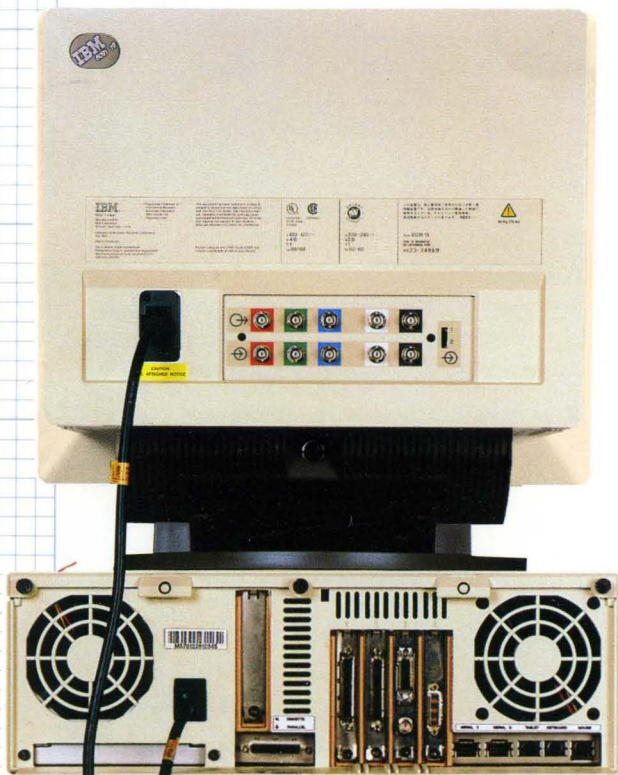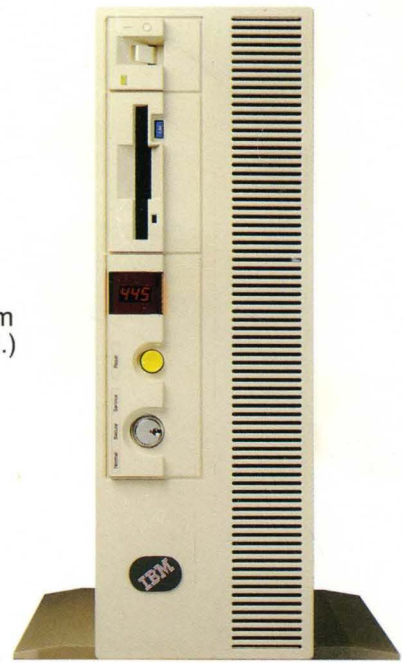# RISC System/6000

Planning for
Your System
Installation

466 mm
(18.3 in.)

280 mm
(11.0 in.)

For the Power Seeker • **Site requirements** • **Electrical needs** • **Cabling planning** • **Network considerations**

IBM

Fifth Edition (September 1992)

Communications Statements

The following statement applies to this IBM product. The statement for other IBM products intended for use with this product appears in their accompanying manuals.

Federal Communications Commission (FCC) Statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference in which case users will be required to correct the interference at their own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

電波障害自主規制 届出装置の記述

> この装置は，第一種情報装置（商工業地域において使用されるべき情報装置）で商工業地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（VCCI）基準に適合しております。
> 従って，住宅地域またはその隣接した地域で使用すると，ラジオ，テレビジョン受信機等に受信障害を与えることがあります。
> 取扱説明書に従って正しい取り扱いをしてください。

VCCI Statement

The following is a summary of the VCCI Japanese statement in the box above.

> This equipment is Type 1 Data Processing Equipment and is intended for use in commercial and industrial areas. When used in residential areas, or areas of proximity, radio and TV reception may be subject to radio interference. VCCI–1.

Avis de conformité aux normes du ministère des Communications du Canada

Cet équipement ne dépasse pas les limites de Classe A d'émission de bruits radioélectriques pour les appareils numériques, telles que prescrites par le Réglement sur le brouillage radioélectrique établi par le ministère des Communications du Canada. L'exploitation faite en milieu résidentiel peut entraîner le brouillage des réceptions radio et télé, ce qui obligerait le propriétaire ou l'opérateur à prendre les dispositions nécessaires pour en éliminer les causes.

Canadian Department of Communications compliance statement

This equipment does not exceed Class A limits for radio noise emissions for digital apparatus, set out in Radio Interference Regulation of the Canadian Department of Communications. Operation in a residential area may cause unacceptable interference to radio and TV reception requiring the owner or operator to take whatever steps necessary to correct the interference.

Radio Protection for Germany

Instructions to User: Properly shielded and grounded cables and connectors must be used for connection to peripherals in order to meet German emission limits.

Proper cables are available from IBM authorized dealers. Shielded, grounded cables with inline filters are included with certain IBM peripherals and features. These cables should be used to ensure that the IBM 7013 system will comply with the German limits.

IBM Peripheral or Feature	Cable Replacement Part Number	System Unit(s) Machine Type
IBM 6094 Model 10 Dials	6247480 or 39F8228	7011, 7012, 7013
IBM 6094 Lighted Programmable Function Keyboard Model 20	6247480 or 39F8228	7011, 7012, 7013
IBM 6093 Model 11 CursorPad Tablet	6247480	7010, 7011, 7012, 7013
IBM 6093 Model 12 CursorPad Tablet	6247480	7010, 7011, 7012, 7013
Color Graphics Adapter	58F2903	7012, 7013
64-Port Async Controller Cable	53F3368	7011, 7012, 7013
7235 Signal Cable	74F3102	7012, 7013

In addition, when attaching peripherals to a RISC System/6000 system unit or an IBM Xstation parallel printer port, the IBM cable P/N 1525612 with the inline filter should be used for compliance to the German requirements.

Order Information: For new orders, contact an IBM authorized sales representative. For replacement orders, contact an IBM authorized service representative.

United Kingdom Telecommunications Requirements

This apparatus is approved under approval number NS/G/1234/J/100003 for indirect connection to public telecommunication systems in the United Kingdom.

International Electrotechnical Commission (IEC) Statement

This product has been designed and built to comply with (IEC) Standard 950.

Korean Communications Statement

전자파장해에 관한 사용자 안내문

이 기기는 업무용으로 전자파장해 검정을 받은 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며, 만약 잘못 구입하였을 때에는 구입한 곳에서 비업무용으로 교환하시기 바랍니다. *(RSFTCSI,*

Please note that this device has been approved for business use with regard to electromagnetic wave interference. If you find this is not suitable for your use, you may exchange it for one designated for non-business purposes.

Trademarks and Acknowledgments

The following trademarks and acknowledgments apply to this book:

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RISC System/6000 is a trademark of International Business Machines Corporation.

Table of Contents/To Do List

Using the order confirmation provided by your marketing representative, check off the items below for which you need to plan. Adapters are listed in order of feature code. Consult your marketing representative if you're unsure if a particular section applies to you.

Site Planning and Preparation Overview

Successful installation does not happen by accident; it takes planning. You are the most valuable resource in site planning, because you know where and how your system, and devices attached to it, will be used.

This book provides the basic information you need to plan for your RISC System/6000 system. It provides an overview of each planning task as well as valuable reference information useful throughout the performance of these tasks. Depending on the complexity of the system you ordered and your existing computing resources, you may not need to perform all the steps noted in this book.

First, with the help of your systems engineer, or with the help of those coordinating your installation, sit down and determine which steps in this book are applicable to you. Use the summary of your order to check off, on the table of contents, the items for which you need to plan. This table of contents is then your planning "To Do" list.

While you are responsible for planning, vendors, contractors, and your IBM representative are also available to help with any aspect of planning. For all system units except the Model 220, a customer service representative will install your system unit and verify correct operation. The Model 220 is customer-installed.

The *IBM RISC System/6000 System Overview* provides information about the features and requirements of RISC System/6000 products, and can be an additional planning resource.

Before proceeding with planning, you should ensure that the hardware and software you have chosen meet your needs. Your IBM representative is available to answer questions.

In assessing the adequacy of hardware and software, consider the following:

- Adequacy of available disk space and memory for accommodating software, online documentation, and data (including future growth needs resulting from additional users, more data, and new applications). "Software Offerings" in *System Overview* contains the DASD information needed for this task.

- Compatibility of all devices.

- Compatibility of software packages with each other and with the hardware configuration.

- Adequate redundancy or backup capabilities in hardware and software.

- Software portability to the RISC System/6000 system, if necessary.

- All prerequisites and corequisites of chosen software have been satisfied. "Software Offerings" in *System Overview* contains information valuable for this task.

- Data can be transferred to the RISC System/6000 system.

Planning Task Checklist

This checklist, along with the Table of Contents/To Do list, provides a convenient way for you to document your planning progress.

Working with your IBM representative, you should establish completion dates for each of the tasks. You may want to review your planning schedule periodically with your IBM representative.

Target Date	Completion Date	Person Responsible	Planning Step
			Plan Your Office or Computer Room Layout
			Prepare for Power Cords and Electrical Needs
			Prepare for Cables and Cabling
			Create or Modify Communications Networks
			Perform Building Alterations, as Needed
			Prepare Maintenance, Recovery, and Security Plans
			Develop an Education Plan
			Order Supplies
			Prepare for System Delivery

Step 1: Physical Planning

Site preparation for the system is your responsibility. The primary task of your site planner is to ensure that each system is installed so that it can operate and be serviced efficiently.

General Considerations

When determining the placement of your system, consider the following:

- Adequate space for the devices
- Working environment of personnel who will be using the devices (their comfort, ability to access the devices, supplies, and reference materials)
- Adequate space for maintaining and servicing the devices
- Physical security requirements necessary for the devices
- Weight of the devices
- Heat output of the devices
- Operating temperature requirements of the devices
  - When using tape media, the maximum operating temperature is 16 to 32°C (60 to 90°F). The maximum operating Wet Bulb temperature is 23°C (73°F).
- Humidity requirements of the devices
  - When using tape media, the humidity is 20 to 80%.
- Air Flow requirements of the devices
- Air quality of the location where the devices will be used (For example, excessive dust could damage your system.)
- Altitude limitations of the devices
- Noise emission levels of the devices
- Any vibration of equipment near where the devices will be placed
- Paths of power cords.

The following pages contain the information you need to evaluate these considerations; simply turn to the page relating to the system units or devices you purchased.

Footprints

The following footprints can help you determine where to put your RISC System/6000 system units, Xstations, and external media devices. You only have to do physical planning for the units or devices you have ordered. Footprints are not drawn to scale.

If you want to use full-sized footprints of the system units or devices, use the measurements provided to construct them out of folded newspaper or sheets of construction paper. You can then use them to plan a layout within the actual office space.

Each footprint represents a top view of the system unit or device. All dimensions given include Air Flow but not service accessibility.

7011 POWERstation and POWERserver 220

Dimensions	Desktop		Deskside	
Height	3.3 in.	84 mm	17 in.	432 mm
Width[1]	16 in.	406 mm	8.5 in.	216 mm
Depth	16.5 in.	419 mm	16.5 in.	419 mm

Weight		
Minimum	20 lbs.	9.0 kg
Maximum	25 lbs.	11.5 kg

Electrical	
Power source loading (typical in kVA)	0.17
Voltage range (Vac)	100 to 127 or 200 to 240 (autoranging)
Frequency (Hertz)	50 or 60
Thermal output (typical)	340 BTU/hr
Power requirements (typical)	100 Watts
Power factor	0.5 to 0.7
Maximum altitude	2135 m (7000 ft.)

Temperature Requirements	Operating	Non-Operating
	16 to 32°C (60 to 90°F)	10 to 43°C (50 to 110°F)

Humidity Requirements	Operating	Non-Operating
(Non-condensing)	8 to 80%	8 to 80%
Wet Bulb	23°C (73°F)	27°C (80°F)

Noise Emissions[2]	Operating	Idle
L_{WAd}	5.2 bels	5.0 bels
L_{pAm}	41 dBA	40 dBA
$<L_{pA}>m$	39 dBA	38 dBA
Impulsive or prominent discrete tones	No	No

Clearances[3]	Front	Back	Left	Right
Install/Air Flow[4, 5]	35 mm (1.5 in.)	51 mm (2 in.)	25 mm (1 in.)	25 mm (1 in.)
Service	466 mm (18 in.)	N/A	N/A	N/A

Notes:
1. Deskside width measurement includes the optional vertical stand.
2. See "Noise Emission Notes" on page 31 for definitions of the various noise emissions positions.
3. Left and right measurements apply only when the Model 220 is used in the desktop position.
4. The amount of space needed by the unit during normal operation is indicated by broken lines on the footprints.
5. When placed in the vertical position, the Model 220 requires 25 mm (1 in.) at the bottom and top for proper Air Flow. The necessary bottom clearance is provided by the optional vertical stand.

456 mm (18 in.) wide

508 mm (20 in.)

Desktop Footprint

216 mm (8.5 in.) wide

508 mm (20 in.)

Deskside Footprint Includes Pedestal
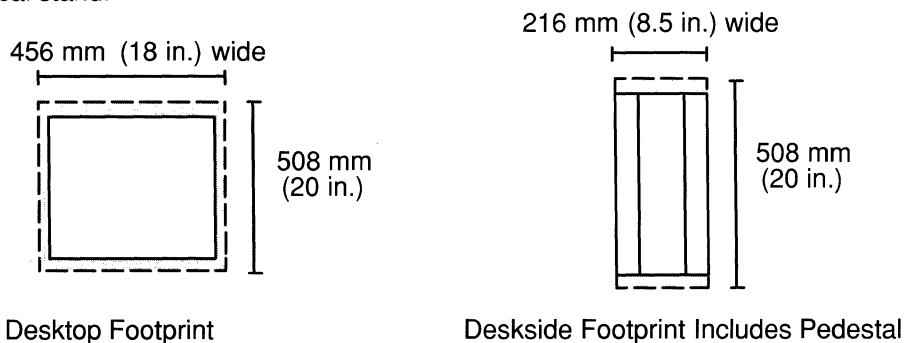
7012 POWERstation and POWERserver 320H, 340, and 350

Dimensions	Desktop		Deskside	
Height	6.4 in.	162 mm	18.3 in.	466 mm
Width (at pedestal for deskside)	18 in.	460 mm	11 in.	280 mm
Depth	20.6 in.	523 mm	20.6 in.	523 mm
Weight				
Minimum	28 lbs.	12.7 kg	28 lbs.	12.7 kg
Maximum	34 lbs.	15.4 kg	34 lbs.	15.4 kg
Electrical				
Power source loading (typical in kVA)	0.26			
Voltage range (Vac)	100 to 125 or 200 to 240 (autoranging)			
Frequency (Hertz)	50 or 60			
Thermal output (typical)	585 BTU/hr			
Power requirements (typical)	171 Watts			
Power factor	0.5 to 0.7			
Maximum altitude	2135 m (7000 ft.)			
Temperature Requirements	**Operating**		**Non-Operating**	
	16 to 32°C (60 to 90°F)		10 to 43°C (50 to 110°F)	
Humidity Requirements	**Operating**		**Non-Operating**	
(Non-condensing)	8 to 80%		8 to 80%	
Wet Bulb	23°C (73°F)		27°C (80°F)	
Noise Emissions[1]	**Operating**		**Idle**	
L_{WAd}	5.7 bels		5.5 bels	
L_{pAm}	45 dBA		45 dBA (desktop)	
	N/A		N/A (deskside)	
$<L_{pA}>m$	41 dBA		41 dBA (desktop)	
	38 dBA		38 dBA (deskside)	
Impulsive or prominent discrete tones	No		No	

Clearances	Front	Back	Left	Right
Install/Air Flow[2]	152 mm (6 in.)	152 mm (6 in.)	N/A	N/A
Service	760 mm (30 in.)	N/A	N/A	N/A

Notes:

1. See "Noise Emission Notes" on page 31 for definitions of the various noise emissions positions.
2. The amount of space needed by the unit during normal operation is indicated by broken lines on the footprints.

460 mm (18 in.) wide   280 mm (11 in.) wide

830 mm (33 in.)   828 mm (32.6 in.)

Desktop Footprint   Deskside Footprint Includes Pedestal
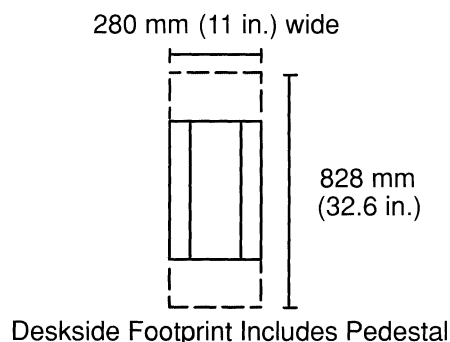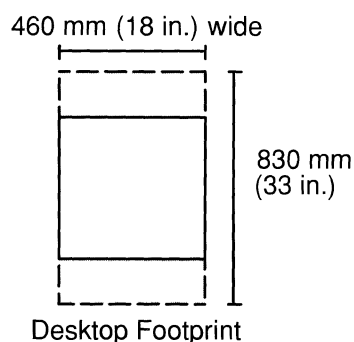
7013 POWERstation and POWERserver 520H and 530H

Dimensions		
Height	24 in.	610 mm
Width	14.2 in.	360 mm
Depth	26.6 in.	675 mm

Weight		
Minimum	81 lbs.	36.7 kg
Maximum	lbs. 117	53.1 kg

Electrical	
Power source loading (typical in kVA)	0.4
Voltage range (Vac)	100 to 125 or 200 to 240 (autoranging)
Frequency (Hertz)	50 or 60
Thermal output (typical)	1360 BTU/hr
Power requirements (typical)	400 Watts
Power factor	0.8 to 1.0
Maximum altitude	2135 m (7000 ft.)

Temperature Requirements	Operating	Non-Operating
	16 to 32°C (60 to 90°F)	10 to 43°C (50 to 110°F)

Humidity Requirements	Operating	Non-Operating
(Non-condensing)	8 to 80%	8 to 80%
Wet Bulb	23°C (73°F)	27°C (80°F)

Noise Emissions[1]	Operating	Idle
L_{WAd}	5.7 bels	5.5 bels
L_{pAm}	N/A	N/A
$<L_{pA}>m$	39 dBA	38 dBA
Impulsive or prominent discrete tones	No	No

Clearances	Front	Back	Left	Right
Install/Air Flow[2]	N/A	152 mm (6 in.)	76 mm (3 in.)	76 mm (3 in.)

Service	Install so that it can be moved to an area providing 760 mm (30 in.) on each side.

Notes:

1. See "Noise Emission Notes" on page 31 for definitions of the various noise emissions positions.
2. The amount of space needed by the unit during normal operation is indicated by broken lines on the footprint.

512 mm (20.2 in.)

828 mm
(32.6 in.)

Footprint for Models 520H and 530H

7013 POWERstation and POWERserver 550 and 560

Dimensions			
Height		24 in.	610 mm
Width		14.2 in.	360 mm
Depth		26.6 in.	675 mm

Weight			
Minimum		81 lbs.	36.7 kg
Maximum		117 lbs.	53.1 kg

Electrical		
Power source loading (typical in kVA)		0.4
Voltage range (Vac)		100 to 125 or 200 to 240 (autoranging)
Frequency (Hertz)		50 or 60
Thermal output (typical)		1360 BTU/hr
Power requirements (typical)		400 Watts
Power factor		0.8 to 1.0
Maximum altitude		2135 m (7000 ft.)

Temperature Requirements	Operating	Non-Operating
	16 to 32°C (60 to 90°F)	10 to 43°C (50 to 110°F)

Humidity Requirements	Operating	Non-Operating
(Non-condensing)	8 to 80%	8 to 80%
Wet Bulb	23°C (73°F)	27°C (80°F)

Noise Emissions[1]	Operating	Idle
L_{WAd}	5.7 bels	5.5 bels
L_{pAm}	N/A	N/A
$<L_{pA}>_m$	39 dBA	38 dBA
Impulsive or prominent discrete tones	No	No

Clearances	Front	Back	Left	Right
Install/Air Flow[2]	N/A	152 mm (6 in.)	76 mm (3 in.)	76 mm (3 in.)
Service	Install so that it can be moved to an area providing 760 mm (30 in.) on each side.			

Notes:

1. See "Noise Emission Notes" on page 31 for definitions of the various noise emissions positions.
2. The amount of space needed by the unit during normal operation is indicated by broken lines on the footprint.

512 mm (20.2 in.)

828 mm (32.6 in.)

Footprint for Model 560

7013 POWERstation and POWERserver 580

Dimensions		
Height	24 in.	610 mm
Width	14.2 in.	360 mm
Depth	26.6 in.	675 mm

Weight		
Minimum	81 lbs.	36.7 kg
Maximum	117 lbs.	53.1 kg

Electrical	
Power source loading (typical in kVA)	0.4 2
Voltage range (Vac)	100 to 125 or 200 to 240 (autoranging)
Frequency (Hertz)	50 or 60
Thermal output (typical)	1430 BTU/hr
Power requirements (typical)	420 Watts
Power factor	0.8 to 1.0
Maximum altitude	2135 m (7000 ft.)

Temperature Requirements	Operating	Non-Operating
	16 to 32°C (60 to 90°F)	10 to 43°C (50 to 110°F)

Humidity Requirements	Operating	Non-Operating
(Non-condensing)	8 to 80%	8 to 80%
Wet Bulb	23°C (73°F)	27°C (80°F)

Noise Emissions[1]	Operating	Idle
L_{WAd}	5.7 bels	5.5 bels
L_{pAm}	N/A	N/A
$<L_{pA}>m$	39 dBA	38 dBA
Impulsive or prominent discrete tones	No	No

Clearances	Front	Back	Left	Right
Install/Air Flow[2]	N/A	152 mm (6 in.)	76 mm (3 in.)	76 mm (3 in.)

Service	Install so that it can be moved to an area providing 760 mm (30 in.) on each side.

Notes:

1. See "Noise Emission Notes" on page 31 for definitions of the various noise emissions positions.
2. The amount of space needed by the unit during normal operation is indicated by broken lines on the footprint.

512 mm (20.2 in.)

828 mm (32.6 in.)

Footprint for Model 560

7015 POWERserver 950

Dimensions		
Height	62 in.	1578 mm
Width	25.5 in.	650 mm
Depth	36.0 in.	921 mm

Weight		
Minimum	450 lbs.	205 kg
Maximum	970 lbs.	441 kg

Electrical	Maximum Entry Configuration	Maximum Configuration
Power source loading (typical in kVA)	0.81	2.0
Voltage range (Vac)	200 to 240	200 to 240
Frequency (Hertz)	50 or 60	50 or 60
Thermal output (typical)	1480 BTU/hr	3920 BTU/hr
Power requirements (typical)	434 Watts	1000 Watts
Power factor	0.5 to 0.7	0.5 to 0.7
Maximum altitude	2135 m (7000 ft.)	2135 m (7000 ft.)

	Operating	Non-Operating
Temperature Range	10 to 40°C (50 to 104°F)	10 to 52°C (50 to 125°F)
Humidity (Non-condensing)		
Without tape drive	8 to 80%	8 to 80%
With tape drive	20 to 80%	20 to 80%
Wet Bulb Requirements		
Without tape drive	27°C (80°F)	27°C (80°F)
With tape drive	23°C (73°F)	27°C (80°F)

Noise Emissions[1, 2]	Operating	Idle
L_{WAd}	6.4 bels	6.2 bels
L_{pAm}	N/A	N/A
$<L_{pA}>m$	49 dBA	47 dBA
Impulsive or prominent discrete tones	No	No

Clearances[3]	Front	Back	Left	Right
Install/Air Flow	Maintenance of a proper service clearance should allow proper air flow.			
Service	1650 mm (65 in.)	760 mm (30 in.)	915 mm (36 in.)	915 mm (36 in.)

Notes:

1. See "Noise Emission Notes" on page 31 for definitions of the various noise emissions positions.
2. Noise emissions data for the 7015 system unit is based on the following configuration: a Processor Drawer with eight memory cards and eight I/O cards, a SCSI Device Drawer with four SCSI devices, an Async Expansion Drawer with eight asynchronous cards, two SCSI Disk Drawers with four SCSI devices each, and a Battery Backup Unit. Noise emissions data for the SCSI Disk Drawer is therefore included in the data.
3. For multiple racks placed side by side, the left and right clearances apply only to the leftmost and rightmost rack. For five to six racks placed side by side, the left and right clearances need to be increased to 1525 mm (60 in.). Having more than six racks side by side is not recommended.

7015 POWERserver 970 and 980

Dimensions		
Height	62 in.	1578 mm
Width	25.5 in.	650 mm
Depth	36.0 in.	921 mm

Weight		
Minimum	450 lbs.	205kg
Maximum	970 lbs.	441kg

Electrical	Maximum Entry Configuration	Maximum Configuration
Power source loading (typical in kVA)	1.0	2.4
Voltage range (Vac)	200 to 240	200 to 240
Frequency (Hertz)	50 or 60	50 or 60
Thermal output (typical)	2165 BTU/hr	4100 BTU/hr
Power requirements (typical)	634 Watts	1200 Watts
Power factor[4]	0.5 to 0.7	0.5 to 0.7
Maximum altitude	2135 m (7000 ft.)	2135 m (7000 ft.)

	Operating	Non-Operating
Temperature Range	10 to 40°C (50 to 104°F)	10 to 52°C (50 to 125°F)
Humidity (Non-condensing)		
Without tape drive	8 to 80%	8 to 80%
With tape drive	20 to 80%	20 to 80%
Wet Bulb Requirements		
Without tape drive	27°C (80°F)	27°C (80°F)
With tape drive	23°C (73°F)	27°C (80°F)

Noise Emissions[1,2]	Operating	Idle
L_{WAd}	6.4 bels	6.2 bels
L_{pAm}	N/A	N/A
$<L_{pA}>m$	49 dBA	47 dBA
Impulsive or prominent discrete tones	No	No

Clearances[3]	Front	Back	Left	Right

Install/Air Flow	Maintenance of a proper service clearance should allow proper air flow.			
Service	1650 mm (65 in.)	760 mm (30 in.)	915 mm (36 in.)	915 mm (36 in.)

Notes:

1. See "Noise Emission Notes" on page 31 for definitions of the various noise emissions positions.
2. Noise emissions data for the 7015 system unit is based on the following configuration: a Processor Drawer with eight memory cards and eight I/O cards, a SCSI Device Drawer with four SCSI devices, the second eight I/O slots with eight asynchronous cards, two SCSI Disk Drawers with four SCSI devices each, and a Battery Backup Unit. Noise emissions data for the SCSI Disk Drawer is therefore included in the data.
3. For multiple racks placed side by side, the left and right clearances apply only to the leftmost and rightmost rack. For five to six racks placed side by side, the left and right clearances need to be increased to 1525 mm (60 in.). Having more than six racks side by side is not recommended.
4. Power factor is 0.7 to 0.9 without a Battery Backup Unit.

7202 Model 900 Expansion Rack

Dimensions			
Height		62.0 in.	1578 mm
Width		25.5 in.	650 mm
Depth		36.0 in.	921 mm

Weight			
Minimum		300 lbs.	136 kg
Maximum		1035 lbs.	470 kg

Electrical[1]	
Power source loading (typical in kVA)	.004
Voltage range (Vac)	200 to 240
Frequency (Hertz)	50 or 60
Thermal output (typical)	15 BTU/hr
Power requirements (typical)	4 Watts
Power factor	0.5 to 0.7
Maximum altitude	2135 m (7000 ft.)

Temperature Requirements	Operating	Non-Operating
	10 to 40°C (50 to 104°F)	10 to 52°C (50 to 125°F)

Humidity Requirements (Non-condensing)	Operating	Non-Operating
	8 to 80%	8 to 80%
Wet Bulb	27°C (80°F)	27°C (80°F)

Noise Emissions[1,2]	Operating	Idle
L_{WAd}	6.2 bels	6.0 bels
L_{pAm}	N/A	N/A
$<L_{pA}>_m$	48 dBA	46 dBA
Impulsive or prominent discrete tones	No	No

Clearances[3]	Front	Back	Left	Right
Install/Air Flow	Maintenance of a proper service clearance should allow proper air flow.			
Service	1650 mm (65 in.)	760 mm (30 in.)	915 mm (36 in.)	915 mm (36 in.)

Notes:

1. No features installed.
2. See "Noise Emission Notes" on page 31 for definitions of the various noise emissions positions.
3. Noise emissions data for the 7202 Model 900 is based on the following configuration: two 9334 Model 10 Drawers with two disk drives in each and two 9334 Model 10 Drawers with three disk drives in each.

The amount of space needed by the unit during normal operation is indicated by broken lines on the footprint.

760 mm (30 in.)
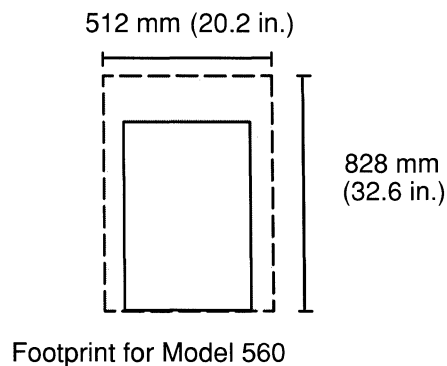
915 mm
(36 in.)

3331 mm
(131in.)
deep

FRONT

2480 mm (97.6 in.) wide
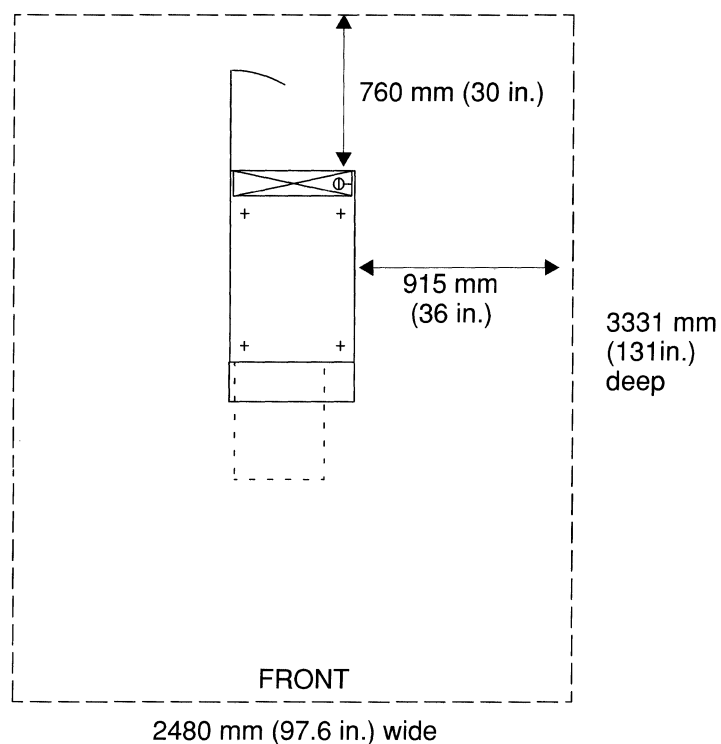
Footprint for Model 950 and the 7202 Model 900

Note: Rack units are large and heavy and are not easily moved. Because maintenance activities require access at both the front and back, extra room needs to be allowed. The footprint shows the radius of the swinging door on the rear of the rack and a drawer in the extended position. The illustration shows the minimum space required.

7015 SCSI and Media Disk Drawers

Dimensions		
Height	6.7 in. 171 mm (4 EIA units)	
Width	17.4 in. 443 mm	
Depth	27.0 in. 686 mm	

Weight		
Minimum	55 lbs. 25 kg	
Maximum	108 lbs. 49 kg	

Electrical		
Power source loading (typical in kVA)	0.34	
Voltage range (Vac)	200 to 240	
Frequency (Hertz)	50 or 60	
Thermal output (typical)	580 BTU/hr	
Power requirements (typical)	170 Watts	
Power factor	0.5 to 0.7	
Maximum altitude	2135 m (7000 ft.)	

Temperature Requirements	Operating	Non-Operating
	10 to 40°C (50 to 104°F)	10 to 52°C (50 to 125°F)

Humidity Requirements	Operating	Non-Operating
(Non-condensing)	8 to 80%	5 to 80%
Wet Bulb	27°C (80°F)	27°C (80°F)

Noise Emissions		
Data included with calculations for the 7015 POWERservers.		

1/2-Inch 9-Track Tape Drive Drawer

Dimensions		
Height	8.75 in. 222 mm (6 EIA units)	
Width	19 in. 483 mm	
Depth	26.75 in. 679 mm	

Weight		
Minimum	105 lbs. 48.2 kg	
Maximum	105 lbs. 48.2 kg	

Electrical		
Power source loading (typical in kVA)	0.2	
Voltage range (Vac)	100 to 125 or 200 to 240 (autoranging)	
Frequency (Hertz)	50 or 60	
Thermal output (typical)	410 BTU/hr	
Power requirements (typical)	120 Watts	
Power factor	0.5 to 0.7	
Maximum altitude	2135 m (7000 ft.)	

Temperature Requirements	Operating	Non-Operating
	16 to 32°C (60 to 90°F)	10 to 43°C (50 to 110°F)

Humidity Requirements	Operating	Non-Operating
(Non-condensing)	20 to 80%	20 to 80%
Wet Bulb	23°C (73°F)	27°C (80°F)

9333 Model 10 Drawer High-Performance Subsystem

Dimensions				
Height		6.7 in.	171 mm	(4 EIA units)
Width		17.4 in.	443 mm	
Depth		27.0 in.	686 mm	

Weight			
Minimum		55 lbs.	25 kg
Maximum		108 lbs.	49 kg

Electrical	
Power source loading (typical in kVA)	0.36
Voltage range (Vac)	100 to 125 or 200 to 240 (selectable)
Frequency (Hertz)	50 or 60
Thermal output (typical)	680 BTU/hr
Power requirements (typical)	200 Watts
Power factor	0.5 to 0.7
Maximum altitude	2135 m (7000 ft.)

Temperature Requirements	Operating	Non-Operating
	10 to 40°C (50 to 104°F)	10 to 52°C (50 to 125°F)

Humidity Requirements	Operating	Non-Operating
(Non-condensing)	8 to 80%	8 to 80%
Wet Bulb	27°C (80°F)	27°C (80°F)

Noise Emissions*	Operating	Idle
L_{WAd}	5.5 bels	5.2 bels
L_{pAm}	N/A	N/A
$<L_{pA}>m$	42 dBA	40 dBA
Impulsive or prominent discrete tones	No	No

*See "Noise Emission Notes" on page 31 for definitions of the various noise emissions positions.

9334 Model 10 Drawer Expansion Unit

Dimensions		
Height	6.7 in.	171 mm (4 EIA units)
Width	17.4 in.	443 mm
Depth	27.0 in.	686 mm

Weight		
Minimum	55 lbs.	25 kg
Maximum	95 lbs.	43 kg

Electrical	
Power source loading (typical in kVA)	0.34
Voltage range (Vac)	200 to 240 (selectable)
Frequency (Hertz)	50 or 60
Thermal output (typical)	580 BTU/hr
Power requirements (typical)	170 Watts
Power factor	0.5 to 0.7
Maximum altitude	2135 m (7000 ft.)

Temperature Requirements	Operating	Non-Operating
	10 to 40°C (50 to 104°F)	10 to 52°C (50 to 125°F)

Humidity Requirements	Operating	Non-Operating
(Non-condensing)	8 to 80%	5 to 80%
Wet Bulb	27°C (80°F)	27°C (80°F)

Noise Emissions*	Operating	Idle
L_{WAd}	5.5 bels	5.2 bels
L_{pAm}	N/A	N/A
$<L_{pA}>_m$	42 dBA	40 dBA
Impulsive or prominent discrete tones	No	No

*See "Noise Emission Notes" on page 31 for definitions of the various noise emissions positions.

7010 Xstation 130

Dimensions		
Height	2.9 in.	72 mm
Width	14.8 in.	375 mm
Depth	15.0 in.	380 mm

Weight		
Minimum	16 lbs.	7.3 kg
Maximum	19 lbs.	8.6 kg

Electrical	
Power source loading (typical in kVA)	0.10
Voltage range (Vac)	100 to 125 or
	200 to 240 (autoranging)
Frequency (Hertz)	50 or 60
Thermal output (typical)	225 BTU/hr
Power requirements (typical)	65 Watts
Power factor	0.7 (maximum)
Maximum altitude	2135 m (7000 ft.)

Temperature Requirements	Operating	Non-Operating
	16 to 32°C (60 to 90°F)	10 to 43°C (50 to 110°F)

Humidity Requirements	Operating	Non-Operating
(Non-condensing)	8 to 80%	8 to 80%
Wet Bulb	23°C (73°F)	27°C (80°F)

Noise Emissions[1]	Operating	Idle
L_{WAd}	5.0 bels	4.8 bels
L_{pAm}	37 dBA	37 dBA
$<L_{pA}>_m$	41 dBA	41 dBA
Impulsive or prominent discrete tones	No	No

Clearances	Front	Back	Left	Right
Install/Air Flow[2]	152 mm (6 in.)	152 mm (6 in.)	N/A	N/A

Notes:

1. See "Noise Emission Notes" on page 31 for definitions of the various noise emissions positions.
2. The amount of space needed by the unit during normal operation is indicated by broken lines on the footprint.

375 mm (14.7 in.)

685 mm (27 in.)

Xstation 130 footprint
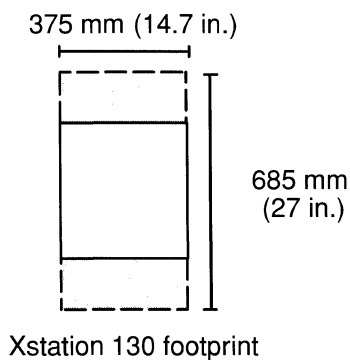
4869 Model 2 5 1/4-Inch 1.2MB External Diskette Drive

Dimensions		
Height	2.5 in.	62.5 mm
Width	8.9 in.	227 mm
Depth	16.0 in.	408 mm

Weight		
Minimum	4.6 lbs.	2.1 kg
Maximum	4.6 lbs.	2.1 kg

Electrical	
Power source loading (typical in kVA)	0.02
Voltage range (Vac)	100 to 125 or 200 to 240 (autoranging)
Frequency (Hertz)	50 or 60
Thermal output (typical)	35 BTU/hr
Power requirements (typical)	10 Watts
Power factor	N/A
Maximum altitude	2135 m (7000 ft.)

Temperature Requirements	Operating	Non-Operating
	10 to 40°C (50 to 104°F)	10 to 52°C (50 to 125°F)

Humidity Requirements (Non-condensing)	Operating	Non-Operating
ANSI Media	8 to 80%	5 to 95%
ISO Media	20 to 80%	5 to 95%
Wet Bulb	23°C (73°F)	27°C (80°F)

Noise Emissions[1]	Operating	Idle
L_{WAd}	6.0 bels	N/A
L_{pAm}	54 dBA	N/A
$<L_{pA}>_m$	42 dBA	N/A
Impulsive or prominent discrete tones	Yes	No

Clearances	Front	Back	Left	Right
Install/Air Flow[2]	152 mm (6 in.)	152 mm (6 in.)	N/A	N/A
Service	152 mm (6 in.)	N/A	N/A	N/A

Notes:

1. See "Noise Emission Notes" on page 31 for definitions of the various noise emissions positions.
2. The amount of space needed by the unit during normal operation is indicated by broken lines on the footprint.

227 mm (8.9 in.)

712 mm
(28 in.)

4869 Model 2 Footprint

7203 Model 1 External Portable Disk Drive

Dimensions		
Height	6.3 in.	160 mm
Width	11.0 in.	280 mm
Depth	13.6 in.	345 mm

Weight	
Minimum	13.5 lbs. 6.12 kg (without module)
Maximum	22.6 lbs. 10.3 kg (with a 355 or 670MB module)

Electrical	
Power source loading (typical in kVA)	0.08
Voltage range (Vac)	100 to 125 or 200 to 240 (autoranging)
Frequency (Hertz)	50 or 60
Thermal output (typical)	155 BTU/hr
Power requirements (typical)	45 Watts
Power factor	0.5 to 0.7
Maximum altitude	2135 m (7000 ft.)

Temperature Requirements	**Operating**	**Non-Operating**
	16 to 32°C (60 to 90°F)	10 to 43°C (50 to 110°F)

Humidity Requirements	**Operating**	**Non-Operating**
(Non-condensing)	8 to 80%	8 to 80%
Wet Bulb	23°C (73°F)	27°C (80°F)

Noise Emissions[1]	**Operating**	**Idle**
L_{WAd}	5.8 bels	5.6 bels
L_{pAm}	N/A	N/A
$<L_{pA}>_m$	42 dBA	41 dBA
Impulsive or prominent discrete tones	No	No

Clearances	**Front**	**Back**	**Left**	**Right**
Install/Air Flow[2]	152 mm (6 in.)	152 mm (6 in.)	N/A	N/A
Service	152 mm (6 in.)	N/A	N/A	N/A

Notes:

1. See "Noise Emission Notes" on page 31 for definitions of the various noise emissions positions.
2. The amount of space needed by the unit during normal operation is indicated by broken lines on the footprint.
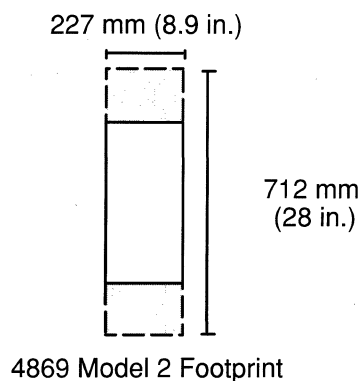
280 mm (11 in.)

649 mm
(25.6 in.)

7203 Model 1 Footprint

7204 Model 320 with 320MB and 7404 Model 1 1GB External Disk Drives

Dimensions		
Height	3.3 in.	80 mm
Width	11.0 in.	280 mm
Depth	11.3 in.	285 mm

Weight		
Minimum	10.3 lbs.	4.7 kg
Maximum	10.3 lbs.	4.7 kg

Electrical	
Power source loading (typical in kVA)	0.07
Voltage range (Vac)	100 to 125 or 200 to 240 (autoranging)
Frequency (Hertz)	50 or 60
Thermal output (typical)	110 BTU/hr
Power requirements (typical)	32 Watts
Power factor	0.5 to 0.7
Maximum altitude	2135 m (7000 ft.)

Temperature Requirements	Operating	Non-Operating
	16 to 32°C (60 to 90°F)	10 to 43°C (50 to 110°F)

Humidity Requirements	Operating	Non-Operating
(Non-condensing)	8 to 80%	8 to 80%
Wet Bulb	23°C (73°F)	27°C (80°F)

Noise Emissions[1]	Operating	Idle
L_{WAd}	5.6 bels	5.6 bels
L_{pAm}	N/A	N/A
$<L_{pA}>m$	40 dBA	40 dBA
Impulsive or prominent discrete tones	No	No

Clearances	Front	Back	Left	Right
Install/Air Flow[2]	152 mm (6 in.)	152 mm (6 in.)	N/A	N/A
Service	152 mm (6 in.)	N/A	N/A	N/A

Notes:

1. See "Noise Emission Notes" on page 31 for definitions of the various noise emissions positions.
2. The amount of space needed by the unit during normal operation is indicated by broken lines on the footprint.
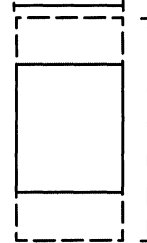
280 mm (11 in.)

589 mm
(23.3 in.)

7204 Model 320
and 7404 Model
1 Footprint

7207 Model 1 150MB, Model 11 525MB, and Model 012 1.2GB External 1/4-Inch Cartridge Tape Drives

Dimensions		
Height	3.3 in.	80 mm
Width	11.0 in.	280 mm
Depth	11.3 in.	285 mm
Weight		
Minimum	10.0 lbs.	4.5 kg
Maximum	10.0 lbs.	4.5 kg
Electrical		
Power source loading (typical in kVA)	0.07	
Voltage range (Vac)	100 to 125 or 200 to 240 (autoranging)	
Frequency (Hertz)	50 or 60	
Thermal output (typical)	140 BTU/hr	
Power requirements (typical)	40 Watts	
Power factor	0.5 to 0.7	
Maximum altitude	2135 m (7000 ft.)	

Temperature Requirements	**Operating**	**Non-Operating**
	16 to 32°C (60 to 90°F)	10 to 43°C (50 to 110°F)

Humidity Requirements	**Operating**	**Non-Operating**
(Non-condensing)	20 to 80%	20 to 80%
Wet Bulb	23°C (73°F)	27°C (80°F)

Noise Emissions[1]	**Operating**	**Idle**
L_{WAd}	6.6 bels	5.3 bels
L_{pAm}	N/A	N/A
$<L_{pA}>m$	46 dBA	40 dBA
Impulsive or prominent discrete tones	No	No

Clearances	**Front**	**Back**	**Left**	**Right**
Install/Air Flow[2]	152 mm (6 in.)	152 mm (6 in.)	N/A	N/A
Service	152 mm (6 in.)	N/A	N/A	N/A

Notes:

1. See "Noise Emission Notes" on page 31 for definitions of the various noise emissions positions.
2. The amount of space needed by the unit during normal operation is indicated by broken lines on the footprint.
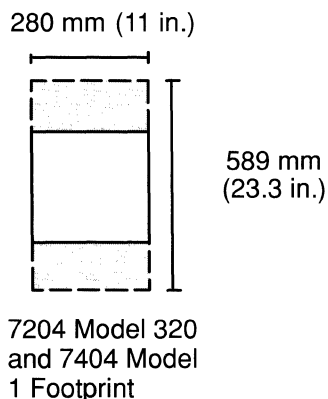
280 mm (11 in.)

589 mm
(23.3 in.)

7207 Model 1 Footprint

7208 Model 1 2.3GB External 8 mm Tape Drive

Dimensions		
Height	4.8 in.	123 mm
Width	11.0 in.	280 mm
Depth	11.3 in.	285 mm

Weight		
Minimum	11 lbs.	5 kg
Maximum	11 lbs.	5 kg

Electrical	
Power source loading (typical in kVA)	0.06
Voltage range (Vac)	100 to 125 or 200 to 240 (autoranging)
Frequency (Hertz)	50 or 60
Thermal output (typical)	120 BTU/hr
Power requirements (typical)	35 Watts
Power factor	0.5 to 0.7
Maximum altitude	2135 m (7000 ft.)

Temperature Requirements	Operating	Non-Operating
	16 to 32°C (60 to 90°F)	10 to 43°C (50 to 110°F)

Humidity Requirements	Operating	Non-Operating
(Non-condensing)	20 to 80%	20 to 80%
Wet Bulb	23°C (73°F)	27°C (80°F)

Noise Emissions[1]	Operating	Idle
L_{WAd}	5.5 bels	5.5 bels
L_{pAm}	N/A	N/A
$<L_{pA}>m$	46 dBA	40 dBA
Impulsive or prominent discrete tones	No	No

Clearances	Front	Back	Left	Right
Install/Air Flow[2]	152 mm (6 in.)	152 mm (6 in.)	N/A	152 mm (6 in.)
Service	152 mm (6 in.)	N/A	N/A	N/A

Notes:

1. See "Noise Emission Notes" on page 31 for definitions of the various noise emissions positions.
2. The amount of space needed by the unit during normal operation is indicated by broken lines on the footprint.
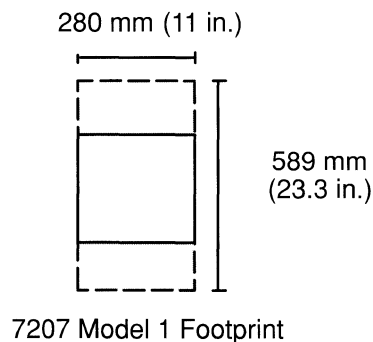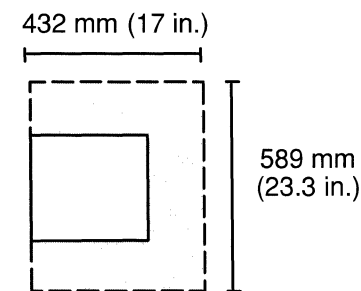
432 mm (17 in.)

589 mm
(23.3 in.)

7208 Model 1 Footprint

7208 Model 011 5/10GB External 8 mm Tape Drive

Dimensions				
Height		3.3 in.	80 mm	
Width		11.0 in.	280 mm	
Depth		11.5 in.	290 mm	

Weight				
Minimum		11 lbs.	5 kg	
Maximum		11 lbs.	5 kg	

Electrical				
Power source loading (typical in kVA)		0.1		
Voltage range (Vac)		100 to 125 or 200 to 240 (autoranging)		
Frequency (Hertz)		50 or 60		
Thermal output (typical)		120 BTU/hr		
Power requirements (typical)		32 Watts		
Power factor		0.5 to 0.7		
Maximum altitude		2135 m (7000 ft.)		

Temperature Requirements		Operating	Non-Operating	
		16 to 32°C (60 to 90°F)	10 to 43°C (50 to 110°F)	

Humidity Requirements		Operating	Non-Operating	
(Non-condensing)		20 to 80%	20 to 80%	
Wet Bulb		23°C (73°F)	27°C (80°F)	

Noise Emissions[1]		Operating	Idle	
L_{WAd}		5.9 bels	5.5 bels	
L_{pAm}		N/A	N/A	
$<L_{pA}>m$		46 dBA	40 dBA	
Impulsive or prominent discrete tones		No	No	

Clearances	Front	Back	Left	Right
Install/Air Flow[2]	152 mm (6 in.)	152 mm (6 in.)	N/A	152 mm (6 in.)
Service	152 mm (6 in.)	N/A	N/A	N/A

Notes:

1. See "Noise Emission Notes" on page 31 for definitions of the various noise emissions positions.
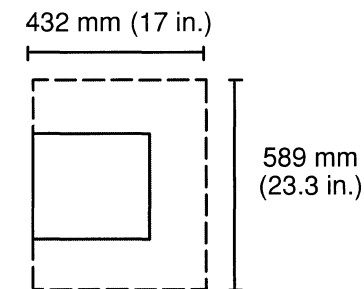2. The amount of space needed by the unit during normal operation is indicated by broken lines on the footprint.

432 mm (17 in.)

589 mm
(23.3 in.)

7208 Model 1 Footprint

7210 Model 1 External CD-ROM Drive

Dimensions			
Height		3.3 in.	80 mm
Width		11.0 in.	280 mm
Depth		11.3 in.	285 mm

Weight			
Minimum		10.8 lbs.	4.9 kg
Maximum		10.8 lbs.	4.9 kg

Electrical	
Power source loading (typical in kVA)	0.05
Voltage range (Vac)	100 to 125 or 200 to 240 (autoranging)
Frequency (Hertz)	50 or 60
Thermal output (typical)	85 BTU/hr
Power requirements (typical)	25 Watts
Power factor	0.5 to 0.7
Maximum altitude	2135 m (7000 ft.)

Temperature Requirements	Operating	Non-Operating
	16 to 32°C (60 to 90°F)	10 to 43°C (50 to 110°F)

Humidity Requirements	Operating	Non-Operating
(Non-condensing)	10 to 80%	10 to 80%
Wet Bulb	23°C (73°F)	27°C (80°F)

Noise Emissions[1]	Operating	Idle
L_{WAd}	5.1 bels	5.1 bels
L_{pAm}	N/A	N/A
$<L_{pA}>m$	36 dBA	36 dBA
Impulsive or prominent discrete tones	No	No

Clearances	Front	Back	Left	Right
Install/Air Flow[2]	152 mm (6 in.)	152 mm (6 in.)	N/A	N/A
Service	152 mm (6 in.)	N/A	N/A	N/A

Notes:

1. See "Noise Emission Notes" on page 31 for definitions of the various noise emissions positions.
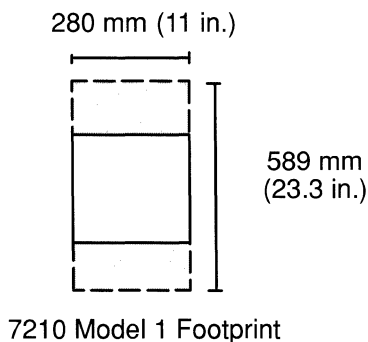2. The amount of space needed by the unit during normal operation is indicated by broken lines on the footprint.

280 mm (11 in.)

589 mm
(23.3 in.)

7210 Model 1 Footprint

7235 POWER GTO

Dimensions	Desktop		Deskside	
Height	6.3 in.	160 mm	18.3 in.	466 mm
Width	18.0 in.	460 mm	6.3 in.	160 mm
Depth	21.0 in.	525 mm	21.0 in.	525 mm
Weight				
Minimum	35 lbs.	16 kg	35 lbs.	16 kg
Maximum	35 lbs.	16 kg	35 lbs.	16 kg
Electrical				
Power source loading (typical in kVA)	0.5			
Voltage range (Vac)	100 to 125 or 200 to 240 (autoranging)			
Frequency (Hertz)	50 or 60			
Thermal output (typical)	850 BTU/hr			
Power requirements (typical)	250 Watts			
Power factor	0.5 to 0.7			
Maximum altitude	2135 m (7000 ft.)			
Temperature Requirements	**Operating**		**Non-Operating**	
	16 to 32°C (60 to 90°F)		10 to 43°C (50 to 110°F)	
Humidity Requirements	**Operating**		**Non-Operating**	
(Non-condensing)	8 to 80%		8 to 80%	
Wet Bulb	23°C (73°F)		27°C (80°F)	
Noise Emissions[1]	**Operating**		**Idle**	
L_{WAd}	5.8 bels		5.5 bels	
L_{pAm}	N/A		N/A	
$<L_{pA}>m$	54 dBA		N/A	
Impulsive or prominent discrete tones	No		No	
Clearances	**Front**	**Back**	**Left**	**Right**
Install/Air Flow[2]	152 mm (6 in.)	152 mm (6 in.)	N/A	N/A
Service	152 mm (6 in.)	N/A	N/A	N/A

Notes:

1. See "Noise Emission Notes" on page 31 for definitions of the various noise emissions positions.
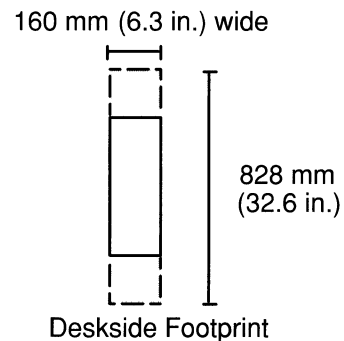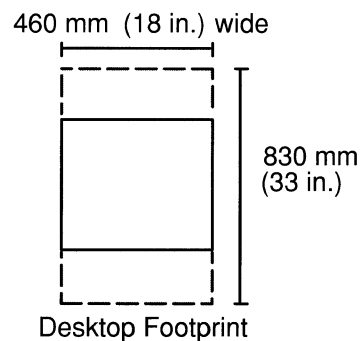2. The amount of space needed by the unit during normal operation is indicated by broken lines on the footprints.
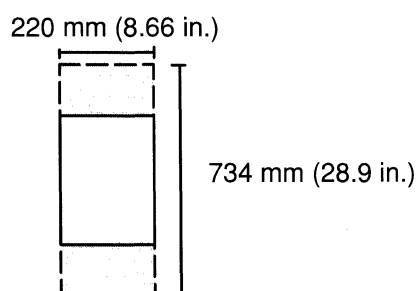
460 mm (18 in.) wide

830 mm (33 in.)

Desktop Footprint

160 mm (6.3 in.) wide

828 mm (32.6 in.)

Deskside Footprint

9291 Single Digital Trunk Processors

Dimensions		
Height	4.33 in.	110 mm
Width	8.66 in.	220 mm
Depth	16.9 in.	430 mm

Weight		
Minimum	16.5 lbs.	7.5 kg
Maximum	16.5 lbs.	7.5 kg

Electrical	
Power source loading (typical in kVA)	0.07
Voltage range (Vac)	100 to 125 or 200 to 240 (autoranging)
Frequency (Hertz)	50 or 60
Thermal output (typical)	240 BTU/hr
Power requirements (typical)	70 Watts
Power factor	0.5 to 0.7
Maximum altitude	2135 m (7000 ft.)

Temperature Requirements	Operating	Non-Operating
	16 to 32°C (60 to 90°F)	10 to 43°C (50 to 110°F)

Humidity Requirements	Operating	Non-Operating
(Non-condensing)	8 to 80%	8 to 80%
Wet Bulb	27°C (80°F)	27°C (80°F)

Noise Emissions[1]	Operating	Idle
L_{WAd}	4.8 bels	4.8 bels
L_{pAm}	N/A	N/A
$<L_{pA}>_m$	46 dBA	40 dBA
Impulsive or prominent discrete tones	No	No

Clearances	Front	Back	Left	Right
Install/Air Flow[2]	152 mm (6 in.)	152 mm (6 in.)	N/A	N/A
Service	152 mm (6 in.)	N/A	N/A	N/A

Notes:

1. See "Noise Emission Notes" on page 31 for definitions of the various noise emissions positions.
2. The amount of space needed by the unit during normal operation is indicated by broken lines on the footprint.

220 mm (8.66 in.)

734 mm (28.9 in.)

9291 Single Digital Trunk Processor

9295 Multiple Digital Trunk Processor

Dimensions	Base Unit		Each T1 or CEPT feature		Second Power Supply feature	
Height	10.5 in.	266 mm	10.3 in.	264 mm	10.3 in.	264 mm
Width	17.6 in.	449 mm	1.9 in.	50 mm	2.7 in.	69.5 mm
Depth	15.7 in.	400 mm	14.6 in.	373 mm	14.6 in.	373 mm

Weight						
Minimum	29.2 lbs.	13.2 kg	4.6 lbs.	2.1 kg	11.0 lbs.	5.0 kg
Maximum	29.2 lbs.	13.2 kg	4.6 lbs.	2.1 kg	11.0 lbs.	5.0 kg

Electrical	
Power source loading (typical in kVA)	0.75
Voltage range (Vac)	100 to 125 or 200 to 240 (autoranging)
Frequency (Hertz)	50 or 60
Thermal output (typical)	1710 BTU/hr
Power requirements (typical)	500 Watts
Power factor	0.5 to 0.7
Maximum altitude	2135 m (7000 ft.)

Temperature Requirements	Operating	Non-Operating
	16 to 32°C (60 to 90°F)	10 to 43°C (50 to 110°F)

Humidity Requirements (Non-condensing)	Operating	Non-Operating
	8 to 80%	8 to 80%
Wet Bulb	27°C (80°F)	27°C (80°F)

Noise Emissions[1]	Operating	Idle
L_{WAd}	5.25 bels	5.25 bels
L_{pAm}	N/A	N/A
$<L_{pA}>_m$	46 dBA	40 dBA
Impulsive or prominent discrete tones	No	No

Clearances	Front	Back	Left	Right
Install/Air Flow[2]	152 mm (6 in.)	152 mm (6 in.)	N/A	N/A
Service	152 mm (6 in.)	N/A	N/A	N/A

Notes:

1. See "Noise Emission Notes" on page 31 for definitions of the various noise emissions positions.
2. The amount of space needed by the unit during normal operation is indicated by broken lines on the footprint.

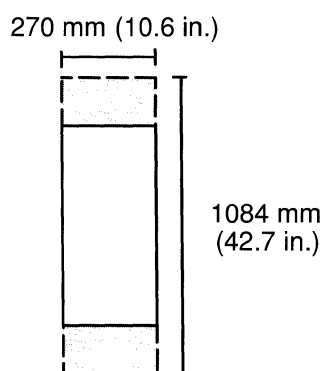449 mm (17.6 in.)
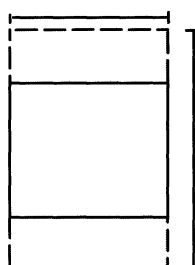
704 mm (27.7 in.)

9295 Multiple Digital Trunk Processor

9333 Model 500 Deskside High-Performance Subsystem

Dimensions			
Height		24.0 in.	610 mm
Width (at pedestal)		10.6 in.	270 mm
Depth		30.7 in.	780 mm

Weight			
Minimum		85 lbs.	39 kg
Maximum		138 lbs.	63 kg

Electrical	
Power source loading (typical in kVA)	0.37
Voltage range (Vac)	100 to 125 or 200 to 240 (selectable)
Frequency (Hertz)	50 or 60
Thermal output (typical)	680 BTU/hr
Power requirements (typical)	200 Watts
Power factor	0.5 to 0.7
Maximum altitude	2135 m (7000 ft.)

Temperature Requirements	Operating	Non-Operating
	16 to 32°C (60 to 90°F)	10 to 43°C (50 to 110°F)

Humidity Requirements	Operating	Non-Operating
(Non-condensing)	8 to 80%	8 to 80%
Wet Bulb	23°C (73°F)	27°C (80°F)

Noise Emissions[1]	Operating	Idle
L_{WAd}	5.5 bels	5.3 bels
L_{pAm}	N/A	N/A
$<L_{pA}>m$	44 dBA	42 dBA
Impulsive or prominent discrete tones	No	No

Clearances	Front	Back	Left	Right
Install/Air Flow[2]	152 mm (6 in.)	152 mm (6 in.)	N/A	N/A
Service	152 mm (6 in.)	N/A	N/A	N/A

Notes:

1. See "Noise Emission Notes" on page 31 for definitions of the various noise emissions positions.
2. The amount of space needed by the unit during normal operation is indicated by broken lines on the footprint.
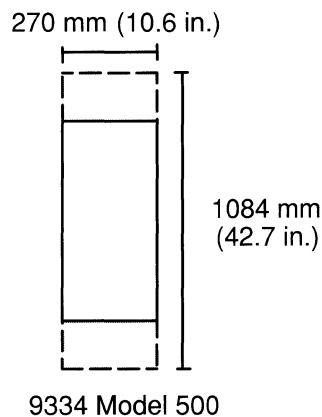
270 mm (10.6 in.)

1084 mm (42.7 in.)

9333 Model 500

9334 Model 500 Deskside Expansion Unit

Dimensions				
Height		24.0 in.	610 mm	
Width (at pedestal)		10.6 in.	270 mm	
Depth		30.7 in.	780 mm	

Weight				
Minimum		85 lbs.	39 kg	
Maximum		142 lbs.	65 kg	

Electrical				
Power source loading (typical in kVA)		0.4		
Voltage range (Vac)		100 to 125 or 200 to 240 (selectable)		
Frequency (Hertz)		50 or 60		
Thermal output (typical)		650 BTU/hr		
Power requirements (typical)		190 Watts		
Power factor		0.5 to 0.7		
Maximum altitude		2135 m (7000 ft.)		

Temperature Requirements	**Operating**		**Non-Operating**	
	16 to 32°C (60 to 90°F)		10 to 43°C (50 to 110°F)	

Humidity Requirements	**Operating**		**Non-Operating**	
(Non-condensing)	8 to 80%		8 to 80%	
Wet Bulb	23°C (73°F)		27°C (80°F)	

Noise Emissions[1]	**Operating**		**Idle**	
L_{WAd}	5.5 bels		5.3 bels	
L_{pAm}	N/A		N/A	
$<L_{pA}>_m$	44 dBA		42 dBA	
Impulsive or prominent discrete tones	No		No	

Clearances	Front	Back	Left	Right
Install/Air Flow[2]	152 mm (6 in.)	152 mm (6 in.)	N/A	N/A
Service	152 mm (6 in.)	N/A	N/A	N/A

Notes:

1. See "Noise Emission Notes" on page 31 for definitions of the various noise emissions positions.
2. The amount of space needed by the unit during normal operation is indicated by broken lines on the footprint.

270 mm (10.6 in.)

1084 mm
(42.7 in.)

9334 Model 500

9348 Model 12 Magnetic Tape Unit

Dimensions				
Height			8.75 in.	222 mm
Width			19.0 in.	483 mm
Depth			26.5 in.	673 mm

Weight				
Minimum			105 lbs.	48.2 kg
Maximum			105 lbs.	48.2 kg

Electrical		
Power source loading (typical in kVA)		0.2
Voltage range (Vac)		100 to 125 or 200 to 240 (autoranging)
Frequency (Hertz)		50 or 60
Thermal output (typical)		410 BTU/hr
Power requirements (typical)		120 Watts
Power factor		0.5 to 0.7
Maximum altitude		2135 m (7000 ft.)

Temperature Requirements	**Operating**	**Non-Operating**
	16 to 32°C (60 to 90°F)	10 to 43°C (50 to 110°F)

Humidity Requirements	**Operating**	**Non-Operating**
(Non-condensing)	20 to 80%	20 to 80%
Wet Bulb	23°C (73°F)	27°C (80°F)

Noise Emissions[1]	**Operating**	**Idle**
L_{WAd}	7.0 bels[2]	6.8 bels
L_{pAm}	N/A	N/A
$<L_{pA}>m$	51 dBA[2]	50 dBA
Impulsive or prominent discrete tones	No	No

Clearances	**Front**	**Back**	**Left**	**Right**
Install/Air Flow[3]	152 mm (6 in.)	152 mm (6 in.)	N/A	N/A
Service	152 mm (6 in.)	N/A	305 mm (12 in.)	305 mm (12 in.)

Notes:

1. See "Noise Emission Notes" on page 31 for definitions of the various noise emissions positions.
2. Data applies when the tape unit is in Streaming Operating mode.
3. The amount of space needed by the unit during normal operation is indicated by broken lines on the footprint.

483 mm (19 in.)

977 mm
(38.5 in.)
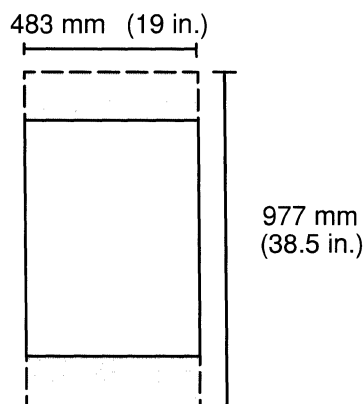
9348 Model 12 Footprint

Noise Emission Notes:

1. L_{WAd} is the declared sound power emission level for a production series of machines.
2. L_{pAm} is the mean value of the sound pressure emission levels at the operator position (if any) for a production series of machines.
3. $<L_{pA}>_m$ is the mean value of the space-averaged sound pressure emission levels at the one-meter positions for a production series of machines.
4. N/A = Not Applicable (no operator position).
5. All measurements are made in accordance with ISO DIS 779, and reported in conformance with ISO DIS 7574/4.

Step 2: Prepare for Power Cords and Electrical Needs

General Considerations

In planning for your electrical needs, consider the following:

- You must have adequate power to meet the requirements of the devices.

- The power cords supplied with the devices need to be long enough to reach the available electrical power receptacles.

- Electrical outlets must be compatible with the electrical plugs supplied with the devices.

- Electrical outlets must be functional and properly grounded.

- Paths of power cords.

- Depending on the computing environment, you may need surge protection devices.

- Radio and radar transmitters close to your location.

- Functionality of Uninterruptable Power Source (UPS), if used.

Power Cords

IBM supplies power cords with attached plugs. For the Model 220, the cord is 1.8 m (6 ft.) long. For all other desktop and deskside system units the cord is 2.8 m (9 ft.) in length, except in Chicago, where it is 1.8 m (6 ft.). For the 7015 POWERservers, the cord is 4.3 m (14 ft.) long, except in Chicago, where it is 1.8 m (6 ft.).
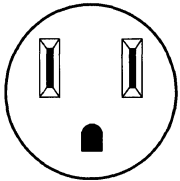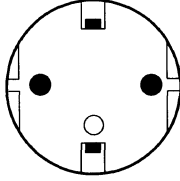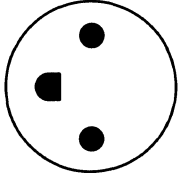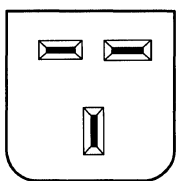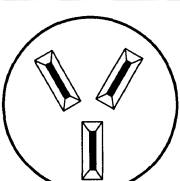
You, the customer, must supply the corresponding power outlet receptacles. For non-U.S. countries IBM supplies power cords with an attached plug that corresponds to the power-outlet receptacle most commonly used in that country.
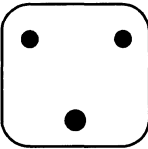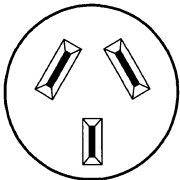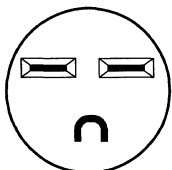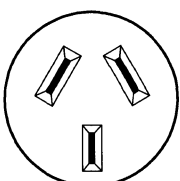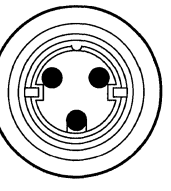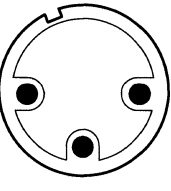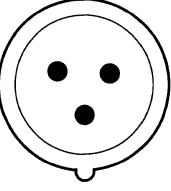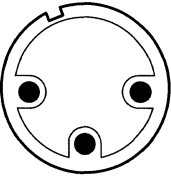
Plugs
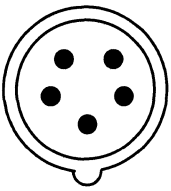
The following table presents information concerning system unit plugs for various countries. The plugs are listed in order of feature code. Consult your RISC System/6000 marketing representative for information on which type of plug is used in your area or country.

Notes:

1. Feature codes 9113 and 9114 are for a rack power distribution unit rather than a power cord. These codes indicate that the power distribution unit includes a power cord, therefore, you do not need to order one separately. Unless otherwise noted, the system units have a 9111 power distribution unit, which does not include a power cord.
2. In the United States, raised floor installations involving racks may require a Russell and Stoll (R & S) watertight plug/connector/receptacle (feature code 9801 or 9987).

Feature Code	Plug	Standard Compliance or Type
Desktop and Deskside Units and Attachments		
9116 9800 9986		NEMA WD-1 5-15P 125 V, 15 A
9820		CEE7 VII 250 V, 16 A
9821		Afsnit 107 250 V, 10 A
9825		BS 1363 250 V, 13 A
9827		SII-32-1971 250 V, 16 A

Feature Code	Plug	Standard Compliance or Type
Desktop and Deskside Units and Attachments (continued)		
9828		SEV 1011.1959 250 V, 10 A
9829		SABS 164, BS 546 250 V, 16 A
9830		CEI 23-16/VII 250 V, 10 A
9831		AS 3122-1981 250 V, 10 A
9833		NEMA WD-1 6-15P 250 V, 15 A
9834		IEC 83-A5 1957 250 V, 10 A

Feature Code	Plug	Standard Compliance or Type
Racks		
9113 9114		IEC 309 380-415 V, 32 A
9800 9824 9986		NEMA WD-5 L6-30P 250 V, 30 A
9801 9987		R & S 3750 250 V, 30 A
9822		Wilco Weatherproof WIP130 250 V, 30 A
9823		IEC 309 220 to 240 V, 32 A
9826		PDL Insulated 56PA330 250 V, 30 A

Electrical Considerations

Most of these electrical considerations apply to all system units, except for the "Power Phase Imbalance" and "Power Phase Rotation" sections, which apply only to the RISC System/6000 racks.

Primary Computer Power Service

While a dedicated power supply is not necessary, for maximum reliability the computer power panel should connect to feeders that do not serve other loads. Connect electrical noise-producing devices to panels separate from those feeding the system units.

Grounding

A system unit or device must be properly grounded. It is recommended that an insulated green wire ground, the same size as the phase wire, be installed between the branch circuit panel and the receptacle.

To ensure proper grounding, a licensed electrician should check the grounding and receptacles for conformance with the country electrical codes.

Computer Room Emergency Power-Off Controls

As a safety precaution, you should provide room emergency power-off controls for disconnecting the main service wiring that supplies the computer equipment. Install these controls at a convenient place for the operator and next to the main exit doors of the room.

Lightning Protection

You should install lightning protection devices when:

- An overhead power service supplies the primary power.
- The area is subject to electrical storms or equivalent-type power surges.

Power Phase Imbalance

Three versions of rack power distribution units are available. The single-phase unit, feature code 9111, has a detachable line cord and can accept single-phase power or power from one phase of a three-phase source. The two multiphase units, feature codes 9113 and 9114, have attached line cords and connect to two and three phases, respectively, of a three-phase power source.

Systems with any of the power distribution units can cause a load imbalance when connected to a three-phase power source. You should consult a licensed electrician to properly balance the loads when new or additional systems are to be connected to a three-phase source.

Power Phase Rotation

The phase rotation (sequence) is not critical for the rack multiphase power distribution units (feature codes 9113 and 9114). The system will operate correctly with a multiphase distribution unit connected to a 200 to 240-volt single-phase power source (all phases connected to one side of the power source, neutral to the other). Note, however, that the 9114 unit does not have a neutral line circuit breaker and must only be connected to power sources that have a grounded (earthed) neutral.

Step 3: Prepare for Cables and Cabling

The purpose of this section is to help you plan your layout by presenting information on IBM-supplied cables used to interconnect the RISC System/6000 system units and devices. The information includes feature codes, part numbers, and pin-out charts for certain IBM and customer-supplied cables.

You must plan the type of cable, cable path, and cable length. Consider not only your current needs, but also your anticipated growth and the relocation of personnel.

You should note cable paths on your office layout as this will assist the customer service representative in installing your system.

You are responsible for planning for the installation of interconnecting cables and should contact the appropriate contractor for guidance and assistance as required. If the IBM cables discussed do not meet your needs, you should talk to your IBM representative or cabling vendor about custom cabling alternatives.

General Considerations

In preparing for cabling, consider the following:

- Where applicable, electrical and physical specifications of cables you currently have and plan to use with the RISC System/6000 system must be compatible with the standards mentioned in this book.

- Lengths and paths of cables. See "Cable Measuring" on page 37.

- Communication signal cables should be installed away from power lines or other sources of electrical interference.

- Toroid and special shielding considerations. The following cables, whether purchased from IBM or supplied by you, must use toroids: Lighted Programmable Function Keyboard, Dials, or Tablet Attachment Cable, the PC Parallel Printer Cable, the Display Adapter Cable, and the 7235 Signal Cable.

- Labeling of cables and ports you currently have in order to indicate which devices you want attached to them. See "Cable Labeling" on page 39.

- Electrostatic discharge (ESD) considerations. In particular, unprotected patch panels, punch blocks, or other intermediate routing or switching devices used in cabling can allow ESD into the network.

  Note: Direct-attached cables that do not have lightning protection cannot travel outside the building in which they are installed. Fiber-optic cables do not require lightning protection, but other standard IBM communication cables do. Contact a cabling vendor about providing lightning protection for cables.

Cable Measuring

Accurate measuring of cables is critical to a successful and efficient installation. Do not guess or estimate your cable lengths.

In determining the cable lengths you need, be sure to consider the following:

- **A**=length allowed for service access, 51 mm (2 ft.) on both system unit and device ends.
- **B**=length from system unit to floor.
  - Tabletop to floor for desktop models.
  - 46 mm (1.5 ft.) for deskside units.
  - See "7015 Considerations" for rack-mounted system units.
- **C**=horizontal and vertical cable runs. Be sure to route cables around furniture and to avoid tripping hazards.
- **D**=distance from floor to device. (This can include distance between floors, between buildings, etc., depending on complexity of installation.)
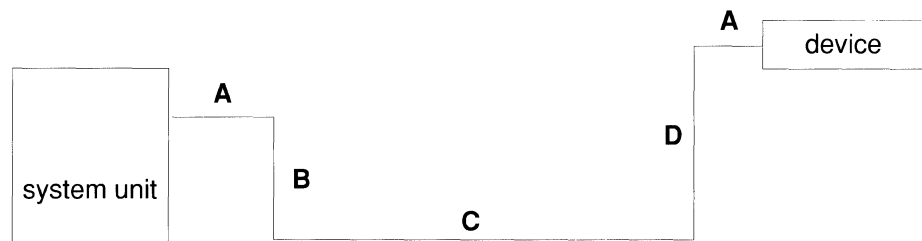
7015 Considerations

All 78-pin multiport cables used with the 7015 POWERservers attach to the system tailgate rather than to the adapter itself. The system tailgate is located near the base of the system unit. You should begin your cable measurements at the system tailgate for multiport cables. See Figure 1 on page 38 for an illustration.

Other cables used with the 7015 system units are routed through a cable management arm located in the upper part of the rack. The management arm is designed to ensure that the cables do not kink, stretch, or accidently disconnect when a drawer is pulled out for service. Cables routed through this arm include token-ring and Ethernet cables, 64-Port Async Controller cables, the System/370 Block Multiplexer Channel Adapter Cable, and cables attached to the serial and parallel ports.

When planning the necessary lengths of cables routed through this arm, add 2.3 m (7.5 ft.) to the measured distance from the base of the rack.
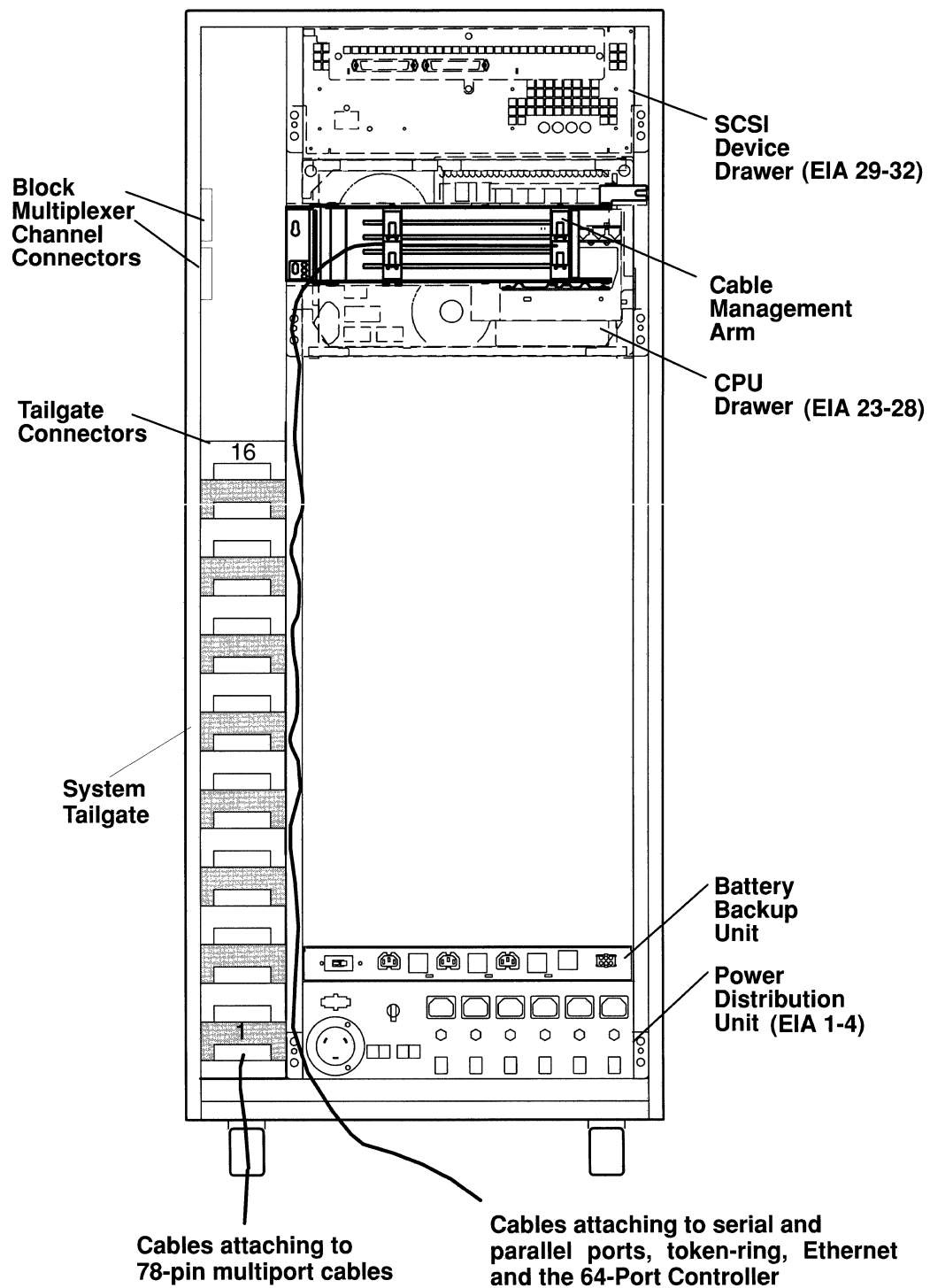
SCSI Device Drawer (EIA 29-32)

Block Multiplexer Channel Connectors

Cable Management Arm

CPU Drawer (EIA 23-28)

Tailgate Connectors

16

System Tailgate

Battery Backup Unit

Power Distribution Unit (EIA 1-4)

1

Cables attaching to 78-pin multiport cables

Cables attaching to serial and parallel ports, token-ring, Ethernet and the 64-Port Controller

Figure 1.   Rear view of a 7015 system unit, showing system tailgate and cable management arm. The EIA scale, which provides a standard unit of measure, is located on the inside right of the rack.

Cable Labeling

Why

For installations requiring cabling between rooms, or use of many cables that are identical in appearance, cable labeling can help you keep track of how each cable is being used. By attaching a cable label to each end of a cable, you can always know the source and destination of any cable. This information will facilitate installation and the inevitable moving of devices that occurs in any office.

Cable labels are shipped with each machine, or can be ordered from your IBM representative if you would like to label the cables before your system arrives. If you attach the cable labels in advance, the installer can make connections to match your cable planning charts. See page 81 for more details on cable planning charts.

How

As a customer, you are primarily interested in the side of the label that describes the cable's destination. However, each side is shown and explained so you can understand the labels.

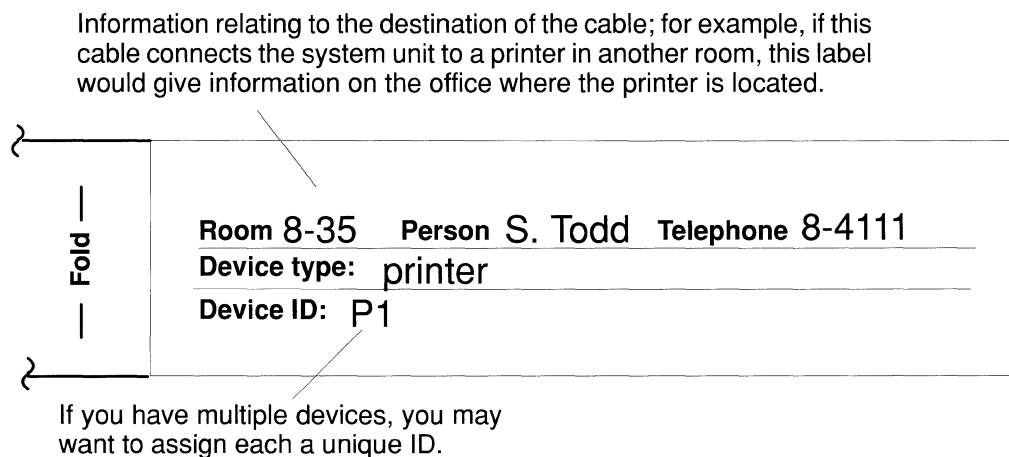The cable label is designed to fold around a cable and stick to itself.

Information relating to the destination of the cable; for example, if this cable connects the system unit to a printer in another room, this label would give information on the office where the printer is located.

Fold	
	Room 8-35 **Person** S. Todd **Telephone** 8-4111
	Device type: printer
	Device ID: P1

If you have multiple devices, you may want to assign each a unique ID.

Figure 2. The right side of the cable label.

Drawer

Connector

Slot

Port

Refers to a number located on an adapter bracket

For async adapters, designated EIA interface

Software Location Code	Adapter Type	Interface
00 – 03 – 01 –	3-6	EIA-232

	This Cable Connects To:				
Service Use Only	EIA	Slot	Connector	Tailgate	System ID:
	23	3	1		

Refers to EIA unit marking bottom edge of rack drawer where adapter is located

Slot where adapter is installed

For multiport adapters, designates connector to which the cable attaches

if installing multiple systems, you should give each a unique ID

For 78-pin multiport cables, designates the rack tailgate connector to which they are attached

Figure 3. The left side of the cable label, which has shaded areas, is primarily for use by the customer engineer installing your system.

Software Location Code

The software location code is the link between the hardware and software. This code appears in the software configuration menus and in the hardware diagnostic menus. The Drawer, Slot, and Connector fields must be filled in for each label. The Port field designates a port on a multiport cable, not on an adapter. Port numbers only apply to the cables that connect the cable port to the device.

Adapter Cabling

The purpose of this section is to help you determine what types of cables you need to attach RISC System/6000 devices to their adapters. *Length* refers to the length of an IBM-provided cable.

Adapters are listed in order of feature code. Adapters without a feature code are listed at the end of the section.

Notes:

1. To aid the person who is installing your system, you should use the cable planning charts on page 81 . When completed, these charts provide valuable information, such as system unit location, and device type and location. You also should use the cable identification labels shipped with the system unit. The labels help you keep track of which cables are used for each system unit or device as your configuration changes over time.

2. All 78-pin multiport cables used with the 7015 POWERservers attach to the system tailgate rather than to the adapter. Internal cables not shown in these cabling diagrams run from the adapter to the system tailgate, which is near the base of the system unit.

FC 2700 (IBM 4-Port Multiprotocol Communications Controller)

The following figure illustrates the 4-Port Multiprotocol Communications Controller with the IBM 4-Port Multiprotocol 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. The cable planning chart for this adapter on page 89 can help you make these assignments. Copy these charts as needed for personal use.

Adapter
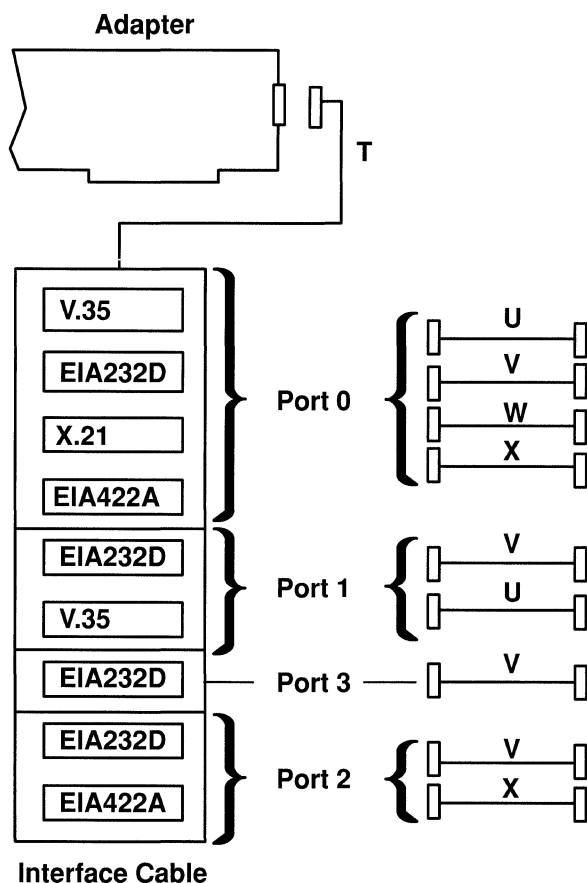
Interface Cable

Cable Letter	Cable Name	IBM Part Number	Feature Code	Length m	ft.
T	Part of cable assembly	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	

FCs 2720, 2722, 2723, and 2724 (IBM Fiber Distributed Data Interface (FDDI) Adapter)

The following figure illustrates the IBM FDDI Adapter with attachment cable. Feature codes 2720 and 2724 are for the base card or single ring attach; feature codes 2722 and 2723 are for the FDDI dual ring upgrade kit. For more detailed information on planning for, installing, and operating the adapter refer to the *IBM FDDI Adapter User's Guide and Programming Reference*, SC23-2426.

Adapter

FDDI Fiber Adapter or Concentrator

PP

2720 or 2724 FDDI Fiber Base Adapter Single Ring Attach

Adapter

2720

2722

PP

PP

FDDI Fiber Adapter or Concentrator

2722 or 2723 FDDI Fiber Dual Ring Attach

Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m ft.
PP	All FDDI Fiber Adapters require Multi-Mode FDDI optical fiber jumper cables. Jumper cables are the responsibility of the customer, and may be ordered from the local authorized IBM cabling distributor. For installation of FDDI systems, refer to IBM publication *FDDI Introduction and Planning Guide*, GA27-3892. For additional information concerning FDDI optical systems, refer to IBM pulication *FDDI Optical Fiber Planning and Installation Guide*, GA27-3943.	N/A	N/A	N/A

FCs 2725 and 2726 Shielded Twisted Pair FDDI Adapter

The following figures show the different FDDI-STP cabling configurations:
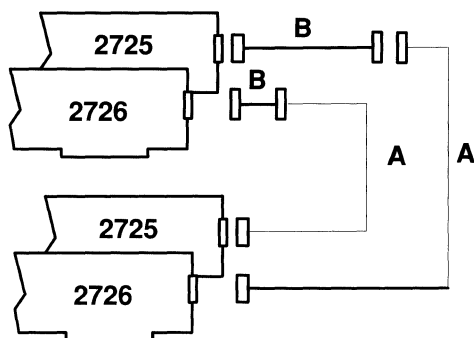
**2726 FDDI-STP Dual Ring Attach
without a Concentrator**
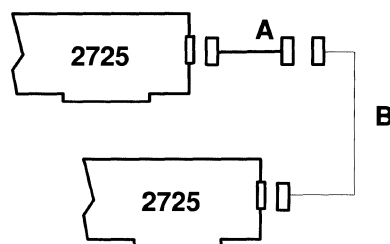
**2725 FDDI-STP Single Ring
Attach without a Concentrator**
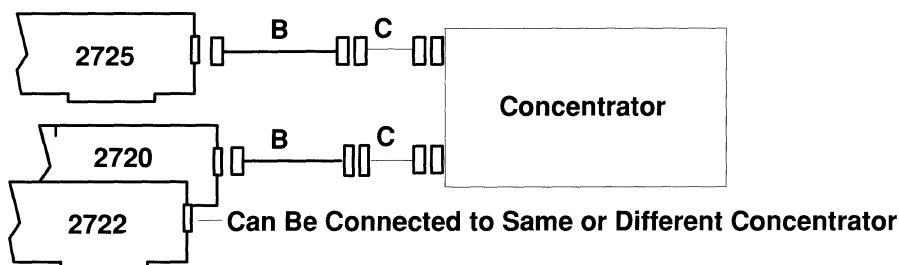
**2725 FDDI-STP Single Ring and 2726 FDDI-STP
Dual Ring Attach to a Concentrator**

Cable Letter	Cable Name/ Description	IBM Part Number	Feature Code	Length m	ft.
A	FDDI Copper Adapter Reversing Cable	33G2762	N/A	3	9.9
B	FDDI Copper Adapter Cable	33G2761	N/A	3	9.9
C	FDDI Copper Adapter Cable	33G2760	N/A	3	9.9

Cable A - FDDI Copper Adapter Reversing Cable				
Adapter Card D Connector Pin	Wire Number	Wire Color	Data Connector Pin	Usage
Shield (ground)	1	Shield	Shield (ground)	Ground
1	3	Black	Black	Receive +
5	4	Red	Red	Transmit +
6	2	Orange	Orange	Receive -
9	5	Green	Green	Transmit -

Cable B - FDDI Copper Adapter Cable				
Adapter Card D Connector Pin	Wire Number	Wire Color	Data Connector Pin	Usage
Shield (ground)	1	Shield	Shield (ground)	Ground
5	3	Black	Black	Receive +
1	4	Red	Red	Transmit +
9	2	Orange	Orange	Receive -
6	5	Green	Green	Transmit -

FC 2755 (IBM S/370 Block Multiplexer Channel Adapter)

Establishing communications with a S/370 or S/390 host requires special planning. Cabling, hardware, and software considerations are discussed below. For more detailed information on planning for, installing, and operating the adapter, refer to the *Block Multiplexer Channel Adapter User's Guide and Service Information*, SC23-2427.

Cable Considerations

The cable and cable assembly in the following figure are separately orderable. Use of the IBM cable and cable assembly is recommended due to the critical cabling specifications required for RISC System/6000 connection to the host.

To order the cables necessary to attach the cable assembly to the host, contact your IBM representative. Keep the following in mind when ordering:

Notes:

1. Blue channel cables must be used if the adapter is to be operated at 4.5mb or if the IBM 3044 Model 2 Channel Extender is used.

2. Cables (bus and tag) must be used in pairs of equal length and matching color (blue or gray, but not both). Bus and tag cables can be ordered separately and must be ordered to the desired length. The Host Channel Cable group for the RISC System/6000 is 0185.

3. There are some cable length limitations. When Data Streaming mode is used, there can be no more than 122 m (400 ft.) between the RISC System/6000 system unit and the host. If there are other channel-attached devices located between the system unit and the host, deduct 4.5 m (15 ft.) for each device in your cable measurement. Some devices may require addtional cable length deductions; consult the *IBM S/360, S/370, 4300, and 9370 Processors Input Output Equipment Installation Manual-Physical Planning*, GC22-7064I, for the particular device.

4. The system unit can connect to an IBM 3044 Model 2 Channel Extender, which allows the 370 parallel channel to be extended up to 3 km (1.9 miles). It can also connect to an IBM 9034 Model 1 ESCON Converter, which allows communications with an System/370 or System/390 ESCON channel. There can be up to 3 km (1.9 miles) between the 9034 and the host.
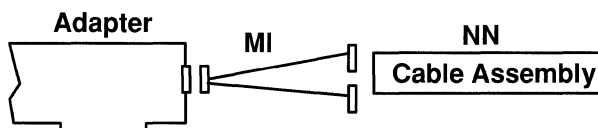
Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
MI	S/370 Block Multiplexer Channel Adapter Cable	92F6697	2757	1.8	6
NN	S/370 Block Multiplexer Channel Cable Interface Assembly	25F9401	2758	N/A	

Hardware Considerations

- The Remote Power Interface as described in *IBM S/360 and S/370 Power-Control Interface Original Equipment Manufacturers' Information*, GA22-6906, is not supported on the RISC System/6000 system.
- The processors supported by the S/370 Block Multiplexer Channel Adapter are summarized below. Certain processors can use the IBM 9034 Model 1 ESCON Converter or the IBM 3044 Model 2 Channel Extender. Connection to an ESCON channel requires a 9034 Model 1. You cannot use both a 9034 and a 3044 on the same channel.

System Processor	Channel Type	Speed
9021	Parallel	Up to 4.5mb
9021	ESCON*	Up to 4.5mb
9121	Parallel	Up to 4.5mb
9121	ESCON*	Up to 4.5mb

9221	Parallel	Up to 4.5mb
9221	ESCON*	Up to 4.5mb
ES/3090	Parallel	Up to 4.5mb
ES/3090 (J)	ESCON*	Up to 4.5mb

*Requires use of the 9034 Model 1 ESCON Converter.

- The System/370 Block Multiplexer Channel Adapter supports three speeds. The type of processor channel used depends on the speed setting.

Speed Setting	Channel Speed	Processor Channel
0	DCI	Any
2	2.7mb (maximum)	3.0mb
4	4.5mb (maximum)	4.5mb

Software Considerations

Consider the following when planning for the S/370 Block Multiplexer Channel Adapter:

- AIX Version 3.2 or later for RISC System/6000 is required. Adapter channel address and speed are set up using SMIT.
- The System/390 Host I/O Control Program (IOCP) must be updated to include the RISC System/6000 system. The RISC System/6000 is defined as a 3088.
- The System/390 Host Operating systems must be updated to recognize and support the RISC System/6000 system unit.

FC 2756 (IBM S/390 ESCON Channel Adapter)

Establishing communications with a S/390 host requires special planning. Cabling, hardware, and software considerations are discussed below. For more detailed information on planning for, installing, and operating the adapter, refer to the *IBM Enterprise System Connection Adapter User's Guide and Service Information*, SC23-2474.
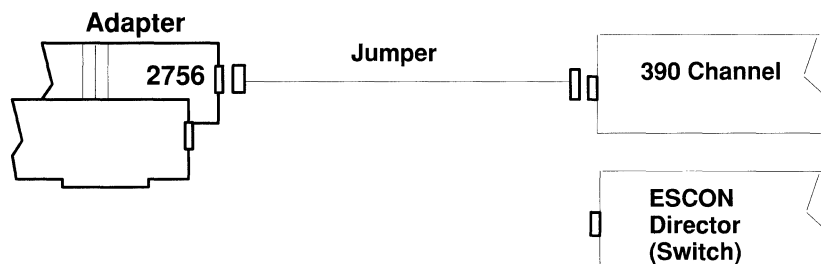
Note: The ESCON jumper cable can connect to any ESCON Channel, Trunk, or an ESCON Director Switch.

Cable Considerations

The ESCON cable is separately orderable.

To order the cable necessary to attach to the host, contact your IBM representative. The following table lists the standard ESCON Duplex-to-Duplex jumper cable part numbers.

Cable Name/Description	IBM Part Number	Length m	ft.
S/390 ESCON Channel Jumper Cable (Duplex-to-Duplex)	74F5412	3.7	12
	74F5413	6.1	20
	74F5414	12.1	40
	74F5415	21.3	70
	74F5416	30.4	100
	74F5417	61	200
	74F5418	122	400

Refer to "Maintenance Information for Enterprise Systems Connection Links," SY27-2597 for additional information.

Hardware Considerations

The processors supported by the S/370 ESCON Channel Adapter are summarized below.

System Processor	Channel Type	Speed
9021	ESCON	Up to 17mb
9121	ESCON	Up to 10mb
9221	ESCON	Up to 10mb
ES/3090 (J)	ESCON	Up to 10mb

Software Considerations

Consider the following when planning for the ESCON Channel Adapter:

- AIX Version 3.2 or later is required. Adapter channel address and speed are set up using SMIT.

- The System/390 I/O Control Program (IOCP) must be updated to include the RISC System/6000. The IOCP should specify a 3088 device type.

- The System/390 operating systems must be updated to recognize and support the RISC System/6000 system unit.

FC 2770 (IBM Color Graphics Display Adapter)

The following figure illustrates the Color Graphics Display Adapter with an attachment cable for a color display.
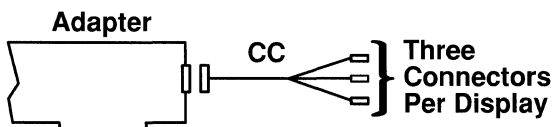
Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
CC	Display Adapter Cable, contains an integral toroid assembly	58F2903	N/A	2.4	8

FC 2777 (IBM POWER Gt3)

The following figure illustrates the POWER Gt3 with an attachment cable for one display.
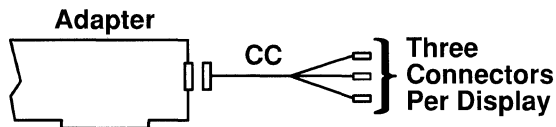
Adapter

CC — Three Connectors Per Display

Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
CC	Display Adapter Cable, contains an integral toroid assembly	58F2903	N/A	2.4	8

FC 2790, 2791 (IBM POWER Gt4 and Gt4x)

The figure below illustrates the POWER Gt4 and Gt4x with an attachment cable for one display.
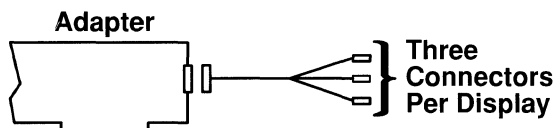
Adapter

Three Connectors Per Display

Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
CC	Display Adapter Cable, contains an integral toroid assembly	58F2903	N/A	2.4	8

FC 2800 (IBM S/370 Host Interface Adapter)

There are a variety of ways to cable the S/370 Host Interface Adapter to the IBM 5088 or the IBM 6098 Graphics Control Units.

For specific planning and cabling information refer to the *RISC System/6000 5080 Graphics System: Setup, Operations, and Problem Determination Guide*, GA23-2063.

FC 2801, 2802 (IBM 5085 or 5086 Attachment Adapters)

The following figure illustrates the 5085 or 5086 Attachment Adapters with an attachment cable for one IBM 5085 or 5086 Graphics Processor.
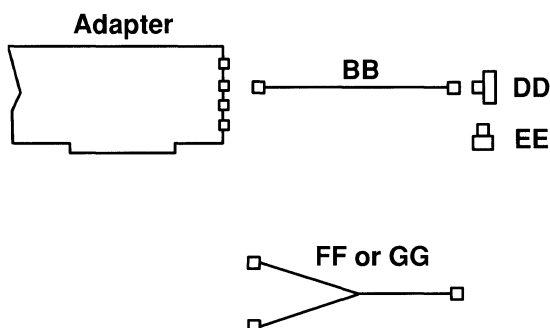
Adapter

BB — DD

EE

FF or GG

Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
BB	Customer-supplied coaxial cable	6245998	N/A	5	16.4
DD	Coaxial BNC Tee connector	N/A	N/A	N/A	
EE	BNC terminator	6246330	N/A	N/A	
FF	"Y" cable from 5085 Graphics Processor to system unit	6247042	N/A	5	16.4
GG	"Y" cable from 5086 Graphics Processor to system unit	6247041	N/A	5	16.4

For specific planning and cabling information, refer to the *IBM 5080/RISC System/6000 Graphics System: Setup, Operations, and Problem Determination Guide*, GA23-2063.

FC 2810 (IBM Graphics Input Device Adapter)

The following figure illustrates the Graphics Input Device Adapter with an attachment cable.

Adapter

Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
F	Lighted Programmable Function Keyboard, Dials, or Tablet Attachment Cable, supplied with IBM 6094 Model 10 Dials or IBM 6094 Lighted Programmable Function Keyboard Model 20	6247480	2811	2.1	7

SCSI I/O Controllers

Cabling scenarios for SCSI controllers vary according to what type of system unit you have. Models 220, 340, 350 ,580, 970, and 980 feature integrated SCSI adapters (not requiring a Micro Channel slot), while the other system units use the IBM SCSI High-Performance I/O Controller.

Performance Considerations

In planning for the SCSI I/O Controller, there are several performance considerations. When the time required for system backup and save and restore operations is an important consideration, having the disk drive with the information to be backed up and the tape backup device on separate I/O controllers can help keep backup operation time down.

System throughput can increase with the Number of disk drives. It is recommended that you have a maximum of four drives per SCSI bus.

Note: Uncontrolled power outages on a system unit or SCSI device may create unpredictable SCSI bus errors. Use of an Uninterruptible Power Supply (UPS) can help prevent such errors.

The following diagram depicts a standard configuration involving the SCSI High-Performance I/O Controller or integrated SCSI controller.
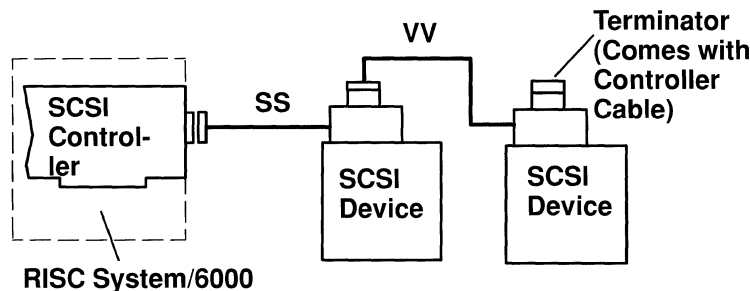
Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
SS	SCSI Controller Cable OR	31F4221	2832	1.5	5
	Integrated SCSI Controller Cable OR	00G2487	2833	1.5	5
	External SCSI Controller Cable (7015)	00G1278	3120	4.75	15.5
VV	SCSI Device-to-Device Cable	31F4222	3130	0.66	2.2

Improved Availability Configurations

RISC System/6000 systems can share an external SCSI bus with another RISC System/6000 system. This sharing can improve system availability and aid in recovery from certain types of hardware, software, and media failures. If one of the systems involved, or a SCSI High-Performance I/O Controller fails, the other system can access the shared drives (with appropriate software support).

Note: Improved availability configurations are supported by the SCSI High-Performance I/O Controller, feature code 2835. The controller must be part Number 00G1887 or later. Models 220, 340, 350, 580, 970, and 980 cannot use their integrated controller for shared devices in an improved availability configuration. Due to cable length restrictions, improved availability configurations involving two 7015 POWERservers are not supported.

There are two typical SCSI improved availability configurations. The first, in which one system unit uses two SCSI buses, provides improved DASD availability. The second, in which two system units share at least two SCSI buses, provides improved DASD and system unit availability.

The second configuration requires the following:

- Two POWERstations or POWERservers
- One IBM SCSI High-Performance I/O Controller per system, and at least one IBM SCSI disk drive, which can be used to boot the system
- A minimum of two shared SCSI buses
- Two IBM SCSI High-Performance I/O Controllers per shared bus, with one to five external SCSI disks per shared bus
- Two SCSI Controller Passthrough Terminator Cables per shared bus, and sufficient SCSI Device-to-Device Cables to concatenate external disks.

When planning to share SCSI devices between two RISC System/6000 systems in such a configuration, consider the following:

1. It is recommended that only disk drives be used on a shared SCSI bus. If tape drives are used, long tape jobs may be reset whenever a host or device on the shared SCSI bus is powered down for service. Scheduling of service activity and tape jobs can avoid unnecessary down time.

2. The SCSI High-Performance I/O Controller supporting the shared disks cannot support any internal SCSI devices. Internal SCSI devices must have their own SCSI High-Performance I/O Controller or integrated controller.

3. The pair of shared SCSI buses allows mirroring of data files across buses. Each host then supports two SCSI buses, each with attached disk drives, and the secondary SCSI bus mirrors the files on the primary SCSI bus.

4. The SCSI High-Performance I/O Controllers on the shared bus must not have terminators on the internal card-edge connector. Termination is provided by the Passthrough Terminator Cable.

5. Each controller and device on the shared bus must have a unique SCSI ID.

6. Jumper J1 must be removed from each SCSI High-Performance I/O Controller on the shared SCSI bus.

7. The Passthrough Terminator Cable must be used (1) to attach the primary host's SCSI High-Performance I/O Controller to the first disk on the SCSI bus, and (2) to attach the last disk on the bus to the secondary host's SCSI High-Performance I/O Controller. The SCSI Device-to-Device Cable should be used to connect the shared disks to one another. For more information on the cables mentioned, see "Cables and Cable Assemblies" on page 91. The following diagram shows a typical attachment of SCSI drives shared between two SCSI controllers.

Note: The shared buses must be quiesced prior to turning on or off or attaching or disconnecting any system unit or device. This will help avoid unpredictable SCSI errors.
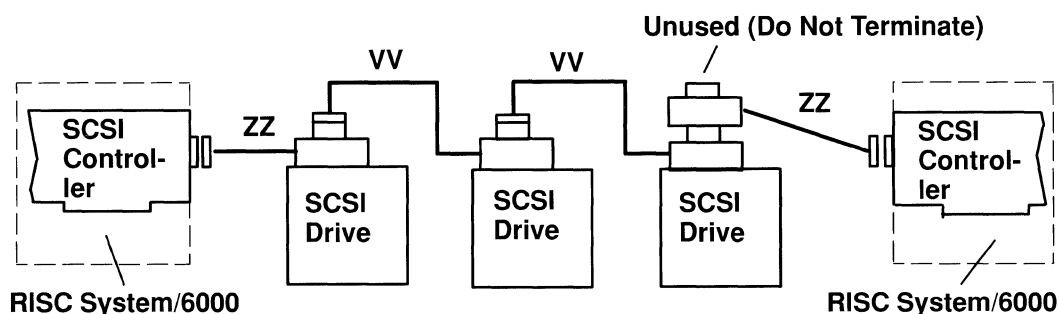
Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
ZZ	Passthrough Terminator Cable	00G0959	2915	1.5	5
VV	SCSI Device-to-Device Cable	31F4222	3130	0.66	2.2

SCSI-2 I/O Controller

Cabling scenarios for the SCSI-2 I/O Controller (part Number 52G1170) vary according to what type of system unit you have. Also the Number of SCSI-2 I/O Controllers varies by machine type (MT). See "Adapter Usage Summary" on page NO TAG for details.

Performance Considerations

In planning for the SCSI-2 I/O Controller, there are several performance considerations. When the time required for system backup and save and restore operations is an important consideration, having the disk drive with the information to be backed up and the tape backup device on separate I/O controllers can help keep backup operation time down.

System throughput can increase with the Number of disk drives. It is recommended that you have a maximum of four drives per SCSI bus.

Note: Uncontrolled power outages on a system unit or SCSI device may create unpredictable SCSI bus errors. Use of an Uninterruptible Power Supply (UPS) can help prevent such errors.

The following system configuration depicts a standard SCSI bus configuration involving the SCSI-2 High Perfomance I/O Controller.

Systems Supported								
Ma-chine Type	**Model Numbers**							
7011	220	220G	220W	220S				
7012	320	320E	320H	340	340R	350	350R	
7013	520H	530E	530H	550	550E	550S	560	560F	580

Configurations Supported

Single-sided SCSI bus support for up to four external SCSI devices per SCSI-2 I/O Controller.

RISC System/6000
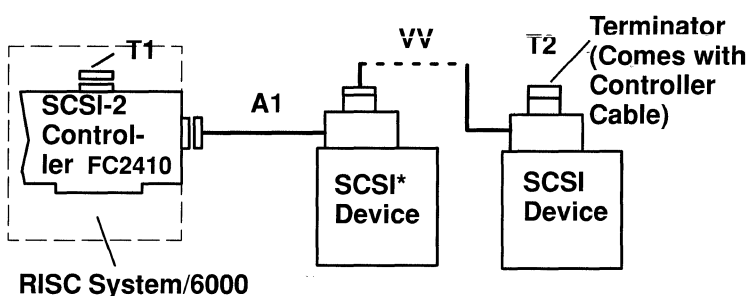
*There can be up to four external SCSI devices per SCSI-2 I/O Controller.

Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
VV	SCSI Device-to-Device Cable	31F4222	3130	0.66	2.2
T1	Internal card-edge terminator (included with FC2410)	00G0972	N/A	N/A	
T2	50-pin low density terminator (included with FC2836)	51G7736	N/A	N/A	
A1	First Device Cable	32G0397	2836	1.5	5

The following configuration is for the External Single-Sided SCSI Bus Support for the 9334-500 Tower.

Systems Supported									
Machine Type	**Model Numbers**								
7011	220	220G	220W	220S					
7012	320	320E	320H	340	340R	350	350R		
7013	520H	530E	530H	550	550E	550S	560	560F	580	580F

Configurations Supported

Single-sided bus support for connection of one 9334-500 Tower.

```
    ┌─ ─ ─ ─ ─ ─T1─ ┐
    │      ═        │
    │ \SCSI-2       │      A4
    │ \Control-   ▯▯──────────
    │ /ler FC2410   │
    │        ╲      │
    └─ ─ ─ ─ ─ ─ ─ ┘
      RISC System/6000
```
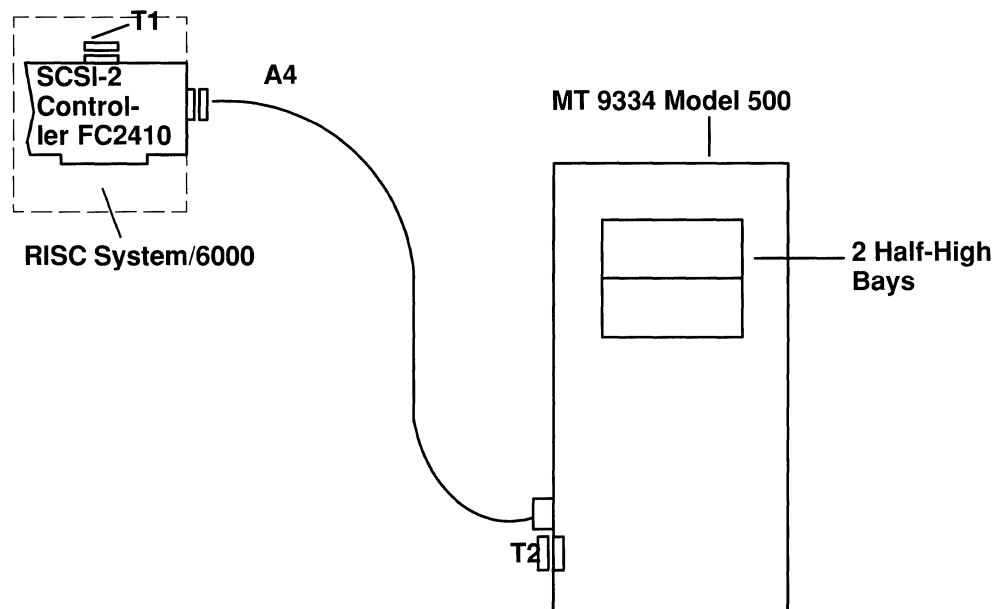
Note: The 9334-500 Tower can support up to four disk drives in the lower bays and up to one full-high or two half-high SCSI tape or CD-ROM devices in the upper bays.

Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
T1	Internal card-edge terminator (included with FC2410)	00G0972	N/A	N/A	
T2	Terminator supplied with 9334-500 to be placed on the lower connector	51G7736	N/A	N/A	
A4	External Tower Cable	45G2858		2.4	7.9

The following configuration is for the external Single-Sided SCSI Bus Support for the 9334-010 Drawer:

Systems Supported					
Ma-chine Type	Model Numbers				
7015	950 951 950E 970 970E 980				

Configurations Supported

Single-sided SCSI bus support for the connection of one 9334-010 Drawer.
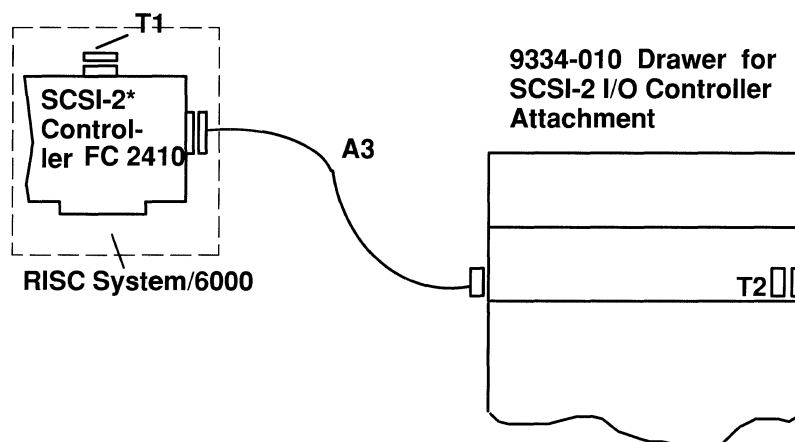
The 9334-010 Drawer for SCSI-2 I/O Controller attachment comes with an internal terminated cable. The 9334-010 Drawer can be installed in either a MT 7015 CPU Rack or a 7209 Expansion Rack. MT 7015 Models 970 and 980 will support two 8-slot Micro Channel busses. Each Micro Channel bus can support up to eight SCSI-2 I/O Controllers (FC 2410).

Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
T1	Internal card-edge terminator (included with FC2410)	00G0972	N/A	N/A	
T2	Supplied with 9334-010 Drawer	51G7736	N/A	N/A	
A3	Attachment cable is supplied with 9334-010 Drawer for MT 7015 attachment				
A3	Optional rack attachment cable for 7209 Expansion Rack	51G7633	3121	4.75	15.6

The following configuration is for the SCSI bus having SCSI devices both internally and externally attached to the SCSI-2 I/O Controller.

Systems Supported								
Ma-chine Type	Model Numbers							
7013	520H	530E	530H	550	550E	550S	560	560F	580

Configurations Supported

- One feature code 2831 supported per system
- Up to six SCSI disk drives in the lower internal bays
- Up to two external SCSI devices
- Up to seven SCSI devices attached to one SCSI-2 I/O Controller.

Note: Maximum external cable length not to exceed 2.8 m.
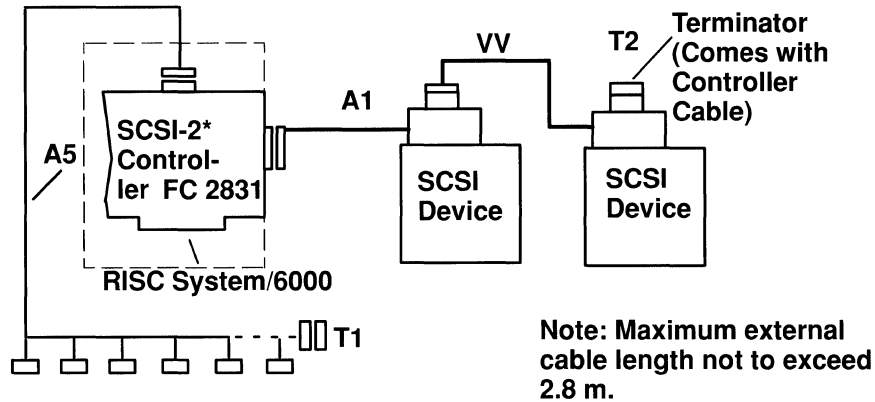
Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
A1	First Device Cable	32G0397	2836	1.5	5
VV	SCSI Device-to-Device Cable	31F4222	3130	0.66	2.2
A5	Six drop Internal Cables supplied with FC 2831			1.8	6
T1	Supplied with FC 2831				
T2	Supplied with FC 2836				

Improved Availability Configurations

RISC System/6000 systems can share an external SCSI-2 bus with another RISC System/6000 system. This sharing can improve system availability and aid in recovery from certain types of hardware, software, and media failures. If one of the systems involved, or a SCSI-2 High-Performance I/O Controller fails, the other system can access the shared drives (with appropriate software support).

Note: Improved availability configurations are supported by the SCSI-2 High-Performance I/O Controller, feature code 2410. Due to cable length restrictions, improved availability configurations involving two 7015 POWERservers are not supported.

There are two typical SCSI-2 improved availability configurations. The first, in which one system unit uses two SCSI-2 buses, provides improved disk storage availability. The second, in which two system units share at least two SCSI-2 buses, provides improved disk storage and system unit availability.

The second configuration requires the following:

- Two POWERstations or POWERservers
- One IBM SCSI-2 High-Performance I/O Controller per system, and at least one IBM SCSI-2 disk drive, which can be used to boot the system
- A minimum of two shared SCSI-2 buses
- Two IBM SCSI-2 High-Performance I/O Controllers per shared bus, with one to three maximum external SCSI-2 disks per shared bus
- Two SCSI-2 Controller Passthrough Terminator Cables per shared bus, and sufficient SCSI-2 Device-to-Device Cables to concatenate external disks.

When planning to share SCSI-2 devices between two RISC System/6000 systems in such a configuration, consider the following:

1. It is recommended that only disk drives be used on a shared SCSI bus. If tape drives are used, long tape jobs may be reset whenever a host or device on the shared SCSI bus is powered down for service. Scheduling of service activity and tape jobs can avoid unnecessary down time.

2. The SCSI-2 High-Performance I/O Controller supporting the shared disks cannot support any internal SCSI devices. Internal SCSI devices must have their own SCSI-2 High-Performance I/O Controller or integrated controller.

3. The pair of shared SCSI-2 buses allows mirroring of data files across buses. Each host then supports two SCSI-2 buses, each with attached disk drives, and the secondary SCSI bus mirrors the files on the primary SCSI-2 bus.

4. The SCSI-2 High-Performance I/O Controllers on the shared bus must not have terminators on the internal card-edge connector. Termination is provided by the Passthrough Terminator Cable.

5. Each controller and device on the shared bus must have a unique SCSI-2 ID.

6. Jumper P3 must be removed from each SCSI-2 High-Performance I/O Controller on the shared SCSI-2 bus.

Note: P3 jumpers should be stored by placing them on the B1 side of the P3 pins.

7. The Passthrough Terminator Cable must be used (1) to attach the primary host's SCSI-2 High-Performance I/O Controller to the first disk on the SCSI bus, and (2) to attach the last disk on the bus to the secondary host's SCSI-2 High-Performance I/O Controller. The SCSI Device-to-Device Cable should be used to connect the shared disks to one another. For more information on the cables mentioned, see "Cables and Cable Assemblies" on page 91.

Note: The shared buses must be quiesced prior to turning on or off or attaching or disconnecting any system unit or device. This will help avoid unpredictable SCSI errors.

Ma- chine Type	Model Numbers								
7011	220	220G	220W	220S					
7012	320	320E	320H	340	340R	350	350R		
7013	520H	530E	530H	550	550E	550S	560	560F	570	580

The following diagram shows a typical attachment of SCSI disk drives shared between two SCSI-2 I/O Controllers, with up to three SCSI disk drives on the shared bus, and up to five SCSI-2 I/O Controllers per system.
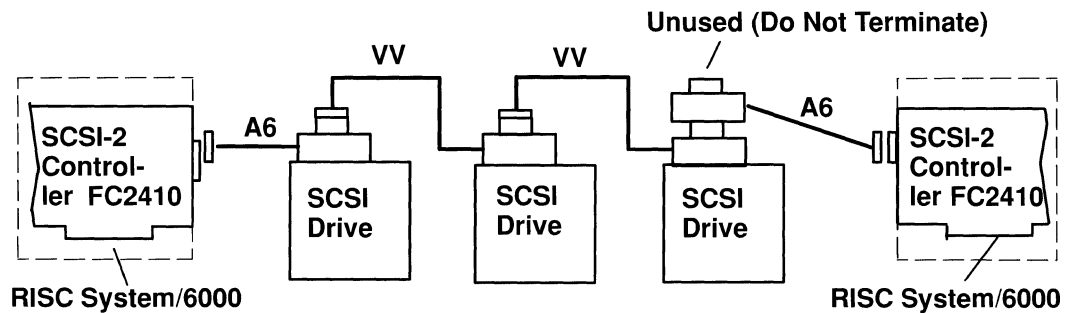
Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
A6	Passthrough Terminator Cable (two are required)	51G8568	2914	1.5	5
VV	SCSI Device-to-Device Cable (maximum of two per shared configuation)	31F4222	3130	0.66	2.2

FC 2860 (IBM Serial Optical Channel Converter)

The following figure illustrates the Serial Optical Channel Converter with an attachment cable.
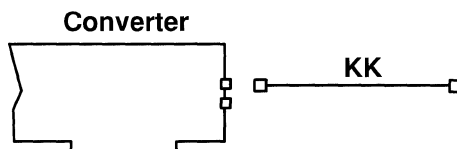
Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
KK	Optical Channel Converter Cable	46F2440	2866	6	20
		46F2441	2867	10	33
		46F2442	2868	20	65.5
		46F2443	2869	60	197
		46F2444	2870	100	328

FC 2930 (IBM 8-Port Async Adapter-EIA-232)

The following figure illustrates the 8-Port Async Adapter-EIA-232 with the IBM 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 cable planning charts on page 81 to help you make these assignments. Copy these charts as needed for personal use.

Adapter

Interface Cable

Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
J	Part of cable assembly	00F5524	2995	3	10
D	Async Cable-EIA-232/V.24, if customer-supplied, must meet EIA-232D requirements	6323741	2936	3	10
E	Printer/Terminal Interposer EIA-232	58F2861	2937	N/A	

FC 2940 (IBM 8-Port Async Adapter-EIA-422A)

The following figure illustrates the 8-Port Async Adapter-EIA-422A with the IBM 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 cable planning charts on page 81 to help you make these assignments. Copy these charts as needed for personal use.

Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
J	Part of cable assembly	00F5524	2995	3	10
K	Terminal Cable-EIA-422A, if customer-supplied, must meet EIA-422A requirements	30F8966	2945	20	65.5

FC 2950 (IBM 8-Port Async Adapter-MIL-STD 188)

The following figure illustrates the 8-Port Async Adapter-MIL-STD 188 with the IBM 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 cable planning charts on page 81 to help you make these assignments. Copy these charts as needed for personal use.

Adapter

Interface Cable

Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
J	Part of cable assembly	00F5524	2995	3	10
D	Async Cable-EIA-232/V.24, if customer-supplied must meet MIL-STD 188 requirements	6323741	2936	3	10
E	Printer/Terminal Interposer EIA-232	58F2861	2937	N/A	

FC 2955 (IBM 16-Port Async Adapter-EIA-232)

The following figure illustrates the adapter with the IBM 16-Port Interface Cable-EIA-232 and attachment cables. The cable assembly ports are labeled 0 through 15. Attachment cables can connect to any of the 16 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 cable planning charts on page 81 to help you make these assignments. Copy these charts as needed for personal use.

Adapter

L

D   **E**
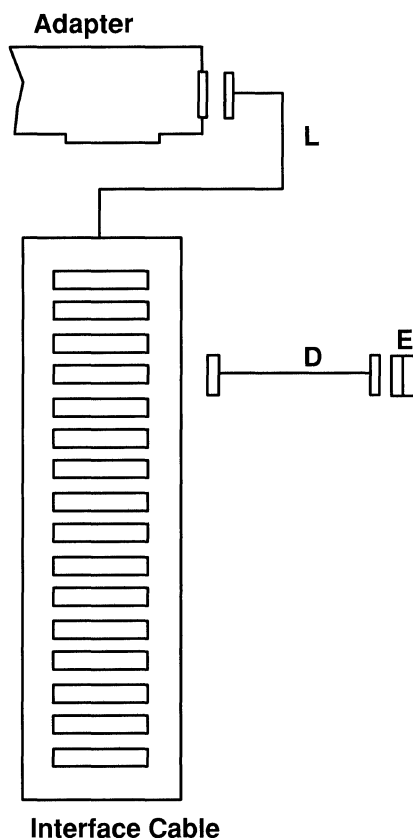
Interface Cable

Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
L	Part of interface cable	53F3311	2996	3	10
D	Async Cable EIA-232/V.24, if customer-supplied must meet EIA-232D requirements	6323741	2936	3	10
E	Printer/Terminal Interposer EIA-232	58F2861	2937	N/A	

FC 2957 (IBM 16-Port Async Adapter-EIA-422A)

The following figure illustrates the adapter with the IBM 16-Port Interface Cable-EIA-422A and attachment cables. The cable assembly ports are labeled 0 through 15. Attachment cables can connect to any of the 16 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 cable planning charts on page 81 to help you make these assignments. Copy these charts as needed for personal use.
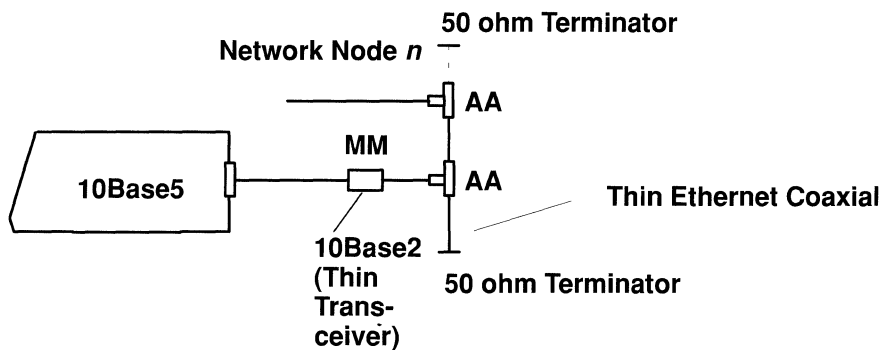
Adapter
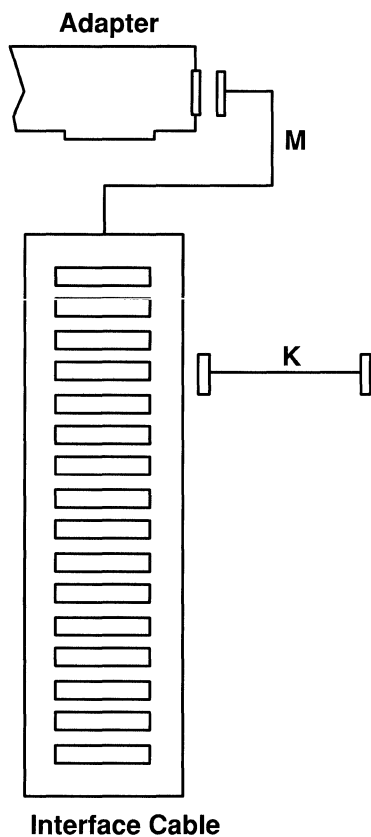
Interface Cable

Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
M	Part of interface cable	53F3381	2997	3	10
K	Terminal Cable-EIA-422A, if customer-supplied must meet EIA-422A requirements	30F8966	2945	20	65.5

FC 2960 (IBM X.25 Interface Co-Processor/2)

The following figure illustrates the X.25 Interface Co-Processor/2 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 assigned to each port. See the cable planning charts on page 81 to help you make these assignments. Copy these charts as needed for personal use.
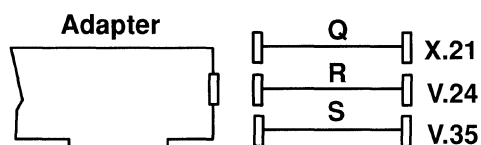
Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
Q	X.25 Attachment Cable-X.21	07F3151	2965	3	10
		53F3926	2976	6	20
R	X.25 Attachment Cable-V.24	07F3161	2966	3	10
		53F3927	2977	6	20
S	X.25 Attachment Cable-V.35	07F3171	2967	3	10
		53F3927	2978	6	20

FC 7022 (IBM 4-Port EIA-232D Multiport/2 Adapter)

The following figure illustrates the 4-Port EIA-232D Multiport/2 Adapter with an attachment cable:
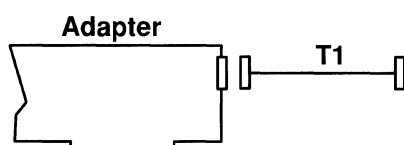
Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
T1	4/8-Port 232/422 Multiport/2 Cable	00F5524	7102	3	10

FC 7026 (IBM 8-Port EIA-232D Multiport/2 Adapter)

The following figure illustrates the 4-Port EIA-232D Multiport/2 Adapter with an attachment cable:
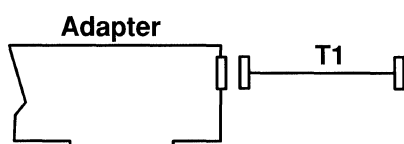
Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
T1	4/8-Port 232/422 Multiport/2 Cable	00F5524	7102	3	10

FC 7030 (IBM 4-Port EIA-232D/4-Port EIA-422A Multiport/2 Adapter)

The following figure illustrates the 4-Port EIA-232D/4-Port EIA-422A Multiport/2 Adapter with an attachment cable:
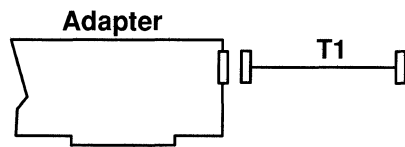
Adapter

T1

Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
T1	4/8-Port 232/422 Multiport/2 Cable	00F5524	7102	3	10

FC 7024 (IBM 6-Port Synchronous Multiport/2 Adapter)

The following figure illustrates the 6-Port Synchronous Multiport/2 Adapter with attachment cable:

Adapter

T2
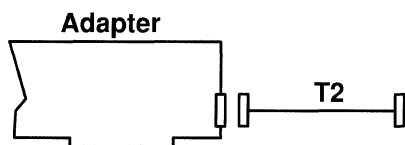
Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
T2	6-Port Sync Multiport/2 Cable	15F8867	7104	3	10

FC 7028 (IBM 8-Port RS-422A Multiport/2 Adapter)

The following figure illustrates the 8-Port RS-422A Multiport/2 Adapter with an attachment cable:
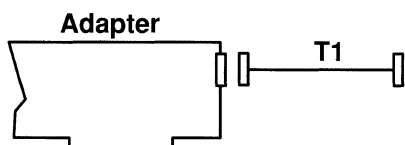
Adapter

T1

Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
T1	4/8-Port 232/422 Multiport/2 Cable	00F5524	7102	3	10

FC 7042 (IBM 8-Port EIA-232 Portmaster Adapter/A)

The following figure illustrates the 8-Port EIA-232 Portmaster Adapter/A with an attachment cable:
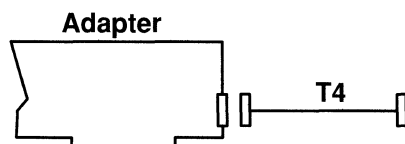
Adapter

T4

Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
T4	8-Port 232/422 Portmaster Cable	33F8962	7108	1.2	4

FC 7044 (IBM 8-Port RS-422A Portmaster Adapter/A)

The following figure illustrates the 8-Port RS-422A Portmaster Adapter/A with an attachment cable:
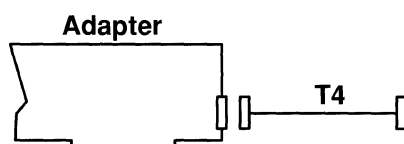
Adapter

T4

Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
T4	8-Port 232/422 Portmaster Cable	33F8962	7108	1.2	4

FC 7046 (IBM 6-Port V.35 Portmaster Adapter/A)

The following figure illustrates the 6-Port V.35 Portmaster Adapter/A with attachment cable:

Adapter

T3
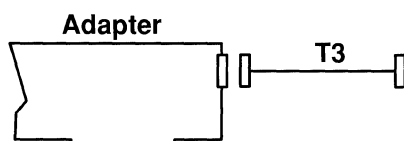
Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
T3	6-Port V.35 Portmaster Cable	72F0162	7106	1.2	4

FC 7048 (IBM 6-Port X.21 Portmaster Adapter/A)

The following figure illustrates the 6-Port X.21 Portmaster Adapter/A with an attachment cable:

Adapter

T5
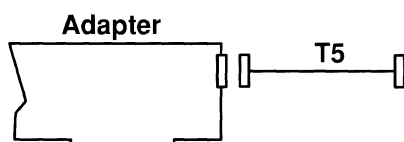
Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
T5	6-Port X.21 Portmaster Cable	04G5501	7110	1.2	4

FC 2970 (IBM Token-Ring High-Performance Network Adapter)

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)
- *IBM Cabling System Planning and Installation Guide* (GA27-3361)
- *Using the IBM Cabling System with Communication Products* (GA27-3620).

The following figure illustrates the Token-Ring High-Performance Network Adapter with an attachment cable for the Token-Ring LAN (IBM Local Area Network). In order to make the necessary connections to this adapter, your setup person needs to know the devices and persons assigned to each port.
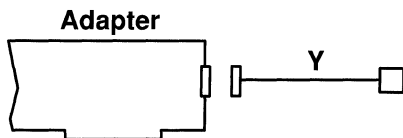
Adapter

Cable Letter	Cable Name	IBM Part Number	Feature Code	Length m	ft.
Y	Token-Ring LAN cable,	6339098	N/A	3	10
	comes with adapter	53F3930	N/A	6	20

Ethernet LAN Adapters

Ethernet cabling varies according to what type of system unit you have.

Model 220 Integrated Ethernet LAN Adapter

The Model 220 Integrated Ethernet adapter features only an Ethernet standard thick connector. Transceivers must be ordered for use with either thin (10Base2) or twisted pair (10Base-T).

Note: *n* is a maximum of 30 nodes per segment (maximum of five segments connected by a repeater).

50 ohm Terminator

Network Node *n*

10Base5

10 Base 5
(Thick Trans-ceiver)

Thick Ethernet Coaxial

50 ohm Terminator

Note: *n* is a maximum of 100 nodes per segment (maximum of five segments with each segment connected by a repeater).

50 ohm Terminator

Network Node X AA

MM BB

10Base5

MM BB

10Base5

MM BB

10Base5

(10BaseT Twisted Pair Transceiv-er)

Ethernet Twisted Pair Hub

AA

Thin Ethernet Coaxial
(This can be thin or thick Coax Ethernet LAN)

50 ohm Terminator

Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
BB	Customer-supplied RJ45 unshielded twisted pair cable, must meet IEEE 802.3 requirements	N/A	N/A	N/A	
MM	Ethernet 10Base2 Transceiver OR	02G7435	4223	1	3
	Ethernet 10Base-T Transceiver	02G7429	4224	1	3
AA	A coaxial "T" connector, "Y-" or "L-" shaped, is recommended	N/A	N/A	N/A	

Models 340 and 350 Integrated Ethernet LAN Adapter

The integrated Ethernet adapter in the Model 340 and 350 features thick and thin connectors (FC 4221) or twisted pair (FC 4222). The thick connector is an Ethernet standard connector.

Note: *n* is a maximum of 30 nodes per segment (maximum of five segments with each segment connected by a repeater).
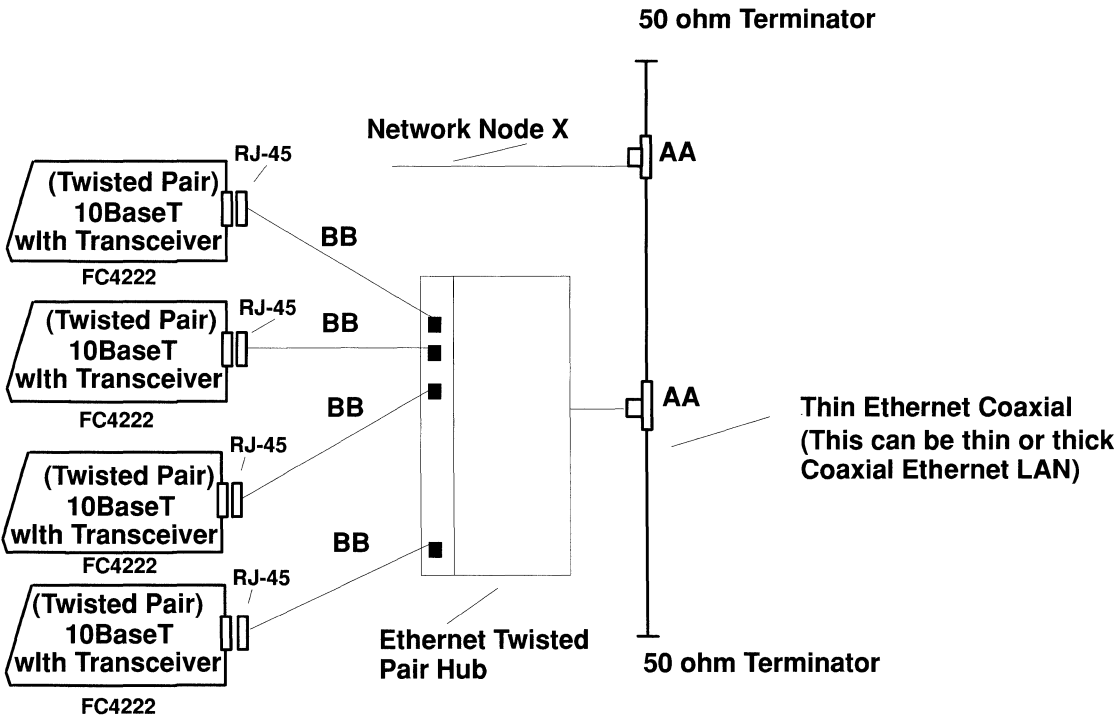
Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length
AA	A coaxial "T" connector, "Y-" or "L-" shaped, is recommended	N/A	N/A	N/A
BB	Customer-supplied RJ-45 unshielded twisted pair cable, must meet IEEE 802.3 requirements	N/A	N/A	N/A

IBM Ethernet High-Performance LAN Adapter (FC 2980)

The following figure illustrates the Ethernet High-Performance LAN Adapter with attachment cables. The thick connector is an Ethernet standard connector.
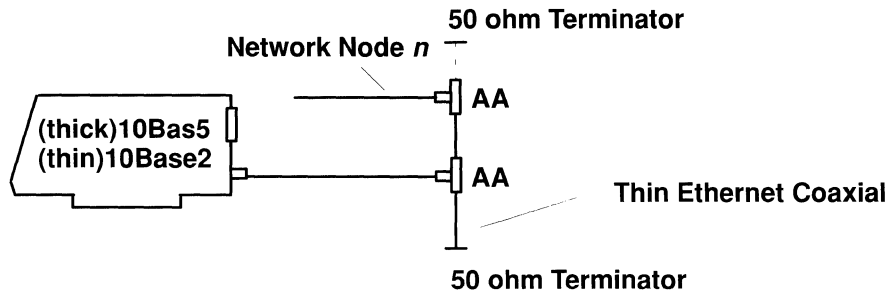
Note: *n* is a maximum of 30 nodes per segment (maximum of five segments with each segment connected by a repeater).
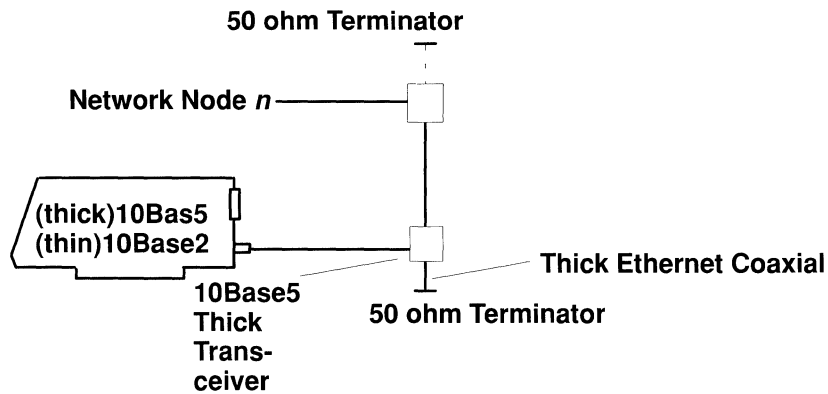
Note: *n* is a maximum of 100 nodes per segment (maximum of 5 segments with each segment connected by a repeater).

Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length	
AA	A coaxial "T" connector, "Y-" or "L-" shaped, is recommended	N/A	N/A	N/A	
BB	Customer-supplied RJ45 unshielded twisted pair cable, must meet IEEE 802.3 requirements	N/A	N/A	N/A	
MM	Ethernet 10Base-T Transceiver	02G7429	4224	1	3

FC 2990 (IBM 3270 Connection Adapter)

The following figure illustrates the 3270 Connection Adapter with attachment cable.
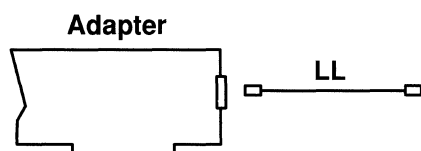
Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
LL	Customer-supplied coaxial cable	6245998	N/A	3	10

FC 4208 (IBM POWER Gt1)

The following figure illustrates the POWER Gt1 with attachment cable for one display.
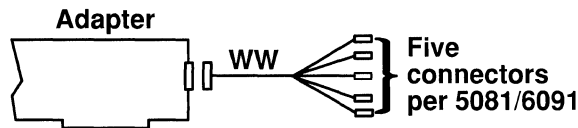
Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
WW	POWER Gt1 Display Adapter Cable, contains an integral toroid assembly.*	58F2902	4217	2	6

*The adapter also supports attachment to some IBM PS/2 displays, which have attached cables.

FC 6210 (IBM High-Performance Disk Drive Subsystem Adapter)

The following figure illustrates the High-Performance Disk Drive Subsystem Adapter with attachment cable.
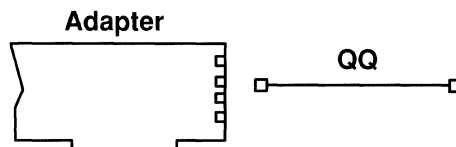
Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
QQ	Serial Link Cable	44F5510	N/A	3	10
		44F5511	N/A	10	33

High Availability Configurations

All 7013 and 7015 RISC System/6000 systems can share an IBM 9333 Model 500 or Model 10 respectively with another RISC System/6000 system. Such configurations can increase system availability and aid in recovery from certain types of hardware, software, and media failures. If one of the systems involved, or a High-Performance Disk Drive Subsystem Adapter fails, the other system can access the shared drives (with appropriate software support). Each 9333 Model 10 or Model 500 supports two independent adapter serial interfaces.

A typical high availability configuration requires the following:

- Two POWERstations or POWERservers
- One or more High-Performance Disk Drive Subsystem Adapters per host system
- One IBM SCSI High-Performance I/O Controller per system and at least one IBM SCSI disk drive, which can be used to boot the system
- Two or more IBM 9333 Model 10 drawers or IBM 9333 Model 500 Subsystems (this allows mirroring of data files across drawers or subsystems, preventing a single point of failure)
- Sufficient 10-m (33-ft.) Serial Link Cables to connect system units with drawers or subsystems.
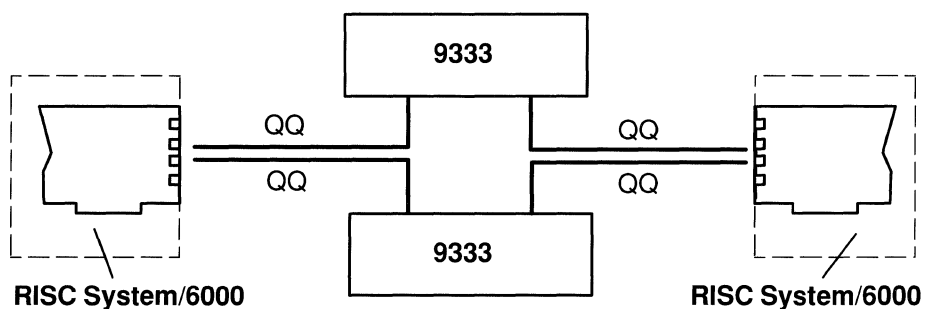
Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
QQ	Serial Link Cable	44F5510	N/A	3	10
		44F5511	N/A	10	33

FC 6300 (IBM 9291/9295 Digital Trunk Adapter)

The following figure illustrates the 9291/9295 Digital Trunk Adapter with an attachment cable.
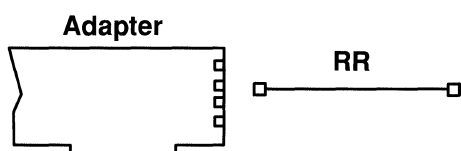
Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
RR	Cable to 9291/9295 assembly, provided with VPACK	34F0873	N/A	2	6.6

FC 6301 (IBM M-Audio Capture & Playback Adapter)

The following figure illustrates the M-Audio Capture & Playback Adapter with an attachment cable.
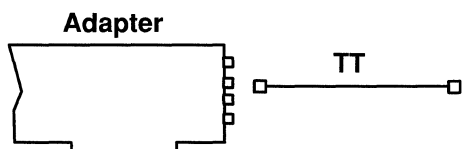
Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
TT	Customer-supplied cable	N/A	N/A		

FC 2400 (IBM M-Video Capture Adapter - NTSC)

The following figure illustrates the M-Video Capture Adapter (NTSC) with an attachment cable.
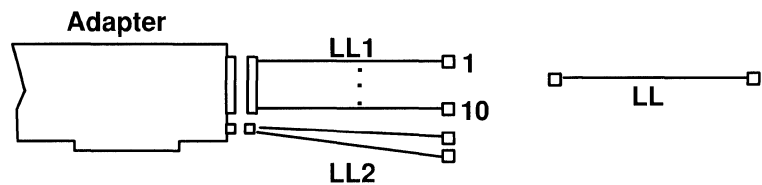
Cable Letter	Cable Name/Descriptions	IBM Part Number	Feature Code	Length m	ft.
LL	Customer-supplied cable	N/A	N/A		
LL1	IBM-supplied cableset	92F3713	N/A	N/A	
LL2	IBM-supplied cableset	92F3713	N/A	N/A	

FC 2401 (IBM M-Video Capture Adapter - PAL)

The following figure illustrates the M-Video Capture Adapter (PAL) with an attachment cable.
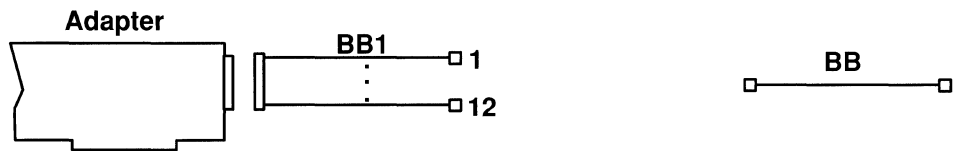
Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
BB	Customer-supplied cable	N/A	N/A		
BB1	IBM-supplied cableset	92F3714	N/A	N/A	

FC 8128 (IBM 128-Port Async Controller)

A Number of cabling scenarios are possible when installing this feature. The following figure shows a typical configuration in which eight IBM Remote Async Nodes are attached to the 128-Port Async Controller using both 4-wire and 8-wire direct cabling.
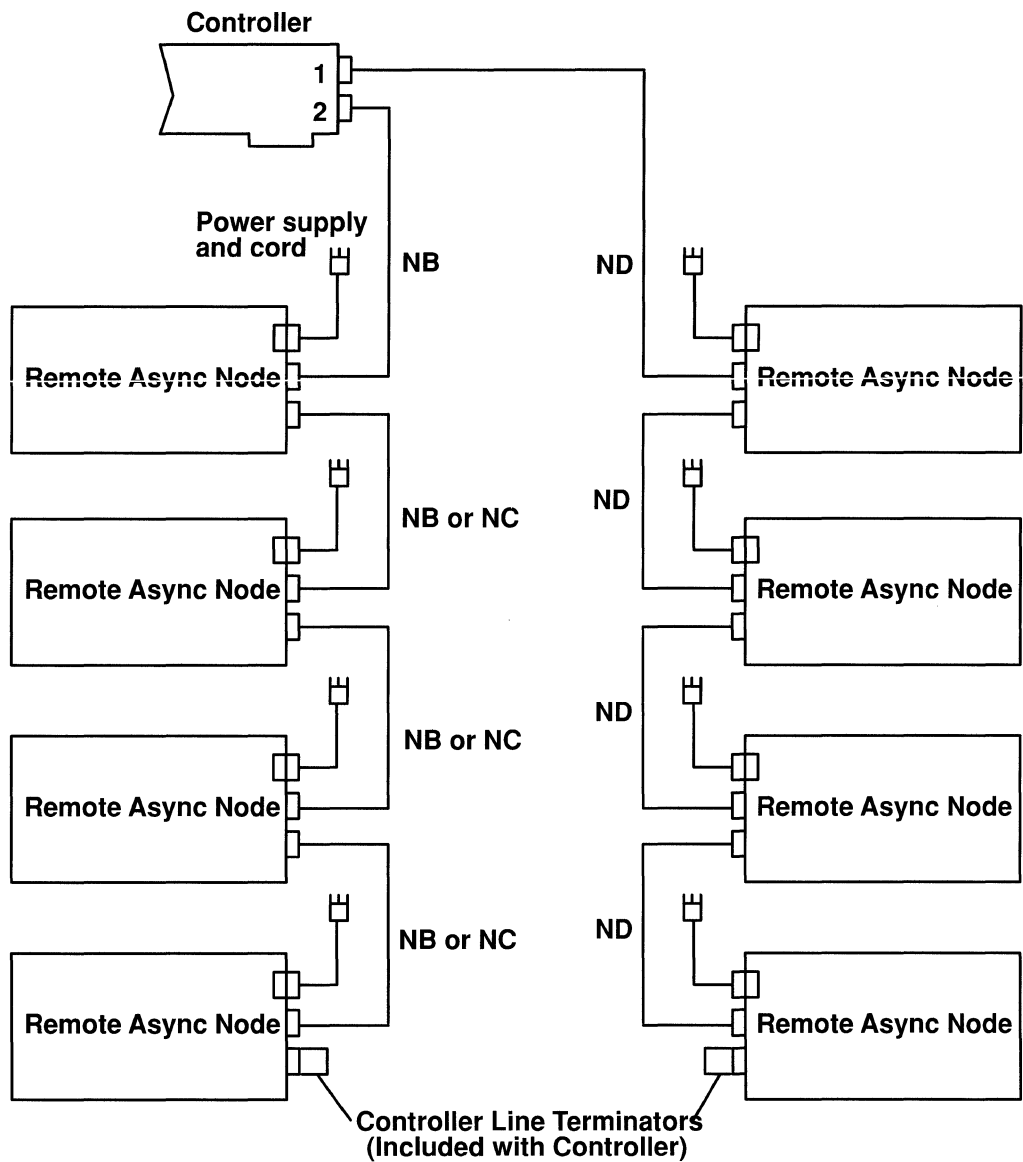
Controller

The 128-Port Async Controller supports up to four Remote Async Nodes on each controller line using the following attachment options:

Attachment Method	Recommended Environment	Benefit
Eight-Wire direct	Moderate to heavy async data loads	Maximum performance
Four-Wire direct	Light async data loads	Reduced cabling cost
Synchronous modems	Light async data loads	Remote location

Any combination of 8-wire cabling and synchronous modems may be used to attach Remote Async Nodes. However, 4-wire cabling cannot be used in combination with 8-wire cabling or sychronous modems on the same controller line.

The following two figures illustrate the use of EIA-232 and EIA-422 synchronous modems in typical 128-Port Async Controller configurations. Note that each configuration requires a unique set of customer-supplied cables for modem attachment.

Controller

NE

EIA-232 Synchronous Modems

Phone Line

A Simplified Overview of the IBM 128-Port Async Controller (See Detail A)

Power Supply and Cord

NF

Remote Async Node

NB or NC

Remote Async Node

Detail A

Controller

EIA-422
Synchronous Modems

Phone Line

Power Supply
and Cord

NG

NH

NB or NC

A Simplified Overview of
IBM 128-Port Async Controller
(See Detail B)
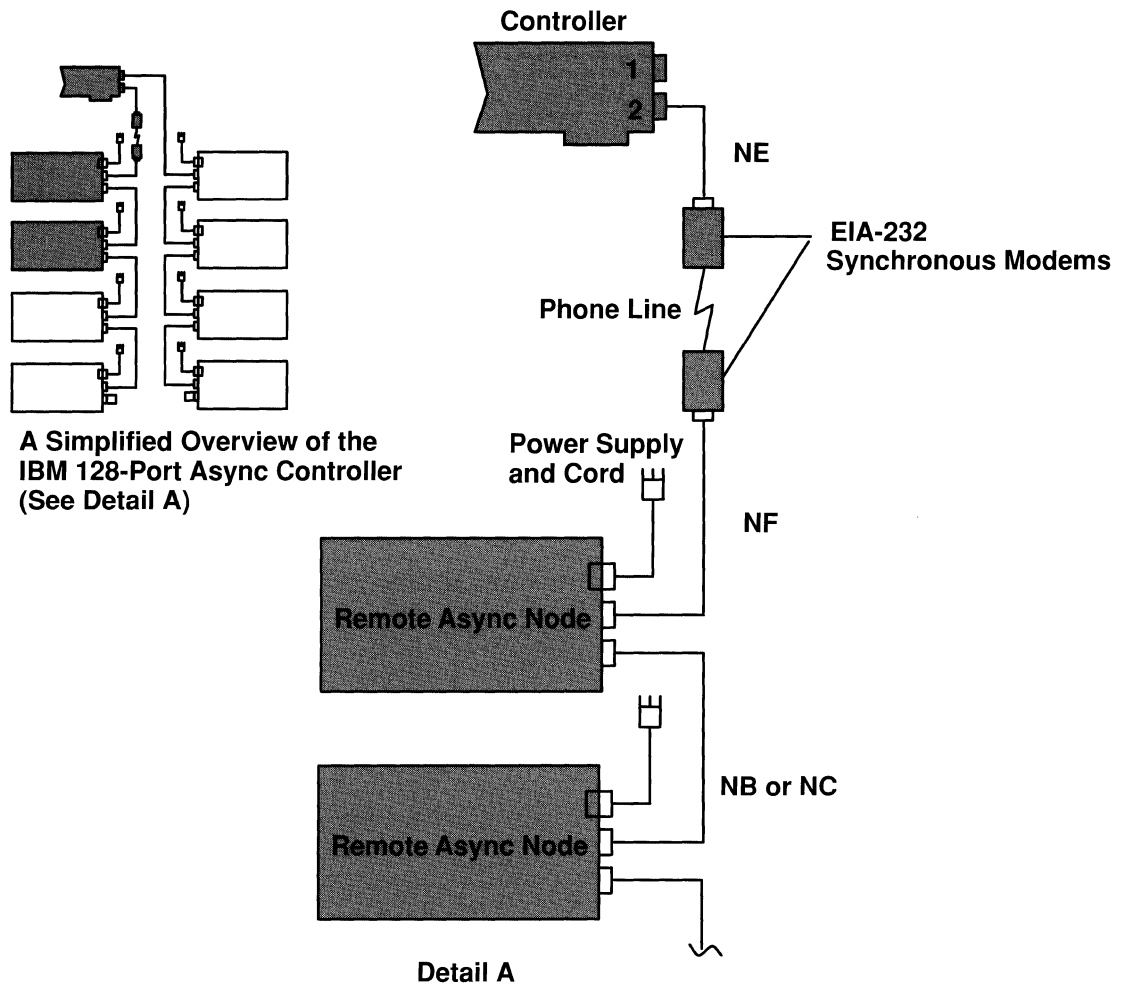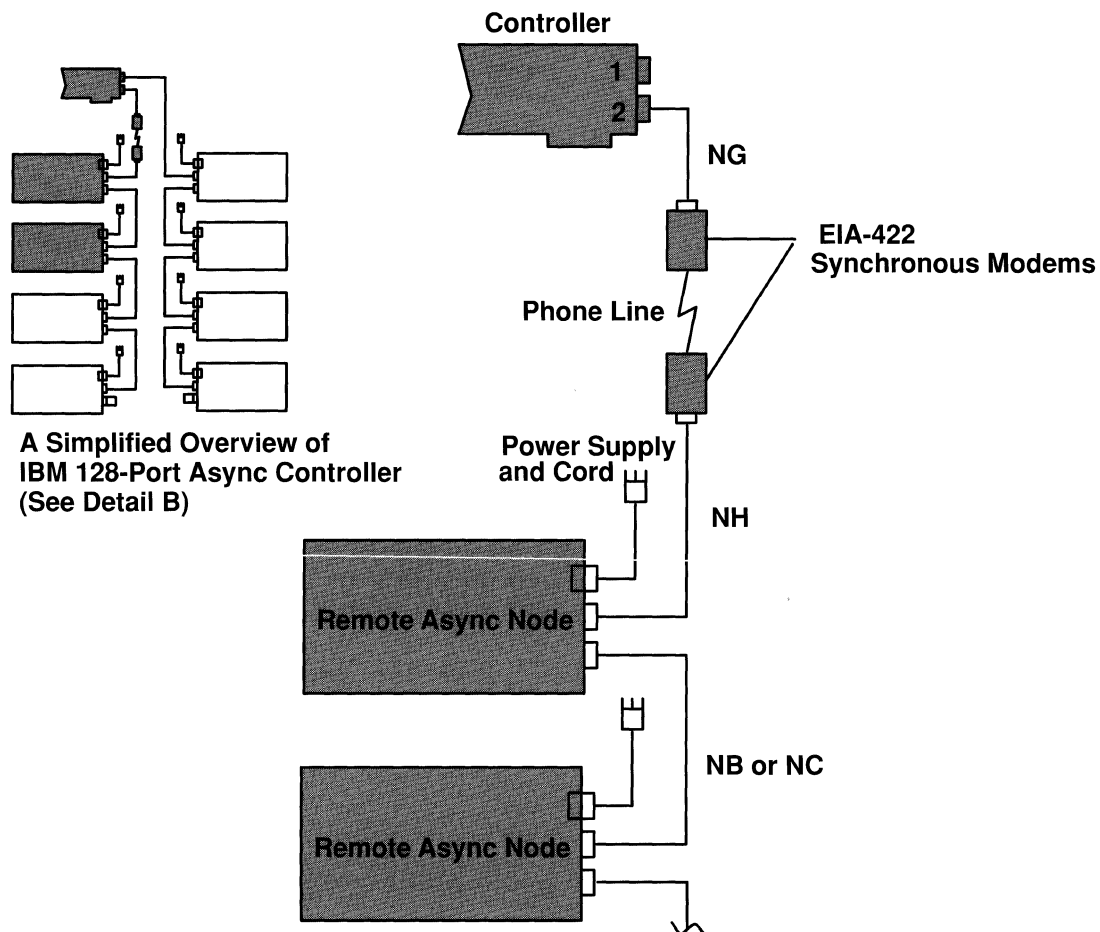
Detail B

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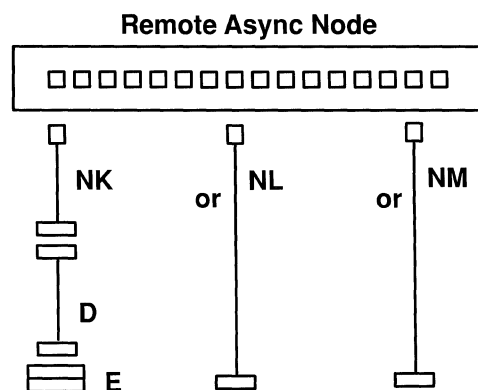
Remote Async Node

NK   or   NL   or   NM

D

E

In order to make the necessary connections to this adapter, your setup person needs to know the devices and persons assigned to each port. The cable planning charts on page 81 can help you make these assignments.

Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
NC	128-Port Async Controller Cable, 8-wire	43G0936	8132	0.23	0.75
NB	128-Port Async Controller Cable, 8-wire	43G0937	8131	4.57	15
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	
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	RJ45 to DB25 Converter Cables (four provided with each order)	43G0935	8133	.61	2
D	Async Cable-EIA-232/V.24, if customer-supplied, must meet EIA-232D requirements.	6323741	2936	3	10
E	Printer/Terminal Interposer EIA-232	58F2861	2937	N/A	
NL	Cable directly wires RJ45 to a DB25 connector for attachment to a terminal or printer; customer-supplied, must meet EIA-232D electrical requirements	N/A	N/A	N/A	
NM	Cable directly wires RJ45 to a DB25 connector for attachment to a modem; customer-supplied, must meet EIA-232D electrical requirements	N/A	N/A	N/A	

IBM POWER GTO Accelerator Adapter

The following figure shows the POWER GTO Accelerator Adapter attached to the 7235 POWER GTO to the RISC System/6000 system unit.
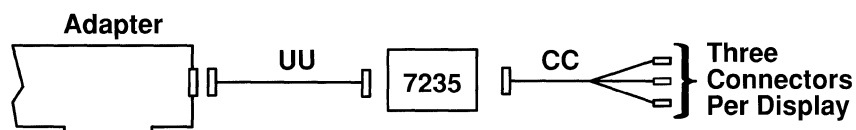
Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
UU	7235 Signal Cable, used to attach system unit to 7235 (supplied with 7235)	74F3102	N/A	2.0	6.5
CC	Display Adapter Cable, contains an integral toroid assembly (cable supplied with 7235)	58F2903	N/A	2.4	8

IBM Standard I/O Adapter

The following figure illustrates the Standard I/O Adapter with attachment cables. The 7015 POWERservers support Serial Port 1 (S1), Serial Port 2 (S2), and Parallel Port (P) only. In order to make the necessary connections to this planar, your setup person needs to know the devices and persons assigned to each port. The cable planning chart for this adapter on page 88 can help you make these assignments. Copy these charts as needed for personal use.

Standard I/O
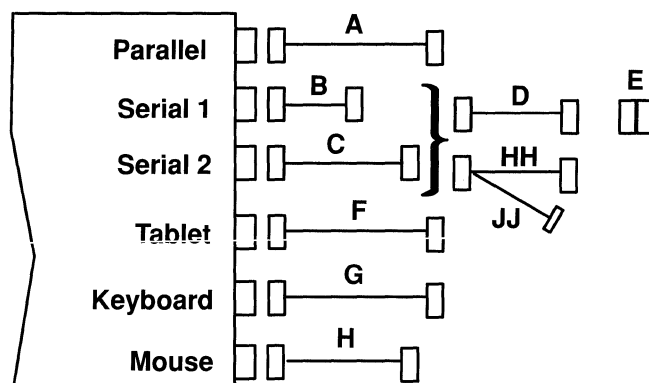
Cable Letter	Cable Name/Description	IBM Part Number	Feature Code	Length m	ft.
A	PC Parallel Printer Cable	1525612	3100	3	10
		09F5544		5	16.4
B	Serial Port Jumper Cable, two provided with each system unit (except for Models 220, 340, and 350, which do not require them)	00G0943	N/A	0.09	.33
C	Serial Port Jumper Cable for 7015, two provided with each system unit	59F4533	N/A	3	10
D	Async Cable-EIA-232/V.24, if customer-supplied, must meet EIA-232D requirements	6323741	2936	3	10
HH	6094 Attachment Cable, attaches to both device and power cable (JJ)	39F8228	4060	1.8	6
JJ	Power cable for 6094, attaches to display	39F8302	4061	1.8	6
E	Printer/Terminal Interposer-232	58F2861	2937	N/A	
F	Tablet cable, supplied with tablet	6247480	2811	2.1	7
G	Keyboard cable, supplied with keyboard	N/A	N/A	3	10
H	Mouse cable, supplied with mouse	N/A	N/A	2.75	9

Cable Planning Charts

Cable planning charts help your electrician or cable vendor understand your master plan for cabling. These are particularly useful for large, complex installations.

Your responsibilities are as follows:

- Fill in each chart, except for the shaded areas, which will be completed by the customer service representative installing your system. You can make copies of the charts as needed. To help you complete the charts, two samples are provided on the following pages.

- Verify that the proper cabling has been ordered and installed.

- Prepare and attach cable labels using the information from the completed charts.

- Once you have completed your sections, give the charts to your electrician or cable vendor who can use them to understand your cabling needs.

Note: Following the installation, the charts should be kept to help you remember the cabling scheme. These charts, in addition to the cable labels that are shipped with each system unit, will be invaluable in the future as you move system units or devices and need to keep cabling in order.

There are four unique charts, one for each of the following adapters or adapter types:
- Asynchronous adapters
- Standard I/O adapters
- 4-Port Multiprotocol Communications Controller
- Other adapters.

4-Port Multiprotocol Communications Controller Cable Planning Chart

Computer Room Location_____

Shaded Areas To
Be Filled In By CE

Adapter Type	*2-3*	Length *3m*
		ID *#3*

System ID	*A*
EIA	
Slot	
Connector	
Tailgate	

V.35

EIA232D [X]

X.21

EIA422A

EIA232D

Port 0
Length *125 feet*
ID *#1*

Device Type	*modem*
Device ID	
Location	*Room 231*
Telephone	*5-3611*

Port 1
Length_____
ID _____

Device Type	
Device ID	
Location	

Figure 4. An example of a 4-Port Multiprotocol Communications Controller Cable Planning Chart completed for a modem. In this example the terminal is attached to Port 0. Protocol type, in this case EIA-232D, is noted with an "X."

Async Adapter Cable Planning Chart

Computer Room Location _____

Shaded Areas To Be Filled In By CE		
Adapter Type	*3-7*	
System ID	*A*	
EIA		
Slot		
Connector		
Tailgate		

Length ID *25 feet*

Port

Lengt h ID _____ _____
- Device Type
- Device ID
- Location
- Telephone

Port

Lengt h ID _____ _____
- Device Type
- Device ID
- Location
- Telephone

Port *2*

Lengt h ID *100 feet* _____
- Device Type *ASCII terminal*
- Device ID
- Location *Room 3-487*
- Telephone *53822*

Figure 1.   An example of an Async Cable Planning Chart (for an 8 or 16-Port Async Adapter) completed for an ASCII terminal. In this example the terminal is attached to Port 2.

128 - Port Async Controller Cable Planning Chart
Remote Async Node

Remote Async Node No. _1_

Location _Room 231_

Device Type		Length _____				Length _____		Device Type
Device ID		ID _____	Port	Port		ID _____		Device ID
Location								Location
Telephone								Telephone

Device Type _ASCII terminal_		Length _100 feet_				Length _____		Device Type
Device ID		ID _A_	Port	Port		ID _____		Device ID
Location _Room 487_			1					Location
Telephone _52238_								Telephone

Device Type		Length _____				Length _____		Device Type
Device ID		ID _____	Port	Port		ID _____		Device ID
Location								
Telephone								
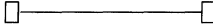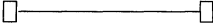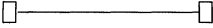
Figure 6.   An example of a 128-Port Async Controller Cable Planning Chart, Remote Async Node, completed for an ASCII terminal. In this example the terminal is attached to Port 1 on Remote Async Node number 1.

Interface No. 1

Length ——

Type

ID —— —— 8-Wire Direct
or
—— 4-Wire Direct

or

ID ——   ID —— —— EIA-422 Modems
or
—— EIA-232 Modems

←— System   Remote —→

Interface No. 2

Length ——

Type

ID —— —— 8-Wire Direct
or
—— 4-Wire Direct

or

ID ——   ID —— —— EIA-422 Modems
or
—— EIA-232 Modems

←— System   Remote —→

Interface No. 3

Length ——

Type

ID —— —— 8-Wire Direct
or
—— 4-Wire Direct

or

ID ——   ID —— —— EIA-422 Modems
or
—— EIA-232 Modems

←— System   Remote —→

Interface No. 4

Length ——

Type

ID —— —— 8-Wire Direct
or
—— 4-Wire Direct

or

ID ——   ID —— —— EIA-422 Modems
or
—— EIA-232 Modems

←— System   Remote —→

Figure 7. An example of a 128-Port Async Controller Cable Planning Chart, Controller Line Interface, completed for two interfaces. In this example, interface number 1 uses a 750-foot 8-wire cable, and interface number 2 uses two EIA-422 synchronous modems and associated cables.

128 - Port Async Controller Cable Planning Chart

Interface No. 1   Interface No. 2   Interface No. 3   Interface No. 4

Adapter Type	Line No.	Remote Async Node No. 1	Remote Async Node No. 2	Remote Async Node No. 3	Remote Async Node No. 4
System ID					
EIA					
Slot					
Connector					
Tailgate					

Interface No. 1

Length ____

Type

ID ____

____ 8-Wire Direct
or
____ 4-Wire Direct

ID ____ ID ____

____ EIA-422 Modems
or
____ EIA-232 Modems

◄— System   Remote —►

Interface No. 2

Length ____

Type

ID ____

____ 8-Wire Direct
or
____ 4-Wire Direct

ID ____ ID ____

____ EIA-422 Modems
or
____ EIA-232 Modems

◄— System   Remote —►

Interface No. 3

Length ____

Type

ID ____

____ 8-Wire Direct
or
____ 4-Wire Direct

ID ____ ID ____

____ EIA422 Modems
or
____ EIA232 Modems

◄— System   Remote —►

Interface No. 4

Length ____

Type

ID ____

____ 8-Wire Direct
or
____ 4-Wire Direct

ID ____ ID ____

____ EIA-422 Modems
or
____ EIA-232 Modems

◄— System   Remote —►

128-Port Async Controller Cable Planning Chart
Remote Async Node

Remote Async Node No. _____

Location _____

Device Type						Device Type
Device ID	Length _____			Length _____		Device ID
Location	ID _____	Port	Port	ID _____		Location
Telephone						Telephone

Device Type						Device Type
Device ID	Length _____			Length _____		Device ID
Location	ID _____	Port	Port	ID _____		Location
Telephone						Telephone

Device Type						Device Type
Device ID	Length _____			Length _____		Device ID
Location	ID _____	Port	Port	ID _____		Location
Telephone						Telephone

Device Type						Device Type
Device ID	Length _____			Length _____		Device ID
Location	ID _____	Port	Port	ID _____		Location
Telephone						Telephone

Device Type						Device Type
Device ID	Length _____			Length _____		Device ID
Location	ID _____	Port	Port	ID _____		Location
Telephone						Telephone

Device Type						Device Type
Device ID	Length _____			Length _____		Device ID
Location	ID _____	Port	Port	ID _____		Location
Telephone						Telephone

Device Type						Device Type
Device ID	Length _____			Length _____		Device ID
Location	ID _____	Port	Port	ID _____		Location
Telephone						Telephone

Device Type						Device Type
Device ID	Length _____			Length _____		Device ID
Location	ID _____	Port	Port	ID _____		Location
Telephone						Telephone

Standard I/O Adapter Cable Planning Chart

Customer Room Location _____

**SIO Planar
Connectors**

Printer

Length_____
ID_____

Device Type
Device ID
Location
Telephone

**Serial
Port 1**

Length_____
ID_____

Device Type
Device ID
Location
Telephone

**Serial
Port 2**

Length_____
ID_____

Device Type
Device ID
Location
Telephone

Tablet

Length_____
ID_____

Device ID

**Key-
board**

Length_____
ID_____

Device ID

Mouse

Length_____
ID_____

Device ID

4-Port Multiprotocol Communications Controller Cable Planning Chart

Computer Room Location _____

**Shaded Areas To
Be Filled In By CE**

Adapter Type
System ID
Drawer
Slot
Tailgate

Length _____
ID _____

V.35

EIA232D

X.21

EIA422A

EIA232D

V.35

EIA232D

EIA232D

EIA422A

Fan-out Box

Port 0
Length _____
ID _____

Device Type
Device ID
Location
Telephone

Port 1
Length _____
ID _____

Device Type
Device ID
Location
Telephone

Port 3
Length _____
ID _____

Device Type
Device ID
Location
Telephone

Port 2
Length _____
ID _____

Device Type
Device ID
Location
Telephone

Note: Select only one interface per port.

Cable Planning Chart - Other Adapters

Computer Room Location _____
Adapter Name _____

Shaded Areas To Be Filled In By CE

Length _____
ID _____

Adapter Type	
System ID	
Drawer	
Slot	
Tailgate	

Interface
____ X.21
____ V.24
____ V.35

Device Type
Device ID
Location
Telephone

Adapter Name _____
Adapter No. _____ of _____

Length _____
ID _____

Adapter Type	
System ID	
Drawer	
Slot	
Tailgate	

Interface
____ X.21
____ V.24
____ V.35

Device Type
Device ID
Location
Telephone

Adapter Name _____
Adapter No. _____ of _____

Length _____
ID _____

Adapter Type	
System ID	
Drawer	
Slot	
Tailgate	

Interface
____ X.21
____ V.24
____ V.35

Device Type
Device ID
Location
Telephone

Adapter Name _____
Adapter No. _____ of _____

Length _____
ID _____

Adapter Type	
System ID	
Drawer	
Slot	
Tailgate	

Interface
____ X.21
____ V.24
____ V.35

Device Type
Device ID
Location
Telephone

Cables and Cable Assemblies

This section provides a summary of cable information, as well as pin-out information for cables you may want to build yourself. Cables are listed in alphabetical order by cable name.

Note: When a second part number is listed, this indicates a cable is unique to the 7015 system unit or that two cable lengths are available. The longer length comes with the 7015 system unit, but also can be used with the other system units.

Cable Identification Cross-Reference

Cable Letter	Feature Code	Cable Name	Part Number	Length m	ft
NC	8132	128-Port Async Controller Cable	43G0936	0.23	0.75
NB	8131	128-Port Async Controller Cable	43G0937	4.57	15
NK	8133	RJ45 to DB25 Converter Cable (four provided with each order)	43G0935	0.61	2
T	2705	4-Port Multiprotocol Interface Cable	40F9897	3	10
L	2996	16-Port Interface Cable-EIA-232	53F3311 53F3048	3	10
M	2997	16-Port Interface Cable-EIA-422A	53F3381	3	10
D	2936	Async Cable-EIA-232/V.24**	6323741	3	10
	6151	Battery Backup Extender Cable (feature code includes three extender cables)	02G7552	3	10
UU	N/A	7235 Signal Cable (comes with 7235)*	74F3102	2	6.5
CC	N/A	Display Adapter Cable (for 16-inch or 19-inch display) (comes with adapter)*	58F2903	2.4	8
MM	4223	Ethernet 10Base2 Transceiver	02G7435	1	3
MM	4224	Ethernet 10Base-T Transceiver	02G7429	1	3
SS	3120	External SCSI Controller Cable (for 7015 POWERservers, includes terminator)	00G1278	4.75	15.5
SS	2833	Integrated SCSI Controller Cable	00G2487	1.5	5
HH	4060	Lighted Programmable Function Keyboard or Dials Attachment Cable (for attaching to serial EIA-232D port)	39F8228	1.8	6
JJ	4061	Lighted Programmable Function Keyboard or Dials Attachment Cable (for attaching to display for power)	39F8302	1.8	6
F	2811	Lighted Programmable Function Keyboard, Dials, or Tablet Attachment Cable (for attaching to IBM Graphics Input Device Adapter)*	6247480	2.1	6.9

* These cables have toroids and special shielding for electromagnetic compatibility (EMC).

** The Async Cable-EIA-232/V.24 is used to connect modems, printers, plotters, and ASCII terminals to the RISC System/6000 system unit. If the cable is used to connect a printer, plotter, or ASCII terminal to an EIA-232D port, a Printer/Terminal Interposer EIA-232 must be

ordered in addition. If used to connect a modem to the RISC System/6000 system unit, the cable requires no interposer.

Cable Letter	Feature Code	Cable Name	Part Number	Length m	ft
J	2995	Multiport Interface Cable	00F5524 53F3048	3 3	10 10
V	2706	Multiprotocol Attachment Cable-EIA-232/V.24	71F0165	3	10
U	2702	Multiprotocol Attachment Cable-V.35	71F0162	2	6.5
W	2704	Multiprotocol Attachment Cable-X.21	71F0164	3	10
ZZ	2915	Passthrough Terminator Cable	00G0959	1.5	5
A	3100	PC Parallel Printer Cable*	1525612 09F5544	2.1 5	6.9 16.4
	3091	Power Control Cable	00G1277	10	33
WW	4217	POWER Gt1 Display Adapter Cable (contains an integral toroid assembly)	58F2902	2	6
E	2937	Printer/Terminal Interposer-EIA-232	59F2861	N/A	N/A
P	6402	RJ45 to DB25 Converter Cable (four provided with each order)	59F3432	.457	1
SS	2832	SCSI Controller Cable	31F4221	1.5	5
VV	3130	SCSI Device-to-Device Cable	31F4222	0.66	2.2
QQ	N/A	Serial Link Cable	44F5510 44F5511	3 10	10 33
KK	2866	Serial Optical Channel Converter Cable	46F2440	6	20
KK	2867	Serial Optical Channel Converter Cable	46F2441	10	33
KK	2868	Serial Optical Channel Converter Cable	46F2442	20	65.5
KK	2869	Serial Optical Channel Converter Cable	46F2443	60	197
KK	2870	Serial Optical Channel Converter Cable	46F2444	100	328
		Serial Port Fanout Cable (to provide additional serial port for Xstation 130)	31F4590	.17	.57
B		Serial Port Jumper Cable (two provided with each system units, except the Models 220, 340, and 350, which do not require them)	00G0943	0.2	0.6
C		Serial Port Jumper Cable for 7015 (two provided with each system unit)	59F4533	3	10
MI	2757	System/370 Block Multiplexer Channel Adapter Cable	92F6697	1.8	6
NN	2758	System/370 Block Multiplexer Channel Cable Interface Assembly	N/A	N/A	N/A
K	2945	Terminal Cable-EIA-422A	30F8966	20	65.5

* These cables have toroids and special shielding for electromagnetic compatibility (EMC).

** The Async Cable-EIA-232/V.24 is used to connect modems, printers, plotters, and ASCII terminals to the RISC System/6000 system unit. If the cable is used to connect a printer, plotter, or ASCII terminal to an EIA-232D port, a Printer/Terminal Interposer EIA-232 must be ordered in addition. If used to connect a modem to the RISC System/6000 system unit, the cable requires no interposer.

Cable Letter	Feature Code	Cable Name	Part Number	Length m	ft
Y	N/A	Token-Ring Cable (provided with adapter)	N/A	3 6	10 20
R	2966 2977	X.25 Attachment Cable-V.24	07F3161 53F3927	3 6	10 20
S	2967 2978	X.25 Attachment Cable-V.35	07F3171 53F3928	3 6	10 20
Q	2965 2976	X.25 Attachment Cable-X.21	07F3151 53F3926	3 6	10 20
T1	7102	4/8-Port 232/422 Multiport/2 Cable	00F5524	3.1	10
T2	7104	6-Port Sync Multiport/2 Cable	15F8867	3.1	10
T3	7106	6-Port V.35 Portmaster Cable	72F0162	1.2	4
T4	7108	8-Port 232/422 Portmaster Cable	33F8962	1.2	4

Multibyte Character Printer Cables					
	N/A	4208, 5327, 5572, 5575, 5577, or 5587 Cable	81X7875	2.4	7.9
	N/A	4208, 5327, 5572, 5575, 5577, or 5587 Cable	09F5544	5	16.4
	N/A	4216 Model 510 Cable	56F7854	2.4	8

*These cables have toroids and special shielding for electromagnetic compatibility (EMC).

**The Async Cable-EIA-232/V.24 is used to connect modems, printers, plotters, and ASCII terminals to the RISC System/6000 system unit. If the cable is used to connect a printer, plotter, or ASCII terminal to an EIA-232D port, a Printer/Terminal Interposer EIA-232 must be ordered in addition. If used to connect a modem to the RISC System/6000 system unit, the cable requires no interposer.

Connector Descriptions

Cable Letter	Cable Name	Connector Descriptions (adapter end/device end)
T	4-Port Multiprotocol Interface Cable	78-pin D male/78-pin D female
L	16-Port Interface Cable-EIA-232	78-pin D male/25-pin D male
M	16-Port Interface Cable-EIA-422A	78-pin D male/25-pin D male
NB,NC	128-Port Async Controller Cable	15-pin HD male/15-pin HD female
NK	RJ45 to DB25 Converter Cable	10-pin RJ45 male/25-pin D male
D	Async Cable-EIA-232/V.24	25-pin D female/25-pin D male
	Battery Backup Extender Cable (includes three extender cables)	Keyed appliance cord
NA	128-Port Async Controller Cable	15-pin HD male/15-pin HD female
UU	7235 Signal Cable (comes with 7235)*	68-pin D male/68-pin D male
CC	Display Adapter Cable (for 16-inch or 19-inch display) (comes with adapter)	Triple coaxial female D-shell/3 BNC male
MM	Ethernet 10Base2 Transceiver	10Base5/10Base2
MM	Ethernet 10BaseT Transceiver	10Base5/10BaseT
SS	External SCSI Controller Cable (for 7015 POWERservers)	60-pin male/50-pin male champ
SS	Integrated SCSI Controller Cable	50-pin SCSI-2/Dual 50-pin SCSI-1
JJ	Lighted Programmable Function Keyboard or Dials Attachment Cable (for attaching to display for power)	6-pin Berg female/6-pin DIN male
F	Lighted Programmable Function Keyboard, Dials, or Tablet Attachment Cable (for attaching to IBM Graphics Input Device Adapter)	8-pin MINI DIN male/8-pin MINI DIN male
HH	Lighted Programmable Function Keyboard or Dials Attachment Cable (for attaching to serial EIA-232D port)	25-pin D male/8-pin MINI DIN male
J	Multiport Interface Cable	78-pin D male/78-pin D female
V	Multiprotocol Attachment Cable-EIA-232/V.24	25-pin D female/25-pin D male
U	Multiprotocol Attachment Cable-V.35	15-pin D female/34-pin D male
W	Multiprotocol Attachment Cable-X.21	15-pin D female/15-pin D female
ZZ	Passthrough Terminator Cable	60-pin male/50-pin male champ
A	PC Parallel Printer Cable	25-pin D male/36-pin D male barrier
	Power Control Cable	4-pin female/4-pin female
WW	POWER Gt1 Display Adapter Cable, contains an integral toroid assembly	15-pin MINI DIN female/5 BNC male
E	Printer/Terminal Interposer-EIA-232	25-pin D female/25-pin D male
SS	SCSI Controller Cable	60-pin male/50-pin male champ
VV	SCSI Device-to-Device Cable	50-pin male/50-pin male champ
QQ	Serial Link Cable	6-pin female/6-pin female

Cable Letter	Cable Name	Connector Descriptions (Adapter End/Device End)
KK	Serial Optical Channel Converter Cable (all lengths)	SC Optical Receptacle Connector (color-coded)
	Serial Port Fanout Cable (to provide additional serial port for Xstation 130)	25-pin D female/25-pin D male (2)
B	Serial Port Jumper Cable (two provided with all system units except the Models 220, 340, and 350)	10-pin MODU female/25-pin D male
B	Serial Port Jumper Cable for 7015 (two provided with all system units)	10-pin MODU female/25-pin D male
MI	System/370 Block Multiplexer Channel Adapter Cable	78-pin D male/78-pin D female and 78-pin D male ("Y" Cable)
NN	System/370 Block Multiplexer Channel Cable Interface Assembly	N/A
K	Terminal Cable-EIA-422A	25-pin D male/25-pin D male
Y	Token-Ring Cable (provided with adapter)	9-pin D male/Cabling System plug
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 D male
Q	X.25 Attachment Cable-X.21	37-pin D female/15-pin D male
T1	4/8-Port 232/422 Multiport/2 Cable	78-pin D male/25-pin D male
T2	6-Port Sync Multiport/2 Cable	78-pin D male/25-pin D male
T3	6-Port V.35 Portmaster Cable	100-pin D male/25-pin D male
T4	8-Port 232/422 Portmaster Cable	100-pin D male/25-pin D male
Multibyte Character Printer Cables		
	4208, 5327, 5572, 5575, 5577, or 5587 Cable	25-pin D male/36-pin D male barrier
	4208, 5327, 5572, 5575, 5577, or 5587 Cable	25-pin D male/36-pin D male barrier
	4216 Model 510 Cable	25-pin D male/36-pin D male barrier

Cable Connector Diagrams and Pin-Out Information

The following charts present pin-out information for cables you may want to build yourself. Only pins that are used are mentioned. Cables are presented alphabetically, according to the letter designations given in "Adapter Cabling" on page 81.

Custom cables must conform to the appropriate EIA standards. Standards information can usually be obtained from a cable vendor, but copies of specifications can be purchased by writing to the following address:

Electronic Industries Association
Attn. Standards Office
2001 Pennsylvania Ave., NW
Washington, DC 20006

Cable A

Description: PC Parallel Printer Cable.

POS 14   POS 1
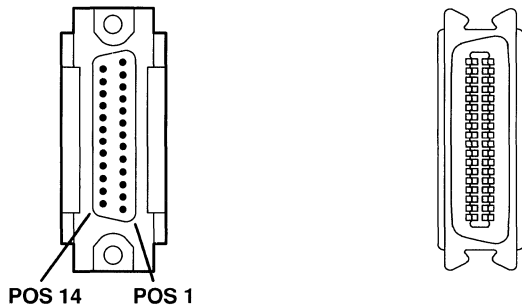
System End Connector	Signal	Device End Connector
Pin (Male)		Socket (Female)
1	Strobe	1
2	Data	2
3	Data	3
4	Data	4
5	Data	5
6	Data	6
7	Data	7
8	Data	8
9	Data	9
10	ACK	10

System End Connector	Signal	Device End Connector
Pin (Male)		Socket (Female)
11	Busy	11
12	PE	12
13	Select	13
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

Cables B and C

Description: Serial Port Jumper Cables.

10 pin MODU
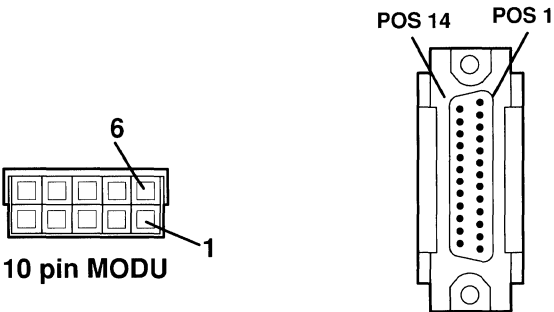
System End Connector	Signal	Device End Connector
Socket (Female)		Pin (Male)
1	TxD	2
2	DTR	20
3	RTS	4
4	RI	22
	Not Used	
6	RxD	3
7	DSR	6
8	CTS	5
9	CD	8
10	Signal Ground	7
	Shield	1

Cable D

Description: Async Cable EIA-232/V.24.
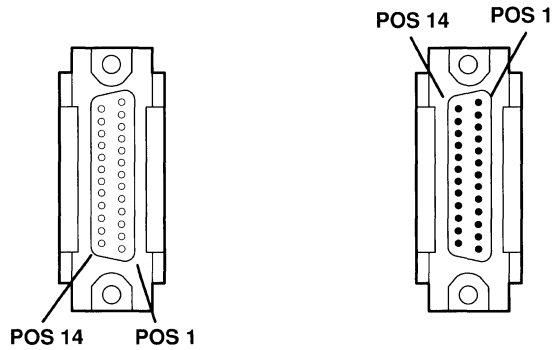
System End Connector	Signal	Device End Connector
Socket (Female)		Pin (Male)
shell	Shield Ground	1, Shell
2	TxD	2
3	RxD	3
4	RTS	4
5	CTS	5
6	DSR	6
7	Signal Ground	7
8	CD	8
20	DTR	20
22	RI	22

Cable E

Description: Printer/Terminal Interposer-EIA-232.

POS 14   POS 1

POS 14   POS 1
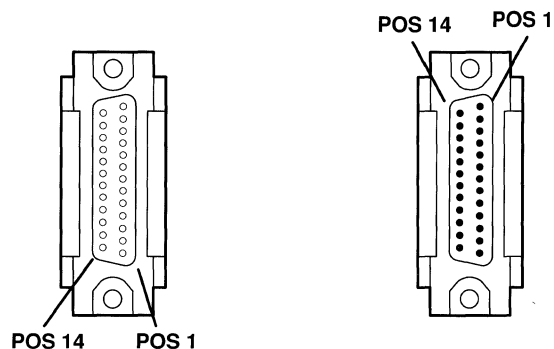
System End Connector	Signal	Device End Connector
Socket (Female)		Pin (Male)
1	Shield Ground	shell
2	TxD	3
3	RxD	2
4	RTS	5
5	CTS	4
6, 8	DSR, CD	20
7	Signal Ground	7
20	DTR	6, 8

Cable J

Description: part of the IBM Multiport Interface Cable.

The pin-out information for the connector on the back of the 8-port adapters is given in the "8-Port Async Adapters" section of the *IBM RISC System/6000 POWERstation and POWERserver Technical Reference Manual-Options and Devices,* SA23-2646.

Cable K

Description: Terminal Cable EIA-422A.
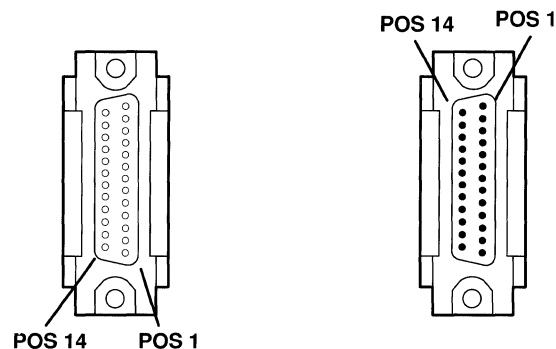
POS 14   POS 1

POS 14   POS 1

System End Connector	Signal	Device End Connector
Socket (Female)		Pin (Male)
shell	Shield Ground	1
2	TxA	15
3	RxA	19
4	TxB	17
5	RxB	25
7	Signal Ground	7

Cable L

Description: part of the IBM 16-Port Interface Cable-EIA-232.

The pin-out information for the connector on the back of the IBM 16-Port Async Adapter-EIA-232 is given in the "16-Port Async Adapters" section of the *IBM RISC System/6000 POWERstation and POWERserver Technical Reference Manual-Options and Devices,* SA23-2646.

Cable M

Description: part of the IBM 16-Port Interface Cable-EIA-422A.

The pin-out information for the connector on the back of the IBM 16-Port Async Adapter-EIA-422A is given in the "16-Port Async Adapters" section of the *IBM RISC System/6000 POWERstation and POWERserver Technical Reference Manual-Options and Devices,* SA23-2646.

Cable Q

Description: X.25 Attachment Cable-X.21.
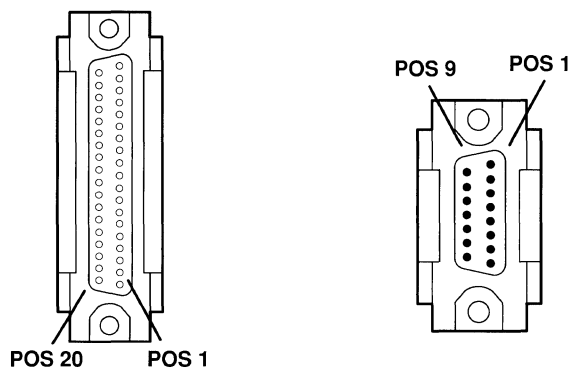
System End Connector	Signal	Device End Connector
Socket (Female)		Pin (Male)
10	T (A)	2
28	T (B)	9
11	C (A)	3
29	C (B)	10
12	R (A)	4
30	R (B)	11
13	I (A)	5
31	I (B)	12
14	S (A)	6
32	S (B)	13
7*	Ground	8
9*	Ground	8

*Tied together at system end connector.

Cable R

Description: X.25 Attachment Cable-V.24.
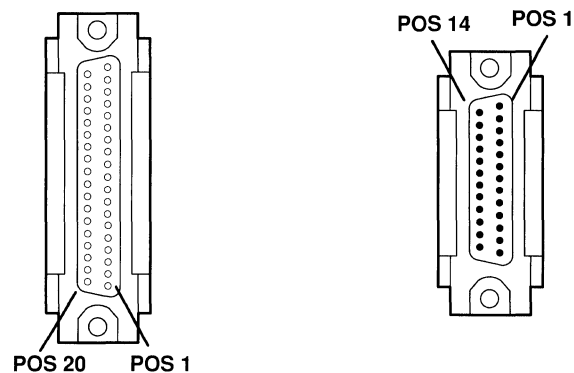
System End Connector	Signal	Device End Connector
Socket (Female)		Pin (Male)
2	TxD	2
3	RxD	3
4	RTS	4
5	CTS	5
6	DSR	6
8	CD	8
24	Tx CLK	15
26	Rx CLK	17
27	LLBT	18
20	DTR	20
21	RLBT	21
22	CI	22
25	TI	25
7*	Ground	7
9*	Ground	7
15*	Ground	7

*Tied together at system end connector.

Cable S

Description: X.25 Attachment Cable-V.35.
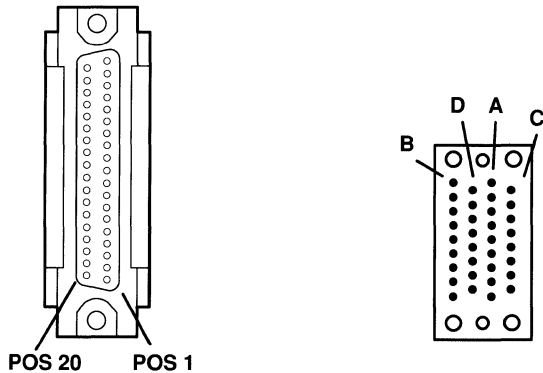
System End Connector	Signal	Device End Connector
Socket (Female)		Pin (Male)
4	RTS	C
5	CTS	D
6	DSR	E
8	CD	F
20	DTR	H
22	CI	J
35	TxD (A)	P
17	TxD (B)	S
37	RxD (A)	R
19	RxD (B)	T
36	Tx Clk (A)	Y
18	Tx Clk (B)	AA
34	Rx Clk (A)	V
16	Rx Clk (B)	X
7	Ground	B
15	Ground	B

Cable T

Description: part of the IBM 4-Port Multiprotocol Communications Controller.

The pin-out information for the connector on the back of the IBM 4-Port Multiprotocol Communications Controller is given in the "4-Port Selectable Interface Board" section of the *IBM RISC System/6000 POWERstation and POWERserver Technical Reference Manual-Options and Devices*, SA23-2646.

Cable U

Description: 4-Port Multiprotocol Communications Controller V.35 Cable
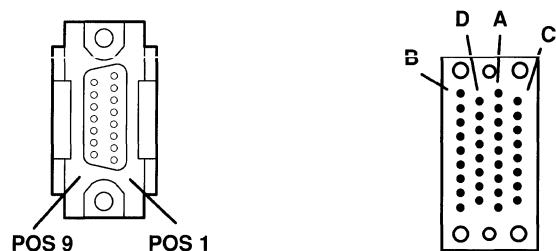
System End Connector	Signal	Device End Connector
Socket (Female)		Pin (Male)
1	Ground Shield	A (Shield)
2	TxD (B)	S
3	RTS	C
4	RxD (B)	T
5	CTS	D
6	DSR	E
7	CD	F
8	Signal Ground	B
9	TxD (A)	P
10	Tx Clk (A)	Y
11	RxD (A)	R
12	Tx Clk (B)	AA
13	Rx Clk (B)	X
14	Rx Clk (A)	V
15	DTR	H

Cable V

Description: EIA-232D/V.24 cable for use with the IBM 4-Port Multiprotocol Communications Controller.
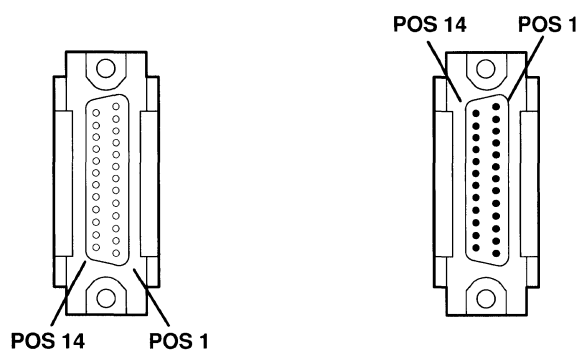
POS 14 POS 1

POS 14 POS 1

System End Connector	Signal	Device End Connector
Socket (Female)		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 4-Port Multiprotocol Communications Controller.

POS 9 POS 1

POS 9 POS 1
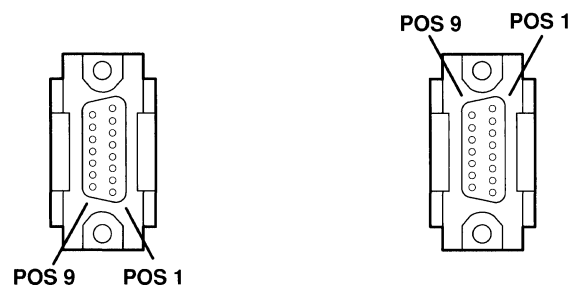
System End Connector	Signal	Device End Connector
Socket (Female)		Socket (Female)
	Shield	
2	T(A)	2
3	C(A)	3
4	R(A)	4
5	I(A)	5
6	S(A)	6
8	Signal Ground	8
9	T(B)	9
10	C(B)	10
11	R(B)	11
12	I(B)	12
13	S(B)	13

Cable X

Description: EIA-422A cable for use with the 4-Port Multiprotocol Communications Controller (Port 0 only).

POS 14   **POS 1**

System End Connector	Signal	Device End Connector
Socket (Female)		Customer-supplied
	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 KK

Description: Optical Channel Converter Cable.

If customer-supplied, the cable must be built based on the following:

- Operating wavelength: 780 nm
- Fiber type and length:
  - 50/125 um (minimum length, 4 m (13 ft.)), maximum length is determined by user-available link loss.
  - 62.5/125 um (minimum length, 4 m (13 ft.)), maximum length is determined by user-available link loss, and cannot exceed 500 m (1640 ft.), regardless of link loss.
- User-available link loss: 10.5 dB
- Averaged launched power: Minimum −4.7 dBm, Typical −3 dBm, Maximum −0.9 dBm
- Receiver sensitivity: Minimum −16.0 dBm, Maximum −0.9 dBm
- Guaranteed user-available link loss: 10.5 dB
- SC connector attenuation: Typical 0.25 dB, Maximum 0.5 dB
- Total fiber bandwidth must exceed 300 MHz.

Cable NB, 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).
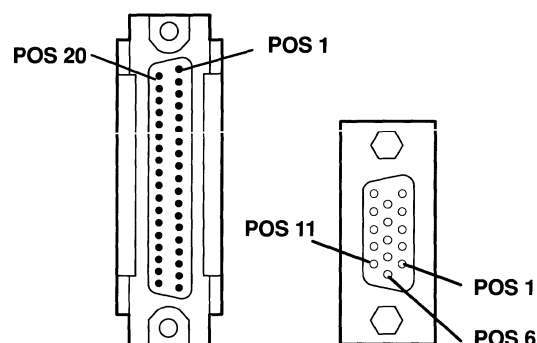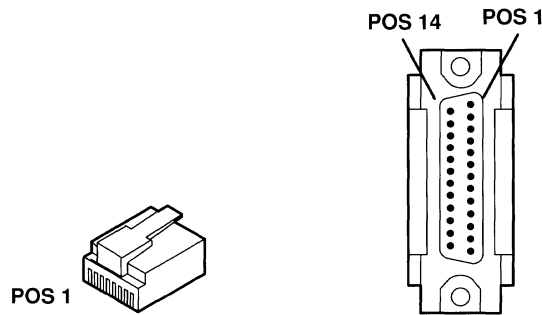

System End Connector		Device End Connector	
Pin (Male)	**Signal**	**Signal**	**Socket (Female)**
1	RxD −	TxD −	1
2	RxD +	TxD +	2
4	RxC −	TxC −	4
5	RxC +	TxC +	5
6	TxD −	RxD −	6
7	TxD +	RxD +	7
9	TxC −	RxC −	9
10	TxC +	RxC +	10
Shell	Shield Ground	Shield Ground	Shell

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.

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

Note: The above table assumes no intermediate connectors between Remote Async Nodes. Each additional connection will decrease the maximum allowable controller line length by approximately two percent due to increased line capacitance.

Cable ND

Description: 128-Port Async Controller 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).
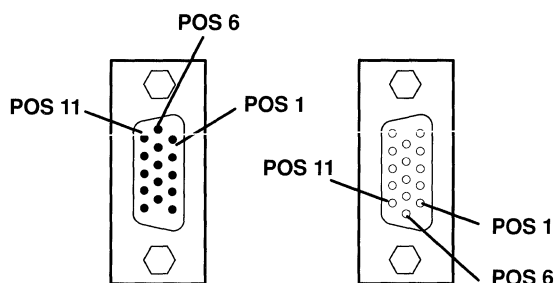
System End Connector		Device End Connector	
Pin (Male)	Signal	Signal	Socket (Female)
1	RxD −	TxD −	1
2	RxD +	TxD +	2
6	TxD −	RxD −	6
7	TxD +	RxD+	7
Shell	Shield Ground	Shield Ground	Shell

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 will decrease 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.

The cable has five conductors and is shielded on the outside. Cable length can be up to 30 m (100 ft.). Conductors should be 24 AWG (stranded wire) with a capcitance rating of 41 pF/m (12.5 pF/ft.) or less (Belden type 9929 or equivalent).
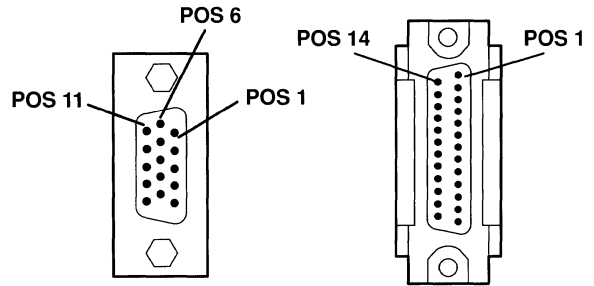
System End Connector		Modem End Connector	
Pin (Male)	Signal	Signal	Pin (Male)
1	RxD	RxD	3
4	RxC	RxC	17
6	TxD	TxD	2
9	TxC	TxC	15
12	Signal Ground	Signal Ground	7
Shell	Shield Ground	Shield Ground	1
		RTS, CTS	4, 5
		DSR, DTR	6, 20

The 128-port async controller supports multiple controller line baud rates in EIA-232 synchronous modem attach mode. However, to ensure data integrity, controller line baud rates of 57.6Kbps or less are recommended.

Cable NF

Description: 128-Port Async Controller EIA-232 Modem Cable, Device.

The cable has five conductors and is shielded on the outside. Cable length can be up to 30 m (100 ft.). Conductors should be 24 AWG (stranded wire) with a capcitance rating of 41 pF/m (12.5 pF/ft.) or less (Belden type 9929 or equivalent).
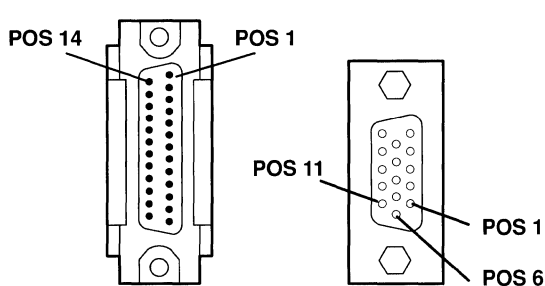
Modem End Connector		Device End Connector	
Pin (Male)	Signal	Signal	Socket (Female)
3	RxD	RxD	6
17	RxC	RxC	9
2	TxD	TxD	1
15	TxC	TxC	4
7	Signal Ground	Signal Ground	12
4,5	RTS,CTS		
6,20	DSR, DTR		
1	Shield Ground	Shield Ground	Shell

The 128-port async controller supports multiple controller line baud rates in EIA-232 synchronous modem attach mode. However, to ensure data integrity, controller line baud rates of 57.6Kbps or less are recommended.

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).
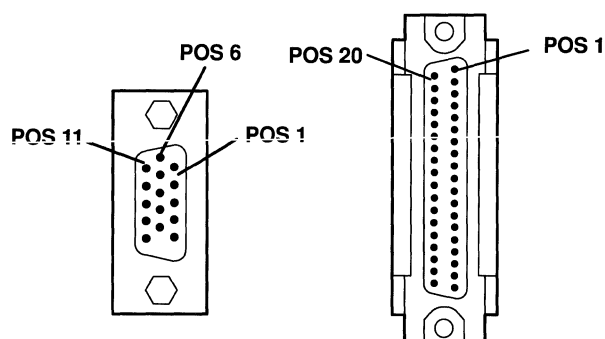
System End Connector		Modem End Connector	
Pin (Male)	Signal	Signal	Pin (Male)
1	RxD –	RD –	6
2	RxD +	RD +	24
4	RxC –	RT –	8
5	RxC +	RT +	26
6	TxD –	SD –	4
7	TxD +	SD +	22
9	TxC –	ST –	5
10	TxC +	ST +	23
12	Shield Ground	Shield Ground	19

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.

Cable NH

Description: 128-Port Async Controller EIA-422 Modem Cable, Device.

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).

Modem 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.

Cable NK

Description: RJ45 to DB25 Converter Cable for use with the IBM Remote Async Node 16-Port EIA-232.

POS 14   POS 1

POS 1

System End Connector		Device End Connector	
Pin (Male)	Signal	Signal	Pin (Male)
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

Notes:

1. This cable assembly is shielded.

2. This cable assembly and the 64-port RJ45 to DB25 converter cable (FC 6402) are not interchangeable.

Multiport/2 4P/8P Interface Cable

The 4P/8P Multiport Interface Cable supports all of the following Multiport/2 EIB's:

- 8P EIA-422
- 8P EIA-232
- 4P EIA-232
- 4P EIA-232/4P EIA-422.

Cable T1

Description: 4/8-Port 232/422 Multiport/2 Cable.
The system end of the 4/8-Port 232/422 Multiport/2
Cable consists of a 78-position D-shell connector.
The cable device end consists of a Molded
Distribution Box (MDB) with eight 25-pin D-shell
connectors to allow up to 8 standard device
connections, depending on the number of Ports
supported by the Multiport/2 adapter.

EIA-422 Multiport/2 Adapter 78 and 25 postion connector

Mne-monic	Port 0	Port 1	Port 2	Port 3	25-Position Connector
TxD	40	04	66	69	02/BA-103
RxD	02	64	28	31	03/BB-104
RTS	01	63	27	30	04/CA-105
CTS	61	25	48	51	05/CB-106
DTECLK	41	05	—	—	24/DA-113
SG	43	07	08	67	07/AB-102
DCD	22	45	09	12	08/CF-109
RxCLKIN	62	26	—	—	17/DD-115
DTR	60	24	47	50	20/CD-108.2
DSR	42	06	68	71	06/CC-107
HRS	21	44	—	—	23/CH-111
RI	03	65	29	32	22/CE-125
TxCLKIN	23	46	—	—	15/DB-114

Mne-monic	Port 4	Port 5	Port 6	Port 7	25-Position Connector
TxD+	73	55	76	58	02/TXA
TxD–	34	16	37	19	04/TXB
RxD+	54	75	57	78	03/RXA
RxD–	15	36	18	39	05/RXB
SG	11	70	—	—	07/

8-Port EIA-232-C Multiport/2 Adapter 78-and 25-Position Connectors
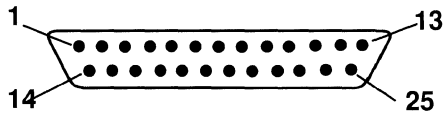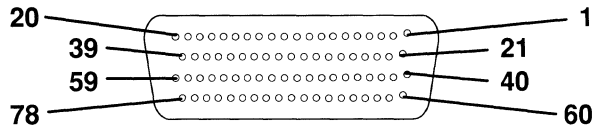
Mnemonic	Port 0	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	25-Position Connector
TxD	40	04	66	69	73	55	76	58	02/BA-103
RxD	02	64	28	31	54	75	57	78	03/BB-104
RTS	01	63	27	30	34	16	37	19	04/CA-105
CTS	61	25	48	51	15	36	18	39	05/CB-106
DTECLK	41	05	—	—	—	—	—	—	24/DA-113
SG	43	07	08	67	11	70	—	—	07/AB-102
DCD	22	45	09	12	74	56	77	59	08/CF-109
RxCLKIN	62	26	—	—	—	—	—	—	17/DD-115
DTR	60	24	47	50	35	17	38	20	20/CD-108.2
DSR	42	06	68	71	72	33	53	14	06/CC-107
HRS	21	44	—	—	—	—	—	—	23/CH-111
RI	03	65	29	32	49	52	10	13	22/CE-125
TxCLKIN	23	46	—	—	—	—	—	—	15/DB-114

4-Port EIA-232-C Multiport/2 Adapter 78-and 25-Position Connectors

Mnemonic	Port 0	Port 1	Port 2	Port 3	25-Position Connector
TxD	40	04	66	69	02/BA-103
RxD	02	64	28	31	03/BB-104
RTS	01	63	27	30	04/CA-105
CTS	61	25	48	51	05/CB-106
DTECLK	41	05	—	—	24/DA-113
SG	43	07	08	67	07/AB-102
DCD	22	45	09	12	08/CF-109
RxCLKIN	62	26	—	—	17/DD-115
DTR	60	24	47	50	20/CD-108.2
DSR	42	06	68	71	06/CC-107
HRS	21	44	—	—	23/CH-111
RI	03	65	29	32	22/CE-125
TxCLKIN	23	46	—	—	15/DB-114

4-Port EIA-232–C/4-Port-422-A Multiport/2 Adapter

Mnemonic	Port 0	Port 1	Port 2	Port 3	25-Position Connector
TxD	40	04	66	69	02/BA-103
RxD	02	64	28	31	03/BB-104
RTS	01	63	27	30	04/CA-105
CTS	61	25	48	51	05/CB-106
DTECLK	41	05	—	—	24/DA-113
SG	43	07	08	67	07/AB-102
DCD	22	45	09	12	08/CF-109
RxCLKIN	62	26	—	—	17/DD-115
DTR	60	24	47	50	20/CD-108.2
DSR	42	06	68	71	06/CC-107
HRS	21	44	—	—	23/CH-111
RI	03	65	29	32	22/CE-125
TxCLKIN	23	46	—	—	15/DB-114

Mnemonic	Port 4	Port 5	Port 6	Port 7	25-Position Connector
TxD+	73	55	76	58	02/TxA
TxD–	34	16	37	19	04/TxB
RxD+	54	75	57	78	03/RxA
RxD–	15	36	18	39	05/RxB
Signal Ground	11	70	—	—	07/GRD

Cable T2

Description: 6-Port Sync Multiport/2 Cable. The
system end of the 6-Port Sync Multiport/2 cable
consists of a 78-position D-shell connector. The
cable device end consists of a MDB with six 25-pin
D-shell connectors to allow six devices connection
to the six ports supported by this adapter.

6-Port Synchronous EIA-232-C Multiport/2 Adapter 78-and 25-Position Connectors
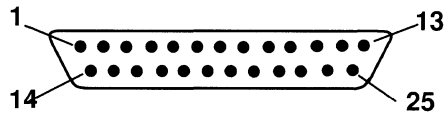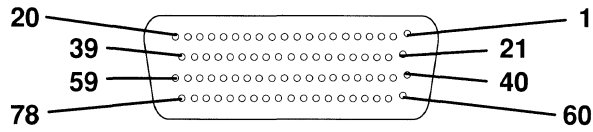
Mnemonic	Port 0	Port 1	Port 2	Port 3	Port 4	Port 5	25-Position Connector
TxD	40	04	66	69	73	55	02/BA-103
RxD	02	64	28	31	54	75	03/BB-104
RTS	01	63	27	30	34	16	04/CA-105
CTS	61	25	48	51	15	36	05/CB-106
DTECLK	41	05	19	20	10	13	24/DA-113
SG	43	07	08	67	11	70	07/AB-102
DCD	22	45	09	12	74	56	08/CF-109
RxCLKIN	62	26	57	77	18	53	17/DD-115
DTR	60	24	47	50	35	17	20/CD-108.2
DSR	42	06	68	71	72	33	06/CC-107
HRS	21	44	76	37	38	58	23/CH-111
RI	03	65	29	32	49	52	22/CE-125
TxCLKIN	23	46	78	59	39	14	15/DB-114

Cable T3

Description: 6-Port V.35 Portmaster Cable. The system end of the 6-Port V.35 Portmaster cable consists of a 100-position D-shell connector. The cable device end consists of a MDB with six 25-pin D-shell connectors to allow six devices connection to the six ports supported by the adapter.

6-Port V.35 Portmaster Adapter/A 100-and 25-Position Connectors
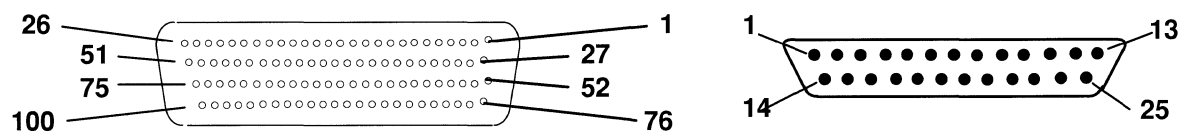
Mnemonic	I/O	Port 0	Port 1	Port 2	Port 3	Port 4	Port 5	25-Position Connector
TxDA	O	94	21	47	71	72	23	02
TxDB	O	70	46	22	95	96	48	14
RxDA	I	08	54	58	29	28	57	03
RxDB	I	33	78	82	04	03	81	16
TxCA IN	I	76	06	77	56	27	55	15
TxCB IN	I	52	31	53	80	02	79	12
RxCA	I	20	41	38	19	32	30	17
RxCB	I	45	16	13	44	07	05	09
TxCA OUT	O	24	73	98	25	99	26	24
TxCB OUT	O	49	97	74	50	75	51	11
RTS	O	42	43	92	93	37	39	04
CTS	I	15	65	86	87	59	09	05
DCD	I	89	40	62	61	35	84	08
DTR	O	18	91	69	68	14	12	20
DSR	I	66	90	88	64	60	85	06
SGND	—	34	17	63	67	01	83	07
FGND	—	100			Shield			01

Cable T4

Description: 8-Port 232/422 Portmaster Cable. The system end of the 8-Port 232/422 Portmaster cable consists of a 100-position D-shell connector. The cable device end consists of a MDB with eight 25-pin D-shell connectors to allow up to eight devices connection to the eight ports supported by the adapter.

8-Port EIA-422-A Portmaster Adapter/A 100-and 25-Position Connectors
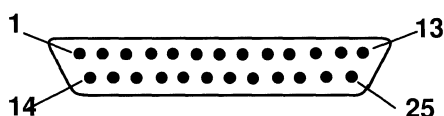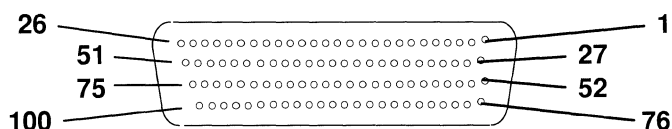
26 — 1
51 — 27
75 — 52
100 — 76

1 — 13
14 — 25

Mnemonic	I/O	Port 0	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	25-Position Connector
TxD	O	51	54	07	10	13	16	94	48	02/SDA
	O	52	55	08	11	14	17	95	49	02/SDB
RxD	I	02	05	83	86	89	92	46	74	03/RDA
	I	78	81	35	38	41	44	72	25	17/RDB
–RTS	O	01	04	82	85	88	91	45	73	04/RSA
	O	76	79	33	36	39	42	70	23	20/RSB
–CTS	I	77	80	34	37	40	43	71	24	05/CSA
	I	53	56	09	12	15	18	96	50	06/CSB
TxCLK	I	28	31	59	62	65	68	21	99	08/STA
	I	03	06	84	87	90	93	47	75	22/STB
RxCLK	I	29	32	60	63	66	69	22	100	15/RTA
	I	27	30	58	61	64	67	20	98	23/RTB
SGND	—	19	19	26	26	57	570	97	97	07/GND
FGND	Cable Shield									01/FGND

8-Port EIA-232-D Portmaster Adapter/A 100-and 25-Position 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	51	54	07	10	13	16	94	48	02/BA
RxD	I	02	05	83	86	89	92	46	74	03/BB
RTS	O	01	04	82	85	88	91	45	73	04/CA
CTS	I	77	80	34	37	40	43	71	24	05/CB
DCD	I	28	31	59	62	65	68	21	99	08/CF
DTR	O	76	79	33	36	39	42	70	23	20/CD
DSR	I	53	56	09	12	15	18	96	50	06/CC
HRS	I	27	30	58	61	64	67	20	98	23/CI
RI	I	03	06	84	87	90	93	47	75	22/CE
TxCLKIN	I	29	32	60	63	66	69	22	100	15/DB
TxCLK	O	52	55	08	11	14	17	95	49	24/DA
RxCLK	I	78	81	35	38	41	44	72	25	17/DD
SGND	—	19	19	26	26	57	570	97	97	07/AB
FGND		Cable Shield								01/AA

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 61 m (200 ft.). 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 capcitance cable can be used, as long as the total capcitance (including intermediate connectors and cables) does not exceed 2500 pF.

POS 14   POS 1

POS1
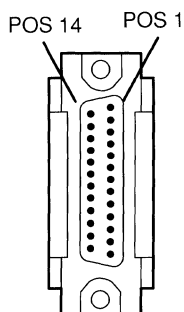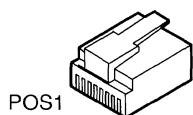
System End Connector				Signal	Device End Connector
Pin (Male)					Pin (Male)
4-Pin RJ11	6-Pin RJ11	8-Pin RJ45	10-Pin RJ45		
			1	RI	N/C
		1	2	DSR*	20
	1	2	3	RTS	5
1	2	3	4	Chassis Ground	7
2	3	4	5	TxD	3
3	4	5	6	RxD	2
4	5	6	7	Signal Ground	7
	6	7	8	CTS	4
		8	9	DTR	8
			10	CD *	N/C

*The physical location of CD and DSR may be interchanged through software control if desired.

Warning: 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 Node16-Port EIA-232.

Notes:

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. 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 61 m (200 ft.). 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.

Warning: 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 cabling practices mentioned under Cable NL.
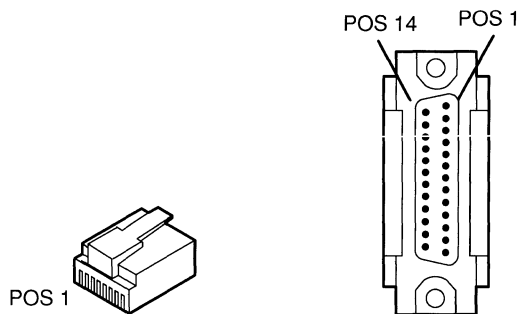
System End Connector				Signal	Device End Connector
Pin (Male)					Pin (Male)
4-Pin RJ11	6-Pin RJ11	8-Pin RJ45	10-Pin RJ45		
			1	RI	22
		1	2	DSR*	6
	1	2	3	RTS	4
1	2	3	4	Chassis Ground	Shell
2	3	4	5	TxD	2
3	4	5	6	RxD	3
4	5	6	7	Signal Ground	7
	6	7	8	CTS	5
		8	9	DTR	20
			10	CD *	8

*The physical location of CD and DSR may be interchanged through software control if desired.

Step 4: Create or Modify Communications Networks

If you intend to use the RISC System/6000 system in a network environment, appoint a central site or system administrator to help design and maintain a system that provides maximum availability of all devices in the network. The system administrator may need to consider the following:

- Types of networks with which your network users must communicate (for example, local and wide area networks, asynchronous, coaxial).

- Types of communications functions your network users need (for example, file transfer, mail, 3278/79 emulation, X-Window server support, data conversion, printing).

- Communications software that is required to communicate between systems within your own network and with systems on external networks.

- International language considerations, if any, between communicating systems.

- Network management functions that you wish to use within your network, including error isolation procedures and performance and monitoring tools.

- Information needed to properly configure your system. The following list provides some of the types of information needed:

  - Transmission speed (in bits per second)

  - Parity checking (whether none, odd, or even)

  - Pacing protocols required or allowed by remote system

  - Dialing or calling protocols, such as autoanswer and autocall, and information such as phone numbers (including back-up phone numbers in case no connection is possible)

  - Times you can call and communicate with the remote systems

  - Naming and addressing requirements within your network and between your systems and remote systems

  - Security relationships within your network and between your systems and remote systems

  - Gateway or bridge requirements

  - Information needed to configure the system software for correct operation in the network.

- Any necessary cables, control units, or other specialized communications hardware.

- Preparation of communications lines

  - Number of concurrent communications users

  - Amount of data to be transmitted

  - Communications software licensing restrictions.

Step 5: Perform Building Alterations, as Needed

Perform any building alterations that you determine are necessary to accommodate your new computing equipment. These may include the following:

- Electrical wiring modifications to accommodate the added computing equipment.

- Network cabling additions to accommodate the replaced or added computing equipment.

- Fire protection measures to protect your data and equipment.

- Antistatic measures to protect your data and equipment.

- Radio or radar shields if you are installing near transmitters.

- Installation of Uninterruptable Power Source (UPS), if required.

- Air conditioning installation.

Step 6: Prepare Maintenance, Recovery, and Security Plans

Maintenance, recovery, and security plans can help protect your investment and maximize productivity. The system administrator may need to formulate the following plans:

- System maintenance program for both hardware and software
- System recovery and availability plan
- Logical security plan
- Physical security plan.

Step 7: Develop an Education Plan

Depending on the applications you will be using, your employees may need formal and/or informal training. The *IBM RISC System/6000 System Overview,* GC23-2406, provides a list of publications available with the system.

Step 8: Order Any Needed Supplies

You may need to order some of the following items:

- Publications. "Documentation Overview" in the *IBM RISC System/6000 System Overview,* GC23-2406, lists publications available with the RISC System/6000 system. The *Documentation Overview* contains more information about the publications available.

  InfoExplorer, a hypertext database of RISC System/6000 documentation that provides an alternative to hardcopy books, is also described in the *IBM RISC System/6000 System Overview.*

- Tapes or diskettes for backing up software and data.

- Printer supplies (paper, printer toner, printer ribbons).

- Plotter supplies (paper, vellum, film, pens).

Step 9: Prepare for System Delivery

Once your system unit arrives, you are responsible for moving it to the installation location. In the case of the Model 220, you are also responsible for setting up the system unit. This section explains how to both identify and inventory your shipment.

Identifying Your Shipment

If you have more than one machine being delivered at the same time, it is important to keep their components separate. Your order, for example, may come from various locations, software from one place and hardware from another.

The shipping label on each box has several numbers that will help you keep everything organized. No matter where they come from, the parts of the order, from the display to the system unit, have the same system number. The serial number identifies all components that come with a particular system unit's processor.

Customer No.	Sched Date	CL	System Number	Mach Type	Serial No.	Br. Off
			340045		2600512	

Figure 8.   Example of a Shipping Label, with System Number and Serial Number Indicated

About Your Machine Printout

The information on the "About Your Machine" printout is used to custom-build your machine. If you bought your machine directly from IBM, this printout should accurately reflect the shipment contents. If you purchased a system from an industry remarketer, they may have made additions or modifications to the machine that may not be reflected on the "About Your Machine" printout.

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GC23–2407–01

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☐ If you would like a reply, check this box. Be sure to print your name and address below.

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