RISC System/6000

Hardware Offerings Overview

For the Power Seeker • POWER architecture • Numeric-intensive computing • 3-D graphics • Versatile communications

IBM

First Edition (February 1990)

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IBM Peripheral or Feature	Cable Replacement Part Number	System Unit(s) Machine Type
Dials – Type # 6094, Model 010	6247480	7013, 7016
Lighted Programmable Function Keyboard – Type # 6094, Model 020	6247480	7013, 7016
Tablet – Type # 5083, Model 021	6247480	7012, 7013, 7016
Tablet – Type # 5083, Model 022	6247480	7012, 7013, 7016
Color Graphics Adapter	58F2903	7012, 7013

In addition, when attaching peripherals to a RISC System/6000 system unit or an IBM Xstation 120 parallel printer port, the IBM cable P/N 1525612 with the in-line filter should be used for compliance to the German requirements.

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RISC System/6000 System Structure Overview

The IBM RISC System/6000 system units are a second generation of computers using the *Reduced Instruction Set Computer (RISC)* architecture. They offer a full range of multi–user, multi–tasking, open–architecture workstations and servers. The RISC System/6000 system units are designed to be used in a wide variety of environments including numeric–intensive scientific applications, graphics–intensive engineering applications, and input/output–intensive commercial applications.

POWER Architecture

The RISC System/6000 system unit is built on IBM POWER (Performance Optimization with Enhanced RISC) Architecture and is implemented in CMOS VLSI technology. The system supports the IBM Personal System/2 Micro Channel architecture and takes advantage of:

- Advanced memory technology
- Advanced printed circuit board technology
- Surface mount technology.

Many design innovations enable the RISC System/6000 system units to function superbly in a wide range of application environments. These innovations include the RISC System/6000 RISC processor, which can perform multiple operations in one clock cycle, the RISC System/6000 virtual memory architecture, which provides extensive addressing capabilities for large data bases, and the RISC System/6000 I/O subsystem, which is built around Micro Channel architecture. In the design of the RISC System/6000 system, reliability, availability, and serviceability are main considerations. Extensive uses of parity and memory Error Correction Code (ECC) are found throughout the system.

RISC Processor

The RISC System/6000 RISC processor employs several architectural and implementation features that set it apart from earlier RISC processors and enable it to perform multiple operations in one clock cycle. Separate fixed–point and floating–point units run simultaneously, while separate instruction and data caches work with the branch processor to perform zero–cycle branch operations. The RISC System/6000 instruction set exploits the concurrent performance capabilities of the processor by providing 184 powerful instructions, including string operations and a floating–point multiply and add operation (A x B + C). With these and other architectural and implementation features, the RISC System/6000 processor can execute four instructions in a single clock cycle: one branch operation, one condition–register operation, one fixed–point operation, and one floating–point operation. Figure 1 illustrates one design of the RISC System/6000 RISC processor.

The RISC System/6000 processor supports precise interrupts. When an instruction causes an interrupt, the pipeline stops before the subsequent instruction can affect the machine state. Consequently, return from an interrupt can resume at the interrupting instruction.

A built–in self test is performed at startup. It tests the processor complex by generating test patterns that are used by the POWER processor VLSI chips to verify correct chip operation. All processor chips have data parity in their data paths; internal arrays and processor chip–to–chip data buses have parity.

Virtual Memory

The RISC System/6000 virtual memory architecture provides 4–petabyte (2^{52}) virtual address space and 4–gigabyte real address space made up of 4K–byte pages. This extensive virtual addressing capability provides the potential for a large number of concurrently open files and active objects.

The memory subsystem is tested during startup. It is designed to implement ECC with detection of double–bit errors and detection and correction of single–bit errors. Bit steering is provided to automatically substitute a spare bit of memory for a detected faulty data bit or ECC bit. Bit scattering is designed to insure that a given memory chip contains no more than 1 bit of any word. Memory control also provides hardware–assisted memory scrubbing, which is a memory test designed to detect and correct single–bit memory errors.

I/O Subsystem

The I/O subsystem maintains a balance between the RISC System/6000 processor and I/O devices by utilizing Micro Channel architecture with the Streaming Data Procedure. The procedure can increase the I/O bandwidth to up to 40M bytes (MB) per second. An independent, high bandwidth path for the I/O bus enables high–performance disks, graphics adapters, and communications adapters to connect to the I/O bus without limiting processor performance. The data integrity of the I/O subsystem is enhanced by the support of parity and synchronous channel check on the Micro Channel bus. In addition, multiple distributed I/O processors in adapters are designed to provide higher system performance.

The RISC System/6000 I/O subsystem supports Programmable Option Select (POS). This part of the IBM Micro Channel architecture features software configuration of the Micro Channel resources and adapter identification.

The subsystem also supports Vital Product Data (VPD), which allows the AIX for RISC System/6000 operating system to obtain detailed information from certain hardware, software, and microcode elements of a system at the Field Replaceable Unit (FRU) level. VPD helps the operating system automatically configure the system and assists the user with inventory control. It also assists in areas such as software licensing and product maintenance.

These features of the processor, the virtual memory architecture, and the I/O subsystem represent just a glimpse of the overall innovation that makes the POWER Architecture and technology of RISC System/6000 system units so attractive to a wide variety of application environments. For a detailed view of the architecture of RISC System/6000 system units, please refer to *RISC System/6000 Technology,* SA23–2619.

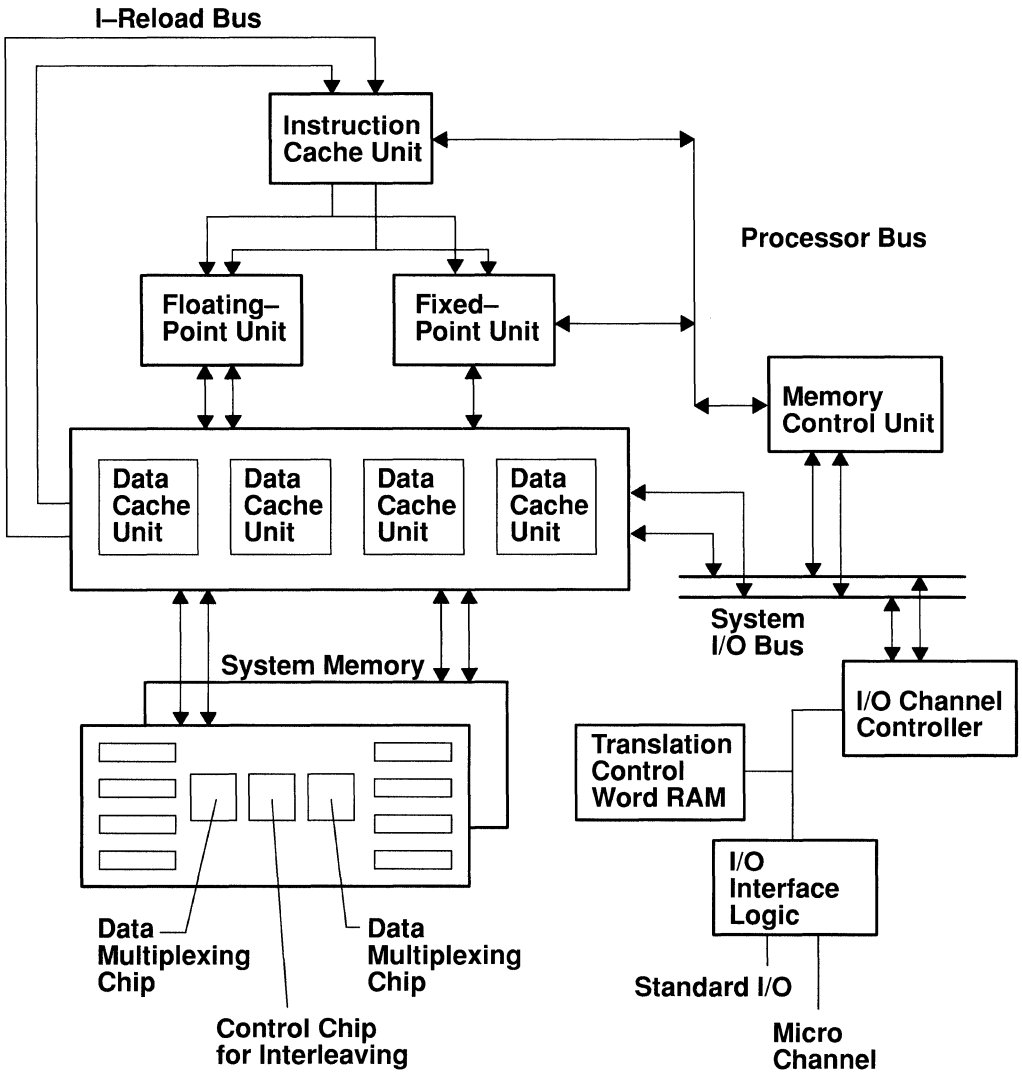


Figure 1. The RISC System/6000 Central Electronics Complex for the Model 530, Model 540, Model 730, and Model 930.

RISC System/6000 System Units

The RISC System/6000 system units have the following elements and options:

Processors: Three processors are used in the RISC System/6000 product line, the IBM SGR 2032 Processor, the IBM SGR 2564 Processor, and the IBM SGR 3064 Processor. The speeds of the processors are 20 MHz, 25 MHz, and 30 MHz, respectively. These processors contain an integrated floating–point unit that, with software assistance, supports single– and double–precision floating–point operations in accordance with ANSI/IEEE 754–1985 IEEE Standard for Binary Floating–Point Arithmetic.

System Memory: 8 or 16 MB of memory is standard on all RISC System/6000 models, except the Model 540, which features 64 MB of standard system memory (using 4 Mbit technology). Maximum system memory for the units ranges from 32 to 256 MB.

Internal fixed–disk storage: Internal fixed–disk capacity ranges from 120 to 857 MB per fixed disk.

Diskette storage: A 1.44 MB 3.5–inch internal diskette drive is standard on all system units. A 1.2 MB IBM 5 1/4–Inch Diskette Drive is optional.

External removable disk storage: On all models except the Model 930, portable disk drives can each provide 355 or 670 MB of formatted disk storage that is removable from the system.

External fixed disk storage: On all models except the Model 930, 320 MB of formatted storage is available in a self–powered unit.

Internal/External storage: The following IBM storage devices allow storing and backing up, restoring, and archiving of programs and data for certain system units:

- CD–ROM Drive
- 8mm Tape Drive
- 150 MB 1/4–Inch Cartridge Tape Drive
- 1/2–Inch 9–Track Tape Drive.

Displays, printers, and plotters: Monochrome and color graphics displays are available in several sizes and a resolution of 1280 by 1024 pixels. ASCII terminals, printers, and plotters are also available.

IBM Xstation 120: The Xstation 120 is a desktop LAN–attached X–Server terminal.

Other devices: A keyboard is optional on most models; a mouse or tablet can be used as an additional input pointing device. Other available I/O devices include digitizers, dials, and a lighted programmable function keyboard.

Communications: Hardware and software options support Ethernet and Token–Ring local area networks, TCP/IP, SNA, asynchronous communications, 3278/79 emulation, and others.

Note: The Xstation 120 is not considered a RISC System/6000 system unit in the context of this document. The station does not support any disks, diskettes, or Micro Channel slots. Further, it does not implement POWER Architecture.

System Units Overview

The RISC System/6000 system consists of POWERstations and POWERservers. POWERstations provide a range of processing power to satisfy engineering, scientific, and other technical and commercial business graphics applications that require a locally–attached graphics adapter.

POWERservers can be configured either as LAN–attached servers for multiple users (for example, computer or file servers) or as multi–user systems using ASCII terminals or IBM Xstation 120s. The POWERservers are designed for those applications that do not require a locally–attached graphics adapter.

Throughout the document POWERstations and POWERservers will often be referred to by model number only.

The Model 320, Model 520, and Model 530 can be either POWERstations or POWERservers, depending on their configuration. Since it comes with an integrated high–speed graphics feature installed, the Model 730 is designated exclusively as a POWERstation. The Model 540 and Model 930 function exclusively as POWERservers.

The POWERstations 320, 520, and 540 can use any of the following IBM graphics adapters:

- IBM Grayscale Graphics Display Adapter
- IBM Color Graphics Display Adapter
- IBM High–Performance 8–Bit 3D Color Graphics Processor
- IBM High–Performance 24–Bit 3D Color Graphics Processor.

The following is a brief overview of the RISC System/6000 product line.

- The POWERstation and POWERserver 320, an entry–level system unit that can be used as either a desktop or a deskside model. The Model 320 can be LAN–attached or stand–alone, depending on the amount of disk storage.
- The POWERstation and POWERserver 520, an entry–level deskside system unit designed to be used as a general purpose system or as a system that performs extensive fixed–point and floating–point arithmetic.
- The POWERstation and POWERserver 530, a deskside system unit similar to the Model 520, but with a faster processor, twice the data cache, and a wider memory bus.
- The POWERserver 540, a high–performance deskside system unit that uses 4 Mbit technology. The unit has a faster processor and more system memory than the Model 530.
- The POWERstation 730, a graphics workstation functionally comparable to the Model 530, but with extensive 3D graphics capabilities added.
- The POWERserver 930, a rack–mounted system unit that can support extensive engineering, scientific, and multi–user server applications.

Standard Features

All RISC System/6000 system units have the following features:

- One 3.5–inch 1.44 MB internal diskette drive.
- One parallel port.*
- Two EIA–232D asynchronous serial ports.
- One tablet port.*
- One mouse port.*
- One keyboard/speaker port.*
- One Small Computer Systems Interface (SCSI) adapter.**

Figure 2. The POWERstation 730, with a 6091 Color Display, Model 23, and other optional features, in a robotics environment.

- An operator panel with the following features:
  - A 3–digit, 7–segment LED display
  - A 3–position key lock to help provide logical security. The positions are: Normal (general operation), Secure (unattended or restricted), and Service (hardware or software service)
  - A reset button.
- Rollers or glides on all deskside models, which can facilitate servicing (excluding the Model 320).
- A battery, which supports 32K of non–volatile memory and a time–of–day clock.
- Power cord with attached plug. See "Power Cords and Plugs" for more information.
- System diagnostics, both online and stand–alone, which are provided with the IBM AIX Version 3 for RISC System/6000 licensed program or can be ordered separately on diskettes. Online diagnostics can be run concurrently with AIX, while stand–alone diagnostics must be run by restarting the system from fixed disk or diskette.
- Warranty, installation, and service support from IBM. System units are warrantied: for detailed warranty information consult your RISC System/6000 marketing representative. An IBM Customer Engineer (CE) will install your system and verify correct operation. Also, IBM has highly skilled professionals available to help you with system expansion, operations, and applications questions.

*Not available on the Model 930

**Not standard on the Model 320

Note: A console is not standard on any system unit. However, console capability is required for diagnostics and configuration tasks. Console capability can be provided by a supported ASCII terminal or a combination of a supported display and a supported display adapter. The console must be appropriately attached to the system unit.

Comparison of RISC System/6000 Systems

The following table provides a summary of differences between the RISC System/6000 system units.

Feature	Model 320	Model 520	Model 530 and Model 730	Model 540	Model 930
System orientation	Desktop or deskside	Deskside	Deskside	Deskside	Rack–mounted
Processor	SGR 2032 Processor (20 MHz)	SGR 2032 Processor (20 MHz)	SGR 2564 Processor (25 MHz)	SGR 3064 Processor (30 MHz)	SGR 2564 Processor (25 MHz)
Data Cache	32 KB	32 KB	64 KB	64 KB	64 KB
Instruction Cache	8 KB	8 KB	8 KB	8 KB	8 KB
Memory Bus Width	64 Bits	64 Bits	128 Bits	128 Bits	128 Bits
Standard system memory	8 MB	8 MB	16 MB	64 MB	16 MB
Maximum system memory[1]	32 MB	128 MB	128 MB	256 MB	128 MB

Feature	Model 320	Model 520	Model 530 and Model 730	Model 540	Model 930
Standard internal fixed–disk capacity	120 MB	355 MB	355 MB	640 MB	670 MB
Maximum internal fixed–disk capacity[2]	640MB	2571MB	2571 MB	2571 MB	11998 MB
Micro Channel adapter slots[3]	4	8	8	8	8

Notes:

1. These maximums, except in the case of the Model 540, are based on current 1 Mbit technology. The Model 540 uses 4 Mbit technology.
2. For the Model 730 the maximum internal fixed–disk capacity is 1714 MB if an 8mm tape drive is installed.
3. The number of available Micro Channel adapter slots depends on the number of standard adapter cards. The Model 320 has three or four slots available, depending on the amount of disk storage. For the other system units, six or seven are actually available for customer–selectable features and options.

The following sections describe each of the system units in depth. "Reference Information" contains physical, electrical, and environmental considerations for the system units.

Figure 3. The desktop Model 320 with an optional 6091 Color Display, Model 19, and optional keyboard and mouse.

The IBM RISC System/6000 7012 POWERstation and POWERserver 320

The Model 320 system unit is a versatile entry–level model that is designed to be used as either a desktop or a deskside system. The Model 320 is designed for balanced system performance and provides a high speed floating–point processor with concurrent instruction execution.

As a POWERstation with 120 MB of disk storage, the Model 320 can be configured as a "client system" attached to a Local Area Network (LAN). As a client system, the system unit has limited user disk space available and is dependent on a LAN–attached IBM AIX server for data and program storage. With 240 MB or more of disk storage, the POWERstation 320 can be a powerful stand–alone graphics workstation, with optional LAN and other communications capabilities.

As a POWERserver, the Model 320 requires a minimum of one 320 MB internal fixed disk and an IBM SCSI High–Performance I/O Controller.

A pedestal used for stabilization in the deskside (vertical) position is provided with the Model 320.

Features

The Model 320 has the following features:

- A 20–MHz IBM SGR 2032 Processor.
- 8 MB standard system memory, expandable to 32 MB total using the two memory adapter slots. The unit can only use 8 or 16 MB cards.
- One 3.5–inch 1.44 MB standard internal diskette drive.
- 120 MB standard fixed–disk capacity provided by one 3.5–inch internal fixed disk. With a selectable option, the system can come with a 320 MB drive. Capacity is expandable to 640 MB through a total of two 320 MB 3.5–inch internal fixed disks
- Support for a maximum of two SCSI High–Performance I/O Controllers.
- Support for external media devices, including the following:
  - IBM 4869 5 1/4–Inch 1.2 MB External Diskette Drive Model 2
  - IBM 7203 External Portable Disk Drive Model 1
  - IBM 7204 External Disk Drive Model 320
  - IBM 7207 150 MB External 1/4–Inch Cartridge Tape Drive Model 1
  - IBM 7208 2.3 GB External 8mm Tape Drive Model 1
  - IBM 7210 External CD–ROM Drive Model 1
  - IBM 9348 Magnetic Tape Unit Model 12.
- Three or four Micro Channel adapter slots. The Model 320 with 120 MB fixed–disk capacity has all four Micro Channel adapter slots available. The Model 320 with 320 MB or greater fixed–disk capacity has three such slots available.

"Reference Information" contains physical, electrical, and environmental considerations for the system unit.

The IBM RISC System/6000 7013 POWERstation and POWERserver 520

The Model 520 is a multi–user, multi–tasking deskside model with expansion capabilities and ability to perform fixed–point and floating–point arithmetic.

The Model 520 can fulfill a variety of roles and can even be upgraded to a Model 530 if your needs change.

Features

The Model 520 has the following features:

- A 20–MHz IBM SGR 2032 Processor.
- 8 MB standard system memory, expandable to 128 MB total using the eight memory adapter slots. The unit can only use 8 or 16 MB cards.
- One 3.5–inch 1.44 MB standard internal diskette drive.
- 355 MB standard fixed–disk capacity provided by one 5.25–inch internal fixed disk. Capacity is expandable to 2571 MB DASD. The Model 520 system has three internal fixed–disk bays. Each bay can support one 5.25–inch fixed disk (355, 670, or 857 MB) or two 3.5–inch fixed disks (320 MB each, or 640 MB total). Selectable options allow you to upgrade the standard fixed disk to any of the drives or pairs of drives mentioned.
- Seven available Micro Channel adapter slots.
- One Small Computer Systems Interface (SCSI) adapter card, the IBM SCSI High–Performance I/O Controller, which occupies one of the eight Micro Channel adapter slots (Slot 8). The unit supports up to four SCSI controllers.
- Support for internal media devices. See "Reference Information" for supported internal media configurations. The following devices are available:
  - IBM Internal CD–ROM Drive
  - IBM 2.3 GB Internal 8mm Tape Drive.
- Support for external media devices, including the following:
  - IBM 4869 5 1/4–Inch 1.2 MB External Diskette Drive Model 2
  - IBM 7203 External Portable Disk Drive Model 1
  - IBM 7204 External Disk Drive Model 320
  - IBM 7207 150 MB External 1/4–Inch Cartridge Tape Drive Model 1
  - IBM 7208 2.3 GB External 8mm Tape Drive Model 1
  - IBM 7210 External CD–ROM Drive Model 1
  - IBM 9348 Magnetic Tape Unit Model 12.
- Two rollers on the bottom rear of the machine to facilitate moving.
- Rear–mounted lock, which can help provide physical security (front and rear locks are operated by the same key).

"Reference Information" contains physical, electrical, and environmental considerations for the system unit.

The IBM RISC System/6000 7013 POWERstation and POWERserver 530

The Model 530 system unit is a high–performance multi–user, multi–tasking deskside model with a faster processor than the Model 520. The Model 530 system is designed to be used as a general–purpose system or as a system that performs extensive fixed–point and floating–point arithmetic.

Figure 4. The Model 520, Model 530, and Model 540 system units all use the same enclosure.

The IBM RISC System/6000 7013 POWERstation and POWERserver 520

The Model 520 is a multi–user, multi–tasking deskside model with expansion capabilities and ability to perform fixed–point and floating–point arithmetic.

The Model 520 can fulfill a variety of roles and can even be upgraded to a Model 530 if your needs change.

Features

The Model 520 has the following features:

- A 20–MHz IBM SGR 2032 Processor.
- 8 MB standard system memory, expandable to 128 MB total using the eight memory adapter slots. The unit can only use 8 or 16 MB cards.
- One 3.5–inch 1.44 MB standard internal diskette drive.
- 355 MB standard fixed–disk capacity provided by one 5.25–inch internal fixed disk. Capacity is expandable to 2571 MB DASD. The Model 520 system has three internal fixed–disk bays. Each bay can support one 5.25–inch fixed disk (355, 670, or 857 MB) or two 3.5–inch fixed disks (320 MB each, or 640 MB total). Selectable options allow you to upgrade the standard fixed disk to any of the drives or pairs of drives mentioned.
- Seven available Micro Channel adapter slots.
- One Small Computer Systems Interface (SCSI) adapter card, the IBM SCSI High–Performance I/O Controller, which occupies one of the eight Micro Channel adapter slots (Slot 8). The unit supports up to four SCSI controllers.
- Support for internal media devices. See "Reference Information" for supported internal media configurations. The following devices are available:
  - IBM Internal CD–ROM Drive
  - IBM 2.3 GB Internal 8mm Tape Drive.
- Support for external media devices, including the following:
  - IBM 4869 5 1/4–Inch 1.2 MB External Diskette Drive Model 2
  - IBM 7203 External Portable Disk Drive Model 1
  - IBM 7204 External Disk Drive Model 320
  - IBM 7207 150 MB External 1/4–Inch Cartridge Tape Drive Model 1
  - IBM 7208 2.3 GB External 8mm Tape Drive Model 1
  - IBM 7210 External CD–ROM Drive Model 1
  - IBM 9348 Magnetic Tape Unit Model 12.
- Two rollers on the bottom rear of the machine to facilitate moving.
- Rear–mounted lock, which can help provide physical security (front and rear locks are operated by the same key).

"Reference Information" contains physical, electrical, and environmental considerations for the system unit.

The IBM RISC System/6000 7013 POWERstation and POWERserver 530

The Model 530 system unit is a high–performance multi–user, multi–tasking deskside model with a faster processor than the Model 520. The Model 530 system is designed to be used as a general–purpose system or as a system that performs extensive fixed–point and floating–point arithmetic.

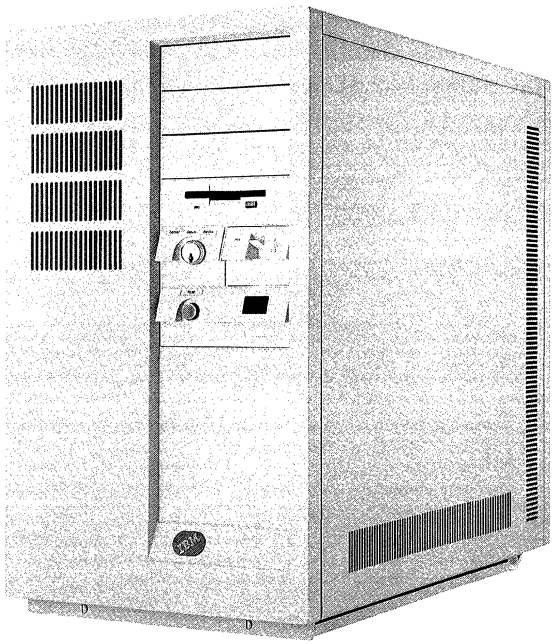


Figure 4. The Model 520, Model 530, and Model 540 system units all use the same enclosure.

Features

The Model 530 has the following features:

- A 25–MHz IBM SGR 2564 Processor.
- 16 MB standard memory (two 8 MB cards), expandable to 128 MB total using the eight memory adapter slots. The unit can only use 8 or 16 MB cards.
- One 3.5–inch 1.44 MB standard internal diskette drive.
- 355 MB standard fixed–disk capacity provided by one 5.25–inch internal fixed disk. Capacity is expandable to 2571 MB DASD. The Model 530 has three internal fixed–disk bays. Each bay can support one 5.25–inch fixed disk (355, 670, or 857 MB) or two 3.5–inch fixed disks (320 MB, or 640 MB total). Selectable options allow you to upgrade the standard fixed disk to any of the drives or pairs of drives mentioned.
- Seven available Micro Channel adapter slots.
- One Small Computer Systems Interface (SCSI) adapter card, the IBM SCSI High–Performance I/O Controller, which occupies one of the eight Micro Channel adapter slots (Slot 8). The unit supports up to four SCSI controllers.
- Support for internal media devices. See "Reference Information" for supported internal media configurations. The following devices are available:
  - IBM Internal CD–ROM Drive
  - IBM 2.3 GB Internal 8mm Tape Drive
- Support for external media devices, including the following:
  - IBM 4869 5 1/4–Inch 1.2 MB External Diskette Drive Model 2
  - IBM 7203 External Portable Disk Drive Model 1
  - IBM 7204 External Disk Drive Model 320
  - IBM 7207 150 MB External 1/4–Inch Cartridge Tape Drive Model 1
  - IBM 7208 2.3 GB External 8mm Tape Drive Model 1
  - IBM 7210 External CD–ROM Drive Model 1
  - IBM 9348 Magnetic Tape Unit Model 12.
- Two rollers on the bottom rear of the machine to facilitate moving.
- Rear–mounted lock, which can help provide physical security (front and rear locks are operated by the same key).

"Reference Information" contains physical, electrical, and environmental considerations for the system unit.

The IBM RISC System/6000 7013 POWERserver 540

The Model 540 system unit is a high–performance multi–user, multi–tasking deskside model with a 30–MHz processor. The system, which uses 4 Mbit technology, is designed to be used as a general purpose system or as a system that performs extensive fixed–point and floating–point arithmetic.

Features

The Model 540 has the following features:

- A 30–MHz IBM SGR 3064 Processor .
- 64 MB standard system memory (two 32 MB cards), expandable to 256 MB total through the eight memory adapter slots. The unit can only use 32 MB cards.
- One 3.5–inch 1.44 MB standard internal diskette drive.
- 640 MB standard fixed–disk capacity, provided by two 3.5–inch 320 MB internal fixed disks. Capacity is expandable to 2571 MB DASD. The Model 540 system has three internal fixed–disk bays. Each bay can support one 5.25–inch fixed disk (857 MB) or two 3.5–inch fixed disks (320 MB each, or 640 MB total). Selectable options allow you to upgrade the standard fixed disk to any of the drives or pairs of drives mentioned.
- Seven available Micro Channel adapter slots.
- One Small Computer Systems Interface (SCSI) adapter card, the IBM SCSI High–Performance I/O Controller, which occupies one of the eight Micro Channel adapter slots (Slot 8). The unit supports up to four SCSI controllers.
- Support for internal media devices. See "Reference Information" for supported internal media configurations. The following are available:
  - IBM Internal CD–ROM Drive
  - IBM 2.3 GB Internal 8mm Tape Drive.

- Support for external media devices, including the following:
  - IBM 4869 5 1/4–Inch 1.2 MB External Diskette Drive Model 2
  - IBM 7203 External Portable Disk Drive Model 1
  - IBM 7204 External Disk Drive Model 320
  - IBM 7207 150 MB External 1/4–Inch Cartridge Tape Drive Model 1
  - IBM 7208 2.3 GB External 8mm Tape Drive Model 1
  - IBM 7210 External CD–ROM Drive Model 1
  - IBM 9348 Magnetic Tape Unit Model 12.
- Two rollers on the bottom rear of the unit to facilitate moving.
- Rear–mounted lock, which can help provide physical security (front and rear locks are operated by the same key).

"Reference Information" contains physical, electrical, and environmental considerations for the system unit.

The IBM RISC System/6000 7016 POWERstation 730

The Model 730 is a deskside model designed for engineering and scientific graphics applications. The Model 730 is functionally comparable to the Model 530, but with extensive graphics capabilities added.

Graphics Functions

The high–performance Graphics Subsystem is incorporated into the Model 730 system unit.

Three features are prominent in the list of the subsystem's capabilities. The Floating Point Graphics Protocol (FPGP) enables realistic rendering of images by performing such functions as transformations, lighting calculations, and hidden line or surface removal.

Non–Uniform Rational B–Splines (NURBS), a mathematical function, facilitates the generation of curves and surfaces that are more precise, are less affected by changes in scale, and are represented in a compact data form. NURBS allows you to execute such functions as trimming and preprocessing of the shading model.

The Shading Processor heightens the visual realism of a displayed image. The processor provides hardware support for applications that can shade polygons, surfaces, or trimmed surfaces using either flat facet (Constant) or smooth (Gouraud) shading; eliminate hidden lines and surfaces prior to displaying an image; and calculate local and ambient lighting effects. It also facilitates depth cueing and the use of transparency modes.

The Graphics Subsystem also features the following:

- Ability to execute high–speed transformations for 3D graphics
- High–speed shading/lighting calculation
- 32–bit floating–point architecture
- Support for 16.7 million color palette
- Micro Channel considerations:
  - Memory slave
  - 32–bit data and address widths
  - Support for data and address parity
  - Machine–readable Vital Product Data (VPD).

The base pixel memory provides 8–bit double–buffering and 8–bit color capability.

The Expanded Pixel Memory Option provides 24–bit double buffering and 24–bit true color capability.

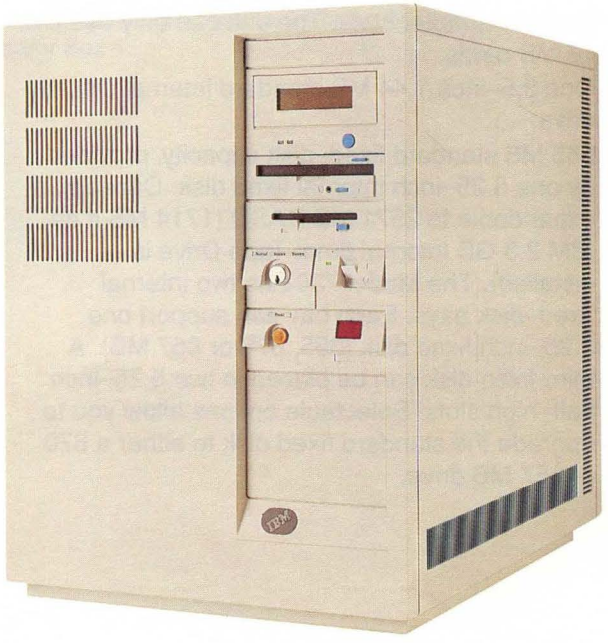


Figure 5. The POWERstation 730, with an optional 8mm tape drive and CD–ROM drive.

Considerable local processing capability increases the adapter's speed and precision. Separate processors within the adapter facilitate efficient handling of diverse tasks, such as vector draw operation, shading calculations, and graphics and interface processing.

The IBM 6094 Model 10 Dials, the IBM 6094 Lighted Programmable Function Keyboard Model 20, the IBM 5083 Tablet (Models 21 and 22), and the IBM 5084 Digitizer (Models 1, 2, and 3) can be used to help enhance graphics capabilities.

The following products support programming to the graphics subsystem.

- IBM AIX Personal graPHIGS Programming Interface/6000 licensed program
- IBM AIXwindows Environment/6000 licensed program.

The subsystem can be used with the IBM 5081 Color Display, Model 16, and the IBM 6091 Color Display, Models 19 and 23.

Features

- A 25–MHz IBM SGR 2564 Processor.
- 16 MB standard system memory (two 8 MB cards), expandable to 128 MB through the eight memory adapter slots. The unit can only use 8 or 16 MB cards.
- One 3.5–inch 1.44 MB standard internal diskette drive.
- 355 MB standard fixed–disk capacity, provided by one 5.25–inch internal fixed disk. Capacity is expandable to 2571 MB DASD (1714 MB if an IBM 2.3 GB Internal 8mm Tape Drive is installed). The Model 730 has two internal fixed–disk bays. Each bay can support one 5.25–inch fixed disk (355, 670 or 857 MB). A third fixed disk can be placed in two 5.25–inch half–high slots. Selectable options allow you to upgrade the standard fixed disk to either a 670 or 857 MB drive.
- Six available Micro Channel adapter slots.
- One Small Computer Systems Interface (SCSI) adapter card, the IBM SCSI High–Performance I/O Controller, which occupies one of the eight Micro Channel adapter slots (Slot 8). The unit supports up to four controllers.
- One Graphics Subsystem Adapter,which links the graphics subsystem to the system I/O board and occupies one Micro Channel Adapter slot.
- Support for internal media devices. See "Reference Information" for supported internal media configurations. The following are available:
  - IBM Internal CD–ROM Drive
  - 2.3 GB Internal 8mm Tape Drive
  - 355, 670, or 857 MB drive.
- Support for external media devices, including the following:
  - IBM 4869 5 1/4–Inch 1.2 MB External Diskette Drive Model 2
  - IBM 7203 External Portable Disk Drive Model 1
  - IBM 7204 External Disk Drive Model 320
  - IBM 7207 150 MB External 1/4–Inch Cartridge Tape Drive Model 1
  - IBM 7208 2.3 GB External 8mm Tape Drive Model 1
  - IBM 7210 External CD–ROM Drive Model 1
  - IBM 9348 Magnetic Tape Unit Model 12.
- Keyboard
- Four nylon glides, one on each bottom corner of the unit, to facilitate moving.
- Rear–mounted lock, which can help provide physical security (front and rear locks are operated by the same key).
- Optional IBM Graphics Input Device Adapter, which occupies any of the six available Micro Channel adapter slots.

"Reference Information" contains physical, electrical, and environmental considerations for the system unit.

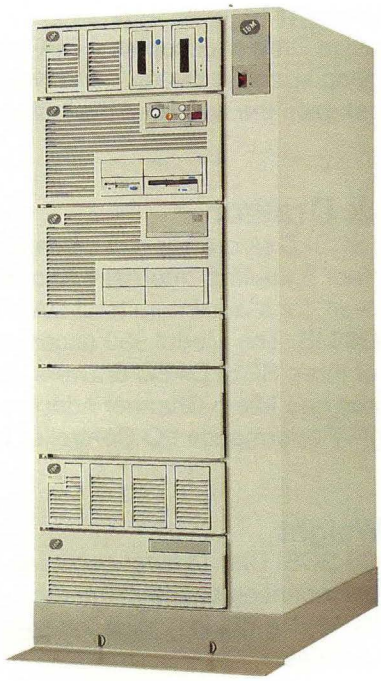


Figure 6. The rack–mounted Model 930 system unit with optional Async Expansion Drawer and SCSI Disk Drawer.

The IBM RISC System/6000 7015 POWERserver 930

The Model 930 system unit is a configuration of high–performance rack–mounted units that fit in a 1.6–m rack. It is designed to support engineering, scientific, and large multi–user file server applications.

Features

The Model 930 features the following:

- One 1.6–m (5.3–ft) rack, which meets the EIA–310C standard.
- One Processor Drawer (see "Processor Drawer" for extensive list of features).
- One Power Distribution Unit.
- One SCSI Device Drawer with an IBM 2.3 GB Internal 8mm Tape Drive and 670 MB of standard fixed–disk capacity. With a selectable option, the drawer can come with an 857 MB drive instead of a 670 MB drive.
- Support for a maximum of four optional drawers:
  - Up to three SCSI Disk Drawers (with either 670 or 857 MB drives), for a maximum total of 11998 MB DASD per system unit
  - One IBM 1/2–Inch 9–Track Tape Drive Drawer or one Async Expansion Drawer (the two are mutually exclusive).
- Support for a maximum of five IBM SCSI High–Performance I/O Controllers.
- Optional battery backup for the Processor Drawer and two other drawers (excluding the 1/2–Inch 9–Track Tape Drive Drawer).

"Reference Information" contains physical, electrical, and environmental considerations for the system unit.

The following sections describe the components of the Model 930.

Model 930 Rack

The rack is an industry–standard 19–inch rack that is designed to comply with the EIA–310C standard and contains 32 EIA units of vertical mounting space.

The rack has an immediate power off switch.

Power Distribution Unit

The Model 930 Power Distribution Unit provides six AC power outlets for the drawers mounted in the rack.

Size and Weight

The Model 930 Power Distribution Unit occupies 4 EIA units of vertical mounting space in the rack and weighs 5.0 kg (11 lbs).

Battery Backup Unit

The Battery Backup Unit provides up to 1500 watts of standby power to three drawers for a minimum of ten minutes. The three drawers include the Processor Drawer and two other drawers (excluding the 1/2–Inch 9–Track Tape Drive Drawer).

A keyed appliance cord, which replaces the standard 220–volt AC appliance cord, distributes 300 volts DC with no change to the drawer power supply.

Size and Weight

The Model 930 Battery Backup unit overlaps the power distribution unit. The unit weighs 45 kg (100 lbs).

Processor Drawer

The Model 930 system comes with one Processor Drawer featuring the following:

- A 25–MHz IBM SGR 2564 Processor.
- 16 MB standard memory (two 8 MB cards), expandable to 128 MB through the eight memory card slots. With a selectable option, the unit can come with 32 MB memory (two 16 MB cards). The drawer can only use 8 or 16 MB cards.
- One 3.5–inch 1.44 MB standard internal diskette drive.
- Two EIA–232D asynchronous serial ports.
- One IBM Internal CD–ROM Drive.
- Seven available Micro Channel adapter slots.
- One Small Computer Systems Interface (SCSI) adapter, the SCSI High–Performance I/O Controller, which occupies one of the eight Micro Channel adapter slots (Slot 8). The drawer supports up to five SCSI controllers.
- A self–contained 460–Watt power supply with cooling.
- Support for one of the following optional half–high 5.25–inch internal devices:
  - IBM 5 1/4–Inch Diskette Drive
  - Second CD–ROM Drive
  - IBM 150 MB Internal 1/4–Inch Cartridge Tape Drive.

Size and Weight

The Model 930 Processor Drawer occupies 6 EIA units of vertical mounting space in the rack and, with the standard configuration, weighs 25 kg (55 lbs).

SCSI Device Drawer

The SCSI Device Drawer, which comes standard with the Model 930, provides power, packaging, and cabling for various supported SCSI devices to attach to the Model 930. The drawer comes with a 2.3 GB Internal 8mm Tape Drive and 670 MB standard DASD provided by one 5.25–inch internal fixed disk. With a selectable option, the drawer can come with an 857 MB drive. Up to two additional devices are supported, including one 2.3 GB Internal 8mm Tape Drive and one 670 or 857 MB DASD drive.

The drawer attaches to the RISC System/6000 system units using a SCSI High–Performance I/O Controller plugged into a Processor Drawer Micro Channel adapter slot.

Size and Weight

The SCSI Device Drawer occupies 4 EIA units of vertical mounting space in the rack and weighs 13.6kg (30 lbs), plus the weight of the installed devices.

SCSI Disk Drawer

The optional SCSI Disk drawer can contain a maximum of four 5.25–inch internal 670 or 857 MB fixed–disk drives, for a maximum total DASD per drawer of 3428 MB. The Model 930 accommodates a maximum of three SCSI DASD drawers. Each drawer requires one Micro Channel Adapter slot for the SCSI High–Performance I/O Controller which is included.

Size and Weight

The Model 930 SCSI Disk Drawer occupies 4 EIA units of vertical mounting space in the rack. The drawer weighs 13.6kg (30 lbs), plus the weight of the installed devices.

Async Expansion Drawer

The Async Expansion Drawer, using the IBM Async Expansion Adapter, connects to the Model 930.

The Async Expansion Drawer provides eight asynchronous expansion slots for the Model 930 system unit. The system can have a total of fourteen asynchronous adapters, the total including those in the Processor Drawer and those in the Async Expansion Drawer. You can have up to eight 8– or 16–port adapters, and up to eight 64–port controllers.

The Async Expansion Adapter extends only those I/O bus signals necessary to support 8–, 16–, and 64–port asynchronous adapters.

The system unit can have either an Async Expansion Drawer or a IBM 1/2–Inch 9–Track Tape Drive Drawer. The two are mutually exclusive.

The adapter has the following Micro Channel considerations:

- Memory and I/O slave
- 16–bit data width
- 24–bit address width
- Requires bus refresh
- Support for data and address parity
- Machine–readable Vital Product Data (VPD).

The adapter requires one Micro Channel adapter slot in the Processor Drawer. The cable required to connect the drawer to the adapter is furnished with the drawer.

Note: For best system performance, asynchronous adapters should be placed in any available Processor Drawer slots before using the Async Expansion Drawer slots.

Size and Weight

The Async Expansion Drawer occupies 6 EIA units of vertical mounting space in the rack and, when empty, weighs 20.5 kg (45 lbs).

1/2–Inch 9–Track Tape Drive Drawer

The 1/2–Inch 9–Track Tape Drive Drawer contains an auto–loading, autothreading, reel–to–reel tape drive that features the following:

- Standard 9–track tape interchange plus fast Save/Restore
- IBM standard 9–track recording format (8 data plus parity)
- Selectable tape density: 6250 bpi (GCR Mode) or 1600 bpi (PE Mode)
- 1 MB buffer
- Tape speed: 123 ips (GCR Mode), 130 ips (PE Mode)
- Nominal Data Throughput Rate of 768 KB/sec (GCR Mode), 208 KB/sec (PE Mode).

The drive requires one Micro Channel adapter slot. The system can have either a 1/2–Inch 9–Track Tape Drive Drawer or an Async Expansion Drawer. The two are mutually exclusive.

The 1/2–Inch 9–Track Tape Drive Drawer does not have support for battery backup operation.

Size and Weight

The 1/2–Inch 9–Track Tape Drive Drawer occupies 6 EIA units of vertical mounting space in the rack and weighs 39 kg (85 lbs).

IBM Xstation 120

The Xstation 120 is a LAN–attached X–server station based on the X Window System Version 11 Release 3 model. It functions on a number of all–points–addressable monitors and offers flexible configuration options, including expanded video and system memory, and color capability (expandable to 256 colors). The station consists of a desktop system unit, a keyboard and a 3–button mouse. A monitor is purchased separately.

X–server software must be downloaded to the station from a host. The host software requirements for the RISC System/6000 system include the IBM AIX Xstation Manager/6000 licensed program, the IBM AIXwindows Environment/6000 licensed program, and the IBM AIX Version 3 for RISC System/6000 licensed program (with TCP/IP installed).

Figure 7. The Xstation 120 shown here consists of a 101–key keyboard, a 3–button mouse, and an optional 6091 Color Display, Model 19.

The Xstation 120 features the following:

- X Window System Version 11 Release 3–compatible server software
- One 80186 8–megahertz I/O processor with 512KB DRAM
- One 50–megahertz 34010 graphics processor with 512 KB VRAM (video frame buffer) and 512 KB DRAM (window management)
- 2 KB of non–volatile memory for configuration and network error logging
- One serial printer port, with a data rate of up to 19.2K bps
- One parallel printer port
- One keyboard port (keyboard is standard)
- One mouse port (3–button mouse is standard)
- One Ethernet IEEE 802.3 port (thick or thin with jackscrew connectors), with a communication rate of 10M bps
- One Token–Ring slot
- One display port, for use by the following supported displays:
  - 5081 Model 16 (with RPQ 8K1700)
  - 6091 Model 19
  - 8503
  - 8507
  - 8508
  - 8512
  - 8513
  - 8514.
- Domestic and international models (with the latter, the user can choose among 11 languages, including U.S. English, for use in diagnostics).

The following options are available:

- 1 and 2 MB Memory Expansion Kits:
  - maximum of 4 options installed
  - usable in any combination
  - maximum memory expansion of 4.5 to 8.5 MB.
- 512K Video Memory Upgrade Kit (expandable to 1 or 2 MB)
- IBM Token–Ring Network 16/4 Adapter/A (with Riser Card)
- Cable for 6091 monitor attachment.

"Reference Information" contains physical, electrical, and environmental considerations for the Xstation 120.

Displays

IBM 5081 Color Display Model 16

The 5081 Model 16 is a high–resolution color analog display designed for applications that create detailed or large images, such as graphics applications. The display includes a tilt–swivel pedestal and can be used with all system units except the Model 930.

The 5081 Model 16 screen, which measures 16 inches diagonally, has a resolution of 1280 by 1024 pixels and a 60–hertz non–interlaced refresh rate.

The display requires Request for Price Quotation (RPQ) number 8K1679 for attachment to the RISC System/6000 system unit.

RISC System/6000 Attachment

The IBM 5081 Model 16 attaches to RISC System/6000 system units using an IBM Display Adapter Cable to an IBM Color Graphics Display Adapter, one of the IBM 3D graphics adapters, or the Graphics Subsystem Adapter in the Model 730. For more information on the Display Adapter Cable, see "Cables and Cable Assemblies."

IBM 6091 Color Display Model 19

The 6091 Color Display Model 19 is a high–resolution color analog display that provides powerful graphics capabilities and outstanding image quality. It can be used with all RISC System/6000 system units except the Model 930. The display features a built–in tilt and swivel base and an anti–reflective screen.

The 6091 Color Display Model 19 screen, which measures 19 inches diagonally, provides three display formats: 1024 by 1024 pixels or 1280 by 1024 pixels at a 60–hertz non–interlaced refresh rate, or 1280 by 1024 pixels at a 67–hertz non–interlaced refresh rate. The RISC System/6000 system units only support the 1280 by 1024 pixels at a 60–hertz non–interlaced refresh rate.

RISC System/6000 Attachment

The 6091 Color Display Model 19 attaches to RISC System/6000 system units using an IBM Display Adapter Cable to either an IBM Color Graphics Display Adapter or to one of the IBM 3D graphics adapters. For more information on the Display Adapter Cable, see "Cables and Cable Assemblies."

IBM 6091 Color Display Model 23

The 6091 Color Display Model 23 is a high–resolution color display that can be used with all system units except the Model 930. The screen, which measures 23 inches diagonally, offers a large viewing area that provides greater image magnification than smaller screen sizes. The display features a built–in tilt base and an anti–reflective screen.

The display provides two display formats: 1024 by 1024 pixel or 1280 by 1024 pixels at a 60–hertz non–interlaced refresh rate. The RISC System/6000 system units only support the 1280 by 1024 pixels at a 60–hertz non–interlaced refresh rate.

RISC System/6000 Attachment

The 6091 Color Display Model 23 attaches to most of the RISC System/6000 system units using an IBM Display Adapter Cable to either a IBM Color Graphics Display Adapter or to one of the IBM 3D graphics adapters.

The display attaches to the Model 730 using a Display Adapter Cable to the Graphics Subsystem Adapter. For more information on the Display Adapter Cable, see "Cables and Cable Assemblies."

IBM 8508 Monochrome Display

The 8508 Monochrome Display is an analog, white phosphor, raster display measuring 19 inches diagonally. The display has 1280 by 1024 pixels and a 67–hertz non–interlaced analog interface.

The display includes a tilt–swivel base and a low–glare screen.

RISC System/6000 Attachment

The 8508 Monochrome Display attaches to RISC System/6000 system units using a 1.8–m (6–ft) built–in cable with a 15–pin female Mini D Connector. The cable connects to the IBM Grayscale Graphics Display Adapter.

Other Supported IBM Displays

The IBM 5081 Model 19, no longer available through IBM, is supported. The display requires Request for Price Quotation (RPQ) number 8K1680 to attach to a RISC System/6000 system unit.

ASCII Terminals

IBM 3151 ASCII Display Station

The 3151 ASCII Display Station is a stand–alone, 14–inch monochrome display station used for displaying up to 3,300 characters, and for entering data into and retrieving data from a host processor. The 3151 display stations provide an asynchronous communication interface with a 7–bit or 8–bit word length, using EIA–232D (CCITT V.24/28) interface or EIA–422A (CCITT V.11) interface. The RISC System/6000 system units support Models 11X, 31X, 41X, and the new 51X and 61X.

The 3151 display stations provide a native mode, 3101 mode, and various emulation modes, which are used to attach to a variety of host processors.

The display stations support transmission speeds from 50 to 38.4 K bps on EIA–232D and EIA–422A interfaces. The data stream is ISO 646 (ANSI X3.4). The displays are 80/132 column format with 25 lines.

The display stations feature the following:

- Etched screen, which minimizes glare and fingerprints
- Native mode compatibility with the 3161 and 3162 display stations
- 24 or 25 lines of data display, plus one line display for operator indicator.

RISC System/6000 Attachment

The 3151 attaches to the system unit standard serial port using an IBM Async Cable–EIA–232/V.24 with a Printer/Terminal Interposer–EIA–232, or to an 8–, 16–, or 64–port asynchronous adapter port using a Terminal Cable–EIA–422A or an Async Cable–EIA–232/V.24 with a Printer/Terminal Interposer–EIA–232.

IBM 3163 ASCII Display Station

The 3163 ASCII Display Station is a stand–alone, 12–inch monochrome display station used for displaying up to 1,920 characters and for entering data into and retrieving data from a host processor.

The 3163 provides an asynchronous communication interface with a 7–bit or 8–bit word length, using EIA–232D (CCITT V.24/V.28) interface and EIA–422A (CCITT V.11) interface.

The 3163 uses the ASCII (ISO) communication protocols and provides a native mode, 3101 mode, DEC VT–100/52 mode, and TeleVideo 950 mode, which allow the 3163 to attach to a variety of host processors.

The 3163 features the following:

- Advanced editing functions
- Upward compatibility from the 3161 native mode
- Etched screen, which minimizes glare and fingerprints.

RISC System/6000 Attachment

The 3163 attaches to the system unit standard serial port using an IBM Async Cable–EIA–232/V.24 with a Printer/Terminal Interposer–EIA–232, or to an 8–, 16–, or 64–port asynchronous adapter port using a Terminal Cable–EIA–422A or an Async Cable–EIA–232/V.24 with a Printer/Terminal Interposer–EIA–232.

IBM 3164 ASCII Color Display Station

The 3164 ASCII Color Display Station is a stand–alone, 14–inch color display station used for displaying up to 1,920 characters, and for entering data into and retrieving data from a host processor. The 3164 provides an asynchronous communication interface with a 7–bit or 8–bit word length, using the EIA–232D (CCITT V.24/V.28) interface and the EIA–422AA (CCITT V.11) interface. The 3164 provides the advanced editing functions of the IBM 3163 and is upwardly compatible from the IBM 3161 or 3163 native modes and displays both the foreground and the background in up to 8 colors.

When using the EIA–232D (CCITT V.24/V.28) interface, the 3164 can directly attach to a host processor within 12.2 m (40 ft) at 50 to 19,200 bps, or can communicate point–to–point to a remote host processor through an external modem.

The 3164 Models 12X/22X can communicate to the host processor, without a modem, up to 1,219 m (4,000 ft) at 50 to 19,200 bps depending on the type of cable used when using the EIA–422AA (CCITT V.11) interface. For EIA–422AA, a shielded communication cable is recommended.

RISC System/6000 Attachment

The 3164 attaches to the system unit standard serial port using an IBM Async Cable–EIA–232/V.24 with a Printer/Terminal Interposer–EIA–232, or to an 8–, 16–, or 64–port asynchronous adapter port using a Terminal Cable–EIA–422A or an Async Cable–EIA–232/V.24 with a Printer/Terminal Interposer–EIA–232.

Other Supported IBM ASCII Terminals

- IBM 3161 ASCII Display Station (no longer available through IBM)
- IBM 3162 ASCII Display Station (no longer available through IBM).

Support for Non–IBM ASCII Terminals

The following meet competitive and non–IBM coexistence requirements:

- WYSE 30, 50, 60, 350 terminals (ANSI X3.64 terminals that use EIA–232D or EIA–422A interfaces)
- DEC VT 100, 220, 240, 320, 330 terminals (ANSI X3.64 terminals that use EIA–232D/422A interfaces).

National Language Support

National language support for IBM ASCII terminals is provided through the 8859/1.2 Cartridge installed in a 3151, 3161, 3162, 3163, or 3164.

Keyboards

IBM Keyboard–U.S.101 Keys

A 101–key keyboard, engraved with U.S. English characters, is optional on most models available in the United States. The keyboard has a speaker.

RISC System/6000 Attachment

The 101–key keyboard connects to the RISC System/6000 keyboard port using a 2.75–m (9–ft) detachable cable with a 6–pin MINI–DIN connector.

IBM Keyboard–102 Keys

A 102–key keyboard is optional on most models. The keyboard has a speaker.

The RISC System/6000 system units support keyboard engravings for the following languages:

- U.K. English
- Belgian–French/Dutch
- Canadian–French
- Danish
- Finnish/Swedish
- French
- German
- Italian
- Norwegian
- Portuguese
- Spanish
- Swiss–French/German.

RISC System/6000 Attachment

The 102–key keyboard connects to the RISC System/6000 keyboard port using a 2.75–m (9–ft) detachable cable with a 6–pin MINI–DIN connector.

IBM Keyboard–106 Keys

The 106–key keyboard is used primarily in Japan to enter Kanji characters into the RISC System/6000 system unit. It is optional on most models.

The keyboard can toggle among the following:

- Japanese (English)
- Japanese (Katakana)
- Japanese (Hiragana).

RISC System/6000 Attachment

The 106–key keyboard connects to the RISC System/6000 keyboard port using a 2.75–m (9–ft) cable with a 6–pin MINI–DIN connector.

Pointing and Locator Devices

IBM 3–Button Mouse

The opto–mechanical 3–Button Mouse allows users to point to and select items on a display. The cover on the mouse snaps off for routine cleaning of the roller ball.

RISC System/6000 Attachment

The mouse connects to the system unit mouse port using a 2.75–m (9–ft) detachable cable with a 6–pin MINI–DIN connector. The mouse adapter is built into the RISC System/6000 system unit.

Tablets, Dials, and Lighted Programmable Function Keyboard

IBM 5083 Model 21 CursorPad Tablet and Model 22 Tablet

The 5083 is a flat–surfaced device that enables the user to interact with a displayed image by moving a cursor or a stylus on the tablet's active surface. The 5083 Tablet is designed to be an easy–to–use input device for graphics applications. The tablet has a palm rest and a snap–on height adjustment, so that it can be used on a desk or on the user's lap.

The 5083 models have the following active surface areas:

Model	Active Surface Area
Model 21	156 by 156 mm (6.1 by 6.1 in.)
Model 22	256 by 256 mm (10.25 by 10.25 in.).

The 5083 Tablet features the following:

- Programmable resolution of up to 1279 lines per inch
- A full sheet Menu–Holder Overlay
- Support for either a 4–button cursor or a stylus. (The cursor and stylus cannot be used concurrently.)

Hardware Requirements

The 5083 Tablet requires either a cursor or a stylus as an input device. The following input devices are available:

4–button cursor	A mouse–shaped device with four buttons for application use and a fine cross–hair for precise alignment and accurate digitization.
stylus	A pen–like device with a tip switch that is activated by pressing the stylus tip against the tablet surface.

RISC System/6000 Attachment

The tablet attaches to the RISC System/6000 system unit using the standard tablet port. The tablet comes with a 2.1–m (7–ft) detachable cable with 8–pin MINI DIN connectors on each end.

IBM 6094 Model 10 Dials

The 6094 Model 10 Dials are a compact, desktop unit with eight cone–shaped controls that allow the user to dynamically pan, zoom, and rotate two– and three–dimensionally displayed images. Manipulation of the dials becomes scalar input to the application program running on the attached host.

RISC System/6000 Attachment

The 6094 Model 10 attaches to the RISC System/6000 IBM Graphics Input Device Adapter using a 2.1–m (7–ft) cable with an 8–pin MINI–DIN connector.

IBM 6094 Lighted Programmable Function Keyboard Model 20

The 6094 Lighted Programmable Function Keyboard Model 20 is a 32–key desktop unit that provides interactive capability with graphics objects. The keys are controlled by the application and the functions the keys control are defined by the user.

RISC System/6000 Attachment

The 6094 Lighted Programmable Function Keyboard Model 20 attaches to the RISC System/6000 IBM Graphics Input Device Adapter using a 2.1–m (7–ft) cable with an 8–pin MINI–DIN connector.

Digitizers

IBM 5084 Digitizer, Models 1, 2, and 3

The 5084 Digitizer provides large–scale digitizing capabilities. The three 5084 models have the following active surface areas:

Model	Active Surface Area
Model 1	610 X 915 mm (24 X 36 in.)
Model 2	915 X 1220 mm (36 X 48 in.)
Model 3	1120 X 1525 mm (44 X 60 in.).

The 5084 Digitizer features the following:

- Resolution of up to 1279 lines per inch
- Programmable command set
- Support for both binary and ASCII output data formats
- Support for use with the IBM 5083 Tablet
- Cursor with 16 buttons and four indicator lights
- Two programmable audible tones
- Power supply/line cords.

The Asynchronous Communications Device Driver, part of the IBM AIX Version 3 for RISC System/6000 licensed program, supports programming to the 5084 Digitizer.

RISC System/6000 Attachment

The 5084 Digitizer attaches to the RISC System/6000 system unit using any EIA–232D port connection. The digitizer uses a 3.7–m (12–ft) EIA–232 Interface Cable with 25–pin connector for attachment.

Printers

IBM 3812 Model 2

The 3812 Model 2 is a non–impact page printer that can be used for departmental letter–quality printing applications. It can print up to 12 pages per minute.

The 3812 Model 2 features the following:

- PMP and PC ASCII data streams
- 240 DPI print resolution
- Two input drawers
- 1 MB of memory, usable for either printer operations or resident font storage
- Support for 62 fonts
- Language Group diskettes for a variety of languages.

RISC System/6000 Attachment

The printer attaches to the RISC System/6000 system unit using an IBM Async Cable–EIA–232/V.24 (with a Printer/Terminal Interposer EIA–232) to a standard serial port or to an IBM 8–, 16–, or 64–port EIA–232D adapter port. The printer can also attach to an IBM 8– or 16–Port Async Adapter – EIA–422A port, but the customer must provide the cable. For more information on the Async Cable–EIA–232/V.24, see "Cables and Cable Assemblies."

IBM 3816 Model 01S

The 3816 is a letter–quality, non–impact printer that can print up to 24 pages per minute. It is a heavy–duty printer designed for an average use of 40,000 pages per month of letter–quality printing. The printer offers 1.5 MB of memory for printer operations and resident font storage and 2 MB for page map storage.

The 3816 is compatible with the IBM 5202 Model 2 Quietwriter III and features the following:

- PMP and PC ASCII data streams
- 240 DPI print resolution
- Two input drawers
- Label and card stock printing capability
- Support for 61 fonts
- Quiet operation (53 dBA).

RISC System/6000 Attachment

The 3816 Model 01S attaches to the RISC System/6000 system unit using an IBM Async Cable–EIA–232/V.24 (with a Printer/Terminal Interposer EIA–232) to a standard serial port or to an IBM 8–, 16–, or 64–port EIA–232D adapter port. The printer can also attach to an IBM 8– or16–Port Async Adapter – EIA–422Aport, but the customer must provide the cable. For more information on the Async Cable–EIA–232/V.24, see "Cables and Cable Assemblies."

IBM 4019 LaserPrinter

The 4019 LaserPrinter is a desktop laser printer that has a single–element operator–replaceable print cartridge. Its speed, function, and extensive font and paper–handling features make the 4019 LaserPrinter an excellent workstation page printer. The printer can print up to 10 pages per minute.

The printer features the following:

- Data stream: PC ASCII, HP Laserjet Series II emulation, and Plotter emulation (IBM 7372 and HP 7475A Color Plotters)
- 300 DPI print resolution
- 512 KB standard memory, expandable to 4 MB
- Two font card slots
- Second Drawer and Envelope Feed options.

RISC System/6000 Attachment

The 4019 LaserPrinter attaches to the RISC System/6000 system unit using an IBM PC Parallel Printer Cable to the standard parallel port. With the printer's serial interface adapter, the printer can attach using an IBM Async Cable–EIA–232/V.24 (with a Printer/Terminal Interposer EIA–232) to a standard serial port or to an IBM 8–, 16–, or 64–port EIA–232D adapter port. For high graphics applications in a multiuser environment, serial connection is recommended. For more information

on the Async Cable–EIA–232/V.24, see "Cables and Cable Assemblies."

IBM 4201 Model 2 Proprinter II

The 4201 Model 2 Proprinter II provides high–speed, narrow–carriage, desk–top printer operation.

The printer features the following:

- PC ASCII data stream
- 240/200/50 cps (Fast Font/Draft/Near–Letter Quality)
- Parallel interface standard, or optional serial EIA–232D interface
- 256–character downloadable font capability
- 8–inch print line.

RISC System/6000 Attachment

The 4201 Model 2 attaches to the RISC System/6000 system unit using an IBM PC Parallel Printer Cable to the standard parallel port. With the Serial Interface option installed, the printer can attach using an IBM Async Cable–EIA–232/V.24 (with a Printer/Terminal Interposer EIA–232) to a standard serial port or to an IBM 8–, 16–, or 64–port EIA–232D adapter port. For more information on the PC Parallel Printer Cable or the Async Cable–EIA–232/V.24, see "Cables and Cable Assemblies."

IBM 4201 Model 3 Proprinter III

The 4201 Model 3 Proprinter III provides low–cost, dot–matrix printer operation.

The printer features the following:

- PC ASCII data stream
- 320/270/65 cps (Fast Font/Draft/Near–Letter Quality)
- Parallel interface standard, or optional serial interface (EIA–232 or EIA–422A)
- 7 KB print buffer expandable to 32 KB
- IBM Multilingual Character Set (Code Page 850) resident
- Single–bin sheet feed option
- 8–inch print line.

RISC System/6000 Attachment

The 4201 Model 3 Proprinter III attaches to the RISC System/6000 system unit using an IBM PC Parallel Printer Cable to the standard parallel port. With the Serial Interface option installed, the printer can attach using an IBM Async Cable–EIA–232/V.24 (with a Printer/Terminal Interposer EIA–232) to a standard serial port or to an IBM 8–, 16–, or 64–port EIA–232D adapter port. The printer can also attach to an IBM 8– or 16–Port Async Adapter – EIA–422A port, but the customer must provide the cable. For more information on the PC Parallel Printer Cable and Async Cable–EIA–232/V.24, see "Cables and Cable Assemblies."

IBM 4202 Model 2 Proprinter XL

The 4202 Model 2 Proprinter XL provides high–speed, wide–carriage, desk–top printer operation.

The printer features the following:

- PC ASCII data stream
- 240/200/50 cps (Fast Font/Draft/Near–Letter Quality)
- Parallel interface standard, or optional serial EIA–232D interface
- 256–character downloadable font capability
- 13.6–inch print line.

RISC System/6000 Attachment

The 4202 Model 2 attaches to the RISC System/6000 system unit using an IBM PC Parallel Printer Cable to the standard parallel port. With the Serial Interface option installed, the printer can attach using an IBM Async Cable–EIA–232/V.24 (with a Printer/Terminal Interposer EIA–232) to a standard serial port or to an IBM 8–, 16–, or 64–port EIA–232D adapter port. For more information on the PC Parallel Printer Cable or the Async Cable–EIA–232/V.24, see "Cables and Cable Assemblies."

IBM 4202 Model 3 Proprinter XL

The 4202 Model 3 Proprinter XL provides high–speed, wide–carriage, desk–top printer operation.

The printer features the following:

- PC ASCII data stream
- 320/270/65 cps (Fast Font/Draft/Near–Letter Quality)
- Parallel interface standard, or optional serial interface (EIA–232D or EIA–422A)
- 7 KB print buffer expandable to 32 KB
- IBM Multilingual Character Set (Code Page 850) resident
- Single–bin sheet feed option
- 8–inch print line.

RISC System/6000 Attachment

The 4201 Model 3 Proprinter III attaches to the RISC System/6000 system unit using an IBM PC Parallel Printer Cable to the standard parallel port. With the Serial Interface option installed, the printer can attach using an IBM Async Cable–EIA–232/V.24 (with a Printer/Terminal Interposer EIA–232) to a standard serial port or to an IBM 8–, 16–, or 64–port EIA–232D adapter port. The printer can also attach to an IBM 8– or 16–Port Async Adapter – EIA–422A port, but the customer must provide the cable. For more information on the PC Parallel Printer Cable and Async Cable–EIA–232/V.24, see "Cables and Cable Assemblies."

IBM 4207 Proprinter X24E Model 2

The 4207 Proprinter X24E Model 2 is a high–speed, letter–quality printer.

The printer features the following:

- PC ASCII data stream
- 240/80 cps (Data Processing/Letter Quality)
- Parallel interface standard, or optional serial interface (EIA–232D or EIA–422A)
- 14 KB print buffer
- Optional Auto Sheet Feed.

RISC System/6000 Attachment

The 4207 attaches to the RISC System/6000 system unit using an IBM PC Parallel Printer Cable to the standard parallel port. With the Serial Interface option installed, the printer can attach using an IBM Async Cable–EIA–232/V.24 (with a Printer/Terminal Interposer EIA–232) to a standard serial port or to an IBM 8–, 16–, or 64–port EIA–232D adapter port. The printer can also attach to an IBM 8– or 16–Port Async Adapter – EIA–422A port, but the customer must provide the cable. For more information on the PC Parallel Printer Cable and the Async Cable–EIA–232/V.24, see "Cables and Cable Assemblies."

IBM 4208 Proprinter XL24E Model 2

The 4208 Proprinter XL24E Model 2 is a high–speed, wide–carriage, letter–quality printer.

The printer features the following:

- PC ASCII data stream
- 240/80 cps (Data Processing/Letter Quality)
- Parallel interface standard, or optional serial interface (EIA–232 or EIA–422)
- 14 KB print buffer
- 13.6–inch print line
- Optional Auto Sheet Feed.

RISC System/6000 Attachment

The 4208 Model 2 attaches to the RISC System/6000 system unit using an IBM PC Parallel Printer Cable to the standard parallel port. With the Serial Interface option installed, the printer can attach using an IBM Async Cable–EIA–232/V.24 (with a Printer/Terminal Interposer EIA–232) to a standard serial port or to an IBM 8–, 16–, or 64–port EIA–232D adapter port. The printer can also attach to an IBM 8– or 16–Port Async Adapter – EIA–422A port, but the customer must provide the cable. For more information on the PC Parallel Printer Cable and the Async Cable–EIA–232/V.24, see "Cables and Cable Assemblies."

IBM 4216 Model 31 Personal Page Printer

The 4216 Model 31 is a compact desktop PostScript page printer capable of printing up to six pages per minute using a laser/electrophotographic (EP) process. It contains an internal controller for printing PostScript documents.

- 300 DPI print resolution
- Very quiet (52 dBA printing, 48 dBA idling)
- 2 MB memory
- HP Laserjet Plus emulation
- 43 resident PostScript typefaces.

RISC System/6000 Attachment

The 4216 Model 31 attaches to the RISC System/6000 system unit using either an IBM PC Parallel Printer Cable to the standard parallel port or an IBM Async Cable–EIA–232/V.24 (with a Printer/Terminal Interposer EIA–232) to a standard serial port or to an IBM 8–, 16–, or 64–port EIA–232D adapter port. For more information on the Async Cable–EIA–232/V.24, see "Cables and Cable Assemblies."

IBM 4224 Models 301, 302, 3C2, and 3E3

The 4224 Models 301, 302, 3C2, and 3E3 are heavy–duty, serial dot–matrix impact printers. They are ideal desktop printers for various data processing and word processing applications in a multiuser environment. The Model 301 has a draft print speed of 200 cps, Models 302 and 3C2 have a draft print speed of 400 cps, and the Model 3E3 has a draft print speed of 600 cps.

All the printers feature the following:

- PC ASCII data stream
- 512 KB print buffer
- OCR and Barcode printing capability
- Multi–function operator panel
- Operator–replaceable printhead.

In addition the Model 3C2 supports color printing.

RISC System/6000 Attachment

The 4224 models attach to the RISC System/6000 system units using an IBM Async Cable–EIA–232/V.24 (with a Printer/Terminal Interposer EIA–232) to a standard serial port or to an IBM 8–, 16–, or 64–port EIA–232D adapter port. The printer can also attach to an IBM 8– or 16–Port Async Adapter – EIA–422A port, but the customer must provide the cable. For more information on the Async Cable–EIA–232/V.24, see "Cables and Cable Assemblies."

IBM 4234 Model 13

The 4234 is a dot band line–matrix impact printer that is designed for heavy–duty line dot–matrix printing applications in a shared environment.

The 4234 Model 13 features the following:

- PC ASCII data stream
- 800/600/200 LPM (Draft/Data Processing/Near Letter Quality)
- Low noise
- Power–assisted forms loading
- Horizontal and Vernier forms adjustment
- Operator–replaceable dot band.

RISC System/6000 Attachment

The 4234 Model 13 attaches to the RISC System/6000 system unit using either an IBM PC Parallel Printer Cable to the standard parallel port or an IBM Async Cable–EIA–232/V.24 (with a Printer/Terminal Interposer EIA–232) to a standard serial port or to an IBM 8–, 16–, or 64–port EIA–232 adapter port. The printer can also attach to an IBM 8– or 16–Port Async Adapter – EIA–422A port, but the customer must provide the cable. For more information on the Async Cable–EIA–232/V.24, see "Cables and Cable Assemblies."

IBM 5202 Quietwriter III

The Quietwriter III Printer is a high–speed, executive letter–quality, non–impact printer designed to print all–points–addressable (APA) graphics.

The printer features the following:

- PC ASCII data stream
- 160/100/80 cps (Draft/Letter Quality/ Enhanced Letter Quality)
- Quiet
- Transparency printing capability.

The printer has the following options:

- Single and Dual Drawer Sheet Feeds
- Pin wheel tractor
- Font cartridges.

RISC System/6000 Attachment

The Quietwriter III Printer attaches to the RISC System/6000 system unit using an IBM PC Parallel Printer Cable to the standard parallel port. For more information on the PC Parallel Printer Cable, see "Cables and Cable Assemblies."

IBM 5204 Quickwriter Model 1

The 5204 Model 1 is a letter–quality matrix impact printer that is designed for heavy–duty, letter–quality printing applications.

The 5204 Model 1 features the following:

- PC ASCII data stream
- 330/110 cps (Draft/Letter Quality)
- Eight resident fonts.

The printer has the following options:

- Dual Auto Sheet Feed, plus envelope feeder
- Pin wheel tractor
- 55 cps with optional Selectric Font
- Font cartridges, with up to 12 fonts online.

RISC System/6000 Attachment

The 5204 Model 1 attaches to the RISC System/6000 system unit using either an IBM PC Parallel Printer Cable to the standard parallel port or, with the printer's serial interface adapter, an IBM Async Cable–EIA–232/V.24 (with a Printer/Terminal Interposer EIA–232) to a standard serial port or to an IBM 8–, 16–, or 64–port EIA–232 adapter port. For more information on the PC Parallel Printer Cable or the Async Cable–EIA–232/V.24, see "Cables and Cable Assemblies."

IBM 5327 Model 11

The 5327 Model 11 is a Japanese language floor–standing line dot matrix printer designed for heavy–duty office use. The 5327 features the following:

- Resolution of 180 pels
- 70–meter (230–ft) black ribbon cassette.

The printer has a print speed of 330 lines per minute in Normal Speed Mode and 400 lines per minute in High Speed Mode.

RISC System/6000 Attachment

The printer attaches to the RISC System/6000 standard parallel port using either of two Japanese printer cables. For more information on these cables, see "Cables and Cable Assemblies."

IBM 5575 Models B02 and F02

The 5575 Models B02 and F02 are Japanese 24–dot impact printers designed for light–duty office use. The 5575 models feature the following:

- Resolution of 180 pels
- Automatic Sheet Feed option.

The B02, in Normal Speed Mode, has a print speed of 60 cps for Kanji characters and 90 cps for Alpha–Numeric–Katakana characters. In High Speed Mode, it has a print speed of 120 cps for Kanji characters and 180 cps for Alpha–Numeric–Katakana characters.

The F02, in Normal Speed Mode, has a print speed of 75 cps for Kanji characters and 150 cps for Alpha–Numeric–Katakana characters. In High Speed Mode, it has a print speed of 150 cps for Kanji characters and 225 cps for Alpha–Numeric–Katakana characters.

RISC System/6000 Attachment

The 5575 Models B02 and F02 attach to the RISC System/6000 standard parallel port using either of two Japanese printer cables. For more information on these cables, see "Cables and Cable Assemblies."

IBM 5577 Models B02 and F02

The 5577 Models B02 and F02 are Japanese language 24–dot impact printers designed for heavy–duty office use. The 5577 models feature the following:

- Resolution of 180 pels
- Automatic Sheet Feed option.

The B02, in Normal Speed Mode, has a print speed of 70 cps for Kanji characters and 105 cps for Alpha–Numeric–Katakana characters. In High Speed Mode, it has a print speed of 140 cps for Kanji characters and 210 cps for Alpha–Numeric–Katakana characters.

The F02, in Normal Speed Mode, has a print speed of 90 cps for Kanji characters and 135 cps for Alpha–Numeric–Katakana characters. In High Speed Mode, it has a print speed of 180 cps for Kanji characters and 270 cps for Alpha–Numeric–Katakana characters.

RISC System/6000 Attachment

The 5577 Models B02 and F02 attach to the RISC System/6000 standard parallel port using either of two Japanese printer cables. For more information on these cables, see "Cables and Cable Assemblies."

IBM 5587 Model G01

The 5587 Model G01 is a Japanese 240–pel laser page printer utilizing electrophotographic printing technology with a laser scanning unit. The 5587 features the following:

- Double input paper cassette
- Font diskette.

The G01 prints up to 8 pages per minute.

RISC System/6000 Attachment

The 5587 Model G01 attaches to the RISC System/6000 standard parallel port using either of two Japanese printer cables. For more information on these cables, see "Cables and Cable Assemblies."

Connection Support for Non–IBM Printers

A variety of non–IBM printers can connect to the RISC System/6000 system unit. Those printers include:

- HP Laserjet Series II
- TI Omnilaser 2115 Page Printer
- Data Products LZR 2665 Laser Printer
- Printronix P9012
- Data Products BP2000.

National Language Support

The U.S. printers previously described support the following languages under Code Page 850:

- English (U.S. and U.K.)
- Finnish/Swedish
- French
- German
- Dutch
- Italian
- Swiss
- Spanish.

Plotters

IBM 6180 Color Plotter Model 1

The 6180 Color Plotter is an 8–pen, desktop, high–resolution vector plotter capable of producing quality graphics on paper or transparency film with highly accurate registration and repeatability. The IBM Graphics Enhancement Cartridge, which provides IBM 7372 compatibility and greatly increases the number of commands and character sets, is an option.

The plotter features the following:

- Support for two pen types:
  - Fiber–tip pen for paper
  - Fiber–tip pen for transparency film.
- Support for two media types:
  - Paper
  - Transparency film.
- 8–pen carousel that allows for automatic pen capping
- Excellent line quality
- Support for A and A4 drawing sizes.

RISC System/6000 Attachment

The 6180 Color Plotter Model 1 attaches to the RISC System/6000 system unit using an IBM Async Cable–EIA–232/V.24 (with a Printer/Terminal Interposer EIA–232) to a standard serial port or to an IBM 8–, 16–, or 64–port EIA–232D adapter port. For more information on the Async Cable–EIA–232/V.24, see "Cables and Cable Assemblies."

IBM 6182 Auto–Feed Color Plotter

The 6182 Auto–Feed Color Plotter is a high–performance 8–pen, desktop plotter with automatic sheet feed. The plotter has a maximum pen speed of 80 cm/sec (31.5 in./sec).

The plotter features the following:

- Plotting on A– or B–sized paper, transparency, vellum, or polyester film
- 1KB I/O buffer, user–configurable to 12 KB
- HP–GL compatible command set.

RISC System/6000 Attachment

The 6182 Plotter attaches to the RISC System/6000 system unit using an IBM Async Cable–EIA–232/V.24 (with a Printer/Terminal Interposer EIA–232) to a standard serial port or to an IBM 8–, 16–, or 64–port EIA–232D adapter port. For more information on the Async Cable–EIA–232/V.24, see "Cables and Cable Assemblies."

IBM 6184 Color Plotter Model 1

The 6184 Color Plotter is an 8–pen drafting plotter that produces large format, C/A2– and D/A1–size, engineering drawings.

The plotter features the following:

- Switchable pen sorting
- Support for three media types:
  - Chart papers
  - Vellum
  - Double–matte polyester film.
- High line quality that provides smooth circles, consistent line widths, and crisp characters
- Support for A1, A2, C, and D drawing sizes.

RISC System/6000 Attachment

The 6184 Color Plotter Model 1 attaches to the RISC System/6000 system unit using an IBM Async Cable–EIA–232/V.24 (with a Printer/Terminal Interposer EIA–232) to a standard serial port or to an IBM 8–, 16–, or 64–port EIA–232D adapter port. For more information on the Async Cable–EIA–232/V.24, see "Cables and Cable Assemblies."

IBM 6186 Color Plotter Models 1 and 2

The 6186 Color Plotter is a high–performance, 8–pen workstation plotter. The plotters have a maximum pen speed of 60 cm/sec (24 in./sec).

The plotters feature the following:

- 8–pen color plotters for A through E–size media: Model 1 – cut sheet, Model 2 – cut sheet and continuous roll
- Cut sheet or continuous roll 26KB buffer
- HP GL or 7375 emulation command sets
- 5 pen types and 6 media types supported
- Pen–sorting algorithm.

RISC System/6000 Attachment

The 6186 color plotters attach to the RISC System/6000 system unit using an IBM Async Cable–EIA–232/V.24 (with a Printer/Terminal Interposer EIA–232) to a standard serial port or to an IBM 8–, 16–, or 64–port EIA–232D adapter port. For more information on the Async Cable–EIA–232/V.24, see "Cables and Cable Assemblies."

IBM 7372 Color Plotter

The 7372 color plotter provides low cost 6–color plotter operation.

The plotter features the following:

- 6–pen color plotter for A/A4–size paper and transparency film media
- Programmable cursor buttons
- Automatic pen capping.

RISC System/6000 Attachment

The 7372 color plotter attaches to the RISC System/6000 system unit using an IBM Async Cable–EIA–232/V.24 (with a Printer/Terminal Interposer EIA–232) to a standard serial port or to an IBM 8–, 16–, or 64–port EIA–232D adapter port. For more information on the Async Cable–EIA–232/V.24, see "Cables and Cable Assemblies."

Graphics Processors

IBM 5086 Model 1

The 5086 is a graphics processor with 2 MB base storage memory expandable to 8 MB. The floor–standing unit features microcode host download and window capabilities.

RISC System/6000Attachment

The 5086 Model 1 comes with a 5–m (16.4–ft) coaxial cable for attachment to an IBM 5086 Attachment Adapter. A "Y" Cable is provided for attachment of the system unit to the graphics processor.

Other Supported Graphics Processors

- IBM 5085, Models 1, 1A, 2, and 2A (no longer available through IBM). To work with the RISC System/6000 system unit, the Model 1 requires the IBM 5085 Attachment Adapter, as well as modification and service assistance from IBM.

Fixed Disks

IBM 120 MB Direct Attached Disk Drive

The 120 MB Direct Attached Disk Drive is a 3.5–inch drive used in the Model 320 system unit. The drive features an average access of 23 milliseconds, a disk–to–buffer data transfer rate of 1.27 MB per second, and a rotational speed of 3600 rpm.

The Model 320 can house up to two internal 120MB drives.

RISC System/6000 Attachment

The 120 MB Direct Attached Disk Drive connects directly to a unique internal connector in Model 320.

IBM 320 MB SCSI Disk Drive

The 320 MB SCSI Disk Drive is a high–performance 3.5–inch drive that features an average access rate of 12.5 milliseconds, a disk–to–buffer data transfer rate of 2 MB per second, and a rotational speed of 4318 rpm.

The drive can be used in all the RISC System/6000 system units except the Model 730 and the Model 930. One or two can be used in the Model 320. The Model 520, the Model 530, and the Model 540 can have the drives installed only in pairs. Two 320 MB drives are standard on the Model 540. The Model 320 can house up to two of these drives and the deskside models (except the Model 730) can house up to six.

The drive is also available in the IBM 7204 External Disk Drive Model 320.

RISC System/6000 Attachment

The 320 MB SCSI Disk Drive attaches to the RISC System/6000 system unit using an appropriate internal cable to an IBM SCSI High–Performance I/O Controller.

IBM 355 MB SCSI Disk Drive

The 355 MB SCSI Disk Drive is a 5.25–inch drive that features an average access time of 16 milliseconds, a disk–to–buffer data transfer rate of 1.875 MB per second, and a rotational speed of 3600 rpm. The storage device can be used in all the RISC System/6000 system units except the Model 320, the Model 540, and the Model 930. The deskside models can support a configuration of up to three 355 MB drives.

RISC System/6000 Attachment

The 355 MB SCSI Disk Drive connects to the RISC System/6000 system unit using an internal cable to an IBM SCSI High–Performance I/O Controller.

IBM 670 MB SCSI Disk Drive

The 670 MB SCSI Disk Drive is a 5.25–inch drive that features an average access time of 18 milliseconds, a disk–to–buffer data transfer rate of 1.875 MB per second, and a rotational speed of 3600 rpm. The storage device can be used in all the RISC System/6000 system units except the Model 320 and the Model 540. The drive is standard in the Model 930. The deskside models can house up to three 670 MB drives, and the Model 930 can house up to four per SCSI Disk Drawer.

RISC System/6000 Attachment

The 670 MB SCSI Disk Drive connects to the RISC System/6000 system unit using an appropriate internal cable to an IBM SCSI High–Performance I/O Controller.

IBM 857 MB SCSI Disk Drive

The 857 MB SCSI Disk Drive is a 5.25–inch high–performance drive that features an average access of 11.2 milliseconds, a disk–to–buffer data transfer rate of 3 MB per second, an SCSI data rate of 4 MB per second, and a rotational speed of 4986 rpm. The storage device can be used in all the RISC System/6000 system units except the Model 320. The deskside models can house up to three 857 MB drives, and the Model 930 can house up to four per SCSI Disk Drawer.

RISC System/6000 Attachment

The 857 MB SCSI Disk Drive connects to the RISC System/6000 system unit using an appropriate internal cable to an IBM SCSI High–Performance I/O Controller.

IBM 355 MB Portable Disk Drive Module

The 355 MB Portable Disk Drive Module contains a shock–mounted 5.25–inch IBM 355 MB SCSI Disk Drive. The portable disk drive provides removable fixed–disk storage and can be used with any RISC System/6000 system unit except the Model 930.

The 355 MB Portable Disk Drive Module comes standard in the IBM 7203 External Portable Disk Drive Model 1 and can also be ordered separately.

For information on the 7203 Model 1, see "Removable Media."

RISC System/6000 Attachment

The 355 MB module attaches to the RISC System/6000 system unit through the 7203 External Portable Disk Drive Model 1.

IBM 670 MB Portable Disk Drive Module

The 670 MB Portable Disk Drive Module contains a shock–mounted 5.25–inch IBM 670 MB SCSI Disk Drive. The module is designed for use with the IBM 7203 External Portable Disk Drive Model 1. The portable disk drive provides removable fixed–disk storage and can be used with any RISC System/6000 system unit except the Model 930.

As a selectable option, the 7203 can come with a 670 MB module rather than a 355 MB module. Additional 670 MB modules can be ordered separately.

For information on the 7203 Model 1, see "Removable Media."

RISC System/6000 Attachment

The 670 MB module attaches to the RISC System/6000 system unit through the 7203 External Portable Disk Drive Model 1.

Removable Media

IBM 3 1/2–Inch Diskette Drive

The 3 1/2–Inch Diskette Drive, standard on all RISC System/6000 system units, is identical to the 3.5–inch drive in the PS/2 Family. The drive has a 1.44 MB capacity and can be used with all RISC System/6000 system units.

The RISC System/6000 system unit supports only one internal 3 1/2–Inch Diskette Drive.

RISC System/6000 Attachment

The drive attaches to the RISC System/6000 system unit using an internal cable to the diskette controller on the standard I/O board.

IBM 5 1/4–Inch Diskette Drive

The internal 1.2 MB 5 1/4–Inch Diskette Drive provides data interchange capability between the RISC System/6000 system unit and other systems. The drive is used in the Model 930 Processor Drawer.

The RISC System/6000 system unit supports only one internal 5 1/4–Inch Diskette Drive.

RISC System/6000 Attachment

The 5 1/4–Inch Diskette Drive connects using an internal cable to the system unit diskette controller.

IBM 4869 5 1/4–Inch 1.2 MB External Diskette Drive Model 2

The 4869 5 1/4–Inch 1.2 MB External Diskette Drive Model 2 provides data interchange capability between the RISC System/6000 system unit and other systems. The drive can be used with all system units except the Model 930.

"Reference Information" contains physical, electrical, and environmental considerations for the drive.

RISC System/6000 Attachment

The 4869 5 1/4–Inch 1.2 MB External Diskette Drive Model 2 comes with a 1.8–m (6–ft) detachable power cord and a signal cable. The nondetachable signal cable connects to the system unit diskette controller. The cable has a 34–pin D–shell connector.

IBM 7203 External Portable Disk Drive Model 1

The 7203 Model 1 is a self–powered external disk drive that can be used with any RISC System/6000 system unit except the Model 930.

The 7203 includes a removable disk drive module that can provide portability and enhanced data security. The unit will support one disk drive module containing either a 355 or 670 MB drive. As a selectable option, you can replace the standard 355 MB module wtih a 670 MB module. Additional modules are available as feature options.

For information on either module for use with the portable disk drive, see "Fixed Disks."

"Reference Information" contains physical, electrical, and environmental considerations for the unit.

RISC System/6000 Attachment

The disk drive comes with a 2.8–m (9–ft) detachable power cord. The drive attaches to the RISC System/6000 system unit using an IBM SCSI Controller Cable to an IBM SCSI High–Performance I/O Controller.

IBM 7204 External Disk Drive Model 320

The 7204 Model 320 is a small, lightweight unit containing a 320 MB SCSI Fixed–Disk Drive that features an average access rate of 12.5 milliseconds, a disk–to–buffer data transfer rate of 2 MB per second, and a rotational speed of 4318 rpm. The drive is shock mounted in the enclosure.

Signal and power connectors are rated for daily disconnect, permitting the entire 7204 enclosure to be placed in a safe at night for enhanced data security.

The drive can be used with all RISC System/6000 system units except the Model 730 and the Model 930.

"Reference Information" contains physical, electrical, and environmental considerations for the drive.

RISC System/6000 Attachment

The 7204 Model 320 comes with a 2.8–m (9–ft) detachable power cord and attaches to the RISC System/6000 system unit using an IBM SCSI Controller Cable to an IBM SCSI High–Performance I/O Controller.

150 MB Internal 1/4–Inch Cartridge Tape Drive

The 150 MB Internal 1/4–Inch Cartridge Tape Drive operates in a streaming mode and provides data interchange and Save/Restore capabilities for the Model 930. The tape drive is housed in the Processor Drawer.

The drive is designed to provide error–checking and correction (ECC) capability, can read IBM 6157 Model 1 tapes, and can read and write IBM 6157 Model 2 tapes. It uses IBM 6150 1/4–inch Data Cartridge Tapes or the equivalent.

The drive features the following:

- Support for the following standards:
  - QIC–24 (read only, without ECC)
  - QIC–120 (read and write, with or without ECC)
  - QIC–150 (read and write, with or without ECC).
- 150 MB capacity per cartridge (135MB with ECC)
- 5 MB/min sustained data rate.

RISC System/6000 Attachment

The drive attaches to the RISC System/6000 system unit using an internal cable to a SCSI High–Performance I/O Controller.

IBM 7207 150 MB External 1/4–Inch Cartridge Tape Drive Model 1

The 7207 150 MB External 1/4–Inch Cartridge Tape Drive Model 1 operates in a streaming mode and provides data interchange and Save/Restore capabilities for all RISC System/6000 system units except the Model 930.

The drive is designed to provide error–checking and correction (ECC) capability, can read IBM 6157 Model 1 tapes, and can read and write IBM 6157 Model 2 tapes. It uses IBM 6150 1/4–inch Data Cartridge Tapes or the equivalent.

The drive features the following:

- Support for the following standards:
  - QIC–24 (read only, without ECC)
  - QIC–120 (read and write, with or without ECC)
  - QIC–150 (read and write, with or without ECC).
- 150 MB capacity per cartridge (135 MB with ECC)
- 5 MB/minute sustained data rate.

"Reference Information" contains physical, electrical, and environmental considerations for the drive.

RISC System/6000 Attachment

The drive comes with a 2.8–m (9–ft) detachable power cord and attaches to the RISC System/6000 system unit using an IBM SCSI Controller Cable to an IBM SCSI High–Performance I/O Controller.

IBM 2.3 GB Internal 8mm Tape Drive

The 2.3 GB Internal 8mm Tape Drive is a streaming tape drive that uses the IBM 8mm data cartridge or equivalent. The drive is primarily used for Save/Restore, Archiving, and software and document distribution.

The drive can be used in all RISC System/6000 models, except the Model 320. One drive can be

housed in the deskside units, while up to two can be housed in the Model 930 SCSI Device Drawer.

The drive features the following:

- Capacity of up to 2.3 GB per cartridge
- 245 KB/sec data transfer rate
- 14.7 MB/minute data transfer rate.

RISC System/6000 Attachment

The drive attaches to the RISC System/6000 system unit using an internal cable to an IBM SCSI High–Performance I/O Controller.

IBM 7208 2.3 GB External 8mm Tape Drive Model 1

The 7208 2.3 GB External 8mm Tape Drive Model 1 is an externally packaged streaming tape drive that uses the IBM 8 mm data cartridge or equivalent. The drive is primarily used for Save/Restore, Archiving, and software and document distribution.

It can be used with all RISC System/6000 system units except the Model 930.

The drive features the following:

- Capacity of up to 2.3 GB per cartridge
- 245 KB/sec data transfer rate
- 14.7 MB/minute data transfer rate.

"Reference Information" contains physical, electrical, and environmental considerations for the drive.

RISC System/6000 Attachment

The drive comes with a 2.8–m (9–ft) detachable power cord and attaches to the RISC System/6000 system unit using an IBM SCSI Controller Cable to an IBM SCSI High–Performance I/O Controller.

IBM Internal CD–ROM Drive

The internal CD–ROM Drive is a read–only optical compact disc drive that supports distribution and use of online data bases (for example, softcopy publications online reference).

The drive can be used with all RISC System/6000 models except Model 320, and is standard in the Model 930 Processor Drawer. The Model 320 does not support internal drives.

The drive has the following features:

- 150 KB/sec data transfer rate
- Capacity of approximately 600 MB per disc
- 380 ms typical access time.

The compact disc resides in a caddy that is inserted into the drive.

RISC System/6000 Attachment

The drive attaches to the RISC System/6000 system unit using an internal cable to an IBM SCSI High–Performance I/O Controller. A jack for audio output is provided on the CD–ROM bezel.

IBM 7210 External CD–ROM Drive Model 1

The 7210 External CD–ROM Drive Model 1 is an externally–packaged optional read–only optical compact disc drive that supports distribution and use of online data bases (for example, softcopy publications online reference).

Multiple CD–ROM drives are supported on the RISC System/6000 system units.

The drive features the following:

- 150 KB/sec data transfer rate
- Capacity of approximately 600 MB per disc
- 380 ms typical access time.

The compact disc resides in a caddy that is inserted into the drive.

"Reference Information" contains physical, electrical, and environmental considerations for the drive.

RISC System/6000 Attachment

The drive comes with a 2.8–m (9–ft) detachable power cord and attaches to the RISC System/6000 system unit using an IBM SCSI Controller Cable to an IBM SCSI High–Performance I/O Controller. A jack for audio output is provided on the CD–ROM bezel.

IBM 9348 Magnetic Tape Unit Model 12

The 9348 Magnetic Tape Unit Model 12 is a autoloading, autothreading, tabletop model that can be used with all RISC System/6000 system units except the Model 930. The unit features the following:

- Standard 9–track tape interchange plus fast Save/Restore
- IBM standard 9–track recording format (8 data plus parity)
- Selectable tape density: 6250 bpi (GCR Mode) or 1600 bpi (PE Mode)
- 1 MB buffer
- Tape speed: 123 ips (GCR Mode), 130 ips (PE Mode)
- Nominal Data Throughput Rate of 768 KB/sec (GCR Mode), 208 KB/sec (PE Mode).

"Reference Information" contains physical, electrical, and environmental considerations for the drive.

RISC System/6000 Attachment

The tape unit attaches to the RISC System/6000 system unit using an IBM SCSI Controller Cable to an IBM SCSI High–Performance I/O Controller.

Modems

The following modems work with the RISC System/6000 system unit. Modem support allows communication through common carrier telephone networks using dial–up or leased lines with either asynchronous protocols or the synchronous SDLC or BSC protocols. Not all of the features supported by the listed modems are supported by the RISC System/6000 software.

IBM 5841 Modem

The 5841 Modem is a stand–alone device that provides a means for interchanging data between the RISC System/6000 system unit and a voice–grade or equivalent communication line. The 5841 Modem transmits data in duplex mode using asynchronous transmission speeds of up to 1200 bps and synchronous transmission speeds of 600 or 1200 bps.

The 5841 Modem is compatible with the Bell 212A and 103 practices and CCITT V.22A and V.22B recommendations for transmitting data over the public–switched telephone network (PSTN).

The cable from the 5841 Modem to the telecommunications jack is 4.6 m (15 ft) in length. One end is fixed to the modem. The other end contains a miniature 6–position non–keyed plug.

RISC System/6000 Attachment

The 5841 Modem attaches to the RISC System/6000 system unit using an IBM Async Cable–EIA–232/V.24 to an IBM 8–, 16–, or 64–port EIA–232D adapter port, a standard I/O port, or an IBM 4–Port Multiprotocol Communications Controller port. For non–U.S. countries the IBM 16–Port Async Adapter – EIA–232 and IBM 64–Port Async Controller are not homologated for modem support. For more information on the Async Cable–EIA–232/V.24, see "Cables and Cable Assemblies."

Communications Network Attachment

The 5841 Modem attaches to the communications network in the following ways:

- Direct attachment to the PSTN by way of a miniature telephone jack, type USOC–RJ11
- Attachment to the PSTN through a ROLM CBX by way of a CBX analog line that ends in an RJ11 jack
- Attachment to the PSTN through a PBX or Key Telephone System by way of an analog line that ends in a miniature telephone jack, type USOC–RJ12 or USOC–RJ13.

IBM 5853 Modem

The 5853 Modem is a stand–alone device that provides a means for interchanging data between the RISC System/6000 system unit and a voice–grade or equivalent communication line. The 5853 Modem transmits data in duplex mode using asynchronous transmission speeds of up to 300 bps; the modem transmits in synchronous or asynchronous transmission speeds of 1200 or 2400 bps.

The 5853 Modem is compatible with the Bell 212A and 103 practices and CCITT V.22 and V.25 recommendations for transmitting data over the public–switched telephone network (PSTN). The 5853 Modem supports the connection of an 801–type external Auto Call Unit (not supplied by IBM).

RISC System/6000 Attachment

The 5853 Modem attaches to the RISC System/6000 system unit using an IBM Async Cable–EIA–232/V.24 to an IBM 8–, 16–, or 64–port EIA–232D adapter port, a standard I/O port, or an IBM 4–Port Multiprotocol Communications Controller port. For non–U.S. countries the IBM 16–Port Async Adapter – EIA–232 and IBM 64–Port Async Controller are not homologated for modem support. For more information on the Async Cable–EIA–232/V.24, see "Cables and Cable Assemblies."

Communications Network Attachment

The 5853 Modem attaches to the communications network in the following ways:

- Direct attachment to the PSTN by way of a miniature telephone jack, type USOC–RJ11

- Attachment to the PSTN through a ROLM CBX by way of a CBX analog line that ends in an RJ11 jack
- Attachment to the PSTN through a PBX or Key Telephone System by way of an analog line that ends in a miniature telephone jack, type USOC–RJ12 or USOC–RJ13.

IBM 7861 Stand–Alone Network Management Modem, Models 14, 24, 15, 25, 45, 16, 26, 46, and 47

The 7861 Modem is a stand–alone device that provides a means for interchanging data between the RISC System/6000 system unit and a voice–grade or equivalent communication line. The 7861 Modem allows synchronous data transmission in half–duplex or duplex mode and contains advanced diagnostic and network management features.

The 7861 Modem has multipoint capabilities and a full speed range from 4800 to 19200 bps, depending on the model. The 7861 Modem also has switched network back–up features and supports Trellis–Coded Modulation (TCM).

A cable assembly facility enables you to attach multiple systems or multiple communication controllers to one 7861 Modem.

The 7861 Modem has a 2.8–m (9–ft) power cable with a non–locking plug. A 1.8–m (6–ft) power cable is also available.

The 7861 Modem comes with a 7.5–m (25–ft) telecommunications cable that attaches the modem to the communications network.

RISC System/6000 Attachment

The 7861 Modem attaches to the RISC System/6000 system unit using an IBM Async Cable–EIA–232/V.24 to a standard I/O port or an IBM 4–Port Multiprotocol Communications Controller port. For more information on the Async Cable–EIA–232/V.24, see "Cables and Cable Assemblies."

Communications Network Attachment

The 7861 Modem attaches directly to the PSTN using a 7.5–m (25–ft) cable with a 8–pin keyed male modular plug.

IBM 7868 Rack–Mounted Network Management Modem, Models 24, 25, 45, 26, 46 and 47

The 7868 Modems are rack–mounted versions of the 7861 that provide a means for interchanging data between the RISC System/6000 system unit and a voice–grade or equivalent communication line. The 7868 Modem allows synchronous data transmission in half–duplex or duplex mode and contains advanced diagnostic and network management features.

The 7868 Modem has multipoint capabilities and a full speed range from 4800 to 19200 bps, depending on the model. The modem also has switched network back–up features and supports Trellis–Coded Modulation (TCM).

A cable assembly facility enables you to attach multiple systems or multiple communication controllers to one IBM 7861 Modem.

The 7868 Modem has a 2.8–m (9–ft) power cable with a non–locking plug. A 1.8–m (6–ft) power cable is also available.

The 7868 Modem comes with a 7.5–m (25 –ft) telecommunications cable that attaches it to the communications network.

RISC System/6000 Attachment

The 7868 Modem must be installed in an IBM 7866, Model 1 Modem Housing. The modem housing attaches to the RISC System/6000 system unit using an IBM Async Cable–EIA–232/V.24 to a standard I/O port or an IBM 4–Port Multiprotocol Communications Controller port. For more information on the Async Cable–EIA–232/V.24, see "Cables and Cable Assemblies."

Communications Network Attachment

The 7861 Modem attaches directly to the PSTN using a 7.5–m (25–ft) cable with a 8–pin keyed male modular plug.

Support for Other IBM Modems:

The RISC System/6000 system unit also supports the attachment of the following IBM modems:

- IBM 5822 Modem Model 10 (no longer available through IBM)
- IBM 5865 Modem, Models 1, 2, and 3 (no longer available through IBM)

Support for Non–IBM Modems:

The RISC System/6000 system unit also supports the attachment of the following non–IBM modems:

- Hayes Smartmodems 1200, 2400, and V–Series 9600
- RacalVadic VI 1222VP, 1200PA, 2400PA, VI 2422S, 1200VP, and 2400VP
- Telebit Trailblazer Plus

Memory Expansion Cards

In RISC System/6000 system units with an IBM SGR 2032 Processor, memory cards can be installed in increments of one. In those with an IBM SGR 2564 Processor or an IBM SGR 3064 Processor, memory cards must be installed in pairs (two cards with the same feature code).

Also, any one RISC System/6000 system unit can only have all 5.0–volt memory or all 3.6–volt memory, meaning the Model 540 can only use the 32 MB HD2 card and the other system units can only use the 8 or 16 MB card.

The Data Cache Units in the Central Electronics Complex are designed to perform error–checking and correction (ECC) for memory.

IBM 8 MB SD1 Memory Card

The 8 MB SD1 Memory Card provides RISC System/6000 workstations with an 8 MB memory upgrade capability. The 8 MB card can be used in all system units except the Model 540.

The card features the following:

- 80–ns 1 mega–bit DRAM modules
- 5.0–volt logic
- 5.0–volt memory.

IBM 16 MB SD1 Memory Card

The 16 MB SD1 Memory Card provides RISC System/6000 workstations with a 16 MB memory upgrade capability. The card can be used in all system units except the Model 540.

The card features the following:

- 80–ns 1 mega–bit DRAM modules
- 5.0–volt logic
- 5.0–volt memory.

IBM 32 MB HD2 High–Density Memory Card

The 32 MB HD2 High–Density Memory Card provides the Model 540 with a 64 MB (two 32 MB cards) memory upgrade capability. The card can only be used in Model 540.

The card features the following:

- 80–ns 4 mega–bit DRAM modules
- 5.0–volt logic
- 3.6–volt memory.

Communications Adapters and Cable Assemblies

The following communication adapters and associated cable assemblies (interface cables) are available for use with the RISC System/6000 system.

Please note that the Model 930 system can have a total of fourteen asynchronous adapters, the total including those in the Processor Drawer and those in the Async Expansion Drawer. You can have up to eight 8– or 16–port adapters, and up to eight 64–port controllers.

IBM 8–Port Async Adapter – EIA–232

The 8–Port Async Adapter – EIA–232 provides support for attaching a maximum of eight EIA–232D asynchronous serial devices (such as modems, terminals and printers) to a RISC System/6000 system unit. The optional IBM Multiport Interface Cable connects to the adapter and provides the eight connectors for device attachment.

The adapter has the following features:

- Eight asynchronous ports, each with a data interchange rate of up to 38.4K bps
- One 78–pin female D–shell connector (interface cable attaches to this connector)
- Support for cable lengths of up to 61 m (200 ft) (provided the cable does not exceed a load capacitance of 2500 pico–farads)
- 16–byte buffering on transmit and receive operations
- To be homologated for international use under CCITT specifications V.24/V.28 Series 100
- Full set of modem control lines
- Compatibility with EIA–232D requirements
- Micro Channel considerations:
  - I/O slave
  - 16–bit data and address widths
  - Support for data and address parity
  - Machine–readable Vital Product Data (VPD).
- Wrap plug for 78–pin connector (supplied for testing).

RISC System/6000 Attachment

The adapter fits into a single Micro Channel adapter slot. You can install up to four adapters in the Model 320, up to six or seven adapters in the RISC System/6000 deskside units, or up to eight adapters in a Model 930 with an Async Expansion Drawer.

IBM 8–Port Async Adapter – EIA–422A

The 8–Port Async Adapter – EIA–422A provides support for attaching a maximum of eight EIA–422A asynchronous serial devices (such as terminals and printers) to a RISC System/6000 system unit. The optional IBM Multiport Interface Cable connects to the adapter and provides eight connectors for device attachment.

The adapter has the following features:

- Eight asynchronous ports, each with a data interchange rate of up to 38.4K bps
- One 78–pin female D–shell connector (interface cable attaches to this connector)
- Support for cable lengths of up to 1220 m (4000 ft)
- Built–in surge protection circuitry
- 16–byte buffering on transmit and receive
- Compatibility with EIA–422A requirements
- Micro Channel considerations:
  - I/O slave
  - 16–bit data and address widths
  - Support for data and address parity
  - Machine–readable Vital Product Data (VPD).
- Wrap plug for 78–pin connector (supplied for testing).

RISC System/6000 Attachment

The adapter fits into a single Micro Channel adapter slot. You can install up to four adapters in the Model 320, up to six or seven adapters in the RISC System/6000 deskside units, or up to eight adapters in a Model 930 with an Async Expansion Drawer.

IBM 8–Port Async Adapter – MIL–STD 188

The 8–Port Async Adapter – MIL–STD 188 provides support for attaching a maximum of eight MIL–STD 188–114 asynchronous serial devices (such as modems, terminals and printers) to a RISC System/6000 system unit. The optional IBM Multiport Interface Cable connects to the 8–Port Async Adapter – MIL–STD 188, and provides eight connectors for device attachment.

The 8–Port Async Adapter – MIL–STD 188 features the following:

- Eight asynchronous ports, each with a data interchange rate of up to 38.4K bps
- One 78–pin female D–shell output connector (cable attaches to this connector)
- Eight signal/control wires per port
- 16–byte buffering on transmit and receive operations
- Compatibility with the MIL–STD 188–114 requirements
- Full set of modem control lines
- Micro Channel considerations:
  - I/O slave
  - 16–bit data and address widths
  - Support for data and address parity
  - Machine–readable Vital Product Data (VPD).
- Wrap plug for 78–pin connector (supplied for testing).

RISC System/6000 Attachment

The 8–Port Async Adapter – MIL–STD 188 fits into a single Micro Channel adapter slot. You can install up to four adapters in the Model 320, up to six or seven adapters in the RISC System/6000 deskside units, or up to eight adapters in a Model 930 with an Async Expansion Drawer.

IBM Multiport Interface Cable

The Multiport Interface Cable allows attachment of up to eight separate devices to any of the three IBM 8–Port asynchronous adapters. An adapter can only be used with one interface cable, no sharing is supported. The interface cable features eight 25–pin male D–shell connectors. A wrap plug is supplied for testing.

RISC System/6000 Attachment

The interface cable connects to the 8–Port adapter using a 3–m (10–ft) cable with a 78–pin male D–shell connector.

IBM 16–Port Async Adapter – EIA–232

The 16–Port Async Adapter – EIA–232 provides support for attaching a maximum of 16 EIA–232D asynchronous serial devices (such as terminals and printers) to a RISC System/6000 system unit.

The adapter contains all of the electronics required to support 16 asynchronous ports. All 16 ports exit the card on a single 78–pin female D–shell connector. This connector attaches to the optional IBM 16–Port Interface Cable–EIA–232.

The adapter features the following:

- 16 asynchronous ports, each with data interchange rate of up to 38.4K bps
- Support for cable lengths of up to 61 m (200 ft) (provided the cable does not exceed a load capacitance of 2500 pico–farads)
- 16–byte buffering on transmit and receive operations
- Compatibility with EIA–232D requirements
- Micro Channel considerations:
  - I/O slave
  - 16–bit data and address widths
  - Support for data and address parity
  - Machine–readable Vital Product Data (VPD).
- Wrap plug for 78–pin connector (supplied for testing).

The adapter supports the following signal lines: RxD, TxD, DTR, DCD, and RTS (RTS always high). The adapter is not homologated for modem support.

RISC System/6000 Attachment

The adapter fits into a single Micro Channel adapter slot. You can install up to four adapters in the Model 320, up to six or seven adapters in the RISC System/6000 deskside units, or up to eight

adapters in a Model 930 with an Async Expansion Drawer.

IBM 16–Port Interface Cable–EIA–232

The 16–Port Interface Cable allows attachment of up to 16 separate devices to an IBM 16–Port Async Adapter – EIA–232. An adapter can only be used with one interface cable, no sharing is supported.

The interface cable features sixteen 25–pin male D–shell connectors. A wrap plug is supplied for testing.

RISC System/6000 Attachment

The interface cable connects to the 16–Port Async Adapter – EIA–232 port using a 3–m (10–ft) cable with a 78–pin male D–shell connector.

IBM 16–Port Async Adapter – EIA–422A

The 16–Port Async Adapter – EIA–422A provides support for attaching a maximum of 16 EIA–422A asynchronous serial devices (such as terminals and printers) to a RISC System/6000 system unit.

The adapter contains all of the electronics required to support 16 asynchronous ports. All 16 ports exit the card on a single 78–pin female D–shell connector. This connector attaches to the optional IBM 16–Port Interface Cable–EIA–422A .

The 16–Port Async Adapter – EIA–422A has the following features:

- 16 asynchronous ports, each with a data interchange rate of up to 38.4K bps
- Support for cable lengths of up to 1200 m (4000 ft)
- Built–in surge protection circuitry on the adapter
- 16–byte buffering on transmit and receive operations
- Compatibility with the EIA–422A requirements
- Micro Channel considerations:
  - I/O slave
  - 16–bit data and address widths
  - Support for data and address parity
  - Machine–readable Vital Product Data (VPD).
- Wrap plug for 78–pin connector (supplied for testing).

RISC System/6000 Attachment

The adapter fits into a single Micro Channel adapter slot. You can install up to four adapters in the Model 320, up to six or seven adapters in the RISC System/6000 deskside units, or up to eight adapters in a Model 930 with an Async Expansion Drawer.

IBM 16–Port Interface Cable–EIA–422A

The 16–Port Interface Cable–EIA–422A allows up to 16 separate devices to be attached to a IBM 16–Port Async Adapter – EIA–422A. An adapter can only be used with one interface cable; no sharing is supported.

The interface cable features sixteen 25–pin male D–shell connectors. A wrap plug is supplied for testing.

RISC System/6000 Attachment

The interface cable connects to the 16–Port Async Adapter – EIA–422A using a 3–m (10–ft) cable with a 78–pin male D–shell connector.

IBM 64–Port Async Controller

The 64–Port Async Controller provides support for attaching a maximum of 64 EIA–232D asynchronous serial devices (such as terminals and printers) to a RISC System/6000 system unit.

The controller features 256K bytes of memory and 64K bytes of ROM. Ring Indicate (RI) and Data Set Ready (DSR) signals are not supported on the EIA–232D ports. The 64–Port Async Controller is not homologated for modem support.

The controller has the following Micro Channel considerations:

- Memory slave
- 16–bit data width
- 24–bit address width
- Requires bus refresh
- Machine–readable Vital Product Data (VPD).

The controller is optimized for best system performance in applications that require large data throughputs. Therefore, when optimization of system performance is desired, the controller

should be chosen over the IBM 8– or 16–Port Async Adapters.

RISC System/6000 Attachment

The 64–Port Async Controller fits into any Micro Channel adapter slot. The controller has four RJ–45 connectors to attach from one to four IBM 16–Port Async Concentrators (each controller requires at least one concentrator). A wrap plug is provided for testing. For information on the cables used with the controller, see "Cables and Cable Assemblies."

The Model 320 supports a maximum of two controllers per system, the other deskside units support a maximum of four, and a Model 930 with an Async Expansion Drawer supports a maximum of eight.

IBM 16–Port Async Concentrator

The 16–Port Async Concentrator is an intelligent interface cable for use with the IBM 64–Port Async Controller. Each controller must have one concentrator; up to four concentrators can be attached to each controller. The concentrator connects to the controller using an RS–485 link; the link can be up to 762 m (2500 ft) long. The Ring Indicate (RI) and Data Set Ready (DSR) signals are not supported on the EIA–232D ports.

The concentrator features the following:

- 16 asynchronous ports, each with a data interchange rate of up to 38.4K bps
- Support for cable lengths of up to 61 m (200 ft) (provided the cable does not exceed a load capacitance of 2500 pico–farads)
- Compatibility with EIA–232D requirements
- 80186 Microprocessor
- Internal power supply with external transformer
- Machine–readable Vital Product Data (VPD)
- Wrap plug for the EIA–232D ports (provided for testing).

RISC System/6000 Attachment

The concentrator connects to the controller using a 6–wire cable and an RJ–45 Connector. For information on the cables used with the concentrator, see "Cables and Cable Assemblies."

IBM X.25 Interface Co–Processor/2

The X.25 Interface Co–Processor/2 provides support for attaching a RISC System/6000 system unit to an X.25 network. The adapter provides a single port that will accommodate three selectable interfaces: X.21, EIA–232D/V.24 and V.35. The port has a 37–pin female D–shell connector.

The X.25 Interface Co–Processor/2 features the following:

- 512 KB memory
- Full duplex synchronous or asynchronous protocol
- To be homologated to support the following interfaces in international countries:
  - X.21 interface at up to 64K bps
  - EIA–232D/V.24 interface at 19.2K bps
  - V.35 interface at 56K bps.
- Micro Channel considerations:
  - I/O slave
  - 16–bit data width
  - 24–bit address width.
- Wrap plug for 37–pin connector (supplied for testing).

This adapter allows a RISC System/6000 system unit to attach to X.25 networks, and is capable of processing inbound and outbound data streams to off–load communications tasks from the system processor.

Six separate cables are optionally available with the adapter (two for each interface). For information on these cables, see "Cables and Cable Assemblies."

RISC System/6000 Attachment

The adapter fits into any Micro Channel adapter slot.

IBM 4–Port Multiprotocol Communications Controller

The 4–Port Multiprotocol Communications Controller attaches a RISC System/6000 system unit to synchronous communications networks using EIA–232D, EIA–422A, V.35, or X.21 physical interfaces. The adapter consists of a base card and

a daughter card. The two cards are physically connected and require a single Micro Channel adapter slot.

The base card prepares all inbound and outbound data, performs address searches, and in general relieves the system processor of many communications tasks. This adapter supports bit synchronous, character synchronous, and asynchronous protocols when appropriately programmed with loadable application software. Not all of the features of the 4–Port Multiprotocol Communications Controller are supported by the RISC System/6000 software.

The daughter card supports four interfaces: EIA 232D on Ports 0 to 3, EIA 422A on Ports 0 and 2, CCITT X.21 on Port 0, and CCITT V.35 on Ports 0 and 1. It also provides drivers, receivers, and surge protection. Devices are attached to the adapter using an IBM 4–Port Multiprotocol Interface Cable, which connects to the daughter card.

The adapter features the following:

- Supports 4 ports concurrently
- 512 KB memory
- 16–bit DMA data transfer width
- Two selectable interrupt levels
- To be homologated to support the following interfaces in international countries: EIA–232D, V.35, and X.21
- CRC generation and checking
- Micro Channel considerations:
  - Memory and I/O slave
  - 16–bit data width
  - 32–bit address width.
- Wrap plug for 78–pin connector (supplied for testing).

RISC System/6000 Attachment

The 4–Port Multiprotocol Communications Controller fits into any Micro Channel adapter slot.

Also, the adapter has a 78–pin female D–shell connector to attach to the 4–Port Multiprotocol Interface Cable, which provides device connections. Up to four 4–Port Multiprotocol Communications Controllers can be installed in a Model 320 and up to six or seven can be installed in the other RISC System/6000 system units. Each adapter can support only one interface cable; no sharing is supported.

IBM 4–Port Multiprotocol Interface Cable

The 4–Port Multiprotocol Interface Cable provides a interface cable for the IBM 4–Port Multiprotocol Communications Controller. The four port connectors are as follows:

- Four 25–pin male connectors for EIA–232D
- Two 15–pin male connectors for V.35
- One 15–pin male connectors for X.21
- Two 25–pin male connectors for EIA–422A.

The four ports can be configured as follows:

Port 0	EIA–232D, EIA–422A, V.35, or X.21
Port 1	EIA–232D or V.35
Port 2	EIA–232D or EIA–422A
Port 3	EIA–232D only.

Wrap plugs are supplied for all four interfaces.

Please see "Cables and Cable Assemblies" for information on appropriate interface cables.

RISC System/6000 Attachment

The interface cable connects to the 4–Port Multiprotocol Communications Controller using a 3–m (10–ft) cable with a 78–pin male D–shell connector.

IBM Token–Ring High–Performance Network Adapter

The Token–Ring High–Performance Network Adapter is a high–performance Micro Channel bus master DMA adapter used to attach the RISC System/6000 system unit to either a 4M bps or a 16M bps Token–Ring Local Area Network.

This adapter supports high–performance applications. The Token–Ring High–Performance Network Adapter is cable– and network–compatible with existing Token–Ring adapters, so no new cables or network components are required. All adapters on a Token–Ring Network must operate at the same speed.

The adapter features the following:

- IEEE 802.5 compatibility
- 8 Address/Interrupt states supported
- Adapter cable supplied to connect to an IBM Cabling System socket or to an IBM 8228 Multi–Station Access Unit socket
- Micro Channel considerations:
  - Bus master
  - I/O slave
  - 16–bit data width
  - 24–bit address width
  - Support for data and address parity
  - Support for streaming data (only as a DMA bus master)
  - Machine–readable Vital Product Data (VPD).
- One 9–pin female D–shell connector.

RISC System/6000 Attachment

The adapter fits into any Micro Channel adapter slot. Up to four Token–Ring High–Performance Network Adapters can be installed in any RISC System/6000 system unit.

IBM Ethernet High–Performance LAN Adapter

The Ethernet High–Performance LAN Adapter is a high–performance Micro Channel busmaster DMA adapter that allows the RISC System/6000 system unit to attach to an Ethernet network.

The adapter is designed to provide a connection to a 10M bps Carrier Sense Multiple Access/Collision Detection (CSMA/CD) Ethernet network. To attach the RISC System/6000 system unit to the network for connection to the standard 50–ohm (thick) coaxial cable, the customer must supply the appropriate cable and external transceiver. To attach the RISC System/6000 system unit to the network for connection to the standard RG–58A/U (thin) coaxial cable, the customer only has to supply an appropriate cable. The transceiver is included within the adapter.

The adapter features the following:

- IEEE 802.3 or Ethernet version 2 compatibility
- 16 KB of memory for data buffering
- Selectable interrupt levels
- Timer interrupt
- Selectable memory addresses
- 32–bit cyclic redundancy check
- Micro Channel considerations:
  - Bus master
  - Memory and I/O slave
  - 32–bit data and address widths
  - Support for data and address parity
  - Machine–readable Vital Product Data (VPD).

RISC System/6000 Attachment

The Ethernet High–Performance LAN Adapter fits into any Micro Channel adapter slot. Up to four Ethernet High–Performance LAN Adapters can be installed in any RISC System/6000 system unit.

IBM 3270 Connection Adapter

The 3270 Connection Adapter allows a RISC System/6000 system unit to connect to a System/370 host. This adapter allows a coaxial connection between a system unit and any of the following: a 3174 or 3274 Display Control Unit, an integrated display or printer adapter, an integrated workstation adapter of the IBM 4331 or 4361 processors, or the workstation subsystem controller of the IBM 9370 processor. The 3270 connection adapter for the RISC System/6000 system unit is the same adapter as the 3270 Connection Adapter/A for the PS/2 system.

The adapter features the following:

- Support for CUT and DFT modes of operation
- 2M bps maximum data transfer rate
- One female BNC connector provided
- Micro Channel considerations:
  - I/O slave
  - 16–bit data and address widths.

RISC System/6000 Attachment

The adapter fits into any Micro Channel adapter slot.

IBM System/370 Host Interface Adapter

The System/370 Host Interface Adapter allows the RISC System/6000 system units to attach to the IBM 5088 Graphics Control Unit. This adapter is physically identical to the 5085 and 5086 Attachment Adapters but has different microcode loaded on it. The adapter runs in secondary mode.

The adapter features the following:

- 64 KB memory buffers
- Link speed of up to 2M bps
- 16 Link Addresses
- Micro Channel considerations:
  - Bus master
  - Memory and I/O slave
  - 16–bit data width
  - 24–bit address width
  - Support for data and address parity
  - Requires bus refresh
  - Machine–readable Vital Product Data (VPD).

RISC System/6000 Attachment

The adapter fits into any Micro Channel adapter slot. There can be a maximum of one adapter per system unit.

Graphics Adapters

The following graphics adapters are available for use with the RISC System/6000 system.

IBM Grayscale Graphics Display Adapter

The Grayscale Graphics DisplayAdapter is an entry–function monochrome graphics adapter that can be used with the IBM 8508 Monochrome Display.

The adapter features the following:

- Support for 1280 by 1024 resolution
- Support for 256 shades of gray
- Support for 16 concurrent shades of gray
- 4–bit pixels
- Programmable 2–plane 64 by 64 pixel hardware cursor
- Micro Channel considerations:
  - Bus master
  - Memory and I/O slave
  - 32–bit data and address widths
  - Support for address parity
  - Requires bus refresh
  - Support for streaming data (only as a DMA bus master)
  - Machine–readable Vital Product Data (VPD).

RISC System/6000 Attachment

The adapter fits into any Micro Channel adapter slot. All units except the Model 730 and the Model 930 support up to two graphics display adapters. The Model 730 supports one graphics display adapter. The Model 930 does not support graphics display adapters.

IBM Color Graphics Display Adapter

The Color Graphics Display Adapter is an entry–function color graphics adapter.

The adapter can be used with the IBM 5081 Color Displays, Model 16 and 19, and the IBM 6091 Color Displays, Models 19 and 23.

The Color Graphics Display Adapter features the following:

- Support for 1280 by 1024 resolution
- Support for 16.7 million color palette
- Support for 256 concurrent colors
- 4– or 8–bit pixels
- Programmable 2–plane 64 by 64 pixel hardware cursor
- Micro Channel considerations:
  - Bus master
  - Memory and I/O slave
  - 32–bit data and address widths
  - Support for address parity
  - Requires bus refresh
  - Support for streaming data (only as a DMA bus master)
  - Machine–readable Vital Product Data (VPD).

RISC System/6000 Attachment

The adapter fits into any Micro Channel adapter slot. All units except the Model 730 and the Model 930 support up to two graphics display adapters. The Model 730 supports one graphics display adapter. The Model 930 does not support graphics display adapters.

IBM High–Performance 8–Bit 3D Color Graphics Processor

The 8–Bit Color Graphics Processor is a mid–range graphics adapter that can be used with the IBM 5081 Color Displays, Models 16 and 19, and the IBM 6091 Color Displays, Models 19 and 23.

The adapter features the following:

- Support for 1280 by 1024 resolution
- Support for 16.7 million color palette
- 8–bit pixels
- Support for 256 concurrent colors
- 2 overlay planes
- 2 window control planes
- Support for arbitrarily shaped windows
- Support for multiple, colored, local and infinite lights

- Support for diffuse, ambient, and specular (Phong) lighting models
- Support for flat and smooth (Gouraud) shading
- Support for dithered RGB shading
- Support for anti–aliased lines
- Support for 6–axis clipping
- Support for pan and zoom of images
- Programmable cursor
  - 3–color plus transparent sprite (3 out of 16.7 million colors)
  - Cross–hair.
- Integer and 32–bit floating–point coordinate systems
- Micro Channel considerations:
  - Bus master
  - Memory slave
  - 32–bit data and address widths
  - Support for data and address parity
  - Support for streaming data (only as a DMA bus master)
  - Machine–readable Vital Product Data (VPD).

With the optional 24–Bit Color Graphics Frame Buffer Upgrade, the 8–Bit Color Graphics Processor has the following features:

- 24–bit planes of pixel memory (provides 24–bit true color)
- Support for 16 sets of 256 concurrent colors
- 2 additional overlay planes
- 8– or 12–bit double–buffered modes
- 2 additional window control planes.

With the 24–Bit Z Buffer Solid Rendering Option, the adapter features a 24–bit Z buffer for hidden line and hidden surface removal.

RISC System/6000 Attachment

The adapter fits into any two adjacent Micro Channel adapter slots. All units except the Model 320, Model 730, and the Model 930 support up to two graphics processors. The Model 320 and Model 730 each support one graphics processor. The Model 930 does not support graphics processors.

IBM High–Performance 24–Bit 3D Color Graphics Processor

The 24–Bit Color Graphics Processor is a mid–range graphics adapter that can be used with the IBM 5081 Color Displays, Models 16 and 19, and the IBM 6091 Color Displays, Models 19 and 23.

The adapter features the following:

- Support for 1280 by 1024 resolution
- Support for 16.7 million color palette
- 8– or 12–bit double–buffered pixels or 24–bit pixels
- Support for 24–bit true color
- 4 overlay planes
- 4 window control planes
- Support for arbitrarily shaped windows
- Support for multiple, colored, local and infinite lights
- Support for diffuse, ambient, and specular (Phong) lighting models
- Support for flat and smooth (Gouraud) shading
- Support for 8– or 12–bit dithered RGB shading
- Support for anti–aliased lines
- Support for 6–axis clipping
- Support for pan and zoom of images
- Programmable cursor
  - 3–color plus transparent sprite (3 out of 16.7 million colors)
  - Cross–hair.
- Integer and 32–bit floating–point coordinate systems
- Micro Channel considerations:
  - Bus master
  - Memory slave
  - 32–bit data and address widths
  - Support for data and address parity
  - Support for streaming data (only as a DMA bus master)
  - Machine–readable Vital Product Data (VPD).

With the 24–Bit Z Buffer Solid Rendering Option, the adapter features a 24–bit Z buffer for hidden line and hidden surface removal.

RISC System/6000 Attachment

The adapter fits into any two adjacent Micro Channel adapter slots. All units except the Model 320, Model 730, and the Model 930 support up to two graphics processors. The Model 320 and Model 730 each support one graphics processor. The Model 930 does not support graphics processors.

IBM 5085 and 5086 Attachment Adapters

The 5085 and 5086 Attachment Adapters, which are physically identical to the System/370 Host Interface Adapter but have different microcode loaded, allow RISC System/6000 system units to attach to an IBM 5085 or 5086 Graphics Processor.

The adapters run in primary mode and feature the following:

- 64KB memory buffers
- 16 Link Addresses
- Micro Channel considerations:
  - Bus master
  - Memory and I/O slave
  - 16–bit data width
  - 24–bit address width
  - Support for data and address parity
  - Requires bus refresh
  - Machine–readable Vital Product Data (VPD).

RISC System/6000 Attachment

The adapters fit into any Micro Channel adapter slot. There can be a maximum of one 5085 or 5086 adapter per system unit.

IBM Graphics Input Device Adapter

The Graphics Input Device Adapter attaches the 6094 Model 10 Dials and the 6094 Lighted Programmable Function Keyboard Model 20 to RISC System/6000 system units. This two–port card provides control lines as well as DC power from the RISC System/6000 system unit to the attached devices.

The adapter has the following Micro Channel considerations:

- I/O slave
- 8–bit data width
- 16–bit address width
- Support for data and address parity
- Machine–readable Vital Product Data (VPD).

RISC System/6000 Attachment

The adapter fits into any Micro Channel adapter slot.

SCSI Adapter

IBM SCSI High–Performance I/O Controller

All RISC System/6000 system units can use the SCSI High–Performance I/O Controller for control of single–ended SCSI devices; all units except the Model 320 come standard with one SCSI controller. The devices supported are internal or external fixed disks, CD–ROM, and tape drives. The Model 930 supports only internal devices.

Any SCSI I/O controller that is driving an internal SCSI device may only have a maximum of two external SCSI devices attached. Those SCSI I/O controllers that are not driving internal SCSI devices may have a maximum of seven external SCSI devices attached using daisy–chained cables (maximum of 6 m (20 ft)).

The controller features the following:

- Ability to accept multiple commands per device
- SCSI data rate of 4 MB per second (synchronous protocol)
- SCSI initiator (Command Issuer)
- Streaming Data mode (100 ns cycle) memory I/O command and status transfer
- Streaming Data mode (100 ns cycle) first party DMA data transfer
- 40MBs per second burst DMA rate
- Programmable DMA burst length (4 to 128 bytes)
- Fully programmable interrupt levels
- Micro Channel considerations:
  - Bus master
  - Memory slave
  - 32–bit data and address widths
  - Support for data and address parity
  - Support for streaming data (as a DMA bus master or as a memory slave)
  - Machine–readable Vital Product Data (VPD).

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

In systems where fixed–disk access time is an important consideration, having four or fewer fixed–disk drives on the I/O controller can help in achieving reasonable access time.

RISC System/6000 Attachment

The SCSI High–Performance I/O Controller fits into any Micro Channel adapter slot.

The Model 320 supports a maximum of two SCSI I/O controllers, the Model 520, Model 530, Model 540, and Model 730 support a maximum of four, and the Model 930 supports a maximum of five.

Adapter Cabling

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

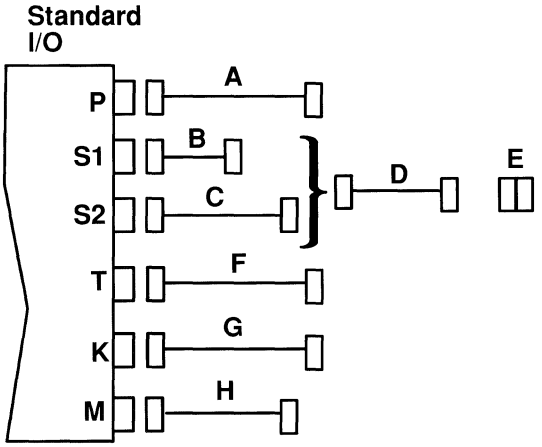
Those adapters used with the Model 930 come with internal cables not shown in these cabling diagrams. In the case of the Model 930 the cables depicted attach to these internal cables rather than to the adapter itself.

See "Cables and Cable Assemblies" for a summary of cable information, including pin–outs for those cables you may want to build yourself.

To aid the person who is installing your system, you can use the Adapter Cable Planning Chart in "Reference Information." When completed by you, this chart provides valuable information, such as system unit location, and device type and location.

IBM Standard I/O Adapter

This figure illustrates the Standard I/O Adapter with attachment cables. The Model 930 supports Serial Port 1 (S1) and Serial Port 2 (S2) only.



Cable/Connector: A
Feature Code: 9100
IBM Part Number: 1525612
Length: 3 m (10 ft)
Comments: parallel port cable

Cable/Connector: B
Feature Code: N/A
IBM Part Number: 59F3740
Length: 0.09 m (.33 ft)
Comments: jumper, two provided with each system unit

Cable/Connector: C (Model 930 only)
Feature Code: N/A
IBM Part Number: 59F4533
Length: 3 m (10 ft)
Comments: jumper, two provided with each system unit

Cable/Connector: D
Feature Code: 2936
IBM Part Number: 6323741
Length: 3 m (10 ft)
Comments: Async cable–EIA–232

Cable/Connector: E
Feature Code: 2937
IBM Part Number: 58F2861
Length: N/A
Comments: Printer/Terminal Interposer–232

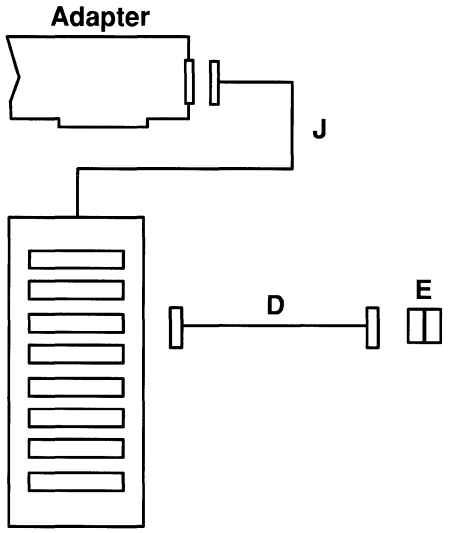
Cable/Connector: F
Feature Code: 2811
IBM Part Number: 6247480
Length: 2.1 m (7 ft)
Comments: tablet cable, supplied with tablet

Cable/Connector: G
Feature Code: N/A
IBM Part Number: N/A
Length: 3 m (10 ft)
Comments: keyboard cable, supplied with keyboard

Cable/Connector: H
Feature Code: N/A
IBM Part Number: N/A
Length: 2.75 m (9 ft)
Comments: mouse cable, supplied with mouse

IBM 8–Port Async Adapter – EIA–232

This figure illustrates the 8–Port Async Adapter – EIA–232, type 3-1, 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 8 ports.



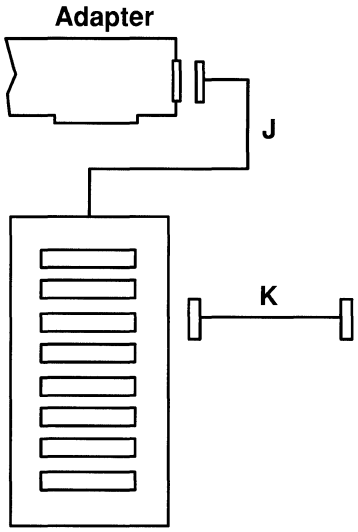
Cable/Connector: J
Feature Code: 2995
IBM Part Number: 00F5524
Length: 3 m (10 ft)
Comments: part of cable assembly

Cable/Connector: D
Feature Code: 2936
IBM Part Number: 6323741
Length: 3 m (10 ft)
Comments: asynchronous cable, if customer–supplied, must meet EIA–232D requirements

Cable/Connector: E
Feature Code: 2937
IBM Part Number: 58F2861
Length: N/A
Comments: Printer/Terminal Interposer EIA–232

IBM 8–Port Async Adapter – EIA–422A

This figure illustrates the 8–Port Async Adapter – EIA–422A, type 3-2, 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 8 ports.

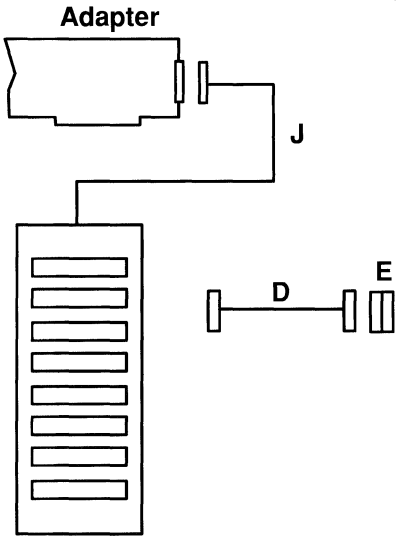


Cable/Connector: J
Feature Code: 2995
IBM Part Number: 00F5524
Length: 3 m (10 ft)
Comments: part of cable assembly

Cable/Connector: K
Feature Code: 2945
IBM Part Number: 30F8966
Length: 20 m (65.5 ft)
Comments: asynchronous cable, if customer–supplied, must meet EIA–422A requirements

IBM 8–Port Async Adapter – MIL–STD 188

This figure illustrates the 8–Port Async Adapter – MIL–STD 188, type 3-3, 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 8 ports.



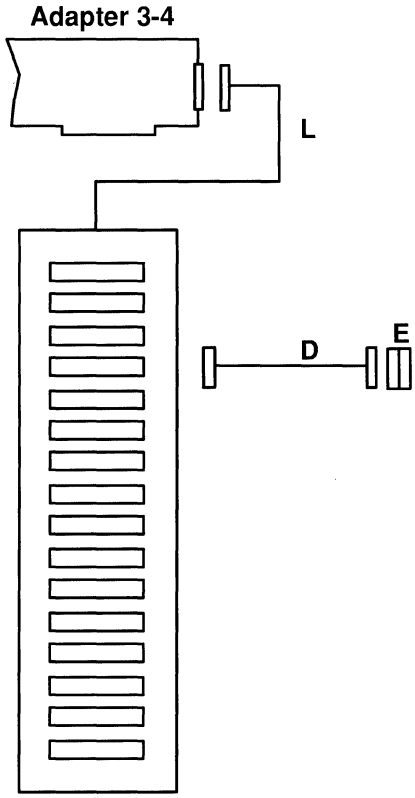
Cable/Connector: J
Feature Code: 2995
IBM Part Number: 00F5524
Length: 3 m (10 ft)
Comments: part of cable assembly

Cable/Connector: D
Feature Code: 2936
IBM Part Number: 6323741
Length: 3 m (10 ft)
Comments: asynchronous cable, if customer–supplied must meet MIL–STD 188 requirements

Cable/Connector: E
Feature Code: 2937
IBM Part Number: 58F2861
Length: N/A
Comments: Printer/Terminal Interposer EIA–232

IBM 16–Port Async Adapter – EIA–232

This figure illustrates the adapter, type 3-4, 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 sixteen ports.



Cable/Connector: L
Feature Code: 2996
IBM Part Number: 53F3311
Length: 3 m (10 ft)
Comments: part of interface cable

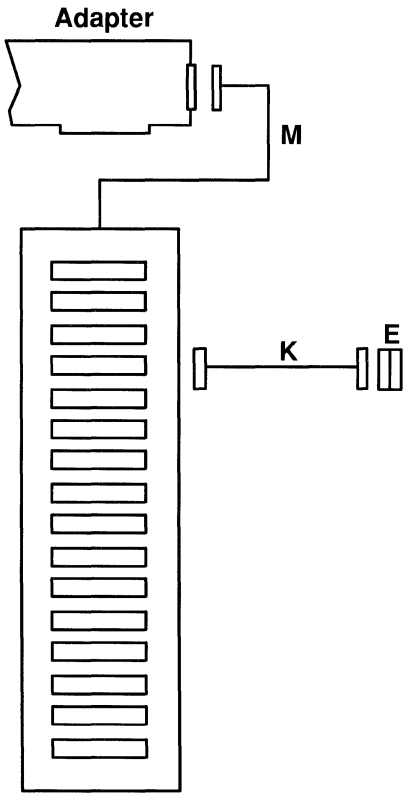
Cable/Connector: D
Feature Code: 2936
IBM Part Number: 6323741
Length: 3 m (10 ft)

Comments: asynchronous cable, if customer–supplied must meet EIA–232D requirements

Cable/Connector: E
Feature Code: 2937
IBM Part Number: 58F2861
Length: N/A
Comments: Printer/Terminal Interposer EIA–232

IBM 16–Port Async Adapter – EIA–422A

This figure illustrates the adapter, type 3-5, 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 sixteen ports.



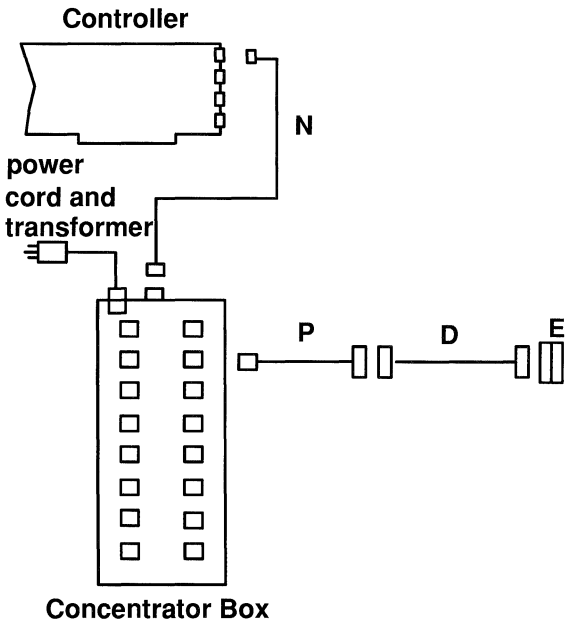
Cable/Connector: M
Feature Code: 2997
IBM Part Number: 53F3381
Length: 3 m (10 ft)
Comments: part of interface cable

Cable/Connector: K
Feature Code: 2945
IBM Part Number: 30F8966
Length: 20 m (65.5 ft)
Comments: asynchronous cable, if customer–supplied must meet EIA–422A requirements

Cable/Connector: E
Feature Code: 2937
IBM Part Number: 58F2861
Length: N/A
Comments: Printer/Terminal Interposer EIA–232

IBM 64–Port Async Controller

This figure illustrates the 64–Port Async Controller, adapter type 3-6, with one of four concentrator boxes, that may be attached to any one of the controller connectors. The controller connectors are labeled top to bottom, one through four. A choice of cables can be attached to any of sixteen concentrator box ports. The ports on the concentrator box are labeled 0 though 15.



Cable/Connector: power cord
Feature Code: 9115, 9116, 9117, 9118
IBM Part Number:
Length: variable
Comments: an AC power cord and transformer is supplied with each concentrator (types vary with country and power system)

Cable/Connector: N
Feature Code: 6401
IBM Part Number: 53F3368
Length: 7.6 m (25 ft)

Comments: cable, included with concentrator box, comes with a removable toroid that should be attached within 152 mm (6 in.) of concentrator box. The toroid needs to be placed similarly if cable is customer–supplied. The cable must also be 3 twisted pair and shielded. If built to a length of 305 m (1000 ft) or less, the cable must be 24 AWG; if built between 305 m (1000 ft) and 762 m (2500 ft), the cable must be 28 AWG.

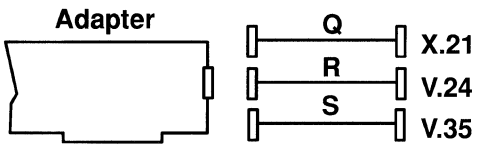
Cable/Connector: P
Feature Code: 6402
IBM Part Number: 59F3432
Length: .45 m (1.5 ft)
Comments: part number includes four RJ45 to DB25 Converter Cables

Cable/Connector: D
Feature Code: 2936
IBM Part Number: 6323741
Length: 3 m (10 ft)
Comments: if customer–supplied, must meet EIA–232D requirements

Cable/Connector: E
Feature Code: 2937
IBM Part Number: 58F2861
Length: N/A
Comments: Printer/Terminal Interposer EIA–232

IBM X.25 Interface Co–Processor/2

This figure illustrates the X.25 Interface Co–Processor/2, type 2-4, with attachment cables for each of the three supported interfaces.



Cable/Connector: Q
Feature Code: 2965
IBM Part Number: 07F3151
Length: 3 m (10 ft)
Comments: X.25 Attachment Cable–X.21

Cable/Connector: Q
Feature Code: 2976
IBM Part Number: 53F3926
Length: 6 m (20 ft)
Comments: X.25 Attachment Cable–X.21

Cable/Connector: R
Feature Code: 2966
IBM Part Number: 07F3161
Length: 3 m (10 ft)
Comments: X.25 Attachment Cable–V.24

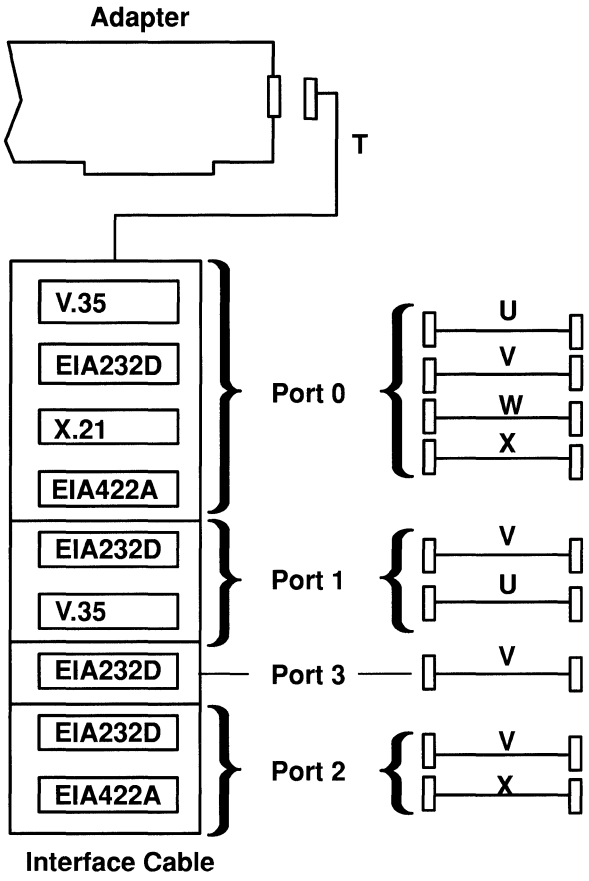
Cable/Connector: R
Feature Code: 2977
IBM Part Number: 53F3927
Length: 6 m (20 ft)
Comments: X.25 Attachment Cable–V.24

Cable/Connector: S
Feature Code: 2967
IBM Part Number: 07F3171
Length: 3 m (10 ft)
Comments: X.25 Attachment Cable–V.35

Cable/Connector: S
Feature Code: 2978
IBM Part Number: 53F3928
Length: 6 m (20 ft)
Comments: X.25 Attachment Cable–V.35

IBM 4–Port Multiprotocol Communications Controller

This figure illustrates the 4–Port Multiprotocol Communications Controller, type 2-3, 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 may be selected per port.



Cable/Connector: T
Feature Code: 2705
IBM Part Number: 40F9897
Length: 3 m (10 ft)
Comments: part of cable assembly

Cable/Connector: U
Feature Code: 2702
IBM Part Number: 71F0162
Length: 2 m (6.5 ft)
Comments: V.35 cable, if customer–supplied, must meet V.35 requirements

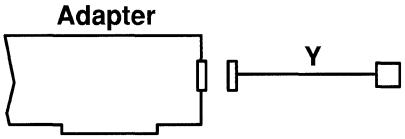
Cable/Connector: V
Feature Code: 2706
IBM Part Number: 71F0165
Length: 3 m (10 ft)
Comments: EIA–232D/V.24 cable, if customer–supplied, must meet EIA–232D/V.24 requirements

Cable/Connector: W
Feature Code: 2704
IBM Part Number: 71F0164
Length: 3 m (10 ft)
Comments: X.21 cable, if customer–supplied, must meet X.21 cable requirements

Cable/Connector: X
Feature Code: N/A
IBM Part Number: N/A
Length: N/A
Comments: if customer–supplied, must meet EIA–422A requirements

IBM Token–Ring High–Performance Network Adapter

This figure illustrates the Token–Ring High–Performance Network Adapter, type 2-2, with attachment cable for the Token-Ring LAN (IBM Local Area Network).



Cable/Connector: Y
Feature Code: N/A
IBM Part Number: 6339098
Length: 3 m (10 ft)
Comments: comes with adapter

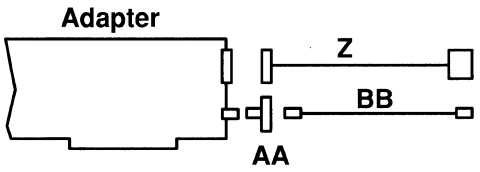
Cable/Connector: Y (Model 930 only)
Feature Code: N/A
IBM Part Number: 53F3930
Length: 6 m (20 ft)
Comments: Token–Ring LAN cable

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

- 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).

IBM Ethernet High–Performance LAN Adapter

This figure illustrates the Ethernet High–Performance LAN Adapter, type 2-1, with attachment cables for the Ethernet network or IBM Local Area Network (LAN).



Cable/Connector: Z
Feature Code: N/A
IBM Part Number: N/A
Length: N/A
Comments: customer–supplied Ethernet LAN cable (must meet IEEE 802.3 requirements)

Cable/Connector: AA
Feature Code: N/A
IBM Part Number: N/A
Length: N/A
Comments: BNC coaxial Tee connector

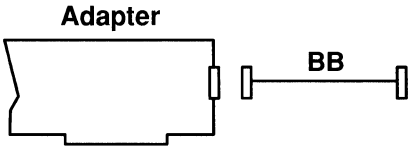
Cable/Connector: BB
Feature Code: N/A
IBM Part Number: 6245998
Length: 3 m (10 ft)
Comments: customer–supplied coaxial cable (must meet IEEE 802.3 requirements)

Considerations for Ethernet applications are found in these publications:

- IEEE 802.3 requirements
- *A Building Planning Guide for Communication Wiring* (G320–8059)
- *IBM Cabling System Planning and Installation Guide*
- *Using the IBM Cabling System with Communication Products.*

IBM 3270 Connection Adapter

This figure illustrates the 3270 Connection Adapter, type 5-1, with attachment cable.



Cable/Connector: BB
Feature Code: N/A
IBM Part Number: 6245998
Length: 3 m (10 ft)
Comments: customer–supplied coaxial cable

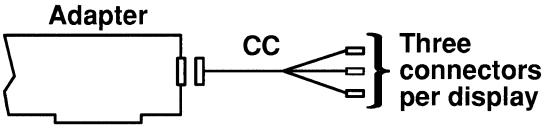
IBM System/370 Host Interface Adapter

There are a variety of ways in which to cable the System/370 Host Interface Adapter, type 6-2, to the IBM 5088.

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

IBM Color Graphics Display Adapter

This figure illustrates the Color Graphics Display Adapter, type 1-1, with attachment cable for a color display.

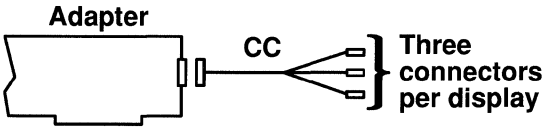


Cable/Connector: CC
Feature Code: N/A
IBM Part Number: 58F2903
Length: 2.4m (8 ft)

Comments: supplied with adapter and an integral toroid assembly

IBM 8 or 24–Bit Color Graphics Processor

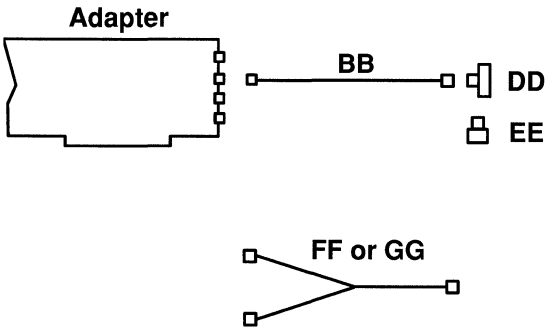
This figure illustrates an 8 or 24–Bit Color Graphics Processor, type 1-3, with attachment cable for one display.



Cable/Connector: CC
Feature Code: N/A
IBM Part Number: 58F2903
Length: 2.4m (8 ft)
Comments: supplied with adapter and an integral toroid assembly

IBM 5085 or 5086 Attachment Adapters

This figure illustrates the 5085 or 5086 Attachment Adapters, type 6–2, with attachment cable for one IBM 5085 or 5086.



Cable/Connector: BB
Feature Code: N/A
IBM Part Number: 6245998
Length: 5 m (16.4 ft)
Comments: customer–supplied

Cable/Connector: DD
Feature Code: N/A
IBM Part Number: N/A
Length: N/A
Comments: coaxial BNC Tee connector

Cable/Connector: EE
Feature Code: N/A
IBM Part Number: 6246330
Length: N/A
Comments: BNC terminator

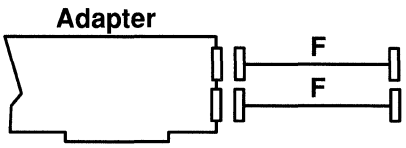
Cable/Connector: FF
Feature Code: N/A
IBM Part Number: 6247042
Length: 5 m (16.4 ft)
Comments: "Y" cable from 5085 Graphics Processor to system unit

Cable/Connector: GG
Feature Code: N/A
IBM Part Number: 6247041
Length: 5 m (16.4 ft)
Comments: "Y" cable from 5086 Graphics Processor to system unit

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

IBM Graphics Input Device Adapter

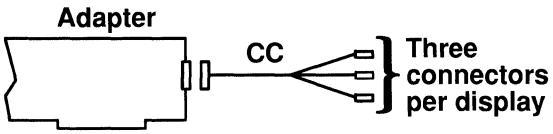
This figure illustrates the Graphics Input Device Adapter, type 6-1, with attachment cable.



Cable/Connector: F
Feature Code: 2811
IBM Part Number: 6247480
Length: 2.1 m (7 ft)
Comments: supplied with IBM 6094 Model 10 Dials or IBM 6094 Lighted Programmable Function Keyboard Model 20

IBM Graphics Subsystem Adapter

This figure illustrates the Graphics Subsystem Adapter, type 1-4, with attachment cable for one display.



Cable/Connector: CC

Feature Code: N/A
IBM Part Number: 58F2903
Length: 2.4m (8 ft)
Comments: supplied with adapter and an integral toroid assembly

IBM SCSI High–Performance I/O Controller

There are a variety of cabling scenarios for the SCSI High–Performance I/O Controller, type 4–1. For cabling considerations refer to "SCSI Adapter."

Cables and Cable Assemblies

The purpose of this section is to facilitate machine layout planning by presenting information on IBM–supplied cables that are used to interconnect the RISC System/6000 system units and devices. The information includes cable feature codes, part numbers, and, for those cables that you may want to build yourself, pin–out charts.

Notes:

1. Some cables have toroids and special shielding for electromagnetic compatibility. The following cables, whether purchased from IBM or customer–supplied, must use toroids: the Lighted Programmable Function Keyboard, Dials, or Tablet Attachment Cable, the PC Parallel Printer Cable, the Display Adapter Cable, and the 64–Port Async Controller Cable.
2. When a second part number is listed, this indicates that there are two cable lengths. The longer length comes with the Model 930; this length can also be used with the other system units.
3. The Async Cable–EIA–232/V.24 is used to connect modems, printers, plotters, and ASCII terminals to the RISC System/6000 system unit. Without an interposer, the cable is used to connect a modem to the RISC System/6000 system unit; if you order a cable for attachment of a printer, plotter, or ASCII terminal to an EIA–232D port, a Printer/Terminal Interposer EIA–232 must be ordered in addition.

Table 1. Cable Identification Cross–Reference

Cable Name	Feature Code	Part Number	Length
X.25 Attachment Cable–X.21	2965 2976	07F3151 53F3926	3 m (10 ft) 6 m (20 ft)
X.25 Attachment Cable–V.24	2966 2977	07F3161 53F3927	3 m (10 ft) 6 m (20 ft)
X.25 Attachment Cable–V.35	2967 2978	07F3171 53F3928	3 m (10 ft) 6 m (20 ft)
Token–Ring Cable (provided with adapter)	N/A	N/A	3 m (10 ft) 6 m (20 ft)
Lighted Programmable Function Keyboard, Dials, or Tablet Attachment Cable	2811	6247480	2.1 m (6.9 ft)
Display Adapter Cable (for 16–inch or 19–inch display) (comes with adapter)	N/A	58F2903	2.4 m (8 ft)
Async Cable–EIA–232/V.24	2936	6323741	3 m (10 ft)
Printer/Terminal Interposer–EIA–232	2937		N/A
RJ45 to DB25 Converter Cable (four provided with each order)	6402	59F3432	0.457 m (1 ft)
Terminal Cable–EIA–422A	2945	30F8966	20 m (65.5 ft)
64–Port Async Controller Cable (included with 16–Port Async Concentrator)	N/A	N/A	7.6 m (25 ft)
SCSI Controller Cable (includes terminator)	2832	70F9733	1.5 m (5 ft)
SCSI Device–to–Device Cable	3130	70F9734	0.66 m (2.2 ft)

Cable Name	Feature Code	Part Number	Length
PC Parallel Printer Cable	3100	1525612	2.1 m (6.9 ft)
4–Port Multiprotocol Interface Cable	2705	40F9897	3 m (10 ft)
Multiprotocol Attachment Cable–X.21	2704	71F0164	3 m (10 ft)
Multiprotocol Attachment Cable–EIA–232/V.24	2706	71F0165	3 m (10 ft)
Multiprotocol Attachment Cable–V.35	2702	71F0162	2 m (6.5 ft)
Multiport Interface Cable	2995	00F5524 53F3048	3 m (10 ft)
16–Port Interface Cable–EIA–232	2996	53F3311 53F3048	3 m (10 ft)
16–Port Interface Cable–EIA–422A	2997	53F3381 53F3048	3 m (10 ft)
Japanese Printer Cables (interchangeable, differ in length only)			
5327, 5575, 5577, or 5587 Cable	N/A	81X7875	2.4 m (7.9 ft)
5327, 5575, 5577, or 5587 Cable	N/A	09F5544	5 m (16.4 ft)

Table 2. Connector Descriptions

Cable Name	Connector Descriptions (adapter end/device end)
X.25 Attachment Cable–X.21	37–pin D male/15–pin D male
X.25 Attachment Cable–V.24	37–pin D male/25–pin D male
X.25 Attachment Cable–V.35	37–pin D male/34–pin D male
Token–Ring Cable (provided with adapter)	9–pin D male/Cabling System plug
Lighted Programmable Function Keyboard, Dials, or Tablet Attachment Cable	8–pin MINI DIN male/8–pin MINI DIN male
Display Adapter Cable (for 16–inch or 19–inch display) (comes with adapter)	Triple coaxial female D–shell/3 BNC male
Printer/Terminal Interposer–EIA–232	25–pin D female/25–pin D male
Async Cable–EIA–232/V.24	25–pin D female/36–pin D male barrier
RJ45 to DB25 Converter Cable	RJ45 male/25–pin D male
Terminal Cable–EIA–422A	25–pin D male/25–pin D male
64–Port Controller Cable	RJ45 male/RJ45 male
SCSI Controller Cable	60–pin male/50–pin male champ
SCSI Device–to–Device Cable	50–pin male/50–pin male champ
PC Parallel Printer Cable	25–pin D male/36–pin D male barrier
4–Port Multiprotocol Interface Cable	78–pin D male/78–pin D female
Multiprotocol Attachment Cable–X.21	15–pin D female/15–pin D female
Multiprotocol Attachment Cable–EIA–232/V.24	25–pin D female/25–pin D male

Cable Name	Connector Descriptions (adapter end/device end)
Multiprotocol Attachment Cable–V.35	15–pin D female/34–pin D male
Multiport Interface Cable	78–pin D male/78–pin D female
16–Port Interface Cable–EIA–232	78–pin D male/25–pin D male
16–Port Interface Cable–EIA–422A	78–pin D male/25–pin D male
Japanese Printer Cables (interchangeable, differ only in length)	
5327, 5575, 5577, or 5587 Cable	25–pin D male/36–pin D female barrier
5327, 5575, 5577, or 5587 Cable	25–pin D male/36–pin D female barrier

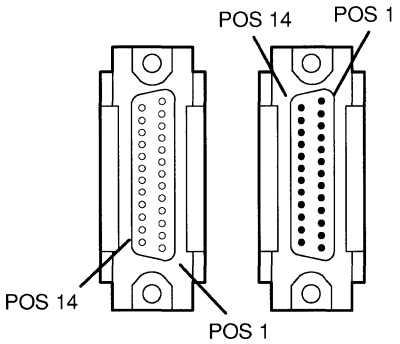
Cable Information

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."

Customer–supplied cables must meet requirements as appropriate for cable application and customer needs.

Cable D

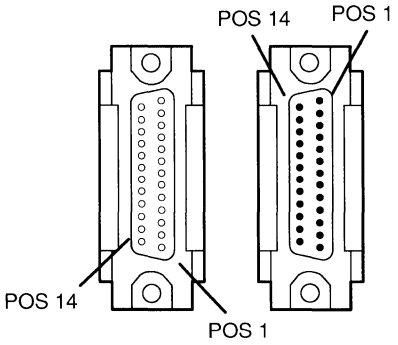
Description: customer–supplied EIA–232D asynchronous cable



Signal	System End Connector	Device End Connector
	Socket (Female)	Pin (Male)
Ground Shield	1	float
TD	2	2
RD	3	3
RTS	4	4
CTS	5	5
DSR	6	6
Signal Ground	7	7
CD	8	8
DTR	20	20
RI	22	22

Cable E

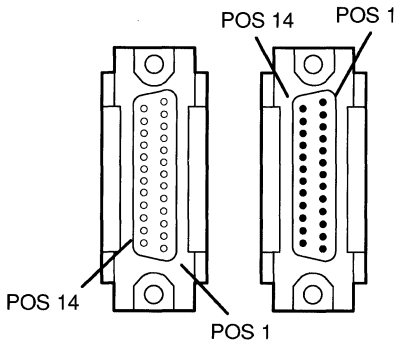
Description: Printer/Terminal Interposer–EIA–232



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

Cable K

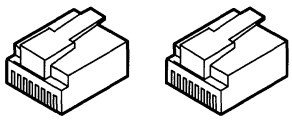
Description: Terminal Cable EIA–422A



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

Cable N

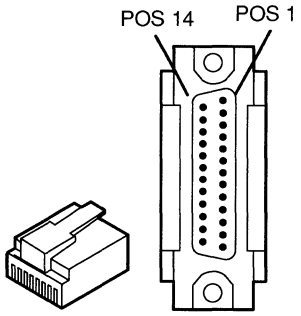
Description: 64–Port Async Controller Cable to the 16–Port Concentrator Box



Signal	System End Connector	Device End Connector
	Pin	Pin
Pair 1	1	1
	2	2
Shield	3	3
Pair 2	4	4
	5	5
Unused (no connector)	6	6
Pair 3	7	7
	8	8

Cable P

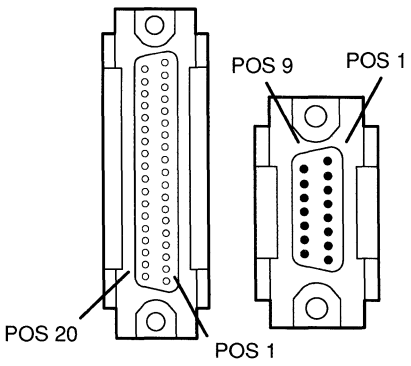
Description: RJ45 to DB25 Converter Cable



Signal	System End Connector	Device End Connector
	Pin	Pin (Male)
Ground Shield	1	1
RTS	2	4
RxD	3	3
CD	4	8
Signal Ground	5	7
TxD	6	2
DTR	7	20
CTS	8	5

Cable Q

Description: X.25 Attachment Cable–X.21

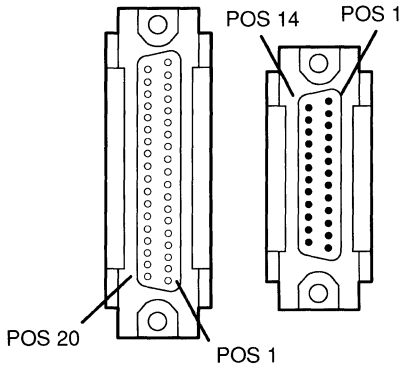


Cable Q (continued)

Signal	System End Connector	Device End Connector
	Socket (Female)	Pin (Male)
T (A)	10	2
T (B)	28	9
C (A)	11	3
C (B)	29	10
R (A)	12	4
R (B)	30	11
I (A)	13	5
I (B)	31	12
S (A)	14	6
S (B)	32	13
Ground	7	8
Ground	7	9

Cable R

Description: X.25 Attachment Cable–V.24



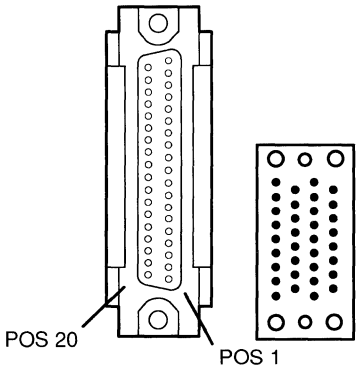
Signal	System End Connector	Device End Connector
	Socket (Female)	Pin (Male)
TxD	2	2
RxD	3	3
RTS	4	4
CTS	5	5
DSR	6	6
CD	8	8

Cable R (continued)

Tx CLK	24	15
Rx CLK	26	17
LLBT	27	18
DTR	20	20
RLBT	21	21
CI	22	22
TI	25	25
Ground	7	7
Ground	9	7
Ground	15	9

Cable S

Description: X.25 Attachment Cable–V.35



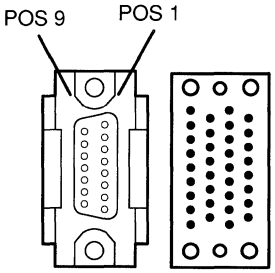
Signal	System End Connector	Device End Connector
	Socket (Female)	Pin (Male)
RTS	4	C
CTS	5	D
DSR	6	E
CD	8	F
DTR	20	H
CI	22	J
TxD–A	35	P
TxD–B	17	S
RxD–A	37	R
RxD–B	19	T
Tx Clk (A)	36	Y

Cable S (continued)

Tx Clk (B)	18	AA
Rx Clk (A)	34	V
Rx Clk (B)	16	X
Ground	7	B
Ground	7	15

Cable U

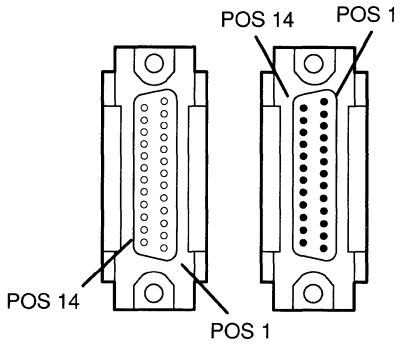
Description: 4–Port Multiprotocol Communications Controller V.35 Cable



Signal	System End Connector	Device End Connector
	Socket (Female)	Pin (Male)
Ground Shield	1	1
TxD	2	S
RTS	3	C
RxD (B)	4	T
CTS	5	D
DSR	6	E
CD	7	F
Signal Ground	8	8
TxD (A)	9	P
TX Clk (A)	10	U
RxD (A)	11	R
Tx Clk (B)	12	W
Rx Clk (B)	13	X
Rx Clk (A)	14	V
DTR	15	H

Cable V

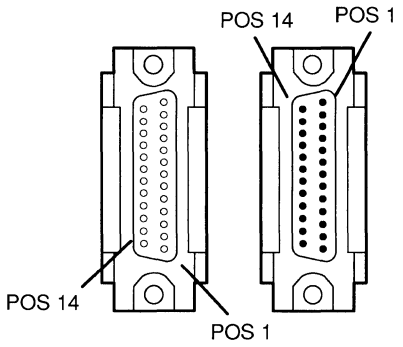
Description: customer–supplied EIA–232D/V.24 cable for use with the IBM 4–Port Multiprotocol Communications Controller



Signal	System End Connector	Device End Connector
	Socket (Female)	Pin (Male)
TxD	2	2
RxD	3	3
RTS	4	4
CTS	5	5
DSR	6	6
Signal Ground	7	7
CD	8	8
Tx Clk	15	15
Rx Clk	17	17
DTR	20	20
RI	22	22
HRS	23	23
DTE Clk	24	24
Shield Ground	1	

Cable W

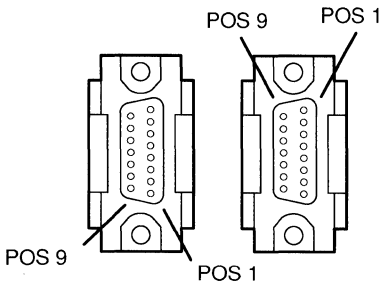
Description: customer–supplied EIA–422A cable for use with the 4–Port Multiprotocol Communications Controller



Signal	System End Connector	Device End Connector
	Socket (Female)	Pin (Male)
Ground Shield		
+TD	2	15
+RD	3	19
–TD	4	17
–RD	5	25
Signal Ground	7	7

Cable X

Description: customer–supplied X.21 cable for use with the 4–Port Multiprotocol Communications Controller



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

Power Cords, Plugs and Electrical Considerations

Power Cords

IBM supplies power cords with attached plugs. For the 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 Model 730 the cord comes in only one length, 1.8 m (6 ft). For the Model 930 the cord is 4.3 m (14 ft), 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 used in that country.

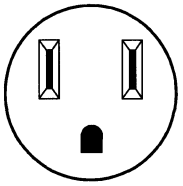
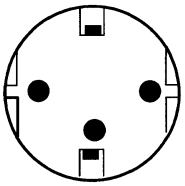
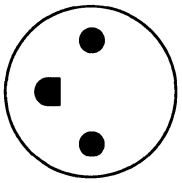
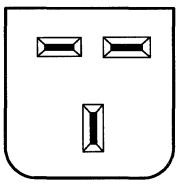
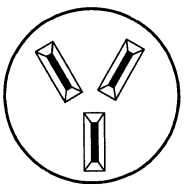
Plugs

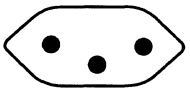
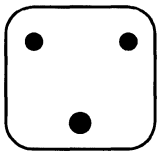
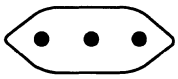
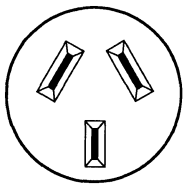
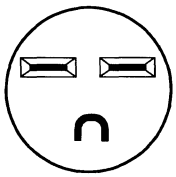
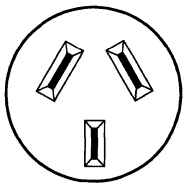
The following table presents information concerning the receptacles that correspond to system unit plugs for various countries. The cords are put in order of feature code.

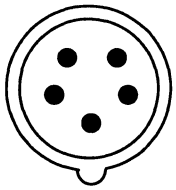
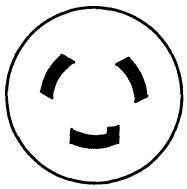
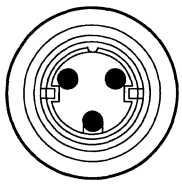
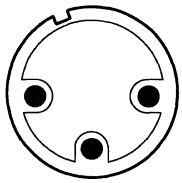
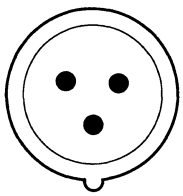
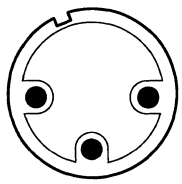
Consult your RISC System/6000 marketing representative for information on which type of plug is used in your area or country.

Notes:

4. 9113 and 9114 denote feature codes for a Model 930 Power Distribution Unit rather than a power cord. When used, they 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.
5. Raised–floor installations require an R & S (Russell and Stoll) 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

Model 930		
9113 9114		IEC 309 380–414 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 Weather-proof 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 "Power Phase Imbalance" and "Power Phase Rotation," which apply only to the Model 930.

Primary Computer Power Service

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 the Model 930 Power Distribution Unit 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 Model 930 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 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 grounded (earthed) neutral.

RISC System/6000 Reference Information

The following sections present information that will help you in planning for the RISC System/6000 system units and devices.

System Unit and Device Considerations

The following is a summary of the information you can use to compare systems and external removable media, and plan your office space for the RISC System/6000 system. Considerations for the optional Model 930 SCSI Disk Drawer are also provided. Electrical and environmental data for the Model 930 represents the following two configurations:

- Maximum Entry Configuration: a Processor Drawer with eight memory cards and eight I/O cards, a full SCSI Device Drawer with four SCSI devices, and a Battery Backup Unit.
- Maximum 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, three SCSI Disk Drawers with four SCSI devices each, and a Battery Backup Unit.

Note: Most Model 930 configurations fall within the ranges represented by the data for the Maximum Entry Configuration and Maximum Configuration.

Physical Considerations for RISC System/6000 System Units or Devices

System Unit or Device	Height	Width	Depth	Minimum Weight	Maximum Weight
Model 320 (desktop position)	162 mm (6.4 in.)	456 mm (18 in.)	523 mm (20.6 in.)	12.7 kg (28 lbs)	15.4 kg (34 lbs)
Model 320 (deskside position)	466 mm (18.3 in.)	280 mm (11 in.) (at pedestal)	523 mm (20.6 in.)	12.7 kg (28 lbs)	15.4 kg (34 lbs)
Model 520	610 mm (24.0 in.)	360mm (14.2 in.)	675 mm (26.6 in.)	36.7 kg (81 lbs)	53.1 kg (117 lbs)
Model 530	610 mm (24.0 in.)	360mm (14.2 in.)	675 mm (26.6 in.)	36.7 kg (81 lbs)	53.1 kg (117 lbs)
Model 540	610 mm (24.0 in.)	360mm (14.2 in.)	675 mm (26.6 in.)	36.7 kg (81 lbs)	53.1 kg (117 lbs)
Model 730	610mm (24.0 in.)	460mm (14.2 in.)	675 mm (26.6 in.)	53.5 kg (118 lbs)	66.2 kg (146 lbs)
Model 930	1578 mm (62.0 in.)	650 mm (25.5 in.)	921 mm (36.0 in.)	194.6 kg (429 lbs)	366.4 kg (808 lbs)
Model 930 SCSI Disk Drawer	171 mm (6.7 in.)	443 mm (17.3 in.)	719 mm (28.3 in.)	13.6 kg (30 lbs)	43 kg (95 lbs)
Xstation 120	65 mm (2.6 in.)	375 mm (14.7 in.)	380 mm (15 in.)	7.7 kg (17 lbs)	8.6 kg (19 lbs)

Physical Considerations (continued)					
System Unit or Device	**Height**	**Width**	**Depth**	**Minimum Weight**	**Maximum Weight**
4869 5 1/4–Inch 1.2 MB External Diskette Drive Model 2	62.5 mm (2.5 in.)	227 mm (8.9 in.)	408 mm (16 in.)	2.1 kg (4.6 lbs)	2.1 kg (4.6 lbs)
7203 External Portable Disk Drive Model 1	160 mm (6.3 in.)	280 mm (11 in.)	345 mm (13.6 in.)	(6.12 kg) (13.5 lbs) (without module)	10.3 kg (22.6 lbs) (with a 355 or 670 MB module)
7204 External Disk Drive Model 320	80 mm (3.3 in.)	280 mm (11 in.)	285 mm (11.3 in.)	4.7 kg (10.3 lbs)	4.7 kg (10.3 lbs)
7207 150 MB External 1/4–Inch Cartridge Tape Drive Model 1	80 mm (3.3 in.)	280 mm (11 in.)	285 mm (11.3 in.)	4.5 kg (10 lbs)	4.5 kg (10 lbs)
7208 2.3 GB External 8mm Tape Drive Model 1	123 mm (4.8 in.)	280 mm (11 in.)	285 mm (11.3 in.)	6 kg (13.3 lbs)	6 kg (13.3 lbs)
7210 External CD–ROM Drive Model 1	80 mm (3.3 in.)	280 mm (11 in.)	285 mm (11.3 in.)	4.9 kg (10.8 lbs)	4.9 kg (10.8 lbs)
9348 Magnetic Tape Unit Model 12	222 mm (8.75 in.)	483 mm (19 in.)	673 mm (26.5 in.)	48.2 kg (105 lbs)	48.2 kg (105 lbs)

Electrical Requirements/Considerations for RISC System/6000 System Units and Devices							
System Unit or Device	**Power Source Loading (Maximum in kVA)**	**Voltage range (Vac)**	**Frequency (Hertz)**	**Thermal Output (Maximum in BTU/hr)**	**Power Requirement (Maximum in Watts)**	**Power Factor**	**Maximum Altitude**
Model 320	0.7	100 to 125 or 200 to 240 (autoranging)	50 or 60 (at any supported voltage)	1200	350	0.5 to 0.7	2135 m (7000 feet)
Model 520	1.0	100 to 125 or 200 to 240 (autoranging)	50 or 60 (at any supported voltage)	2732	900	0.8 to 1.0	2135 m (7000 feet)

Electrical Requirements/Considerations (continued)							
System Unit or Device	**Power Source Loading (Maximum in kVA)**	**Voltage range (Vac)**	**Frequency (Hertz)**	**Thermal Output (Maximum in BTU/hr)**	**Power Requirement (Maximum in Watts)**	**Power Factor**	**Maximum Altitude**
Model 530	1.0	100 to 125 or 200 to 240 (autoranging)	50 or 60 (at any supported voltage)	2732	900	0.8 to 1.0	2135 m (7000 ft)
Model 540	1.0	100 to 125 or 200 to 240 (autoranging)	50 or 60 (at any supported voltage)	2732	900	0.8 to 1.0	2135 m (7000 ft)
Model 730	1.2	100 to 125 or 200 to 240 (autoranging)	50 or 60 (at any supported voltage)	3688	1200	0.8 to 1.0	2135 m (7000 ft)
Model 930 Maximum Entry Configuration	1.1	200 to 240	50 or 60	2500	730	0.5 to 0.7	2135 m (7000 ft)
Model 930 Maximum Configuration	3.3	200 to 240	50 or 60	5750	1680	0.5 to 0.7	2135 m (7000 ft)
Model 930 SCSI Disk Drawer	0.41	200 to 240	50 or 60	840	250	0.5 to 0.7	2135 m (7000 ft)
IBM Internal 1/2–Inch 9–Track Tape Drive Drawer	0.2	100 to 125 or 200 to 240 (selectable)	50 or 60	400	115	0.5 to 0.7	2135 m (7000 ft)
Xstation 120	0.09	100 to 125 or 200 to 240 (autoranging)	50 or 60	212	62	0.7 (maximum)	2135 m (7000 ft)
4869 5 1/4–Inch 1.2 MB External Diskette Drive Model 2	0.1	100 to 125 or 200 to 240 (autoranging	50 or 60	68	17	N/A	2135 m (7000 ft)

Electrical Requirements/Considerations (continued)							
System Unit or Device	**Power Source Loading (Maximum in kVA)**	**Voltage range (Vac)**	**Frequency (Hertz)**	**Thermal Output (Maximum in BTU/hr)**	**Power Requirement (Maximum in Watts)**	**Power Factor**	**Maximum Altitude**
7203 External Portable Disk Drive Model 1	0.24	100 to 125 or 200 to 240 (autoranging)	50 or 60	400	120	0.5 to 0.7	2135 m (7000 ft)
7204 External Disk Drive Model 320	0.07	100 to 125 or 200 to 240 (autoranging)	50 or 60	110	32	0.5 to 0.7	2135 m (7000 ft)
7207 150 MB External 1/4–Inch Cartridge Tape Drive Model 1	0.12	100 to 125 or 200 to 240 (autoranging)	50 or 60	200	60	0.5 to 0.7	2135 m (7000 ft)
7208 2.3 GB External 8mm Tape Drive Model 1	0.07	100 to 125 or 200 to 240 (autoranging)	50 or 60	110	32	0.5 to 0.7	2135 m (7000 ft)
7210 External CD–ROM Drive Model 1	0.07	100 to 125 or 200 to 240 (autoranging)	50 or 60	110	32	0.5 to 0.7	2135 m (7000 ft)
9348 Magnetic Tape Unit Model 12	0.2	100 to 125 or 200 to 240 (selectable)	50 or 60	400	115	0.5 to 0.7	2135 m (7000 ft)

Note: The figures for Power source loading, Thermal output, and Power requirement represent maximums. Please work with your IBM marketing representative to determine the typical figures for your configuration.

Temperature Requirements for RISC System/6000 System Units and Devices		
System Unit or Device	**Operating**	**Non–operating**
Model 320	16 to 32°C (60 to 90°F)	10 to 43° C (50 to 110°F)
Model 520	16 to 32°C (60 to 90°F)	10 to 43° C (50 to 110°F)
Model 530	16 to 32°C (60 to 90°F)	10 to 43° C (50 to 110°F)
Model 540	16 to 32°C (60 to 90°F)	10 to 43° C (50 to 110°F)
Model 730	16 to 32°C (60 to 90°F)	10 to 43° C (50 to 110°F)

Temperature Requirements (continued)		
System Unit or Device	**Operating**	**Non–operating**
Model 930 (for most configurations)	10 to 40°C (50 to 104°F)	10 to 52° C (50 to 125°F)
Model 930 SCSI Disk Drawer	10 to 40°C (50 to 104°F)	10 to 52° C (50 to 125°F)
IBM Internal 1/2–Inch 9–Track Tape Drive Drawer	16 to 32°C (60 to 90°F)	10 to 43° C (50 to 110°F)
Xstation 120	16 to 32°C (60 to 90°F)	10 to 43° C (50 to 110°F)
4869 5 1/4–Inch 1.2 MB External Diskette Drive Model 2	10 to 40°C (50 to 104°F)	10 to 52° C (50 to 125°F)
7203 External Portable Disk Drive Model 1	16 to 32°C (60 to 90°F)	10 to 43° C (50 to 110°F)
7204 External Disk Drive Model 320	16 to 32°C (60 to 90°F)	10 to 43° C (50 to 110°F)
7207 150 MB External 1/4–Inch Cartridge Tape Drive Model 1	16 to 32°C (60 to 90°F)	10 to 43° C (50 to 110°F)
7208 2.3 GB External 8mm Tape Drive Model 1	16 to 32°C (60 to 90°F)	10 to 43° C (50 to 110°F)
7210 External CD–ROM Drive Model 1	16 to 32°C (60 to 90°F)	10 to 43° C (50 to 110°F)
9348 Magnetic Tape Unit Model 12	16 to 32°C (60 to 90°F)	10 to 43° C (50 to 110°F)

Relative Humidity Requirements for RISC System/6000 System Units and Devices (non–condensing)		
System Unit or Device	**Operating**	**Non–Operating**
Model 320	8 to 80%	8 to 80%
Model 520	8 to 80%	8 to 80%
Model 530	8 to 80%	8 to 80%
Model 540	8 to 80%	8 to 80%
Model 730	8 to 80%	8 to 80%
Model 930	20 to 80%	20 to 80%
Model 930 SCSI Disk Drawer	8 to 80%	5 to 80%
IBM Internal 1/2–Inch 9–Track Tape Drive Drawer	20 to 80%	20 to 80%
Xstation 120	8 to 80%	8 to 80%
4869 5 1/4–Inch 1.2 MB External Diskette Drive Model 2	8 to 80% (ANSI media) 20 to 80% (ISO media)	5 to 95%
7203 External Portable Disk Drive Model 1	8 to 80%	8 to 80%
7204 External Disk Drive Model 320	8 to 80%	8 to 80%

Relative Humidity Requirements (continued)		
System Unit or Device	**Operating**	**Non–Operating**
7207 150 MB External 1/4–Inch Cartridge Tape Drive Model 1	20 to 80%	20 to 80%
7208 2.3 GB External 8mm Tape Drive Model 1	20 to 80%	20 to 80%
7210 External CD–ROM Drive Model 1	10 to 80%	10 to 80%
9348 Magnetic Tape Unit Model 12	20 to 80%	20 to 80%

Note: If any tape drive is installed, the minimum relative humidity of a system unit is 20%. If a CD–ROM Drive is installed, the minimum relative humidity of a system unit is 10%.

Wet Bulb Requirements for RISC System/6000 System Units and Devices		
System Unit or Device	**Operating**	**Non–operating**
Model 320	23°C (73°F)	27° C (80°F)
Model 520	23°C (73°F)	27° C (80°F)
Model 530	23°C (73°F)	27° C (80°F)
Model 540	23°C (73°F)	27° C (80°F)
Model 730	23°C (73°F)	27° C (80°F)
Model 930	23°C (73°F)	27° C (80°F)
Model 930 SCSI Disk Drawer	27°C (80°F)	29° C (84°F)
IBM Internal 1/2–Inch 9–Track Tape Drive Drawer	23°C (73°F)	27° C (80°F)
Xstation 120	23°C (73°F)	27° C (80°F)
4869 5 1/4–Inch 1.2 MB External Diskette Drive Model 2	23°C (73°F)	27° C (80°F)
7203 External Portable Disk Drive Model 1	23°C (73°F)	27° C (80°F)
7204 External Disk Drive Model 320	23°C (73°F)	27° C (80°F)
7207 150 MB External 1/4–Inch Cartridge Tape Drive Model 1	23°C (73°F)	27° C (80°F)
7208 2.3 GB External 8mm Tape Drive Model 1	23°C (73°F)	27° C (80°F)
7210 External CD–ROM Drive Model 1	23°C (73°F)	27° C (80°F)
9348 Magnetic Tape Unit Model 12	23°C (73°F)	27° C (80°F)

Noise Emissions Values for RISC System/6000 System Units and Devices								
System Unit or Device	**L_{WAd}**		**L_{pAm}**		**$<L_{pA}>_m$**		**Impulsive Noise**	**Prominent Discrete tones**
	Operating (bels)	**Idle (bels)**	**Operating (dBA)**	**Idle (dBA)**	**Operating (dBA)**	**Idle (dBA)**		
Model 320 (desktop position)	5.7	5.5	43	41	41	41	No	No
Model 320 (deskside position)	5.7	5.5	N/A	N/A	38	38	No	No
Model 520	5.7	5.5	N/A	N/A	39	38	No	No
Model 530	5.7	5.5	N/A	N/A	39	38	No	No
Model 540	5.7	5.5	N/A	N/A	39	38	No	No
Model 730	5.7	5.5	N/A	N/A	39	38	No	No
Model 930 *	6.4	6.2	N/A	N/A	49	47	No	No
Xstation 120	4.6	4.6	32	32	31	31	No	No
4869 5 1/4–Inch 1.2 MB External Diskette Drive Model 2	6.0	N/A	54	N/A	42	N/A	Yes	No
7203 External Portable Disk Drive Model 1	5.8	5.6	N/A	N/A	42	41	No	No
7204 External Disk Drive Model 320	5.6	5.6	N/A	N/A	40	40	No	No
7207 150 MB External 1/4–Inch Cartridge Tape Drive Model 1	6.6	5.3	N/A	N/A	46	40	No	No
7208 2.3 GB External 8mm Tape Drive Model 1	5.5	5.5	N/A	N/A	46	40	No	No
7210 External CD–ROM Drive Model 1	5.1	5.1	N/A	N/A	36	36	No	No
9348 Magnetic Tape Unit Model 12	7.0**	6.8	N/A	N/A	51**	50	No	No

*Noise emissions data is based on the following Model 930 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.

**Data applies when the tape unit is in the streaming operating mode.

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).
All measurements are made in accordance with ISO DIS 779, and reported in conformance with ISO DIS 7574/4.

System Unit Configuration Options

The following tables present the various internal media configuration options for the Model 520, Model 530, Model 540, and Model 730 system units. The Model 320 system unit does not support additional internal media devices.

Table 1. Internal media configuration options for the Model 520, Model 530, and Model 540 system units.

Front Panel Slot A	Front Panel Slot B	Front Panel Slot C	Front Panel Slot D
Empty	Empty	Empty	3.5–inch 1.44MB diskette drive
8 mm Tape Drive		Empty	3.5–inch 1.44MB diskette drive
8 mm Tape Drive		CD–ROM	3.5–inch 1.44MB diskette drive
Empty	Empty	CD–ROM	3.5–inch 1.44MB diskette drive

Table 2. Internal media configuration options for the Model 730 system unit.

Front Panel Slot A	Front Panel Slot B	Front Panel Slot C	Front Panel Slot D
Empty	Empty	Empty	3.5–inch 1.44MB diskette drive
8 mm Tape Drive		Empty	3.5–inch 1.44MB diskette drive
8 mm Tape Drive		CD–ROM	3.5–inch 1.44MB diskette drive
Empty	Empty	CD–ROM	3.5–inch 1.44MB diskette drive
Fixed Disk		Empty	3.5–inch 1.44MB diskette drive
Fixed Disk		CD–ROM	3.5–inch 1.44MB diskette drive

Physical Planning Templates and Floor Plan Grid

The following templates for the RISC System/6000 system units, the IBM Xstation 120, and external media devices can aid in planning for your system.

To facilitate office planning using the templates, a grid is also provided. The templates and grids are drawn to a scale where 1 cm equals 1/2 m, or 1/4 in. equals 1 ft. You can make copies of the templates and grids as needed for personal use.

Installation Positions and Air flow

The amount of space needed by the unit or device during normal operation is indicated by broken lines. This clearance includes the following air flow considerations. The Xstation 120 and the Model 320 should have 152 mm (6 in.) of clearance in the front and back to allow proper air flow. The Model 520, Model 530, Model 540, and Model 730 should each have 76 mm (3 in.) on the left and right sides and 152 mm (6 in.) in the back for proper airflow. For the Model 930 air intake is through the front panel and air exhaust is out the bottom and top of the rack rear door. The Model 930 template shows the radius of the swinging door on the rack and a drawer in the extended position. Maintenance of a proper service clearance for the rack (see below) should allow proper air flow.

The external media devices require 152 mm (6 in.) in the front and rear for proper air flow. The IBM 7208 2.3 GB External 8mm Tape Drive Model 1 requires an additional 152 mm (6 in.) on the right side.

Service Positions

Because most of the system units can be moved from an installation to a service position, the service clearances are not indicated on the templates. The Model 320 should have 760 mm (30 in.) in the front for proper servicing. The Model 520, Model 530, Model 540, and Model 730 should each be installed in a way which would allow them to be moved to an area that would provide 760 mm (30 in.) on each side for servicing.

The template for the Model 930 includes a service clearance, since it cannot be moved. The rack should have 1220 mm (48 in.) on both the left and right sides, 760 mm (30 in.) in the back, and 1650 mm (65 in.) in the front in order to be serviced.

For the media devices, 152 mm (6 in.) at the front of each unit is allowed for servicing. The IBM 9348 Magnetic Tape Unit Model 12, which is serviced by tilting it on its side, requires 305 mm (12 in.) on either side for servicing.

The front of the system unit or device is the end nearest the bottom of the page.

System Unit Templates

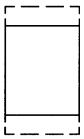


Figure 8. Model 320 Template (Desktop Position)

Figure 9. Model 320 Template (Deskside Position)

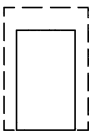


Figure 10. Model 520, Model 530, and Model 540 Template

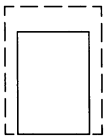


Figure 11. Model 730 Template

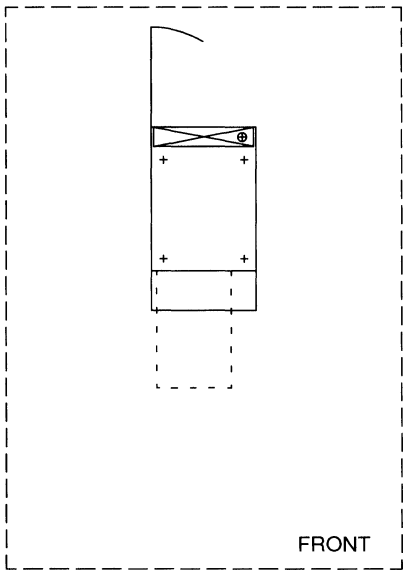


Figure 12. Model 930 Template

IBM Xstation 120 Template

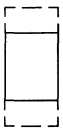


Figure 13. Xstation 120 Template

External Media Device Templates

Figure 14. IBM 4869 5 1/4–Inch 1.2 MB External Diskette Drive Model 2 Template

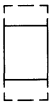


Figure 15. IBM 7203 External Portable Disk Drive Model 1 Template

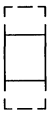


Figure 16. IBM 7204 External Disk Drive Model 320 Template

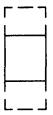


Figure 17. IBM 7207 150 MB External 1/4–Inch Cartridge Tape Drive Model 1 Template

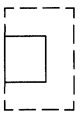


Figure 18. IBM 7208 2.3 GB External 8mm Tape Drive Model 1 Template

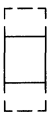


Figure 19. IBM 7210 External CD–ROM Drive Model 1 Template

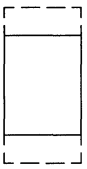
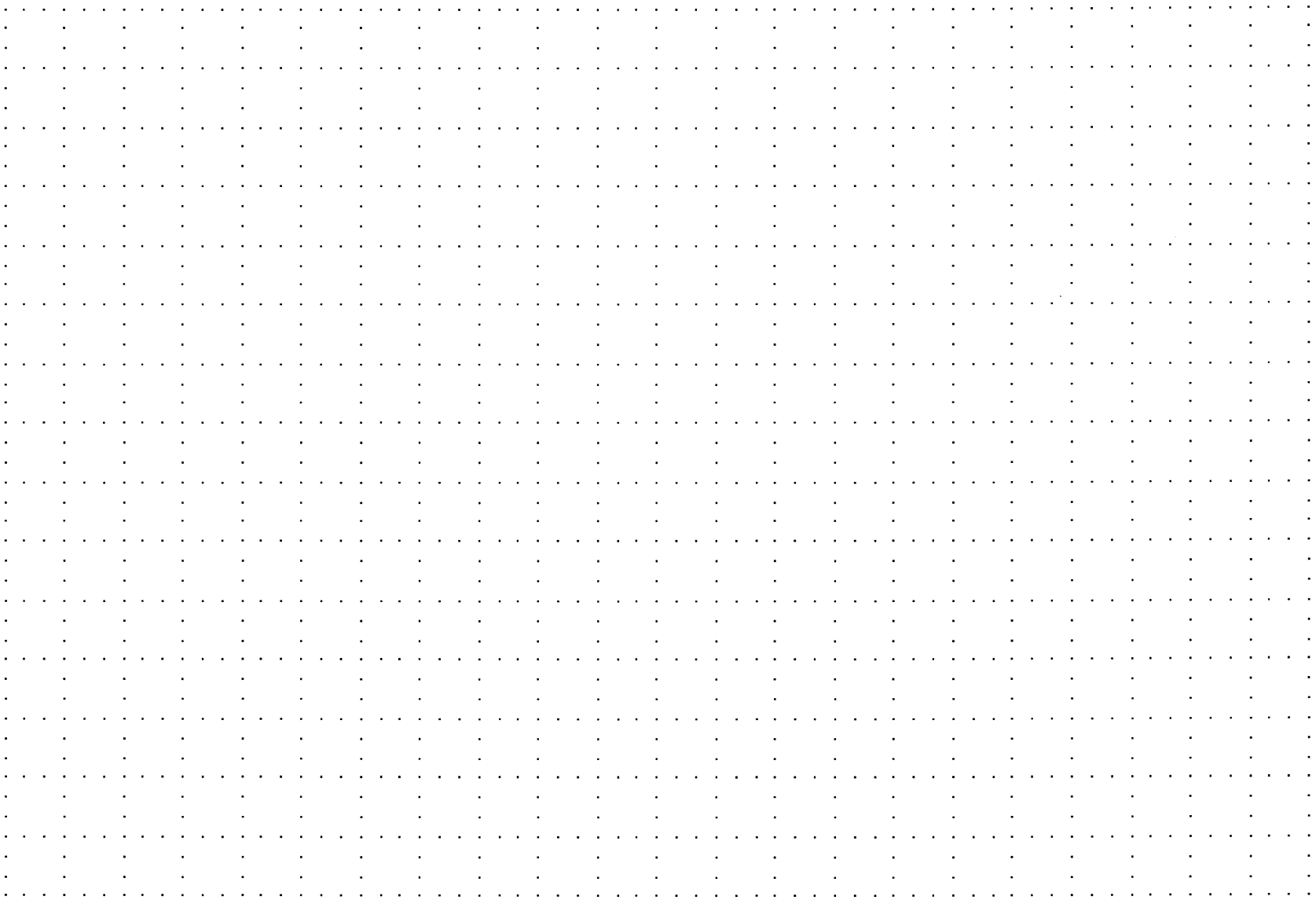


Figure 20. IBM 9348 Magnetic Tape Unit Model 12 Template

Site Planning Worksheet

System_____

Customer Name _____ Customer Number_____ Worksheet _____

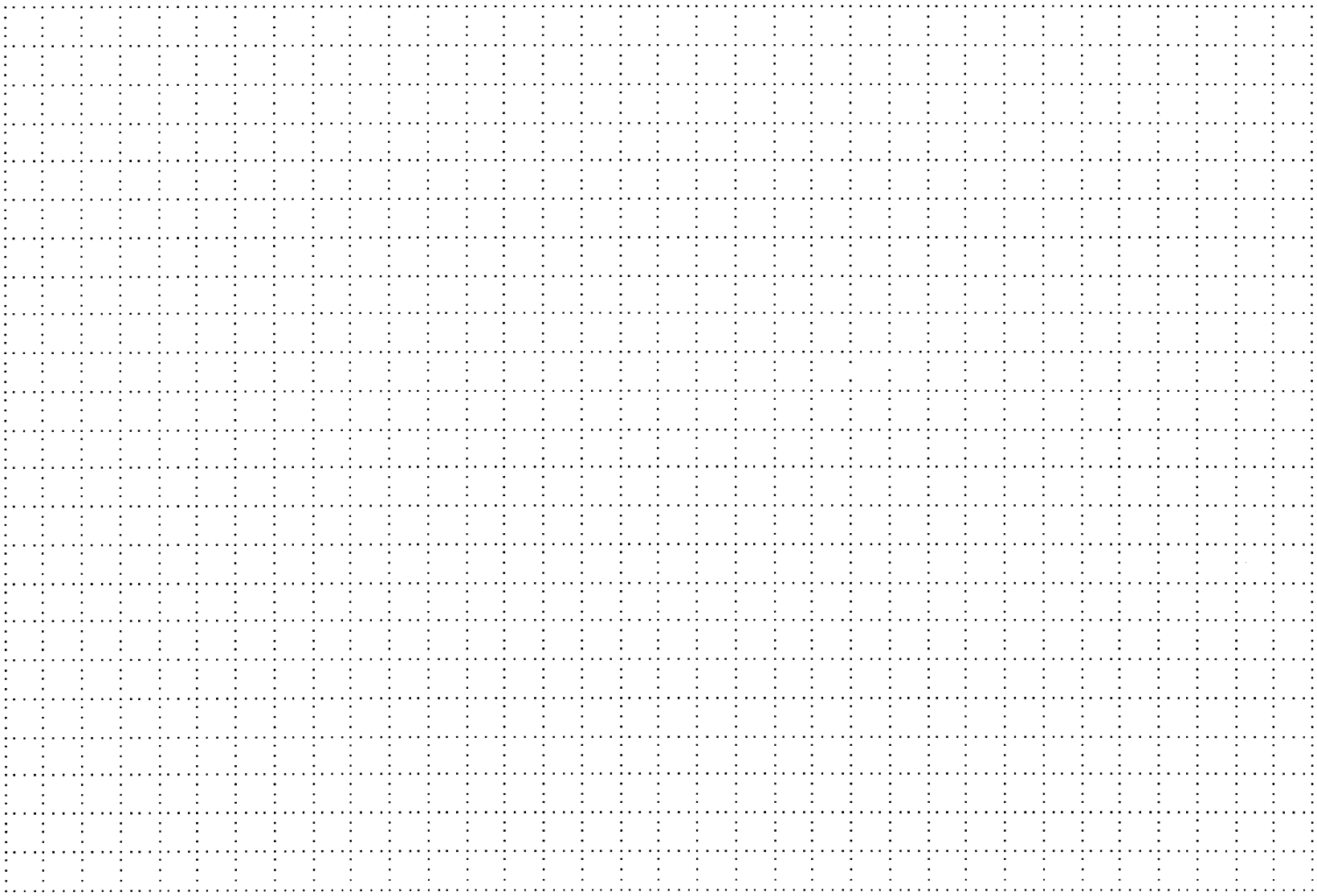


SCALE: 1 square (1cm) = 1/2 m

Site Planning Worksheet

System_____

Customer Name _____ Customer Number_____ Worksheet _____



SCALE: 1 square (1/4 in.) = 1 ft.

Cable Planning Charts

The following are charts you can use in planning for your cabling. There are four unique charts, one for each of the following adapters or adapter types: asynchronous adapters, standard I/O adapters, the 4–Port Multiprotocol Communications Controller, and other adapters ("Cable Planning Chart–Other Adapters".) For cable planning involving the SCSI High–Performance I/O Controller, refer to the *Installation and Service Guide* for your system.

You can make copies of the charts as needed. To help you complete the charts, two samples are provided below.

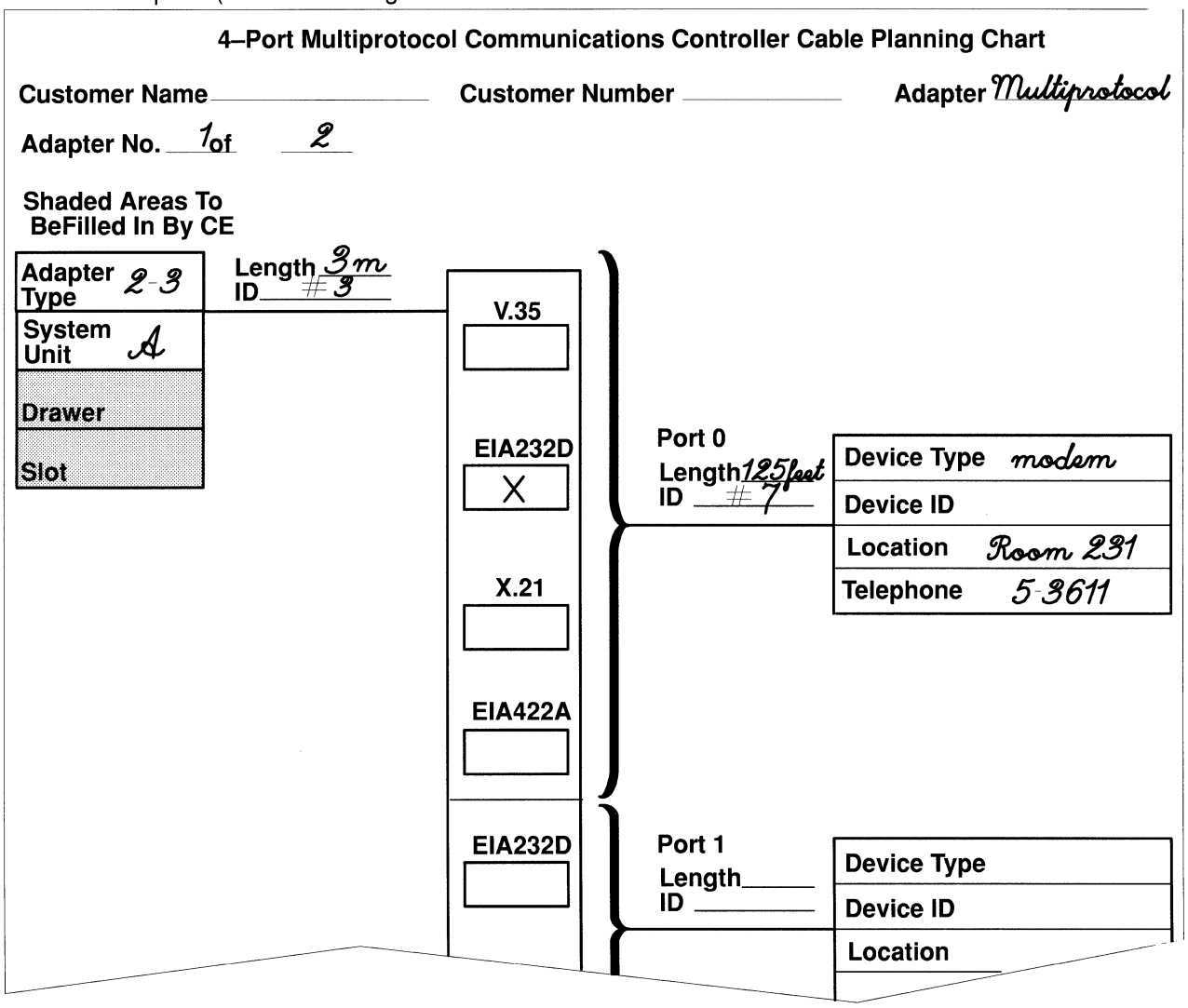


Figure 21. A 4–Port Multiprotocol Communications Controller Cable Planning Chart completed for a modem. In this example the terminal is attached to Port 0.

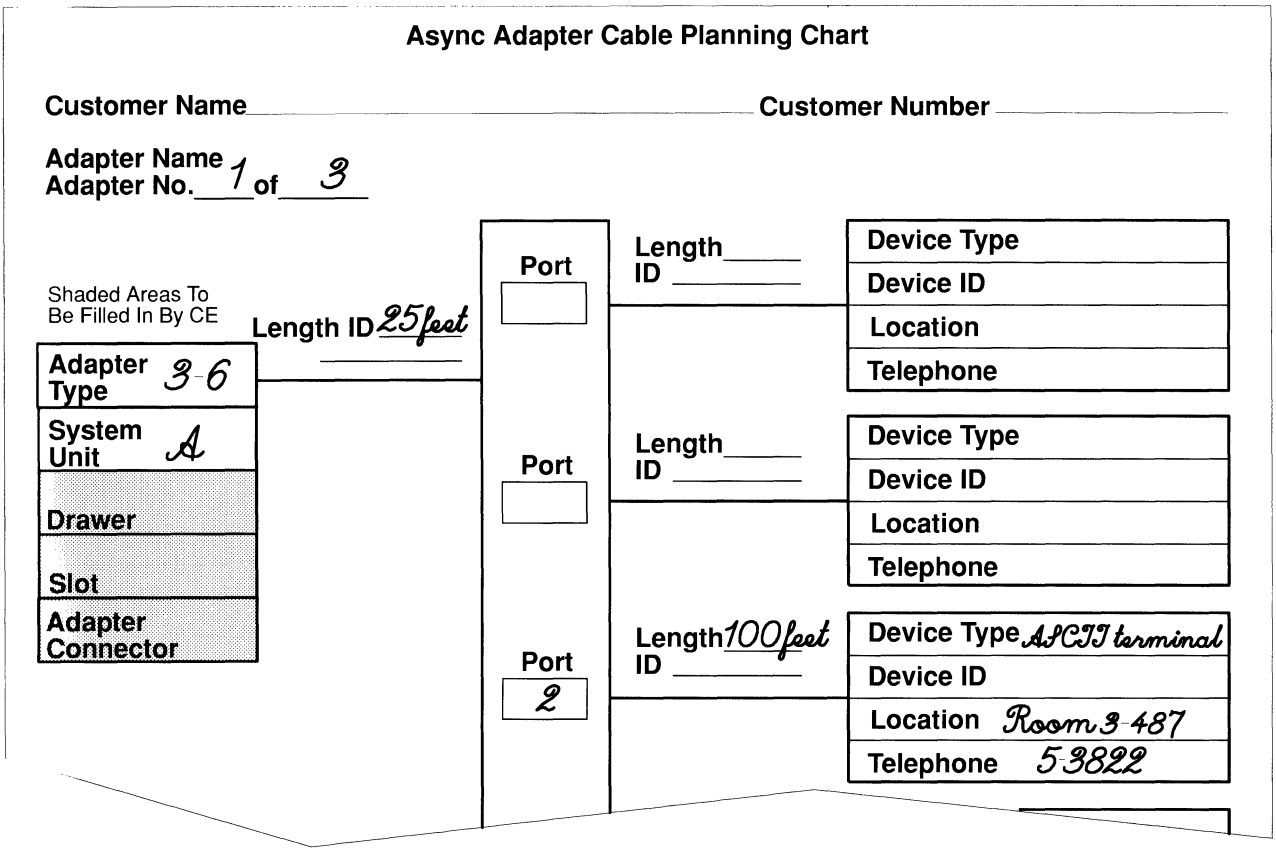


Figure 22. An Async Cable Planning Chart (for an IBM 64–Port Async Controller) completed for an ASCII terminal. In this example the terminal is attached to Port 2 of Concentrator Box 4.

Cable Planning Chart – Other Adapters

Page __ of __

Customer Name ______________________ **Customer Number** ______________

Adapter Name ______________________ **Adapter No.** ____ **of** ______

Shaded Areas To
Be Filled In By CE

Adapter Type	Length_______ ID__________	Device Type
System Unit	Interface ___ X.21 ___ V.24 ___ V.35	Device ID
Drawer		Location
Slot		Telephone

Adapter Name ___________
Adapter No. _____ **of** _____

Adapter Type	Length_______ ID__________	Device Type
System Unit	Interface ___ X.21 ___ V.24 ___ V.35	Device ID
Drawer		Location
Slot		Telephone

Adapter Name ___________
Adapter No. _____ **of** _____

Adapter Type	Length_______ ID__________	Device Type
System Unit	Interface ___ X.21 ___ V.24 ___ V.35	Device ID
Drawer		Location
Slot		Telephone

Adapter Name ___________
Adapter No. _____ **of** _____

Adapter Type	Length_______ ID__________	Device Type
System Unit	Interface ___ X.21 ___ V.24 ___ V.35	Device ID
Drawer		Location
Slot		Telephone

Async Adapter Cable Planning Chart

Customer Name ______________________ Customer Number ______________

Adapter Name
Adapter No.____of______

Shaded Areas To Be Filled In By CE

Adapter Type
System Unit
Drawer
Slot
Adapter Connector

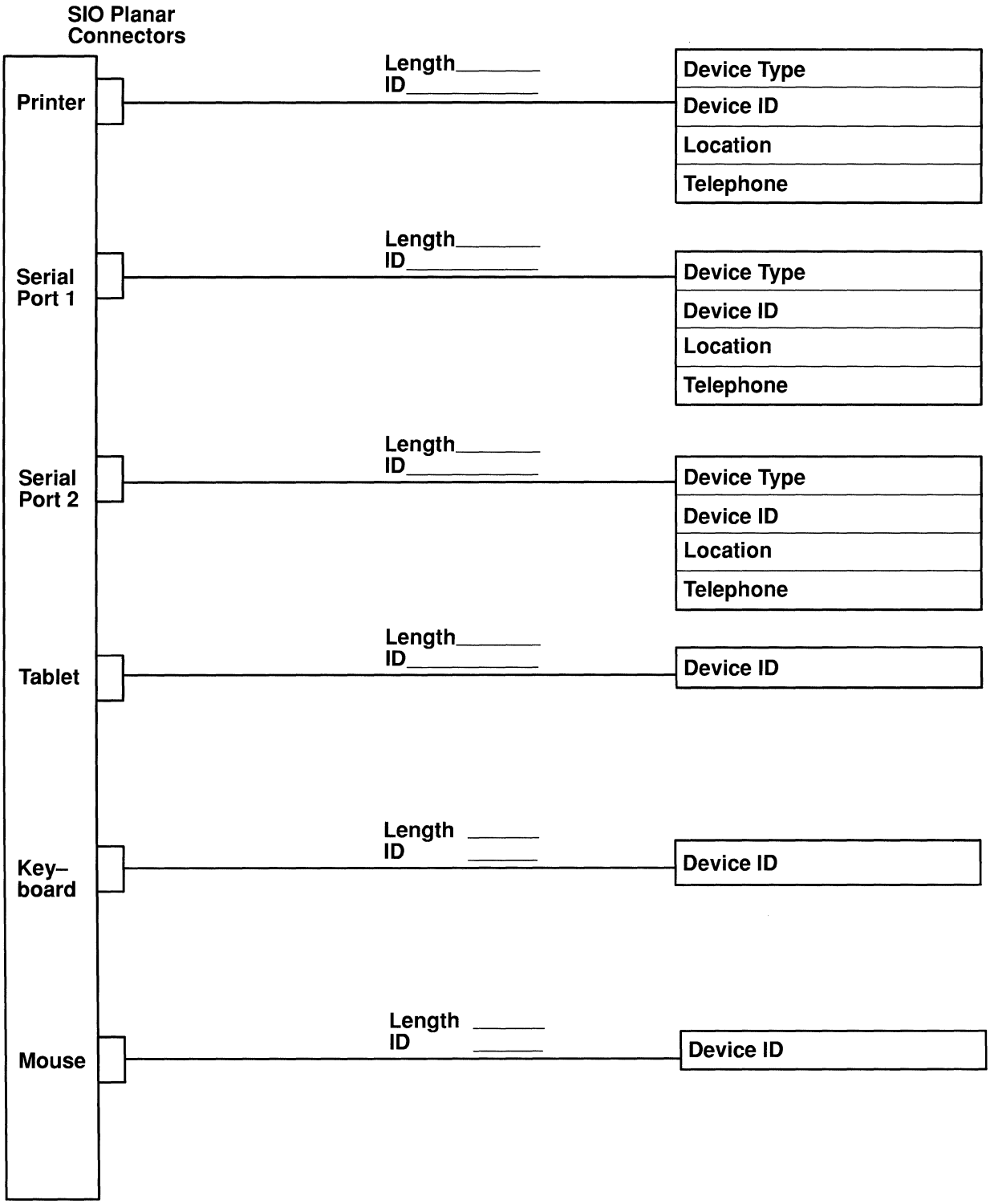
Length ID____

Concentrator Box No. ____
Location ____________

Port	Cable	Device
Port	Length____ ID ____	Device Type / Device ID / Location / Telephone
Port	Length____ ID ____	Device Type / Device ID / Location / Telephone
Port	Length____ ID ____	Device Type / Device ID / Location / Telephone
Port	Length____ ID ____	Device Type / Device ID / Location / Telephone
Port	Length____ ID ____	Device Type / Device ID / Location / Telephone
Port	Length____ ID ____	Device Type / Device ID / Location / Telephone
Port	Length____ ID ____	Device Type / Device ID / Location / Telephone
Port	Length____ ID ____	Device Type / Device ID / Location / Telephone

Standard I/O Adapter Cable Planning Chart

Customer Name _____ Customer Number _____

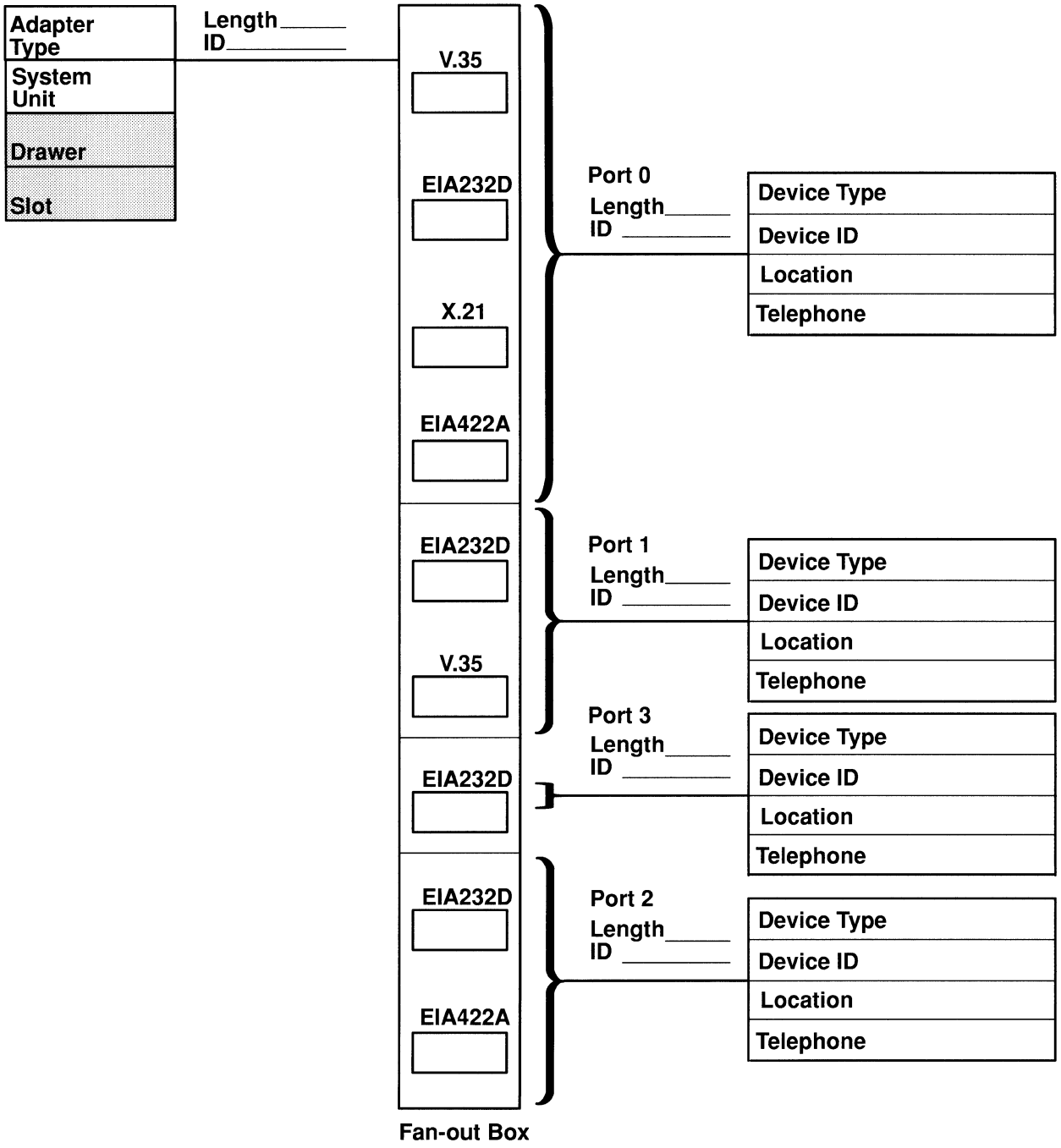


4–Port Multiprotocol Communications Controller Cable Planning Chart

Customer Name_____ Customer Number_____ Adapter Name_____

Adapter No. _____of_____

Shaded Areas To BeFilled In By CE



Note: Select Only One Interface Per Port

Glossary

adapter. A printed circuit card that modifies the system unit to allow it to operate in a particular way. See *communications adapter*.

AIX Operating System. The operating system for the RISC System/6000 system unit that exists between the hardware and the application programs. It consists of a kernel and a shell (command interpreter).

All Points Addressable (APA) display. A display that allows each pixel to be individually addressed and displayed. An APA display permits the display of images that are not predefined in character boxes.

American National Standard Code for Information Interchange (ASCII). The code developed by ANSI for information interchange among data processing systems, data communications systems, and associated equipment. The ASCII character set consists of 7-bit control characters and symbolic characters.

American National Standards Institute (ANSI). An organization sponsored by the Computer and Business Equipment Manufacturers Association through which accredited organizations create and maintain voluntary industry standards.

ANSI. See *American National Standards Institute*.

APA. See *All Points Addressable Display*.

ASCII. See *American National Code for Information Interchange. (ASCII)*.

asynchronous transmission. Data transmission in which transmission of a character or block of characters can begin at any time but in which the bits that represent the character or block have equal time duration. Contrast with *synchronous transmission*.

bit-mapped display. A display with an adapter that has a hardware representation of each separately addressable point on the display. The hardware representation can be processor memory or adapter memory. See *All Points Addressable Display*.

bpi. Bits per inch, a measure of linear density for storage products.

bps. Bits per second. In serial transmission, the instantaneous bit speed with which a device or channel transmits a character.

BTU. British thermal unit.

bus. (1) In a processor, a physical facility on which data is transferred to all destinations, but from which only addressed destinations can read in accordance with appropriate conventions. (2) A computer configuration in which processors are interconnected in series. (3) One or more conductors that transmit signals or power.

byte. (1) The amount of storage required to represent one character; a byte is 8 bits. (2) A binary character operated on as a unit and usually shorter than one word. (3) A string that consists of a certain number of bits (usually eight) treated as a unit, and represents a character. (4) A group of eight adjacent binary digits representing one EBCDIC character.

C. Celsius.

carrier sense multiple access with collision detection (CSMA/CD). The generic term for a class of medium access procedures that allows multiple stations to access the medium at will without explicit prior coordination, avoids contention by way of carrier sense and deference, and resolves contention by way of collision detection and transmission.

coaxial cable. A cable consisting of one conductor, usually a small copper tube or wire, within and insulated from another conductor of larger diameter, usually copper tubing or copper braid.

color display. A display device capable of displaying more than two colors and the shades produced by combinations of two colors, as opposed to a monochrome display.

communications adapter. A card that enables a computer or device to become a part of a data communications network. See *adapter*.

Consultative Committee on International Telegraphy and Telephone (CCITT). A United Nations Specialized Standards group, whose membership includes common carriers concerned

with devising and proposing recommendations for international telecommunications relating to alphabets, graphics, control information, and other fundamental information interchange issues.

control unit terminal (CUT) mode. An IBM protocol used for communications with an IBM 3174 Control Unit. In this protocol, the RISC System/6000 system unit is emulating a dumb 3278/79 terminal, and the 3174 is responsible for enforcing the protocol.

DASD. Direct access storage device.

data terminal ready (DTR). A signal to the modem.

disk. A storage device made of one or more flat, circular plates with magnetic surfaces on which information can be stored.

disk drive. The mechanism used to read and write information on disk.

diskette. A thin, flexible magnetic plate that is permanently sealed in a protective cover. It can be used to store information copies from the disk or another diskette.

diskette drive. The mechanism used to seek, read, and write information on diskettes.

Distributed Function Terminal (DFT). A terminal that performs operations previously accomplished by the processing unit, such as managing data links, controlling devices, and formatting data.

duplex. Pertains to communications data that can be sent and received at the same time. Synonymous with *full duplex*. Contrast with *half duplex* (*HD or HDX*).

ECC. See *error–checking and correction.*

EIA. Electronic Industries Association.

EIA-232D. An EIA interface standard that defines the physical, electronic, and functional characteristics of an interface line connecting a computer to communications equipment. It uses a 25-pin connector and an unbalanced line voltage.

EIA-422A. An EIA interface standard that defines the physical, electronic and functional characteristics of an interface line connecting a computer to communications equipment. It uses a balanced line voltage for noise reduction and longer distance capability. The RISC System/6000 system unit uses the send and receive pins from the set of 40 pins defined by the EIA-422A interface.

error–checking and correction. The detection, in the processing unit, and correction of all single–bit errors, plus the detection of double–bit and some multiple–bit errors.

fiber. A transmission medium that utilizes optical fiber.

fixed disk. A flat, circular, unremoveable plate with a magnetizable surface layer on which data can be stored by magnetic recording. A rigid magnetic disk.

fixed-disk drive. The mechanism used to read and write information on a fixed disk.

floating point. In the RISC System/6000 system unit, a way of representing real numbers (that is, values with fractions or decimals) in 32 bits or 64 bits. Floating-point representation is useful to describe very small or very large numbers.

full duplex. Synonym for *duplex.*

GCR. Group Code Recording, a magnetic tape recording format with a density of 6250 bpi.

gigabyte(GB). 1,073,741,824 in decimal notation when referring to memory capacity; in all other cases, it is defined as 1,000,000,000.

half duplex (HD or HDX). Pertains to communications in which data can be sent in only one direction at a time. Contrast with *duplex.*

hertz (Hz). A unit of frequency equal to one cycle per second.

IEEE. Institute of Electrical and Electronics Engineers.

ips. Inches per second, a measure of tape drive speed and performance.

keyboard. An input device consisting of various keys that allows the user to input data, control cursor and pointer locations, and to control the dialogue with the work station.

kilobyte (KB). 1024 bytes in decimal notation when referring to memory capacity; in all other cases, it is defined as 1,000.

KTS. Key Telephone System. A private telephone system requiring manual selection of outside lines. See *PBX.*

kVA. Kilovolt-ampere, or 1000 Volt–ampere.

lighted programmable function keyboard (LPFK). An input device used with the 5085 or 5086 Graphics Processor.

line printer. A printer that prints output one line of characters at a time, as a unit. Output of line printers is in constant-width characters.

local area network (LAN). (1) A network in which communications are limited to a moderate-sized geographic area (1 to 10 km), such as a single office building, warehouse, or campus. A local network depends upon a communications medium capable of moderate to high data rate (1 to 20 MB per second), and normally operates with a consistently low error rate. (2) A data network in which serial transmission is used for direct data communication among data stations.

locator. In computer graphics, an input device that provides coordinate data; for example, a mouse, tablet, or thumbwheel.

Logical Unit Type 1 (LU1). An SNA session that supports communication between an application and multiple input/output devices. This communication could occur in an interactive or batch environment.

mm. Millimeter.

Logical Unit Type 2 (LU2). An SNA session that uses a 3270 device data stream to support communication between an application and a display.

Logical Unit Type 3 (LU3). An SNA session that uses a 3270 device data stream to support communication between an application and a printer.

Logical Unit Type 6.2 (LU6.2). (1) An SNA session between two applications in a distributed data processing environment. (2) The LU type used for SNA advanced program-to-program communications (APPC).

LPFK. See *lighted programmable function keyboard (LPFK)*.

Mbit. Megabit.

megabyte (MB). 1,048,576 in decimal notation (two to the twentieth power (2^{20}))when referring to memory capacity; in all other cases, it is defined as 1,000,000.

megahertz (MHz). A unit of measure for frequency. One megahertz equals 1,000,000 hertz.

memory. (1) Program-addressable storage from which instructions and other data can be loaded directly into registers for subsequent execution or processing. (2) Storage on electronic chips. Examples of memory are random access memory, read only memory, or registers. See also *storage*.

MHz. See *megahertz*.

millisecond. One one thousandth of a second.

modem. See *modulator–demodulator*.

modulator-demodulator (modem). A device that converts data from the computer to an analog signal for transmission on a telecommunications line, and converts the analog signal received into data for the computer.

module. A packaged functional hardware unit designed for use with other components.

monochrome display. A display device that has only two colors.

mouse. A hand-held locator that a user operates by moving it on a flat surface. A mouse allows the user to select objects and scroll the display screen by pressing buttons.

non–volatile random access memory (NVRAM). A portion of random access memory (storage) that retains its contents after the electrical power to the machine is shut off.

offline. (1) Neither controlled directly by, nor communicating with the computer. (2) Pertaining to the operation of a functional unit when it is not under the direct control of a computer. Contrast with *online*.

online. (1) Controlled directly by, or directly communicating with, the computer. (2) Pertaining to the operation of a functional unit when under the direct control of a computer. Contrast with *offline*.

PBX. Private Branch Exchange. A private telephone system that performs automatic selection of outside lines (trunks). See *KTS*.

PE. Phase Encoded, a magnetic tape recording format with a density of 1600 bpi.

peta. Two to the fifty-second power (2^{52}).

plotter. A printing device attached to the system with cables, that prints two-dimensional graphs and charts.

power factor. The ratio of power consumed to the volt amps (apparent power).

power requirement. The actual power consumed by a computer system, measured in watts.

power source. The minimum acceptable rating of the electrical circuit providing power to a computer system, measured in volt amps (kVA).

printer. A device externally attached to the system unit, used to print system output on paper.

public–switched telephone network (PSTN). A communications common carrier network that provides voice and data communications services over switched lines.

Reduced Instruction Set Computer (RISC). A computer design that uses a relatively small, simplified set of frequently used instructions for rapid execution.

RISC. See *Reduced Instruction Set Computer (RISC)*.

SCSI. Small Computer Systems Interface.

storage. In contrast to memory, the saving of information on physical devices such as disk or tape. See also *memory*.

streaming tape drive. A magnetic tape unit that stores large amounts of data and is designed to make a nonstop dump or restore of magnetic disks without using interblock gaps.

synchronous transmission. (1) In data communications, a method of transmission in which the sending and receiving of characters is controlled by timing signals. Contrast with *asynchronous transmission*. (2) Data transmission in which the time of occurrence of each signal representing a bit is related to a fixed time base.

system unit. The part of the system that contains the processing unit, the disk drive and the disk, and the diskette drive.

tablet. A special flat surface with a mechanism for indicating positions on it. A tablet is normally used as a locator.

tape drive. A mechanism for moving magnetic tape and controlling its movement.

thermal output. The heating load that a computer system places on the cooling system of the building, measured in British thermal units per hour (BTU/hr).

V.24. The 24th CCITT recommendation in the V series, listing the definitions for interchange circuits between a DTE and a DCE.

V.35. The 35th CCITT recommendation in the V series, defining data transmission at 48 kilobits per second using 60–180 kHz group band circuits.

WAN. See *wide area network*.

wide area network (WAN). A network that provides data communication capability in geographic areas larger than those serviced by local area networks.

X.21. (1) In data communications, a specification of the CCITT that defines the connection of data terminal equipment to an X.21 public data network for digital leased and circuit switched services. (2) The 21st CCITT recommendation in the X series, defining a general purpose interface between a DCE and a DTE for synchronous operation on public data networks.

X.25. In data communications, a recommendation of the CCITT that defines the interface between data terminal equipment and packet–switching networks.

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