

## IBM RISC System/6000 Model 59H

Dramatically improved commercial performance in a uniprocessor, deskside system is possible with the new RISC System/6000® Model 59H. The 66MHz POWER2™ architecture of the 59H is enhanced with a 1MB level 2 (L2) cache, resulting in significantly improved transaction processing performance over the previously announced Model 590. The L2 cache boosts commercial online transaction processing performance to over 1,000 transactions per minute.

The Model 59H is a natural choice as a:

- Commercial server
- Database server

Commercial customers will see the best performance improvements with the Model 59H. The new system opens the door to many new commercial opportunities and provides growth for existing applications.

This system is very competitive against symmetric multiprocessing (SMP) offerings. The Model 59H follows the RISC System/6000 uniprocessor growth curve that has doubled performance every 12 to 18 months.

Additional capability can be provided by using High Availability Cluster Multi-Processing/6000 (HACMP/6000). With HACMP/6000, the Model 59H can be configured into a cluster of up to four systems, providing high availability and greater throughput.

**Upgrades:** To protect and extend your investment in the RISC System/6000, IBM offers upgrades to the new Model 59H from most of the deskside 500 series models. Upgrades are available from:

- Models 520, 520H, 530, 530E, 530H, 550, 550E, 550S, 560, 560F, 570, 57F, 580, 58F, 58H, and 590

### IN BRIEF . . .

#### IBM RISC System/6000 Model 59H

- ◆ High-end deskside RISC System/6000 increases commercial performance using POWER2 technology
- ◆ 66MHz POWER2 processor (15 nanoseconds)
- ◆ Standard 1MB L2 cache
- ◆ Standard SCSI-2 Fast/Wide Adapter and integrated SCSI controller
- ◆ 64MB memory expandable to 2GB
- ◆ Standard 4GB (two 2GB) SCSI-2 8-bit disks expandable to 12GB
- ◆ Select features for 8-bit SCSI-2 to 16-bit SCSI-2 disks and cables
- ◆ Standard CD-ROM-2 drive
- ◆ High-availability clustered system configuration possible
- ◆ Upgrade growth for installed Model 500 series machines

Description	Planned Availability Date	Purchase Price
Model 59H	June 10, 1994	\$72,500
59H Model Upgrades Conversion	July 15, 1994	20,000 to 42,000

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## Description

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### **POWER2 Technology**

The POWER2 technology implemented in this machine is a next-generation, multi-chip RISC processor implementation of the POWER Architecture™. The processor chips are fabricated in .5-micron, 4-level metal/1-level polysilicon CMOS 4S and are packaged on a single, multi-chip ceramic module.

Like the POWER2 technology introduced in September 1993, the primary features of the system include:

- 32KB, two-way set associative instruction cache and a multi-port, 128KB four-way set associative data cache.
- Dual fixed-point execution units and dual floating-point, multiply-add-divide units. The architecture provides a quad word floating-point load/store instruction, convert-to-integer instruction, square root instruction, new address translation, and a new interrupt structure.
- Hardware performance monitors accessible by software.
- Memory interface is four-words wide and supports memory up to 2GB (memory interface on Models 58H and 590 is eight-words wide).
- Binary-compatible with previous IBM RISC System/6000 systems.

### **Level 2 (L2) Cache**

The introduction of a Level 2 (L2) cache, in addition to the already-resident L1 cache, provides significant performance improvements to many applications. The standard 1MB L2 cache, much larger than the L1 cache, accommodates large programs and increases the probability that the next instruction or data can be found in the cache, avoiding the access of main memory. The L2 cache, L1 cache, and main memory, provide a three-level hierarchy of memory that provides the best balance of cost and performance efficiency for most commercial and technical customers. Existing AIX/6000 application programs will, in general, exploit the new L2 cache without being recompiled.

### **High-End Open System With Emphasis on Commercial Performance**

The RISC System/6000 Model 59H uses POWER2 technology to provide greater performance than previous desktside models. Using a 66MHz CMOS processor, the standard 64MB of memory, 128KB data cache, 32KB instruction cache, and 1MB L2 cache provide a new level of performance. Coupled with seven available 80MB-per-second, 32-bit Micro Channel® expansion slots, integrated SCSI controller, standard SCSI-2 Fast/Wide Adapter, 4GB of disk storage, standard CD-ROM-2 drive, and a full range of optional features, the RISC System/6000 Model 59H is a powerful open systems commercial/compute server. A select feature is available to replace the standard 8-bit, SCSI-2 2GB disk with a SCSI-2 Fast/Wide 16-bit, 2GB drive, which offers higher data transfer rate capability. Replacement of both base 8-bit drives is recommended for maximum performance.

**Performance Improvement:** Customers can enjoy greater performance than previously available on RISC System/6000 desktside systems. The combination of increased performance, memory, and options expands the possibilities for the customer to support more active users and add additional applications.

**Upgradeability Improvements:** Customers with installed desktside systems who need additional performance can upgrade to the Model 59H, preserving their investments and attaining the increased levels of performance they require.

### **High-Availability Cluster**

The Model 59H can be configured into a cluster of up to four systems utilizing High Availability Cluster Multi-Processing/6000 (HACMP/6000) to provide high availability and greater throughput. Customers with a need for an environment that exceeds the capacity of a single processor can achieve their level of performance with the economy of RISC processing along with the open-system architecture of the RISC System/6000 and AIX/6000 by selecting a cluster configuration of up to four Model 59Hs.

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## Supported I/O Devices

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### **External Storage Machines**

- IBM 0840 Model 001 Exabyte EXB-10e 50GB 8 mm Tape Cartridge Handling Subsystem
- IBM 3490 Model C11 4.8GB Enhanced Capability Magnetic Tape Subsystem
- IBM 3490 Model C22 9.6GB Enhanced Capability Magnetic Tape Subsystem
- IBM 3995 Model 063 40GB Optical Library Data Server
- IBM 3995 Model 163 188GB Optical Library Data Server
- IBM 0562 Model 001 270GB LAGO Systems\*\* LS/380L DataWheel\*\* 8 mm Tape Library
- IBM 0562 Model 002 270GB LAGO Systems LS/380L DataWheel 8 mm Tape Library with Laser Bar Code Scanner
- IBM 0562 Model 004 Prestoserve for IBM AIX/6000
- IBM 3494 Model L10 Tape Library Data Server
- IBM 7135 Model 010 RAIDiant Array
- IBM 7135 Model 110 RAIDiant Array
- IBM 7202 Model 900 Expansion Rack
- IBM 7203 Model 001 Portable Disk Unit
- IBM 7204 Model 320 External Disk Drive
- IBM 7204 Model 001 1GB External Disk Drive
- IBM 7204 Model 010 1GB External Disk Drive
- IBM 7204 Model 215 External Disk Drive
- IBM 7204 Model 315 2GB External Disk Drive
- IBM 7206 Model 001 2.0GB External 4 mm Tape Drive
- IBM 7206 Model 005 4.0GB External 4 mm Tape Drive
- IBM 7207 Model 001 150MB ¼-Inch Tape Drive
- IBM 7207 Model 011 525MB External ¼-Inch Cartridge Tape Drive
- IBM 7207 Model 012 1.2GB External ¼-Inch Cartridge Tape Drive
- IBM 7208 Model 001 2.3GB 8 mm Tape Drive
- IBM 7208 Model 011 5.0GB 8 mm Tape Drive
- IBM 7209 Model 001 650MB R/W Optical Disk Drive
- IBM 7209 Model 002 1.19GB R/W Optical Disk Drive
- IBM 7210 Model 001 External CD-ROM Drive
- IBM 7210 Model 005 External CD-ROM Drive
- IBM 9291 Single Digital Trunk Processor
- IBM 9295 Multiple Digital Trunk Processor
- IBM 9333 Model 500 High-Performance Disk Drive Subsystem
- IBM 9333 Model 501 High-Performance Disk Drive Subsystem
- IBM 9333 Model 010 High-Performance Disk Drive Subsystem (for installation on 7202 Model 900 only)
- IBM 9333 Model 011 High-Performance Disk Drive Subsystem (for installation on 7202 Model 900 only)

- IBM 9334 Model 500 Deskside Expansion Unit (requires dedicated SCSI I/O Controller)
- IBM 9334 Model 501 Deskside Expansion Unit (requires dedicated SCSI I/O Controller)
- IBM 9334 Model 010 Deskside Expansion Unit (for installation on IBM 7202 Model 900 only)
- IBM 9334 Model 011 Deskside Expansion Unit (for installation on IBM 7202 Model 900 only)
- IBM 9348 Model 012 Magnetic Tape Unit (½-Inch, 9-Track Tape Drive)

\*\* Product or company name is a trademark or registered trademark of its respective holder.

### **ASCII Terminals**

The IBM 3151, 3161, 3162, 3163, and 3164 are supported in 3161 mode. Support of the IBM 3164 includes color attributes.

- IBM 3151 Model 310/410<sup>1</sup>
- IBM 3161<sup>1</sup>
- IBM 3162<sup>1</sup>
- IBM 3163<sup>1</sup>
- IBM 3164<sup>1</sup>
- DEC\*\* VT100
- DEC VT220
- DEC VT320
- DEC VT330
- WYSE\*\* 30
- WYSE 50
- WYSE 60
- WYSE 350

<sup>1</sup> National language models are supported through the use of a cartridge with ISO 8859-1 and national language keyboards.

#### **Dials:**

- IBM 6094-010

Requires 6094 cable (#4015) for attachment to a Graphics Input Device Adapter (#2810). Requires 6094 feature number 4060 for attachment to standard serial port. The 6094 feature number 4061 may be required.

#### **Lighted Programmable Function Keyboard:**

- IBM 6094-020

Requires 6094 cable feature number 4015 for attachment to a Graphics Input Device Adapter (#2810). Requires 6094 feature number 4060 for attachment to a standard Serial Port. The 6094 feature number 4061 may be required.

#### **3D Input Device:**

- IBM 6094 Spaceball\*\* Model 30

#### **X Terminals:**

- IBM Xstation 120
- IBM Xstation 130
- IBM Xstation 140
- IBM Xstation 150

#### **Communication Servers:**

- IBM 7318 Communications Network Server P10
- IBM 7318 Communications Network Server S20

#### **Displays:**

- IBM 5081-016 (#1280 required)

The 5081-016 Display, featuring a Trinitron\*\* CRT, has a fixed image size of 14.9 inches (377 mm) measured diagonally.

- IBM 5081-019 (RPQ 8K1680 required)

The 5081-019 Display, featuring a Trinitron CRT, has a fixed image size of 17.3 inches (439 mm) measured diagonally.

- IBM 6091-016

The 6091-016 Display, featuring a Trinitron CRT, has a fixed image size of 14.8 inches (375 mm) measured diagonally.

- IBM 6091-019

The 6091-019 Display, featuring a Trinitron CRT, has a fixed image size of 17.3 inches (439 mm) measured diagonally.

- IBM 6091-19i

The 6091-19i Display, featuring a Trinitron CRT, has a fixed image size of 17.3 inches (439 mm) measured diagonally.

- IBM 6091-023 (supported in 1280 x 1024 60Hz mode only)

The 6091-023 Display, featuring a Trinitron CRT, has a fixed image size of 21.4 inches (544 mm) measured diagonally.

- IBM 8508 (supported in 1280 x 1024 67Hz mode only)

- IBM POWERdisplay 16

The POWERdisplay 16, featuring a Trinitron CRT, has a fixed image size of 14.8 inches (375 mm) measured diagonally.

- IBM POWERdisplay 17

The POWERdisplay 17, featuring a Trinitron CRT, has a maximum viewable image size of 16.1 inches (409 mm) measured diagonally.

- IBM POWERdisplay 19

The POWERdisplay 19, featuring a Trinitron CRT, has a maximum viewable image size of 17.3 inches (439 mm) measured diagonally.

- IBM POWERdisplay 20

The POWERdisplay 20, featuring a Trinitron CRT, has a maximum viewable image size of 19.1 inches (486 mm) measured diagonally.

#### **Graphic Processors:**

- IBM 5085 All Models
- IBM 5086 Model 001
- IBM 5086 Model 01i
- IBM 7235 Model 001
- IBM 7235 Model 002
- IBM 7235 Model 01i
- IBM 7235 Model 02i
- IBM 7250 Model 001
- IBM 7250 Model 002

#### **Digitizers:**

- IBM 5084 Model 1
- IBM 5084 Model 2
- IBM 5084 Model 3

#### **Tablets:**

- IBM 5083 Model 021 (requires 5083 cable feature number 4015)
- IBM 5083 Model 022 (requires 5083 cable feature number 4015)
- IBM 6093 Tablet Model 011 (requires 6093 cable feature number 4015)
- IBM 6093 Tablet Model 012 (requires 6093 cable feature number 4015)

#### **Plotters:**

- IBM 6180 Model 1 Color
- IBM 6182 Color
- IBM 6184 Color
- IBM 6185 Model 1 Color

- IBM 6185 Model 2 Color
- IBM 6186 Color
- IBM 6187
- IBM 7372

**Modems:** Modem support is provided to allow communication through common carrier telephone networks using dial-up or leased lines with asynchronous protocols or the synchronous half-duplexed SDLC or BSC protocols. Not all of the features supported by the listed modems are supported by AIX/6000 Version 3 for RISC System/6000.

Modems	Protocols	Standards
IBM 5822 up to 56Kbps	SYNC	CCITT V.35
IBM 5841 1200bps	ASYN	SYNC
IBM 5853 2400bps	ASYN	SYNC
IBM 5865 9600bps	SYNC	EIA-232D, CCITT V.24
IBM 7855 up to 19.2Kbps	ASYN	CCITT V.32 V.22 bis Bell 103,212
IBM 7861 up to 19.2Kbps	SYNC	EIA-232D, CCITT V.24
IBM 7868 up to 19.2Kbps	SYNC	EIA-232D, CCITT V.24
Hayes Smartmodem 1200**	ASYN	EIA-232D
Hayes Smartmodem 2400**	ASYN	SDLC
Hayes V-Series 9600	ASYN	SDLC
Racal-Vadic** 1200PA	ASYN	EIA-232D
Racal-Vadic 1200VP	ASYN	EIA-232D
Racal-Vadic VI2422	ASYN	EIA-232D
Racal-Vadic 2400PA	ASYN	EIA-232D
Racal-Vadic 2400VP	ASYN	EIA-232D
Racal-Vadic VI1222VP	ASYN	EIA-232D
Telebit Trailblazer Plus	ASYN	EIA-232D

#### Printers:

- IBM 2380-001 Personal Printer II
- IBM 2381-001 Personal Printer II
- IBM 2390-001 Personal Printer II
- IBM 2391-001 Personal Printer II
- IBM 2380 Plus Printer, emulating the 2380 Personal Printer for PPDS (IBM ASCII)<sup>2</sup>
- IBM 2381 Plus Printer, emulating the 2381 Personal Printer for PPDS<sup>3</sup>
- IBM 2390 Plus Printer, emulating the 2390 Personal Printer for PPDS<sup>3</sup>
- IBM 2391 Plus Printer, emulating the 2391 Personal Printer for PPDS<sup>3</sup>
- IBM 3812-002 Page Printer<sup>4</sup>
- IBM 3816-01D and 01S Page Printer<sup>3</sup>
- IBM 3930-03D and 03S Page Printer, emulating the HP LaserJet III\*\* Si
- IBM 4019-001 LaserPrinter<sup>5</sup>
- IBM 4019-E01 LaserPrinter E<sup>5</sup>
- IBM 4029-010 LaserPrinter 5E
- IBM 4029-020 LaserPrinter 6
- IBM 4029-022 LaserPrinter<sup>2</sup>
- IBM 4029-030 LaserPrinter 10
- IBM 4029-042 LaserPrinter
- IBM 4029-040 LaserPrinter 10L
- IBM 4037 5E Page Printer, emulating the 4029 LaserPrinter for PCL emulation and for PPDS (IBM ASCII)<sup>2</sup>
- IBM 4039-10R LaserPrinter 10R<sup>6</sup>
- IBM 4039-10D LaserPrinter 10D<sup>6</sup>
- IBM 4039-12L LaserPrinter 12L<sup>6</sup>
- IBM 4039-12R LaserPrinter 12R<sup>6</sup>
- IBM 4039-16L LaserPrinter 16L<sup>6</sup>

- IBM 4070 IJ Printer Model 1
- IBM 4072-001 ExecJet® Printer
- IBM 4076 ExecJet II Printer<sup>3 7</sup>
- IBM 4079-001 Color JetPrinter
- IBM 4201-002 Proprinter® II
- IBM 4201-003 Proprinter III
- IBM 4202-002 Proprinter II XL
- IBM 4202-003 Proprinter III XL
- IBM 4207-002 Proprinter X24E
- IBM 4208-002 Proprinter XL24E
- IBM 4212-001 Proprinter 24P
- IBM 4216-031 Personal Page Printer II
- IBM 4224-301, 302, 3C2 and 3E3 Serial Printer
- IBM 4226-302 Printer
- IBM 4232 -302 Dot Matrix Printer, emulating the IBM 4202
- IBM 4234-009 Line Dot Matrix Printer
- IBM 4234-13 Line Dot Matrix Printer
- IBM 5202-001 Quietwriter® III<sup>8</sup>
- IBM 5204-001 Quickwriter<sup>8</sup>
- IBM 6252 Impactwriter® AP2 (7012: #2936, #2937, or #3100 required)
- IBM 6252 AS2 (7012: #2936, #2937, or #3100 required)
- IBM 6252 AP8 Impactwriter<sup>9</sup>
- IBM 6252 AS8 Impactwriter<sup>9</sup>
- IBM 6262 A12, A14, A22
- IBM 6408 Line Matrix Printer emulating the IBM 4234

The following non-IBM printers are also supported:

- HP LaserJet Series II\*\*<sup>10</sup>
  - HP LaserJet Series III\*\*<sup>10</sup>
  - HP LaserJet Series III Si\*\*<sup>10</sup>
  - Hewlett-Packard LaserJet 4<sup>10</sup>
  - TI Omnilaser 2115\*\*
  - DATAPRODUCTS LZR 2665\*\*
  - PRINTRONIX P9012\*\*
  - DATAPRODUCTS BP 2000\*\*
  - QMS\*\* Colorscript 100 Model 20
- <sup>2</sup> For assistance with these printers and for the latest AIX virtual printer files (colon files), call Lexmark Customer Support. Virtual printer files (colon files) for the 4037 and 4076 printers are available from Lexmark. Colon files for these printers are distributed via: Lexmark Customer support line: 606-232-3000; Dial-in BBS: 606-232-5238; Lexmark Internet file server: ftp.lexmark.com; and Reader response card for the 4037 and 4076.
- <sup>3</sup> Feature number 7652 for the IBM 3816 printer is required for attachment to the RISC System/6000 system.
- <sup>4</sup> Feature number 3155 for the IBM 3812 printer is required for attachment to the RISC System/6000 system.
- <sup>5</sup> When using the serial ports, the IBM 4019 requires feature number 9143 (system serial interface adapter) for attachment to the RISC System/6000 system.
- <sup>6</sup> AIX support software for the LaserPrinter Integrated Network Option is provided with the Network Option cards (#5495, #5496, #5497 on the IBM 4039 LaserPrinter).
- <sup>7</sup> Use the virtual printer files available from Lexmark for the PCL emulation mode of the 4076 printer. For PPDS (IBM ASCII), select emulation of the 2390 Personal Printer.
- <sup>8</sup> The IBM RISC System/6000 system supports Code Page 850. The Code Page 850 cartridge must be installed on the IBM 5202 Printer to fully utilize the full character sets of the system. For details on available cartridges, refer to the IBM 5202 Sales Manual. Other IBM printers have Code Page 850 resident.
- <sup>9</sup> Impactwriter A models emulate the IBM 4202-3 printer for traditional line printing of simple text and numbers. Graphics, all points addressable, and large characters cannot be printed.
- <sup>10</sup> AIX support software for the HP JetDirect Ethernet Card.

#### Printer Peripherals

- 4033-001 IBM LAN Connection For Printers and Plotters (Token Ring)
- 4033-002 IBM LAN Connection For Printers and Plotters (Ethernet, Twisted Pair)
- 4033-003 IBM LAN Connection For Printers and Plotters (Ethernet, Thick and Thin)

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## Product Positioning

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The RISC System/6000 Model 59H is the highest performance deskside uniprocessor in the RISC System/6000 family. It offers expansion capability between the high-end 300 series desktop systems and the rack systems, such as Models R20 and R24. The Model 59H is best suited as a high-end commercial server.

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## Statement of General Direction

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IBM intends to offer upgrades from RISC System/6000 rack Models 970, 97B, 97E, 97F, 980, 98B, 98E, 98F, 990, 99E, 99F, 99J, 99K, R10, R20, and R24; and RISC System/6000 deskside Models 55L, 570, 57F, 58F, 580, 58H, 590, and 59H to future rack and deskside SMP systems. These upgrades will be available in 1995.

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## Publications

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The System Library Subscription Service (SLSS) is available by order number only. Customers currently subscribing to SLSS will receive publication updates automatically.

The following publications are shipped with the RISC System/6000 Model 59H. Additional copies are available for a fee. To order, contact your IBM representative.

Title	Order Number
Quick Reference	SC23-2401
Getting Started	GC23-2521
Customer Support Information	SA23-2690
Documentation Overview	SC23-2456
7013 POWERstation™ and POWERserver™ Operator Guide	SA23-2621
POWERstation and POWERserver Common Diagnostics and Service Guide	SA23-2687
7013 POWERstation and POWERserver Installation and Service Guide	SA23-2622
System Unit Safety Information	SA23-2652

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## Education Support

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Education is available to support effective installation planning, programming, and efficient day-to-day operations of the IBM RISC System/6000 hardware and related software. For a complete listing of available courses, schedules, and information, contact your IBM representative or call Skill Dynamics™, An IBM Company, at 800-IBM-TEACH (426-8322).

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## Technical Information

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### Specified Operating Environment

#### Physical Specifications:

- Net Weight and Physical Size:
  - Width: 360 mm (14.2 inches)
  - Depth: 675 mm (26.6 inches)
  - Height: 610 mm (24.0 inches)
  - Weight: 36.7 kg to 53.1 kg (81 to 117 pounds)
- Gross Weight and Box Size:
  - Width: 568 mm (22.36 inches)
  - Depth: 803.3 mm (31.63 inches)
  - Height: 755 mm (29.72 inches)
  - Weight: 43.1 kg to 56.7 kg (95 to 125 pounds)

**Operating Environment:** EMC Conformance Classification:

- U.S.A. —FCC Class A
- Germany —IOP
- Europe —CISPR 22
- Japan —VCCI-1

- Temperature: 16° —32°C (60° —90°F)
- Relative humidity:
  - 10 —80% with CD-ROM Installed
  - 20 —80% with 8 mm Tape Drive Installed
- Maximum wet bulb: 23°C (73°F) (Relative Humidity 8 —80%)
- Noise emission:
  - Declared (upper limit) sound power level for a random sample of machines:
    - Operating —6.0 bels
    - Idle —5.5 bels
  - Mean value of the A-weighted sound pressure levels at one-meter (bystander) positions for a random sample of machines
    - Operating —39 dBA<sup>11</sup>
    - Idle —38 dBA<sup>11</sup>
  - Voltage
    - 100 V to 125 V nominal, auto ranging
    - 200 V to 240 V nominal, auto ranging
    - 50Hz/60Hz
  - Power supply: 475 Watts average output (759 Watts peak)
  - Thermal Output: 1,706 Btus per hour (500 joules)
  - Power source loading: 0.5 KVA

<sup>11</sup> Preliminary, Subject to Change

The RISC System/6000 Model 59H was developed in compliance with IBM corporate policy letter number 139 (Environmental Affairs).

**Environmental Impact Assessment:** Compliance with IBM Corporate Standard C-S 3-0527-002 (1991-06) Control of Chemicals in IBM Facilities, Requirements and Responsibilities.

#### Product Safety/Country Testing/Certification:

- U.S.A. —UL
- Canada —CSA
- Germany —GS Mark (Safety, TUV)
- Europe —EN60-950

#### ISO 9000 Certification for Model 59H:

ISO 9000-Registered IBM Locations:

- Santa Palomba, Italy
  - Manufacturing: 9002
- Havant, England
  - Development: 9001
- Austin, Texas, USA
  - Manufacturing: 9002
  - Development: 9001
  - AIX Software Development: 9001
- Supported IBM Monitors complying to ISO 9241 Part 3
  - 6091 Models 016 and 19i
- Supported IBM features complying to ISO 9241 Part 3
  - POWERdisplay 16 (#3600)
  - POWERdisplay 17 (#3607)
  - POWERdisplay 19 (#3601)
  - POWERdisplay 20 (#3608)

#### HACMP/6000 Test Compliance

HACMP/6000 Releases 1.2 and 2.1 have been tested for compliance with AIX Version 3.2.5 for RISC System/6000, additional PTFs, and Model 59H and associated I/O devices.

## Standard Features

- 15 nanosecond (66MHz) processor for the Model 59H
- 32KB instruction cache
- 128KB data cache
- 1MB L2 cache
- SCSI-2 Fast/Wide Adapter
- Eight memory slots
- 64MB of memory using two of the eight memory slots
- Six 3.5-inch or three 5.25-inch disk bays
- 4GB of disk, two 2GB, SCSI-2 8-bit drives, using two 3.5-inch disk bays
- One CD-ROM-2 drive
- One full-high or two half-high 5.25-inch media bays available
- 1.44MB, 3.5-inch diskette drive
- Seven Micro Channel slots available (80MB/sec)
- Integrated SCSI controller
- Two EIA-232 asynchronous serial ports
- One parallel port
- One keyboard port
- One mouse port
- One pointing device (tablet) port

**Hardware Requirements:** An IBM-supported terminal or IBM-supported display, display adapter, and keyboard are required.

### Limitations

Memory must be installed in equal pairs and card pairs must be of equal capacity.

The only memory cards supported on the Model 59H are memory cards at EC level 33 or greater. Older memory cards, EC level 00, 20, 21, and 22 will not work on the Model 59H. New cards will be provided/exchanged when upgrading occurs from an installed RISC System/6000 to a new Model 59H.

To determine the EC level of existing installed memory, key the following AIX command from the shell prompt:

- `lscfg -vl mem* |pg.`

Technical data, including the EC level, will be displayed for each installed memory card. Shelf-stocked memory cards must be installed in a RISC System/6000 in order to determine the EC level.

Similarly, if memory SIMM kits are installed, the memory capacity of card pairs must be kept equal.

The following features, if installed on an existing 500 series model, cannot be installed on a Model 59H.

Description	Feature Number
High-Performance 8-bit 3D Color Graphics Processor	2780
High-Performance 24-bit 3D Color Graphics Processor	2781
24-bit Z-Buffer Solid Rendering Option	2782
24-bit Color Graphics Frame Buffer Upgrade	2783
Serial optical channel converter	2860
6-meter optical cable	2866
10-meter optical cable	2867
20-meter optical cable	2868
60-meter optical cable	2869
100-meter optical cable	2870
Serial Optical Channel Converter Module Specify	9150
External 5.25-inch Diskette Drive cable	2615
8MB HD3 Memory Card	4063
16MB HD3 Memory Card	4066
8MB S1 Memory Card	4008
16MB S1 Memory Card	4016
16MB S1 Memory Select	4010
8MB S1 Memory Base	9231
16MB S1 Memory Base	9236
16MB HD3 Memory Base	9234
Speech Accelerator 1	6306
Speech Accelerator 2	6307

If these features are removed in performing an upgrade, they remain the property of the customer and are not for return to IBM. The only exception is the Serial Optical Channel Converter Module, specify feature number 9150, an integrated circuit on the system board which is replaced and returned.

**Software Requirements:** AIX Version 3.2.5 for RISC System/6000 and additional PTFs are required for the Model 59H. These PTFs are included on all 3.2.5 orders shipped after June 3, 1994, labeled AIX/6000 Version 3.2.5 (3250-01-04). Refer to the Memo to Users for details on installing these PTFs, or call the IBM Support Center and request the PTFs referenced in APAR number IX42623.

AIX/6000 applications written for POWER-based RISC System/6000s will run on the new POWER2-based models without being recompiled and will run significantly faster. Additional performance improvements can be achieved by recompiling with the latest versions of the IBM XL compilers to further exploit the POWER2 technology.

Applications compiled using a compiler option that exploits POWER2 technology may not function properly on systems that do not employ the new POWER2 technology. Customers with any combination of POWER-, PowerPC™ 601- and POWER2-based systems can continue to run their applications unmodified. New applications and recompilation of existing applications for use in a mixed processor environment should be compiled using the POWER or common mode options available in the XL compilers or any other compilers that support those options.

Refer to Software Announcements 293-488 and 293-493, dated September 21, 1993, for more information.

**Compatibility:** The following can be upgraded to the Model 59H:

- Models 520, 520H, 530, 530E, 530H, 550, 550E, 550S, 560, 560F, 570, 57F, 580, 58F, 58H, 590

All upgraded machines must have a minimum of two memory cards totaling 64MB or more. The memory cards must be pairs of equal capacity. Memory cards for the Model 59H must be EC card level 33 or greater.

All upgraded machines must contain the same base features as the Model 59H at the conclusion of the upgrade. If additional memory, SCSI-2 disk, or SCSI-2 Fast/Wide Adapter are required, the customer must purchase and have these features available or installed prior to the upgrade. It will also be necessary to perform a prerequisite analysis of the customer's machine prior to scheduling the upgrade being scheduled.

Upgrades to the Model 59H will contain a 1MB L2 cache as standard.

Upgrades from other models to the Model 59H will be reviewed and, if approved, priced based on the history and configuration of the machine to be upgraded. The IBM representative should submit an RPQ for other requested upgrades.

AIX Version 3.2.5 for RISC System/6000 and additional PTFs must be installed prior to upgrading a system. These PTFs are included on all Version 3.2.5 orders shipped after June 3, 1994, labeled AIX/6000 Version 3.2.5 (3250-01-04). Refer to the Memo to Users for details on installing these PTFs, or call the IBM Support Center and request the PTFs referenced in APAR number IX42623.

The 58H/590 upgrade to the Model 59H contains some or all of the following items:

- CPU processor with 1MB L2 cache
- As-required engineering changes
- Installation instructions
- New publications
- 59H logo

**Note:** The customer must have a minimum of 4GB of SCSI-2 disk and a SCSI-2 Fast/Wide Adapter installed or available in conjunction with this upgrade.

The 570/57F/580/58F upgrade to the Model 59H contains some or all of the following items:

- CPU processor with 1MB L2 cache
- New memory cards without SIMMs
- Power supply
- CD-ROM-2
- Maintenance documentation
- 59H logo
- As-required engineering changes

**Note:** The customer must have a minimum of 64MB memory in pairs, SCSI-2 Fast/Wide Adapter, and 4GB of SCSI-2 disk installed or available with the upgrade.

The 520, 520H, 530, 530E, 530H, 550, 550E, 55S, 560, and 560F upgrade to the Model 59H contains some or all of the following items:

- Base Model 59H electronics and covers with customer's existing serial number
- CD-ROM-2
- New memory cards without SIMMs
- Maintenance documentation
- As-required engineering changes

**Notes:**

- The customer must have a minimum of 64MB memory in pairs, SCSI-2 Fast/Wide Adapter, and 4GB of SCSI-2 disk installed or available in conjunction with the upgrade. This upgrade is accomplished by transferring all of the customer's existing supported disk/media/adapters/memory SIMMs to the new 59H chassis. The replaced chassis and all associated components become the property of and must be returned to IBM.
- Parts removed/replaced become the property of IBM.

**Limitations for Disk Storage Subsystems and Adapters and LAN Adapters:**

- A maximum of seven SCSI Adapters (#2410, #2415, #2835)
- A maximum of seven SCSI-2 Fast/Wide Differential Adapters (#2416)
- A maximum of four SCSI-2 Differential Adapters (#2420)
- A maximum of six serial-link adapters (#6210, #6211, #6212)
- A maximum of seven Token-Ring (#2970) and/or Ethernet (#2980) adapters

Storage configurations can be maximized for individual types of storage or combination of types (for example, all SCSI, all serial-link, SCSI and serial-link in combination). The following chart shows maximum disk capacity for each maximized configuration. The **Assumptions** section defines each adapter/subsystem combination. The **Configuration** section shows the type or combination of types of storage in each header followed by the quantity of each adapter in the left-hand column with the quantity of each type of storage in the center and right-hand columns.

**Assumptions:**

- SCSI-2 SE Adapter connects to one IBM 9334-010
  - 9334-010 contains one 2GB and three 2.41GB disks = 9.23GB
- SCSI-2 Differential Adapter connects to two IBM 9334-011

- First 9334-011 contains four 2GB disks = 8GB
- Second 9334-011 contains three 2GB disks = 6GB
- Calculate as 7GB for each 9334-011
- SCSI-2 Differential Adapter connects to two IBM 7135 RAIDiant arrays
  - Each 7135 contains 30 —2GB disks.
  - Assume Protected Mode = 48GB
- SCSI-2 Differential Adapter connects to two 3514 RAIDiant arrays
  - 3514 Model 213 contains 15GB maximum
  - 3514 Model 212 contains 7.8GB maximum
- Serial Adapter connects to four IBM 9333
  - Each 9333 contains four 2GB disks = 8GB
- Integrated SCSI supports internal media and disk devices

**Calculated Storage Limits:**

- Maximum without RAID —218GB
- Maximum with RAID —492GB

# ADAPTERS	INTERNAL/RAID7135	9333/9334 DRAWERS
<b>CONFIGURATION 1 —</b>		
<b>BASE + SCSI-MIX: &gt;&gt; 110.00GB</b>		
0 SCSI-2 SE	6 INTERNAL @ 2GB	0 -9334 @ 9.23GB
7 SCSI-2 DIFF	0 -RAID <sup>12</sup> @ 48GB	14 -9334 @ 7.00GB
0 SERIAL		0 -9333 @ 8.00GB
<b>CONFIGURATION 2 —</b>		
<b>BASE + SCSI-SE: &gt;&gt; 76.61GB</b>		
7 SCSI-2 SE	6 INTERNAL @ 2GB	7 -9334 @ 9.23GB
0 SCSI-2 DIFF	0 -RAID <sup>12</sup> @ 48GB	0 -9334 @ 7.00GB
0 SERIAL		0 -9333 @ 8.00GB
<b>CONFIGURATION 3 —</b>		
<b>BASE + SCSI-DIFF: &gt;&gt; 110.00GB</b>		
0 SCSI-2 SE	6 INTERNAL @ 2GB	0 -9334 @ 9.23GB
7 SCSI-2 DIFF	0 -RAID <sup>12</sup> @ 48GB	14 -9334 @ 7.00GB
0 SERIAL		0 -9333 @ 8.00GB
<b>CONFIGURATION 4 —</b>		
<b>BASE + SERIAL: &gt;&gt; 204.00GB</b>		
1 SCSI-2 SE	6 INTERNAL @ 2GB	0 -9334 @ 9.23GB
0 SCSI-2 DIFF	0 -RAID <sup>12</sup> @ 48GB	0 -9334 @ 7.00GB
6 SERIAL		24 -9333 @ 8.00GB
# ADAPTERS	INTERNAL/RAID7135	9333/9334 DRAWERS
<b>CONFIGURATION 5 —</b>		
<b>BASE + SCSI + SERIAL: &gt;&gt; 218.00GB</b>		
0 SCSI-2 SE	6 INTERNAL @ 2GB	0 -9334 @ 9.23GB
1 SCSI-2 DIFF	0 -RAID <sup>12</sup> @ 48GB	2 -9334 @ 7.00GB
6 SERIAL		24 -9333 @ 8.00GB
<b>CONFIGURATION 6 —</b>		
<b>BASE + RAID: &gt;&gt; 396.00GB</b>		
0 SCSI-2 SE	6 INTERNAL @ 2GB	0 -9334 @ 9.23GB
4 SCSI-2 DIFF	8 -RAID <sup>12</sup> @ 48GB	0 -9334 @ 7.00GB
0 SERIAL		0 -9333 @ 8.00GB
<b>CONFIGURATION 7 —</b>		
<b>BASE + RAID + SCSI: &gt;&gt; 438.00GB</b>		
0 SCSI-2 SE	6 INTERNAL @ 2GB	0 -9334 @ 9.23GB
7 SCSI-2 DIFF	8 -RAID <sup>12</sup> @ 48GB	6 -9334 @ 7.00GB
0 SERIAL		0 -9333 @ 8.00GB
<b>CONFIGURATION 8 —</b>		
<b>BASE + RAID + SERIAL: &gt;&gt; 492.00GB</b>		
0 SCSI-2 SE	6 INTERNAL @ 2GB	0 -9334 @ 9.23GB
4 SCSI-2 DIFF	8 -RAID <sup>12</sup> @ 48GB	0 -9334 @ 7.00GB
3 SERIAL		12 -9333 @ 8.00GB

<sup>12</sup> RAID is 7135 or 3514

**Cable Orders:** No cables are required.

**Problem Determination:** For problem analysis, the IBM RISC System/6000 Model 59H diagnostic programs, resident on the system, provide console routines that lead a user through problem determination and help provide direction to resolve problems. An IBM-supported terminal or IBM-supported display/display adapter and keyboard are required on all RISC System/6000 500-series models.

**Security, Auditability, and Control**

Security and auditability features of this product are:

- Physical security is provided by a rear-mounted lock that helps prevent cover removal when locked.
- A three-position, key-operated MODE switch helps provide logic security for the system.

This product uses the security and auditability features of host hardware, software, and application software.

User management is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communications facilities.

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**Terms and Conditions**

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**Volume Discount:** Volume purchasing is available under the Volume Discounts section of the IBM Customer Agreement (ICA).

**Volume Orders:** For information regarding volume orders, contact your IBM representative.

**IBM Credit Corporation Financing:** Term leases and installment payment plans are available for commercial and state and local government customers.

**Customer Fulfillment Option Applies:** Yes

**Warranty Period:** One year

**Warranty Service:** IBM On-Site Repair (IOR)

**Maintenance Service:** IOR

**IBM Hourly Service Rate Classification:** The IBM Hourly Service Rate Classification is two.

IBM Warranty Service, Maintenance Service, or IBM Hourly Service can be obtained by calling 800-IBM-SERV (426-7378). IBM Hourly Service is available at the applicable rate and terms, including element exchange price, if applicable.

**Mid-Range System Option:** The announced product is an eligible machine for the Mid-Range System Option of the ICA. A revised exhibit will be available at a later date.

Eligible Type	Discount	
	Three-Year	Five-Year
7013	12%	17%

**Corporate Service Option:** The announced product is an eligible machine for the Corporate Service Option of the ICA. A revised exhibit will be available at a later date.

Option	Discount	
	Three-Year	Five-Year
Network System	15%	20%
	12%	17%

**Extended Maintenance Option:** The announced product is an eligible machine under the Extended Maintenance Option of the ICA.

The IBM AIX/6000 Support Family offers a number of technical support services designed to meet the varying system support requirements of our AIX/6000 and RISC System/6000 customers. These services provide timely, knowledgeable assistance and information from IBM specialists and experts. The various options of the services provide flexibility in defining the scope of services received from IBM.

The AIX/6000 Support Service family includes:

- AIX/6000 Support Line — provides you with telephone access to a team of IBM specialists.
- AIX/6000 Associate — an analyst is assigned to work remotely with you and becomes familiar with your specific systems requirements.
- AIX/6000 Consult Line — allows you to schedule time with the experts to address highly technical topics such as system design, performance evaluation, and in-depth communications.
- AIX/6000 Performance Management — provides automated performance data collection software that continually monitors your system and transmits results back to the performance experts for evaluation.
- AIX Technical Library/6000 — provides you with a library of service and support information on a CD-ROM that is updated and distributed quarterly.
- AIX/6000 House Call — provides you with on-site assistance with such tasks as installation, problem assistance, software maintenance, and updates.

The AIX/6000 Support family also includes packages of services designed to meet the needs of specific customer types:

- AIX/6000 New Customer Support Package
- AIX/6000 Growing Customer Support Package
- AIX/6000 Established Customer Support Package

For complete details on the AIX/6000 Support Family, refer to Services Announcement 693-004, dated March 16, 1993.

**Product Availability Status:** New product available

**Field-Installable Features:** Yes

**Model Conversions:** Yes

**Customer Setup:** No

**Licensed Internal Code:** Yes

**Educational Allowance:** A 20% educational allowance is available to qualifying institutions in accordance with the Attachment for Educational Allowance for the Model 59H. The educational allowance may not be added to any other discount or allowance.

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**Charges**

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**Machine Type:** 7013

Description	Feature Number	Purchase Price	Monthly Minimum Maint. Charge	Removal Charge
RISC System/6000	59H	\$72,500	\$725	N/A
L2 cache, 5MB				
Specify <sup>13</sup>	9042	0	0	\$116
SCSI-2				
Fast/Wide Adapter/A				
Specify	9216	0	0	116
SCSI-2 Fast/Wide Internal Cable				
Specify	9430	0	0	116



Description	Feature Number	Purchase Price	Monthly Minimum Maint. Charge	Removal Charge	Description	Feature Number
2GB to Two 1GB Disk Drive Select	2567	\$ 100	\$0	\$116	SCSI-2 Differential High-Performance External I/O Controller	2420
2GB SCSI-2 Disk Drive Specify <sup>13</sup>	9263	0	0	116	SCSI-2 Differential Y Cable	2422
2.4GB SCSI-2 Disk Drive Select (In place of one FC9263)	2598	1,500	55	116	SCSI-2 Differential System-to-System Cable	2423
CD-ROM-2 to 4GB 4mm Tape Drive Select	6145	2,000	20	192	1GB SCSI-2 Disk Drive	2555
					2GB 3.5-inch SCSI-2 Drive	2580
					2.4GB SCSI-2 Disk Drive	2590
					High-Performance External I/O Controller	2835
					SCSI-2 High-Performance Internal I/O Controller	2831
					SCSI-2 High-Performance External I/O Controller	2410
					SCSI Controller Cable	2832
					SCSI-2 Controller Cable	2836
					SCSI Device-to-Device Cable	3130
					2GB SCSI-2 16-bit Drive-Additional SCSI-2 Fast/Wide	2586
					Adapter/A-Additional	2415
					SCSI-2 Differential Fast/Wide Adapter/A	2416
					8-bit Internal 6-Drop SCSI-2 Fast/Wide Adapter/A Cable	2430
					16-bit Internal 6-Drop SCSI-2 Fast/Wide Adapter/A Cable	2431
					8-bit SCSI-2 Fast/Wide Adapter/A Single-Ported Device Cable	2439
					8-bit SCSI-2 Fast/Wide Adapter/A Dual-Ported Device Cable	2437
					16-bit SCSI-2 Fast/Wide Adapter/A Dual-Ported Device Cable	2435
					8-bit SCSI-2 Differential Fast/Wide Adapter/A Dual-Ported Device Cable	2438
					16-bit SCSI-2 Differential Fast/Wide Adapter/A Dual-Ported Device Cable	2436
					8-bit SCSI-2 Differential Fast/Wide Adapter/A Y-Cable	2427
					16-bit SCSI-2 Differential Fast/Wide Adapter/A Y-Cable	2426
					0.6m 16-bit SCSI-2 Differential System-to-System Cable	2424
					2.5m 16-bit SCSI-2 Differential System-to-System Cable	2425

<sup>13</sup> Specify a quantity of two.

**Note:** Select/specify features can only be ordered with the initial system order.

### Specify and Select Features

The following features are applicable to the Model 59H.

**Note:** Select features can only be ordered with the initial system order.

Description	Feature Number	Description	Feature Number
SCSI-2 Fast/Wide Adapter/A Specify	9216	32MB HD3 Memory Card	4067
SCSI-2 Fast/Wide Internal Cable Specify	9430	64MB HD3 Memory Card	4069
SCSI-2 Fast/Wide 16-bit Internal Cable Select	2433	128MB HD3 Memory Card	4090
SCSI-2 Differential Fast/Wide Adapter/A Select	2417	256MB HD3 Memory Card	4095
2GB SCSI-2 Fast/Wide Drive Select	2587	64MB Memory SIMM Kit	5064
Internal CD-ROM-2 Specify	9218	128MB Memory SIMM Kit	5128
CD-ROM-2 to 5.0GB 8 mm Tape Select	6141		
2GB SCSI-2 Disk Drive Specify (Two required on initial order)	9263		
32MB HD3 Memory Specify (Two required on initial order)	9235		
L2 cache .5MB Specify (Two required on initial order)	9042		
64MB HD3 Memory Select	4071		
128MB HD3 Memory Select	4092		
256MB HD3 Memory Select	4096		
2GB to Two 1GB Disk Drive Select	2567		
2.4GB SCSI-2 Disk Drive Select (In place of one FC9263)	2598		
3.5-inch Diskette Specify	9221		
CD-ROM-2 to 4GB 4 mm Tape Drive Select	6145		
3.5-inch Mounting Hardware Specify	6501		
CCS Custom Services Specify	0986		

The following previously announced features are applicable to the Model 59H.

### Optional Features

Description	Feature Number	Description	Feature Number
<b>Language Groups</b>		<b>Media and I/O Controllers</b>	
Language Group —U.S. English	9300	4/8GB 4 mm Internal Tape Drive	6142
<b>Direct Access Storage</b>		5/10GB 8 mm Internal Tape Drive	6147
Integrated SCSI Controller Cable	2833	Internal CD-ROM-2 (additional)	2603
High-Performance Disk Drive Subsystem Adapter (40/80MB/sec)	6212	Internal 1.2GB ¼-Inch Tape	2630
		<b>Async Support Adapters</b>	
		8-Port Async Adapter —EIA-232	2930
		16-Port Async Adapter —EIA-232	2955
		8-Port Async Adapter —EIA-422A	2940
		16-Port Async Adapter —EIA-422A	2957
		8-Port Async Adapter —MIL-STD 188	2950
		Multipoint Interface Cable	2995
		16-Port Interface Cable —EIA-232	2996
		16-Port Interface Cable —EIA-422A	2997
		Async Cable EIA-232/V.24	2936

Description	Feature Number	Description	Feature Number
Printer/Terminal Interposer EIA-232	2937	<b>ARTIC Adapters</b>	
Terminal Cable —EIA-422A	2945	Realtime Interface Co-Processor: Multiport/2 Adapter (.5Mb)	7002
PC Parallel Printer Cable	3100	Realtime Interface Co-Processor: Multiport/2 Adapter (1MB)	7004
128-Port Async Controller	8128	Realtime Interface Co-Processor: Portmaster® Adapter/A (1MB)	7006
64-Port to 128-Port Pinout Converter	8135	Realtime Interface Co-Processor: Portmaster Adapter/A (2MB)	7008
16-Port Async Concentrator	6401	Realtime Interface Co-Processor: Multiport/2 4-Port RS-232 Interface Board	7022
RJ-45 to DB-25 Converter Cable	6402	Realtime Interface Co-Processor: Multiport/2 6-Port RS-232-C Synchronous Interface Board	7024
Transformer — 100 to 110 V AC	9115	Realtime Interface Co-Processor: Multiport/2 8-Port RS-232 Interface Board	7026
Transformer — 115 to 127 V AC	9116	Realtime Interface Co-Processor: Multiport/2 8-Port RS-422-A Interface Board	7028
Transformer — 200 to 220 V AC	9117	Realtime Interface Co-Processor: Multiport/2 RS-232/RS-422 Interface Board	7030
Transformer — 200 to 240 V AC	9118	Realtime Interface Co-Processor: 8-Port RS-232 Interface Board/A	7042
Remote Async Node 16-Port EIA-232	8130	Realtime Interface Co-Processor: 8-Port RS-422 Interface Board/A	7044
128-Port Async Controller Cable (15-feet)	8131	Realtime Interface Co-Processor: 6-Port V.35 Interface Board/A	7046
128-Port Async Controller Cable (9-inch)	8132	Realtime Interface Co-Processor: EIA RS-232-C Multiport Interface Cable	7102
RJ-45 to DB-25 Converter Cable	8133	Realtime Interface Co-Processor: Synchronous Interface Cable	7104
<b>LAN Adapters and FDDI Adapters</b>		Realtime Interface Co-Processor: 6-Port V.35 Cable	7106
Token-Ring High-Performance Network Adapter	2970	Realtime Interface Co-Processor: 8-Port Cable	7108
Ethernet High-Performance LAN Adapter	2980	<b>Channel Adapters</b>	
Ethernet 10Base T Transceiver	4224	S/390® ESCON® Channel Emulator	2754 <sup>15</sup>
FDDI Fiber Single-Ring Adapter	2724	Block Multiplexer Channel Adapter	2755
FDDI Fiber Dual-Ring Upgrade	2723	Block Multiplexer Channel Adapter Cable	2757
FDDI-STP Single-Ring Adapter	2725	Block Multiplexer Channel Cable Assembly	2758
FDDI-STP Dual-Ring Upgrade	2726	S/370™ Channel Emulator A	2759
Network Terminal Accelerator 256 (Requires Incremental Fan 6506)	2402 <sup>14</sup>	Incremental Cooling Fan	6506
Network Terminal Accelerator 2048 (Requires Incremental Fan 6506)	2403 <sup>14</sup>	RISC System/6000 ESCON Control Unit	2756 <sup>15</sup>
<b>Note:</b> Feature numbers 6401, 6402, 9115, 9116, 9117, and 9118 are only orderable on upgraded machines that have the 64-port Async Controller (#6400) installed.		RISC System/6000 High-Performance Parallel Interface (HIPPI)	2735 <sup>15</sup>
<sup>14</sup> Feature numbers 2402 and 2403 are Ethernet Adapters that offload TELNET and RLOGIN protocol processing.		Fibre Channel Adapter/266	1906
<b>WAN Adapters</b>		<sup>15</sup> Feature requires Incremental cooling fan (#6506).	
Multi-Protocol Communications Adapter (MP/A)	2959	<b>Graphics Adapters</b>	
X.25 Interface Co-Processor/2	2960	POWER Gt4i (24-bit) Graphics Adapter	2713 <sup>15</sup>
X.25 Attachment Cable —		POWER Gt4xi (24-bit) Graphics Adapter	2712 <sup>15</sup>
X.21 — 3 meter	2965	POWER Gt4xi (8-bit) Graphics Adapter	2711
V.24 — 3 meter	2966	Graphics Input Device Adapter	2810
V.35 — 3 meter	2967	Graphics Input Device Cable	2811
X.21 — 6 meter	2976		
V.24 — 6 meter	2977		
V.35 — 6 meter	2978		
Asynchronous Transfer Mode TURBOWAYS 100 ATM Adapter	2984		
TURBOWAYS 100 ATM Device Driver/6000	5063		
4-Port Multiprotocol Communications Controller	2700		
4-Port Multiprotocol Interface Cable	2705		
Multiprotocol Attachment Cable —X.21	2704		
Multiprotocol Attachment Cable —V.35	2702		
Multiprotocol Attachment Cable — EIA-232/V.24	2706		

Description	Feature Number
5086 Attachment Adapter	2801
5085 Attachment Adapter	2802
System/370™ Host Interface Adapter	2800
POWERgraphics GTO Accelerator	4350
POWER Gt3™	2768
POWER Gt4e™	2776
POWER GXT150M™	2650

### Displays

POWERdisplay 17	3607
POWERdisplay 20	3608

### Keyboards

Keyboard — U.S. 101 Keys	6010
U.S. English Soft Touch Keyboard <sup>16</sup>	1110
102 Keys (Belgian — Dutch/French)	6011
102 Keys (Canadian French)	6012
102 Keys (Danish)	6013
102 Keys (Finnish)	6014
102 Keys (French)	6015
102 Keys (German)	6016
102 Keys (Italian)	6017
102 Keys (Norwegian)	6019
102 Keys (Portuguese)	6020
102 Keys (Spanish)	6021
102 Keys (Swiss)	6022
102 Keys (United Kingdom-English)	6023
102 Keys (Icelandic)	6024
102 Keys (Turkish, ID 179)	6025
102 Keys (Greek)	6026
102 Keys (Dutch)	6034
102 Keys (Turkish, ID 440)	6035
102 Keys (Hebrew)	6027
102 Keys (Arabic)	6028
106 Keys (Taiwan)	6033
106 Keys (Korean)	6031
106 Keys (Japan KANJI)	6030

<sup>16</sup> Available in U.S. and Canada only

### Other

Digital Trunk Adapter	6300
M-Audio Capture and Playback Adapter	6301
Digital Trunk Dual Adapter	6305
3270 Connection Adapter	2990
3-Button Mouse	6041
Software Preload	5005

### Power Cords

United States/Canada/Brazil	9800
Chicago Twist Lock	9986
Belgium, Finland, France	9820
Denmark	9821
United Kingdom	9825
Israel	9827
Switzerland	9828
South Africa, Pakistan	9829
Italy	9830
Argentina	9831
Thailand	9833
Uruguay	9834

**Feature 2835 Support by Models 590 and 58H:** The High-Performance External I/O Controller (#2835) is now supported by Models 590 and 58H.

The following previously announced features, if installed on previous 500 series models, can be included in the upgrade to the Model 59H. After the upgrade, however, these features cannot be ordered for the Model 59H with the exception of features numbers 6401, 6402, 9115, 9116, 9117, and 9118, which can be ordered provided that feature 6400 is already installed on the previous 500-series model.

Description	Feature Number
1GB SCSI Disk Drive	2550
Internal CD-ROM	2600
FDDI Single-Ring Adapter	2720
FDDI Dual-Ring Upgrade Kit	2722
Grayscale Graphics Display Adapter	2760
Color Graphics Display Adapter	2770
POWER Gt3™	2777
External I/O Controller	2829
2.4GB SCSI-2 Disk Drive Select	2594
SCSI-2 Passthrough Terminator Cable	2914
SCSI Controller Passthrough Terminator Cable	2915
High-Performance Disk Drive Subsystem Adapter	6210
High-Performance Disk Drive Subsystem Adapter (80MB/sec)	6211
64-Port Async Controller	6400
2.3GB 8 mm Internal Tape Drive	6146
2.3GB 8 mm Internal Tape Drive Select	6143
5GB 8 mm Internal Tape Drive Select	6144
POWERdisplay 16	3600
POWERdisplay 19	3601
355MB Disk Drive	2500
670MB Disk Drive	2510
640MB Disk Drive	2542
400MB Disk Drive	2560
540MB SCSI-2 Drive	2390
857MB Disk Drive	2530
800MB SCSI Disk Drive Pair	2562
Base SCSI-2 SE Adapter and Cable	9219
Base SCSI Adapter	9220
SE SCSI-2 Select	2414
SCSI-2 Fast/Wide Adapter Differential Select	2413
POWER Gt4™ 8-bit	2795
POWER Gt4x™ 8-bit	2790
Power GT4 24-bit	2796
Power GT4x 24-bit	2791
Power GT4 8-bit to 24-bit Upgrade	2792
Power GT4 Performance Upgrade	2794
SCSI-2 Internal to SCSI-2 Fast/Wide 8-bit Cable Select	2428
SCSI-2 Internal to SCSI-2 Fast/Wide 16-bit Cable Select	2429
320MB x 2 SCSI Base Drives	9243
320MB x 2 SCSI Drive Select	2543
355MB Base SCSI Drive	9246
400MB Base SCSI Drive	9244
400MB x 2 Base SCSI Drives	9245
400MB to 540MB SCSI-2 Drive Select	2391
670MB SCSI Drive Select (355MB)	2511
857MB SCSI Drive Select (2x320MB)	2532
857MB SCSI Drive Select (355MB)	2531
857MB SCSI Drive Select (400MB)	2529
857MB SCSI Drive Select (2x400MB)	2534
1GB SCSI Drive Select (400MB)	2551
1GB SCSI-2 Drive Select	2556
1GB Base SCSI-2 Drive	9249
1GB SCSI Drive Select (400MB)	2552
1GB x 2 SCSI-2 Drive Select	2557

<b>Description</b>	<b>Feature Number</b>
1.37GB SCSI Drive	2570
1.37GB SCSI Drive Select (400MB)	2572
1.37GB SCSI Drive Select (2x400MB)	2574
2GB SCSI-2 Drive Select (2x400MB)	2585
2GB SCSI-2 Drive Select (1GB)	2583
2GB SCSI-2 Fast/Wide Drive Select	2588
2.4GB SCSI-2 5.25-Inch Drive Select	2592
2.4GB SCSI-2 5.25-Inch Drive Select	2593
32MB HD1 Memory	4032
32MB HD1 Memory Select	4033
32MB HD3 Memory Select	4068
64MB HD1 Memory	4035
64MB HD1 Memory Select	4036
64MB HD3 Memory Select	4070
32MB Memory SIMM Upgrade	5032
Base CD-ROM Drive	9223
CD-ROM-2 Select from Base CD-ROM	2602

**Model Conversion Purchase Prices:**

<b>Model From</b>	<b>Model To</b>	<b>Model Conversion Purchase Price*</b>
520	59H	\$40,000 *
52H	59H	40,000 *
530	59H	40,000 *
53E	59H	40,000 *
53H	59H	40,000 *
550	59H	35,000 *
55E	59H	35,000 *
55S	59H	35,000 *
560	59H	35,000 *
56F	59H	35,000 *
570	59H	42,000 *
57F	59H	42,000 *
580	59H	33,000 *
58F	59H	33,000 *
58H	59H	30,000 *
590	59H	20,000 *

\* Parts removed or replaced become the property of IBM and must be returned. Exceptions have been noted earlier in the Limitations section.