	33F8967
FRU number Daughter *	84F7540
FRU number 1MB SIMM	53F2662
I/O bus architecture	ISA
Interrupt levels	3, 4, 7, 2 or 9, 10, 11, 12, 15
Maximum number	Up to four adapters in available ISA bus slots
Connector information	78-position, D-shell Connector
Wrap Plugs	78-position, part number 40F9902 X.21, part number 40F9904 V.35, part number 40F9900 EIA-232D, part number 40F9903 EIA-422A. part number 53F3886
Cables	Interface/Breakout Box, part number 53F2622/40F9897 X.21, part number 71F0164 V.35, part number 71F0162 EIA-232D, part number 71F0165 EIA-422A, Customer Supplied

Note: To install the new daughter card, the customer or customer representative must replace the Micro Channel bracket on the new daughter card with the ISA bracket from the daughter card that is being replaced.

Co-Processor Multiport Adapter, Model 2 78-Position Connector



Mnemonic	Signal Name (Type of Interface)	Port 0	Port 1	Port 2	Port 3
-TXD	Transmit Data (EIA232D)	40	04	66	69
-RXD	Receive Data (EIA232D)	02	64	28	31
+RTS	Request To Send (EIA232D, V.35)	01	63	27	30
+CTS	Clear To Send (EIA232D, V.35)	61	25	48	51
SG	Signal Ground	43	07	08	67
+DCD	Data Carrier Detect (EIA232D, V.35)	22	45	09	12
-RCLKIN	Receive Clock (EIA232D)	62	26	10	17
+DTR	Data Terminal Ready (EIA232D, V.35)	60	24	47	50
+DSR	Data Set Ready (EIA232D, V.35)	42	06	68	71
+HRS	Data Rate Selector (EIA232D)	21	44	11	
+RI	Ring Indicator (EIA232D)	03	65	29	32
-TCLKIN	Transmit Clock (EIA232D)	23	56	70	75
-DTECLK	DTE Clock (EIA232D)	15	34	54	73
+TxD (A)	+Transmit Data (V.35)	36	49		
-TxD (B)	-Transmit Data (V.35)	53	14		
+TDATA (A)	+Transmit Data (EIA422A- X.21)	37		13	
-TDATA (B)	-Transmit Data (EIA422A- X.21)	76		52	
+RxD (A)	+Receive Data (V.35, EIA422A- X.21)	19	78	33	
-RxD (B)	-Receive Data (V.35, EIA422A- X.21)	58	35	72	
+TCLK (A)	+Transmit Clock (V.35, EIA422A) +Indicate (Port 0, X.21)	18	39		
-TCLK (B)	-Transmit Clock (V.35, EIA422A) Indicate (Port 0, X.21)	57	16		
+RCLK (A)	+Receive Clock (V.35, EIA422A- X.21)	38	74		
-RCLK (B)	-ReceiveClock (V.35, EIA422A- X21)	77	55		
+C (A)	+Control (Port 0, X.21)	20			
-C (B)	-Control (Port 0, X.21)	59			
	Reserved (any port)	05			
	Reserved (any port)	46			
	Reserved (any port)	41			

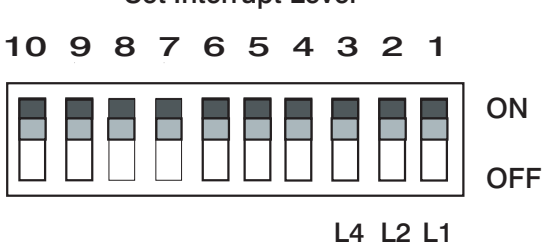
Co-Processor Multiport Adapter's 10-Position Option Switch

This section contains a description of setting the switches on the Co-Processor Multiport Adapter.

Setting the Interrupt Level: Switch positions 1, 2, and 3 (L1, L2, and L4, as shown in the illustration) configure the co-processor multiport adapter for any one of eight interrupt priority levels if the expansion slot that holds the adapter is a two-edge connector. If the expansion slot that holds the adapter is a one-edge connector, the valid interrupt levels are 3, 4, 7, and 2.

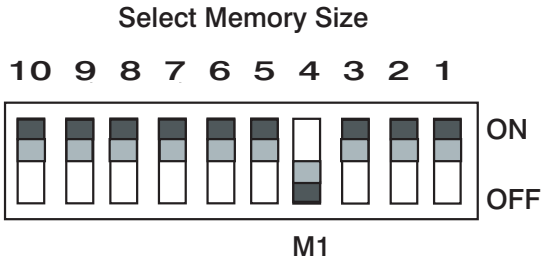
Note: For an explanation of edge connectors, see the note under "Setting the Edge Connector (ED)" on page 1-136.

The 4-Port Multi-Protocol Communications Controller, ISA Installation Guide has additional information that is useful when setting the interrupt level. It explains how to find out what interrupt levels are in use using the **lsresource** command.



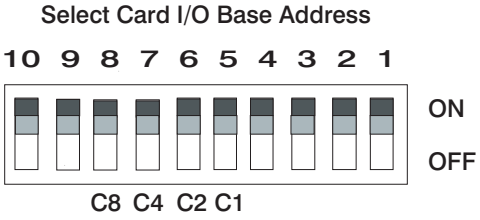
Switch Settings			Interrupt Level
L4	**L2**	**L1**	
ON	ON	ON	3
ON	ON	OFF	4
ON	OFF	ON	7
ON	OFF	OFF	2 or 9
OFF	ON	ON	10
OFF	ON	OFF	11
OFF	OFF	ON	12
OFF	OFF	OFF	15

Verifying the Memory-Size-Switch Position: Switch position 4 (M1, as shown in the following illustration) is factory set to indicate the size of the RAM installed on the Multiport adapter. Verify that switch position 4 is set to OFF to indicate that 1M byte of RAM installed on the co-processor multiport adapter.



Switch Setting	Memory Size
M1	
ON	Reserved
OFF	1M byte

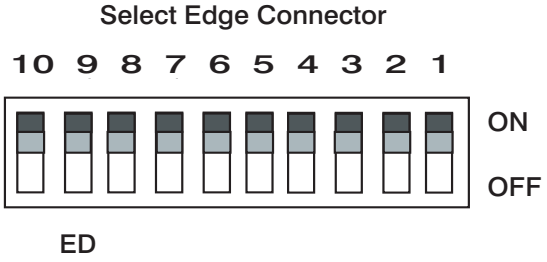
Setting the Card I/O Base Address: Set switch positions 5, 6, 7, and 8 (C1, C2, C4, and C8) as indicated below.



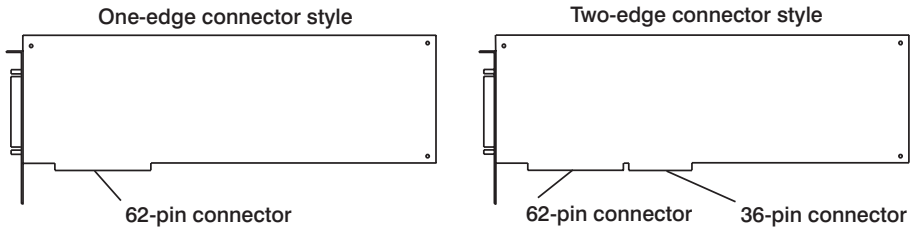
Switch Settings				Base Address (hex)	Physical Card Designation
C8	**C4**	**C2**	**C1**		
ON	ON	ON	ON	2A0	0
ON	ON	ON	OFF	6A0	1
ON	ON	OFF	ON	AA0	2
ON	ON	OFF	OFF	EA0	3
ON	OFF	ON	ON	12A0	4
ON	OFF	ON	OFF	16A0	5
ON	OFF	OFF	ON	1AA0	6
ON	OFF	OFF	OFF	1EA0	7
OFF	ON	ON	ON	22A0	8
OFF	ON	ON	OFF	26A0	9
OFF	ON	OFF	ON	2AA0	10
OFF	ON	OFF	OFF	2EA0	11
OFF	OFF	ON	ON	32A0	12
OFF	OFF	ON	OFF	36A0	13
OFF	OFF	OFF	ON	3AA0	14
OFF	OFF	OFF	OFF	3EA0	15

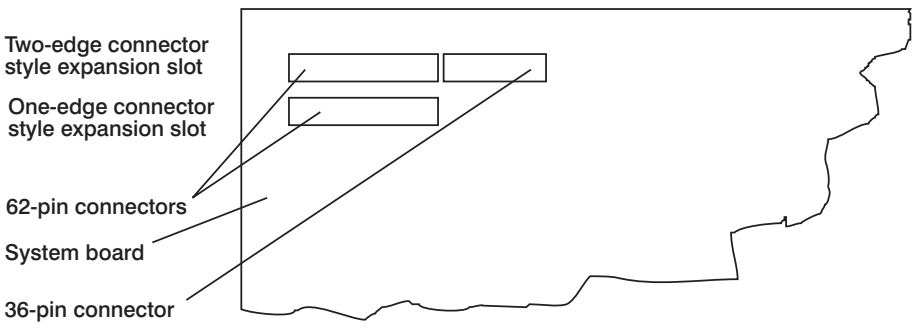
Setting the Edge Connector (ED): Switch position 9, the edge connector switch (ED, as shown in the following illustration), indicates whether a one-edge (62-pin) connector or a two-edge (62-pin and 36-pin) connector is in the expansion slot that holds your Multiport adapter Model 2.

Note: The edge connector switch should be set to ON for use with your system.



Switch Setting	Edge Connector
ED	
OFF	Co-Processor is in a one-edge connector expansion slot.
ON	Co-Processor is in a two-edge connector expansion slot.



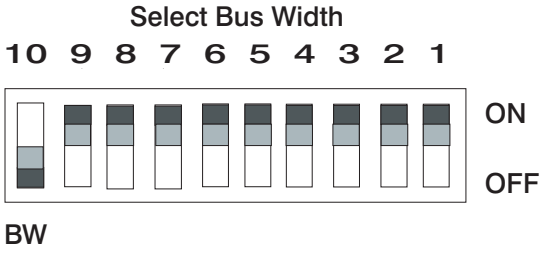


Setting the Bus Width (BW): Switch position 10 (BW, as shown in the following illustration) sets the bus width. If the expansion slot that holds your multiport adapter model 2 has one edge connector, (a single 62-pin connector) set BW for an 8-bit bus width. See illistration below. If the expansion slot has two edge connectors, (a 62-pin and a 36-pin connector) BW can be set for an 8-bit or 16-bit bus width, depending on the application.

Notes:

a. For an explanation of edge connectors, see the note under "Setting the Edge Connector (ED)" on page 1-136.

b. The bus width switch should be set to OFF (16-bit bus) for use with your system.

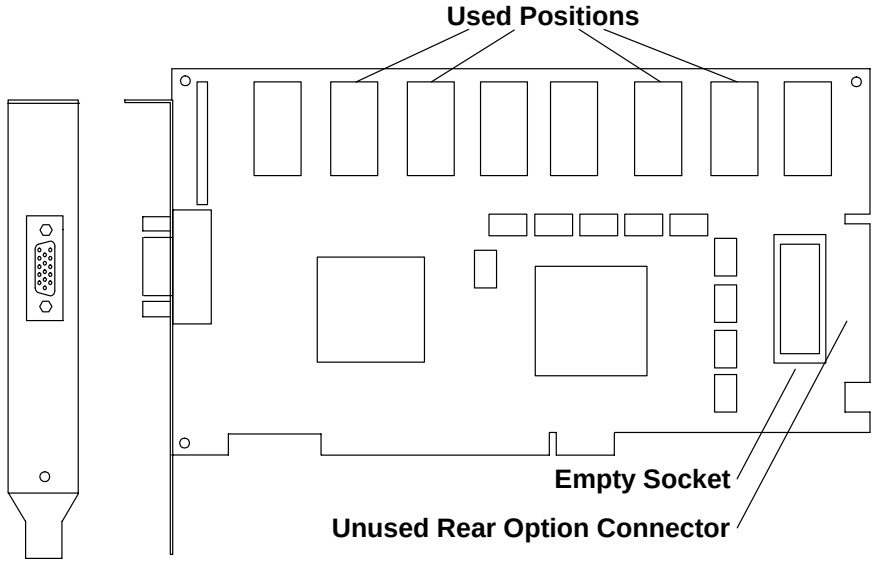


Switch Setting	Bus Width Connector
BW	
ON	8-bit bus
OFF	16-bit bus

FC(2657) S15 PCI Graphics Adapter (Type *)

Note: * This adapter does not have an assigned Card Type.

The S15 Graphics Adapter is a high-performance VRAM-based adapter. It is designed to operate with any computer that supports the Peripheral Component Interconnect (PCI) bus interface. It has an integrated video co-processor and graphical user interface (GUI) accelerator. It supports multisync monitors having at least 64 kHZ horizontal scan capability.

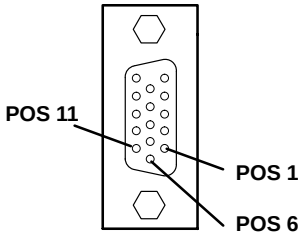


S15 PCI Graphics Adapter Specifications

Item	Description
FRU number	11H6095
Interrupt levels	Int A
I/O bus architecture	PCI
Maximum number	Two adapters may be installed in available PCI bus slots, however, due to a limitation in the system boot firmware, only one adapter on the PCI bus will be initialized at power on.

Item	Description
Resolutions	640 x 480 x 8bpp 640 x 480 x 16bpp 640 x 480 x 24bpp 800 x 600 x 8bpp 800 x 600 x 16bpp 800 x 600 x 24bpp 1024 x 768 x 8bpp 1024 x 768 x 16bpp 1280 x 1024 x 8bpp 1600 x 1280 x 8bpp
Colors	Up to 16M
Connector information	External 15-pin (HD-15) D-shell connector Internal Card Edge Connector (Not Used)
Cables	11H4003 7091-7S1 15-pin (HD-15) D-shell to 13W3 ID=1010 (not P series) 58F2901 4217 15-pin (HD-15) D-shell to 5 BNC, POWERdisplay 17, 20 96G2156 4238 DDC 15-pin (HD-15) D-shell to 13W3 with DDC, P70, P200 96G1712 4237 15-pin (HD-15) D-shell to13W3 DDC/ID switch, P201 only 15-pin (HD-15) D-shell attached to display, P50

S15 Graphics Adapter 15-Pin D-Shell (HD-15) Connector

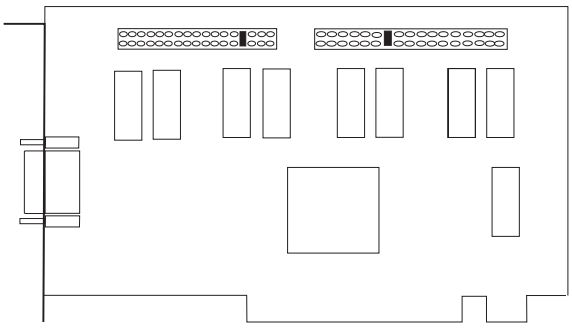


Position	Signal Name
1	Red
2	Green
3	Blue
4	Monitor ID Bit 2
5	Test (ground)
6	Red Video Return
7	Green Video Return
8	Blue Video Return
9	No Connection
10	SYNC Return
11	Monitor ID Bit 0
12	Monitor ID Bit 1
13	HSYNC
14	VSYNC
15	Monitor ID Bit 3

FC(2839) POWER GXT110P Video Accelerator Adapter PCI (Type *)

Note: * This adapter does not have an assigned Card Type.

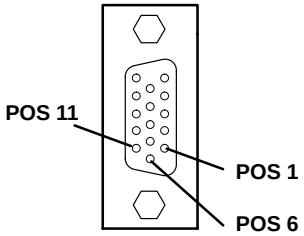
The POWER GXT110P Video Accelerator Adapter is a high-performance PCI graphics adapter. It is designed to operate in any computer that supports the Peripheral Component Interconnect (PCI) bus interface.



POWER GXT110P Video Accelerator Adapter Specifications

Item	Description
FRU number	40H5838
Bus architecture	PCI
Bus width	32-bit
Interrupt level	Int A
Maximum number	2
Number of colors supported	8-bit
Screen resolutions	640x480 at 60 - 85 Hz vertical refresh 800x600 at 56 - 85 Hz vertical refresh 1024x768 at 60 - 85 Hz vertical refresh 1280x1024 at 60 - 75 Hz vertical refresh
Display Power Management	supports Video Electronics Standards Association (VESA) Display Power Management Signalling (DPMS)
Connector	15 pin D-shell connector

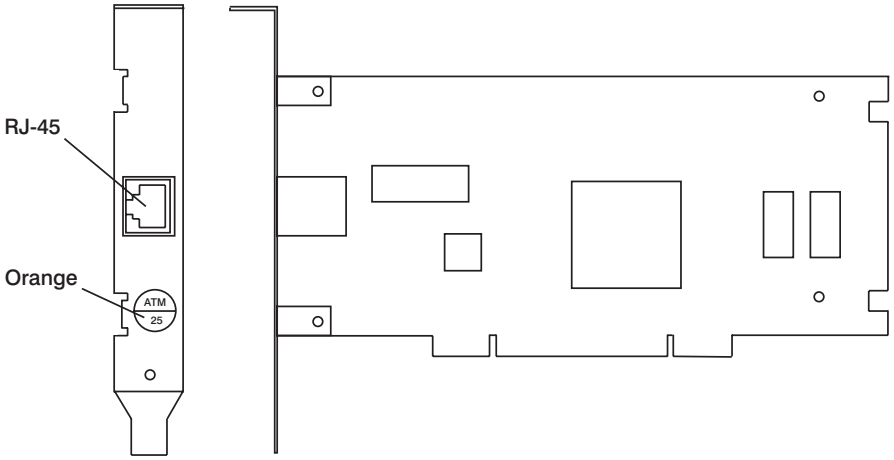
POWER GXT110P Video Accelerator Adapter 15-Pin D-Shell (HD-15) Connector



Position	Signal Name
1	Red
2	Blue
3	Green
4	Reserved
5	DDC Return (ground)
6	Red Video Return
7	Green Video Return
8	Blue Video Return
9	+ 5V supply
10	SYNC Return
11	Reserved
12	Bi-directional Data
13	HSYNC
14	VSYNC
15	Data Clock

FC(2998) TURBOWAYS 25 ATM PCI Adapter (Type *)

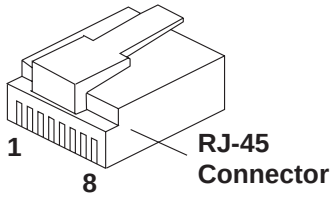
The TURBOWAYS 25 ATM PCI Adapter provides direct access to ATM networks. The TURBOWAYS 25 ATM PCI adapter provides dedicated 25 Mbit/second full duplex connection using PVCs or SVCs and enables TCP/IP to run over an ATM network. The adapter also supports communication with devices located on an ATM network or bridged to a Token Ring, Ethernet, or other LAN.



TURBOWAYS 25 ATM PCI Adapter Specifications

Item	Description
FRU number	93H5513
I/O bus architecture	PCI
Bit rate	25.6 Mbits per second
Busmaster	Yes
Wrap plug	Supplied with adapter
Connector information	RJ-45
Cables	The cable can be Unshielded Twisted Pair (UTP) or Shielded Twisted Pair (STP), up to 100 meters long.

TURBOWAYS 25 ATM PCI Adapter Connector



Position	Signal Name
1	Transmit A
2	Transmit B
3	No Connection
4	No Connection
5	No Connection
6	No Connection
7	Receive A
8	Receive B

Chapter 2. Device Information

This chapter provides service information on setting SCSI addresses and other service information for the devices.

CD-ROM Drives

The CD-ROM drive is a read-only device which reads compact optical discs. The compact disc (CD) is removable. There are four versions of CD-ROM drives. There is a quad-speed version, an 8X speed version, a 12 to 20X speed version, and a 14 to 32X speed version.

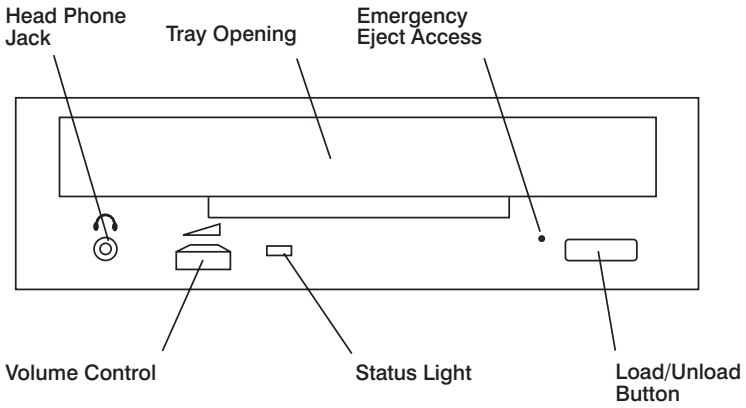
All four drives utilize tray loading mechanisms, and can be operated either horizontally or vertically.

The quad speed and 8X speed drives look the same on the outside. However, the tray in the quad-speed CD-ROM is white while the tray in the 8X speed CD-ROM is black. There status light blinks amber, is located left of center on the bezel, and have a 50-pin SCSI connector.

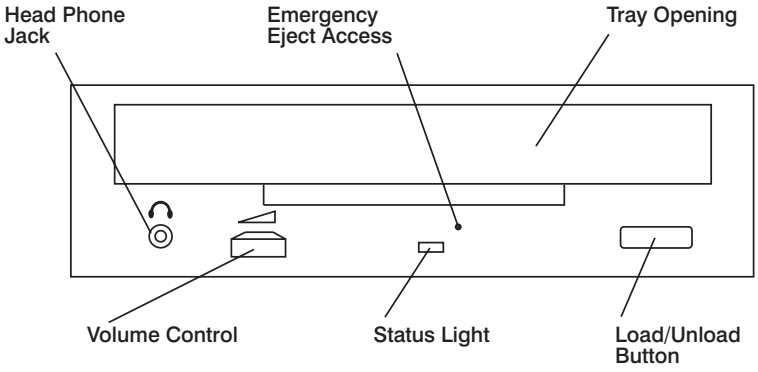
The 12 to 20X, and the 14 to 32X speed drives look similar to the other drives on the outside. The main distinguishing differences are that the status light blinks green on the 12 to 20X and 14 to 32X speed drives, is centered left to right on the bezel, and has a 68-pin SCSI connector which plugs directly onto the SCSI bus cable.

The CD-ROM drive connects to the internal SCSI bus cable coming from the standard SCSI I/O controller.

Quad Speed and 8X Speed Drives



12 to 20X, and 14 to 32X Speed Drives

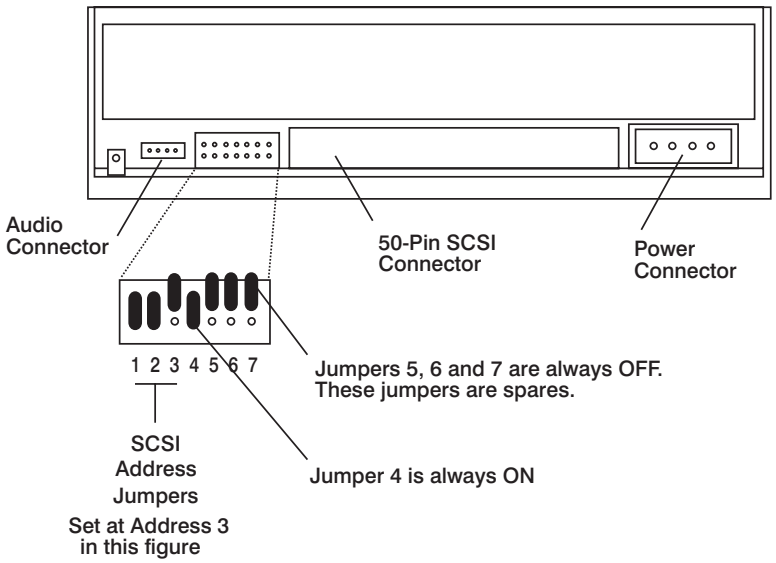


Setting SCSI Addresses

The steps for setting the SCSI address on all four CD-ROM drives are the same.

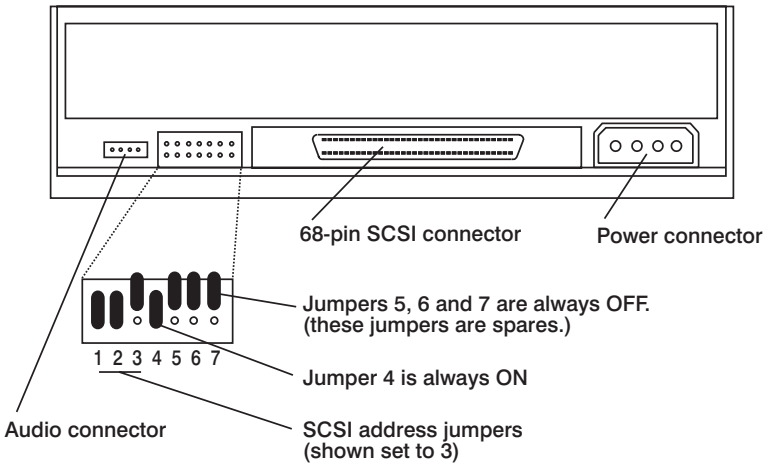
The SCSI address is set with jumpers located on the rear of the drive.

Jumper Settings on Quad and 8X Speed Drives: Use the following table and diagram to locate and set the SCSI address jumpers.



Address	Jumper 1	Jumper 2	Jumper 3
0	Off	Off	Off
1	On	Off	Off
2	Off	On	Off
3	On	On	Off
4	Off	Off	On
5	On	Off	On
6	Off	On	On

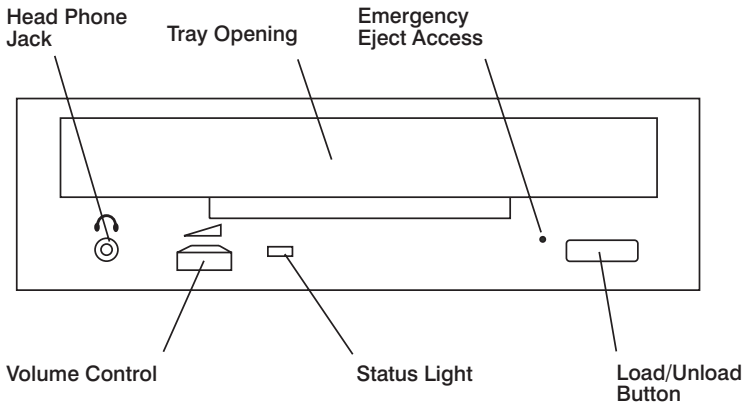
Jumper Settings on 12 to 20X, and 14 to 32X Speed Drives: Use the following table and diagram to locate and set the SCSI address jumpers.



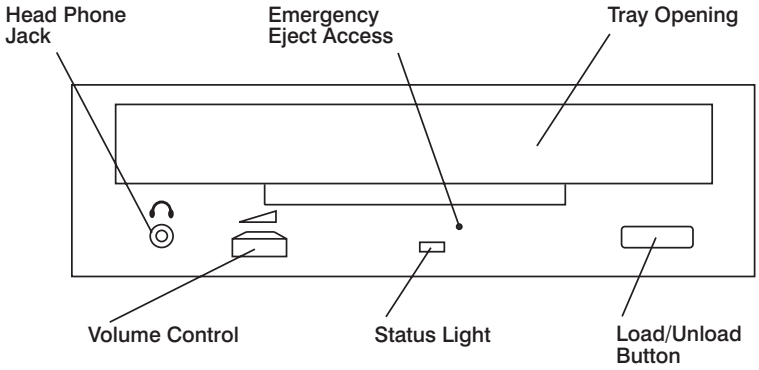
Address	Jumper 1	Jumper 2	Jumper 3
0	Off	Off	Off
1	On	Off	Off
2	Off	On	Off
3	On	On	Off
4	Off	Off	On
5	On	Off	On
6	Off	On	On

Manually Removing the Disc

Quad Speed and 8X Speed Drives



12 to 20X, and 14 to 32X Speed Drives



Note: Use the following manual procedure only after other methods have not worked successfully.

The steps for manually removing a CD from all four CD-ROM drives is the same.

The normal way to remove a disc is to press and hold the load/unload button for about 2 seconds.

When a power or drive failure prevents the disc from unloading normally, use the following procedure to remove the CD.

Note: Execute the following procedure only in an emergency (ie. tray does not eject after pressing the load/unload button).

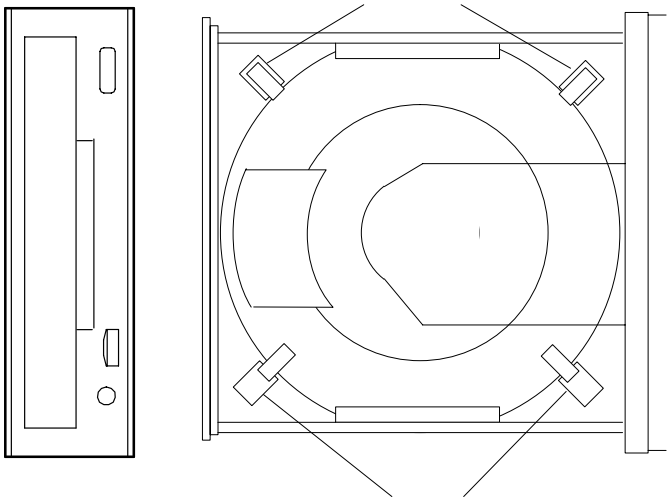
1. Power-off the system unit.
2. Insert a small diameter rod, such as a straightened paper clip into the emergency eject hole. (Refer to the illustrations above for the location of the emergency eject hole.)
3. Push the tool in until some resistance is felt.
4. Maintain a small amount of pressure on the rod while pulling on the tray with your finger nail.
5. Pull the tray open and lift out the disc.

Note: Normally the tray makes a ratcheting sound when pulling it open using the above procedure. This does not damage the drive.

Vertical Orientation

All four drives use a tray. They have tabs on both sides of the tray. Therefore, they can be oriented either way vertically. The two tabs at the bottom of the tray must be extended to hold the disc in place when operating vertically.

Top tabs retracted



Bottom tabs extended to hold CD

Note: All four tabs should be retracted when the drive is used horizontally.

4.0GB 4-mm Tape Drives

There are two types of 4.0GB 4-mm tape drives. They are designated as type A and B. The two drives can be identified by looking at the rear of the drives or at the ventilation holes on the drive chassis. The type A drives have the 50 position SCSI connector at the top of the drive at about the center and has elongated ventilation holes in the chassis. The type B drives have the SCSI 50 position SCSI connector and the power connector across the bottom of the drive and has circular ventilation holes in the chassis.

Setting the SCSI Address for Internal Installations

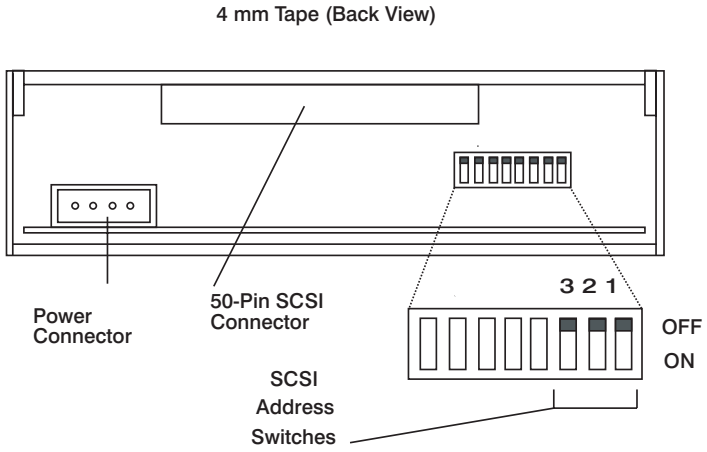
Attention: The SCSI address must be set while both the system unit and the tape drive are turned off. Attaching the tape drive to an active system unit may damage the drive and/or the system unit.

Note: Prior to installing the SCSI media device into the media bay, the address of the device must be set to any of the available SCSI addresses.

Do not change any of the other switches or jumpers that were set at the factory.

For Type A Drives

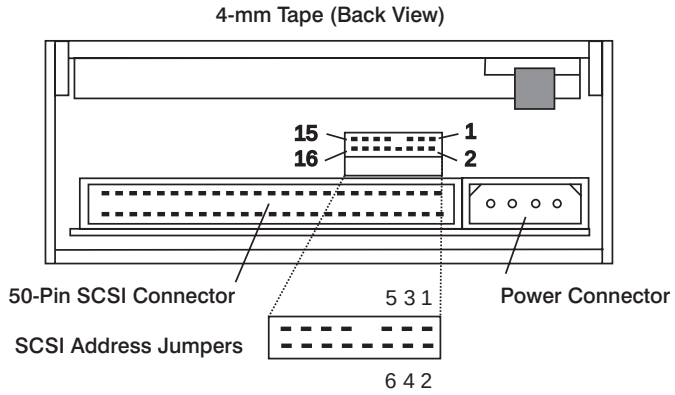
Set the SCSI address by using switches 1 through 3 as shown. The dip switch is located on the rear panel or the drive.



Address	Switch 3	Switch 2	Switch 1
0	Off	Off	Off
1	Off	Off	On
2	Off	On	Off
3	Off	On	On
4	On	Off	Off
5	On	Off	On
6	On	On	Off

For Type B Drives

Set the SCSI address by using jumpers 1 through 3 as shown. The address pins are the rightmost pins of the jumper block. The jumper block is located on the rear panel of the drive.



Address	Jumper 5-6	Jumper 3-4	Jumper 1-2
0	Off	Off	Off
1	Off	Off	On
2	Off	On	Off
3	Off	On	On
4	On	Off	Off
5	On	Off	On
6	On	On	Off

Manually Removing the Tape Cartridge from a 4-mm Tape Drive

This procedure describes how to manually remove a stuck data cartridge from a 4.0GB 4-mm Tape Drive.

Attention: This procedure is very delicate and could result in damage to your tape cartridge, 4-mm Tape Drive, or both. Please use this procedure only when you have exhausted the other options for removing the tape cartridge. These include:

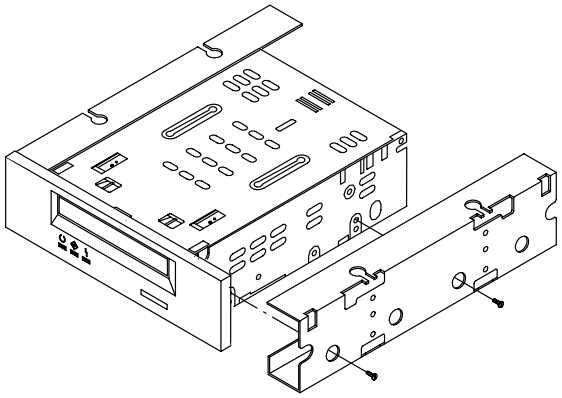
1. Power the 4-mm Tape Drive off and on again to attempt to clear any potential hang conditions.
2. Issue the Unload SCSI command from the system command menu, if available, or press the Unload button on the tape drive.

Removing a Loaded Tape Cartridge: Perform the following steps to remove the tape drive from the system unit:

1. Disconnect the power to the system unit.
2. Disconnect the tape drive from the system unit.
   - Disconnect the SCSI connections to the host system.
   - Disconnect the power connections to the tape drive.
3. Remove the tape drive and any attached mounting hardware from the system unit.

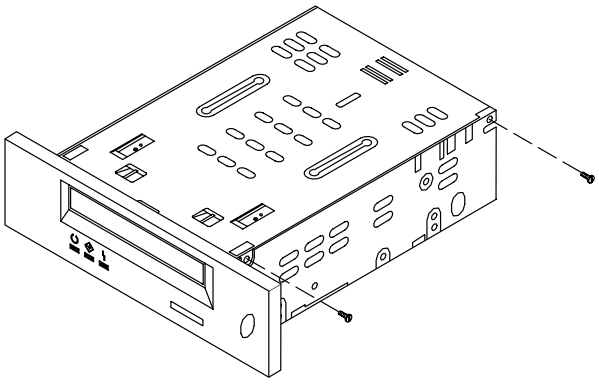
Type A Drives

1. Remove the mounting brackets by removing the four screws near the lower edge of the tape drive assembly (two on each side) that are accessed through holes in the side of each bracket.



A4AA0216

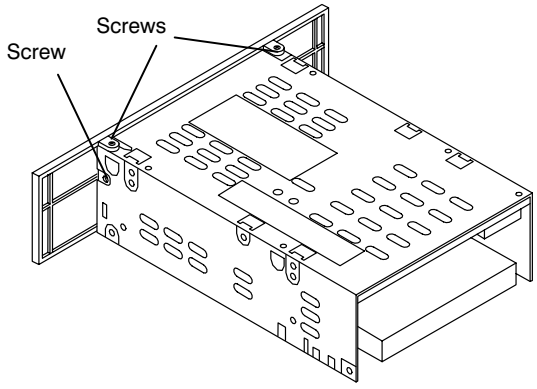
2. Remove the top cover by removing the four screws near the top edge of the tape drive (two on each side) and lifting at the back of the cover.



A4AA0217

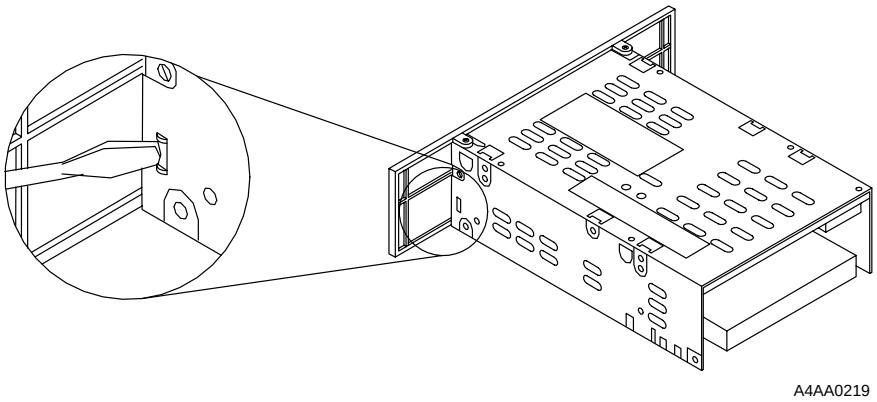
3. Remove the front bezel by doing the following:

   a. Turn the tape drive upside down and remove the two screws that secure the front bezel on the bottom and one screw on the left side of the bezel.

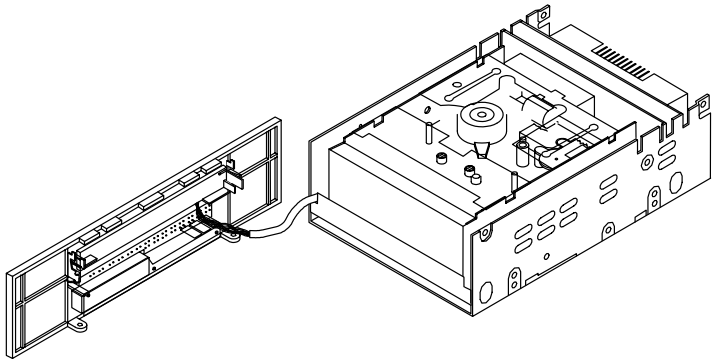


b. Place the drive assembly on its right side. Facing the drive assembly, use a small screwdriver to gently press on the bezel tab (through the rectangular hole in the drive assembly). Continue to press on the bezel tab until the latch on the bezel tab clears the hole and the bezel can be pulled away from the drive assembly.

   Note: The bezel cannot be completely removed because of the Light Emitting Diode (LED) printed circuit board assembly.



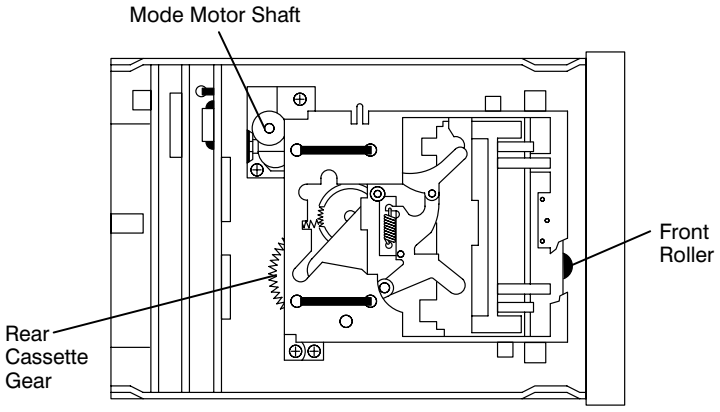
c. Move the bezel aside to provide access to the front of the drive assembly.



A4AA0220

4. Turn the mode motor shaft counterclockwise until the mode motor stops.

   Note: It may require many turns before the mode motor stops.



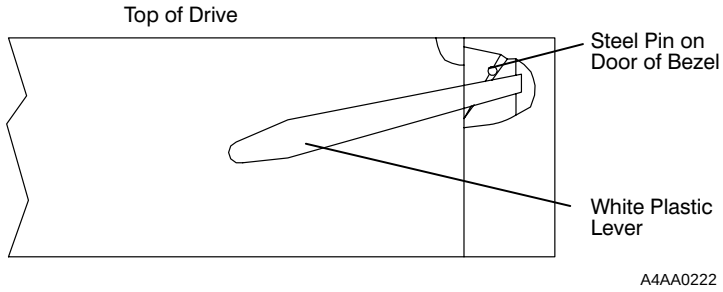
A4AA0221

5. Push the front roller in and turn it clockwise until the tape is wound on the supply reel, and the roller stops.

   Note: It may require many turns before the front roller stops.

6. Use a small screwdriver to rotate the rear cartridge gear counterclockwise until the cartridge ejects.

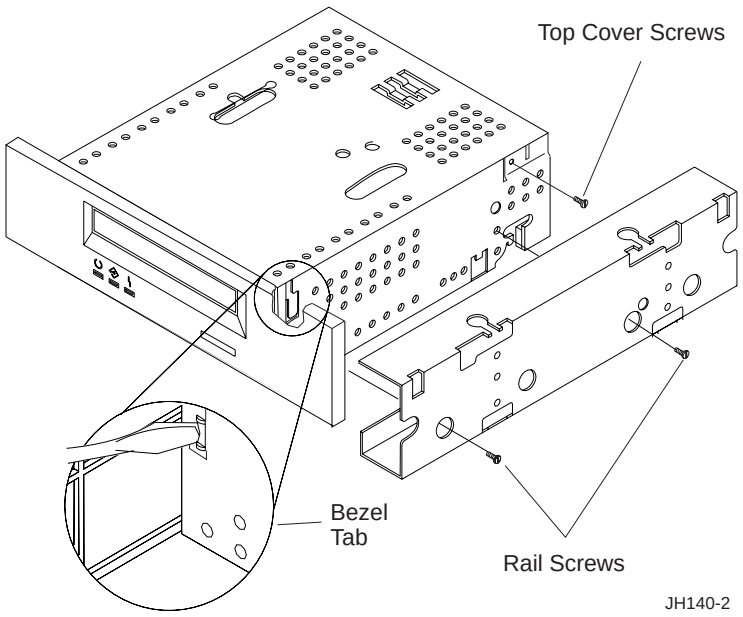
7. Reassemble the tape drive and reconnect it to the system unit.



Attention: When attaching the bezel, the cassette door should be raised to make sure that the steel pin on the left side of the door (with the drive assembly facing you) is above the white plastic lever on the left side of the drive assembly.

Type B Drives:

1. Remove the drive assembly from the your system. Use the documentation that came with your system.
2. Remove the mounting rails by removing the four screws near the lower edge of the drive assembly (two on each side) that are accessed through holes in the side of each rail.



3. Remove the front bezel (the bezel snaps on).
   a. Depress the bezel tabs (one on each side).
   b. Pull the bezel down from the top.
   c. Lift the bezel off of the bottom locating tabs.
   d. Remove the bezel from the unit.

4. Remove the top cover (two screws).

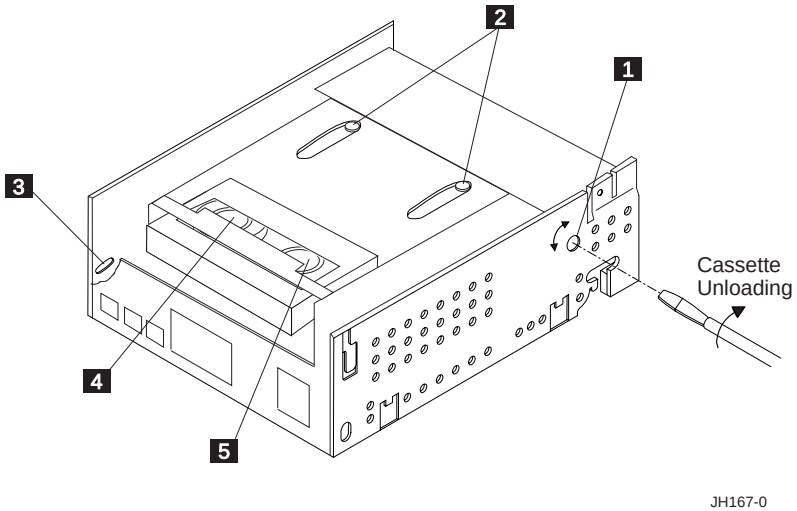
   a. Remove the two screws securing the cover to the drive (one on each side towards rear of drive).
   b. Lift up on the rear of the top cover.
   c. Remove the top cover from the drive.

   Attention: The mode motor gear can be damaged if cycled in the wrong direction.

   The following steps attempt to remove the tape from the drive without damaging the tape.

   a. Manually cycle the drive through an unload cycle until the tape is free of the drive mechanism.
   b. Then, manually rotate the spindle to ensure the tape is pulled back inside the tape cartridge so that the tape is not be damaged when the cartridge door closes.
   c. Complete the unload cycle until the tape ejects and can be removed from the drive.

5. The 0.25" diameter access hole **1** allows access to the mode gear. You can find it on the right side of the drive chassis near the back of the unit.



Right Side View of the Drive Chassis

6. With a small flat blade screwdriver, turn the mode motor gear inside the access hole, clockwise until the two pins **2** in the elongated slots begin to move toward the front of the drive (this can take up to 100 rotations of the screw driver).

7. Insert a small diameter allen wrench (or a similar tool) into slot **3**. Use it to rotate the left spindle **4** in a counter-clockwise direction by ratcheting the drive gear on the bottom of the spindle. This pulls the excess tape back into the tape cartridge.
8. Continue turning the left spindle until the right spindle **5** begins to move, indicating the tape is inside the cartridge.
9. Return to the 0.25" diameter access hole **1** and continue cycling the drive (in a clockwise direction) through the unload cycle until the tape cartridge ejects from the drive. This may take another 100 turns of the screwdriver.
10. Assemble the drive in reverse order.

12.0GB 4-mm Tape Drive

This section is used to set SCSI addresses and to give instructions for manually removing a stuck tape.

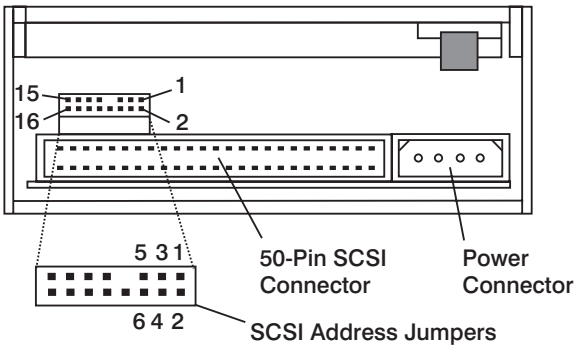
Setting the SCSI Address

Note: Prior to installing the SCSI media device into the media bay, the address of the device must be set to any of the available SCSI addresses.

Do not change any of the other switches or jumpers that were set at the factory.

The SCSI address is set using address pins located on the rear panel of the drive.

12.0GB 4-mm Tape (Back View)



Address	Jumper 5-6	Jumper 3-4	Jumper 1-2
0	Off	Off	Off
1	Off	Off	On
2	Off	On	Off
3	Off	On	On
4	On	Off	Off
5	On	Off	On
6	On	On	Off

Note: The 12.0GB 4-mm tape drive is shipped with the three jumpers installed and set to address zero.

Manually Removing the Tape Cartridge From the 12.0GB 4-mm Tape Drive

Use the following procedure to manually remove the data cartridge.

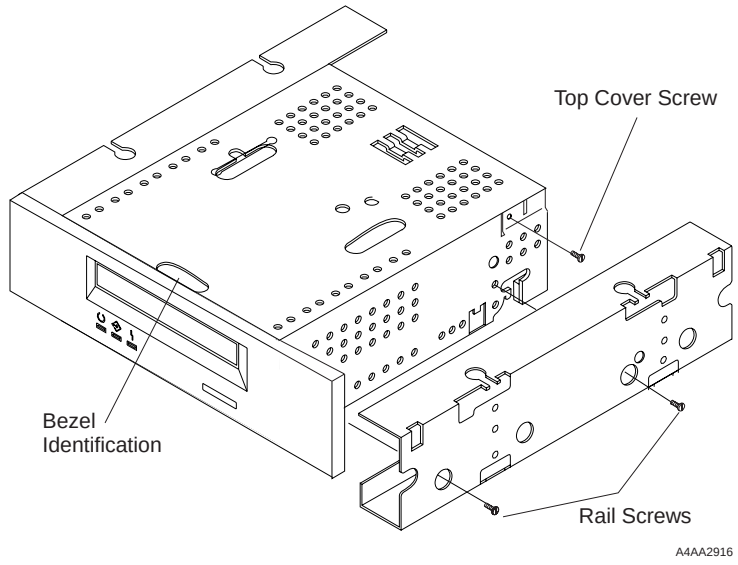
If a power outage occurs while a tape cartridge is loaded or the automatic unload procedure fails, you may want to manually unload a cartridge from the drive. The following steps outline the manual tape cartridge unloading and removal procedure.

During this process you will need to remove the top cover and front bezel, access and turn the mode motor shaft, and access and rotate the drive reel motor sprockets in order to safely disengage the tape and remove tape cartridge from the drive.

Once the front bezel has been removed, you can access the tape drive reel motor sprockets from the front of the drive. Just below the cartridge opening and above the flex cable there is a opening for access to the supply and take-up reel sprockets. Manually rotating either one of these sprockets will move the tape as long as the cartridge reels are still minimally engaged.

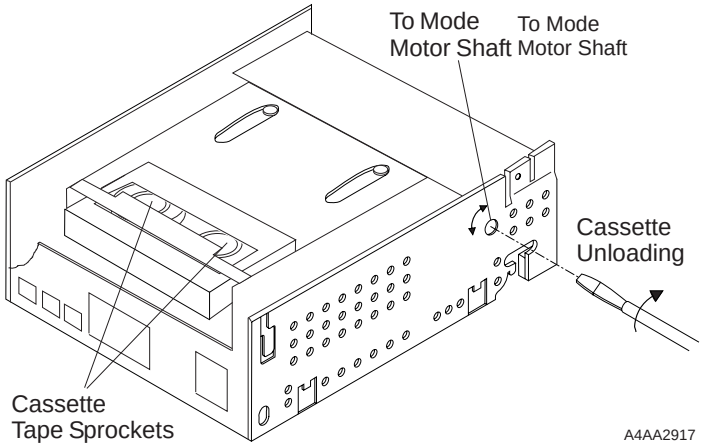
Procedure:

1. For the external model:
   - Remove the drive from your system using the documentation that came with your external drive.
   - Remove the tape drive from the external covers. Turn the unit upside down and remove the four screws (two screws on each side) that attach the external cover to the drive unit. Remove the exterior cover and retain the screws.
2. For the internal model:
   - Remove the drive assembly from the computer using the documentation that came with your system.



- For internal models with rails, remove the mounting rails by removing the four screws near the lower edge of the unit (two on each side) that are accessed through holes in the side of each rail.
- Remove the front bezel by pulling out on the top of the bezel at the indentation.

3. Remove the top cover of the drive unit by removing the two screws at the top edge near the rear of the unit (one on each side). Save the screws in a safe place.



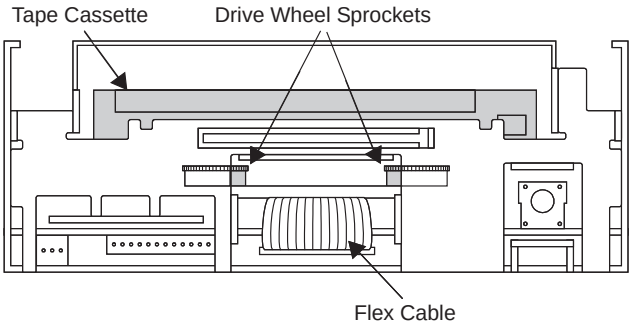
The following steps attempt to remove the tape from the drive without damaging the tape. In the following steps it can take more than 100 turns (revolutions) of the screwdriver before the tape cartridge can be removed.

Attention: The mode motor gear can be damaged if cycled in the wrong direction. **DO NOT** turn the mode motor shaft countercolckwise.

4. Insert a small (precision) screw driver in the hole on the right side of the drive near the rear and begin turning the mode motor shaft clockwise.

   As you turn the shaft clockwise, you can see the tape drive's guidance rollers slowly retract. Once completely retracted it is necessary to access the tape drive reel sprockets to rewind all of the exposed tape into the tape cartridge so that the tape is not damaged when the cartridge door closes. See illustration on page 2-21.

   Note: Be sure to rewind all of the loose tape back into the cartridge before completing cartridge removal since tape damage can occur.



   Once the tape drive guidance rollers have fully retracted turn the drive so that you are facing the front. With a small **non-magnetic** probe access one of the drive reel sprockets and manually rotate the drive reels until all of the tape has been wound inside of the cartridge.

5. Once all the tape has been wound back into the cartridge, continue turning the mode motor shaft clockwise until the cartridge rises and protrudes from the slot and "clicks" free. Remove the cartridge.
6. Replace the top cover on the drive and secure it with the two screws that you removed.
7. For the external model:
   - Reassemble the drive unit into the exterior cover using the screws that you removed.
   - Reconnect the drive to your system using the documentation that came with your external drive.

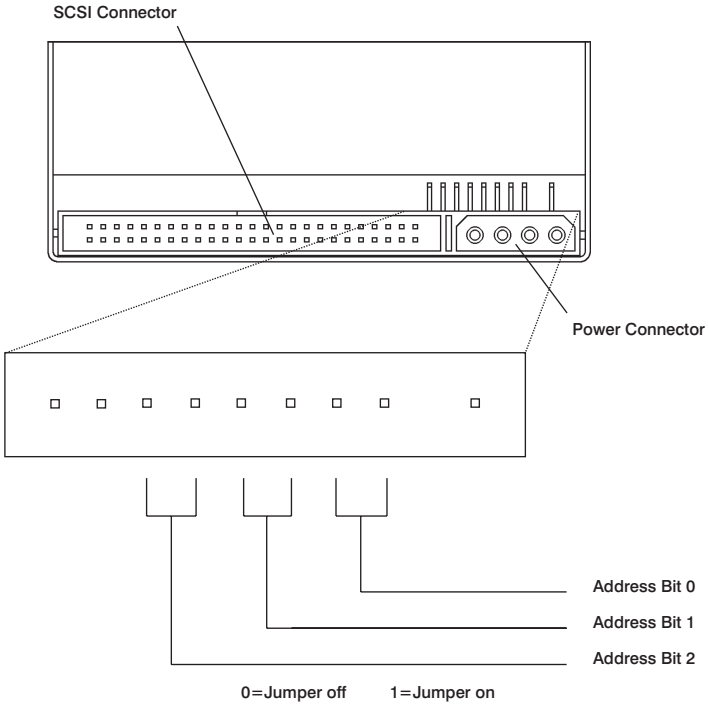
8. For the internal model:
    - Replace the front bezel by angling the two plastic feet at the botton of the bezel into the two allgning holes on the bottom of the unit. Then snap the top of the bezel into place.
    - For the internal model with rails, reattach the rails using the screws that you removed.
    - Reinstall and connect the drive unit in your system using the documentation that came with your external drive.

24/48GB DDS-2 4-mm Tape Autoloader

The 4-mm tape autoloader is a 5.25 inch full high device. It consists of a 4-mm tape drive with an autoloading mechanism. The autoloading mechanism accepts a magazine that holds six 4-mm tapes.

Setting the SCSI ID

The SCSI ID is set by using jumpers on the pins near the SCSI connector at the rear of the drive.



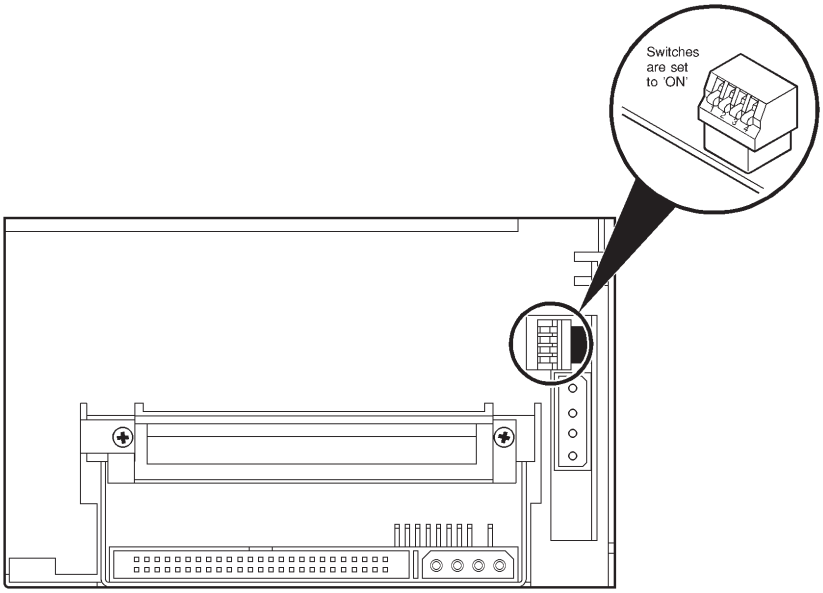
There are two pins for each bit. When a jumper is on (shorting two pins together) that represents a one in the SCSI ID table below. The three bits in the ID give a range of 0 through 7 as follows:

SCSI ID	Bit 2	Bit 1	Bit 0
0	0	0	0
1	0	0	1
2	0	1	0
3	0	1	1
4	1	0	0
5	1	0	1
6	1	1	0
7	1	1	1

The 4-mm tape autoloader software reads the SCSI ID at power-up time and during self-test. The 4-mm tape autoloader is shipped with the SCSI ID set to 0.

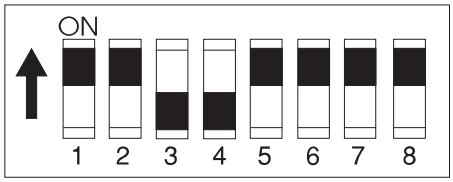
Option Switches

The option switches are located on the back of the 24/48GB DDS-2 4-mm tape Autoloader. These switches must be in the *on* position. The 4-mm tape autoloader software reads the option switches at power-up time and during self-test.



Configuration Switches

The configuration switches are located on the bottom of the 4-mm tape Autoloader. Switches 3 and 4 must be *off*, and all the other switches must be *on*. The 4-mm tape autoloader software reads the configuration switches at power-up time and during self-test.



5.0GB 8-mm Tape Drive

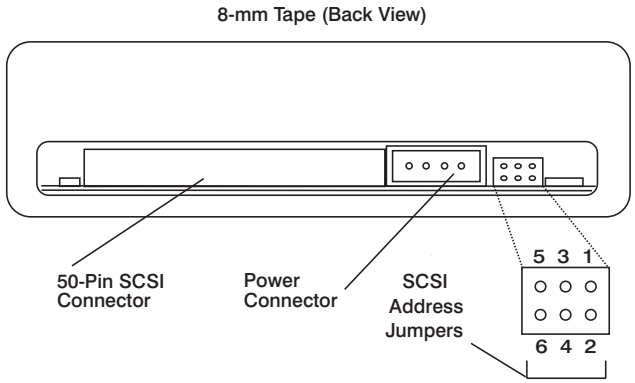
This section is used to set SCSI addresses and to give instructions for manually removing a stuck tape.

Setting the SCSI Address

Note: Prior to installing the SCSI media device into the media bay, the address of the device must be set to any of the available SCSI addresses.

Do not change any of the other switches or jumpers that were set at the factory.

The SCSI address is set using address pins located on the rear panel of the drive.



Address	Jumper 5-6	Jumper 3-4	Jumper 1-2
0	Off	Off	Off
1	Off	Off	On
2	Off	On	Off
3	Off	On	On
4	On	Off	Off
5	On	Off	On
6	On	On	Off

Note: The 8-mm Tape Drive is shipped with three jumpers installed.

Manually Removing the Tape Cartridge From an 8-mm Tape Drive

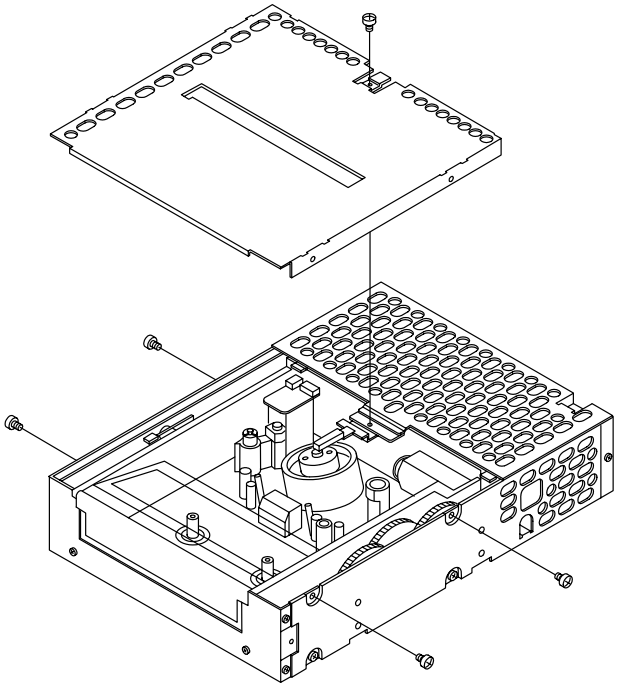
Use the following procedure to manually remove the data cartridge for a non-functioning 8-mm tape drive:

Attention: This procedure is very delicate. You may damage the tape drive and/or destroy the tape. Use this procedure only as a last option after you have attempted to clear any potential hang condition by powering the tape drive on and off.

Manually Removing a Loaded Tape Cartridge: Use the following removal procedure when a tape cartridge has been loaded into the tape path:

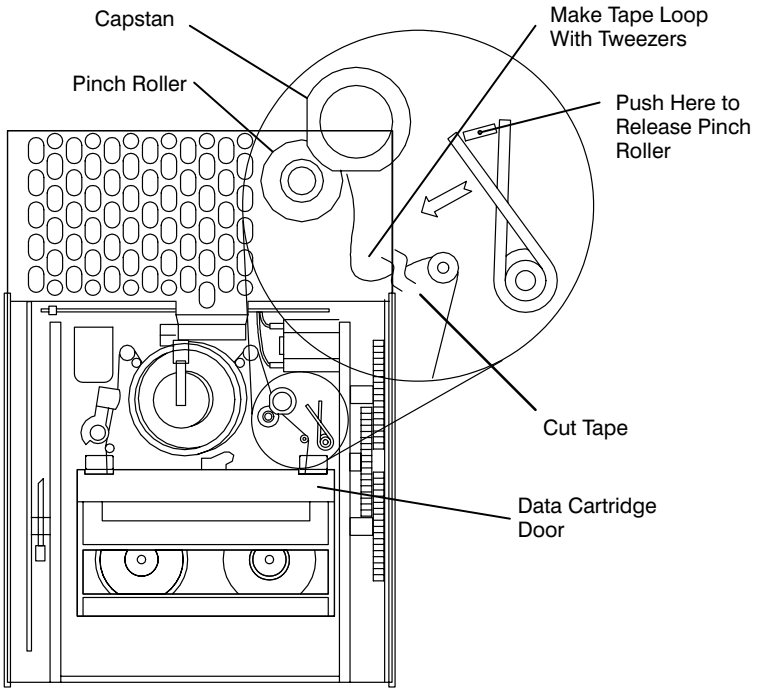
Attention: This procedure destroys the tape.

1. Remove the five screws from the top cover of the tape drive.



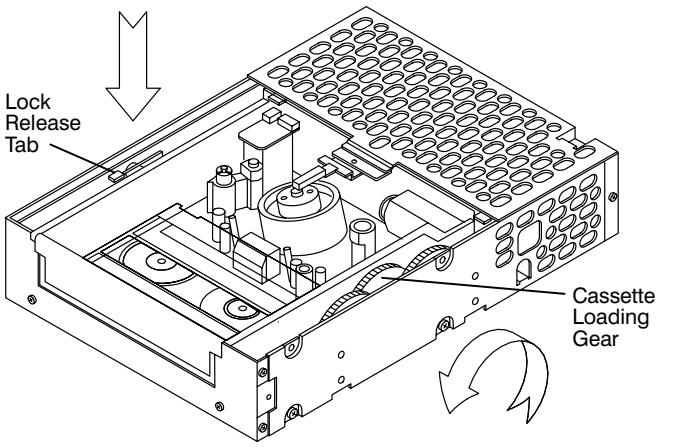
A4AA0223

2. Using tweezers, loosen the tape as shown in the illustration on the follow page. If the pinch roller is engaged, push the indicated spring to release the pinch roller and loosen the tape.



3. Make a loop in the tape with the tweezers, and cut the tape where shown above.
4. Using your index finger, gently press down the lock release tab until it clicks.

5. With the thumb of your other hand, roll the cassette loading gear toward the data cartridge. The cartridge should eject.



Manually Removing an Unloaded Tape Cartridge

- Perform Steps 1, 4, and 5 of the loaded tape cartridge removal procedure.

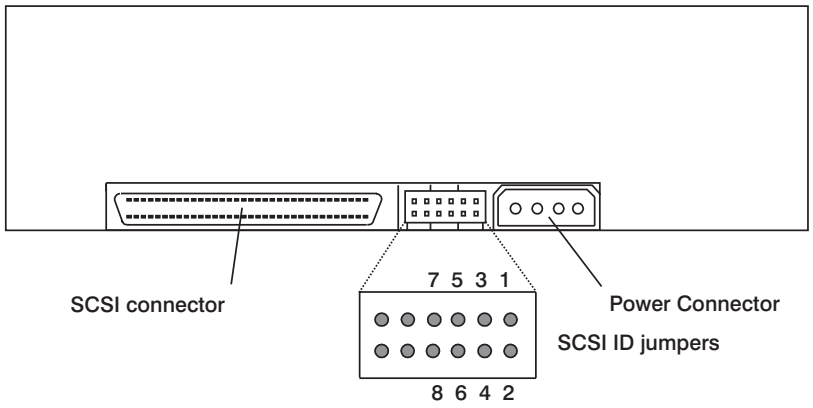
20.0GB 8-mm Tape Drive

This section is used to set SCSI addresses and to give instructions for manually removing a stuck tape.

Setting the SCSI Address

Note: Prior to installing the SCSI media device into the media bay, the address of the device must be set to any of the available SCSI addresses.

The SCSI address (ID) is set by placing jumpers on the address pins located on the rear panel of the drive. See table of Valid Addresses (SCSI IDs) on page 2-31.



Valid Addresses (SCSI IDs)

Address	Jumper 7-8	Jumper 5-6	Jumper 3-4	Jumper 1-2
0	Off	Off	Off	Off
1	Off	Off	Off	On
2	Off	Off	On	Off
3	Off	Off	On	On
4	Off	On	Off	Off
5	Off	On	Off	On
6	Off	On	On	Off
7*	Off	On	On	On
8	On	Off	Off	Off
9	On	Off	Off	On
10	On	Off	On	Off
11	On	Off	On	On
12	On	On	Off	Off
13	On	On	Off	On
14	On	On	On	Off
15	On	On	On	On

Note:

1. Address 7 is reserved for the adapter.
2. The 20GB 8-mm tape drive is shipped with three jumpers installed.

Manually Removing the Tape Cartridge From an 20GB 8-mm Tape Drive

Use the following procedure to manually remove the data cartridge from a non-functioning 20GB 8-mm tape drive:

Attention: This procedure is very delicate, and could result in damage to the tape, the tape drive or both. Use this procedure only as a last option after you have attempted to clear the hang condition by powering the tape drive on and off.

Use the service information for your system to remove the tape drive. Then move the tape drive to a suitable work area.

1. Remove the three T6™ screws that hold the top cover of the tape drive. Remove the top cover. This will allow you to observe the tape unload progress.
2. Alternate moving the drive's trolleys to ward the unloaded position and moving the supply reel motor to take up slack in the media. Do not touch the media itself. As the drive faces you, the trolleys are moved by inserting a 2.5mm Allen driver in the hole marked UNLOAD at the left rear and turning in the marked direction (clockwise). The supply reel motor is moved by inserting a non-metallic probe into the hole marked UNLOAD on the drives bottom and turning in the marked direction (clockwise). The wooden end of a swab works well for this purpose. Alternate frequently, between moving the trolleys and taking up slack, to avoid damaging the media. Use of a metal tool may damage the supply reel motor. This process is complete when the trolleys stop moving and the media is fully retracted into the cartridge shell.
3. Unload the cartridge. As the drive faces you, the cartridge is unloaded by inserting a 2.5mm Allen driver in the hole marked UNLOAD at the left front and turning in the marked direction (counter-clockwise). This process is complete when the cartridge is ejected.
4. Replace the drive's top cover.

1080MB SCSI-2 Disk Drive

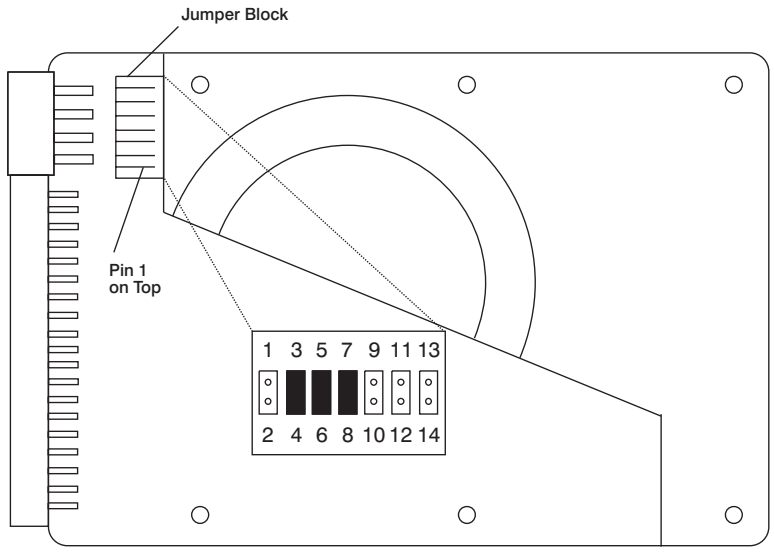
The 1080MB SCSI-2 disk drive has a 3.5 inch form factor and mounts in a half-height media position.

Setting the SCSI Address Jumpers.

Note:

1. The device is shown with jumpers configured for SCSI Address 6.
2. Pins 7-8 must always have a jumper as shown.
3. Pins 9-10, 11,12 and 13,14 must never have a jumper as shown.

The SCSI address of the 1080MB SCSI-2 Disk Drive is set by jumpers located on the logic card. Use the following diagram and table to set the jumpers.



Address	Jumper 1-2	Jumper 3-4	Jumper 5-6
0	Off	Off	Off
1	On	Off	Off
2	Off	On	Off
3	On	On	Off
4	Off	Off	On
5	On	Off	On
6	Off	On	On

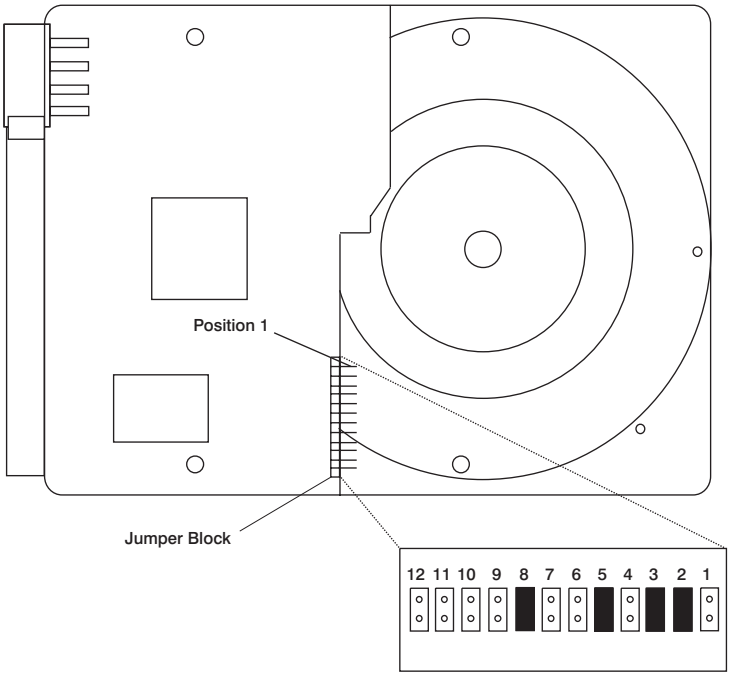
2.1GB SCSI-2 Disk Drive

The 2.1GB SCSI-2 disk drive has a 3.5 inch form factor and mounts in a half-height media position.

Setting the SCSI Address Jumpers

Note: The device is shown with jumpers configured for SCSI Address 6.

The SCSI address of the 2.1GB SCSI-2 disk drive is set by jumpers located on the logic card. Use the following diagram and the SCSI address table on page 2-36 to set the jumpers.



- Positions 5, and 8 must have jumpers.
- Positions 1, 6, 7, 9, 10, 11, and 12 must not have jumpers.

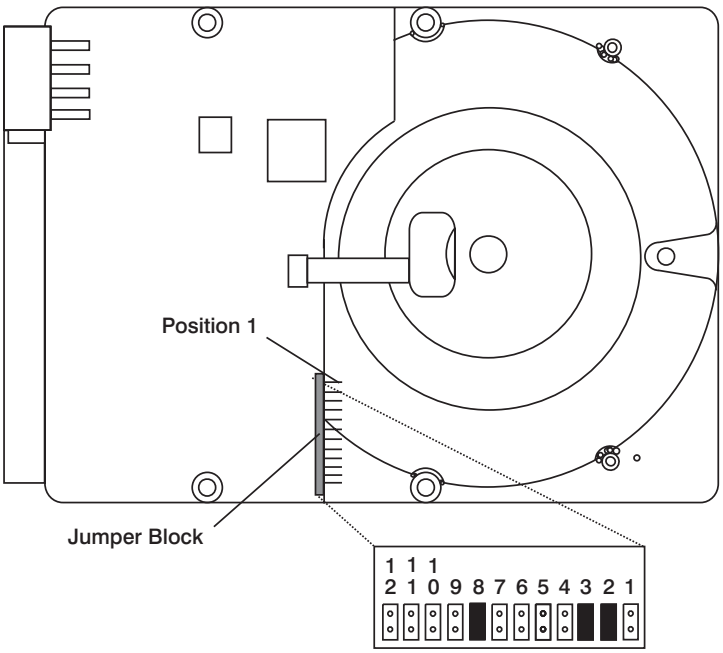
4.5GB SCSI-2 Disk Drive - Type F1

The 4.5GB SCSI-2 disk drive has a 3.5 inch form factor and mounts in a half-height media position. See table in section "1.1GB, 2.2GB, 4.5GB, 9.1GB, (50 and 68-pin) Single-Ended Disk Drives" on page 2-37 for description of disk drive Type - F1.

Setting the SCSI Address Jumpers

Note: The device is shown with jumpers configured for SCSI Address 6.

The SCSI address of the 4.5GB SCSI-2 disk drive is set by jumpers located on the logic card. Use the following diagram and the SCSI address table on page 2-36 to set the jumpers.



- Position 8 must have a jumper.
- Positions 5, 6, 7, 9, 10, 11, and 12 must not have jumpers.

SCSI Address Table

Address	Jumper 4	Jumper 3	Jumper 2	Jumper 1
0	Off	Off	Off	Off
1	On	Off	Off	Off
2	Off	On	Off	Off
3	On	On	Off	Off
4	Off	Off	On	Off
5	On	Off	On	Off
6	Off	On	On	Off
7	On	On	On	Off
8	Off	Off	Off	On
9	On	Off	Off	On
10	Off	On	Off	On
11	On	On	Off	On
12	Off	Off	On	On
13	On	Off	On	On
14	Off	On	On	On
15	On	On	On	On

Note:

1. Address 7 is reserved for the adapter.
2. There is no jumper 1 on 50 pin drives, thus SCSI addresses eight to fifteen are not valid.

1.1GB, 2.2GB, 4.5GB, 9.1GB, (50 and 68-pin) Single-Ended Disk Drives

There are many different types of the SCSI-2 Disk Drives. Before you can set the SCSI address, you must determine which type of SCSI-2 disk drive you have. The table below describes the various features of each drive to help you do this.

Type	Form Factor	Capacity in GB	SCSI Conn Pins	Required Jumper(s)	Jumper Block Pins	Drive Type
A1	1"	1.1/2.2	50-pin	23-24[1]	32	DFHS/DFMS
A2	1"	1.1/2.2	68-pin	23-24[1]	32	DFHS/DFMS
A3	1.6"	4.5	68-pin	23-24[1]	32	DFHS/DFMS
A4	1"	2.2	68-pin[4]	23-24[1] 25-26[2]	32	DFHS
B1	1"	1.1/2.2	50-pin	None	20	Quantum
B2	1"	1.1/2.2	68-pin	None	12	Quantum
B3	1.6"	4.5	68-pin	None	12	Quantum
C1	1"	2.2	50-pin	None	32	DCHS
C2	1"	2.2	68-pin	None	32	DCHS
C3	1"	4.5	68-pin	23-24 & 31-32[2]	32	DCHS
C4	1.6"	9.1	68-pin	23-24 & 31-32[2]	32	DCHS
C5	1"	2.2	68-pin[4]	25-26[2]	32	DCHS
D1	1"	2.2/4.5	68-pin	31-32[2]	32	Quantum
D2	1.6"	9.1	68-pin	31-32[2]	32	Quantum
D3	1"	2.2	68-pin[4]	23-24 & 31-32[2]	32	Quantum
E1	1"	9.1	68-pin	None	32	DGHS
F1	1"	4.5	68-pin	Note [3]	-	DDRS

Notes:

[1]Factory installed jumpers
[2]Customer or customer representative installed jumpers.
[3]See jumper setting information in “4.5GB SCSI-2 Disk Drive - Type F1” on page 2-35.
[4]This is a 68-pin drive being used as a 50-pin drive.

Other differences to look for are the number jumper block pins, and SCSI connector size.

SCSI-2 Disk Drives

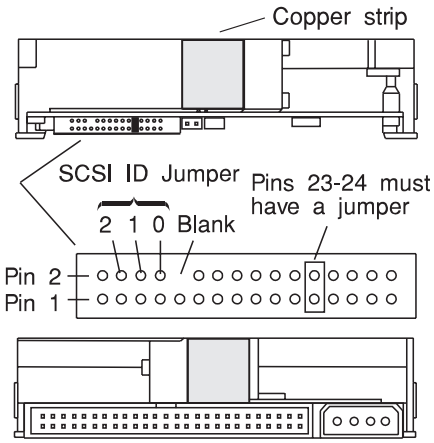
The following figures show the location of the jumper blocks and where to place the jumpers to set the SCSI address or SCSI ID. There are three jumpers to set on 50-pin models and four on 68-pin models.

Setting the SCSI address or SCSI ID

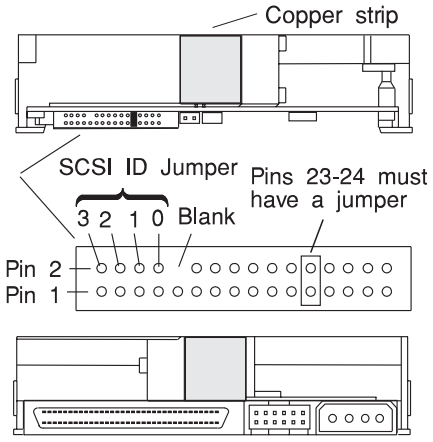
To set the SCSI address or SCSI ID see the Valid Addresses (SCSI IDs) table on page 2-49.

Type A1 Drive: For 1.1GB, and 2.2GB drives, 50-pin models.

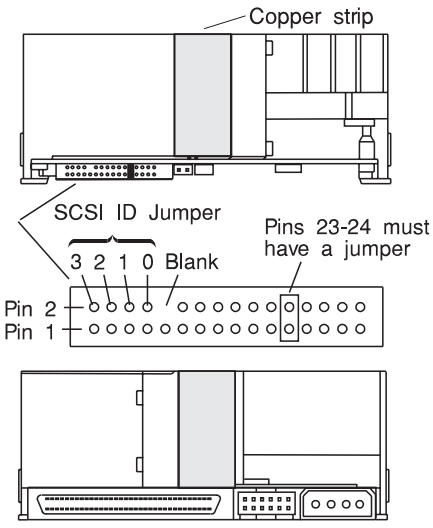
Note: Type A disk drives are shipped with one factory installed jumper. Do not change the factory installed jumper.



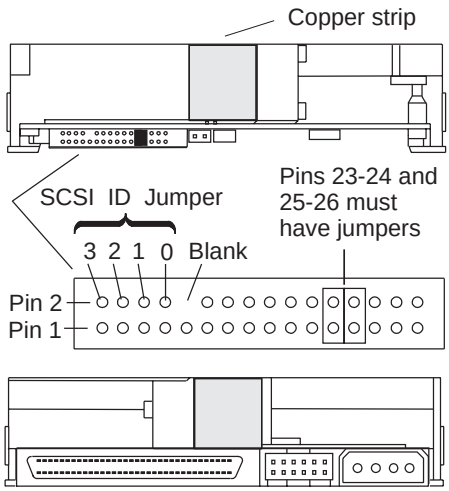
Type A2 Drive: For 1.1GB, and 2.2GB drives, 68-pin models.



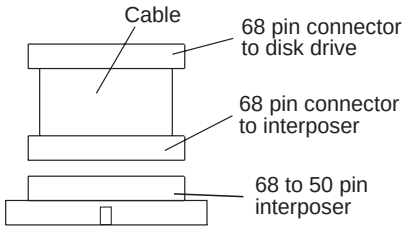
Type A3 Drive: For 4.5GB drives, 68-pin model.



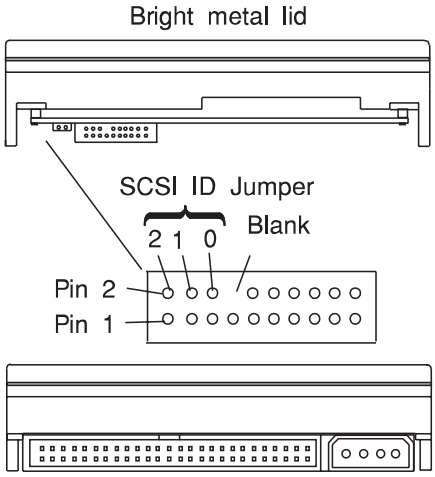
Type A4 Drive: The type A2 2.2GB, 68-pin (16-bit) disk drive can be used as a 50-pin (8-bit) drive by adding a jumper. This configuration is only used in Micro Channel systems.



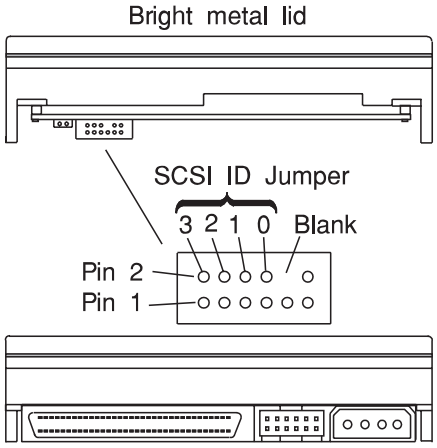
- Pins 23-24 and 25-26 must be jumpered together as shown in the figure above. This configuration is only used in Micro Channel systems.
- Jumper 3 on pins 1 to 2 is not used in this configuration. Do not place a jumper on these pins. Eight bit devices can only use SCSI ID's zero (0) through six (6).
- Some systems require a 68-pin to 50-pin interposer, made up of a short cable and an interposer as shown below.



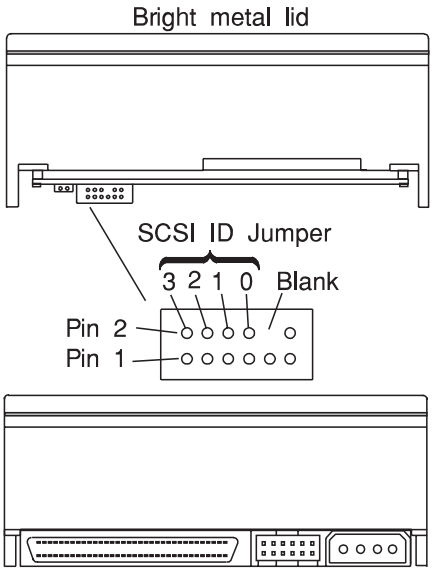
Type B1 Drive: For 1.1GB, and 2.2GB drives, 50-pin models.



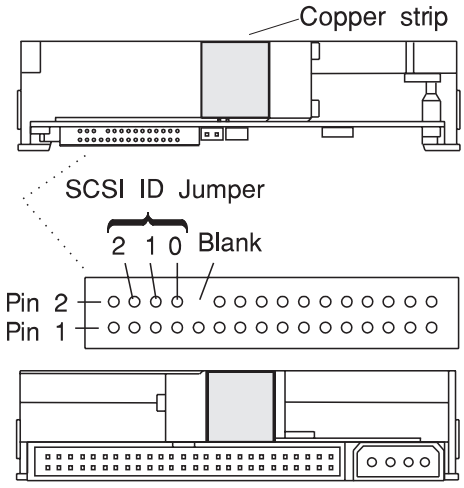
Type B2 Drive: For 1.1GB, and 2.2GB drives, 68-pin models.



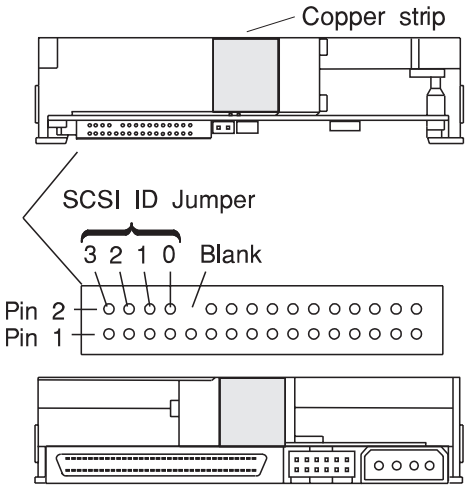
Type B3 Disk Drive, SCSI Addresses: For 4.5GB drives, 68-pin model.



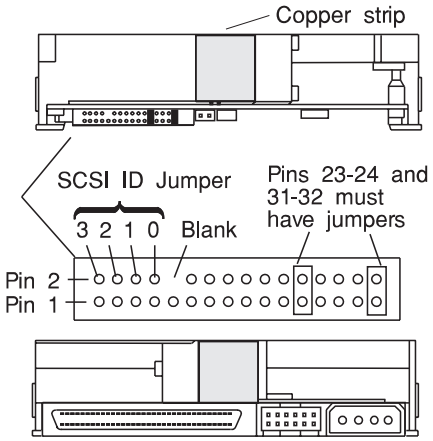
Type C1 Drive: For 2.2GB drives, 50-pin model.



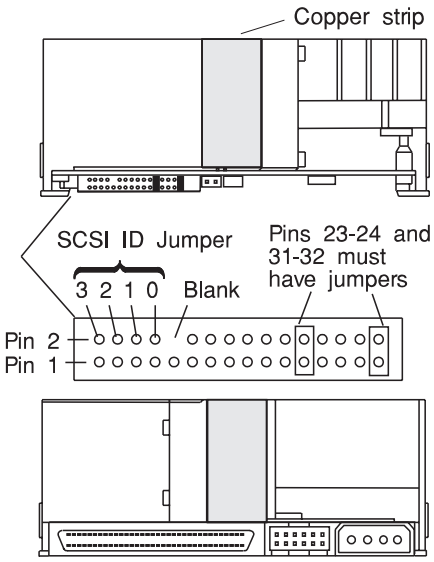
Type C2 Drive: For 2.2GB drives, 68-pin model.



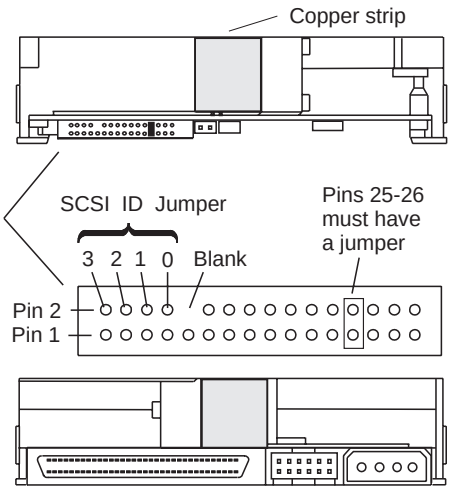
Type C3 Drive: For 4.5GB drives, 68-pin model.



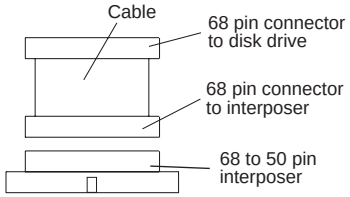
Type C4 Drive: For 9.1GB drives, 68-pin model.



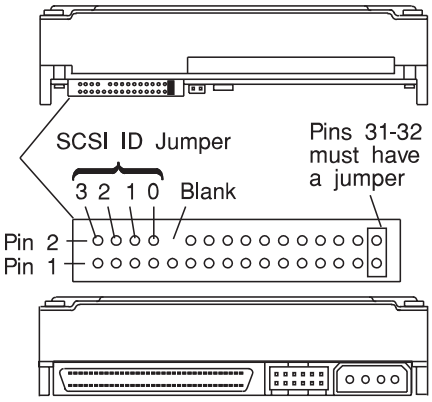
Type C5 Drive: The type C2 2.2GB, 68-pin (16-bit) disk drive can be used as a 50-pin (8-bit) drive by adding a jumper. This configuration is only used in Micro Channel systems.



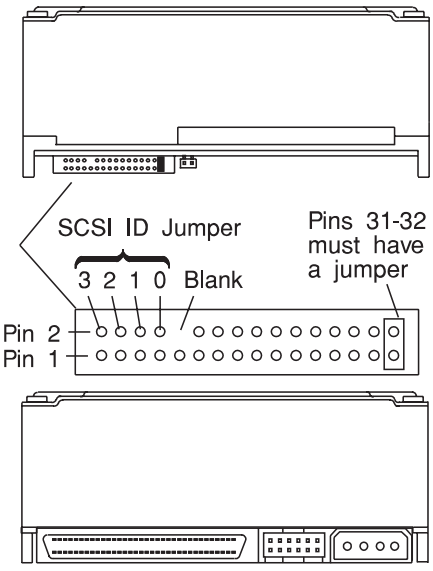
- Pins 25 and 26 must be jumpered together as shown in the figure above.
- Jumper 3 on pins 1 to 2 is not used in this configuration. Do not place a jumper on these pins. Eight bit devices can only use SCSI ID's zero (0) through six (6).
- Some systems require a 68-pin to 50-pin interposer, made up of a short cable and interposer as shown below.



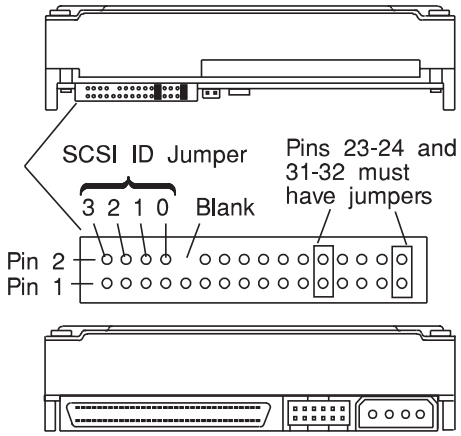
Type D1 Drive: For 2.2GB and 4.5GB drives, 68-pin models.



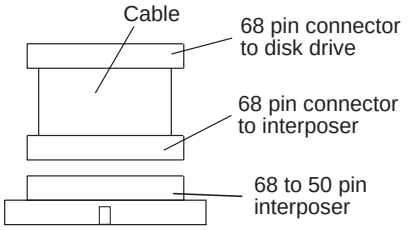
Type D2 Drive: For 9.1GB drives, 68-pin models.



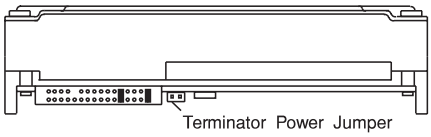
Type D3 Drive: The type D1 2.2GB, 68-pin (16-bit) disk drive can be used as a 50-pin (8-bit) drive by adding a jumper. This configuration is only used in Micro Channel systems.



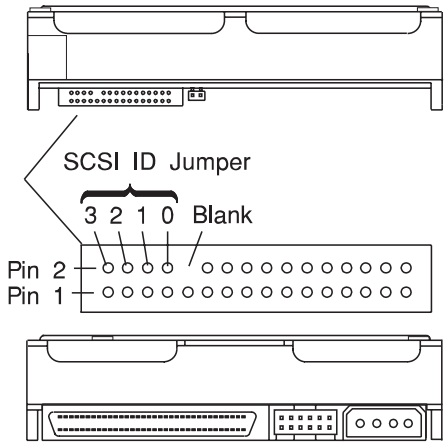
- Pins 23 and 24 must be jumpered together as shown in the figure above.
- Jumper 3 on pins 1 to 2 is not used in this configuration. Do not place a jumper on these pins. Eight bit devices can only use SCSI ID's zero (0) through six (6).
- Some systems require a 68-pin to 50-pin interposer, a cable and interposer or an interposer cable as shown below.



- When this disk drive is used on a Machine Type 7015 Models R20, R30, R40, or R50, the terminator power jumper (2.5 mm) must be installed. See figure below.



Type E1 Drive: For 9.1GB drive, 68-pin model.



Valid Addresses (SCSI IDs)

Address	Jumper 3	Jumper 2	Jumper 1	Jumper 0
0	Off	Off	Off	Off
1	Off	Off	Off	On
2	Off	Off	On	Off
3	Off	Off	On	On
4	Off	On	Off	Off
5	Off	On	Off	On
6	Off	On	On	Off
7*	Off	On	On	On
8	On	Off	Off	Off
9	On	Off	Off	On
10	On	Off	On	Off
11	On	Off	On	On
12	On	On	Off	Off
13	On	On	Off	On
14	On	On	On	Off
15	On	On	On	On

Note:

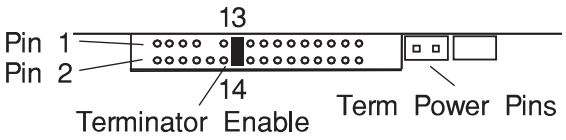
1. Address 7 is reserved for the adapter.
2. There is no jumper 3 on 50 pin drives, thus SCSI addresses eight to fifteen are not valid.

For Machine Type 7043 Model 140 Systems:

Every SCSI bus consists of a SCSI controller, a cable with drives attached, and cable terminators. One terminator is permanently mounted at the controller end of the cable and the other is mounted at the opposite end. Most systems have this terminator attached to the cable connector furtherest from the controller. In Machine Type 7043 Model 140 only, the terminator is located on the drive at the end of the cable. For drive types A1, A2, A3, C1, C2, D1, D2, and D3 the terminator is enabled by installing 2 jumpers on the drive. One jumper between jumper pins 13 and 14 enables the terminator and the other (larger jumper) attaches to the pins labelled Term Power Pins.

It is very important that every SCSI bus have 2 and only 2 terminators installed. Otherwise, intermittent operation or device damage may occur. If the drive on the end of a SCSI bus is moved or removed (from a Machine Type 7043 Model 140), it must be assured that the last drive on that SCSI bus is properly terminated before moving on. If a drive is moved to other positions in a Machine Type 7043 Model 140 or to another system, you must remove the two (2) terminator jumpers. For more general information on SCSI busses, see Chapter 4, “SCSI Cabling” on page 4-1.

The position of the terminator jumper and the terminator power pins are shown in the figure below.



Chapter 3. Cables and Cabling

This chapter has information for those servicing installed systems and for those planning for new installations. There is information that describes cabling to many of the optional adapters that are used with the system.

In most cases when a system unit is being attached to large computer systems, file systems, or networks, the cabling is complicated and the appropriate publications for those specific products are required for cabling and setup.

Chapter 4, “SCSI Cabling” on page 4-1 has all of the information about SCSI cabling.

Chapter 5, “Cable Assembly and Pin-Outs” on page 5-1 has information on cable building and pin-outs that may be helpful if you are considering custom built cables.

Adapter Cabling

This section helps you determine the types of cables you need to attach devices to their adapters. Length refers to the length of a cable. There are some general purpose cables shown in this section. However, there are cases where custom cables are required when installing large or complicated systems. Chapter 5, “Cable Assembly and Pin-Outs” on page 5-1 provides pin-outs and in some cases additional information that may help you or your cable vendor build these cables.

If custom built cables are used with your system, be sure to read the applicable sections in Chapter 5, “Cable Assembly and Pin-Outs” on page 5-1 of this book and in the *Site and Hardware Planning Information*, order number SA38-0508.

Communications Adapter Cabling

This section provides information on cabling for communications adapters.

There are many ways to connect communications cables and devices. Because each installation may have unique requirements, the following topics present attachment configurations using part-numbered cables. These drawings are not the only ways you can cable devices to a system; see Chapter 5, “Cable Assembly and Pin-Outs” on page 5-1 for additional information about custom built cables.

EIA-232 Cabling Considerations

Attention: EIA-232 asynchronous adapters may be damaged if the following cabling practices are not observed:

Note: Use of the following recommendations does not guarantee compliance with FCC EMI/RFI regulations.

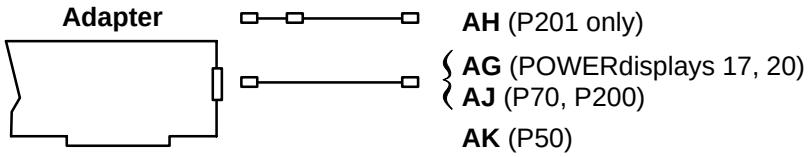
- Cable directly from the adapter, fanout box, or remote async node to the using device such as an async terminal or printer. Direct cabling should not leave an Electrical Static Discharge (ESD) entry point other than a charged cable.
- Discharge cables before plugging into adapters or interface cable ports (fanout box).
- Do not allow persons who are not static-protected to touch conductors, leads, or pins.
- Avoid the use of Type 66 Punchdown or similar terminal blocks. If these terminal blocks must be used, ensure that the person handling interface wires is using appropriate ESD precautions:
  - Use ground straps and grounded floor mats.
  - Before access, insure that grounded equipment covers that require touching are in use.

  These precautions must be taken even if power is off, since ESD damage is independent of circuit power.
- Eight- and 128-port adapter cables should not be used outdoors. Such outdoor use is at the customer's risk. An appropriate transient voltage suppression device should be used on each signal wire in the cable at every exit or entry point.
- Do not route cables near or around power cables, power transformers, or high power switching devices such as air conditioners, refrigeration units, or elevators.
- Shielded cables are essential to prevent damaging high voltage noise impulses from coupling onto signal lines. The shielded cable should be data grade, at least 24 AWG, and of individual shielded twisted pairs. Shielding should have both overall shorted aluminum foil to suppress high frequency noise and tinned copper braid (capacitance approximately 12pF per foot, not to exceed 2500pF in the recommended maximum cable length of 200 feet) to suppress low frequency noise. Shielded connectors with metal shrouds are also recommended, as are cable strain reliefs.

Note: Twisted pair cable with only overall aluminum foil shielding , as described above, may be used if the signal conductors are carefully bundled to prevent crosstalk.

- If the cable is routed from the system (fanout box) to the I/O device, the shields and drain wire should be connected to the metal shell of the connector at the system end. At the I/O device end, the drain wire should be connected to Pin 1, and the shields should be connected to the metal shell of the connector. If a cable similar to the Async cable is to be attached from the system (fanout box) to a permanently installed cable, frame ground should be present on Pin 1 and on both ends of the permanently installed cable.
- Excessive cable lengths expose the system to more noise. Maximum supported cable length is 200 feet for EIA-232 applications. The EIA-232 specification states that the total capacitance of a cable with connectors must be less than 2500pf.
- The cable should not contain unterminated (connected at one end only) wires. Unterminated wires act as antennas and can pick up or emit electrical noise.
- Do not tie the frame (shield) ground to the signal ground within the cable or connector.

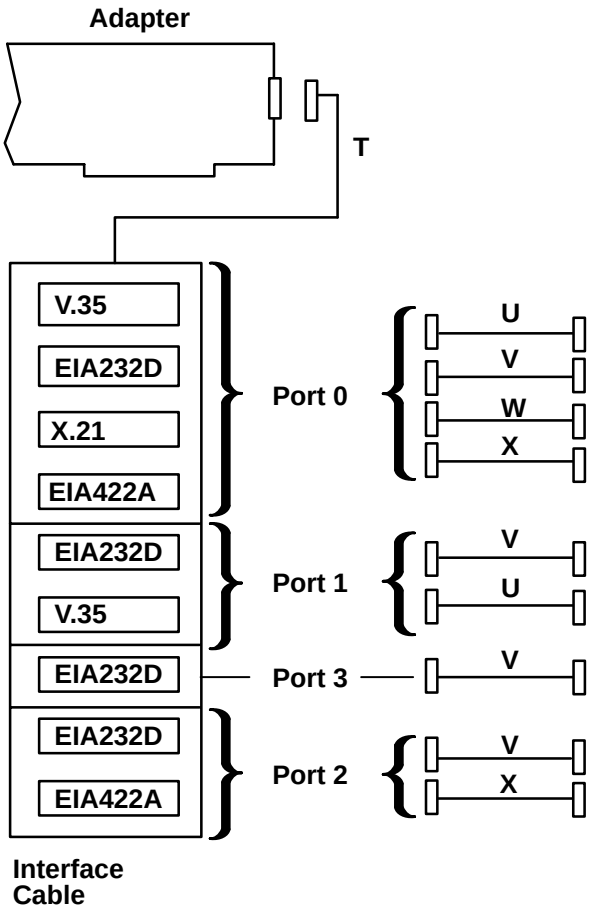
FC (2657) S15 Graphics Adapter



Cable Letter	Cable Name/ Description	Part Number	Feature Code	Length	
				m	ft
AG	Display cable, 15-pin D-shell to 5 BNC connectors	58F2901	4217	N/A	N/A
AH	Display conversion cable, 15-pin D-shell to 13W3 DDC ID switch	96G1712	4237	0.3	1
AJ	Display cable, DDC 15-pin D-shell to 13W3 with DDC	96G2156	4238	1.83	6
AK	Display cable, use 15 pin D-shell attached to display	N/A	N/A	N/A	N/A

FC (2701) Co-Processor Multiport Adapter, Model 2

The following figure illustrates the Co-Processor Multiport Adapter with the Co-Processor Multiport Adapter Interface Cable and attachment cables. The interface cable ports are labeled 0, 1, 3, and 2. Only one interface and associated cable can be selected per port. In order to make the necessary connections to this adapter, your setup person needs to know the type of network interface assigned to each port.



Cable Letter	Cable Name/ Description	Part Number	Feature Code	Length	
				m	ft
T	Interface/Breakout Box	53F2622/ 40F9897	2705	3	10
U	V.35 cable, if customer-supplied, must meet V.35 requirements	71F0162	2702	2	6.5
V	EIA-232D/V.24 cable if customer-supplied, must meet EIA-232D/V.24 requirements	71F0165	2706	3	10
W	X.21 cable, if customer-supplied, must meet X.21 cable requirements	71F0164	2704	3	10
X	If customer-supplied, must meet EIA-422A requirements	N/A	N/A	N/A	N/A

FC (2825) POWER GXT3000P 3D Graphics Adapter

Display and Adapter Cable Information

Display Type	Screen Resolution (Non-Interlaced)	Refresh Freq (Hz)	Adapter Cable Part Number
6091-16 Color POWERdisplay 16	1280 x 1024	60 *	39H8683
		77	39H8683
6091-19i Color POWERdisplay 19	1280 x 1024	60 *	39H8683
		77	39H8683
16.1 TFT LCD display	1280 x 1024	60 *	58F2901
POWERdisplay 17 POWERdisplay 20	1024 x 768	75	39H8683
		85	39H8683
	1280 x 1024	60 *	39H8683
		75	39H8683
G52, G54	1024 x 768	75	Cable Included with Display
		85	Cable Included with Display
	1280x1024	60 *	Cable Included with Display
P70, P72	1024x768	75	96G2156
		85	96G2156
	1280 x 1024	60 *	96G2156
		75 [2]	96G2156
P200, P92	1024 x 768	75	96G2156
		85	96G2156
	1280 x 1024	60 *	96G2156
		75	96G2156
		85 [1,2]	96G2156
P201, P202	1024 x 768	75	96G1712
		85	96G1712
		120	96G1712
	1280 x 1024	60 *	96G1712
		75	96G1712
		85	96G1712

Display Type	Screen Resolution (Non-Interlaced)	Refresh Freq (Hz)	Adapter Cable Part Number
Other VESA Resolutions/Refresh Rates	1024 x 768	75	
		85	
		120	
	1280 x 1024	60*	
		75	
		85	

Note:

* Default display mode. Monitors listed are selectable via the AIX utility (SMIT) except where noted.

[1] Only P200 Monitors with the N2 Chassis (M/T 6555, Model 77x) support 1280x1024 at 85Hz.

[2] This monitor at this refresh rate and screen resolution complies with the ISO 9241, Part 3 video ergonomics standard. ISO 9241, Part 3 compliance is dependent on a complete ISO capable platform of system unit, monitor, video sub-system, operating system and fonts.

FC (2851, 2852) POWER GXT250P and POWER GXT255P High-Performance Graphics Adapters

Display and Adapter Cable Information

Display Type	Screen Resolution (Non-Interlaced)	Refresh Freq (Hz)	Adapter Cable Part Number
6091-16 Color POWERdisplay 16	1280 x 1024	60 [1] *	39H8683
		77 [2]	39H8683
6091-19i Color POWERdisplay 19	1280 x 1024	60 [3] *	39H8683
		77	39H8683
1091-051 Color POWERdisplay 16S	1280 x 1024	72*	09G3588 [6]
5081-16 Color	1280 x 1024	60*	39H8683
6091-19 Color	1280 x 1024	60*	39H8683
6091-23 Color	1280 x 1024	60*	39H8683
6314 Color 6317 Color [4] 6319 Color	1024 x 768	60*	Cable Included with Display
6324 Color 6325 Color 6327 Color 9524 Color 9525 Color	1024 x 768	60*	Cable Included with Display
		75.8	Cable Included with Display
	1280 x 1024	60	Cable Included with Display
7091-7S1 [5]	1024 x 768	60*	11H4003 (select with 7091 order)
		75.8	11H4003 (select with 7091 order)
	1280 x 1024	60	11H4003 (select with 7091 order)
		77	11H4003 (select with 7091 order)
8508 Mono	1280 x 1024	67*	Cable Included with Display
8517 Color	1024 x 768	70*	Cable Included with Display

Display Type	Screen Resolution (Non-Interlaced)	Refresh Freq (Hz)	Adapter Cable Part Number
9521 Color 9527 Color	1024 x 768	60*	Cable Included with Display
		75.8	Cable Included with Display
	1280 x 1024	60	Cable Included with Display
		77	Cable Included with Display
POWERdisplay 17 POWERdisplay 20	1024 x 768	75.8	39H8683
	1280 x 1024	60*	39H8683
		77	39H8683
P50	1024 x 768	60*	Cable Included with Display
		85	Cable Included with Display
P70	1024 x 768	60*	96G2156
		85	96G2156
	1280 x 1024	60	96G2156
		77	96G2156
G50	1024 x 768	60*	Cable Included with Display
		70	Cable Included with Display
G70	1024 x 768	60*	Cable Included with Display
		75	Cable Included with Display
	1280 x 1024	60	Cable Included with Display
G200	1024 x 768	60*	Cable Included with Display
		85	Cable Included with Display
	1280 x 1024	60	Cable Included with Display
		75	Cable Included with Display

Display Type	Screen Resolution (Non-Interlaced)	Refresh Freq (Hz)	Adapter Cable Part Number
P200	1024 x 768	60*	96G2156
		85	96G2156
	1280 x 1024	60	96G2156
		77	96G2156
	1600 x 1280	60	96G2156
P201	1024 x 768	60*	92G1712
		85	92G1712
	1280 x 1024	60	92G1712
		85	92G1712
	1600 x 1280	60	96G1712
Other VESA Resolutions/Refresh Rates	1024 x 768	60	
		70	
		75	
		85	
	1280 x 1024	75	
		85	

Note:

* Default display mode. Monitors listed are selectable via the AIX utility (SMIT) except where noted.

[1] For 6091-16 Color/POWERdisplay 16 at 60 Hz, set the monitor display mode switch to `out(1).`

[2] For 6091-16 Color/POWERdisplay 16 at 77 Hz, set the monitor display mode switch to `in(2).`

[3] For 6091-19i Color/POWERdisplay 19 at 60 Hz, set the monitor display mode switch to `2.`

[4] The 6317 color display is not explicitly included in SMIT. To run the 6317 in a mode other than 1024 x 768 at 60 Hz, select a display type of IBM-17V in SMIT.

[5] The 7091-7S1 display is not explicitly included in SMIT. To run the 709-7S1 in a mode other than 1024 x 768 at 60 Hz, select a display type of IBM-21P in SMIT.

[6] When installing cable P/N 09G3599, the black leaded BNC connector (labeled "V") *must* be connected to the "VD" sync out connector on the back of the display.

FC (2853, 2859) POWER GXT800P 3D Graphics Adapter

Display and Adapter Cable Information

Display Type	Screen Resolution (Non-Interlaced)	Refresh Freq (Hz)	Adapter Cable Part Number
6091-16 Color POWERdisplay 16	1280 x 1024	60 [1] *	39H8683
		77 [2]	39H8683
6091-19i Color POWERdisplay 19	1280 x 1024	60 [3] *	39H8683
		77	39H8683
1091-051 Color POWERdisplay 16S	1280 x 1024	72*	09G3588 [4]
5081-16 Color 5081-019 w/ RPQ	1280 x 1024	60*	39H8683
6091-19 Color	1280 x 1024	60*	39H8683
6091-23 Color	1280 x 1024	60*	39H8683
POWERdisplay 17 POWERdisplay 20	1024 x 768	74	39H8683
		76	39H8683
	1280 x 1024	60*	39H8683
		77	39H8683
P50	1024 x 768	74	Cable Included with Display
		75	Cable Included with Display
		85	Cable Included with Display
	1280x1024	60*	Cable Included with Display
P70	1024 x 768	70	96G2156
		74	96G2156
		75 [6]	96G2156
		85	96G2156
	1280 x 1024	60*	96G2156
		75 [6]	96G2156
		77	96G2156

Display Type	Screen Resolution (Non-Interlaced)	Refresh Freq (Hz)	Adapter Cable Part Number
P200	1024 x 768	70	96G2156
		74	96G2156
		75	96G2156
		85	96G2156
	1280 x 1024	60*	96G2156
		75	96G2156
		77	96G2156
		85 [5,6]	96G2156
P201	1024 x 768	70	96G1712
		74	96G1712
		75	96G1712
		85	96G1712
	1280 x 1024	60*	96G1712
		75	96G1712
		77	96G1712
		85	96G1712
9516-A03 (US/EMEA) 9516-A04 (AP)	1280 x 1024	60*	39H8683
Other VESA Resolutions/Refresh Rates	1024 x 768	60	
		70	
		75	
		85	
	1280 x 1024	60*	
		75	
		85	

Note:

* Default display mode. Monitors listed are selectable via the AIX utility (SMIT) except where noted.

[1] For 6091-16 Color/POWERdisplay 16 at 60 Hz, set the monitor display mode switch to `out(1)`.

[2] For 6091-16 Color/POWERdisplay 16 at 77 Hz, set the monitor display mode switch to `in(2)`.

[3] For 6091-19i Color/POWERdisplay 19 at 60 Hz, set the monitor display mode switch to 2.

[4] When installing cable P/N 09G3588, the black leaded BNC connector (labeled "V") *must* be connected to the "VD" sync out connector on the back of the display.

[5] Only P200 Monitors with the N2 Chassis (M/T 6555, Model 77x) support 1280x1024 at 85Hz.

[6] This monitor at this refresh rate and screen resolution complies with the ISO 9241, Part 3 video ergonomics standard. ISO 9241, Part 3 compliance is dependent on a complete ISO capable platform of system unit, monitor, video sub-system, operating system and fonts.

FC (2854, 2855) POWER GXT500P and POWER GXT550P 3D Graphics Adapters

Display and Adapter Cable Information

Display Type	Screen Resolution (Non-Interlaced)	Refresh Freq (Hz)	Adapter Cable Part Number
6091-16 Color POWERdisplay 16	1280 x 1024	60 [1] *	09G3539
		77 [2]	09G3541
6091-19i Color POWERdisplay 19	1280 x 1024	60 [3] *	09G3539
		77	09G3541
1091-051 Color POWERdisplay 16S	1280 x 1024	72*	09G3589 [5]
5081-16 Color 5081-019 w/ RPQ	1280 x 1024	60*	09G3539
6091-19 Color	1280 x 1024	60*	09G3539
6091-23 Color	1280 x 1024	60*	09G3539
6317 Color [4] 14V 15V 17V 14P 15P	1024 x 768	60	Cable Included with Display [6]
		70	Cable Included with Display [6]
		76	Cable Included with Display [6]
	1280 x 1024	60*	Cable Included with Display [6]
7091-7S1	1024 x 768	60	11H4004 (select with 7091 order)
		74	11H4004 (select with 7091 order)
		76	11H4004 (select with 7091 order)
	1280 x 1024	60*	11H4004 (select with 7091 order)
		77	11H4004 (select with 7091 order)

Display Type	Screen Resolution (Non-Interlaced)	Refresh Freq (Hz)	Adapter Cable Part Number
21P 17P	1024 x 768	60	Cable Included with Display [6]
		76	Cable Included with Display [6]
	1280 x 1024	60*	Cable Included with Display [6]
		60*	09G3539
		77	Cable Included with Display [6]
		77	09G3541
POWERdisplay 17 POWERdisplay 20	1024 x 768	74	09G3539
		76	09G3539
	1280 x 1024	60*	09G3539
		77	09G3541
P50	1024 x 768	74	Cable Included with Display [6]
		75	Cable Included with Display [6]
		85	Cable Included with Display [6]
	1280x1024	60*	Cable Included with Display [6]
P70	1024 x 768	70	96G2157
		74	96G2157
		75 [8]	96G2157
		85	96G2157
	1280 x 1024	60*	96G2157
		75 [8]	96G2157
		77	96G2157
P200	1024 x 768	70	96G2157
		74	96G2157
		75	96G2157
		85	96G2157
	1280 x 1024	60*	96G2157
		75	96G2157
		77	96G2157
		85 [7,8]	96G2157

Display Type	Screen Resolution (Non-Interlaced)	Refresh Freq (Hz)	Adapter Cable Part Number
P201	1024 x 768	70	60H7742
		74	60H7742
		75	60H7742
		85	60H7742
	1280 x 1024	60*	60H7742
		75	60H7742
		77	60H7742
		85	60H7742
9516-A03 (US/EMEA) 9516-A04 (AP)	1280 x 1024	60*	09G3539
Other VESA Resolutions/Refresh Rates	1024 x 768	60	
		70	
		75	
		85	
	1280 x 1024	60*	
		75	
		85	

Note:

* Default display mode. Monitors listed are selectable via the AIX utility (SMIT) except where noted.

[1] For 6091-16 Color/POWERdisplay 16 at 60 Hz, set the monitor display mode switch to `out(1).`

[2] For 6091-16 Color/POWERdisplay 16 at 77 Hz, set the monitor display mode switch to `in(2).`

[3] For 6091-19i Color/POWERdisplay 19 at 60 Hz, set the monitor display mode switch to `2.`

[4] The 6317 color display is not explicitly included in SMIT. To run the 6317 in a mode other than 1024 x 768 at 60 Hz, select a display type of 17V in SMIT.

[5] When installing cable P/N 09G3589, the black leaded BNC connector (labeled "V") *must* be connected to the "VD" sync out connector on the back of the display.

[6] A 13W3 to 15-pin D shell converter cable (p/n 52G3255) is required to attach to display cable.

[7] Only P200 Monitors with the N2 Chassis (M/T 6555, Model 77x) support 1280x1024 at 85Hz.

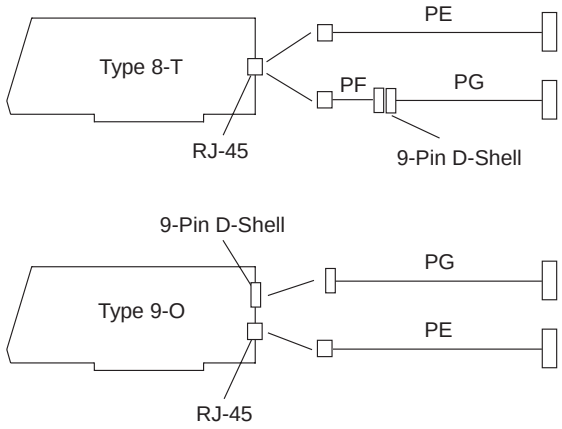
[8] This monitor at this refresh rate and screen resolution complies with the ISO 9241, Part 3 video ergonomics standard. ISO 9241, Part 3 compliance is dependent on a complete ISO capable platform of system unit, monitor, video sub-system, operating system and fonts.

FC (2920, 2979) Token-Ring Adapters

Considerations for Token-Ring applications are found in the following:

- IEEE 802.5 requirements
- Token-Ring Network Introduction and Planning Guide (GA27-3677)
- A Building Planning Guide for Communication Wiring (G320-8059)
- Cabling System Planning and Installation Guide (GA27-3361)
- Using the Cabling System with Communication Products (GA27-3620).

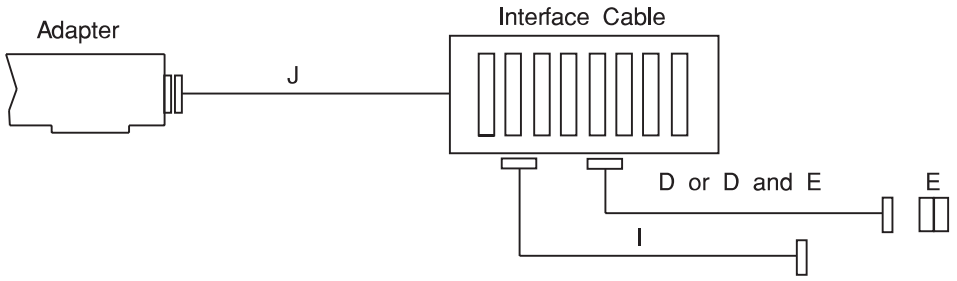
The following figures illustrates the Token-Ring Adapters with an attachment cable for the Token-Ring LAN.



Cable Letter	Cable Name/ Description	Part Number	Feature Code	Length	
				m	ft
PE	RJ-45 to IBM Cabling System data connector cable	60G1063	N/A	3.04	10
	Token-Ring Unshielded Twisted Pair (UTP) cable, two twisted pairs of UTP cabling (Customer supplied)	N/A	N/A	N/A	N/A
PF	For Feature Code 2979, the conversion cable is shipped with the adapter. It converts from an RJ-45 connector to a 9-pin D-shell connector.	93H8894	N/A	0.3	1
	For Feature Code 2920, the conversion cable is available but **NOT** shipped with the adapter. It converts from an RJ-45 connector to a 9-pin D-shell connector.	93H8894	N/A	0.3	1
PG	IBM Cabling System data Connector to 9-pin D-shell token-ring Shielded Twisted Pair (STP) cable	6339098	N/A	N/A	N/A

FC (2931) 8-Port Async Adapter EIA-232E

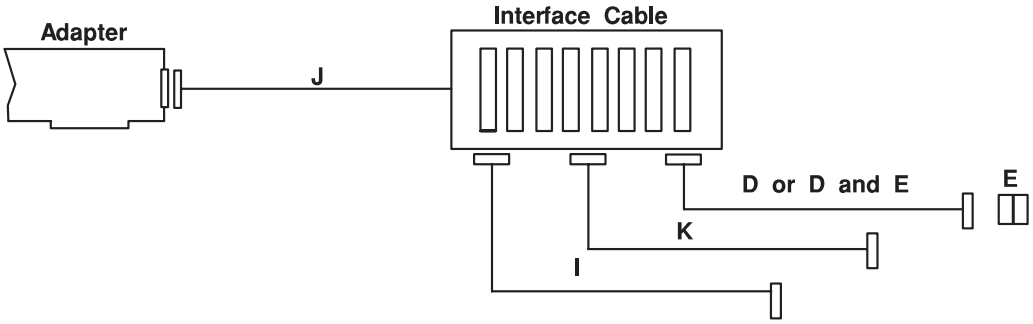
The following figure illustrates the 8-Port Async Adapter EIA-232E with the Multiport Interface Cable and attachment cables. The cable assembly ports are labeled 0 through 7. Attachment cables can connect to any of the eight ports. In order to make the necessary connections to this adapter, your setup person needs to know the devices and persons assigned to each port. See the first of this chapter and chapter 5 for cable building information.



Cable Letter	Cable Name/ Description	Part Number	Feature Code	Length	
				m	ft
J	Cable assembly supplied with adapter	11H6011	N/A	1.5	5
		07L9001	N/A	3	10
D	Async Cable EIA-232E/V.24, if customer-supplied, must meet EIA-232E requirements	6323741	2936	3	10
E	Printer/Terminal Interposer EIA-232E	58F2861	2937	.004	.17
I	Printer/Terminal Cable EIA-232E if customer-supplied, must meet EIA-232E requirements	12H1204	2934	3	10

FC (2932 and 2943) 8-Port Async Adapters EIA-232E/RS-422A

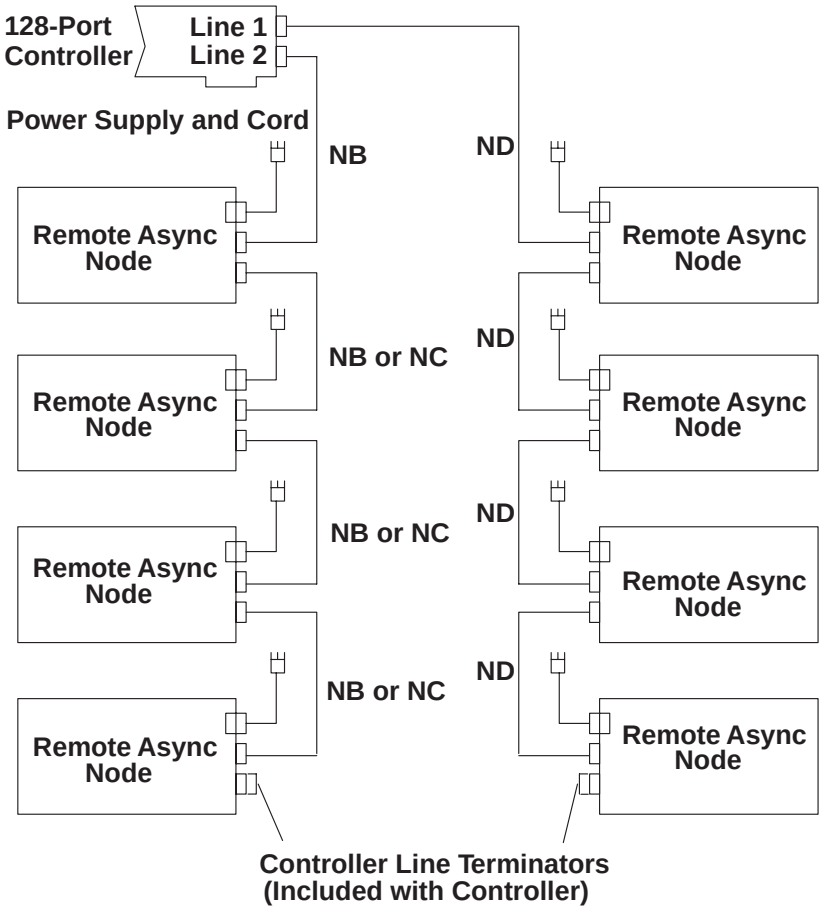
The following figure illustrates the 8-Port Async Adapter EIA-232E/RS-422A with the Multiport Interface Cable and attachment cables. The cable assembly ports are labeled 0 through 7. Attachment cables can connect to any of the eight ports. In order to make the necessary connections to this adapter, your setup person needs to know the devices and persons assigned to each port. See the first of this chapter and Chapter 5 for cable building information.



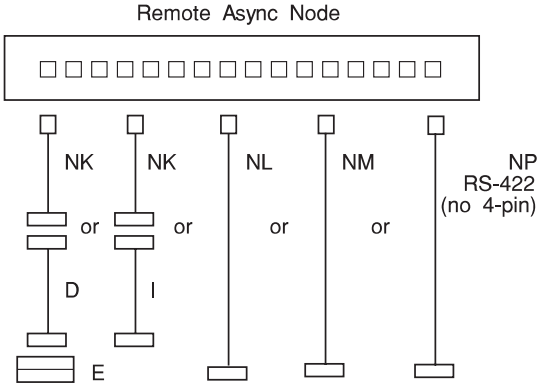
Cable Letter	Cable Name/ Description	Part Number	Feature Code	Length	
				m	ft
J	Cable assembly supplied with adapter	11H6011	N/A	3	10
D	Async Cable EIA-232E/V.24, if customer-supplied, must meet EIA-232E requirements	6323741	2936	3	10
E	Printer/Terminal Interposer EIA-232E	58F2861	2937	.004	.17
I	Printer/Terminal Cable EIA-232E if customer-supplied, must meet EIA-232E requirements	12H1204	2934	3	10
K	Printer/Terminal Cable RS-422A, if customer-supplied, must meet RS-422A requirements	30F8966	2945	20	65.5

FC (2933, 2944) 128-Port Async Controllers

A number of cabling scenarios are possible when installing this feature. The following figure shows a typical configuration in which eight Remote Async Nodes are attached to the 128-Port Async Controller using both 4-wire and 8-wire direct cabling. Note that in the figure below, the 128-Port Async Controller supports up to four Remote Async Nodes on each controller. Cables NB and NC are available or can be customer supplied. The ND cable in the configuration below is a customer-supplied cable. See “128-Port Async Controllers” on page 5-23.



A choice of cables can be attached to any of the 16 Remote Async Node ports. See the following illustration. These ports are labeled 0 through 15 and accept 4-, 6-, 8-, and 10-pin RJ-type connectors.



In order to make the necessary connections to the Remote Async Node, the system administrator must know the type of device that is being configured and its port location on the Remote Async Node. The cable planning charts section of the *Site and Hardware Planning Information*, order number SA38-0508 can help you make these assignments.

The following table shows the cables that are used to configure the 128-Port Async Controller, see “128-Port Async Controllers” on page 5-23, for information on cables that you can build yourself.

Cable Letter	Cable Name/ Description	Part Number	Feature Code	Length m ft
NB	128-Port Async Controller Cable, 8-wire	43G0937	8131	4.57 15
NC	128-Port Async Controller Cable, 8-wire	43G0936	8132	.23 .75
ND	128-Port Async Controller Cable, 4-wire, customer-supplied	N/A	N/A	N/A
NE	128-Port Async Controller EIA-232 Modem Cable, system, customer-supplied	N/A	N/A	N/A
NF	128-Port Async Controller EIA-232 Modem Cable, device, customer-supplied	N/A	N/A	N/A

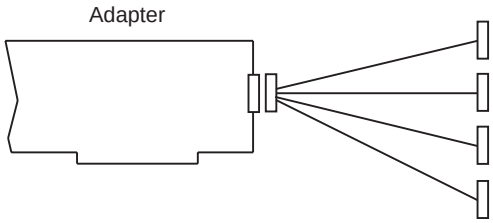
Cable Letter	Cable Name/ Description	Part Number	Feature Code	Length m ft
NG	128-Port Async Controller EIA-422 Modem Cable, system, customer-supplied	N/A	N/A	N/A
NH	128-Port Async Controller EIA-422 Modem Cable, device, customer-supplied	N/A	N/A	N/A
NK	RJ-45 to DB-25 Converter Cables (four provided with each order)	43G0935	8133	0.61 2
D	Async Cable EIA-232/V.24, if customer-supplied, must meet EIA-232-D requirements.	6323741	2936	3 10
E	Printer/Terminal Interposer EIA-232	58F2861	2937	N/A
I	Printer/Terminal Cable EIA-232 if customer-supplied, must meet EIA-232-D requirements	12H1204	2934	3 10
NL	Cable directly wires RJ-45 to a DB-25 connector for attachment to a terminal or printer; customer-supplied, must meet EIA-232-D electrical requirements	N/A	N/A	N/A
NM	Cable directly wires RJ-45 to a DB-25 connector for attachment to a modem; customer-supplied, must meet EIA-232-D electrical requirements	N/A	N/A	N/A
NP	Cable for RS-422. Directly wires RAN to RS-422 device. RJ-45 to DB-25, customer-supplied, must meet RS-422 electrical requirements	N/A	N/A	N/A

Cable Letter	Cable Name/ Description	Part Number	Feature Code	Length m ft
See Note	Cable converter 64-Port to 128-Port Pin-out converter Allows customers to use 64-Port Concentrator wiring with 128-Port Remote Async Node; if customer-supplied, must meet EIA-232-D electrical requirements	88G3650 (pkg of 4)	8135	N/A

Note: This converter cable allows customers with installed 64-Port Async Card and 16-Port concentrators to convert the 8-wire wiring used with the 16-Port concentrators to the 10-wire wiring used with the 16-Port Remote Async Nodes that are used with the 128-Port Adapter.

FC (2947) IBM ARTIC960Hx 4-Port Selectable PCI Adapter

The following figure illustrates the IBM ARTIC960Hx Base PCI Adapter with a 4-Port Selectable Mezzanine card. See the first of this chapter and Chapter 5, “Cable Assembly and Pin-Outs” on page 5-1 for cable building information.



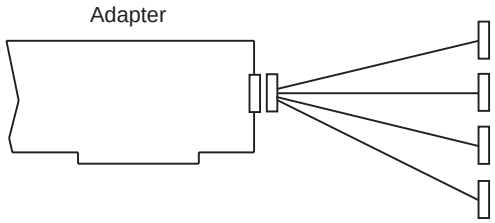
Each cable has a single 120-pin, male, D-shell connector that branches into four individual cables, each of which provides access to one of four independent ports.

The following table lists the FRU number and feature codes for each optional cable and the electrical interface it supports.

Cable Letter	Cable Name/ Description	FRU Part Number	Feature Code	Length	
				m	ft
PK	EIA-232 (ISO 2110) if customer-supplied, must meet EIA-232/(ISO 2110) requirements	87H3405	2861	1.8	6
PL	EIA-530 (ISO 2110) if customer-supplied, must meet EIA-530/(ISO 2110) requirements	87H3402	2865	1.8	6
PM	V.35 DTE (ISO 2593) if customer-supplied, must meet V.35 DTE/(ISO 2593) requirements	87H3399	2864	1.8	6
PP	RS-449 (ISO 4902) if customer-supplied, must meet RS-449/(ISO 4902) requirements	87H3396	2862	1.8	6
PR	X.21 (ISO 4903) if customer-supplied, must meet X.21/(ISO 4903) requirements	87H3408	2863	1.8	6

FC (2948) IBM ARTIC960Hx 4-Port T1/E1 PCI Adapter

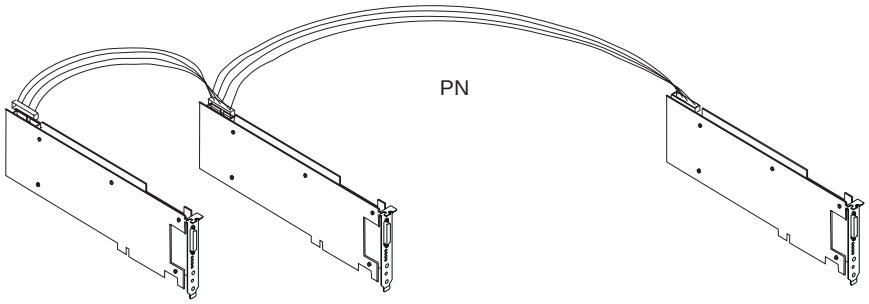
The T1 RJ-48 and the E1 RJ-48 assemblies consist of a 36-pin male connector at one end of a cable that branches into four individual cables, each of which provides access to one of four independent ports.



Cable Letter	Cable Name/ Description	Part Number	Feature Code	Length	
				m	ft
PS	4-Port T1 RJ-48 cable	87H3518	2709	1.8	6
	4-Port E1 RJ-48 cable	87H3515	2710	1.8	6

FC (2949) IBM ARTIC960Hx DSP Resource PCI Adapter

The following figure shows the cabling of the SC-Bus on the adapters.

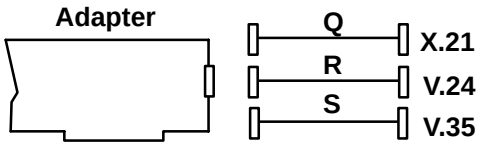


SC-Bus Ribbon Cabling

Cable Letter	Cable Name/ Description	Part Number	Feature Code	Length	
				m	ft
PN	SC-Bus Ribbon Cable is customer-supplied, See build instructions in Chapter 5.	N/A	N/A	N/A	N/A

FC (2961) X.25 Interface Co-Processor Adapter

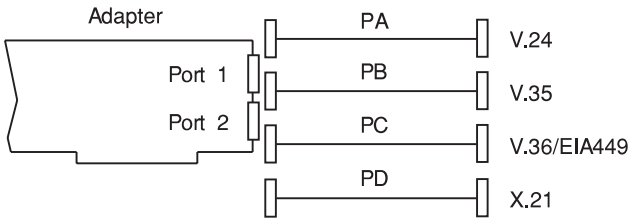
The following figure illustrates the X.25 Interface Co-Processor Adapter with attachment cables for each of the three supported interfaces. In order to make the necessary connections to this adapter, your setup person needs to know the type of network interface to be used.



Cable Letter	Cable Name/ Description	Part Number	Feature Code	Length	
				m	ft
Q	X.25 Attachment Cable-X.21	07F3150/07F3151 53F3926	2965	3	10
			2976	6	20
R	X.25 Attachment Cable-V.24	07F3160/07F3161 53F3927	2966	3	10
			2977	6	20
S	X.25 Attachment Cable-V.35	07F3170/07F3171 53F3928	2967	3	10
			2978	6	20

FC (2962) 2-Port Multiprotocol PCI Adapter

The following figure illustrates the 2-Port Multiprotocol PCI Adapter and attachment cables. The adapter has two ports one and two. Each port can handle all of the available protocols. See the first of this chapter and chapter 5 for cable building information.

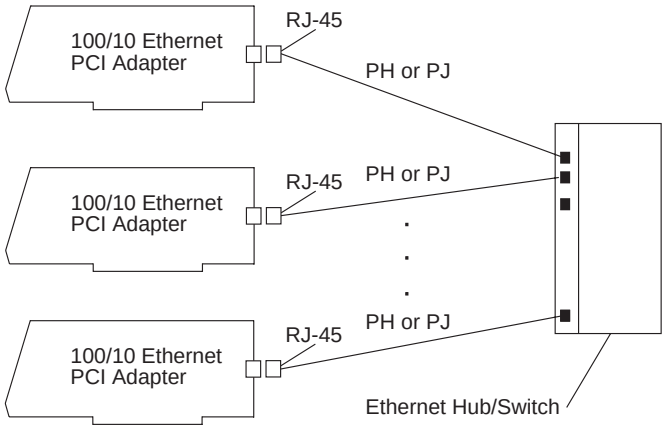


Cable Letter	Cable Name/ Description	Part Number	Feature Code	Length	
				m	ft
PA	V.24 if customer-supplied, must meet V.24 requirements	93H2899	2951	3	10
PB	V.35 if customer-supplied, must meet V.35 requirements	93H2900	2952	3	10
PC	V.36/EIA-449 if customer-supplied, must meet V.36/EIA-449 requirements	93H2901	2953	3	10
PD	X.21 if customer-supplied, must meet X.21 requirements	93H2902	2954	3	10

FC (2968) 10/100 Ethernet PCI Adapter

- For 10Mbps - Use unshielded, twisted-pair category 3, 4, or 5 cable. Category 5 is recommended. Maximum length is 100 meters.
- For 100Mbps - Use unshielded, twisted-pair category 5 cable only. Maximum length is 100 meters.

Twisted-pair (100/10BaseT) and Uses RJ-45 Connectors



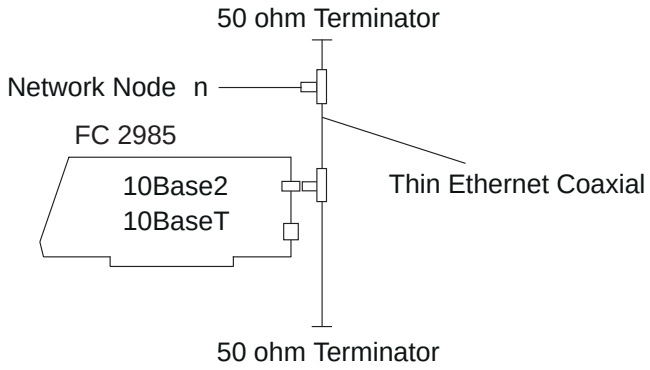
Cable Letter	Cable Name/ Description	Part Number	Feature Code	Length Meters
PH	Straight thru Ethernet cable - Customer supplied unshielded RJ-45 twisted-pair cable, must meet IEEE 802.3 requirements - This type of cable is typically used on switches, consult your manual	N/A	N/A	Maximum 100M
PJ	Crossover Ethernet cable - Customer-supplied RJ-45 unshielded twisted-pair cable, must meet IEEE 802.3 requirements- Refer to your Hub/Switch manual for proper cable type	N/A	N/A	Maximum 100M

Note: See cable building information in chapter five of this publication.

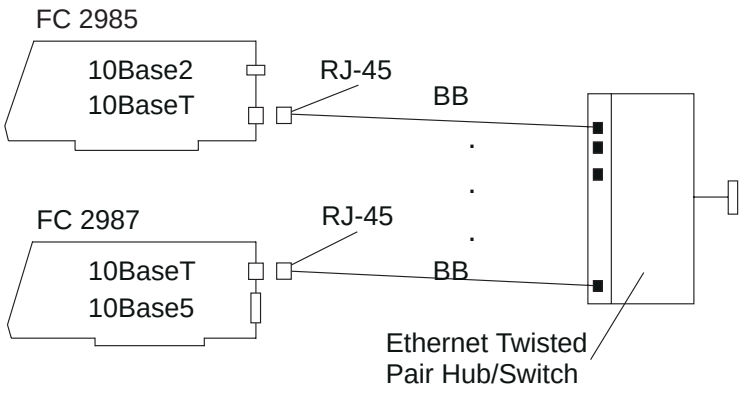
FC (2985, 2987) Ethernet PCI Adapter

The following figures illustrate the Ethernet Adapter with attachment cables.

The Thin (10Base2) BNC Connector is the Ethernet Standard Connector

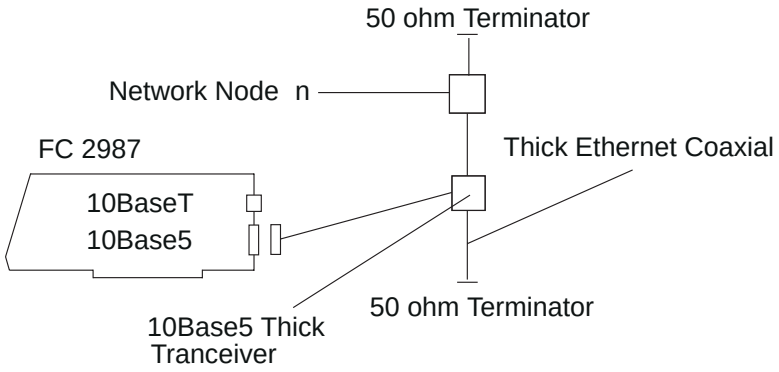


Twisted-pair (10BaseT) and Uses RJ-45 Connectors



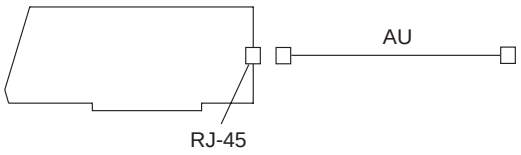
Cable Letter	Cable Name/ Description	Part Number	Feature Code	Length
BB	Customer-supplied RJ-45 unshielded twisted-pair cable, must meet IEEE 802.3 requirements	N/A	N/A	N/A

The Thick (10Base5) Connector is the Ethernet Standard Connector



FC (2998) TURBOWAYS 25 ATM PCI Adapter

The following figure illustrates the TURBOWAYS 25 ATM PCI Adapter with an attachment cable for the TURBOWAYS 25 ATM LAN.



Cable Letter	Cable Name/ Description	Part Number	Feature Code	Length	
				m	ft
AU	RJ-45 to RJ-45 shielded Twisted Pair (STP) cable, two twisted pairs of STP cabling (Customer supplied)	N/A	N/A	100	325
AU	RJ-45 to RJ-45 Unshielded Twisted Pair (UTP) cable, two twisted pairs of UTP cabling (Customer supplied)	N/A	N/A	100	325

FC (6215 and 6218) SSA Subsystems Attaching to SSA Adapters

Use this section when connecting SSA subsystem units as follows:

- MT 7133 Models 010, 020, 500, and 600
- MT 7131 Model 405

to SSA Adapters such as the PCI SSA Multi-Initiator/RAID EL RAID Adapter or to the PCI SSA 4-Port RAID Adapter.

Introduction to SSA Cabling

This section provides the configuration rules for each SSA adapter, a general introduction to SSA cabling, and details of the SSA cables.

The installation and service manuals for each SSA subsystem unit have more information that relates to connecting that unit; those manuals contain cabling details for sample configurations that meet the simplest requirements. Marketing representatives have information on more complex configurations for installations where performance or availability are particularly important.

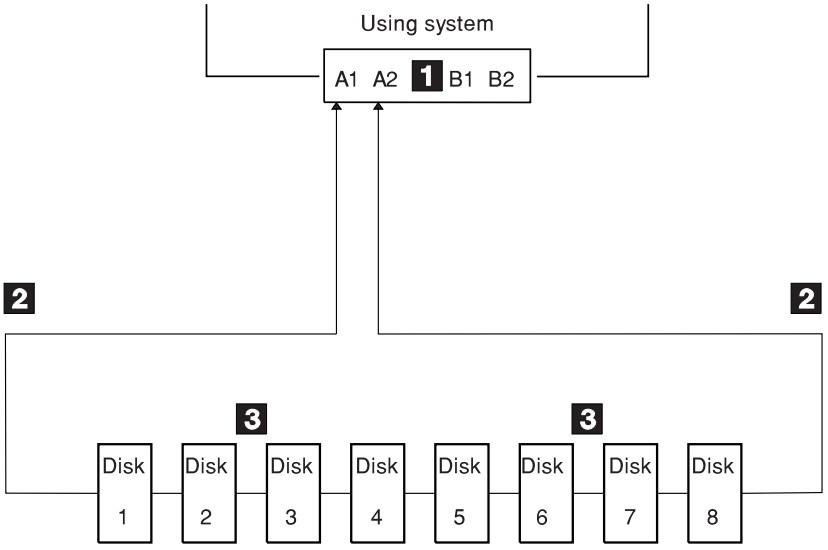
SSA Loops, Links, and Data Paths: In the simplest SSA configuration, SSA devices are connected through two or more SSA links to an SSA adapter that is located in a using system. The devices, SSA links, and SSA adapter are configured in loops. Each loop provides a data path that starts at one connector of the SSA adapter and passes through a link (SSA cable) to the devices. The loop continues through the devices and returns through another link to a second connector on the SSA adapter.

The maximum permitted length for an external copper cable that connects two SSA nodes (disk drives or adapters) is 25 meters (82 feet).

Nodes that have the fibre-optic extender feature can be connected by fiber optic cable over a maximum permitted length of 2.4 kilometers (7874 feet).

All devices that are attached to an SSA adapter **1** are connected through SSA links **2**. Data and commands to a particular device pass through all other devices in the loop between the adapter and the target device.

Data can travel in either direction round a loop. The adapter can, therefore, access the devices **3** through two data paths. The using system cannot detect which data path is being used.



If a disk drive fails or is turned off, the loop is broken. At this point one of the data paths to each disk drive is no longer available. The other disk drives continue to work through the remaining data path, but an error is reported to the system.

Rules for SSA Loops: For SSA loops that include the PCI SSA 4-Port RAID Adapter (FC 6218, type 4-J), the following rules apply:

- Each SSA loop must be connected to a valid pair of connectors on the SSA adapter (that is, either connectors A1 and A2, or connectors B1 and B2).
- A maximum of 48 devices can be connected in a particular SSA loop.
- Only one pair of adapter connectors can be connected in a particular SSA loop.
- Ports B1 and B2 have two sets of connectors. There is an internal B1, B2 pair and an external B1, B2 pair. Only one pair of these loop connectors can be used at a time.

For SSA loops that include the PCI SSA Multi-Initiator/RAID EL Adapter (FC 6215, type 4-N), the following rules apply:

- Each SSA loop must be connected to a valid pair of connectors on the SSA adapter (that is, either connectors A1 and A2, or connectors B1 and B2).
- A maximum of 48 devices can be connected in a particular SSA loop.
- If the fast-write cache or RAID functions of the adapter are used, no other adapter can be connected in an SSA loop with this adapter.
- If the fast-write cache or RAID functions of the adapter are not used, a second PCI SSA Multi-Initiator/RAID EL adapter (or a Micro Channel SSA Multi-Initiator/RAID EL Adapter) can be connected in the loop.
- Ports B1 and B2 have two sets of connectors. There is an internal B1, B2 pair and an external B1, B2 pair. Only one pair of these loop connectors can be used at a time.

SSA Cables for MT 7133 Models 010, 020, 500, and 600

See “Rules for SSA Loops” on page 3-37 for information on setting up your system.

See “SSA Cables for 7133 Models D40 and T40” on page 3-48 for cabling 7133 models D40 and T40.

Important: The following SSA cables are available as features of the 7133 models 010, 020, 500, and 600:

Part Number	Feature Code	Length	
		m	ft
07H9163	5002 (See note)	0.18	0.6
31H7960	5006 (See note)	0.6	1.9
07H8985	5010	1.0	3.3
32H1465	5025	2.5	8.2
88G6404	5050	5.0	16.4
32H1466	5100	10	32.8
88G6406	5250	25	82.0
Note: For Models 010 and 500 only			

SSA Cabling for MT 7133 Models 010 and 020: If you order one or more 7133 Model 010 or 020 units as part of a new system, some cables are supplied with each 7133 unit. These cables might be connected to the unit, the adapter, or both. The cables supplied depends on the number of disk drives that are installed in the 7133 unit. The following SSA Cables are Provided with a 7133 Model 010 or 020:

Number of Disk Drives	Number of Cables	Part Number	Feature Code	Length	
				m	ft
1 through 4	2	88G6404	5050	5.0	16.4
5 through 8	2	88G6404	5050	5.0	16.4
	1	07H8985	5010	1.0	3.3
9 through 12	2	88G6404	5050	5.0	16.4
	1	07H8985	5010	1.0	3.3
	1 (Model 010 only)	07H9163	5002	0.18	0.6
13 through 16	2	88G6404	5050	5.0	16.4
	2	07H8985	5010	1.0	3.3
	1 (Model 010 only)	07H9163	5002	0.18	0.6

Some of these cables might have to be disconnected and discarded when the system is installed.

SSA Cabling for MT 7131 Model 405

This section provides information on cabling for 7131 model 405 to the PCI SSA 4-Port RAID Adapter or the PCI SSA Multi-Initiator/RAID EL Adapter.

See “Rules for SSA Loops” on page 3-37 for information on setting up your system.

Pages 3-41 and 3-42 show two configurations for SSA subsystems using 7131 units.

Attention: When you connect the SSA cables to a 7131 unit, always connect them as specified in the diagram; this enables operators and service representatives to identify the disk drives more easily.

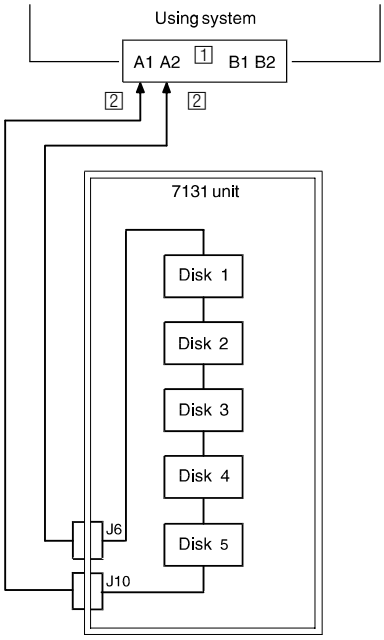
Important: All of the feature codes listed for the SSA Copper Cables (item **2**) in the following table are feature codes of machine type 7131.

Item	Description	Part Number	Feature Code	Length	
				m	ft
1	PCI SSA 4-Port RAID Adapter	32H3835	6218 feature of system unit	N/A	N/A
1	PCI SSA Multi-Initiator/RAID RAID EL Adapter	96H9938	6215 feature of system unit	N/A	N/A
2	SSA Cable, 7131 to Adapter	07H8985	2895*	1.0	3.3
		32H1465	2896	2.5	8.2
		88G6404	2897	5.0	16.4
		32H1466	2898	10	32.8
		88G6406	2899	25	82.0

Base Configuration

A 7131 unit base configuration includes two disk drive carrier assemblies. These carrier assemblies are installed in the lower two slots of the 7131 unit. The other 3 disk drive positions contain dummy disk drive carrier assemblies.

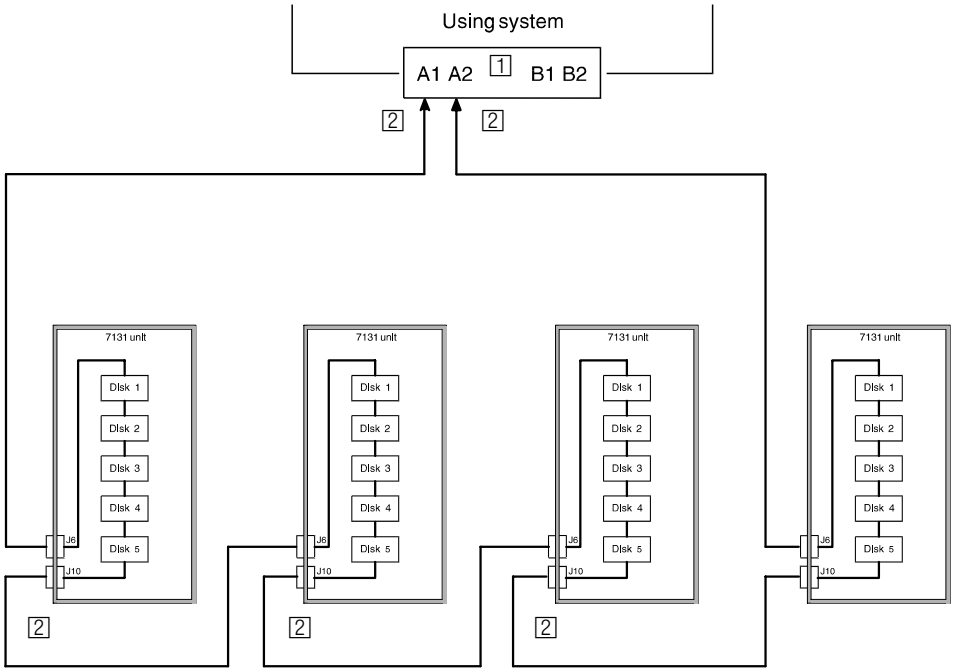
In the simplest configuration, the SSA loop is completed by connecting the two SSA connectors on the 7131 unit to one of the two pairs of connectors on an SSA adapter card in the using system:



Note: The cables shown in the diagram above are described on page 3-40.

Loop Configuration using Four 7131 Units

All 20 disk drive carrier assemblies in the four full 7131 units are connected in a single loop.



For a higher-availability configuration, a second SSA adapter can be included in the loops.

Note: The cables shown in the diagram above are described on page 3-40.

Cabling SSA Adapters Using External Cables to Internal Devices

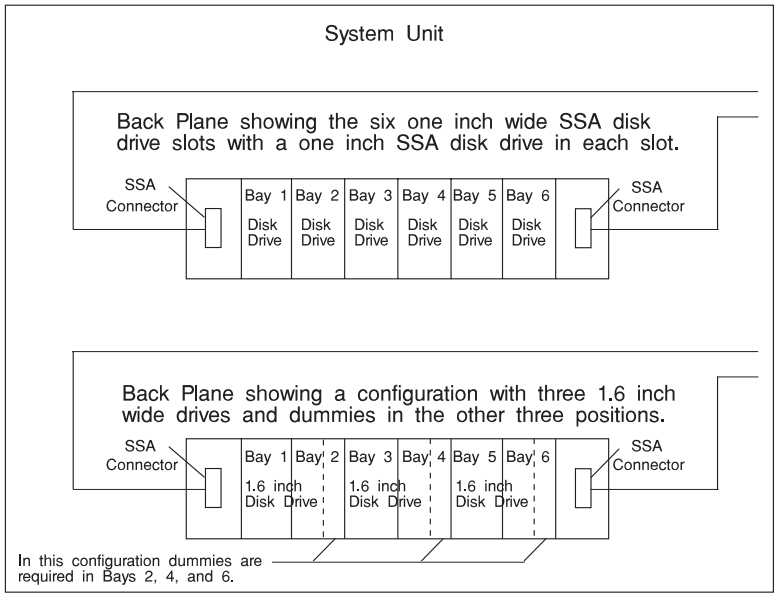
Review this section to connect the PCI SSA 4-Port RAID adapter's, or the PCI SSA Multi-Initiator/RAID EL adapter's, external ports to internal SSA disk drives.

Some system units have a pair of SSA bulkhead connectors at the rear of the system unit. The bulkhead connectors allow a pair of the SSA adapters external ports to be used to support internal SSA devices. This configuration is used when it is necessary to support both internal and external SSA disk drives on a single pair of SSA ports.

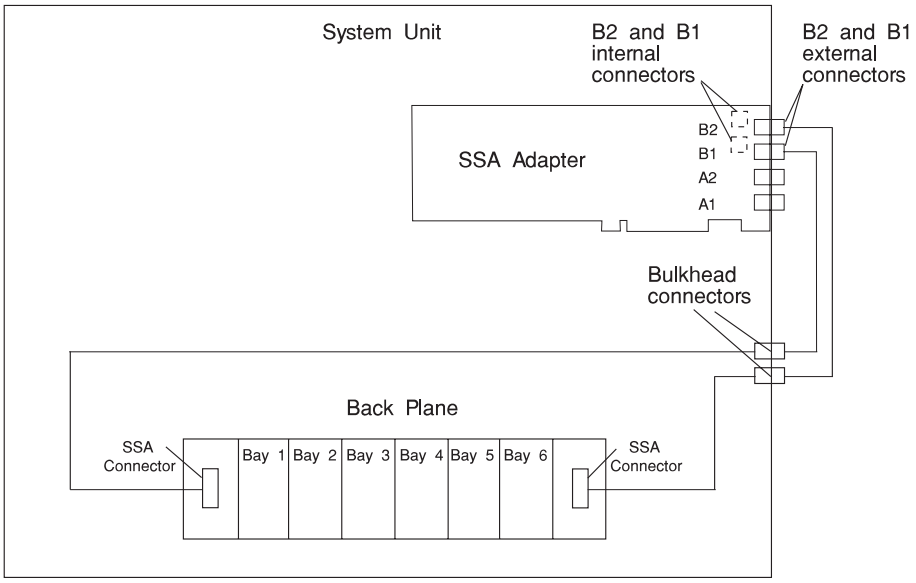
A pair of SSA ports A1 and A2 or B1 and B2 can support a maximum of 48 SSA disk drives.

For more detailed information on cabling the SSA subsystem, see "FC (6215 and 6218) SSA Subsystems Attaching to SSA Adapters" on page 3-36 in this publication.

Internal SSA Back Planes: The internal SSA back planes can support up to 18 one inch SSA drives. The back planes are shown with six one inch wide bays or SSA drives. When 1.6 inch SSA drives are used only three drives can be installed (each drive takes two bays) and a dummy is required in each of the three unused bays to complete the loop. See the illustration below.



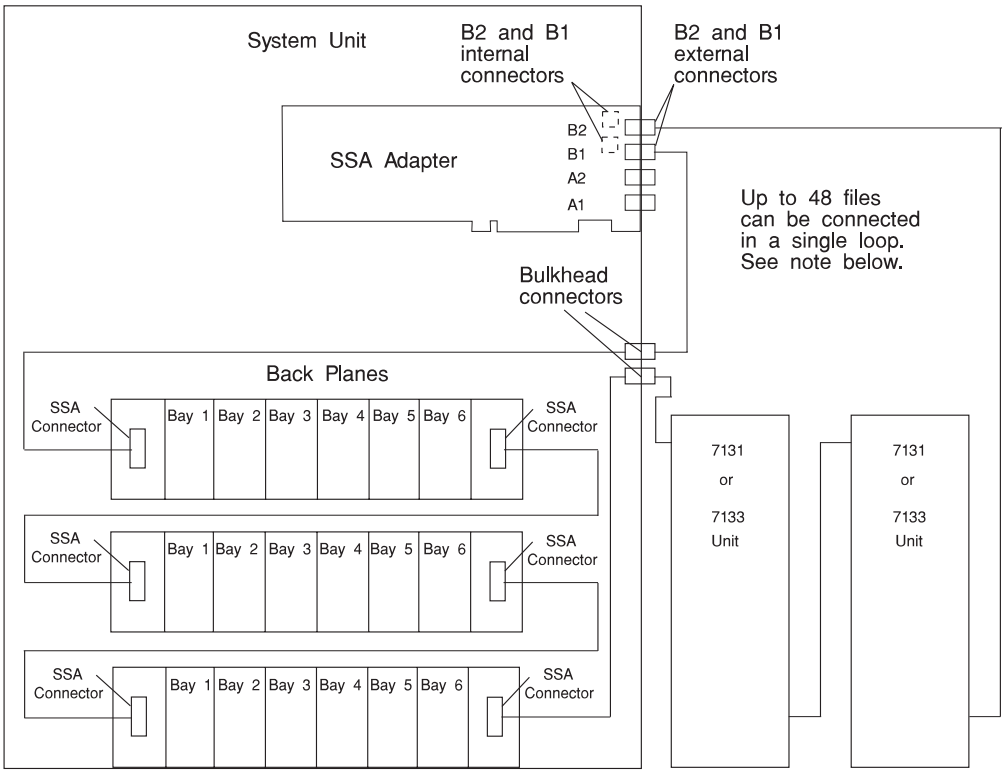
Simple SSA Loop to Internal SSA Drives: The illustration below shows a simple loop configuration using two short (0.6m or 2ft. P/N 93H4340) external cables from the SSA adapters external ports to the bulkhead connectors.



Note:

- The cables required to cable up SSA subsystems are described on page 3-40.
- When cabling to external cable pair B1 and B2, insure that the internal cable pair B1 and B2 are not being used. These port pairs are mutually exclusive. They cannot be used at the same time.

SSA Loop to Internal and External SSA Drives: The illustration below shows a configuration using both internal and external SSA disk drives to form the SSA loop. The external SSA devices can be installed in any combination of 7131 model 405 or 7133 external SSA subsystem storage units.



Note:

- A pair of SSA ports can support up to 48 disk drives. Two to 18 can be internal and remainder can be external. Two 7131/7133 disk drive units are shown in the illustration above. Several can be cabled together until a total of 48 disk drives are in a single SSA loop.
- The cables required to cable up SSA subsystems are described on page 3-40.
- When cabling to external cable pair B1 and B2, insure that the internal cable pair B1 and B2 are not being used. These port pairs are mutually exclusive, that is they cannot be used at the same time.
- For information on cabling the internal SSA back planes to the internal connectors on the SSA adapter, see your System Unit User's Guide.

FC (6218) Attaching SSA Subsystems MT 7133 Models D40 and T40 to an SSA Adapter

Use this section when connecting SSA subsystem units as follows:

- MT 7133 Models D40 and T40

to the PCI SSA 4-port RAID Adapter.

Introduction to SSA cabling

This section provides the configuration rules for SSA adapter FC 6218, a general introduction to SSA cabling, and details of the SSA cables.

The installation and service manuals for each SSA subsystem unit have more information that relates to connecting that unit; those manuals contain cabling details for sample configurations that meet the simplest requirements. Marketing representatives have information on more complex configurations for installations where performance or availability are particularly important.

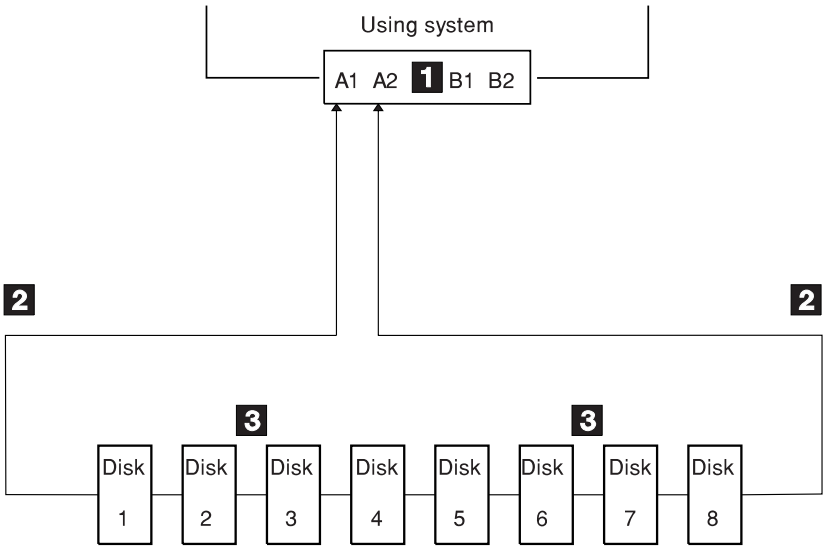
SSA Loops, Links, and Data Paths: In the simplest SSA configuration, SSA devices are connected through two or more SSA links to an SSA adapter that is located in a using system. The devices, SSA links, and SSA adapter are configured in loops. Each loop provides a data path that starts at one connector of the SSA adapter and passes through a link (SSA cable) to the devices. The loop continues through the devices and returns through another link to a second connector on the SSA adapter.

The maximum permitted length for an external copper cable that connects two SSA nodes (disk drives or adapters) is 25 meters (82 feet).

Nodes that have the fibre-optic extender (feature code 8851 on MT 7133) feature can be connected by fiber optic cable over a maximum permitted length of 5 kilometers (16400 feet).

All devices that are attached to an SSA adapter card **1** are connected through SSA links **2**. Data and commands to a particular device pass through all other devices in the loop between the adapter and the target device. Use the illustration below and the cables shown in the table on page 3-48

Data can travel in either direction round a loop. The adapter can, therefore, access the devices **3** through two data paths. The using system cannot detect which data path is being used.



If a disk drive fails or is turned off, the loop is broken. At this point one of the data paths to each disk drive is no longer available. The other disk drives continue to work through the remaining data path, but an error is reported to the system.

Rules for SSA Loops: For SSA loops that include the PCI SSA 4-Port RAID Adapter (FC 6218, type 4-J), the following rules apply:

- Each SSA loop must be connected to a valid pair of connectors on the SSA adapter (that is, either connectors A1 and A2, or connectors B1 and B2).
- A maximum of 48 devices can be connected in a particular SSA loop.
- Only one pair of adapter connectors can be connected in a particular SSA loop.
- Ports B1 and B2 have two sets of connectors. There is an internal B1, B2 pair and an external B1, B2 pair. Only one pair of these loop connectors can be used at a time.

SSA Cables for 7133 Models D40 and T40

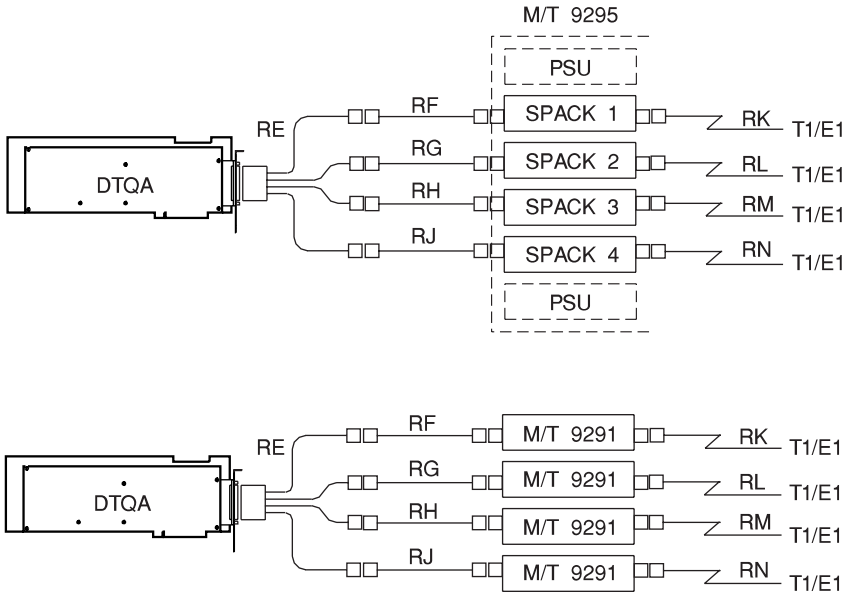
This section provides information on cabling for the 7133 Models D40 and T40 SSA disk drive subsystems, to the PCI SSA 4-Port RAID adapter.

See “Rules for SSA Loops” on page 3-47 for information on setting up your system.

Important. The following SSA cables are available as features of the MT 7133 Models D40 and T40:

Part Number	Feature Code	Length	
		m	ft
02L7445	8801	1.0	3.3
02L7446	8802	2.5	8.2
02L7447	8805	5.0	16.4
02L7448	8810	10	32.8
02L7449	8825	25	82.0

FC (6309) Digital Trunk Quad PCI Adapter



Cable Letter	Cable Name/ Description	Part Number	Feature Code	Length m	Length ft
RE	Quad Cable	10J2560	None	0.3	1
RF, RG, RH, RJ	SPACK	34F0873	None	2	6
RK, RL, RM, RN	T1	54F0740	None	15	45
	E1 120 ohms	05F2045	None	2	6
	E1 75 ohms	58G6195	None	1.5	7.5

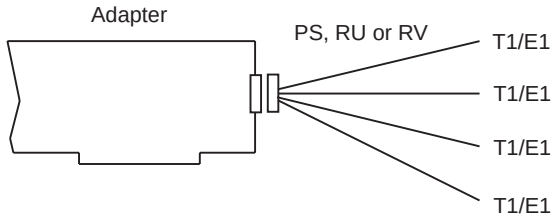
FC (6310) IBM ARTIC960RxD Quad Digital Trunk PCI Adapter

The IBM ARTIC960RxD Quad Digital Trunk PCI Adapter has both internal and external Cables.

IBM ARTIC960RxD Quad Digital Trunk PCI Adapter External Cables

The IBM ARTIC960RxD Quad Digital Trunk PCI Adapter external cable assemblies consist of a 36-pin male connector at one end of a cable that branches into four individual cables, each of which connects to an independent T1 or E1 digital trunk interface.

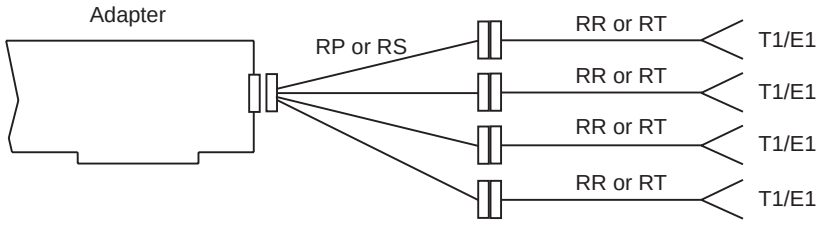
The following figure illustrates the IBM ARTIC960RxD Quad DTA with a 4-port T1/E1 cable.



Cable Letter	Cable Name/ Description	Part Number	Feature Code	Length	
				m	ft
PS	T1, RJ-48 cable	87H3518	2709	1.8	6
	E1, RJ-48 cable	87H3515	2710	1.8	6
RU	E1, 75 ohm Unbalanced/Grounded	87H3521	2875	1.8	6
RV	E1, 75 ohm Unbalanced/Ungrounded	87H3629	2876	1.8	6

The only difference between Cables RU and RV is that cable RU has the outer coax shields of BOTH transmit and receive cables connected to frame ground in the 36-pin connector whereas cable RV has ONLY the transmit coax cable shields connected to ground. To avoid earth loops, it is recommended that only one end of each coax cable shield should be connected to frame ground and that this should be done at the transmit end of each cable. Note: Transmit at the Quad DTA end becomes Receive at the other end of the cable and vice-versa. Cable RU should be used only when both cables are ungrounded at the network end. Other cable configurations (TX ungrounded, RX ungrounded and TX ungrounded, RX grounded) can only be handled with a custom-made cable.

The following figure illustrates the IBM ARTIC960RxD Quad DTA with a 4-port T1/E1 cable and a T1/E1 extension cable.



Cable Letter	Cable Name/ Description	Part Number	Feature Code	Length	
				m	ft
RP	T1, 100 ohm Balanced	87H3793	2871	3	10
RR	T1, 100 ohm Balanced Extension	87H3791	2872	15	50
RS	E1, 120 ohm Balanced	87H3790	2873	3	10
RT	E1, 120 ohm Balanced Extension	05F2045	2874	7.5	25

Note:

If it is necessary to connect Cable RT to telecommunications equipment which provides Insulation Displacement Connectors (IDC), this should be done using a terminal block which allows a short length of IDC-compatible solid cored cable to be added to the end of Cable RT. Suitable terminal blocks are available from AMP as part numbers AMP-601716-4 and 601717-4.

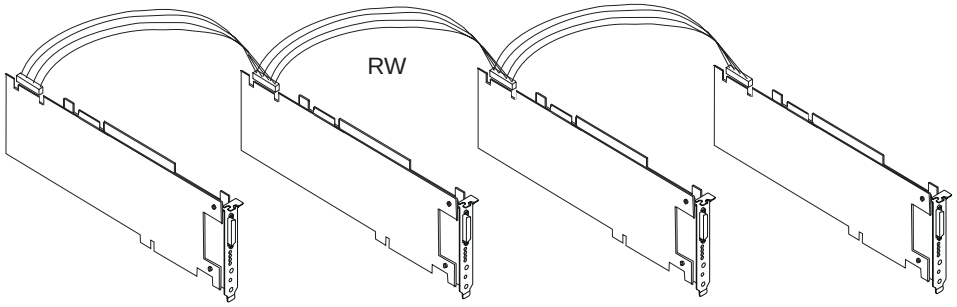
IBM ARTIC960RxD Quad Digital Trunk PCI Adapter Internal Cabling

Multi-drop cable assemblies are used to connect the internal busses on up to four Quad Digital Trunk PCI Adapters. There are three top card cables, RW, RX and RY. RW is used to connect multiple IBM ARTIC960RxD Quad DTAs to each other as well as other adapters with H.100 connectors, see below. Cables RX and RY are used to connect Quad DTAs or other adapters that have H.100 connectors as well as adapters that have SC-Bus connectors, see the following two pages.

These cables are just long enough to connect four adapters that support H.100 connectors in adjacent slots.

H.100, 4-Drop Cabling: The IBM ARTIC960RxD Quad DTAs have H.100 top card connectors.

The following figure illustrates the internal cabling for the IBM ARTIC960RxD Quad DTAs with the H.100 top card connectors cabled together. Up to four IBM ARTIC960RxD Quad DTAs are supported and must be in adjacent slots.

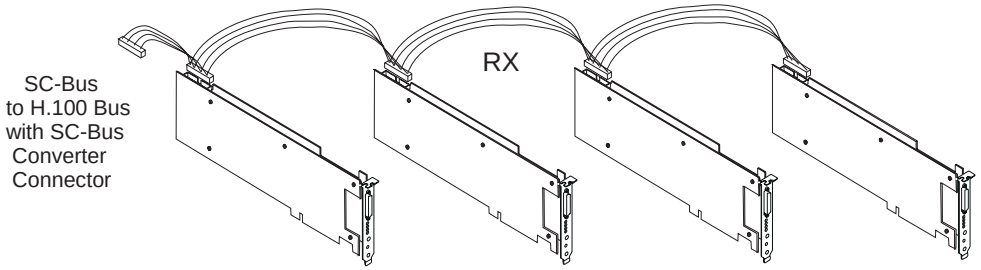


H.100, 4-Drop Ribbon Cabling

Cable Letter	Cable Name/ Description	Part Number	Feature Code	Length	
				m	ft
RW	H.100, 4-drop Internal Cable	08L1215	2877	0.127	0.417

SC-Bus, 5-Drop Cable: This Multi-drop cable assembly is used to connect up to four adapters with SC-Bus internal connectors. It has an additional SC-Bus connector which connects to cable RY. See “H.100, 4-Drop Cable With SC-Bus Converter Connector” on page 3-54. This allows adapters with SC-Bus connectors to be used with the IBM ARTIC960RxD Quad DTAs and with other adapters that have H.100 top card connectors.

The following figure illustrates the internal cabling for up to four adapters with SC-Busses and an additional SC-Bus connector which goes to the H.100 4-drop Cable with SC-Bus converter connector.

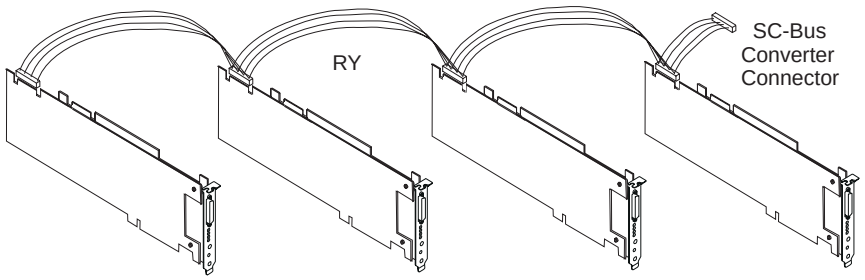


SC-Bus, 5-Drop Cable

Cable Letter	Cable Name/ Description	Part Number	Feature Code	Length	
				m	ft
RX	SC-Bus, 5-Drop cable	08L1217	2878	0.176	0.58

H.100, 4-Drop Cable With SC-Bus Converter Connector: This Multi-drop cable assembly is used to connect the internal busses on up to four IBM ARTIC960RxD Quad DTAs with H.100 connectors. It has an additional connector to connect to cable RX. See “SC-Bus, 5-Drop Cable” on page 3-53. This allows adapters with SC-Bus connectors to be used with the IBM ARTIC960RxD PCI Adapters and other adapters that have H.100 connectors.

The following figure illustrates the internal cabling for up to four IBM ARTIC960RxD Quad DTAs with an additional connector to the SC-Bus 5-drop cable with SC-Bus converter connector.



H.100, 4-Drop cable with SC-Bus Converter Connector

Cable Letter	Cable Name/ Description	Part Number	Feature Code	Length	
				m	ft
RY	H.100, 4-Drop Cable with SC-Bus Converter Connector	08L1219	2879	0.176	0.58

Note: This cable is referred to as the Four-drop, H.100 Cable with SC-Bus Converter in other publications associated with this cable.

Chapter 4. SCSI Cabling

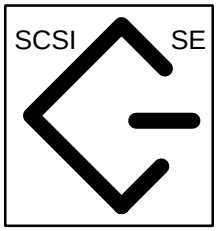
This chapter describes the cabling for SCSI Adapters and Devices used with the system.

Description of the SCSI Cable Information

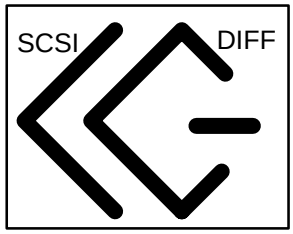
The following sections describe the cabling, termination, and addressing for all SCSI adapters. There are many descriptions describing how to cable various adapters to the SCSI devices.

Note: The end brackets of non-OEM SCSI-2 differential adapters carry the label, “Differential.”

OEM SCSI-1 or SCSI-2 single-ended and SCSI-2 differential adapters may carry one of the following ANSI icons:



Single-Ended



Differential

How to Find the 5% You Need to Know

The following SCSI cable section contains lots of information on all of the SCSI Adapters, cables, terminators and SCSI rules. If all you want to do is attach one SCSI device to a SCSI adapter, you do not need all of this information and you can follow the quick procedure below. If you are attaching more than one device to an adapter, you need to read the entire general section and all of the detail section for the SCSI adapter so you understand all of the adapter rules.

QUICK Procedure to attach one device.

- Go to table "External SCSI Devices" on page 4-4 and look up the device you want to attach. Make a note of its characteristics.
- Go to table "Cabling SCSI Devices" on page 4-3 and in the first column look up the adapter to which you want to attach the device. (Note: You cannot attach single-ended (SE) devices to differential adapters or visa-versa). Note the page number from the first column.
- Go to the page for the selected adapter and continue forward until you come to the "Adapter-to-First Device Cable Table." Look up the cable you need. Both the feature code and part number are provided. The machine type (MT) column tells you if the cable is ordered with the system or with the device.

Example: You want to attach a 7204-010 external 1GB disk drive.

- From the table "External SCSI Devices" on page 4-4, you record that the 7204-010 is an 8-bit, single-ended dual connector device.
- You decide to connect this device to the PCI SCSI-2 Fast /Wide adapter. From "Cabling SCSI Devices" on page 4-3, you see that the cabling information for this adapter starts on "Cabling the PCI SCSI-2 Fast/Wide Single-Ended Adapter FC 2408/6208" on page 4-9.
- You go to "Cabling the PCI SCSI-2 Fast/Wide Single-Ended Adapter FC 2408/6208" on page 4-9 and continue to the "Adapter-to-First Device Cables" on page 4-10. From this table you choose feature code 2111 which is the cable to attach an 8-bit device which has 2 connectors.
- From the MT column, you know to order that feature code against the host system.

Note: The terms SCSI IDs and SCSI addresses are used interchangeably in the publication.

Cabling SCSI Devices

The table below shows where in this section to look for information on cabling specific SCSI configurations:

Note: To understand the cabling for the SCSI adapers read “General SCSI Considerations” on page 4-5, and then refer to the sections described in the table for information on specific SCSI cabling configurations.

Reference and Page	ID	Type	Label
“Cabling the PCI SCSI-2 Fast/Wide Single-Ended Adapter FC 2408/6208” on page 4-9	SCSI-2	Single-ended	4-A 4_A
“Cabling the PCI Single-Ended Ultra SCSI Adapter FC 6206” on page 4-19	SCSI	Single-ended	4-K
“Cabling the PCI SCSI-2 Fast/Wide Differential Adapter FC 2409/6209” on page 4-28	SCSI-2	Differ-ential	4-B 4_B
“Cabling the PCI Differential Ultra SCSI Adapter FC 6207” on page 4-44	SCSI	Differ-ential	4-L
“Cabling the PCI SCSI-2 F/W RAID Adapter FC 2493” on page 4-60	SCSI-2	Single-ended	4-H

External SCSI Devices

The table below shows some characteristics of some External SCSI Devices:

Machine Type / Model	Bus Width	SE or Diff	Connectors
7203 - 001 7204 - 001 7204 - 010 7204 - 112	8 Bit 8 Bit 8 Bit 16 Bit	Single-ended Single-ended Single-ended Single-ended	Single Single Dual Dual
7204 - 113 7204 - 114 7204 - 139	16 Bit 16 Bit 16 Bit	Single Ended Single Ended Single Ended	Dual Dual Dual
7204 - 215 7204 - 315 7204 - 317 7204 - 320	8 Bit 16 Bit 16 Bit 8 Bit	Differential Differential Differential Single-ended	Dual Dual Dual Single
7204 - 325 7204 - 339 7206 - 001 7206 - 005 7207 - 001	16 Bit 16 Bit 8 Bit 8 Bit 8 Bit	Differential Differential Single-ended Single-ended Single-ended	Dual Dual Dual Dual Single
7207 - 011 7207 - 012 7207 - 315 7208 - 001 7208 - 011 7208 - 341	8 Bit 8 Bit 16 Bit 8 Bit 8 Bit 16 Bit	Single-ended Single-ended Differential Single-ended Single-ended Differential	Single Single Dual Single Single Dual
7209 - 001 7209 - 002 7209 - 003 7210 - 001 7210 - 005	8 Bit 8 Bit 8 Bit 8 Bit 8 Bit	Single-ended Single-ended Single-ended Single-ended Single-ended	Single Dual Dual Single Dual
7210 - 010 7210 - 015 7331 - 205 7331 - 305 7332 - 005	8 Bit 8 Bit 16 Bit 16 Bit 8 Bit	Single-ended Single-ended Differential Differential Single-ended	Dual Dual Quad Quad Dual
7131 - 105 7131 - 105	16 Bit 16 Bit	Single-ended Differential	Single Dual
7336 - 205	16 Bit	Differential	Quad

General SCSI Considerations

SCSI Terminators

- There must be exactly two terminators on the SCSI bus, and they must be located at each end of the bus.
- If the configuration consists of an adapter with external devices only, make sure the appropriate SCSI terminator is connected to the last device on the bus. Refer to the adapter installation guide for instructions on verifying proper jumper settings on the adapter.
- If the configuration consists of an adapter with internal devices only, make sure that the appropriate SCSI terminator is connected to the end of the internal SCSI cable. Refer to the adapter installation guide for instructions on verifying proper jumper settings on the adapter.
- If the configuration uses both internal and external devices, make sure that the appropriate SCSI terminator is connected to the last device on the external bus and that the end of the internal SCSI cable has been properly terminated. Refer to the adapter installation guide for instructions on verifying proper jumper settings on the adapter.
- Some devices may be shipped with terminators installed. These must be removed before adding a device onto an existing SCSI bus.

SCSI Bus Length General Guidelines

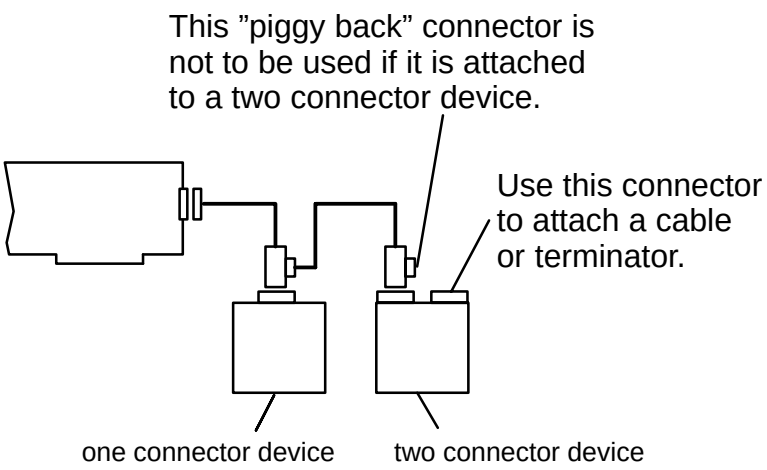
SCSI bus length is defined as the distance between terminators at either end of a SCSI bus. The SCSI specification allows for single ended SCSI bus configurations of up to 6 meters (approximately 20 feet). If a single ended configuration includes SCSI-2 Fast devices (devices that support data rates of up to 10MB/sec for 8-bit or 20MB/sec for 16-bit transfers), the maximum cable length allowed with the PCI SCSI-2 Fast/Wide adapter is limited to 3 meters (approximately 10 feet).

The maximum allowed cable length for differential SCSI bus configurations is 25 meters (approximately 80 feet).

- For configurations using both internal and external cabling length restrictions, refer to the length from the end of the internal cable (where the internal termination is located) to the terminator on the last device on the external bus.
- Devices which have two SCSI connectors have internal cabling which must be included when calculating total cable length. When attaching these devices to a SCSI chain, connect one cable to one connector and the other cable (or terminator if this is the last device on the bus) to the other connector. Do not

"piggy back" the second cable/terminator onto the first as you would with a device that had only one SCSI connector (see illustration below).

Single-Ended External Narrow Bus



- A dedicated adapter should be used for attachment of any external enclosure containing multiple SCSI devices.

SCSI Device Addresses

The SCSI-2 Fast/Wide adapters support a maximum of 16 SCSI addresses, including devices and adapters. The default address for an adapter is 7.

- All devices on the SCSI bus must have a unique SCSI ID.
- The SCSI bus address determines priority on the bus. Address priority from highest to lowest is as follows:
  - 7, 6, 5, 4, 3, 2, 1, 0, and 15, 14, 13, 12, 11, 10, 9, 8, with the 15 through 8 addresses being used in 16-bit configurations only.
  - Generally, the highest priority is assigned to the adapter.
- For any single-adapter, 8-bit configuration, a maximum of 7 devices are permitted, provided that the supported configuration specific bus lengths are not exceeded. For 16-bit configurations, a maximum of 15 devices are permitted, provided that the supported configuration specific bus lengths are not exceeded.
- The default ID of the SCSI adapter in a single adapter configuration is 7. All devices on that bus must have a unique ID from 0 to 6 (8 to 15 are also valid if SCSI-wide); two different devices may not have the same SCSI ID. In the high-availability configurations, the second adapter must have its address changed to avoid conflicts.

Note: The SCSI address switch for each device must be set while power to the system unit is off. The operating system determines the system configuration during IPL.

- If a SCSI address is changed after the operating system is loaded, the operating system must be stopped and loaded again to have the correct configuration.
- Standalone diagnostics always default to a SCSI ID of 7 when testing SCSI adapters and devices. Choosing SCSI IDs other than 7 for both adapters prevents problems when using standalone diagnostics on systems in HA clusters or in multi-initiator configurations.
- Check the documentation for your specific SCSI subsystem to insure that there are be no SCSI ID conflicts if the adapters are addressed at ID(s) other than 6 or 7.

SCSI Bus Width Guidelines

- Operation of both 8-bit and 16-bit devices on the same external SCSI bus is not supported due to termination and cabling restrictions.
- Operation of both 8-bit and 16-bit devices on the same internal bus is supported concurrently as long as a 16-bit internal cable and 68-pin to 50-pin interposers (for attachment of 8-bit devices) are used. The FRU part number for this interposer is 92F0324 (ASM P/N 92F2565).
- Mixed width internal attachment is supported concurrently with single width external attachment as long as maximum cable length restrictions are not exceeded.

Overload Protection and Terminator Power (TERMPWR)

The SCSI adapters provide TERMPWR for the SCSI bus; configure devices on the bus so that they do not provide TERMPWR.

The adapter uses a positive temperature coefficient (PTC) resistor to control TERMPWR on the bus - when an overload condition is sensed the PTC electrically "opens" and TERMPWR is no longer be present on the SCSI bus. The PTC resets within 5 minutes after removal of the cause for the overload condition.

The PTC may be tripped by a defective, miswired or improper cable, terminator, or device, but typically not by a defective adapter.

In general, do not connect or disconnect any SCSI device while power is on. Hot plugging of SCSI devices is not supported without specially designed connectors and chassis developed for that purpose, unless you first ensure that the SCSI bus is in an inactive (quiescent) state at the time of device attachment or detachment. To do otherwise may cause undetectable data errors.

Cabling the PCI SCSI-2 Fast/Wide Single-Ended Adapter FC 2408/6208

To understand the cabling for this adapter, read the “General SCSI Considerations” on page 4-5, then read the following for specific information.

SCSI-2 Single-Ended Cable Lengths Using This Adapter

The maximum supported cable length for configurations without any SCSI-2 Fast devices is 6 meters (approximately 20 feet).

If a configuration includes SCSI-2 Fast devices (devices that support data rates of up to 10MB/sec for 8-bit or 20MB/sec for 16-bit transfers) then the maximum cable length supported is 3 meters (approximately 10 feet).

The maximum length includes the internal cabling of any device that has two SCSI connectors.

- When connecting external devices, a maximum of 4 independent physical enclosures is allowed, provided each physical enclosure presents one device load to the SCSI bus. For example, a 7131-105 cannot be attached in combination with any other internal or external load, but up to four external devices such as the 7204-112 can be attached. If four external devices are attached and any one device is capable of SCSI-2 fast transfers, then total bus length is limited to 3 meters. In this case, the maximum bus length has been reached and therefore no additional external or internal devices can be attached to the SCSI bus.
- A single enclosure containing any amount of multiple SCSI device loads attached externally to this adapter is supported, but subject to the following restrictions:
  - Maximum combined internal and external cable length is 3 meters.
  - Loads on the cable (cable length between devices) must be 0.1 meters apart at a minimum.
  - No mixing of device widths (8-bit and 16-bit) unless the 68-pin to 50-pin interposer (PN 92F2565 or equivalent) is used.
  - SCSI-2 architectural restrictions (timing requirements and skew restrictions) must be observed.
  - No internal devices are allowed to be attached to the adapter. It is recommended that dedicated adapters be used for external SCSI enclosures that contain more than two devices.
- Only one multi-initiator (High-Availability) configuration is supported with this adapter. Refer to “Multi-Initiator SCSI-2 Fast/Wide Single-Ended Cabling” on page 4-16 for further details.

Cable and Terminator Tables for the PCI SCSI-2 Fast/Wide Single-Ended Adapter

Adapter-to-First Device Cables

M/T	F/C	Cable Description	Part Number	Cable Length (meters)
Host System	2111	Adapter-to-first device (where first device has two connectors), 8-bit narrow bus	06H6037	1.0
Host System	2113	Adapter-to-first device (where first device has one connector), 8-bit narrow bus	52G0174	1.5
Host System	2115	Adapter-to-first device (where first device has two connectors), 16-bit wide bus	06H6036	1.0
Host System	2117	16-bit Y-cable	52G0173	0.94

Note:

1. When cables are ordered by Feature Code, the appropriate terminator is included with the order. When cables are ordered by part number, only the cable is included. For terminator part numbers, refer to the table on page 4-11.
2. For this adapter the same cable can be used for either single-ended or differential attachments. The difference in Feature Code orders is the terminator type.
3. The external connector on this adapter is the SCSI-3 standard, 68-pin "P" cable connector. Many of the 16-bit SCSI devices also use this connector type, and as a result some cables can be used as either adapter-to-first device or device-to-device cables, depending upon what type of SCSI connectors are present on the devices.

Device-to-Device Cables

M/T	F/C	Cable Description	Part Number	Cable Length (meters)
SE External Device	2840	Device-to-device (where second device has two connectors), 8-bit narrow bus	33F4607	0.7
SE External Device	3130	Device-to-device (where second device has one connector), 8-bit narrow bus	31F4222	0.66
SE External Device	2860/ 9139	Device-to-device (where second device has two connectors), 16-bit wide bus	52G9921	0.3
SE External Device	2884/ 9160	Device-to-device (where second device has two connectors), 16-bit wide bus	52G4291	0.6
SE External Device	2883/ 9150	Device-to-device (where second device has two connectors), 16-bit wide bus	52G4233	2.5
7027 HST	2425			
7027 HST	3132	Device-to-device (where second device has two connectors), 16-bit wide bus	40H7351	6.0

Note:

1. Most feature codes for cables are only orderable against the attachment device (7204, 7206, 7208, etc). For some cables the feature codes have been made available on the system units in these cases the system feature code will be listed, otherwise the attachment device feature codes will be used.

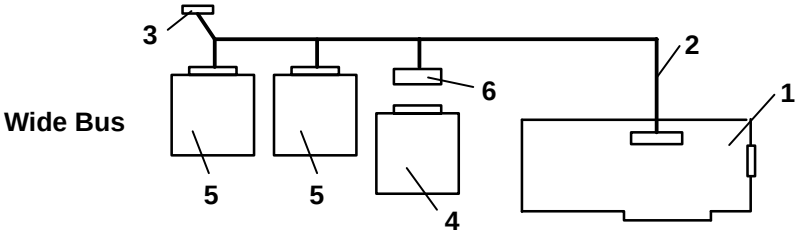
Terminators for Use With This Adapter

This adapter has on-board terminators that can be enabled or disabled by automatic sensing logic. This sensing logic can detect the presence or absence of external termination and enables or disables the on-card termination when needed. This automatic feature can also be disabled by jumpers on the adapter. Refer to the adapter installation guide for more information on jumpers and automatic termination detection logic.

M/T	F/C	Terminator Description	Part Number	Connector
SE External Devices	part of cable F/C	8-bit external FPT18C terminator	52G4260	50-pin low density
SE External Devices	part of cable F/C	16-bit external Boulay terminator	92F0432 (52G9907)	68-pin high density
SE Internal Cabling	part of cable F/C	16-bit internal bus terminator	92F0322 (92F2566)	68-pin high density

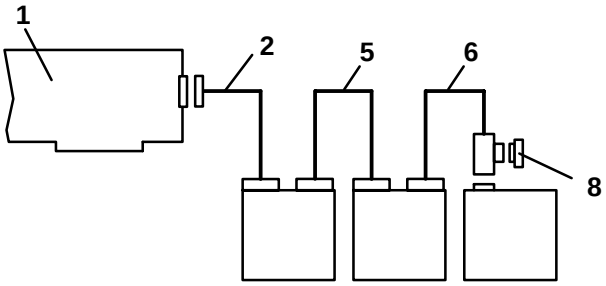
Cabling Examples for the PCI SCSI-2 Fast/Wide adapter

Single-Ended Internal

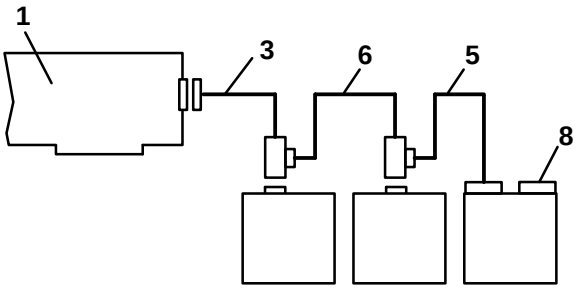


Item Number	Description
1	Adapter
2	Internal SCSI cable and terminator assembly (wide)
3	System Specific Terminator
4	Narrow device (50-pin connector)
5	Wide device (68-pin connector)
6	68-pin to 50-pin interposer FRU 92F0324 (ASM P/N 92F2565)

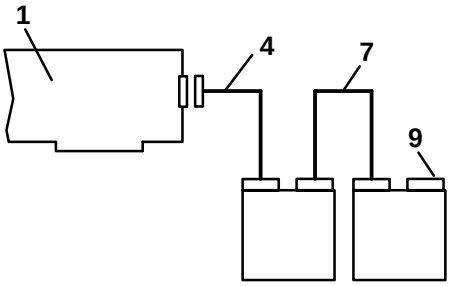
Single-Ended External Narrow Bus



or

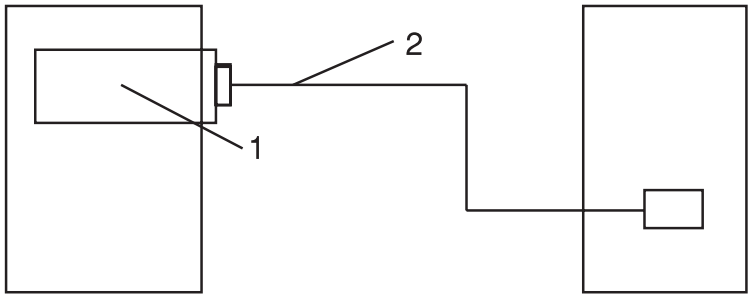


Single-Ended External Wide Bus



Item Number	Part Number	Description	Cable Length (meters)
1		Adapter	N/A
2	06H6037	Adapter-to-dual-connector device (narrow 8-bit)	1.0
3	52G0174	Adapter-to-single-connector device (narrow 8-bit)	1.5
4	06H6036	Adapter-to-dual-connector device (wide 16-bit)	1.0
5	33F4607	Device-to-dual-connector device (narrow 8-bit)	0.7
6	31F4222	Device-to-single-connector device (narrow 8-bit)	0.66
7	52G9921	Device-to-dual-connector device (wide 16-bit)	0.3
	52G4291		0.6
8	52G4260	Terminator (8-bit)	
9	92F0432	Terminator (16-bit)	

Special Cabling Considerations for the 7131 Single-Ended Interface



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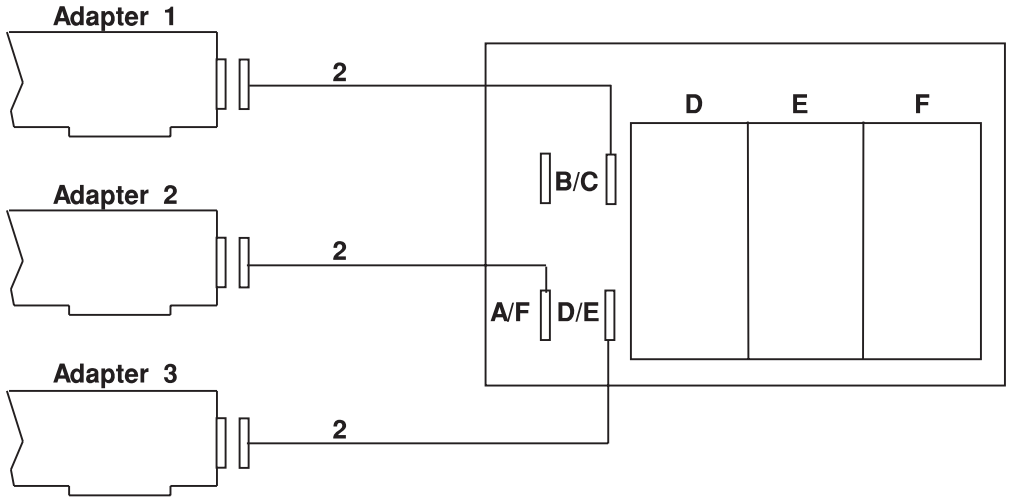
Item Number	Part Number	Description	Cable Length (meters)
1		SCSI-2 Fast/Wide Adapter	N/A
2	06H6036	Adapter-to-dual-connector device (16-bit)	1.0

Note: The single ended version of the 7131 cannot be connected to any other device. The SCSI terminator is built into the 7131.

Special Cabling Considerations for the 7027 - HSC Single-Ended Interface

The following figure shows the back of the 7027. Banks A, B, and C are on the front of the 7027.



Note: Up to three adapters can be connected as shown. The adapters are on different SCSI-Busses. This is not a multi-initiator setup.

- Adapter 1 controls Banks B and C.
- Adapter 2 controls Banks A and F.
- Adapter 3 controls Banks D and E.

Item Number	Part Number	Description	Cable Length (meters)
1		SCSI-2 Fast/Wide Adapter	NA
2	52G4233	Adapter-to-Dual-Connector device (16-bit)	2.5
	40H7351		6.0

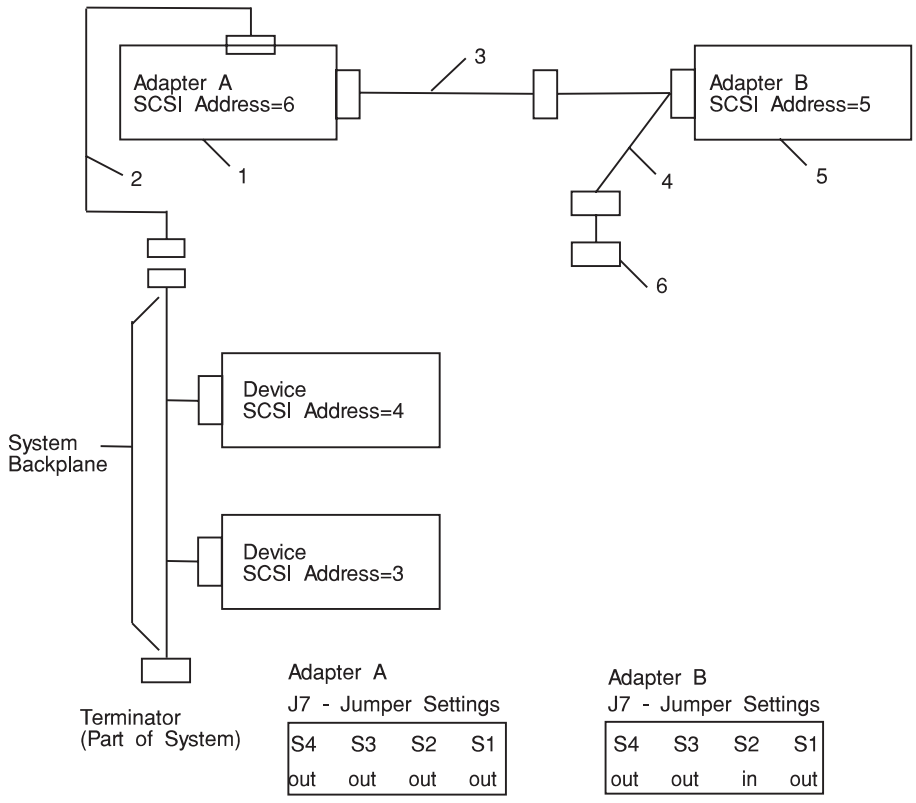
Multi-Initiator SCSI-2 Fast/Wide Single-Ended Cabling

The multi-initiator configuration has more than one SCSI adapter on the SCSI bus. The automatic sensing logic must be overridden by setting the individual jumpers S1, S2, S3, and S4 located on jumper block J7.

The automatic sensing logic, which controls the enablement or disablement of the built in terminators, works by detecting an external terminator on the external SCSI bus, or by detecting an internal terminator on the internal SCSI bus. This control logic cannot sense the built-in adapter terminators of another adapter on the SCSI bus. Therefore, you must specify to the adapters that external cabling is in use by moving the jumpers on J7.

This configuration also requires that you change the default SCSI ID of the additional adapter to something other than 7. All devices and adapters that share a SCSI bus must have a unique SCSI ID. The default SCSI ID setting on the adapter is modified by software. Refer to the software documentation for the operating system and device driver you are using to determine how to do this.

Attention: The following illustration shows the only supported hardware configurations for Multi-Initiator setups with this adapter. These configurations may not be supported by your software application. Be sure that your software application supports this configuration before you set up and use your system in this way. Only one adapter per system per SCSI bus is allowed.



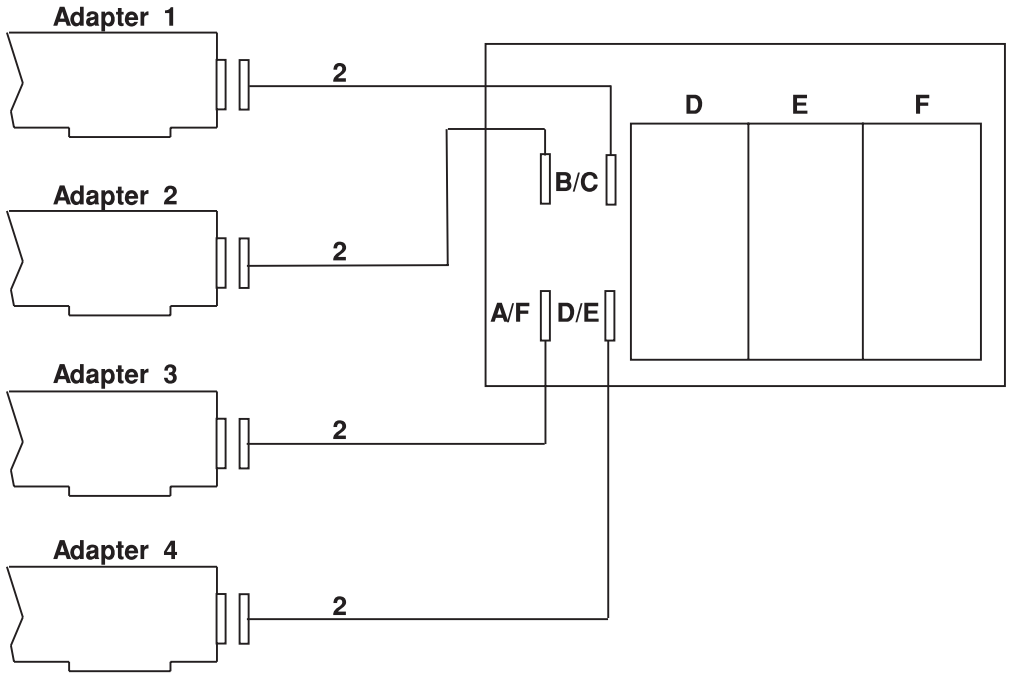
Attention: Adapters A and B must be in different host systems.

Item Number	Part Number	Description	Cable Length (meters)
1		Adapter	
2	06H6660	Internal Cable	1.0
3	06H6036	Adapter-to-dual connector device	1.0
4	52G0173	Y-cable	0.94
5		Adapter	
6	92F0432	Terminator	

Special Cabling Considerations for the 7027 - HSC Single-Ended Interface With the Twin Initiator Option

The following figure shows the back of the 7027. Banks A, B, and C are on the front of the 7027. Banks A and F are not used in the twin (multi) initiator option.

Attention: Only one adapter per system per SCSI bus is allowed.



Note:

- The top two connectors control banks B, and C (adapters 1, and 2 share the same SCSI bus). Adapters 1 and 2 must be in different host systems.
- The bottom two connectors control banks D, and E (adapters 3, and 4 share the same SCSI bus). Adapters 3 and 4 must be in different host systems.
- Banks A, and F are not available with this twin initiator configuration.

Item Number	Part Number	Description	Cable Length (meters)
1		SCSI-2 Fast/Wide Adapter	NA
2	52G4233	Adapter-to-Dual-Connector device (16-bit)	2.5
	40H7351		6.0

Cabling the PCI Single-Ended Ultra SCSI Adapter FC 6206

To understand the cabling for this adapter, read the “General SCSI Considerations” on page 4-5, then read the following for specific information.

SCSI Single-Ended Cable Lengths Using This Adapter

The maximum supported cable length for this adapter depends on what type of devices are attached (SCSI-1, SCSI-2 etc.) and where they are attached (to the internal or external connector). Device types are classified as:

- SCSI-1 - maximum transfer rate of 5 MB/sec (one byte transfers)
- SCSI-2 Fast - maximum transfer rate of 10 MB/sec (one byte transfers)
- SCSI-2 Fast Wide - maximum transfer rate of 20 MB/sec (two byte transfers)
- Ultra SCSI - maximum transfer rate of 20 MB/sec (one byte transfers)
- Ultra SCSI Wide - maximum transfer rate of 40 MB/sec (two byte transfers)

For this adapter:

- The maximum supported cable length for configurations without any SCSI-2 fast or ultra SCSI devices is 6 meters (approximately 20 feet).
- The maximum supported cable length for configurations that include SCSI-2 fast (but not ultra) is 3 meters (approximately 10 feet) with the exception of the 7027-HSC, which can be attached with up to 6 meters of cable.
- To ensure optimum signal quality for Ultra SCSI transfers, attachment of multiple Ultra SCSI devices is only recommended for devices mounted inside the system unit. This adapter has circuitry that can detect the the presence of a cable on the external connector, and the default configuration limits the SCSI bus speed to SCSI-2 fast and wide (20 MB/sec).
- To ensure optimum signal quality for Ultra SCSI transfers, it is recommended that only Ultra SCSI devices be attached to a backplane that is driven by a PCI Single-Ended Ultra SCSI adapter.

This default setting can be changed (via SMIT or the chdev command) to allow attachment of external Ultra SCSI devices, with the restriction that there are no SCSI devices attached to the internal connector.

Supported Ultra Configurations for This Adapter

- Internal Ultra devices running at Ultra speeds:
  - up to 6 ultra devices attached to the internal port (dependent on internal configuration and cabling)
  - No external attachments are allowed
- External Ultra devices running at Ultra speeds:
  - No internal attachments allowed
  - Up to 2 external Ultra wide (16-bit) devices can be attached to the external port. Maximum cable length must not exceed 3 meters.
  - Up to 2 external Ultra (8-bit) devices can be attached to the external port. Maximum cable length must not exceed 3 meters.
- Ultra and or SCSI-2 Fast devices running at SCSI-2 Fast speeds:
  - Up to 6 devices attached to the internal port (dependant on internal system configuration and cabling)
  - External attachment of up to 4 independant physical enclosures are allowed, provided each physical enclosure presents only one load to the SCSI bus. The total bus length must not exceed 3 meters. Total bus length includes internal and external cable length.
- Multiple SCSI-2 Fast devices in external enclosures:
  - No internal attachments allowed
  - Maximum combined internal (to enclosure) and external cable length is 3 meters
  - Loads on the cable must be 0.1 meters apart at a minimum (cable length between devices must be 0.1 meters apart at a minimum).
  - No mixing of bus widths (8-bit and 16-bit) unless the 68-pin to 50-pin interposer (PN 92F2565 or equivalent) is used.

Cable and Terminator Tables for the PCI Single-Ended Ultra SCSI Adapter

Adapter-to-First Device Cables

M/T	F/C	Cable Description	Part Number	Cable Length (meters)
Host System	2111	Adapter-to-first device (where first device has two connectors), 8-bit narrow bus	06H6037	1.0
Host System	2113	Adapter-to-first device (where first device has one connector), 8-bit narrow bus	52G0174	1.5
Host System	2115	Adapter-to-first device (where first device has two connectors), 16-bit wide bus	06H6036	1.0

Note:

1. When cables are ordered by Feature Code, the appropriate terminator is included with the order. When cables are ordered by part number, only the cable is included. For terminator part numbers, refer to the table on page 4-23.
2. For this adapter the same cable can be used for either single-ended or differential attachments. The difference in Feature Code orders is the terminator type.
3. The external connector on this adapter is the SCSI-3 standard, 68-pin "P" cable connector. Many of the 16-bit SCSI devices also use this connector type, and as a result some cables can be used as either adapter-to-first device or device-to-device cables, depending upon what type of SCSI connectors are present on the devices.

Device-to-Device Cables

M/T	F/C	Cable Description	Part Number	Cable Length (meters)
SE External Device	2840	Device-to-device (where second device has two connectors), 8-bit narrow bus	33F4607	0.7
SE External Device	3130	Device-to-device (where second device has one connector), 8-bit narrow bus	31F4222	0.66
SE External Device	2860/ 9139	Device-to-device (where second device has two connectors), 16-bit wide bus	52G9921	0.3
SE External Device	2884/ 9160	Device-to-device (where second device has two connectors), 16-bit wide bus	52G4291	0.6
SE External Device	2883/ 9150	Device-to-device (where second device has two connectors), 16-bit wide bus	52G4233	2.5
7027 HST	2425			
7027 HST	3132	Device-to-device (where second device has two connectors), 16-bit wide bus	40H7351	6.0

Note:

1. Most feature codes for cables are only orderable against the attachment device (7204, 7206, 7208, etc). For some cables the feature codes have been made available on the system units - in these cases the system feature code will be listed, otherwise the attachment device feature codes will be used.
2. Refer to “SCSI Single-Ended Cable Lengths Using This Adapter” on page 4-19 for guidelines concerning maximum cable lengths.

Terminators for Use With This Adapter

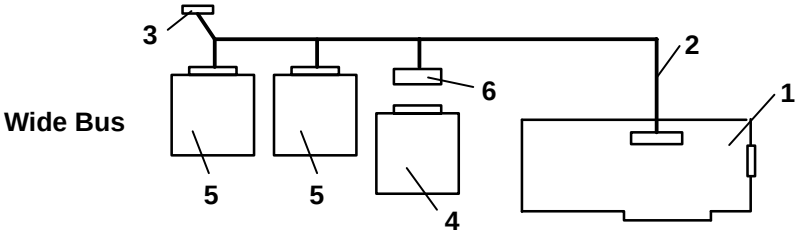
This adapter has on-board terminators that can be enabled or disabled by automatic sensing logic. This sensing logic can detect the presence or absence of external termination and enables or disables the on-card termination when needed. This automatic feature can also be disabled by jumpers on the adapter. Refer to the adapter installation guide for more information on jumpers and automatic termination detection logic.

M/T	F/C	Terminator Description	Part Number	Connector
SE External Devices	part of cable F/C	8-bit external FPT18C terminator	52G4260	50-pin low density
SE External Devices	part of cable F/C	16-bit external Boulay terminator	92F0432 (52G9907)	68-pin high density
SE Internal Cabling	part of cable F/C	16-bit internal bus terminator	92F0322 (92F2566)	68-pin high density

Automatic Bus Speed Selection, External Devices: This adapter will automatically sense the presence of an external device. The default mode of operation is for the adapter to limit negotions to fast (10MB/sec for 8-bit, 20MB/sec for 16-bit) operation when ever there is an external device attached.

Cabling Examples for the PCI Ultra SCSI Adapter

Single-Ended Internal



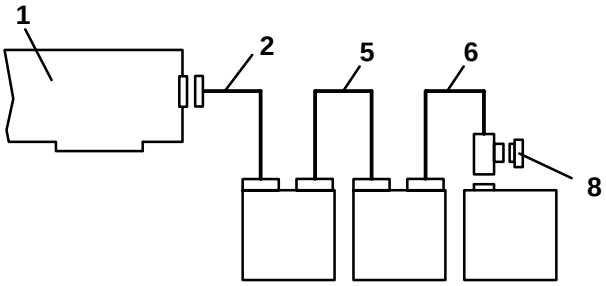
Item Number	Description
1	Adapter
2	Internal SCSI cable and terminator assembly (wide), see table below
3	System Specific Terminator (88G3977)
4	Narrow device (50-pin connector)
5	Wide device (68-pin connector)
6	68-pin to 50-pin interposer FRU 92F0324 (ASM P/N 92F2565)

Internal System Cables for Use With This Adapter

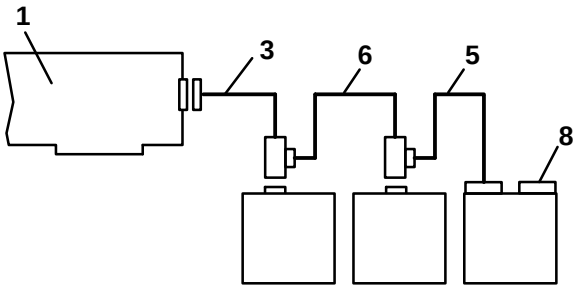
Machine Type	Feature Code	Part Number	Devices Supported
7043-140	2445	93H6151	3
7043-240	2445	93H6151	3
7024-Exx	2442	40H6637	4
7025-Fxx, 7026-Hxx	2447	06H6660	6

Note: Feature codes for internal cables are only orderable against the system unit. Some include the terminator as part of the cable feature code, some have a separate feature code for the terminators, and others require no terminator. This means you will use the on board terminator on the last SCSI device on the SCSI bus (activated by a jumper) to terminate the cable. If you are unsure of your system's configuration, refer to the system user's guide for more information.

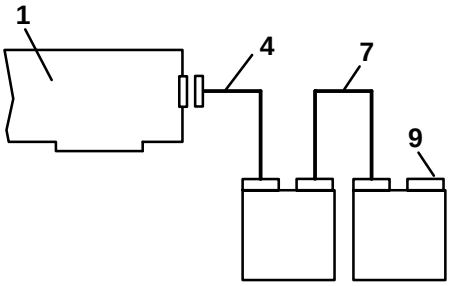
Single-Ended External Narrow Bus



or



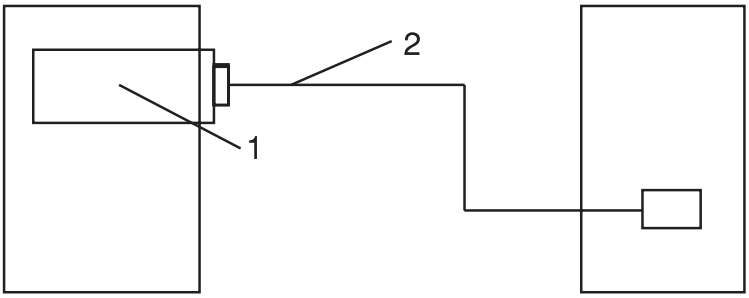
Single-Ended External Wide Bus



Item Number	Part Number	Description	Cable Length (meters)
1		Adapter	N/A
2	06H6037	Adapter-to-dual-connector device (narrow 8-bit)	1.0
3	52G0174	Adapter-to-single-connector device (narrow 8-bit)	1.5
4	06H6036	Adapter-to-dual-connector device (wide 16-bit)	1.0
5	33F4607	Device-to-dual-connector device (narrow 8-bit)	0.7
6	31F4222	Device-to-single-connector device (narrow 8-bit)	0.66
7	52G9921	Device-to-dual-connector device (wide 16-bit)	0.3
	52G4291		0.6
8	52G4260	Terminator (8-bit)	
9	92F0432	Terminator (16-bit)	

Note: Refer to “SCSI Single-Ended Cable Lengths Using This Adapter” on page 4-19 for guidelines concerning maximum cable lengths.

Special Cabling Considerations for the 7131 Single-Ended Interface



7131 - 105

Item Number	Part Number	Description	Cable Length (meters)
1		PCI single-ended ultra SCSI Adapter	N/A
2	06H6036	Adapter-to-dual-connector device (16-bit)	1.0

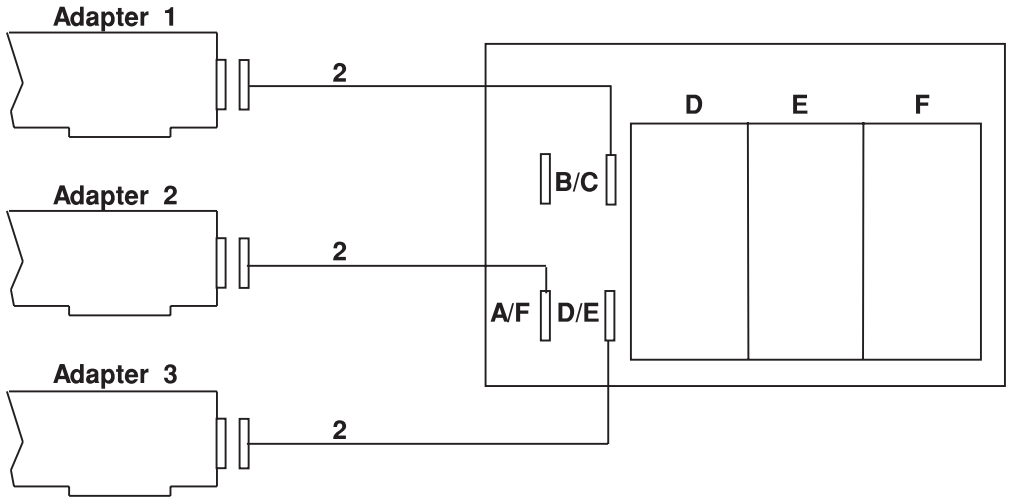
Note:

- This configuration does not support any Ultra SCSI devices.
- The single ended version of the 7131 cannot be connected to any other device. The SCSI terminator is built into the 7131.

Special Cabling Considerations for the 7027 - HSC Single-Ended Interface

Note: This configuration does not support any Ultra SCSI devices.

The following figure shows the back of the 7027. Banks A, B, and C are on the front of the 7027.



Note: Up to three adapters can be connected as shown. The adapters are on different SCSI-Busses. This is not a multi-initiator setup.

- Adapter 1 controls Banks B and C.
- Adapter 2 controls Banks A and F.
- Adapter 3 controls Banks D and E.

Item Number	Part Number	Description	Cable Length (meters)
1		PCI Single-Ended Ultra SCSI Adapter	NA
2	52G4233	Adapter-to-Dual-Connector device (16-bit)	2.5
	40H7351		6.0

Multi-Initiator PCI Single-Ended Ultra SCSI Cabling

The multi-initiator configuration is not supported on the adapter.

Cabling the PCI SCSI-2 Fast/Wide Differential Adapter FC 2409/6209

To understand the cabling for this adapter, read “General SCSI Considerations” on page 4-5, then read the following for specific information.

SCSI-2 Differential Cable Lengths Using This Adapter

The maximum supported cable length for configurations is 25 meters (approximately 80 feet).

Adapter-to-First Device Cables

M/T	F/C	Cable Description	Part Number	Cable Length (meters)
Host System	2112	Adapter-to-first device (where first device has two connectors), 8-bit narrow bus	06H6037	1.0
Host System	2114	16-bit Y-cable	52G0173	0.94
Host System	2116	Adapter-to-first device (where first device has two connectors), 16-bit wide bus	06H6036	1.0

Note:

1. When cables are ordered by Feature Code, the appropriate terminator is included with the order. When cables are ordered by part number, only the cable is included. For terminator part numbers, refer to the table on page 4-30.
2. For this adapter the same cable can be used for either single-ended or differential attachments. The difference in Feature Code orders is the terminator type.
3. The external connector on this adapter is the SCSI-3 standard, 68-pin "P" cable connector. Many of the 16-bit SCSI devices also use this connector type, and as a result some cables can be used as either adapter-to-first device or device-to-device cables, depending upon what type of SCSI connectors are present on the devices.

Device-to-Device Cables

M/T	F/C	Cable Description	Part Number	Cable Length (meters)
DE External Device	2848/ 9134	Device-to-device (where second device has two connectors), 8-bit narrow bus	74G8511	0.6
DE External Device	2860/ 9139	Device-to-device (where second device has two connectors), 16-bit wide bus	52G9921	0.3
DE External Device	2884/ 9160	Device-to-device (where second device has two connectors), 16-bit wide bus	52G4291	0.6
DE External Device	2846/ 9132	Device-to-device (where second device has two connectors), 16-bit wide bus	52G4233	2.5
7027 HSD	2425			
DE External Device	2885/ 9161	Device-to-device (where second device has two connectors), 16-bit wide bus	88G5749	4.5
7027 HSD	3132	Device-to-device (where second device has two connectors), 16-bit wide bus	40H7351	6.0
DE External Device	2870/ 9146	Device-to-device (where second device has two connectors), 16-bit wide bus	88G5747	12.0
7027 HSD	3135			
DE External Device	2869/ 9145	Device-to-device (where second device has two connectors), 16-bit wide bus	88G5748	14.0
DE External Device	2868/ 9144	Device-to-device (where second device has two connectors), 16-bit wide bus	88G5746	18.0
7027 HSD	3136			

Note:

1. Most feature codes for cables are only orderable against the attachment device (7204, 7206, 7208, etc). For some cables the feature codes have been made available on the system units - in these cases the system feature code is listed, otherwise the attachment device feature codes are used.
2. 9xxx feature codes are used for new build orders; 2xxx feature codes are used for MES orders.

Terminators for Use With This Adapter

This adapter has on-card SCSI terminators that must be removed before the adapter can be used in a high availability configuration. The high-availability configuration is implemented by removing the three on-card differential terminating resistors (labeled RN1, RN2, and RN3) on the adapter, then attaching the middle leg connector of the high-availability configuration Y-cable to the adapter's 68-pin external connector. The remaining two legs of the Y-cable are used to attach other systems and devices to the SCSI bus.

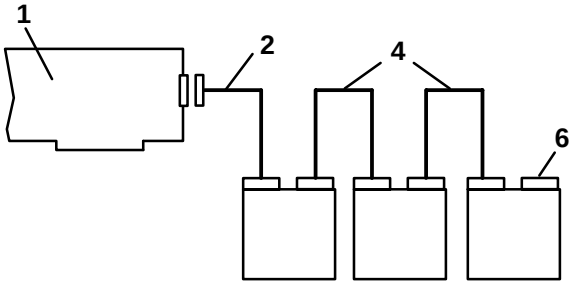
If the PCI SCSI-2 Fast/Wide Differential adapter is at the end of the SCSI bus, the shorter leg of the Y-cable must be terminated with the appropriate terminator.

Note: The high-availability configuration (Y-cable with a terminator on the shorter leg) allows disconnection of the adapter from a "live" SCSI bus, by removal of the external bus connection (the middle leg of the Y-cable). Although termination and SCSI bus continuity is maintained during removal of the adapter, the noise generated may create undetected data errors if the bus is in use during time of removal. To maintain data integrity, the SCSI bus should be inactive during the removal of adapters, cables, or terminators.

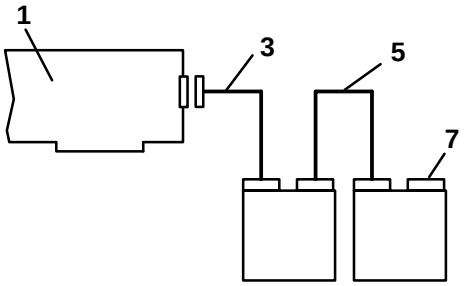
M/T	F/C	Terminator Description	Part Number	Connector
DE External Devices	part of cable F/C	8-bit external bus terminator	87G1356	50-pin low density
DE External Devices	part of cable F/C	16-bit external bus terminator	61G8324	68-pin high density

Cabling Examples for the PCI SCSI-2 Fast/Wide Differential Adapter

Differential External Narrow Bus



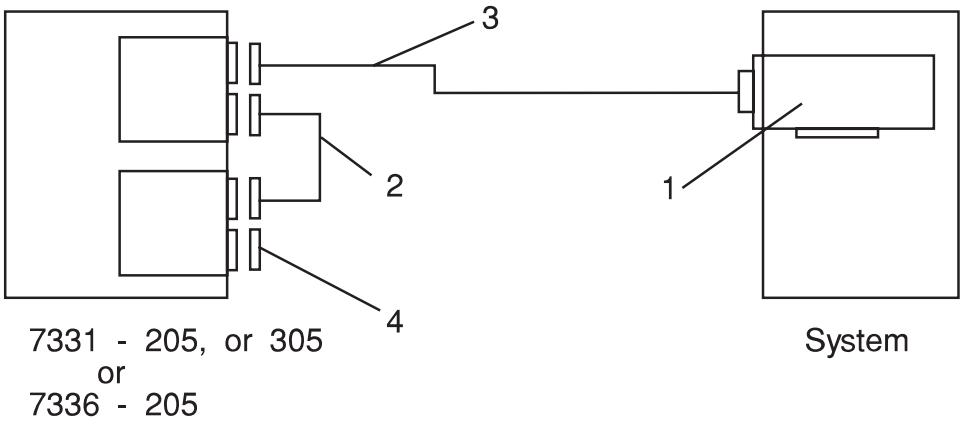
Differential External Wide Bus



Item Number	Part Number	Description	Cable Length (meters)
1		Adapter	N/A
2	06H6037	Adapter-to-dual-connector device (narrow 8-bit)	1.0
3	06H6036	Adapter-to-dual connector device (wide 16-bit)	1.0
4	74G8511	Device-to-dual-connector device (narrow 8-bit)	0.6
5	52G4291	Device-to-dual connector device (wide 16-bit)	0.6
	52G9921		0.3
6	87G1356	Terminator (8-bit)	
7	61G8324	Terminator (16-bit)	

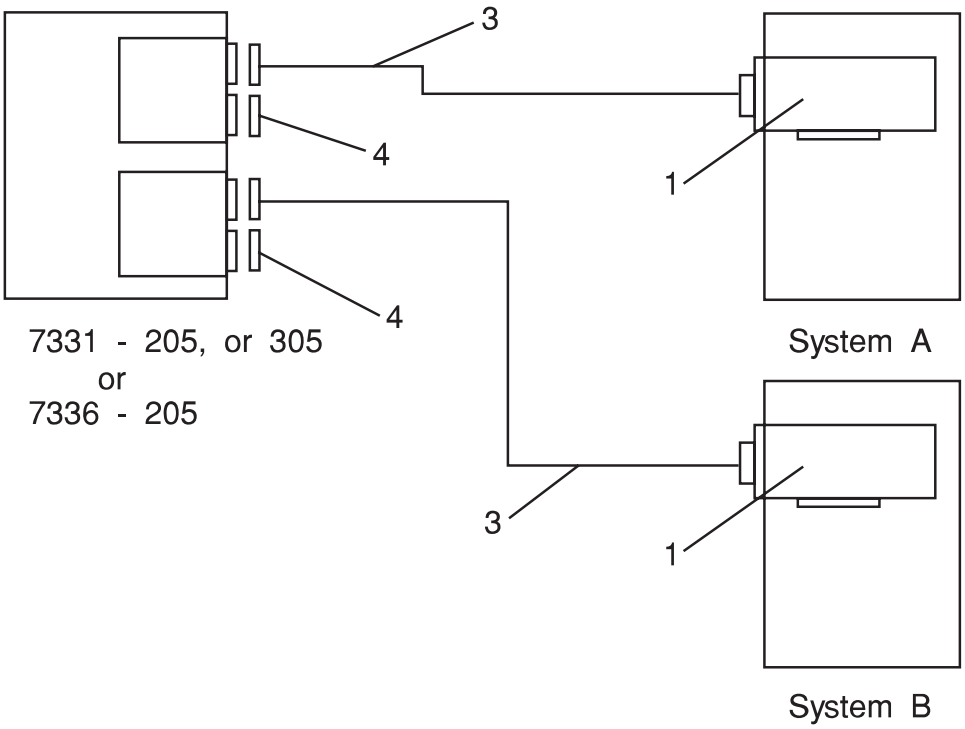
Special Cabling Considerations for the 7331-205, 7331-305 8mm Tape Library or the 7336-205 4mm Tape Library

Single Drive - Single Host or Dual Drive - Single Host



Item Number	Part Number	Description	Cable Length (meters)
1		SCSI-2 Differential Fast/Wide Adapter	
2		Cable - SCSI jumper	
3	06H0636 52G4233 88G5749 88G5747 88G5746	Device-to-Device cable (wide 16-bit)	1.0 2.5 4.5 12.0 18.0
4	61G8324	Terminator (16-bit)	

Dual Drive - Dual Host

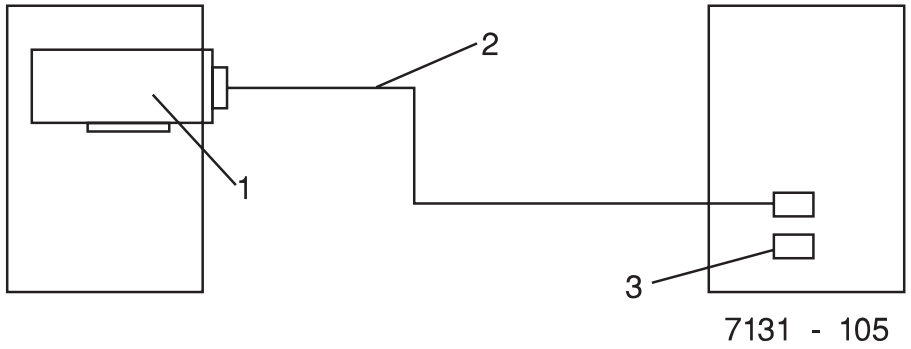


Note: For more information on these configurations, refer to the *7331 Tape Library Installation Guide*, order number SA26-7110, or the *7336 4mm Tape Library Model 205 Setup and Operator Guide*, order number SA37-0309.

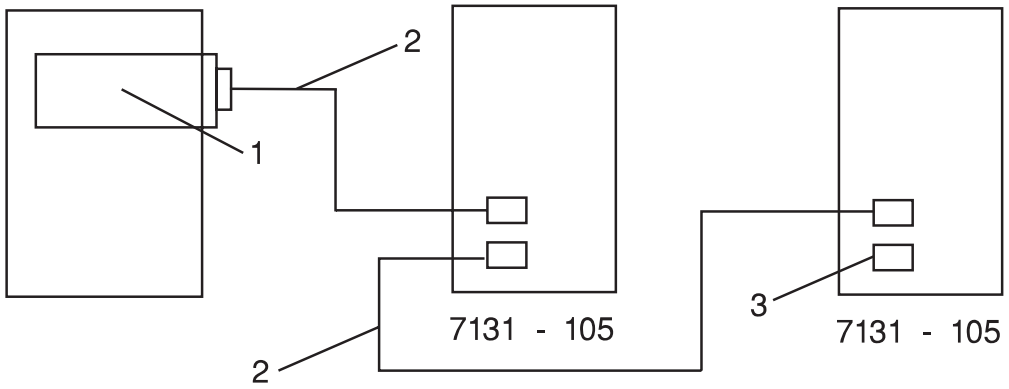
Item Number	Part Number	Description	Cable Length (meters)
1		SCSI-2 Differential Fast/Wide Adapter	
2		Cable - SCSI jumper	
3	06H0636 52G4233 88G5749 88G5747 88G5746	Device-to-Device cable (wide 16-bit)	1.0 2.5 4.5 12.0 18.0
4	61G8324	Terminator (16-bit)	

Special Cabling Considerations for the 7131 Differential Interface (FC 2508)

Single Host - Single Tower



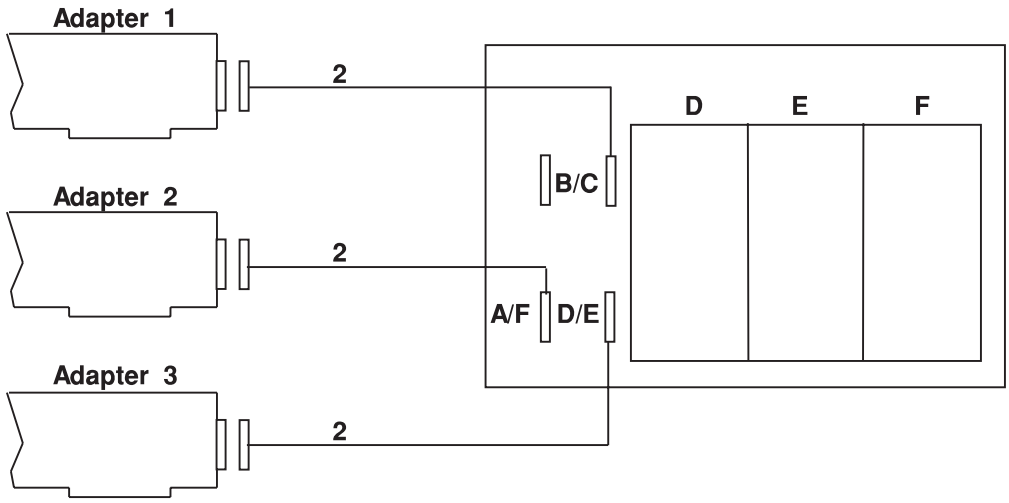
Single Host - Dual Tower



Item Number	Part Number	Description	Cable Length (meters)
1		SCSI-2 Differential Fast/Wide Adapter	
2	52G4291 06H0636 52G4233 88G5749 88G5747 88G5748 88G5746	Device-to-Device cable (wide 16-bit)	0.6 1.0 2.5 4.5 12.0 14.0 18.0
3	61G8324	Terminator (16-bit)	

Special Cabling Considerations for the 7027 - HSD Differential Interface

The following figure shows the back of the 7027. Banks A, B, and C are on the front of the 7027.



Note: Up to three adapters can be connected as shown. The adapters are on different SCSI-Busses. This is not a multi- initiator setup.

- Adapter 1 controls Banks B and C.
- Adapter 2 controls Banks A and F.
- Adapter 3 controls Banks D and E.

Item Number	Part Number	Description	Cable Length (meters)
1		SCSI-2 Differential Fast/Wide Adapter	NA
2	52G4233 40H7351 88G5747 88G5746	Adapter-to-Dual-Connector device (16-bit)	2.5 6.0 12.0 18.0

High-Availability Multi-Initiator SCSI-2 Fast/Wide Differential Cabling

A high-availability configuration can be implemented with the PCI SCSI-2 Fast/Wide Differential adapter by removing the three built-in differential terminator resistors (labeled RN1, RN2, and RN3) on the adapter, then attaching the middle leg connector of the high-availability configuration Y-cable to the adapter's external 68-pin connector. See “Multi-Initiator With Y Cables” on page 4-37. The remaining two legs of the Y-cable are used to attach other systems and devices to the SCSI bus.

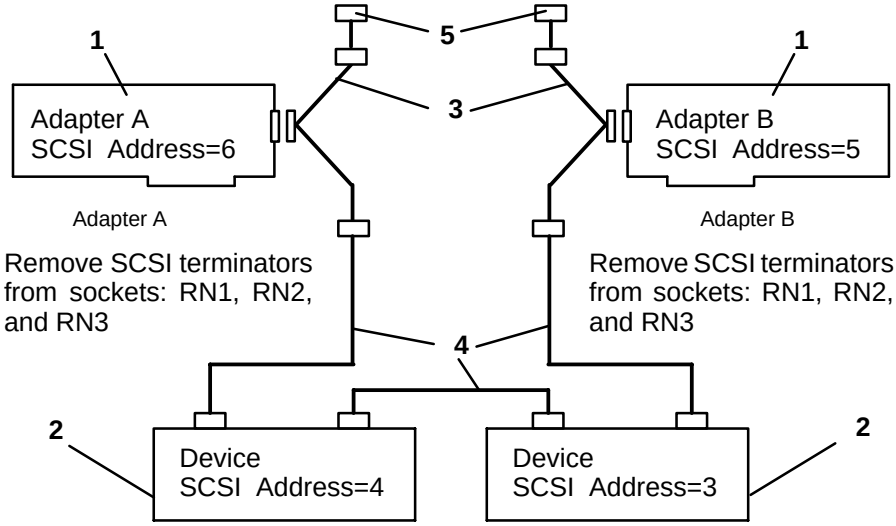
If the PCI SCSI-2 Fast/Wide adapter is at the end of the SCSI bus, the shorter leg of the high-availability configuration Y-cable must be terminated with the appropriate terminator.

With this configuration if a Y-cable is removed from one adapter, the other adapter can still use the SCSI bus. The bus remains properly terminated since the Y-cable with the attached external terminator is still connected to the SCSI bus. The adapter from which the Y-cable was removed is no longer terminated and may fail diagnostics due to the lack of a terminator. To run diagnostics, on this adapter, replace RN1, RN2, and RN3, or simply attach a wide differential SCSI terminator to the adapter's external connector.

When the multi-initiator configuration, “ Multi-Initiator With Standard Cables” on page 4-38 is used, and any adapter-to-device cable is removed, the result is an improperly terminated SCSI bus. Do not attempt to run diagnostics on the SCSI bus with out proper termination. Diagnostics, however, may be run on any adapter in this configuration without disconnecting any cables or adding a terminator to the adapter's external port.

Attention: The following illustrations show the only supported hardware configurations for multi-initiator setups with this adapter. These configurations may not be supported by your software application. Be sure that your software application can support this type of configuration before you set up and use your system in this way. Only one adapter per system per SCSI bus is allowed.

Multi-Initiator With Y Cables

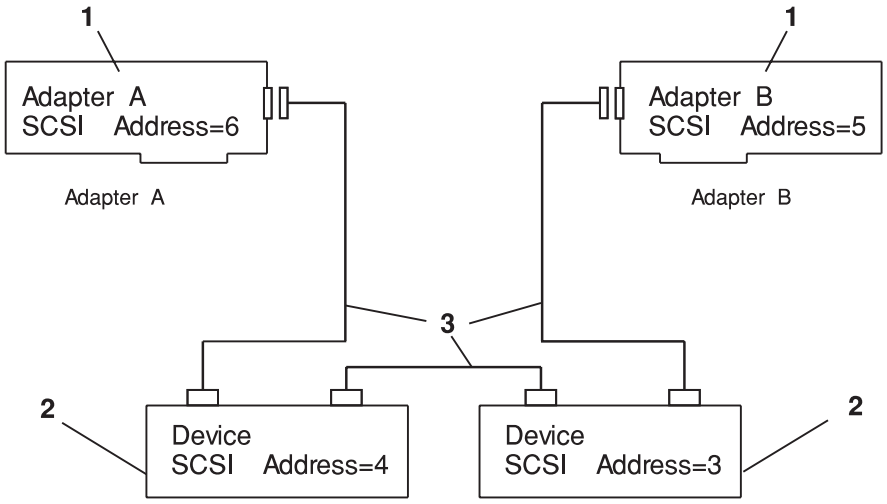


Attention: Adapters A and B must be in different host systems.

Item Number	Part Number	Description	Cable Length (meters)
1		Adapter	
2		Dual port device	
3	52G0173	Y-cable	0.94
4	52G4291 52G4233 88G5749 88G5747 88G5748	Device-to-Device cable (wide 16-bit)	0.6 2.5 4.5 12.0 14.0
5	61G8324	Terminator (16-bit)	

Note: Any Y-cable may be removed from any adapter and the SCSI bus remains properly terminated and functional for the remaining adapters. Since all terminators have been removed from their sockets the adapter removed from the SCSI bus must have the terminators replaced or a terminator placed on its external connector before running diagnostics.

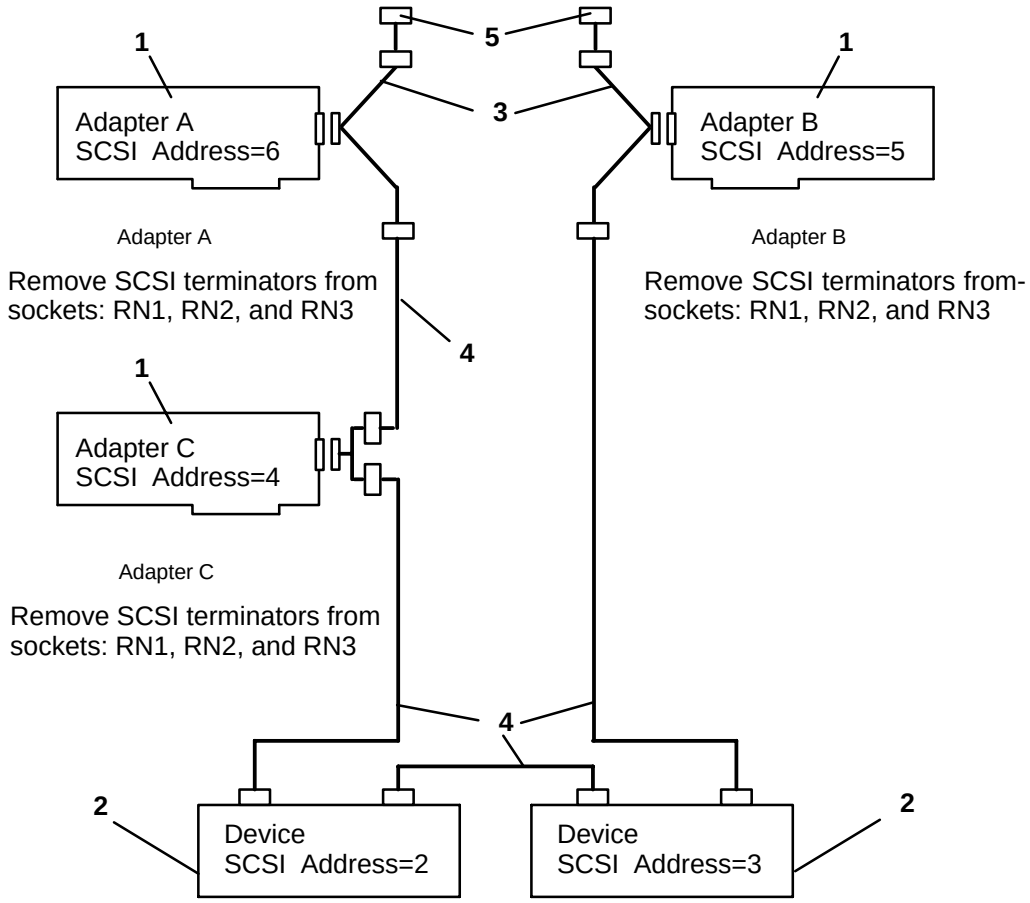
Multi-Initiator With Standard Cables



Attention: Adapter A and Adapter B must be in different host systems.

Item Number	Part Number	Description	Cable Length (meters)
1		Adapter	
2		Dual Port Device	
3	52G4291 52G4233 88G5749 88G5747 88G5748 88G5746	Device-to-Device Cable (wide 16-bit)	0.6 2.5 4.5 12.0 14.0 18.0

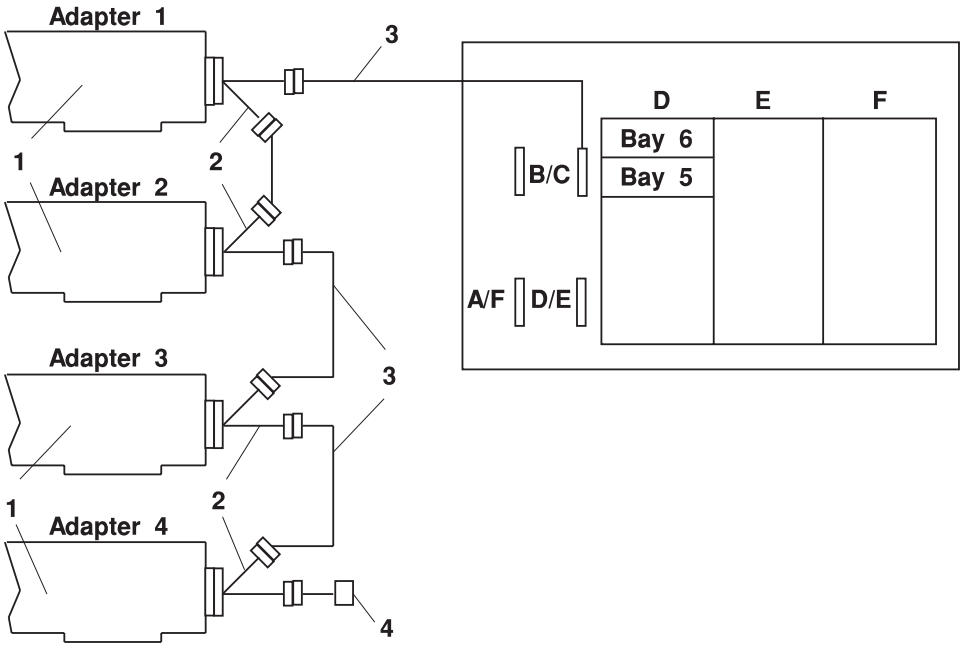
Multi-Initiator With Three Adapters



Attention: Adapter A, Adapter B, and Adapter C must be in different host systems.

Item Number	Part Number	Description	Cable Length (meters)
1		Adapter	
2		Dual Port Device	
3	52G0173	Y-cable	0.94
4	52G4291 52G4233 88G5749 88G5747	Device-to-Device Cable (wide 16-bit)	0.6 2.5 4.5 12.0
5	61G8324	Terminator (16-bit)	

Special Cabling Considerations for the 7027 - HSD Differential Interface With Multiple Initiators



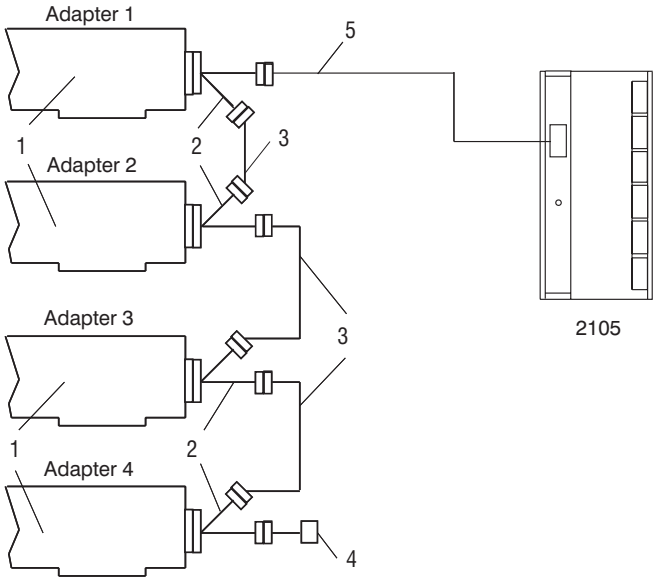
Attention: Adapters 1, 2, 3, and 4 must be in different host systems.

Item Number	Part Number	Description	Cable Length (meters)
1		Adapter	
2	52G0173	Y-cable	0.94
3	52G4291 52G4233 40H7351 88G5747	Device-to-Device Cable (wide 16-bit)	0.6 2.5 6.0 12.0
4	61G8324	Terminator (16-bit)	

Note: This configuration shows four adapters in a multiple-initiator configuration with the devices in banks B and C. If four adapters are used then you must remove the devices from bays 5 and 6 in banks D and B. If only three adapters are used, you must remove the device in bay six of banks B and D. For more information, refer to the *7027 HSD Disk Drive Drawer Installation and Service Guide*, order number SA23-2787.

Note: When Y-cables are used on card, terminating resistors must be removed from the adapters.

Special Cabling Considerations for the 2105 Differential Interface With Multiple Initiators



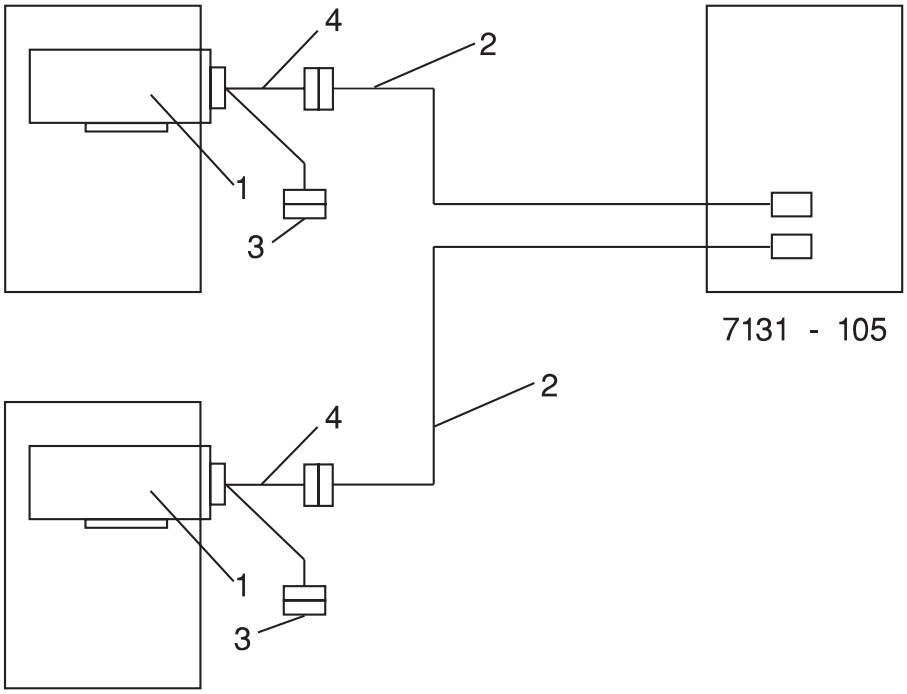
Attention: Adapters 1, 2, 3, and 4 must be in different host systems.

Item Number	Part Number	Description	Cable Length (meters)
1		SCSI-2 Differential Fast/Wide Controller (4-B or 4_B)	
2	52G0173	Y-cable	0.94
3	52G4291 52G4233 40H7351 88G5747	Device-to-Device Cable (wide 16-bit)	0.6 2.5 6.0 12.0
4	61G8324	Terminator (16-bit)	
5	05J7336 05J7337	SCSI Cable to 2105	10 20

Note: When Y-cables are used on card, terminating resistors must be removed from the adapters.

Special Cabling Considerations for the 7131 Differential Interface (FC 2508) High Availability

Dual Host - Single Tower



Item Number	Part Number	Description	Cable Length (meters)
1		SCSI-2 Differential Fast/Wide Controller (4-B or 4_B)	
2	52G4291 06H0636 52G4233 88G5749 88G5747 88G5748 88G5746	Device-to-Device cable (wide 16-bit)	0.6 1.0 2.5 4.5 12.0 14.0 18.0
3	61G8324	Terminator (16-bit)	
4	52G0173	Y-cable	0.94

Note:

1. When a Y-cable is used, the three (3) termination resisters on the controller adapter must be removed.
2. For item 2, any cable combination may be used as long as the total bus length is kept to 25 meters or less.
3. Please refer to the 7131 documentation for SCSI addressing limitations. If there are any devices in the upper media bay of the 7131, the adapters will be restricted to certain SCSI IDs.

Cabling the PCI Differential Ultra SCSI Adapter FC 6207

To understand the cabling for this adapter, read “General SCSI Considerations” on page 4-5, then read the following for specific information.

SCSI Differential Cable Lengths Using This Adapter

The maximum supported cable length for configurations is 25 meters (approximately 80 feet).

Adapter-to-First Device Cables

M/T	F/C	Cable Description	Part Number	Cable Length (meters)
Host System	2112	Adapter-to-first device (where first device has two connectors), 8-bit narrow bus	06H6037	1.0
Host System	2114	16-bit Y-cable	52G0173	0.94
Host System	2116	Adapter-to-first device (where first device has two connectors), 16-bit wide bus	06H6036	1.0

Note:

1. When cables are ordered by feature code, the appropriate terminator is included with the order. When cables are ordered by part number, only the cable is included. For terminator part numbers, refer to the table on page 4-46.
2. For this adapter the same cable can be used for either single-ended or differential attachments. The difference in feature code orders is the terminator type.
3. The external connector on this adapter is the SCSI-3 standard, 68-pin "P" cable connector. Many of the 16-bit SCSI devices also use this connector type, and as a result some cables can be used as either adapter-to-first device or device-to-device cables, depending upon what type of SCSI connectors are present on the devices.

Device-to-Device Cables

M/T	F/C	Cable Description	Part Number	Cable Length (meters)
DE External Device	2848/ 9134	Device-to-device (where second device has two connectors), 8-bit narrow bus	74G8511	0.6
DE External Device	2860/ 9139	Device-to-device (where second device has two connectors), 16-bit wide bus	52G9921	0.3
DE External Device	2884/ 9160	Device-to-device (where second device has two connectors), 16-bit wide bus	52G4291	0.6
DE External Device	2846/ 9132	Device-to-device (where second device has two connectors), 16-bit wide bus	52G4233	2.5
7027 HSD	2425			
DE External Device	2885/ 9161	Device-to-device (where second device has two connectors), 16-bit wide bus	88G5749	4.5
7027-HSD	3132	Device-to-device (where second device has two connectors), 16-bit wide bus	40H7351	6.0
DE External Device	2870/ 9146	Device-to-device (where second device has two connectors), 16-bit wide bus	88G5747	12.0
7027 HSD	3135			
DE External Device	2869/ 9145	Device-to-device (where second device has two connectors), 16-bit wide bus	88G5748	14.0
DE External Device	2868/ 9144	Device-to-device (where second device has two connectors), 16-bit wide bus	88G5746	18.0
7027 HSD	3136			

Note:

1. Most feature codes for cables are only orderable against the attachment device (7204, 7206, 7208, etc). For some cables the feature codes have been made available on the system units - in these cases the system feature code is listed, otherwise the attachment device feature codes are used.
2. 9xxx feature codes are used for new build orders; 2xxx feature codes are used for MES orders.

Terminators for Use With This Adapter

This adapter has on-card SCSI terminators that must be removed before the adapter can be used in a high availability configuration. The high-availability configuration is implemented by removing the three on-card differential terminating resistors (labeled RN1, RN2, and RN3) on the adapter, then attaching the middle leg connector of the high-availability configuration Y-cable to the adapter's 68-pin external connector. The remaining two legs of the Y-cable are used to attach other systems and devices to the SCSI bus.

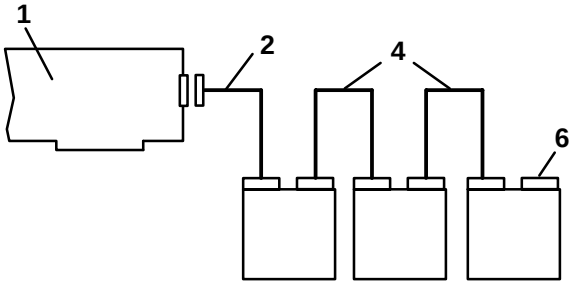
If the PCI Differential Ultra SCSI adapter is at the end of the SCSI bus, the shorter leg of the Y-cable must be terminated with the appropriate terminator.

Note: The high-availability configuration (Y-cable with a terminator on the shorter leg) allows disconnection of the adapter from a "live" SCSI bus, by removal of the external bus connection (the middle leg of the Y-cable). Although termination and SCSI bus continuity is maintained during removal of the adapter, the noise generated may create undetected data errors if the bus is in use during time of removal. To maintain data integrity, the SCSI bus should be inactive during the removal of adapters, cables, or terminators.

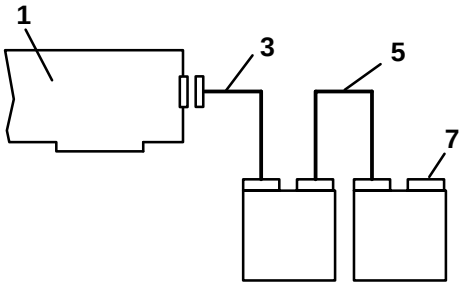
M/T	F/C	Terminator Description	Part Number	Connector
DE External Devices	part of cable F/C	8-bit external bus terminator	87G1356	50-pin low density
DE External Devices	part of cable F/C	16-bit external bus terminator	61G8324	68-pin high density

Cabling Examples for the PCI Differential Ultra SCSI Adapter

Differential External Narrow Bus



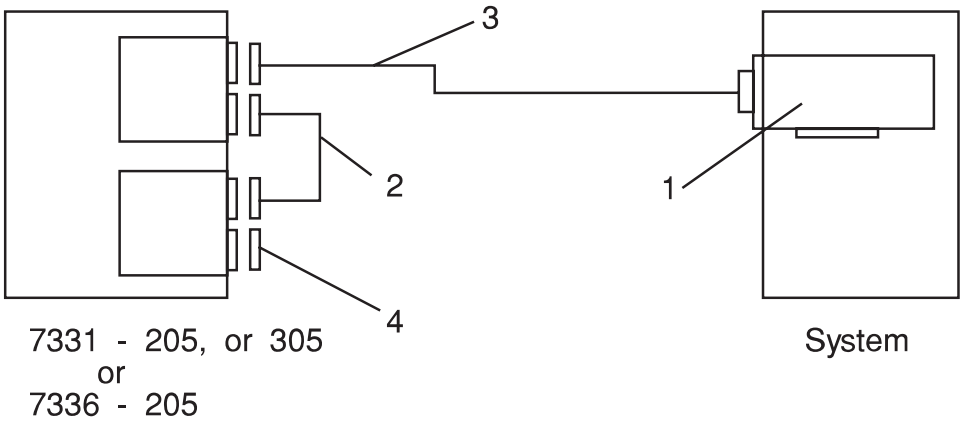
Differential External Wide Bus



Item Number	Part Number	Description	Cable Length (meters)
1		Adapter	N/A
2	06H6037	Adapter-to-dual-connector device (narrow 8-bit)	1.0
3	06H6036	Adapter-to-dual connector device (wide 16-bit)	1.0
4	74G8511	Device-to-dual-connector device (narrow 8-bit)	0.6
5	52G4291	Device-to-dual connector device (wide 16-bit)	0.6
	52G9921		0.3
6	87G1356	Terminator (8-bit)	
7	61G8324	Terminator (16-bit)	

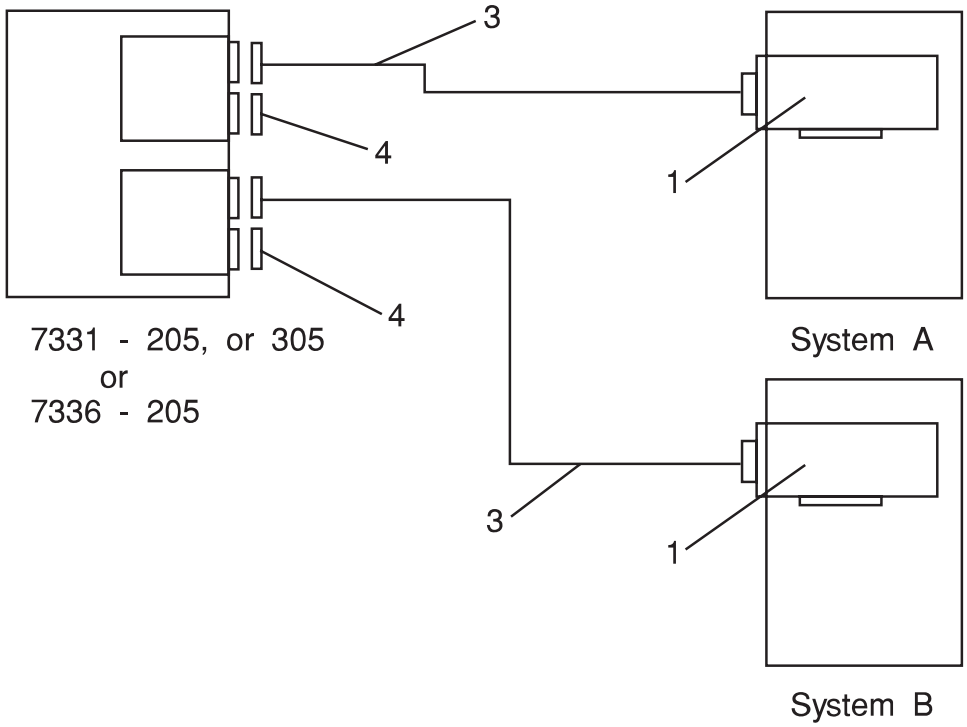
Special Cabling Considerations for the 7331-205, and 7331-305 8mm Tape Libraries or the 7336-205 4mm Tape Library

Single Drive - Single Host or Dual Drive - Single Host



Item Number	Part Number	Description	Cable Length (meters)
1		Differential Ultra SCSI Adapter	
2		Cable - SCSI jumper	
3	06H0636 52G4233 88G5749 88G5747 88G5746	Device-to-Device cable (wide 16-bit)	1.0 2.5 4.5 12.0 18.0
4	61G8324	Terminator (16-bit)	

Dual Drive - Dual Host



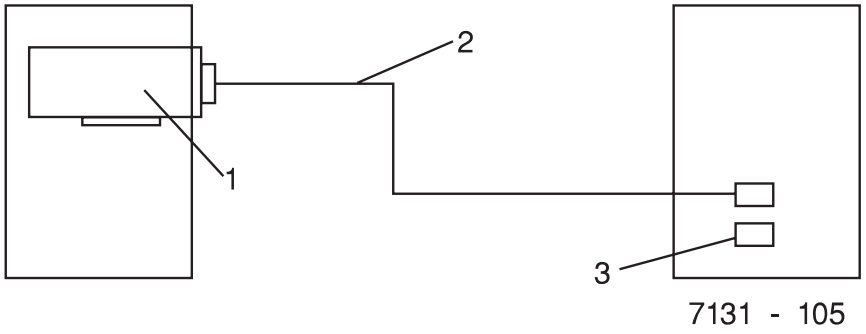
Note: For more information on these configurations, refer to the *7331 Tape Library Installation Guide*, order number SA26-7110, or the *7336 4mm Tape Library Model 205 Setup and Operator Guide*, order number SA37-0309.

Item Number	Part Number	Description	Cable Length (meters)
1		PCI Differential Ultra SCSI Adapter	
2		Cable - SCSI jumper	
3	06H0636 52G4233 88G5749 88G5747 88G5746	Device-to-Device cable (wide 16-bit)	1.0 2.5 4.5 12.0 18.0
4	61G8324	Terminator (16-bit)	

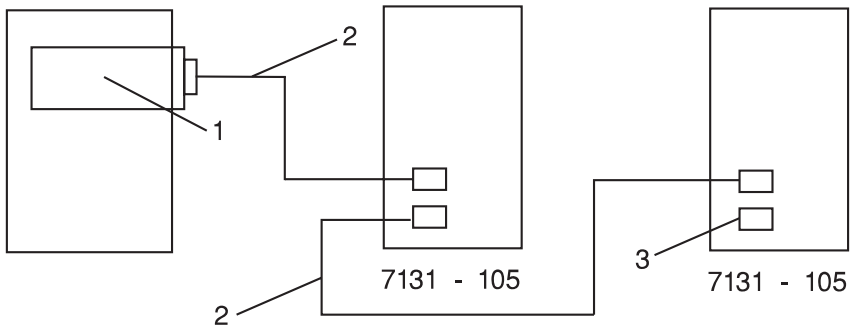
Special Cabling Considerations for the 7131 Differential Interface (FC 2508)

Note: This configuration does not support ultra SCSI devices.

Single Host - Single Tower



Single Host - Dual Tower

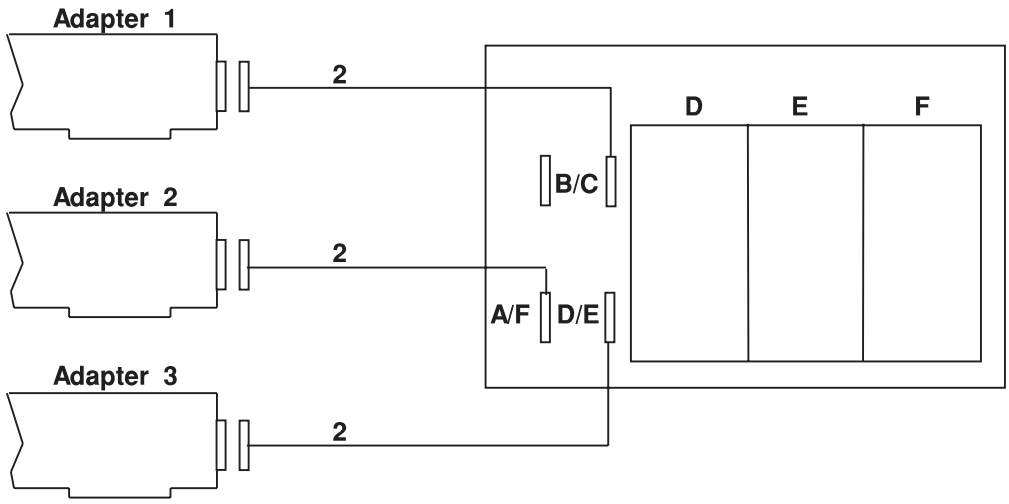


Item Number	Part Number	Description	Cable Length (meters)
1		PCI Differential Ultra SCSI Adapter	
2	52G4291 06H0636 52G4233 88G5749 88G5747 88G5748 88G5746	Device-to-Device cable (wide 16-bit)	0.6 1.0 2.5 4.5 12.0 14.0 18.0
3	61G8324	Terminator (16-bit)	

Special Cabling Considerations for the 7027 - HSD Differential Interface

Note: This configuration does not support ultra SCSI devices.

The following figure shows the back of the 7027. Banks A, B, and C are on the front of the 7027.



Note: Up to three adapters can be connected as shown. The adapters are on different SCSI-Busses. This is not a multi- initiator setup.

- Adapter 1 controls Banks B and C.
- Adapter 2 controls Banks A and F.
- Adapter 3 controls Banks D and E.

Item Number	Part Number	Description	Cable Length (meters)
1		PCI Differential Ultra SCSI Adapter	NA
2	52G4233 40H7351 88G5747 88G5746	Adapter-to-Dual-Connector device (16-bit)	2.5 6.0 12.0 18.0

High-Availability Multi-Initiator PCI Differential Ultra SCSI Cabling

A high-availability configuration can be implemented with the PCI Differential Ultra SCSI Adapter by removing the three built-in differential terminator resistors (labeled RN1, RN2, and RN3) on the adapter, then attaching the middle leg connector of the high-availability configuration Y-cable to the adapter's external 68-pin connector. See “Multi-Initiator With Y Cables” on page 4-53. The remaining two legs of the Y-cable are then used to attach other systems and devices to the SCSI bus.

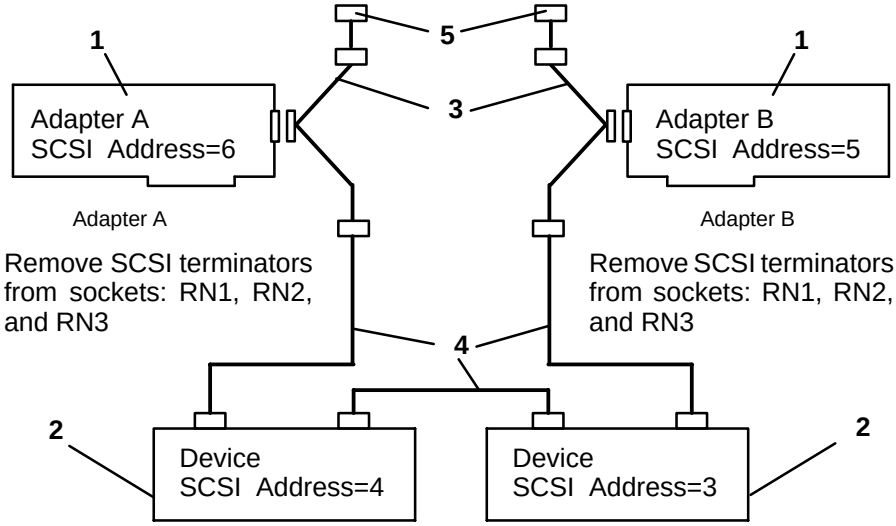
If the PCI Differential Ultra SCSI Adapter is at the end of the SCSI bus, the shorter leg of the high-availability configuration Y-cable must be terminated with the appropriate terminator.

With this configuration if a Y-cable is removed from one adapter, the other adapter can still use the SCSI bus. The bus remains properly terminated since the Y-cable with the attached external terminator is still connected to the SCSI bus. The adapter from which the Y-cable was removed is no longer terminated and may fail diagnostics due to the lack of a terminator. To run diagnostics, on this adapter, replace RN1, RN2, and RN3, or simply attach a wide differential SCSI terminator to the adapter's external connector.

When the multi-initiator configuration, “ Multi-Initiator With Standard Cables” on page 4-54 is used, and any adapter-to-device cable is removed, the result is an improperly terminated SCSI bus. Do not attempt to run diagnostics on the SCSI bus with out proper termination. Diagnostics, however, may be run on any adapter in this configuration without disconnecting any cables or adding a terminator to the adapter's external port.

Attention: The following illustrations show the only supported hardware configurations for Multi-Initiator setups with this adapter. These configurations may not be supported by your software application. Be sure that your software application can support this type of configuration before you set up and use your system in this way. Only one adapter per system per SCSI bus is allowed.

Multi-Initiator With Y Cables

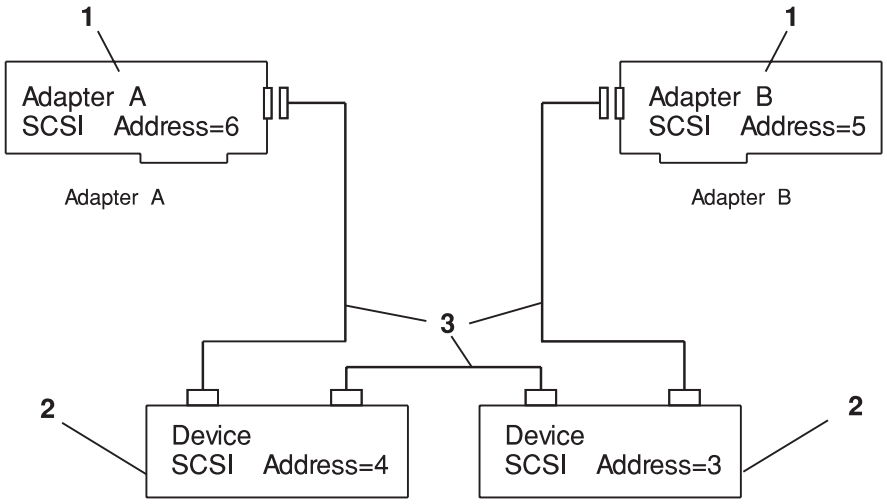


Attention: Adapter A and Adapter B must be in different systems.

Item Number	Part Number	Description	Cable Length (meters)
1		Adapter	
2		Dual port device	
3	52G0173	Y-cable	0.94
4	52G4291 52G4233 88G5749 88G5747 88G5748	Device-to-Device cable (wide 16-bit)	0.6 2.5 4.5 12.0 14.0
5	61G8324	Terminator (16-bit)	

Note: Any Y-cable may be removed from any adapter and the SCSI bus remains properly terminated and functional for the remaining adapters. Since all terminators have been removed from their sockets the adapter removed from the SCSI bus must have the terminators replaced or a terminator placed on its external connector before running diagnostics.

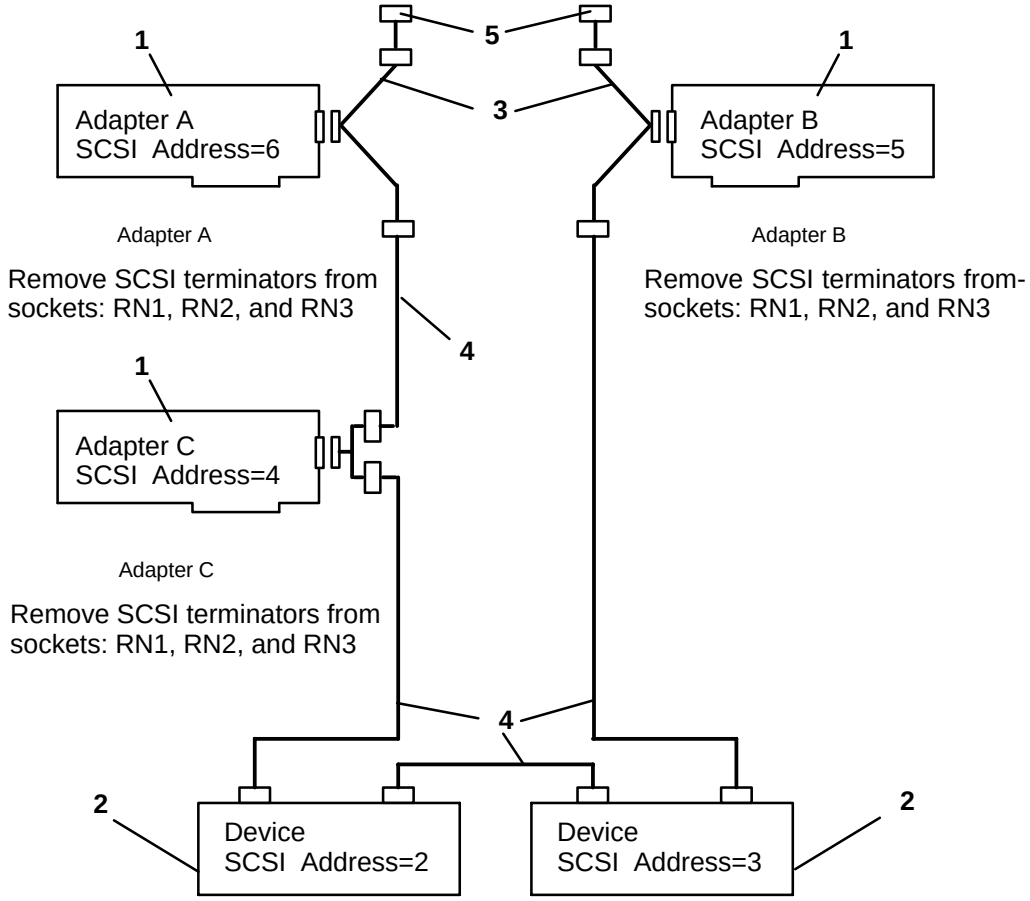
Multi-Initiator With Standard Cables



Attention: Adapter A and Adapter B must be in different systems.

Item Number	Part Number	Description	Cable Length (meters)
1		Adapter	
2		Dual Port Device	
3	52G4291 52G4233 88G5749 88G5747 88G5748 88G5746	Device-to-Device Cable (wide 16-bit)	0.6 2.5 4.5 12.0 14.0 18.0

Multi-Initiator with Three Adapters

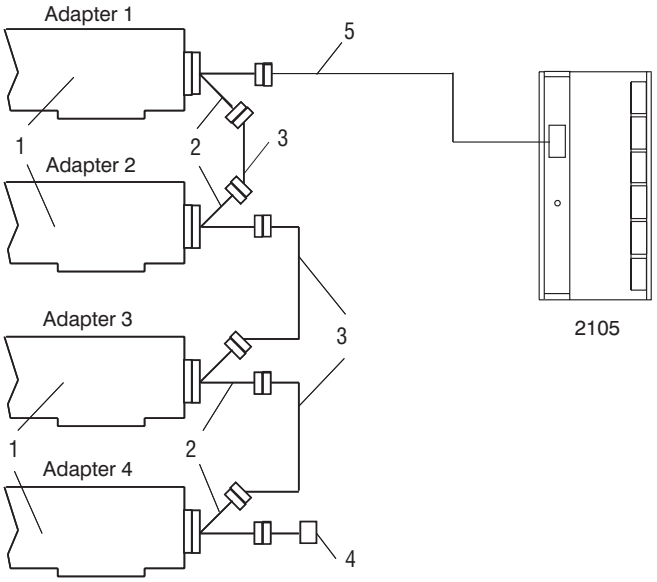


Attention: Adapters A, B, and C must be in different systems.

Item Number	Part Number	Description	Cable Length (meters)
1		Adapter	
2		Dual Port Device	
3	52G0173	Y-cable	0.94
4	52G4291 52G4233 88G5749 88G5747	Device-to-Device Cable (wide 16-bit)	0.6 2.5 4.5 12.0
5	61G8324	Terminator (16-bit)	

Special Cabling Considerations for the 2105 Differential Interface with Multiple Initiators

Note: This configuration does not support ultra SCSI devices.



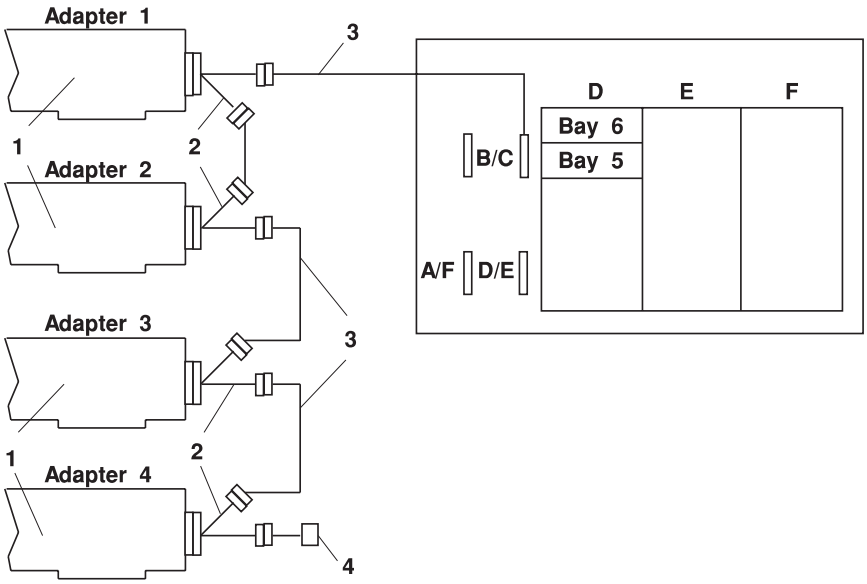
Attention: Adapters 1, 2, 3, and 4 must be in different systems.

Item Number	Part Number	Description	Cable Length (meters)
1		Adapter	
2	52G0173	Y-cable	0.94
3	52G4291 52G4233 40H7351 88G5747	Device-to-Device Cable (wide 16-bit)	0.6 2.5 6.0 12.0
4	61G8324	Terminator (16-bit)	
5	05J7336 05J7337	SCSI Cable to 2105	10 20

Note: When Y-cables are used on card, terminating resistors must be removed from the adapters.

Special Cabling Considerations for the 7027-HSD Differential Interface with Multiple Initiators

Note: This configuration does not support ultra SCSI devices.



Attention: Adapters 1, 2, 3, and 4 must be in different systems.

Item Number	Part Number	Description	Cable Length (meters)
1		Adapter	
2	52G0173	Y-cable	0.94
3	52G4291 52G4233 40H7351 88G5747	Device-to-Device Cable (wide 16-bit)	0.6 2.5 6.0 12.0
4	61G8324	Terminator (16-bit)	

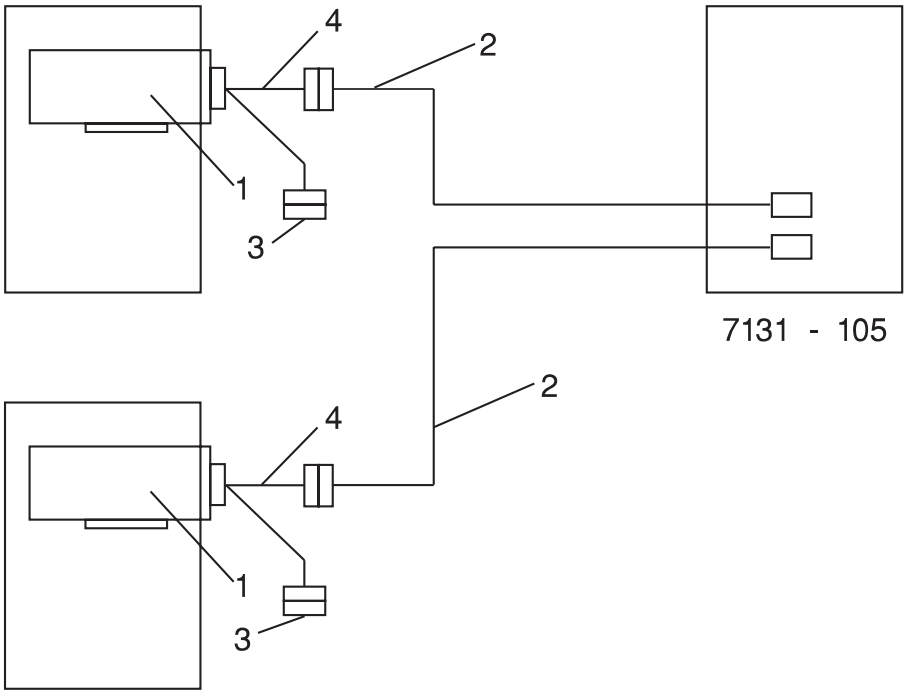
Note: This configuration shows four adapters in a multiple-initiator configuration with the devices in banks B and C. If four adapters are used then you must remove the devices from bays 5 and 6 in banks D and B. If only three adapters are used, you must remove the device in bay six of banks B and D. For more information, refer to the *7027 HSD Disk Drive Drawer Installation and Service Guide*, order number SA23-2787.

Note: When Y-cables are used on card, terminating resistors must be removed from the adapters.

Special Cabling Considerations for the 7131 Differential Interface (FC 2508) High Availability

Note: This configuration does not support Ultra SCSI devices.

Dual Host - Single Tower



Item Number	Part Number	Description	Cable Length (meters)
1		PCI Differential Ultra SCSI Adapter (4-L)	
2	52G4291 06H0636 52G4233 88G5749 88G5747 88G5748 88G5746	Device-to-Device cable (wide 16-bit)	0.6 1.0 2.5 4.5 12.0 14.0 18.0
3	61G8324	Terminator (16-bit)	
4	52G0173	Y-cable	0.94

Note:

1. When a Y-cable is used, the three (3) termination resisters on the adapter must be removed.
2. For item 2, any cable combination may be used as long as the total bus length is kept to 25 meters or less.
3. Please refer to the 7131 documentation for SCSI addressing limitations. If there are any devices in the upper media bay of the 7131, the adapters will be restricted to certain SCSI IDs.

Cabling the PCI SCSI-2 F/W RAID Adapter FC 2493

This section provides specific cabling information for the PCI SCSI-2 F/W RAID Adapter. For more general cabling information, see “General SCSI Considerations” on page 4-5.

Note: This adapter cannot be used as a boot adapter. That means you cannot put your "rootvg" on any disk drive connected to this adapter.

SCSI-2 Single-Ended Cable Lengths for This Adapter

The maximum cable length supported for configurations without any SCSI-2 fast devices is 6 meters (approximately 20 feet). (SCSI-2 fast devices support data rates of up to 10 MB per second for 8-bit or 20 MB per second for 16-bit transfers.) If a configuration includes SCSI-2 fast devices, the maximum cable length supported is 3 meters (approximately 10 feet). The maximum length includes the internal cabling of any device that has two SCSI connectors.

When you connect external devices, you can attach only one independent physical enclosure per SCSI bus (also called a *channel*). For example, you cannot attach a 7131-105 in combination with another external load. If you attach any external devices and any one device is capable of SCSI-2 fast transfers, total bus length is limited to 3 meters.

You can externally attach a single enclosure that contains any amount of multiple SCSI device loads to the PCI SCSI-2 F/W RAID Adapter, but the following restrictions apply:

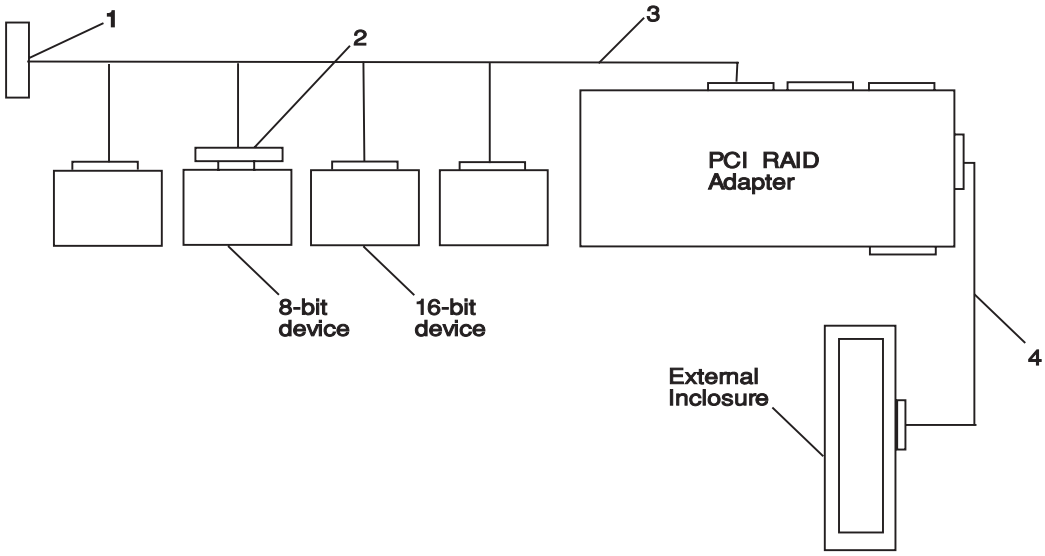
- The maximum combined internal and external cable length is 3 meters.
- Loads on the cable (cable length between devices) must be a minimum of 0.1 meters apart.
- You can mix device widths (8-bit and 16-bit) only if you use the 68-pin to 50-pin interposer (FRU 92F0324, ASM 92F2565).
- You must observe SCSI-2 architectural restrictions (timing requirements and skew restrictions).
- You cannot attach any internal devices to the internal port adapter (J10) when the external port (J11) is in use.

No other adapters can be connected to any of the adapter SCSI ports. The adapter must have exclusive use of all attached drives. The adapter has on-board terminators that are always enabled. No terminator is needed at the adapter end of a SCSI cable.

An extender cable, Feature 3131 allows internal adapter SCSI ports to be made available for external connection through an unused card slot.

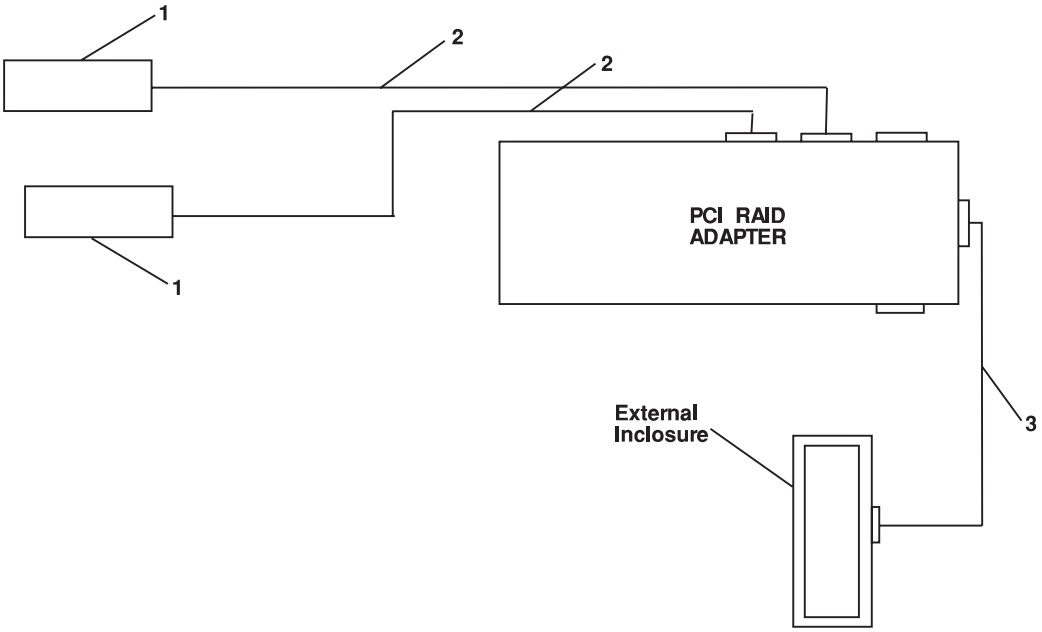
Cabling Examples for the PCI SCSI-2 F/W RAID Adapter

Internal and External Drive Connections for M/T 7024



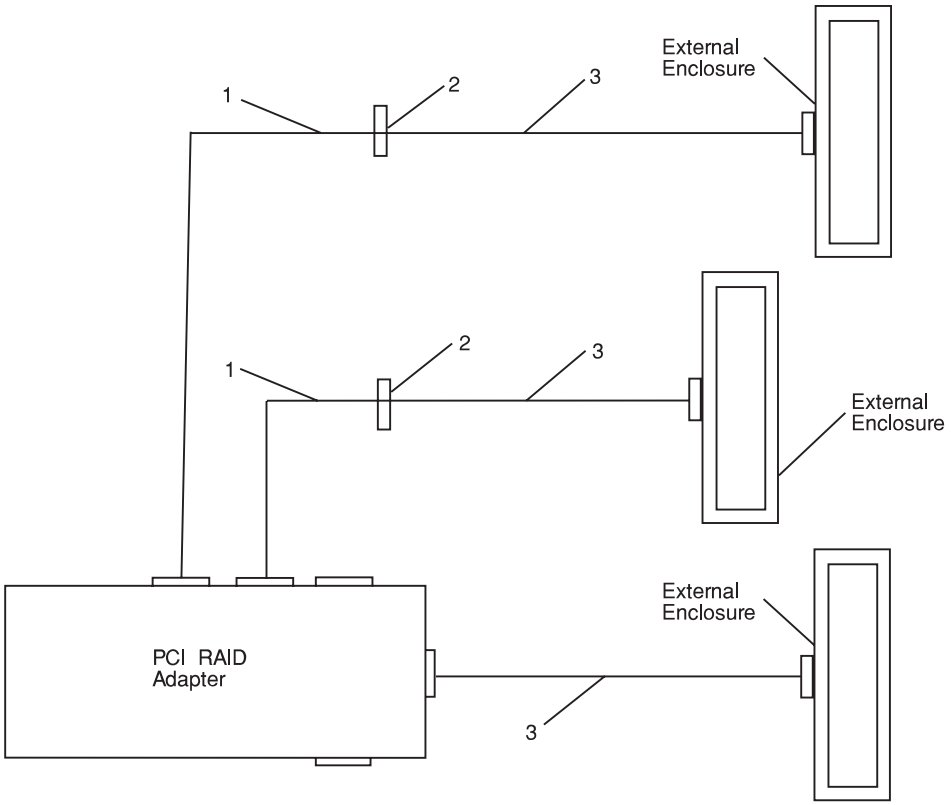
Item Number	F/C	Part Number	Description	Cable Length (meters)
1			System Specific Terminator	
2	6513	92F0324	68-pin to 50-pin Interposer	
3	2442	40H6637	Four drop internal cable for M/T 7024	
4	9158 2425 3132	06H6036 52G4233 40H7351	Device-to-Device Cable (wide 16-bit)	1.0 2.5 6.0

Combination Internal and External Connection for M/T 7025



Item Number	F/C	Part Number	Description	Cable Length (meters)
1			System specific SCSI Hot Plug Backplane	
2	2447	06H6660	One drop internal cable	
3	9158 2425 3132	06H6036 52G4233 40H7351	Device-to-Device Cable (wide 16-bit)	1.0 2.5 6.0

External Connections (Maximum of Three Per Adapter)



Item Number	F/C	Part Number	Description	Cable Length (meters)
1	3131	73H3142	Internal Extender Cable	
2			Card Slot Opening	
3	9158 2425 3132	06H6036 52G4233 40H7351	Device-to-Device Cable (wide 16-bit)	1.0 2.5 6.0

Chapter 5. Cable Assembly and Pin-Outs

Disclaimer

The information presented in this chapter does not guarantee functionality or compliance with any RFI or EMI regulations.

This information should be used along with other information about the location and use of the cables to help provide custom cabling that is acceptable for the customer.

Chapter 3, “Cables and Cabling” on page 3-1 has some general information on cabling that may be helpful if you are considering building your own cablws.

General Cable Building Information

The following information is things to consider and to keep in mind if you are going to build your own cables. All of this information does not apply to all cables you are building. Use the information that is needed.

1. Any communications cable being run outdoors must have an appropriate lightning arrester on it. All outer foil shields should be connected to the metal shell of the connector at both ends.
2. Be sure any wire that is connected at one end is terminated at the other end. No wire should be attached to circuitry at only one end, because it acts like an antenna to pick up or give out electrical noise.
3. On modem cables for async communications, ground wires for twisted pairs should be connected together and to position 7 of the connector at each end of the cable.
4. On other than modem async communications cables, the outer foil drain wire should connect to the metal shell of the connector on the system end of the cable. The outer foil drain wire should be connected to position 1 of the connector on the device end of the cable.
5. The connectors on all cables should provide strain relief to prevent breaking the wires.

Adapter-Specific Cable Building Information

The following information is presented to help the person building or servicing custom cables understand specific needs of certain adapters.

The following charts show pin-out information for many cables. Only pins that are used are mentioned. Cables are presented alphabetically, according to the letter designations given in Chapter 3, “Cables and Cabling” on page 3-1.

Custom cables must conform to the appropriate standards. Standards information can usually be obtained from a cable vendor, but copies of EIA specifications can be purchased by writing to the following address:

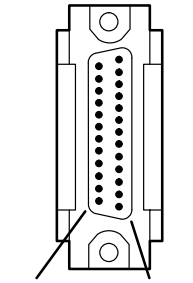
Electronic Industries Association
Attn. Standards Office
2001 Pennsylvania Ave., NW
Washington, DC 20006

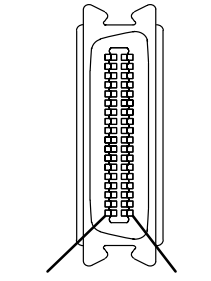
Cable Description and Page Number

Most of the cables in this chapter are arranged alphabetically by cable letter.

Cable A

Description: PC Parallel Printer Cable.





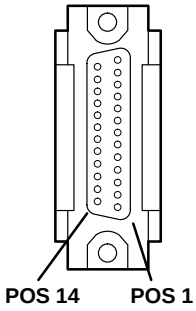
System End Connector Pin (Male)	Signal	Device End Connector Socket (Female)
1	Strobe	1
2	Data	2
3	Data	3
4	Data	4
5	Data	5
6	Data	6
7	Data	7
8	Data	8
9	Data	9
10	ACK	10
11	Busy	11
12	PE	12
13	Select	13

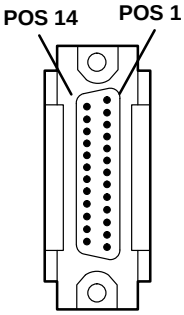
Cable A (continued)

System End Connector Pin (Male)	Signal	Device End Connector Socket (Female)
14	Autofeed XT	14
18	Ground	15
19	Ground	16
Not Used		17
Not Used		18
21	Ground	19
21	Ground	20
21	Ground	21
22	Ground	22
22	Ground	23
23	Ground	24
23	Ground	25
24	Ground	26
24	Ground	27
24	Ground	28
25	Ground	29
25	Ground	30
16	INIT	31
15	Error	32
25	Ground	33
Not Used		34
Not Used		35
17	Select IN	36

Cable D

Description: Async Cable EIA-232/V.24.





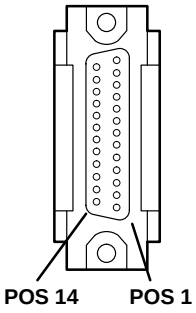
System End Connector Socket (Female)	Signal	Device End Connector Pin (Male)
Shell	Shield Ground	1, Shell
2	TxD	2
3	RxD	3
4	RTS	4
5	CTS	5
6	DSR	6
7	Signal Ground	7
8	CD	8
20	DTR	20
22	RI	22

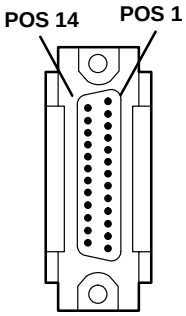
For applications where the Co-Processor Multiport Adapter Model 2 is used, the following additional pins are required.

System End Connector Socket (Female)	Signal	Device End Connector Pin (Male)
15	Tx CLK	15
17	Rx CLK	17

Cable E

Description: Printer/Terminal Interposer EIA-232. Use this to convert modem cables to use with Printer or terminal connections. This is a Printer/Terminal interposer which is about two inches long and connects the pins from input to output as shown below.

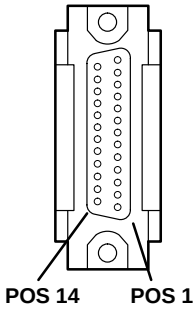


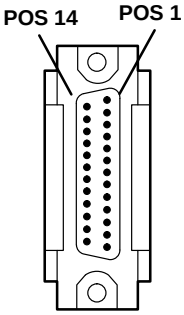


System End Connector Socket (Female)	Signal	Device End Connector Pin (Male)
1	Shield Ground	shell
2	TxD	3
3	RxD	2
4	RTS	5
5	CTS	4
6, 8	DSR, CD	20
7	Signal Ground	7
20	DTR	6, 8

Cable I

Description: Printer/Terminal Cable-EIA-232 - 3m or 10 feet long.

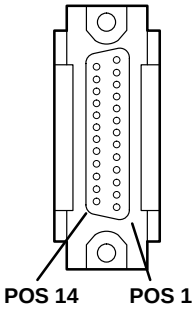


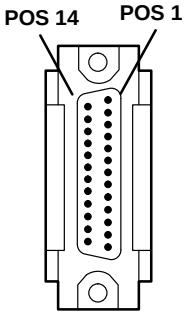


System End Connector Socket (Female)	Signal	Device End Connector Pin (Male)
Shell	Shield Ground	Shell, 1
2	TxD	3
3	RxD	2
4	RTS	5
5	CTS	4
6, 8	DSR, CD	20
7	Signal Ground	7
20	DTR	6, 8

Cable K

Description: Terminal Cable RS-422A

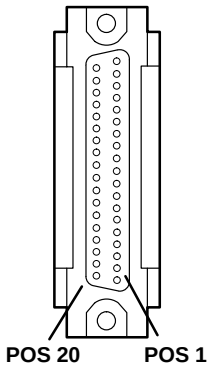


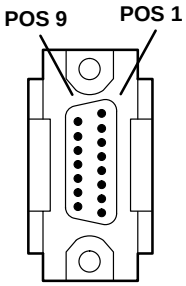


System End Connector Socket (Female)	Signal	Device End Connector Pin (Male)
Shell	Shield Ground	1
2	TxA	15
3	RxA	19
4	TxB	17
5	RxB	25
7	Signal Ground	7

Cable Q

Description: X.25 Attachment Cable-X.21.



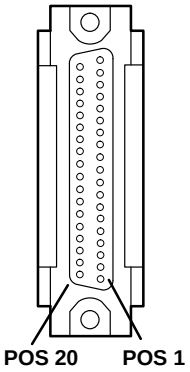


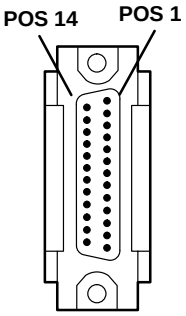
System End Connector Socket (Female)	Signal	Device End Connector Pin (Male)
10	T (A)	2
28	T (B)	9
11	C (A)	3
29	C (B)	10
12	R (A)	4
30	R (B)	11
13	I (A)	5
31	I (B)	12
14	S (A)	6
32	S (B)	13
7*	Ground	8
9*	Ground	8

*Tied together at system end connector.

Cable R

Description: X.25 Attachment Cable-V.24.



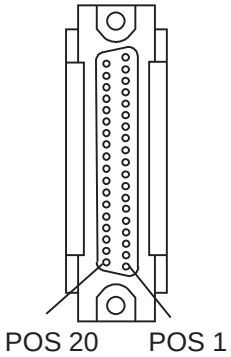


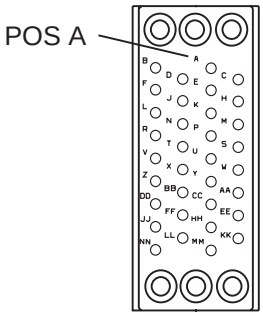
System End Connector Socket (Female)	Signal	Device End Connector Pin (Male)
2	TxD	2
3	RxD	3
4	RTS	4
5	CTS	5
6	DSR	6
8	CD	8
24	Tx CLK	15
26	Rx CLK	17
27	LLBT	18
20	DTR	20
21	RLBT	21
22	CI	22
25	TI	25
7*	Ground	7
9*	Ground	7
15*	Ground	7

*Tied together at system end connector.

Cable S

Description: X.25 Attachment Cable-V.35.





System End Connector Socket (Female)	Signal	Device End Connector Pin (Male)
4	RTS	C
5	CTS	D
6	DSR	E
8	CD	F
20	DTR	H
22	CI	J
35	TxD (A)	P
17	TxD (B)	S
37	RxD (A)	R
19	RxD (B)	T
36	Tx Clk (A)	Y
18	Tx Clk (B)	AA
34	Clk (A)	V
16	Rx Clk (B)	X
7	Ground	B
15	Ground	B

Cable T

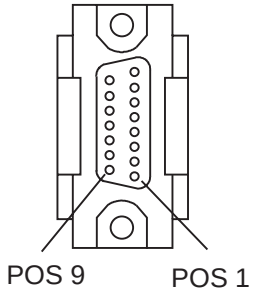
Description: This cable comes with an Interface/Breakout box. It has nine connectors for the four ports. For a description of the Co-Processor Multiport Adapter, Model 2 interface cable, see Chapter 3, “Cables and Cabling” on page 3-1 of this book. The interface cable is used with the Co-Processor Multiport Adapter, Model 2.

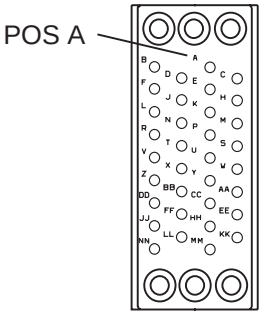
For the pin-out of the Co-Processor Multiport Adapter Model, 2 card connector, see Chapter 1 "Adapter Information" in this book.

Cable U

Description: V.35 Cable for use with the Co-Processor Multiport Adapter, Model 2.

Use a 15-position female connector and a 34-position block connector. The bulk cable must have four shielded twisted pairs and six individually shielded wires.



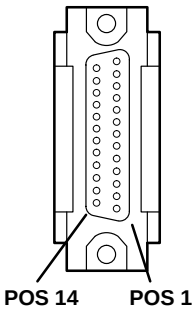


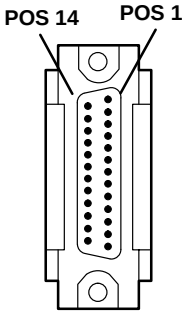
System End Connector Socket (Female)	Signal	Twisted Pair Number	Device End Connector Pin (Male)
1	Ground Shield		A (Shield)
2	TxD (B)	1	S
3	RTS		C
4	RxD (B)	2	T
5	CTS		D
6	DSR		E
7	CD		F
8	Signal Ground		B
9	TxD (A)	1	P
10	Tx Clk (A)	3	Y
11	RxD (A)	2	R
12	Tx Clk (B)	3	AA
13	Rx Clk (B)	4	X
14	Rx Clk (A)	4	V
15	DTR		H

Cable V

Description: EIA-232D/V.24 cable for use with the Co-Processor Multiport Adapter, Model 2.

Use a 25-position male connector and a 25-position female connector. Use bulk cable that has individually shielded wires.



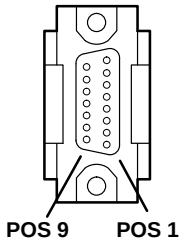


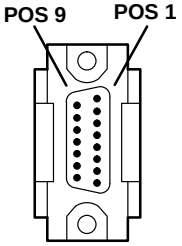
System End Connector Socket (Female)	Signal	Device End Connector Pin (Male)
2	TxD	2
3	RxD	3
4	RTS	4
5	CTS	5
6	DSR	6
7	Signal Ground	7
8	CD	8
15	Tx Clk	15
17	Rx Clk	17
20	DTR	20
22	RI	22
23	HRS	23
24	DTE Clk	24
1	Shield Ground	

Cable W

Description: X.21 cable for use with the Co-Processor Multiport Adapter, Model 2.

Use a 15-position male connector and a 15-position female connector. Use bulk cable with at least five shielded twisted pairs. Wire the pairs as shown (the pin numbers are the same on both ends).

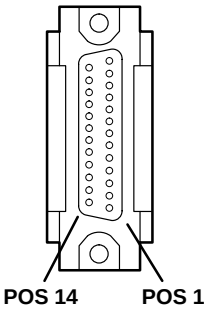




System End Connector Socket (Female)	Signal	Device End Connector Pin (Male)
	Shield	
2	T(A)	2
3	C(A)	3
4	R(A)	4
5	I(A)	5
6	S(A)	6
8	Signal Ground	8
9	T(B)	9
10	C(B)	10
11	R(B)	11
12	I(B)	12
13	S(B)	13

Cable X

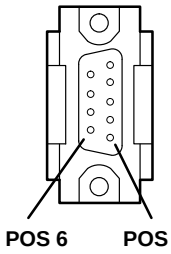
Description: EIA-422A cable for use with the Co-Processor Multiport Adapter, Model 2. This cable is customer supplied.

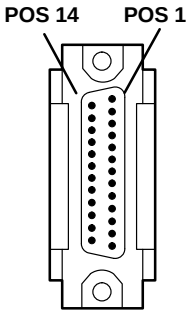


System End Connector Socket (Female)	Signal	Device End Connector Pin (Male)
	Ground Shield	
2	TxA	-
3	RxA	-
4	TxB	-
5	RxB	-
7	Signal Ground	-
17	RxB Clk	-
22	RxA Clk	-
23	TxA Clk	-
24	TxB Clk	-

Cable AR

Description: This Serial Port cable (Async Cable EIA-232) is for systems that have a nine pin serial port connector.



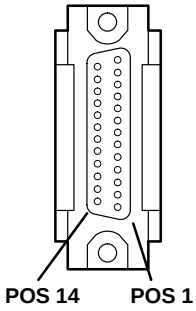


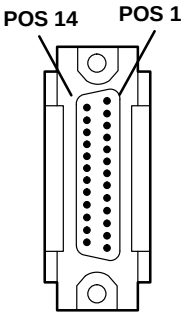
System End Connector Socket (Female)	Signal	Device End Connector Pin (Male)
Shell	Shield Ground	1, Shell
3	TxD	2
2	RxD	3
7	RTS	4
8	CTS	5
6	DSR	6
5	Signal Ground	7
1	CD	8
4	DTR	20
9	RI	22

Cable AS

Description: This Serial Port fan-out cable (Async Cable EIA-232) is a feature that makes the second serial port available on systems that have a single serial port connector with signals for two serial ports. The pin-out is such that if a standard serial port cable is installed on the system then Serial Port (1) is available. This serial port fan-out cable is a "Y" cable with three connectors. They have a single standard serial port connector that connects to the system and two standard serial port output connectors, one for serial port (1) and another for serial port (2).

Cable AS (continued)





System End Connector Socket (Female)	Signal	Device End Connector Pin (Male)
Shell	Shield Ground	1, Shell
2	TxD (1)	2
3	RxD (1)	3
4	RTS (1)	4
5	CTS (1)	5
6	DSR (1)	6
7	Signal Ground	7
8	CD (1)	8
20	DTR (1)	20
22	RI (1)	22
Shell	Shield Ground	1, Shell
14	TxD (2)	2
16	RxD (2)	3
19	RTS (2)	4
13	CTS (2)	5
15	DSR (2)	6
7	Signal Ground	7
12	CD (2)	8
24	DTR (2)	20
17	RI (2)	22
Others	Reserved	Others

Cable AU

Description: This cable attaches a TURBOWAYS 25 ATM PCI adapter to an ATM switch or concentrator. The TURBOWAYS 25 ATM Cable is made from unshielded twisted pair or shielded twisted pair. The cable must meet ATM standards. The maximum length is 100 meters (325 feet).

Adapter End (RJ-45)		Device End (RJ-45)	
Signal Name	**Pin**	**Pin**	**Signal Name**
Transmit A	1	1	Receive A
Transmit B	2	2	Receive B
Reserved	3	3	Reserved
Reserved	4	4	Reserved
Reserved	5	5	Reserved
Reserved	6	6	Reserved
Receive A	7	7	Transmit A
Receive B	8	8	Transmit B

128-Port Async Controllers

The following information is for custom built cables connecting the 128-Port Async Controllers to the Remote Async Nodes (RANs) and RANs to async devices. For more information on asynchronous communications, see *AIX Versions 3.2 and 4 Asynchronous Communications Guide*, order number SC23-2488.

128-Port Async Adapters

- FC (2933) 128-Port Async Adapter is an ISA adapter which can communicate with a Remote Async Node (RAN) at bit rates up to 1.2 Mbps.
- FC (2944) 128-Port Async Adapter is an PCI adapter which can communicate with a Remote Async Node (RAN) at bit rates up to 2.4 Mbps.

Cabling the Two Adapters and the Four Different Remote Async Nodes

The following table shows the bit rates when different adapters and remote async nodes are connected:

Adapter Feature Code	Adapter Description	Remote Async Node	Maximum RAN to device Bit Rate in bps
2933/ 2944	ISA and PCI 128-Port Async	FC 8130 box style EIA-232	57,000
		FC 8136 rack style EIA-232	
		FC 8137 box style Enhanced EIA-232	230,000
		FC 8138 box style Enhanced RS-422	

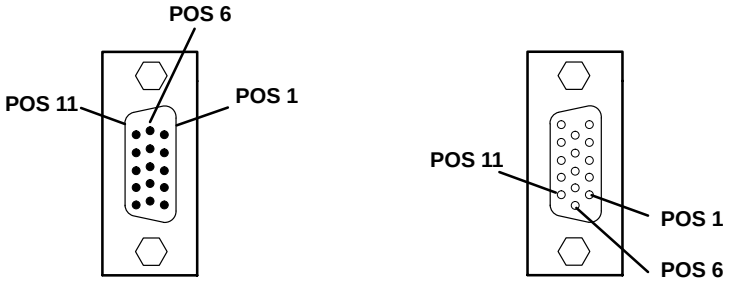
128-Port Async Controller to Remote Async Node Cables

The cable has an HD-15 male connector on the controller side and an HD-15 female connector on the remote async node side.

Cables NB and NC

Description: 128-Port Async Controller Cable, 8-wire.

The cable has eight conductors, four twisted-pair, and is shielded on the outside. If built to a length of 300 m (1000 ft) or less, conductors should be 28 AWG (stranded wire) with a capacitance rating of 52 pF/m (16 pF/ft) or less (Belden type 9806 or equivalent). For lengths greater than 300 m (1000 ft), conductors should be 24 AWG (stranded wire) with a capacitance rating of 52 pF/m (16 pF/ft) or less (Belden type 9831 or equivalent).



System End Connector		Device End Connector	
Pin (Male)	**Signal**	**Signal**	**Socket (Female)**
1	RxD -	TxD -	1
2	RxD +	TxD +	2
4	RxC -	TxC -	4
5	RxC +	TxC +	5
6	TxD -	RxD -	6
7	TxD +	RxD +	7
9	TxC -	RxC -	9
10	TxC +	RxC +	10
Shell	Shield Ground	Shield Ground	Shell

Line Length, 8-Wire: Controller line length for the 128-port async subsystem is measured as the total cabling length from the adapter to the last remote async node on the controller line. Individual cable lengths between remote async nodes or between the adapter and the first remote async node are not significant as long as total cable length does not exceed 1200 m (3930 feet) depending on the baud rate.

The 128-port async controller supports multiple controller line baud rates in 8-wire direct-attach mode. The following table shows the maximum allowable controller line length for each supported baud rate. The controller line length is the actual cable length from the controller to the last remote async node in the controller line.

For maximum performance, NB cables can be greater than 4.6 m (15 ft) if the distance from the controller to the last remote async node in the controller line does not exceed 300 m (1000 ft) running at 1.2 Mbps or 90m (300 ft.) running at 2.4 Mbps.

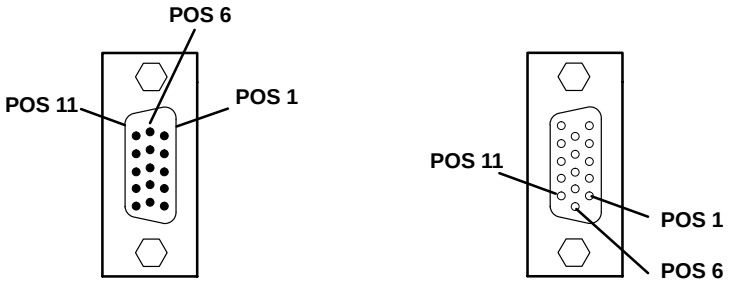
Controller Line Baud Rate	Total Controller Cable Length	
bps	**m**	**ft**
2400	1200	3930
4800	1200	3930
9600	1200	3930
19200	1200	3930
38400	1200	3930
57600	1200	3930
76800	1200	3930
115000	900	2950
230000	400	1350
460000	300	1000
920000	300	1000
1200000	300	1000
2400000	90	300

Note: The above table assumes no intermediate connectors between remote async nodes. Each additional connection decreases the maximum allowable controller line length by approximately two percent due to increased line capacitance.

Cable ND

Description: 128-Port Async Controller to Remote Async Node Cable, 4-wire.

The cable has four conductors, two twisted-pair, and is shielded on the outside. If built to a length of 300 m (1000 ft) or less, conductors should be 28 AWG (stranded wire) with a capacitance rating of 52 pF/m (16 pF/ft) or less (Belden type 9804 or equivalent). For lengths greater than 300 m (1000 ft), conductors should be 24 AWG (stranded wire) with a capacitance rating of 52 pF/m (16 pF/ft) or less (Belden type 9829 or equivalent).



System End Connector		Device End Connector	
Pin (Male	**Signal**	**Signal**	**Socket (Female)**
1	RxD -	TxD -	1
2	RxD +	TxD +	2
6	TxD -	RxD -	6
7	TxD +	RxD+	7
Shell	Shield Ground	Shield Ground	Shell

Line Length, 4-Wire: The 128-port Async Controller supports two controller line baud rates in 4-wire, direct-attach mode. The following table shows the maximum allowable controller line length for each supported baud rate. The controller line length is the actual cable length from the controller to the last remote async node in the controller line.

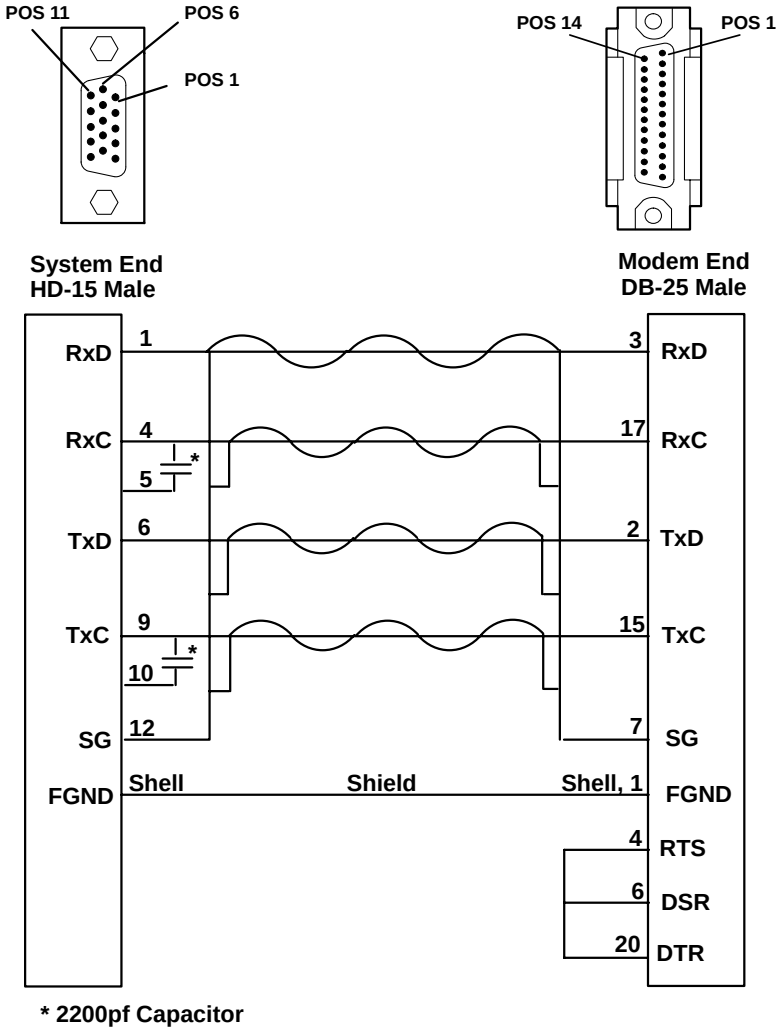
Controller Line Baud Rate	Total Controller Cable Length	
bps	**m**	**ft**
230000	400	1350
460000	300	1000

Note: The above table assumes no intermediate connectors between remote async nodes. Each additional connection decreases the maximum allowable controller line length by approximately two percent due to increased line capacitance.

Cable NE

Description: 128-Port Async Controller EIA-232 Modem Cable, System-Side.

The cable has eight twisted-pair conductors and is shielded on the outside. Cable length can be from 1.8 m (6 ft) to 3.7 m (12 ft). Conductors should be 24 AWG (stranded wire) with a capacitance rating of 41 pF/m (12.5 pF/ft) or less.



Note: See next page for notes.

The 128-port async controller supports multiple controller line baud rates in EIA-232 synchronous-modem-attach mode. Although the 128-port async controller can operate at 57.6 Kbps, to ensure a low error rate on the synchronous link, controller line baud rates of 19.2 Kbps or less are recommended.

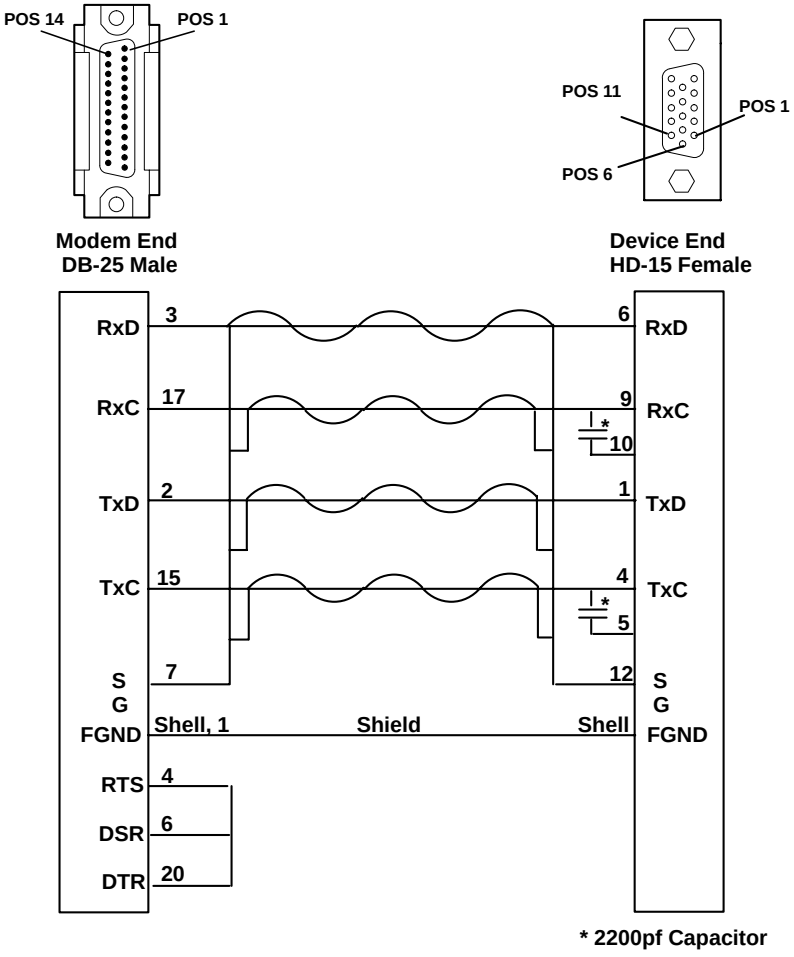
Note: The length to the furthest RAN including modem cable should be limited to 50 feet. If there is a requirement to go up to 1000 feet, then EIA-422 modems must be used.

Attention: Testing Recommendation - When setting up equipment: Hook up all equipment near the host system. Make sure that the 128-port adapter, cables, modems, and RAN are all functioning properly. Equipment is easier to trouble shoot when all compoments are local. Consult modems technical manual for settings and wiring when modems are used back to back in a test configuration as described here. Baud rates of 19.2 Kbps or less are recommended to help insure low error rates. Using EIA232 modems, the length to the furthest RAN including modem cable should be limited to 50 feet. If there is a requirement to go up to 1000 feet, then EIA422 modems must be used. .

Cable NF

Description: 128-Port Async Controller EIA-232 Modem Cable, Device-side.

The cable has eight twisted-pair conductors and is shielded on the outside. Cable length can be from 1.8 m (6 ft) to 3.7 m (12 ft). Conductors should be 24 AWG (stranded wire) with a capacitance rating of 41 pF/m (12.5 pF/ft) or less.



The 128-port async controller supports multiple controller line baud rates in EIA-232 synchronous-modem-attach mode. Although the 128-port async controller can operate at 57.6 Kbps, to ensure a low error rate on the synchronous link, controller line baud rates of 19.2 Kbps or less are recommended.

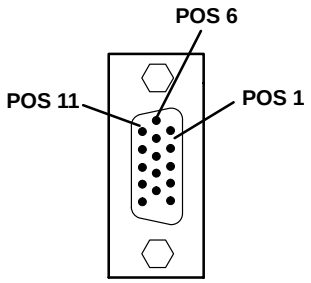
Note: The length to the furthest RAN including modem cable should be limited to 50 feet. If there is a requirement to go up to 1000 feet, then EIA-422 modems must be used.

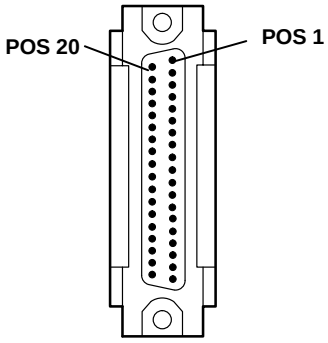
See Testing Recommendation in Chapter 5 Cable NE on page 5-29.

Cable NG

Description: 128-Port Async Controller EIA-422 Modem Cable, System.

The cable has eight conductors, four twisted-pair, and is shielded on the outside. If built to a length of 300 m (1000 ft) or less, conductors should be 28 AWG (stranded wire) with a capacitance rating of 52 pF/m (16 pF/ft) or less (Belden type 9806 or equivalent). For lengths greater than 300 m (1000 ft), conductors should be 24 AWG (stranded wire) with a capacitance rating of 52 pF/m (16 pF/ft) or less (Belden type 9831 or equivalent).





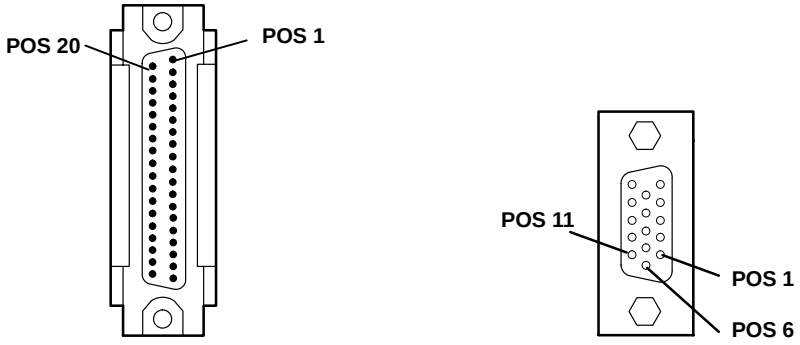
System End Connector		Device End Connector	
Pin (Male	**Signal**	**Signal**	**Socket (Female)**
1	RxD -	RD -	6
2	RxD +	RD +	24
4	RxC -	RT -	8
5	RxC +	RT +	26
6	TxD -	SD -	4
7	TxD +	SD +	22
9	TxC -	ST -	5
10	TxC +	ST +	23
12	Shield Ground	Shield Ground	19

The 128-port async controller supports multiple controller line baud rates in EIA-422 synchronous-modem-attach mode. See the Controller Line Baud Rate table for Cable NB “Line Length, 8-Wire” on page 5-25.

Cable NH

Description: 128-Port Async Controller EIA-422 Modem Cable, Device-Side.

The cable has eight conductors, four twisted-pair, and is shielded on the outside. If built to a length of 300 m (1000 ft) or less, conductors should be 28 AWG (stranded wire) with a capacitance rating of 52 pF/m (16 pF/ft) or less (Belden type 9806 or equivalent). For lengths greater than 300 m (1000 ft), conductors should be 24 AWG (stranded wire) with a capacitance rating of 52 pF/m (16 pF/ft) or less (Belden type 9831 or equivalent).



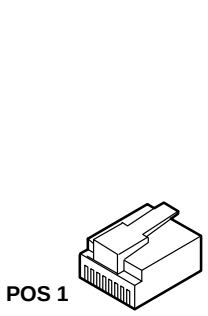
System End Connector		Device End Connector	
Pin (Male	**Signal**	**Signal**	**Socket (Female)**
6	RD -	RxD -	6
24	RD +	RxD +	7
8	RT -	RxC -	9
26	RT +	RxC +	10
4	SD -	TxD -	1
22	SD +	TxD +	2
5	ST -	TxC -	4
23	ST +	TxC +	5
19	Shield Ground	Shield Ground	12

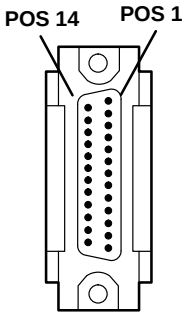
The 128-port async controller supports multiple controller line baud rates in EIA-422 synchronous-modem-attach mode. See the Controller Line Baud Rate table for Cable NB “Line Length, 8-Wire” on page 5-25.

Remote Async Node-to-Device Cables

Cable NK

Description: 10-pin RJ-45 to DB-25 Converter Cable for use with the Remote Async Node 16-Port EIA-232.





System End Connector		Device End Connector	
Pin (Male	**Signal**	**Signal**	**Socket (Female)**
1	RI	RI	22
2	DSR	DSR	6
3	RTS	RTS	4
4	Chassis Ground	Chassis Ground	Shell
5	TxD	TxD	2
6	RxD	RxD	3
7	Signal Ground	Signal Ground	7
8	CTS	CTS	5
9	DTR	DTR	20
10	CD	CD	8

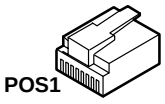
Note:

1. This cable assembly is shielded.
2. This cable assembly and the 64-port RJ-45 to DB-25 converter cable (FC 6402) are not interchangeable.

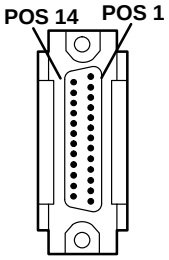
Cable NL

Description: Customer-supplied cable for connecting Remote Async Node 16-Port EIA-232 to a printer or terminal device.

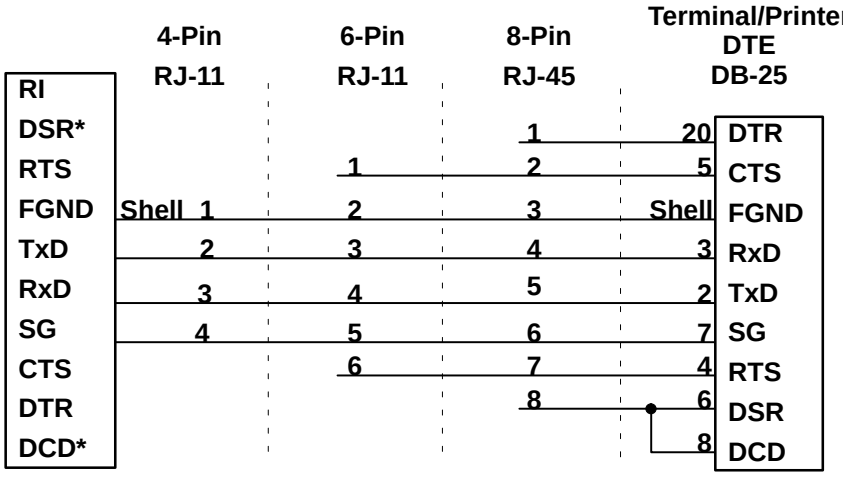
Cable length can be up to 30 m (100 ft) for baud rates up to 57.6 Kbps. See RAN to device cable length table on page 5-38. Use overall foil/braid shielded multiconductor cable with a capacitance rating of 41 pF/m (12.5 pF/ft) or less. Conductors should be 28 AWG (stranded wire). For lengths less than 61 m (200 ft), higher capacitance cable can be used, as long as the total capacitance (including intermediate connectors and cables) does not exceed 2500 pF.



4-, 6-, and 8-Pin RJ-11 or RJ-45 Plug (Male)



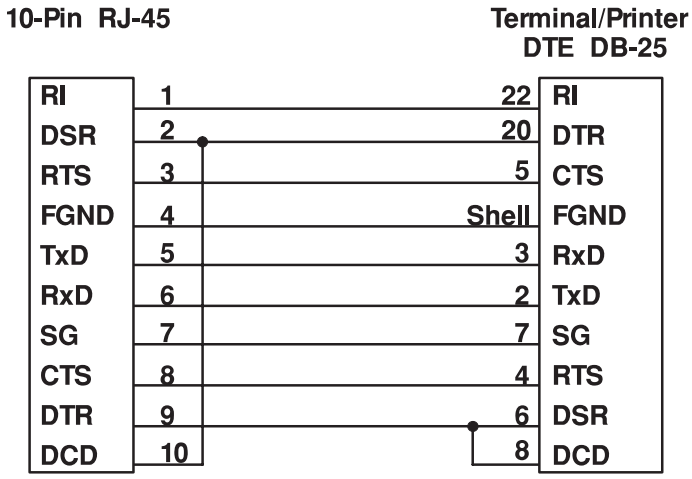
DB-25 Pin (Male)



RAN to Printer/Terminal Cable (NL)
for 4- and 6-Pin RJ-11, and 8-Pin RJ-45 Plugs

Note: *The physical location of DCD and DSR may be interchanged through software control if desired. Used only on 8-pin RJ-45 cable.

The following diagram illustrates cable NL using a 10-pin RJ-45 plug.



RAN to Printer/Terminal Cable (NL)
for 10-Pin RJ-45 Plug

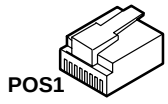
Attention: The receivers and drivers used in most asynchronous communications devices are sensitive to electrostatic discharge (ESD). To reduce the possibility of exposure to ESD, observe the following cabling practices when building or using device cables for attachment to the Remote Async Node 16-Port EIA-232:

1. Do not build a cable that has exposed conductors, leads, or pins that could be touched by someone not protected against ESD. Avoid the use of punchdown blocks and patch panels which have exposed terminator/pins. In the event that you use intermediate connectors or cables, be sure to discharge them to ground before plugging them into equipment.
2. Do not run any cables outdoors without having proper transient voltage suppression devices installed.
3. Do not route cables near or around items such as power transformers, high-power switching devices and refrigeration units.
4. Use shielded cables. All wires should be terminated, not floating. The shield should be connected to shield ground at the remote async node.

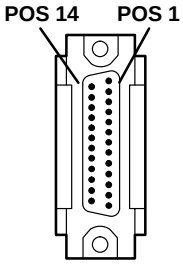
Cable NM

Description: Customer-supplied cable for connecting Remote Async Node 16-Port EIA-232 to a modem device.

Cable length can be up to 30 m (100 ft) for baud rates up to 57.6 Kbps. See RAN to device cable length table on page 5-38. Use overall foil/braid shielded multiconductor cable with a capacitance rating of 41 pF/m (12.5 pF/ft) or less. Conductors should be 28 AWG (stranded wire). For lengths less than 61 m (200 ft), higher capacitance cable can be used, as long as the total capacitance (including intermediate connectors and cables) does not exceed 2500 pF.



4-, 6-, and 10-Pin R-J11 or RJ-45 Plug (Male)



DB-25 Pin (Male)

	4-Pin RJ-11		6-Pin RJ-11		10-Pin RJ-45		Cable NM Modem DCE DB-25	
RI	1				1	22		RI
DSR	2				2	6		DSR
RTS	3			1	3	4		RTS
FGND	4	1		2	4	Shell		FGND
TxD	5	2		3	5	2		TxD
RxD	6	3		4	6	3		RxD
SG	7	4		5	7	7		SG
CTS	8			6	8	5		CTS
DTR	9				9	20		DTR
DCD	10				10	8		DCD

RAN to Modem Cable (NM)
for 4-Pin, 6-Pin RJ-11, and 10-Pin RJ-45 Plugs

Attention: The receivers and drivers used in most asynchronous communications devices are sensitive to electrostatic discharge (ESD). To reduce the possibility of exposure to ESD, observe the following cabling practices when building or using device cables for attachment to the Remote Async Node 16-Port EIA-232:

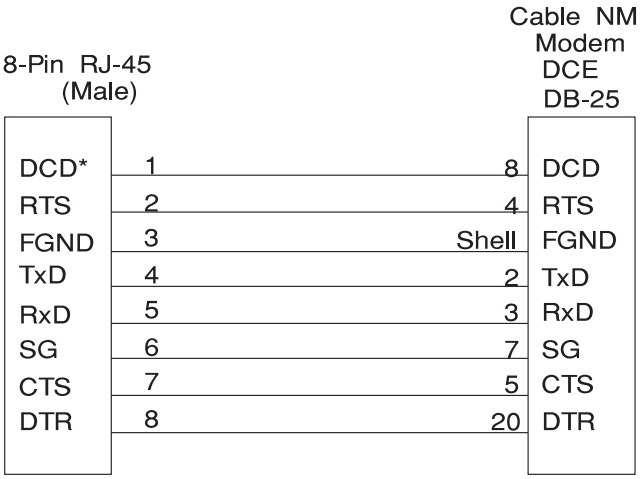
1. Do not build a cable that has exposed conductors, leads, or pins that could be touched by someone not protected against ESD. Avoid the use of punchdown blocks and patch panels which have exposed terminator/pins. In the event that you use intermediate connectors or cables, be sure to discharge them to ground before plugging them into equipment.
2. Do not run any cables outdoors without having proper transient voltage suppression devices installed.
3. Do not route cables near or around items such as power transformers, high-power switching devices and refrigeration units.
4. Use shielded cables. All wires should be terminated, not floating. The shield should be connected to shield ground at the remote async node.

Note:

1. This cable assembly is shielded.
2. This cable assembly and the 64-port RJ-45 to DB-25 converter cable (FC 6402) are not interchangeable.

RAN to Device Line Baud Rate	Total RAN to Device Cable Length	
bps	**m**	**ft**
57600 or less	30	100
115000	24	80
230000	12	40

The following diagram illustrates cable NM using an 8-pin RJ-45 plug.



RAN to Modem Cable (NM)
for 8-Pin RJ-45 Plug

Note: *The physical location of DCD is switched with DSR through software control.

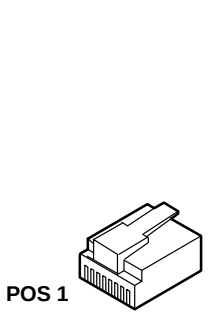
Attention: The receivers and drivers used in most asynchronous communications devices are sensitive to electrostatic discharge (ESD). To reduce the possibility of exposure to ESD, observe the following:

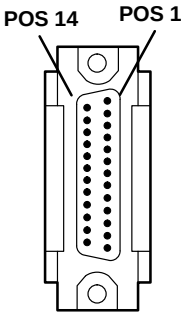
1. Do not build a cable that has exposed conductors, leads, or pins that could be touched by someone not protected against ESD. Avoid the use of punchdown blocks and patch panels which have exposed terminator/pins. In the event that you use intermediate connectors or cables, discharge them to ground before plugging them into equipment.
2. Do not run any cables outdoors without having proper transient voltage suppression devices installed.
3. Do not route cables near or around items such as power transformers, high-power switching devices and refrigeration units.
4. Use shielded cables.
5. All wires should be terminated, not floating. The shields should be connected to shield ground at the remote async node.

Cable NP

Description: 10-pin RJ-45 to DB-25 converter cable for use with the Enhanced Remote Async Node 16-Port RS-422. Only six wires are used by the NP cable.

Note: An NK cable (an EIA-232 cable) can be used for an NP cable if available. It has some extra wires but should work.





System End Connector		Device End Connector	
Pin (Male	**Signal**	**Signal**	**Socket (Female)**
1	Reserved	Reserved	22
2	Reserved	Reserved	6
3	TxD+	TxD+	4
4	Chassis Ground	Chassis Ground	Shell
5	TxD-	TxD-	2
6	RxD-	RxD-	3
7	Signal Ground	Signal Ground	7
8	RxD+	RxD+	5
9	Reserved	Reserved	20
10	Reserved	Reserved	8

Note:

- This cable assembly is shielded.

2-Port Multiprotocol PCI Adapter

The following information is for custom built cables connecting the 2-Port Multiprotocol PCI Adapter to the interfaces supported by the adapter. There is a section for each interface cable PA through PD.

Cable Construction Information

If you plan to build your own cables for your 2-port multiprotocol installation, be sure to follow the following guidelines.

Wire Gauge, Grounding, and Pairing

- Use 28 AWG: 7-strand wire with 0.020--0.028 inch insulation and shielded with braid and drain wire.
- The chassis must be grounded both by a drain wire and by the braid. Both must be connected to the connector case and shell at each end of the cable. The braid must be connected through its full circumference.
- Wires identified under the heading "Twisted Pairs" must be paired. If you do not install twisted pairs correctly, the cable will not work.

The type of connector for each cable is shown at the end of this chapter. See “Connector Descriptions” on page 5-60.

Cable PA

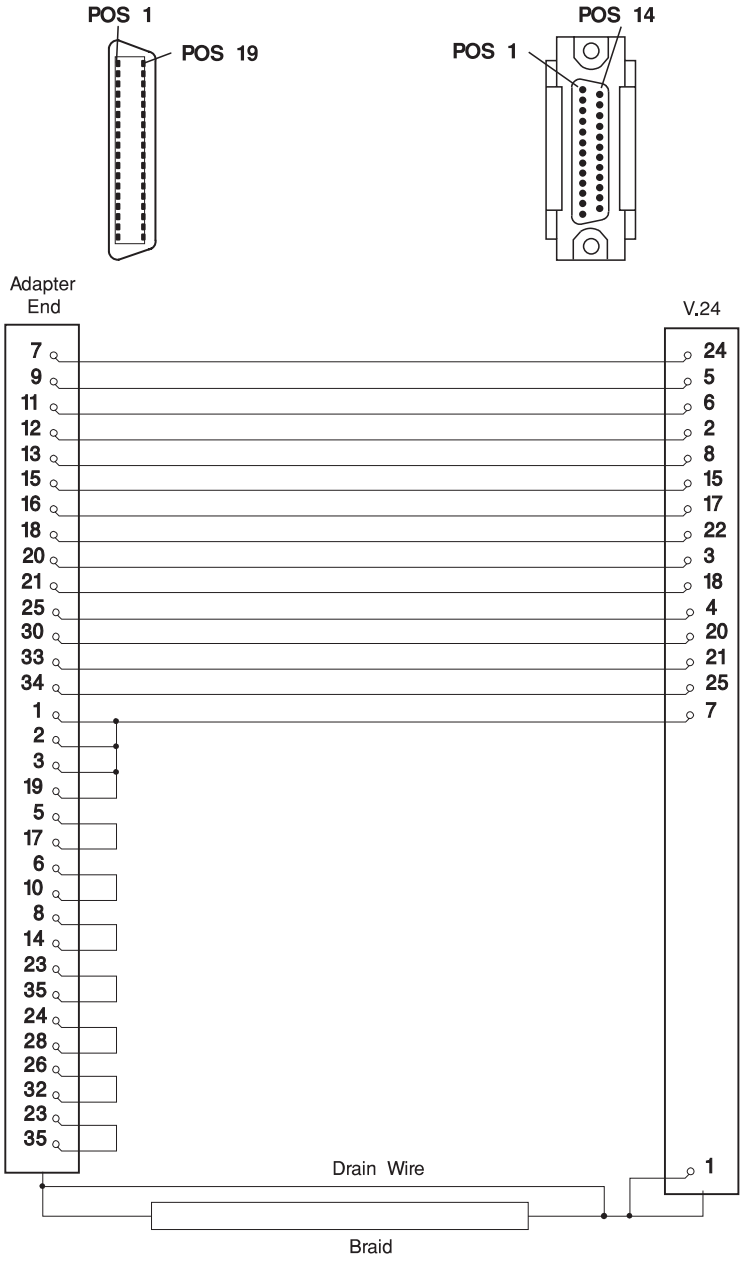
Description: V.24 cable for use with the 2-Port Multiprotocol PCI adapter.

A pin-out diagram with signal names and a wiring diagram for the V.24 interface are shown below.

Pin No.	Signal	Name
1	PGND	Protective Ground
2	TXD	Transmit Data
3	RXD	Receive Data
4	RTS	Request to Send
5	CTS	Clear to Send
6	DSR	Data Set Ready
7	SGND	Signal Ground
8	DCD	Data Carrier Detect
15	TCLK	Transmit Clock (DCE)
17	RCLK	Receive Clock
18	TEST	Local Loopback Activation
20	DTR	Data Terminal Ready
21	RLB	Remote Loopback
22	RI	Ring Indicator
24	DTECLK	Transmit Clock (DTE)
25	TI	Test Indicator

V.24 Connections

The wiring diagram below shows the connections required to construct a V.24 cable. For additional information to construct your own cable, see “Cable Construction Information” on page 5-41.



Cable PB

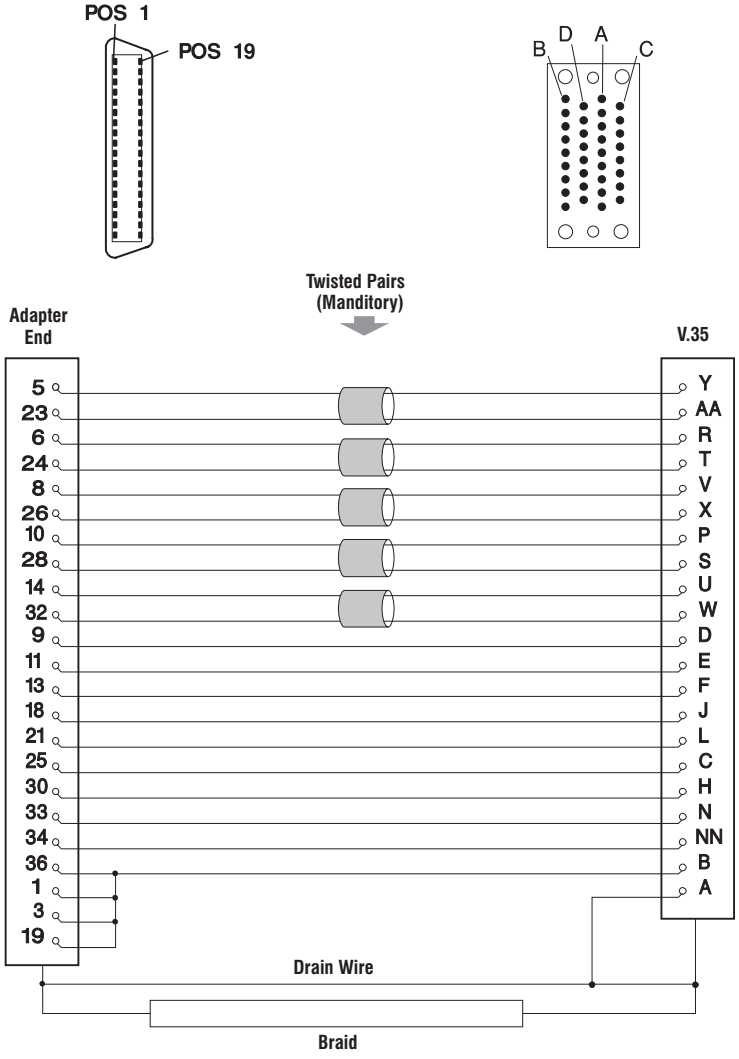
Description: V.35 cable for use with the 2-Port Multiprotocol PCI adapter.

A pin-out diagram with signal names and a wiring diagram for the V.35 interface are shown below.

Pin No.	Signal	Name
A	PGND	Protective Ground
B	SGND	Signal Ground
C	RTS	Request to Send
D	CTS	Clear to Send
E	DSR	Data Set Ready
F	DCD	Data Carrier Detect
H	DTR	Data Terminal Ready
J	RI	Ring Indicator
L	TEST	Local Loopback Activation
N	RLB	Remote Loopback
P	TXD+	Transmit Data
R	RXD+	Receive Data
S	TXD-	Transmit Data
T	RXD-	Receive Data
U	CLK+	Transmit Clock (DTE)
V	RCLK+	Receive Clock (DCE)
W	CLK-	Transmit Clock (DTE)
X	RCLK-	Receive Clock (DCE)
Y	TCLK+	Transmit Clock (DCE)
AA	TCLK- Transmit Clock (DCE)	
NN	TI	Test Indicator

V.35 Connections

The wiring diagram below shows the connections required to construct a V.35 cable. For additional information to construct your own cable, see “Cable Construction Information” on page 5-41.



Cable PC

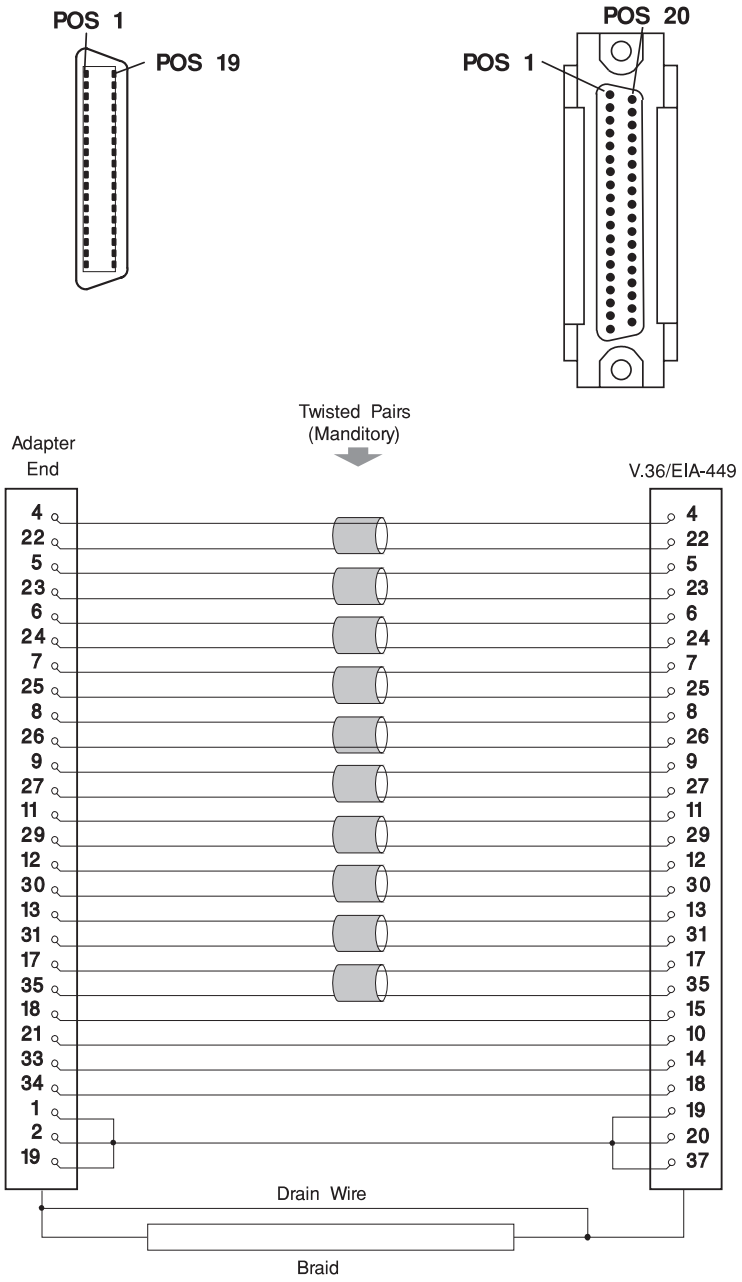
Description: V.36/EIA-449 cable for use with the 2-Port Multiprotocol PCI Adapter.

A pin-out diagram with signal names and a wiring diagram for the V.36/EIA-449 interface are shown below.

Pin No.	Signal	Name
Case	PGND	Protective Ground
4	TXD+	Transmit Data
5	TRXC+	Transmit Clock (DCE)
6	RXD+	Receive Data
7	RTS+	Request to Send
8	RTXC+	Receive Clock (DCE)
9	CTS+	Clear to Send
10	TEST	Local Loopback Activation
11	DSR+	Data Set Ready
12	DTR+	Data Terminal Ready
13	DCD+	Data Carrier Detect
14	RLB	Remote Loopback
15	RI	Ring Indicator
17	CLK+	Transmit Clock (DTE)
18	TI	Test Indicator
19	GND	DTE Common Return
22	TXD-	Transmit Data
23	TRXC-	Transmit Clock (DCE)
24	RXD-	Receive Data
25	RTS-	Request to Send
26	RTXC-	Receive Clock (DCE)
27	CTS-	Clear to Send
29	DSR-	Data Set Ready
30	DTR-	Data Terminal Ready
31	DCD-	Data Carrier Detect
35	CLK-	Transmit Clock (DTE)

V.36/EIA-449 Connections

The wiring diagram below shows the connections required to construct a V.36/EIA-449 cable. For additional information to construct your own cable, see “Cable Construction Information” on page 5-41.



Cable PD

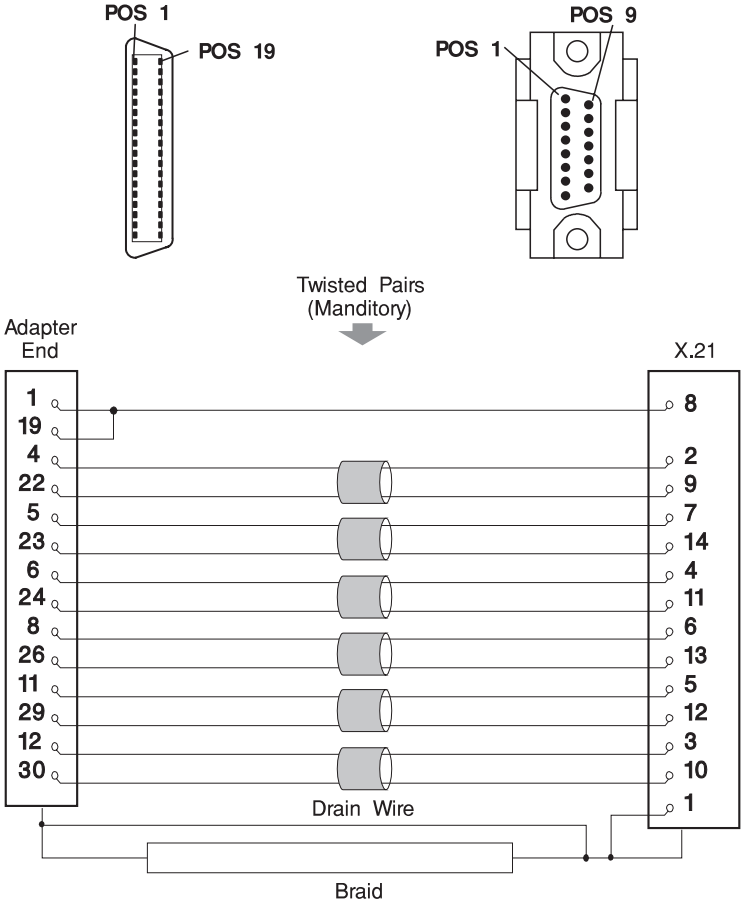
Description: X.21 cable for use with the 2-Port Multiprotocol PCI Adapter.

A pin-out diagram with signal names and a wiring diagram for the X.21 interface are shown below.

Pin No.	Signal	Name
1/15	PGND	Protective Ground
2	T(A)	Transmit Data (+)
3	C(A)	Control Signal (+)
4	R(A)	Receive Data (+)
5	I(A)	Indication (+)
6	S(A)	Signal Element Timing (+)
7	B(A)	Byte Timing (+)
8	SGND	Signal Ground
9	T(B)	Transmit Data (-)
10	C(B)	Control Signal (-)
11	R(B)	Receive Data (-)
12	I(B)	Indication (-)
13	S(B)	Signal Element Timing (-)
14	B(B)	Byte Timing (-)

X.21 Connections

The wiring diagram below shows the connections required to construct a X.21 cable. For additional information to construct your own cable, see “Cable Construction Information” on page 5-41.



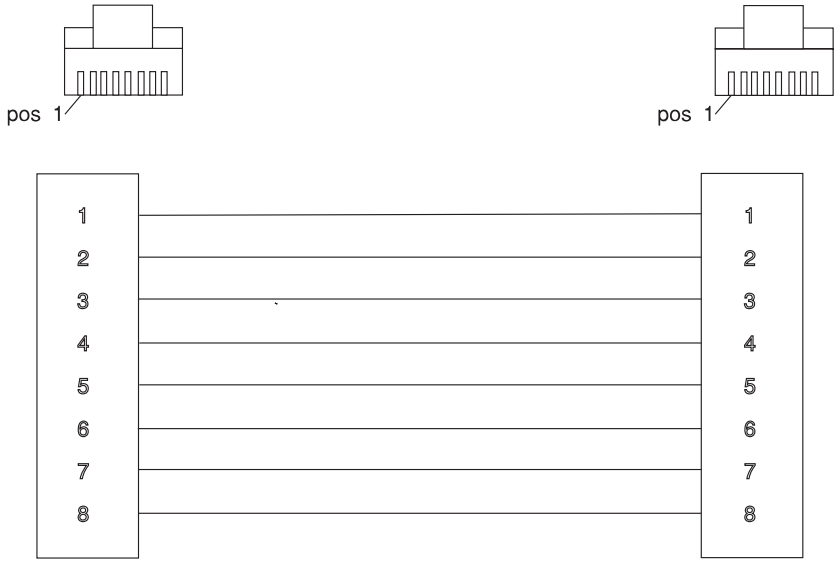
10/100 Ethernet Tx PCI Adapter

Cable PH

Description: Ethernet straight thru cable for use with the 10/100 Ethernet Tx PCI Adapter.

Ethernet Straight Thru Connections

The wiring diagram below shows the connections required to construct an Ethernet Straight thru cable.



This cable is to be constructed using twisted-pair cable. The twisted-pairs of wires must be wired as shown in the table below. For additional information to construct your own cable, see Ethernet specification IEEE-802.3u. Ethernet cables must meet Ethernet specification IEEE-802.3u.

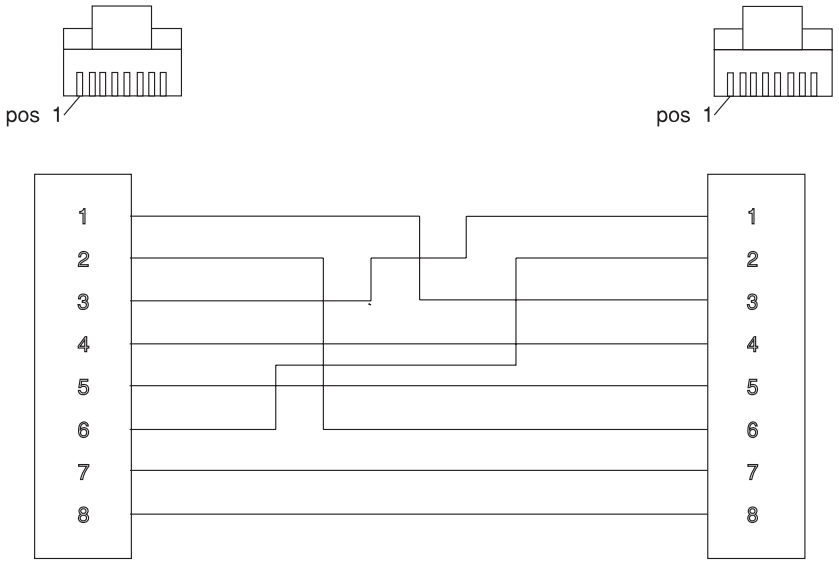
Twisted- Pair	Positions
1	1,2
2	3,6
3	4,5
4	7,8

Cable PJ

Description: Ethernet crossover cable for use with the 10/100 Ethernet Tx PCI Adapter.

Ethernet Crossover Connections

The wiring diagram below shows the connections required to construct an ethernet crossover cable.



This cable is to be constructed using twisted-pair cable. The twisted-pairs of wires must be wired as shown in the table below. For additional information to construct your own cable, see Ethernet specification IEEE-802.3u. Ethernet cables must meet Ethernet specification IEEE-802.3u.

Twisted- Pair	Positions
1	1,2
2	3,6
3	4,5
4	7,8

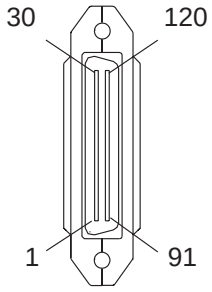
IBM ARTIC960Hx Series of Adapters

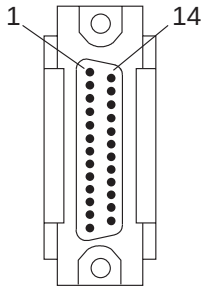
The following information is for custom built cables connecting the IBM ARTIC960Hx Series of PCI Adapters to the interfaces supported by the adapter. There is a section for each interface cable PK through PS.

Cable PK

Description: EIA-232 (ISO 2110) cable for use with the ARTIC960Hx 4-Port Selectable PCI Adapter.

The following illustration shows a 25-pin, male, D-shell connector. The other end is a 120 pin D-Shell. The table below lists the pin assignments for the EIA-232 (ISO 2110) electrical interface. Each signal is identified as input (I) or output (O), as viewed from the PMC card. The “x” in the signal name is the number of the port. The ID for the EIA-232 cable is 02h.



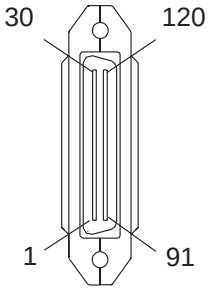


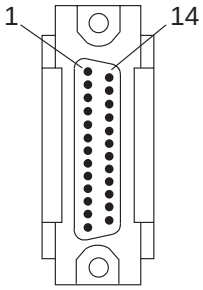
Signal Name	I/O	120-Pin Connector				25-Pin Connector
		0	1	2	3	
TXDx	O	105	45	17	77	02
RXDx	I	104	44	16	76	03
RTSx	O	114	54	06	66	04
CTSx	I	120	60	15	75	05
CDx	I	094	34	26	86	08
DTRx	O	112	52	08	68	20
DSRx	I	098	38	22	82	06
TXCLKOx	n/a	111	51	11	71	24
TXCLKIx	n/a	091	31	30	90	15
RXCLKx	n/a	106	46	01	61	17
GND	n/a	110	50	10	70	07
Shield	n/a	Housing				01/Housing

Cable PL

Description: EIA-530 (ISO 2110) cable for use with the IBM ARTIC 960Hx 4-Port Selectable PCI Adapter.

The following illustration shows a 25-pin, male, D-shell connector. The other end is a 120 pin D-Shell. The table below lists the pin assignments for the EIA-530 (ISO 2110) electrical interface. Each signal is identified as input (I) or output (O), as viewed from the PMC card. The “x” in the signal name is the number of the port. The ID for the EIA-530 cable is F7h.



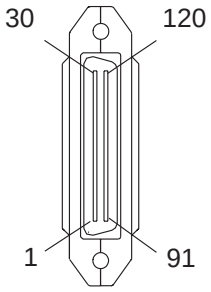


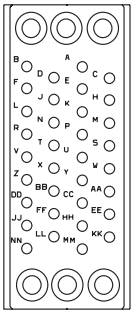
Signal Name	I/O	120-Pin Connector				25-Pin Connector
		0	1	2	3	
TXDxA	O	118	58	02	62	02
TXDxB	O	119	59	03	63	14
RTSxA	O	114	54	06	66	04
RTSxB	O	115	55	07	67	19
RXDxA	I	096	36	24	84	03
RXDxB	I	097	37	25	85	16
CTSxA	I	100	40	20	80	05
CTSxB	I	101	41	21	81	13
CDxA	I	094	34	26	86	08
CDxB	I	095	35	27	87	10
RCLKIxA	I	108	48	12	72	17
RCLKIxB	I	109	49	13	73	09
TCLKOxA	O	116	56	04	64	24
TCLKOxB	O	117	57	05	65	11
TCLKIxA	I	102	42	18	78	15
TCLKIxB	I	103	43	19	79	12
DSRxA	I	098	38	22	82	06
DSRxB	I	099	39	23	83	22
DTRxA	O	112	52	08	68	20
DTRxB	O	113	53	09	69	23
GND	n/a	110	50	10	70	07
Shield	n/a	Housing				01/Housing

Cable PM

Description: V.35 DTE (ISO 2593) cable for use with the IBM ARTIC960Hx 4-Port Selectable PCI Adapter.

The following shows a 34-pin male connector. The other end is a 120 pin D-Shell. The table below lists pin assignments for the V.35 DTE (ISO 2593) electrical interface. Each signal is identified as input (I) or output (O), as viewed from the PMC card. The “x” in the signal name is the number of the port. The ID for the V.35 DTE cable is FBh.





Signal Name	I/O	120-Pin Connector				34-Pin Connector
		0	1	2	3	
TXDxA	O	118	58	02	62	P
TXDxB	O	119	59	03	63	S
RTSx	O	114	54	06	66	C
RXDxA	I	096	36	24	84	R
RXDxB	I	097	37	25	85	T
CTSx	I	120	60	15	75	D
DSRx	I	098	38	22	82	E
DTRx	O	112	52	08	68	H
CDx	I	094	34	26	86	F
RCLKIxA	I	108	48	12	72	V
RCLKIxB	I	109	49	13	73	X
TCLKOxA	O	116	56	04	64	U
TCLKOxB	O	117	57	05	65	W
TCLKIxA	I	102	42	18	78	Y
TCLKIxB	I	103	43	19	79	AA
GND	n/a	110	50	10	70	B
Shield	n/a					A

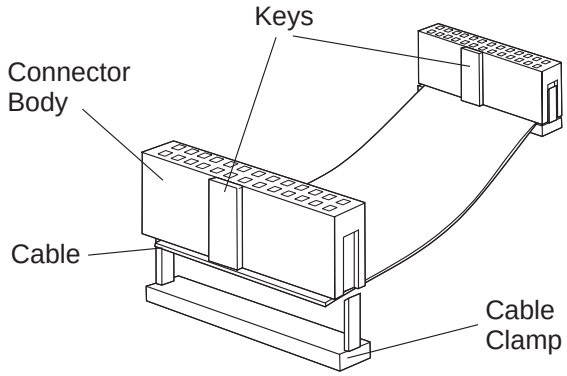
Cable PN

Description: A 26-pin ribbon cable to connect the SC buses on similarly-capable neighboring adapters in the system unit.

This optional SC-bus cable can be constructed using 26 conductor, flat ribbon cable 28 AWG.

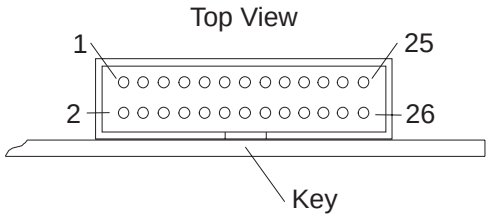
Note:

- The 26 pin-cable connector comes in two pieces and requires a special tool such as a 3M™ Scotchflex press (or equivalent).
- The cable assembly can have several connectors; however, the minimum distance between connectors is 25.4 mm (1.0 in).
- When assembling the cable, make sure that all of the connectors are oriented in the same direction (the connectors are facing in the same direction).



Item	Description
26-pin cable connector	Amphenol 842-812-2633-134 (or equivalent)
26-conductor ribbon cable	3M 3365/26 Amphenol 843-191-2801-126 Berg 65088-126 (or equivalent)

SC-Bus Connector Pin Numbering and Assignments: The following figures show the 26-pin, male connector and the signal assignments for the connector.

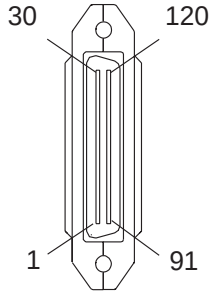


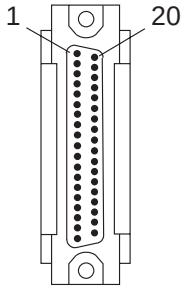
Pin Number	Signal Name	Pin Number	Signal Name
1	SCLKx2	2	Ground
3	SCLK	4	Reserved
5	FSYNC	6	CLKFAIL
7	SD0	8	Ground
9	SD1	10	SD2
11	SD3	12	SD4
13	SD5	14	SD6
15	Ground	16	SD7
17	SD8	18	SD9
19	SD10	20	SD11
21	Ground	22	SD12
23	SD13	24	SD14
25	SD15	26	MC Data
Note: MC Data (pin-26) is not implemented on the IBM ARTIC960 DSP Resource Mezzanine Card.			

Cable PP

Description: RS-449 (ISO 4902) cable for use with the IBM ARTIC960Hx 4-Port Selectable PCI Adapter.

The following illustration shows a 37-pin, D-shell connector. The table below lists pin assignments for the RS-449 (ISO 4902) electrical interface. The other end is a 120 pin D-Shell. Each signal is identified as input (I) or output (O), as viewed from the PMC card. The “x” in the signal name is the number of the port. The ID for the RS-449 cable is FDh.



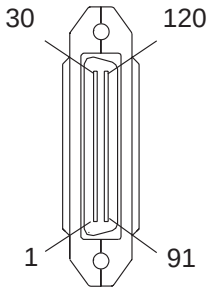


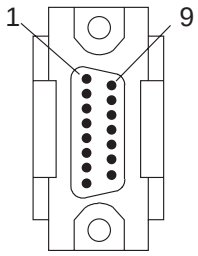
Signal Name	I/O	120-Pin Connector				37-Pin Connectors
		0	1	2	3	
TXDxA	O	118	58	02	62	04
TXDxB	O	119	59	03	63	22
RXDxA	I	096	36	24	84	6
RXDxB	I	097	37	25	85	24
RTSxA	O	114	54	06	66	07
RTSxB	O	115	55	07	67	25
CTSxA	I	100	40	20	80	09
CTSxB	I	101	41	21	81	27
DSRxA	I	098	38	22	82	11
DSRxB	I	099	39	23	83	29
DTRxA	O	112	52	08	68	12
DTRxB	O	113	53	09	69	30
CDxA	I	094	34	26	86	13
CDxB	I	095	35	27	87	31
RCLKIxA	I	108	48	12	72	08
RCLKIxB	I	109	49	13	73	26
TCLKOxA	O	116	56	04	64	17
TCLKOxB	O	117	57	05	65	35
TCLKIxA	I	102	42	18	78	05
TCLKIxB	I	103	43	19	79	23
GND	n/a	100	50	10	70	19,20,37

Cable PR

Description: X.21 (ISO 4903) cable for use with the IBM ARTIC960Hx 4-Port Selectable PCI Adapter.

The following illustration shows a 15-pin, male, D-shell connector. The table below lists the pin assignments for the X.21 (ISO 4903) electrical interface. The other end is a 120 pin D-Shell. Each signal is identified as input (I) or output (O), as viewed from the PMC card. The “x” in the signal name is the number of the port. The ID for the X.21 cable is DFh.





Signal Name	I/O	120-Pin Connector				15-Pin Connector
		0	1	2	3	
TXDxA	O	118	58	02	62	02
TXDxB	O	119	59	03	63	09
RTSxA	O	114	54	06	66	03
RTSxB	O	115	55	07	67	10
RXDxA	I	096	36	24	84	04
RXDxB	I	097	37	25	85	11
CTSxA	I	100	40	20	80	05
CTSxB	I	101	41	21	81	12
RCLKIxA	I	108	48	12	72	06
RCLKIxB	I	109	49	13	73	13
TCLKOxA	O	116	56	04	64	07
TCLKOxB	O	117	57	05	65	14
GND	n/a	110	50	10	70	08
Shield	n/a	Housing				01/Housing

Cable PS

Description: RJ-48 Jack for use with the IBM ARTIC960Hx 4-Port T1/E1 PCI Adapter.

The following illustration shows an RJ-48 jack connector. The table below lists the pin assignments for the T1 and E1 electrical interfaces. The “x” in the signal name is the number of the port. The ID is 9h for the T1; 1h for the E1.

Signal Name	I/O	36-pin Connector				RJ-48 Connector
		0	1	2	3	
TX1_x	O	33	29	23	19	04
TX2_x	O	34	30	24	20	05
FGND_x	n/a	16	12	08	04	06,03
RX1_x	I	35	31	25	21	01
RX2_x	I	36	32	26	22	02
FGND	n/a	Housing				Housing

Connector Descriptions

Cable Letter	Cable Name	Connector Descriptions (adapter end/device end)
A	PC Parallel Printer Cable	25-pin D male/36-pin D male barrier
D	Async Cable-EIA-232/V.24	25-pin D female/25-pin D male
E	Printer/Terminal Interposer-EIA-232	25-pin D female/25-pin D male
I	Printer/Terminal Cable-EIA-232	25-pin D female/25-pin D male
K	Terminal Cable-EIA-422A	25-pin D male/25-pin D male
Q	X.25 Attachment Cable-X.21	37-pin D female/15-pin D male
R	X.25 Attachment Cable-V.24	37-pin D female/25-pin D male
S	X.25 Attachment Cable-V.35	37-pin D female/34-pin Type M male
T	4-Port Multiprotocol Interface Cable	78-pin D male/78-pin D female
U	Multiprotocol Attachment Cable-V.35	15-pin D female/34-pin Type M male
V	Multiprotocol Attachment Cable-EIA-232/V.24	25-pin D female/25-pin D male
W	Multiprotocol Attachment Cable-X.21	15-pin D female/15-pin D female
X	EIA-422A Cable	25-pin D female/customer supplied
AR	Serial Port Cable EIA-232 with 9-pin	9-pin D female/25-pin D male
AS	Serial Port fanout Cable makes second serial port	25-pin D female/two 25-pin D male
AU	Customer-supplied cable for connecting the TURBOWAYS 25 ATM adapter to an ATM switch or concentrator	RJ-45/RJ-45
NB, NC	128-Port Async Controller Cable, 8-wire	15-pin HD male/15-pin HD female
ND	128-Port Async Controller Cable, 4-wire	15-pin HD male/15-pin HD female
NE	128-Port Async Controller EIA-232 Modem Cable, System	15-pin HD male/25-pin D male
NF	128-Port Async Controller EIA-232 Modem Cable, Device	25-pin D male/15-pin HD female
NG	128-Port Async Controller EIA-422 Modem Cable, System	15-pin HD male/37-pin D male
NH	128-Port Async Controller EIA-422 Modem Cable, Device	37-pin D male/15-pin HD female
NK	RJ-45 to DB-25 Converter Cable	10-pin RJ-45 male/25-pin D male
NL	Customer-supplied cable for connecting Remote Async Node 16-Port EIA-232 to a printer or terminal device	4-, 6-, 8-, 10-pin RJ-45 male/25-pin D male
NM	Customer-supplied cable for connecting Remote Async Node 16-Port EIA-232 to a modem device	4-, 6-, 8-, 10-pin RJ-45 male/25-pin D male

Cable Letter	Cable Name	Connector Descriptions (adapter end/device end)
NP	RJ-45 to DB-25 Converter Cable	10-pin RJ-45 male/25-pin D male
PA	Customer-supplied cable for connecting the 2-Port Multiprotocol adapter to a V.24 network ec.high density 36-pin male/25-pin D male	
PB	Customer-supplied cable for connecting the 2-Port Multiprotocol adapter to a V.35 network	high density 36-pin male/34-pin Type M male
PC	Customer-supplied cable for connecting the 2-Port Multiprotocol adapter to a V.36/EIA-449 network	high density 36-pin male/37-pin D male
PD	Customer-supplied cable for connecting the 2-Port Multiprotocol adapter to a X.21 network	high density 36-pin male/15-pin D male
PH	Customer-supplied cable for connecting the Ethernet adapter to an Ethernet hub	RJ-45/RJ-45
PJ	Customer-supplied cable for connecting the Ethernet adapter to an Ethernet adapter	RJ-45/RJ-45
PK	Customer-supplied cable for connecting the 4-Port Selectable PCI adapter to four EIA-232 (ISO 2110) devices	120-pin D male/25-pin D male
PL	Customer-supplied cable for connecting the 4-Port Selectable PCI adapter to four EIA-530 (ISO 2110) devices	120-pin D male/25-pin D male
PM	Customer-supplied cable for connecting the 4-Port Selectable PCI adapter to four V.35 DTE (ISO 2593) networks	120-pin D male/34-pin Type M male
PN	Customer-supplied cable for connecting the SC-Busses together on the mezzanine adapters	26-pin ribbon cable connectors
PP	Customer-supplied cable for connecting the 4-Port Selectable PCI adapter to four RS-449 (ISO 4902) network	120-pin D male/37-pin D male
PR	Customer-supplied cable for connecting the 4-Port Selectable PCI adapter to four X.21 (ISO 4903) networks	120-pin D male/15-pin D male
PS	Customer-supplied cable for connecting the 4-Port T1/E1 PCI adapter to four T1/E1 networks	36-pin D male/15-pin D male

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