



Netfinity

**Four-Way Processor Upgrade Kit
Installation Instructions**



Netfinity

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Installation Instructions**

Important

Before using this information and the product it supports, be sure to read the general information under Appendix B, "Product warranties and notices" on page 27.

First Edition (February 1999)

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Safety information



Before installing this product, read the Safety Information book.

Antes de instalar este produto, leia o Manual de Informações sobre Segurança.

安装本产品前请先阅读《安全信息》手册。

Prije instalacije ovog proizvoda pročitajte priručnik sa sigurnosnim uputama.

Pred instaláci tohto produktu si p e t e p íru ku bezpe nostních instrukcí.

Læs hæftet med sikkerhedsforskrifter, før du installerer dette produkt.

Lue Safety Information -kirjanen, ennen kuin asennat tämän tuotteen.

Avant de procéder à l'installation de ce produit, lisez le manuel Safety Information.

Vor Beginn der Installation die Broschüre mit Sicherheitshinweisen lesen.

Πριν εγκαταστήσετε αυτό το προϊόν, διαβάστε το εγχειρίδιο Safety Information.

Installálás el tt olvassa el a Biztonsági el írások kézikönyvét !

Prima di installare questo prodotto, leggere l'opuscolo contenente le informazioni sulla sicurezza.

本製品を導入する前に、安全情報資料を御読みください。

이 제품을 설치하기 전에, 안전 정보 책자를 읽어보십시오.

Пред да го инсталирате овој производ прочитајте ја книгата со безбедносни информации.

Lees voordat u dit product installeert eerst het boekje met veiligheidsvoorschriften.

Les heftet om sikkerhetsinformasjon (Safety Information) før du installerer dette produktet.

Przed zainstalowaniem tego produktu należy przeczytać broszurę Informacje Dotyczące Bezpieczeństwa.

Antes de instalar este produto, leia o folheto Informações sobre Segurança.

Перед установкой продукта прочтите брошюру по технике безопасности (Safety Information).

Pred inštaláciou tohto produktu si pre ítajte Informa nú brožúrku o bezpe nosti.

Preden namestite ta izdelek, preberite knjižico Varnostne informacije.

Antes de instalar este producto, lea la Información de Seguridad.

Läs säkerhetsinformationen innan du installerar den här produkten.

在安裝本產品之前，也請先閱讀「安全性資訊」小冊子。

1



DANGER

Electrical current from power, telephone, and communication cables is hazardous.

To avoid a shock hazard:

- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **Connect all power cords to a properly wired and grounded electrical outlet.**
- **Connect to properly wired outlets any equipment that will be attached to this product.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.**

To Connect:

1. Turn everything OFF.
2. First, attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

To Disconnect:

1. Turn everything OFF.
2. First, remove power cords from outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

Upgrade installation

You can upgrade your Netfinity 5500 or Netfinity 5500 M10 server with up to four Intel® Pentium® II Xeon™ microprocessors or up to four Pentium III Xeon microprocessors. This Processor Upgrade Kit provides a new microprocessor assembly that includes the processor board and three terminator cards. It does not include the microprocessors, voltage regulator modules (VRMs), or memory modules.

You must install at least one microprocessor kit. Optionally, you can install up to four microprocessor kits. (The microprocessor kits include the required VRMs.) You must also install the memory-module kits.

This book provides instructions for installing the Processor Upgrade Kit. It also includes instructions for installing the microprocessors, VRMs, and the memory-module kits.

Important

This Processor Upgrade Kit must be installed by trained service personnel. Contact IBM or a trained service provider for assistance.

Before you begin

Read through these instructions to familiarize yourself with the installation procedure. Be sure you have the additional microprocessors and memory options required to complete the upgrade (see “Required companion options” on page 2).

The option contains the following items:

- Processor housing assembly, consisting of:
 - Processor housing
 - Processor board
 - Memory board
 - Three terminator cards
 - Fan Assembly
- Power supply
- Power supply handle
- Power backplane
- Power supply separator
- RS-485 interface cable
- Processor housing guide
- SCSI controller-to-bulkhead cable
- Front panel assembly
- Diagnostic panel assembly
- Air diffuser
- Half-card slot insulator
- Power supply filler panel
- Four blue thumbscrews
- Jumper extension cable
- *IBM Netfinity 5500 M20 Advanced System Management Processor Firmware Update Diskette*
- *IBM Netfinity 5500 M20 BIOS Update Diskette*
- *IBM Netfinity 5500 M20 Diagnostic Update Diskette 1 of 2*
- *IBM Netfinity 5500 M20 Diagnostic Update Diskette 2 of 2*
- *IBM Netfinity Four-Way Processor Upgrade Kit Installation Instructions* (this book)

- *IBM Netfinity 5500 M20 Server Library*, which includes the *ServerGuide CDs*
- IBM Netfinity 5500 M20 system service label
- Intel microprocessor label
- Two upgrade stickers

Note: The illustrations in this book might be slightly different from your hardware.

Required companion options

You must install the following companion options with the Processor Upgrade Kit:

1. You can install one to four microprocessor kits in your server. To avoid damage and ensure proper server operation when you install a new or an additional microprocessor, use microprocessors that have the same cache size and type, and the same clock speed.

Note: If you are upgrading a Netfinity 5500 M10, your server might come with one or more microprocessors that are compatible with this Processor Upgrade Kit.

2. You can add memory modules to your server in any of the following configurations.
 - 128 MB synchronous dynamic random access memory (SDRAM) error checking and correction (ECC) registered dual inline memory module (DIMM)
 - 256 MB registered SDRAM ECC DIMM
 - 512 MB registered SDRAM ECC DIMM
 - A combination of the 128 MB, 256 MB, and 512 MB registered SDRAM ECC DIMMs

For more information about the memory configurations supported, see “Installing memory-module kits” on page 14.

3. Optionally, you can install a second 500-watt power supply for redundant power. With a redundant power supply installed, you can replace a failing power supply without turning off the server.

Additional considerations

Additionally, review the following considerations:

1. You must remove any adapter you have installed in slot 6. You can populate slot 5 only with a half-size adapter. Before you install the option, consider how to maximize the performance of your adapters using slots 1 through 5. Review the documentation that comes with the adapters and the documentation that comes with your server for more information.
2. You need the following items to install the Processor Upgrade Kit.
 - A medium flat blade screwdriver
 - A medium Phillips screwdriver
 - The documentation that comes with your server

3. If you need to move the server to install the option, arrange for additional help.

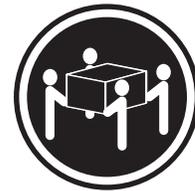
4



≥18 kg (37 lbs)



≥32 kg (70.5 lbs)



≥55 kg (121.2 lbs)

CAUTION:
Use safe practices when lifting.

This book contains the warranty for your option. Store it in a safe place for future reference.

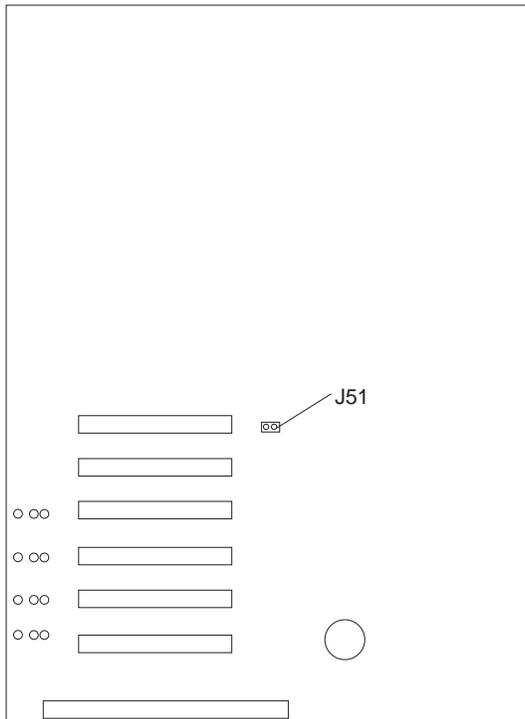
Special information for installers

- Be sure to leave this booklet with the server owner because it contains the warranty and service information.
- IBM service personnel, record all time to service code 33, using the appropriate completion status, machine type, and serial number. Use TA (tac code) L01 and action code 4, for the installation. Use the appropriate TA and action code if you experience problems. Record other B/O as 990 and enter the MES number of 866UPG in the MES field (requires a six-digit number).
- IBM business partners, authorized to provide warranty service, can be reimbursed for installation of this upgrade. To request payment, submit a warranty claim using type of service OE (Engineering Change Announcement) ECA #991.

Important

If the Disable Advanced System Management Processor jumper (J51) on the system board has a jumper installed, remove the jumper. Refer to the “Hardware Information” section of the *IBM Netfinity 5500 M20 Server Library* for instructions on working with jumpers.

Note: In normal operation, there is no jumper on J51. A jumper installed on J51 disables the Netfinity Advanced System Management Processor.



Updating the system BIOS

Complete this procedure to update the system BIOS.

1. Insert the *IBM Netfinity 5500 M20 BIOS Update Diskette* in the diskette drive.
2. Press Ctrl+Alt+Del to restart your server. The system begins the power-on self-test (POST).
3. Select **1 - Update POST/BIOS** from the menu that contains various flash (update) options.
4. Select **Y** when you are asked if you would like to move the current POST/BIOS image to the backup ROM location.
Important: The backup image of the current POST/BIOS is helpful with troubleshooting the upgrade, if troubleshooting becomes necessary.
5. Select **N** when you are asked if you would like to save the current code to a diskette.
6. You will be asked to choose which language you wish to use. Select your language (0–7) and press Enter to accept your choice.

7. Press Enter to start the update process.
8. Press Enter to confirm that you want to update the system BIOS. When the update process completes, you will be prompted to remove the diskette and press Enter to restart the system.
9. Remove the diskette and go to “Removing the shuttle and processor housing.”

Removing the shuttle and processor housing

Complete this procedure to remove the shuttle and processor housing.

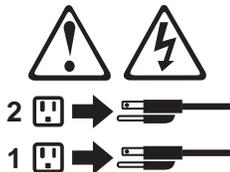
1. Remove all media (diskettes, CDs, optical discs, or tapes) from the drives.
2. Turn off the server and any attached devices.

5



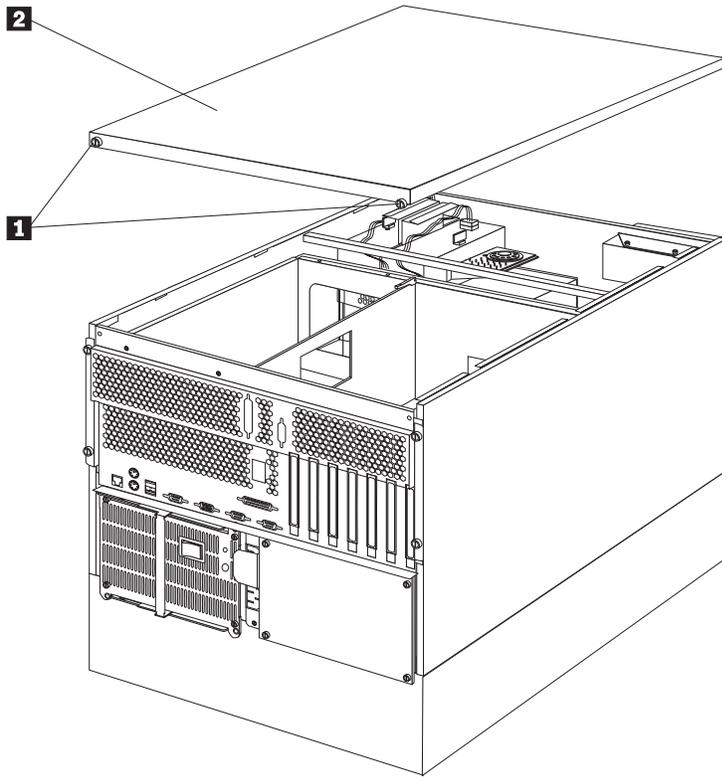
CAUTION:

The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.

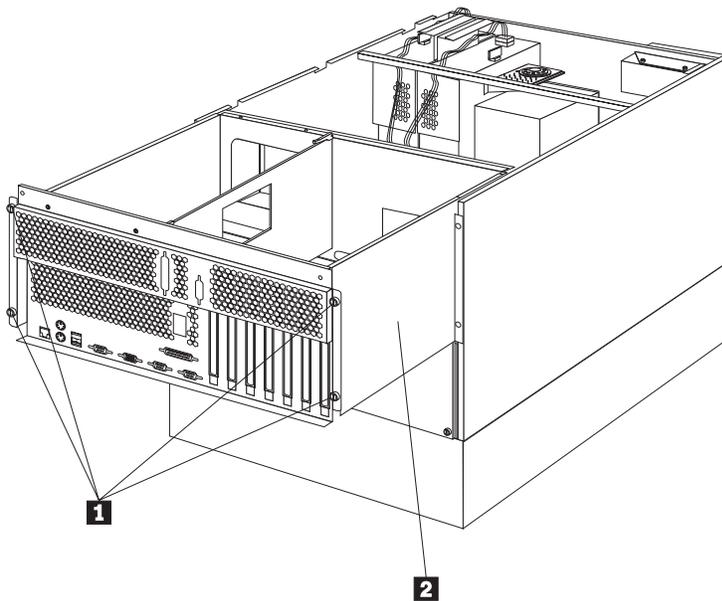


3. If you are in the United Kingdom and have a modem or fax machine attached to your server, you must disconnect the telephone line from the server *before* unplugging any power cords (also known as power cables). When reassembling your server, you must reconnect the telephone line *after* you plug in the power cords.
4. Disconnect all power cords (cables) from electrical outlets.
5. Disconnect all power cords from the server.
Note: The power cords used with your server are compatible with this option. Keep a power cord nearby for use after the upgrade is installed.
6. Disconnect all communication cables from external receptacles.
7. Note the location of the remaining cables and cords; then, disconnect them from the server.

8. Unscrew the top cover thumbscrews **1** and remove the top cover **2**.



9. Loosen the four thumbscrews **1** at the rear of the shuttle.



10. Slide the shuttle **2** to the rear of the server.

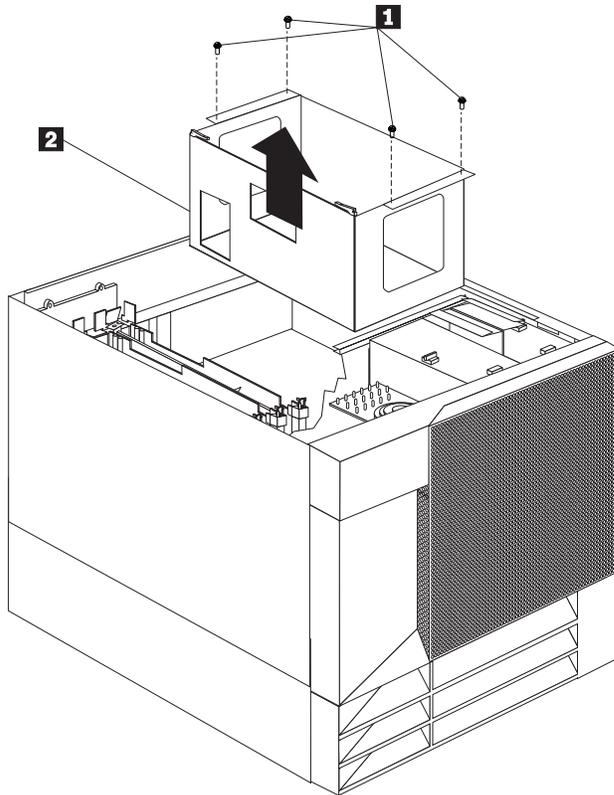
11. Remove the power supply cables from the rear of the processor housing.

12. Remove the four screws **1** securing the processor housing.

13. If the processor housing has two levers at the top corners, pull the levers up.

14. Lift the processor housing **2** out of the server and put it aside. This processor housing is not used with the upgrade.

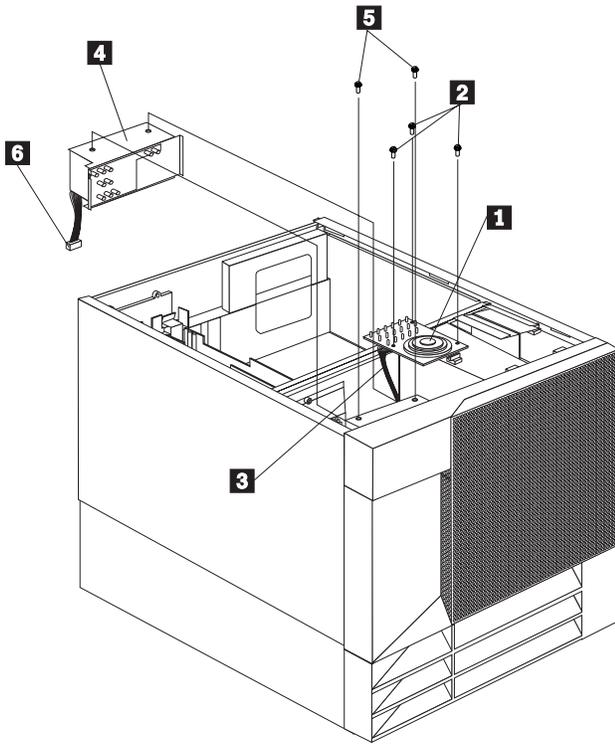
Note: Keep the processor housing nearby and in a safe place for use in troubleshooting the upgrade, if troubleshooting becomes necessary.



15. Note the location of all cables connected to the shuttle and disconnect the cables.
16. Remove the shuttle from the server and place it on a flat, static-free surface.
17. Go to “Replacing the diagnostic panel and front panel assemblies” on page 8.

Replacing the diagnostic panel and front panel assemblies

Complete this procedure to replace the diagnostic panel assembly and the front panel assembly.

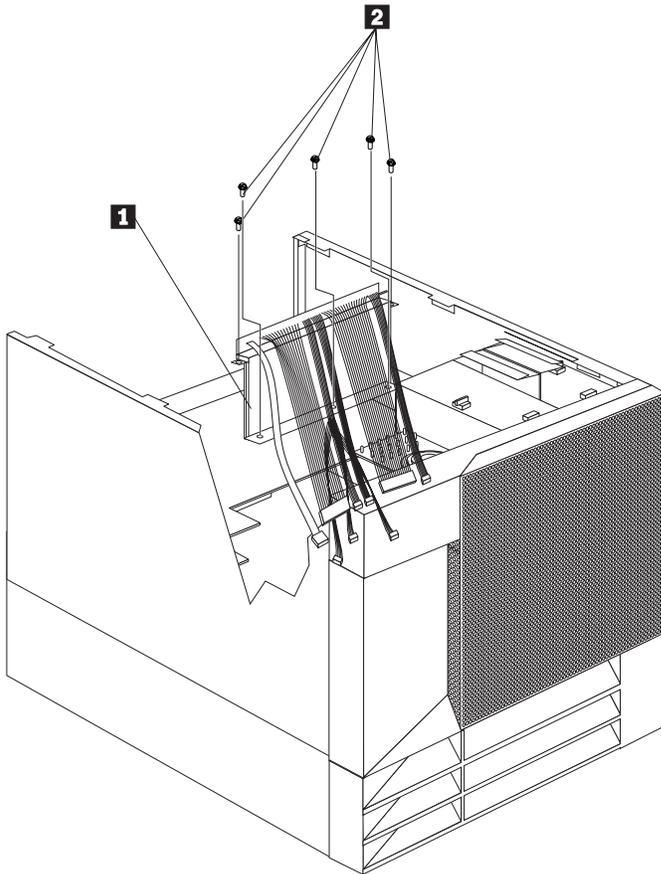


1. Replace the diagnostic panel assembly **1** :
 - a. Disconnect the cable **3** and remove the screws **2** that secure the diagnostic panel assembly.
 - b. Remove the diagnostic panel assembly from the server.
 - c. Install the diagnostic panel assembly that comes with this option. Connect the cable and secure the diagnostic panel assembly with screws.
2. Replace the front panel assembly **4** :
 - a. Disconnect the cable **6** and remove the screws **5** that secure the front panel assembly.
 - b. Remove the front panel assembly from the server.
 - c. Carefully position the front panel assembly that comes with this option.
 - d. Connect the cable and secure the panel with screws.
3. Go to "Replacing the power backplane, ac box, and power supplies" on page 9.

Replacing the power backplane, ac box, and power supplies

Complete this procedure to replace the power backplane, ac box, and power supplies.

1. Loosen the two screws and remove the ac box.
2. Remove the power supply:
 - a. Remove any shipping screws from the power supply.
 - b. Pull the handle on the power supply; then, slide the power supply out of the chassis.
 - c. Repeat this procedure if a second power supply is installed.
3. Loosen the five screws **2**, disconnect all power cables, and remove the power backplane **1**.



4. Install the power backplane contained in this option:
 - a. Lower the power backplane with the power supply connectors toward the rear of the server.
 - b. Seat the power backplane on the guide pins and secure with screws.

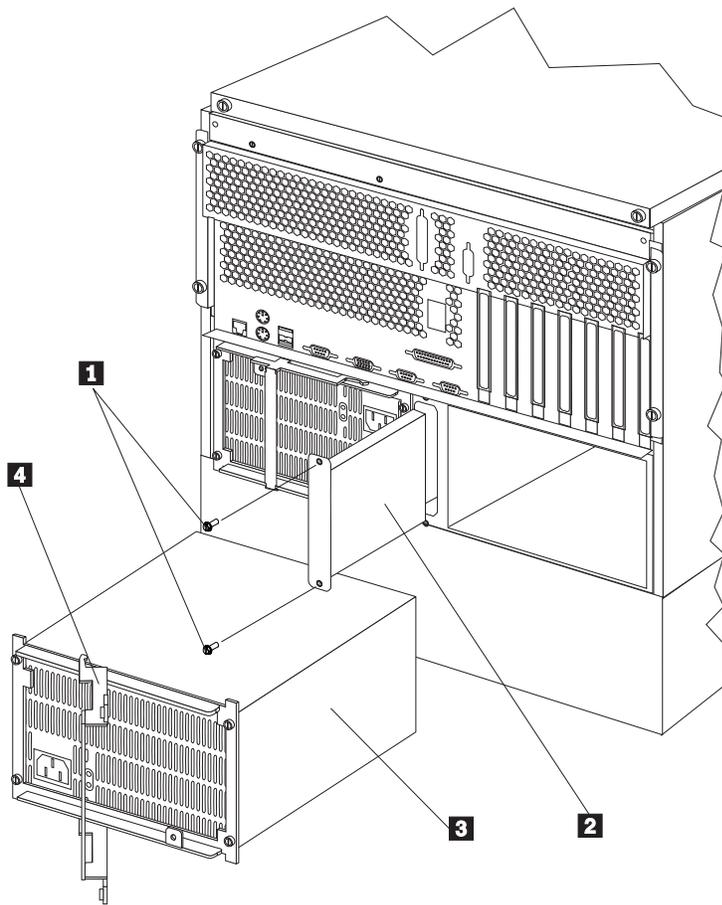
5. Install the power supply separator **2** contained in this option and secure with screws **1**.

Note: The power supply separator replaces the ac box in this option.

6. Install the power supply contained in this option **3**:

Note: The power supplies you might have in your server are not compatible with this option.

- a. Secure the handle to the power supply with screws.
- b. Place the handle **4** on the power supply in the open position, and slide the power supply into the chassis.
- c. Close the handle on the power supply to seat the power supply in the bay.
- d. Repeat this procedure if a second power supply is installed.



7. If you are not installing a second power supply, attach the filler panel over the open bay.

8. Go to “Installing a microprocessor kit” on page 11.

Installing a microprocessor kit

The following table shows the order in which microprocessors and VRMs must be installed.

Table 1. Microprocessor and VRM Installation Order

Note: A terminator card must be installed in each microprocessor connector that does not contain a microprocessor.

One Microprocessor Installed in J1

J12 (VRM 1)	J13 (VRM 2)	J14 (VRM 3)	J16 (VRM 4)	J17 (VRM 5)	J18 (VRM 6)
Installed	Installed				

Two Microprocessors Installed in J1 and J4

J12 (VRM 1)	J13 (VRM 2)	J14 (VRM 3)	J16 (VRM 4)	J17 (VRM 5)	J18 (VRM 6)
Installed	Installed			Installed	Installed

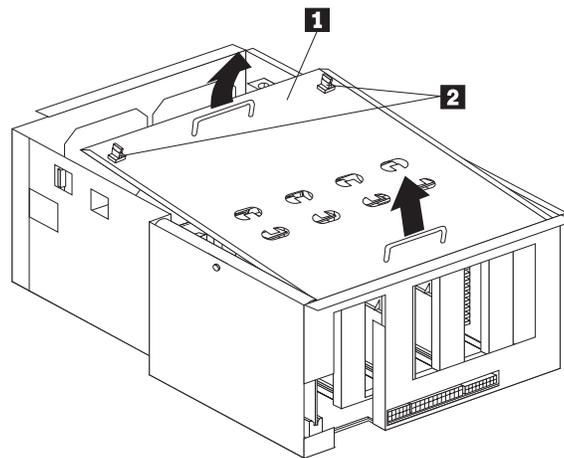
Three Microprocessors Installed in J1, J2, and J4

J12 (VRM 1)	J13 (VRM 2)	J14 (VRM 3)	J16 (VRM 4)	J17 (VRM 5)	J18 (VRM 6)
Installed	Installed	Installed		Installed	Installed

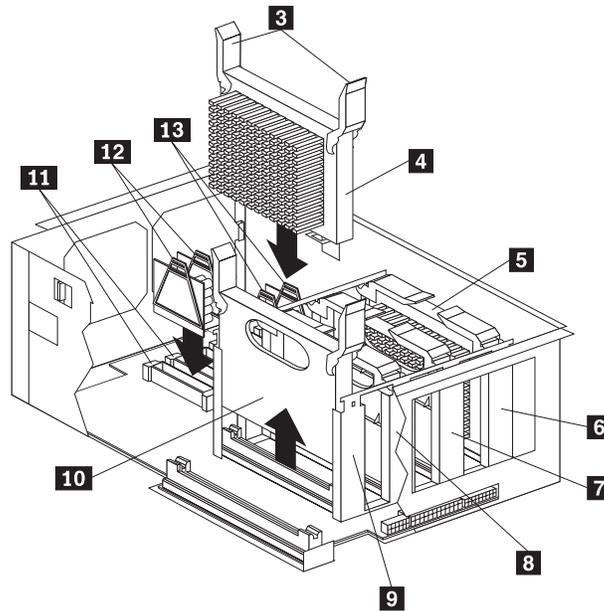
Four Microprocessors Installed in J1, J2, J3, and J4

J12 (VRM 1)	J13 (VRM 2)	J14 (VRM 3)	J16 (VRM 4)	J17 (VRM 5)	J18 (VRM 6)
Installed	Installed	Installed	Installed	Installed	Installed

Refer to the following illustrations of the processor housing and processor board that come with this option while you perform the steps in this procedure.



- 1** Processor housing cover
- 2** Quarter-turn fasteners



- 3** Latches
- 4** Second installed microprocessor (CPU or processor 4)
- 5** First installed microprocessor (CPU or processor 1)
- 6** Microprocessor connector 1 (J1)
- 7** Microprocessor connector 2 (J2)
- 8** Microprocessor connector 3 (J3)
- 9** Microprocessor connector 4 (J4)
- 10** Terminator card
- 11** VRM connectors 5 (J17) and 6 (J18)
- 12** VRMs for second microprocessor (VRMs 5 and 6)
- 13** VRMs for first microprocessor (VRMs 1 and 2)

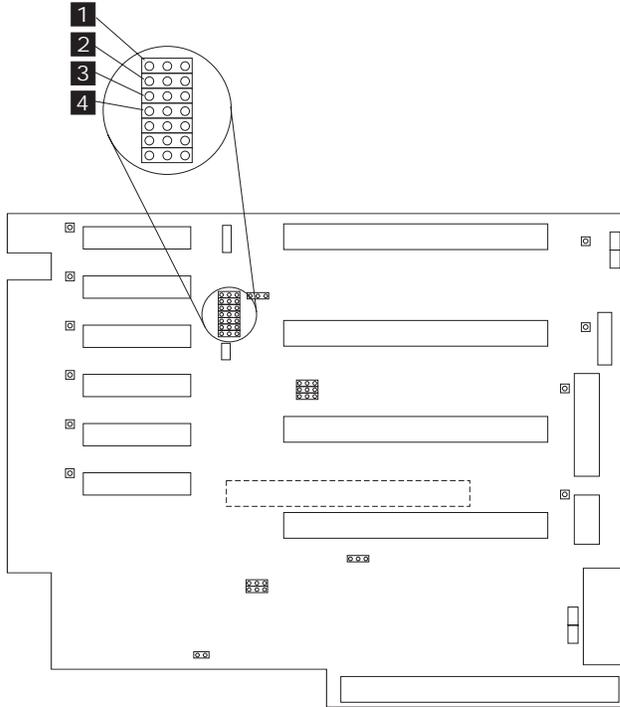
Complete this procedure to install a microprocessor in the processor housing that comes with this option.

1. Determine the connectors where the microprocessor and VRMs are to be installed. See Table 1 on page 11.
2. Turn the quarter-turn fasteners **2** and remove the processor housing cover **1**.
3. Pull on the fasteners and remove the fan assembly.
4. If the microprocessor connector **9** contains a microprocessor terminator card **10**, remove the terminator card from the microprocessor connector.
5. Install the microprocessor:
 - a. Touch the static-protective package containing the new microprocessor to any *unpainted* metal surface on the processor housing; then, remove the microprocessor from the package.
 - b. Hold the microprocessor **4** by the open latches **3**, and center the microprocessor over the microprocessor connector **9**.

Attention: Make sure the microprocessor is oriented and aligned correctly before you try to close the latches.
 - c. Press the microprocessor into the connector and carefully close the latches **3** to seat the microprocessor in the connector.

6. Set the microprocessor core-frequency selection jumper block for the correct core frequency.

Attention: If the microprocessor bus-to-core ratio is incorrect, system-board components will overheat and component damage might occur. Be sure that the microprocessor core-frequency selection is properly set.



1 (J31)– **4** (J28) Microprocessor core-frequency-selection.

For the core/bus fraction 4.0 (400/100 MHz), jumpers are installed on pins 1 and 2 of J28, J30, and J31 and on pins 2 and 3 of J29.

For the core/bus fraction 4.5 (450/100 MHz), jumpers are installed on pins 1 and 2 of J28 and J31 and on pins 2 and 3 of J29 and J30.

For the core/bus fraction 5.0 (500/100 MHz), jumpers are installed on pins 1 and 2 of J30 and J31 and on pins 2 and 3 of J28 and J29.

7. Install the voltage regulator modules (VRMs) **12** included in the microprocessor kit:

- Determine the connectors where the VRMs are to be installed. See Table 1 on page 11. The microprocessor upgrade kit comes with two VRMs. You might need to install only one, depending on the number of microprocessors in your server.
- Center the VRM **12** over the connector **11**. Make sure that the VRM is oriented and aligned correctly; then, press the VRM into the connector.
- Repeat the preceding step for the second VRM, if needed.

Note: If you need to install only one VRM, store the remaining VRM in a safe place to use as a replacement.

8. Go to “Installing memory-module kits” on page 14.

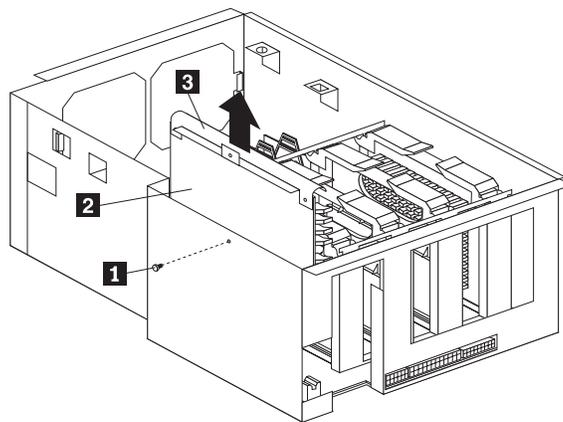
Installing memory-module kits

You install memory-module kits on the memory board included in the Processor Upgrade Kit.

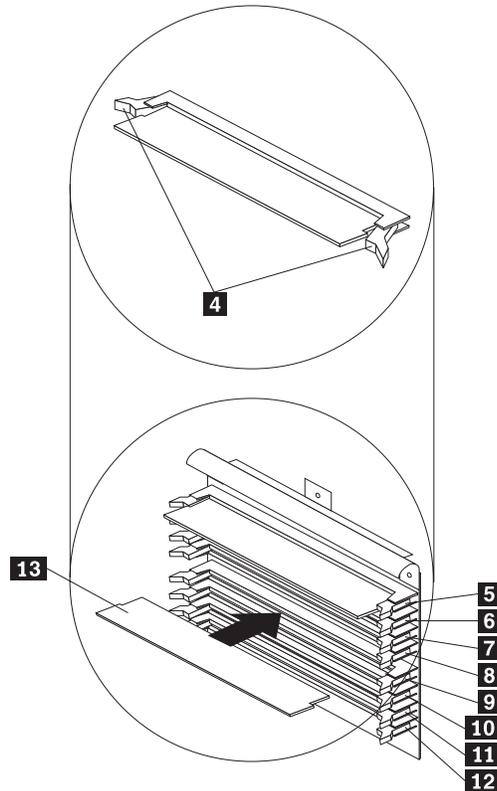
Notes:

1. Install memory modules in connectors J1, J5, J2, J6, J3, J7, J4, and J8, in that order. (See the illustration on the next page for memory connector locations.)
2. If you mix DIMM sizes, install the largest sized DIMM in connector J1, the next largest sized DIMM in connector J2, and so forth, to enhance memory-module performance.
3. Installing or removing memory modules changes the configuration information in the server. Therefore, after installing or removing a DIMM, you must save the new configuration information in the Configuration/Setup program. When you restart the server, the system displays a message indicating that the memory configuration has changed. Start the Configuration/Setup Utility program and select **Save Settings**.

Refer to the following illustrations of the processor housing and the processor board while you perform the steps in this procedure.



- 1** Thumbscrew
- 2** Memory board
- 3** Memory board handle



- 4** Retaining clips
- 5** Memory connector 1 (J1)
- 6** Memory connector 2 (J2)
- 7** Memory connector 3 (J3)
- 8** Memory connector 4 (J4)
- 9** Memory connector 5 (J5)
- 10** Memory connector 6 (J6)
- 11** Memory connector 7 (J7)
- 12** Memory connector 8 (J8)
- 13** DIMM

Complete this procedure to install memory-module kits.

1. Remove the memory board:
 - a. Remove the thumbscrew **1** from the side of the processor housing.
 - b. Lift up on the memory board handle **3** and remove the memory board **2** from the server.
 - c. Place the memory board on a static-protective surface, such as the static-protective package in which the option came.
2. Locate the memory-module connectors on the memory board. Determine the memory-module connector into which you will install the memory module.
3. Touch the static-protective package containing the memory-module kit to any unpainted metal surface on the server. Then, remove the memory module from the package.

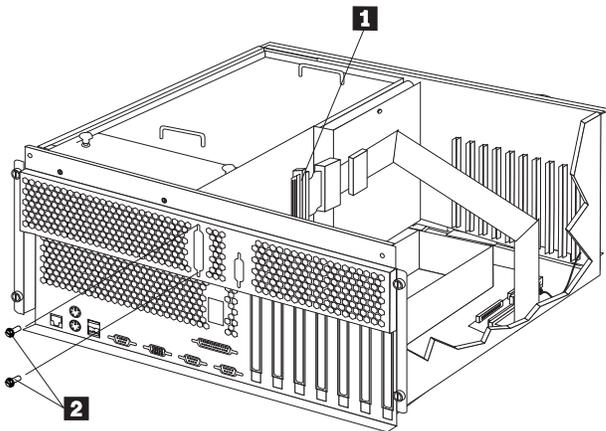
Note: To avoid breaking the retaining clips or damaging the memory-module connectors, handle the clips gently.

4. Install the memory module:
 - a. Turn the memory module (DIMM) **13** so that the pins align correctly with the connector **5**.
 - b. Insert the DIMM into the connector by pressing on one edge of the DIMM and then on the other edge of the DIMM. Be sure to press straight into the connector. The retaining clips **4** will snap into the closed positions.
 - c. Make sure the retaining clips **4** are in the closed position. If a gap exists between the DIMM and the retaining clips, the DIMM has not been properly installed. In this case, open the retaining clips and remove the DIMM; then, reinsert the DIMM.
 - d. Repeat these steps for each memory module that you install.
5. Install the memory board:
 - a. Hold the memory board by the top edge and align the memory board over the memory board connector.
 - b. Press on the top edge of the memory board, insert the memory board into the connector, and tighten the thumbscrew to secure.
6. Go to "Installing the processor housing."

Installing the processor housing

Complete this procedure to install the processor housing.

1. If slot 6 contains an adapter, move the adapter to an empty slot. If slot 5 contains a full-size adapter, move the adapter to an empty slot. (Only half-size adapters will fit in slot 5.)
2. Remove the slot 5 and 6 plastic guides opposite the bulkhead.
3. If you have installed the SCSI Controller-to-Bulkhead Cable option, remove the option and replace it with the SCSI controller-to-bulkhead cable contained in this option:
 - a. Detach the SCSI cable from the SCSI connector on the system board.



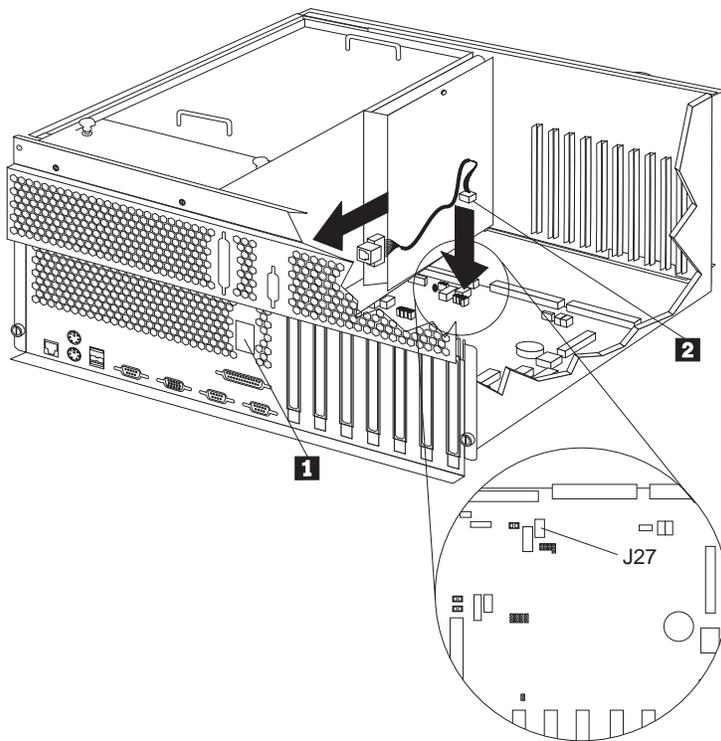
- b. Remove the screws from the external connector on the bulkhead opening.

- c. Connect one end of the SCSI cable contained in this option to the SCSI connector on the system board.
- d. Insert the SCSI cable external connector **1** into the knockout opening.
- e. Insert the two screws **2** that come with the replacement SCSI cable into the external connector; tighten the screws.

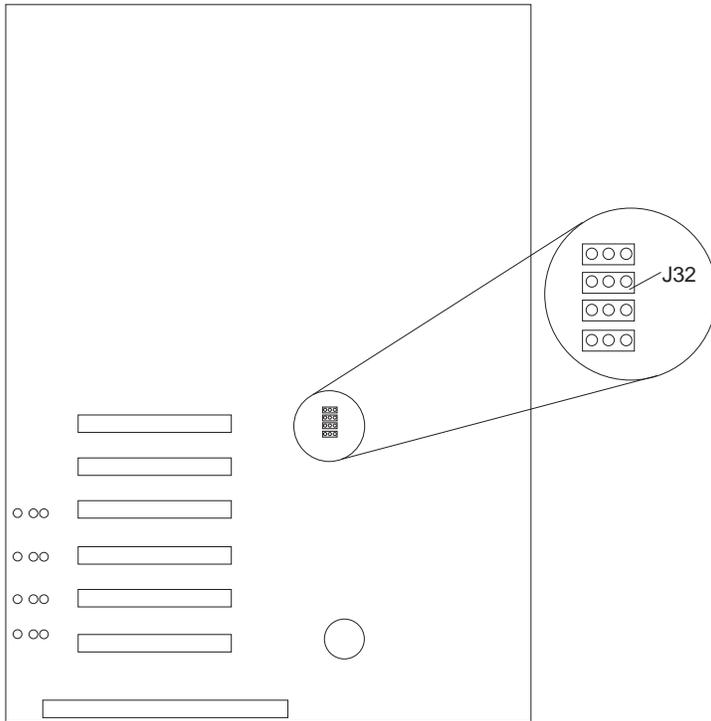
4. Optionally, install the RS-485 cable:

Note: Only models with either 01K7234 or 28L1019 as the system board assembly part number support the RS-485 cable option. The system board assembly part number is located near the battery on the system board.

- a. Connect the RS-485 cable to the RS-485 connector (J27) **2** on the system board.
- b. Insert the external connector into the knockout opening **1**.



5. Install the jumper extension cable on the Power on control jumper (J32):
 - a. Note the position of the jumper on the pin block and remove the jumper.



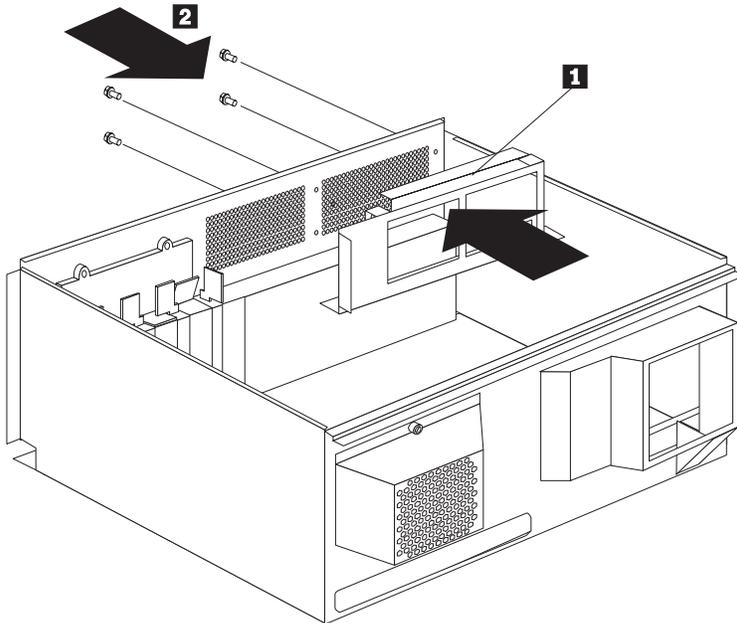
- b. Align the white cable with pin 1 and insert the connector over the pin block.
 - c. If necessary, change the position of the jumper on the jumper extension cable.

Note: The default jumper position of J32 and the jumper extension cable is a jumper on pins 1 and 2. Refer to the "Hardware Information" section of the *IBM Netfinity 5500 M20 Server Library* for a description of the jumper.

- d. Route the jumper extension cable along the system board and the shuttle side wall.

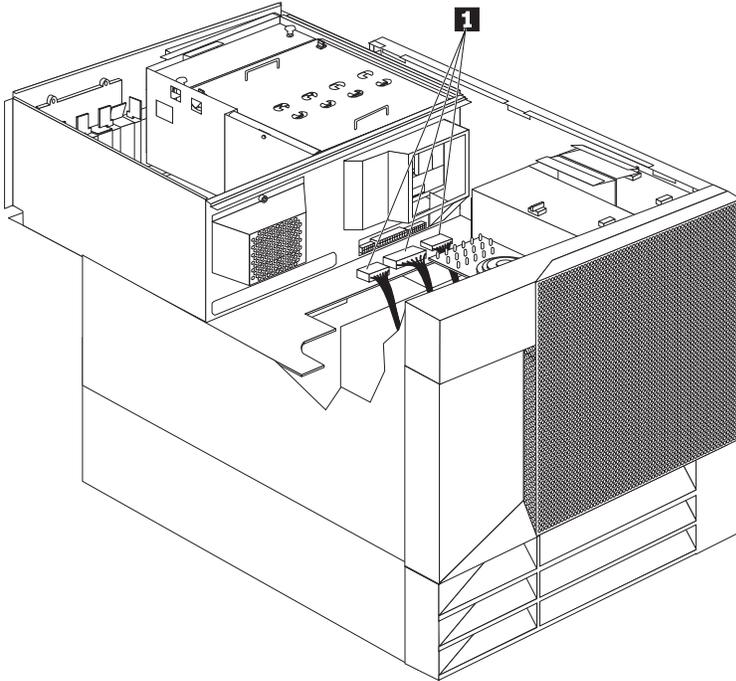
6. Replace the processor housing guide:

- a. Remove the screws that secure the processor housing guide and remove the guide.
- b. Install the processor housing guide **1** that comes with this option and secure with screws **2**.

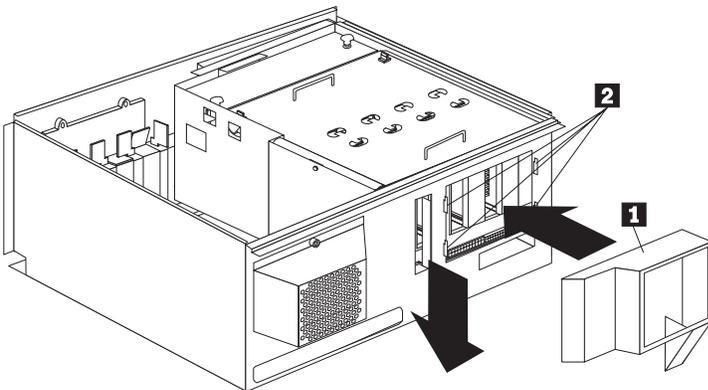


7. Replace the fan assembly and press on the fasteners to lock in place.
8. Replace the processor housing top cover and press on the fasteners to lock in place.
9. Align the shuttle with the guides and slide the shuttle partially into the server.
10. Reconnect the cables to the shuttle that you disconnected in step 15 on page 7.
11. Reconnect the power cables that you disconnected in step 3 on page 9.
12. Grasp the handles on the processor housing top cover and lift the housing.
13. Orient the processor housing with the cable connectors toward the front of the server.
Attention: When you install the processor housing in the server, be sure that it is aligned correctly before seating in the shuttle. Incorrect seating might cause damage to server components.
14. Align the processor housing with the guides. Carefully lower the processor housing into the shuttle until it is fully seated.
15. Install and tighten the four blue thumbscrews.
16. Install the half-card slot insulator between slot 5 and the processor housing.

17. Connect the power supply cables **1** to the processor housing.



18. Secure the air diffuser **1** in the server by positioning the air diffuser on the matching metal tabs **2** on the shuttle.



19. Seat the shuttle in the server and tighten the four shuttle thumbscrews.

20. Place the IBM Netfinity 5500 M20 system service label on the inside of the top cover.

21. Place one upgrade sticker near the machine type serial number on the information label. The upgrade sticker identifies the server as having this option installed.

Note: The information label is located at the front of the server behind the media-bay trim bezel.

22. Place the other upgrade sticker on the front bezel, above the machine type serial number.

23. Place the Intel microprocessor label on the front bezel.

24. Reinstall the top cover.
 - a. Check that all cables, adapters, and other components are installed and seated correctly and that you have not left loose tools or parts inside the server.
 - b. Lower the cover with the rear edge of the cover approximately 2.5 cm (1 in.) back from the rear edge of the server.
 - c. Slide the cover forward.
 - d. Tighten the two thumbscrews on the back edge of the cover.
25. Go to “Completing the upgrade installation.”

Completing the upgrade installation

Information on the following pages will guide you in completing the hardware installation and installing the necessary software for this processor upgrade.

Updating the system configuration

Complete this procedure.

1. Connect the power cord to the power supply.
2. Connect all other server and device cables and connectors.
3. Turn the server power on.
4. Watch the monitor screen. The system automatically accesses the Configuration/Setup program.
5. Select **Save Settings** and exit the Configuration/Setup program.
6. Insert the *HardwareGuide CD* that comes with the *IBM Netfinity 5500 M20 Server Library* contained in this option package, into the CD-ROM drive. If necessary, refer to the *Server Library* for information on using the *HardwareGuide CD*.
7. Restart the server.
8. Go to “Updating the system diagnostic programs” on page 22.

Updating the system diagnostic programs

Complete this procedure to update the system diagnostic programs.

1. Insert the *IBM Netfinity 5500 M20 Diagnostic Update Diskette 1 of 2* into the diskette drive.
2. Press Ctrl+Alt+Del to restart your server. The system begins the power-on self-test (POST).

Information similar to the following will appear on the screen.

```
Flash Utility
Select one:
1. Update Diagnostics
3. Exit

Enter      F1=Help    F3=Exit
```

3. Select: **1. Update Diagnostics** and press Enter.
4. Select a language (0–7) from the list shown on the next screen and press Enter to accept your choice.
A message in your selected language similar to the following appears.

```
Reading the flash image $0021000.us1
```

After this message appears, you will be prompted to insert the *IBM Netfinity 5500 M20 Diagnostic Update Diskette 2 of 2* into the diskette drive.

5. Insert the diskette into the diskette drive and press Enter.
6. Press Enter to confirm that you want to update the system diagnostic programs.
A message similar to the following appears.

```
Reading the flash image $0021000.us2
```

After this message, another message similar to the following appears.

The system diagnostic is being updated and it might take up to 5 minutes to complete. Do not power off or restart the system during this procedure.

7. When the update is complete, a message similar to the following appears.

Diagnostic Update Completed.
Remove the diskette from the drive and press Enter to restart the system.

8. Go to “Updating the advanced system-management processor code.”

Updating the advanced system-management processor code

Complete this procedure to update your advanced system management processor code.

1. Insert the *IBM Netfinity 5500 M20 Advanced System Management Processor Firmware Update Diskette* into the diskette drive.
2. Press Ctrl+Alt+Del to restart your server. The system begins the power-on self-test (POST). Information similar to the following will appear on the screen.

Flash Utility
Select one:
1. Update Advanced System Management Processor
2. Update Watchdog Timer
3. Exit
Enter F1=Help F3=Exit

3. Select **1. Update Advanced System Management Processor** and press Enter.

A warning message appears on the screen with information similar to the following.

```
Warning

This procedure will update the Advanced
System Management Processor code. The
system must not lose power during this
operation.

Press Enter to continue with the update
or press Esc to cancel it.

Enter      Esc=Cancel
```

4. Press Enter when you are ready to continue. Several screens are displayed as the system upgrades the microcode.

After a successful upgrade, a message similar to the following appears.

```
Information

The Advanced System Management Processor
update was successful.

Press Enter to return to the main menu.

Enter
```

5. Press Enter when this screen appears. The main menu appears.

6. Press Enter or F3 to exit from the utility program. A message similar to the following appears.

```
Information

Remove the diskette from the default
drive and reboot the system.
```

7. Remove the diskette from the diskette drive.
8. Verify that the advanced system management processor code matches the level on the update diskette.
 - a. Turn off the server; then, restart the server.
 - b. When the IBM logo appears, press F1 to use the Configuration/Setup program.
 - c. Select **System Information** and **Product Data** to check the code level.
 - d. Press Esc and select **Exit Setup** to exit from the Configuration/Setup program.
 - e. Turn off the server.

This upgrade installation is complete.

Troubleshooting

Complete the following procedure, if you must troubleshoot the upgrade.

1. Remove all media (diskettes, CDs, optical discs, or tapes) from the drives.
2. Turn off the server and any attached devices.
3. If you are in the United Kingdom and have a modem or fax machine attached to your server, you must disconnect the telephone line from the server *before* unplugging any power cords (also known as power cables). When reassembling your server, you must reconnect the telephone line *after* you plug in the power cords.
4. Disconnect all power cords (cables) from electrical outlets.
5. Disconnect all power cords from the server.
6. Disconnect all communication cables from external receptacles.
7. Note the location of the remaining cables and cords; then, disconnect them from the server.
8. Reinstall the original processor housing.
9. Change the position of the J30 Flash ROM page swap jumper on the system board. The default position is a jumper installed on pins 2 and 3. Move the jumper to pins 1 and 2 to change which of the two pages of Flash ROM is used when the system is started. The system will start from the original POST/BIOS, if you selected to save the original POST/BIOS during the flash update procedure in step 4 on page 4.
10. Connect the power cord to the power supply.
11. Connect all other server and device cables and connectors.
12. Turn the server power on. If the system starts properly, you have isolated the problem to the components in the processor assembly included in this Processor Upgrade Kit.

Appendix A. Help and service information

During the warranty period, you can get toll-free technical support 24 hours a day, 7 days a week¹ to answer questions about your upgrade kit (toll-free technical support is available in the United States, Puerto Rico, and Canada only). If you need warranty service, return or exchange is available. In addition, you might be entitled to service at your location. Your technical support representative can help you determine the best alternative.

Before calling, please prepare for your call by following these steps.

Step 1: Troubleshooting

1. Remove and reattach all cables.
2. Inspect the upgrade kit components for any damage.
3. Retrace all steps in the upgrade kit instructions.

Step 2: Preparing for the service call

To assist the technical support representative, have the following information available:

1. Option name and description
2. Proof of purchase
3. Server model, serial number, and the documentation that comes with your server.
4. Exact wording of the error message (if any)
5. Description of the problem
6. Hardware and software configuration information for your system

If possible, be at your server. Your technical support representative might want to walk you through the problem during the call.

Step 3: Placing the service call to IBM

Use one of the following numbers:

- In the United States and Puerto Rico, call 1-800-772-2227.
- In Canada, call 1-800-565-3344.
- In all other countries, contact your IBM reseller, IBM marketing representative, or your place of purchase.

¹ Response time will vary depending on the number and nature of calls received.

Appendix B. Product warranties and notices

The following sections contain the warranty, notice, and trademark information.

Warranty Statements

The warranty statements consist of two parts: Part 1 and Part 2. Part 1 varies by country. Part 2 is the same for both statements. Be sure to read both the Part 1 that applies to your country and Part 2.

- **United States, Puerto Rico, and Canada (Z125-4753-05 11/97)**
(Part 1 - General Terms on page 27)
- **Worldwide except Canada, Puerto Rico, Turkey, and United States (Z125-5697-01 11/97)**
(Part 1 - General Terms on page 29)
- **Worldwide Country-Unique Terms**
(Part 2 - Country-Unique Terms on page 31)

IBM Statement of Limited Warranty for United States, Puerto Rico, and Canada (Part 1 - General Terms)

This Statement of Limited Warranty includes Part 1 - General Terms and Part 2 - Country-unique Terms. The terms of Part 2 may replace or modify those of Part 1. The warranties provided by IBM in this Statement of Limited Warranty apply only to Machines you purchase for your use, and not for resale, from IBM or your reseller. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them. The term "Machine" does not include any software programs, whether pre-loaded with the Machine, installed subsequently or otherwise. Unless IBM specifies otherwise, the following warranties apply only in the country where you acquire the Machine. Nothing in this Statement of Warranty affects any statutory rights of consumers that cannot be waived or limited by contract. If you have any questions, contact IBM or your reseller.

Machine - Netfinity Four-Way Processor Upgrade Kit

Warranty Period* - Three Years

**Contact your place of purchase for warranty service information. Some IBM Machines are eligible for On-site warranty service depending on the country where service is performed.*

The IBM Warranty for Machines

IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications. The warranty period for a Machine is a specified, fixed period commencing on its Date of Installation. The date on your sales receipt is the Date of Installation, unless IBM or your reseller informs you otherwise.

During the warranty period IBM or your reseller, if approved by IBM to provide warranty service, will provide repair and exchange service for the Machine, without charge, under the type of service designated for the Machine and will manage and install engineering changes that apply to the Machine.

If a Machine does not function as warranted during the warranty period, and IBM or your reseller are unable to either 1) make it do so or 2) replace it with one that is at least functionally equivalent, you may return it to your place of purchase and your money will be refunded. The replacement may not be new, but will be in good working order.

Extent of Warranty

The warranty does not cover the repair or exchange of a Machine resulting from misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by you, or failure caused by a product for which IBM is not responsible. The warranty is voided by removal or alteration of Machine or parts identification labels.

THESE WARRANTIES ARE YOUR EXCLUSIVE WARRANTIES AND REPLACE ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THESE WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM

JURISDICTION TO JURISDICTION. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF EXPRESS OR IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION OR LIMITATION MAY NOT APPLY TO YOU. IN THAT EVENT, SUCH WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD.

Items Not Covered by Warranty

IBM does not warrant uninterrupted or error-free operation of a Machine.

Unless specified otherwise, IBM provides non-IBM machines **WITHOUT WARRANTIES OF ANY KIND.**

Any technical or other support provided for a Machine under warranty, such as assistance via telephone with "how-to" questions and those regarding Machine set-up and installation, will be provided **WITHOUT WARRANTIES OF ANY KIND.**

Warranty Service

To obtain warranty service for the Machine, contact your reseller or IBM. In the United States, call IBM at 1-800-772-2227. In Canada, call IBM at 1-800-565-3344. You may be required to present proof of purchase.

IBM or your reseller provides certain types of repair and exchange service, either at your location or at a service center, to keep Machines in, or restore them to, conformance with their Specifications. IBM or your reseller will inform you of the available types of service for a Machine based on its country of installation. IBM may repair the failing Machine or exchange it at its discretion.

When warranty service involves the exchange of a Machine or part, the item IBM or your reseller replaces becomes its property and the replacement becomes yours. You represent that all removed items are genuine and unaltered. The replacement may not be new, but will be in good working order and at least functionally equivalent to the item replaced. The replacement assumes the warranty service status of the replaced item.

Any feature, conversion, or upgrade IBM or your reseller services must be installed on a Machine which is 1) for certain Machines, the designated, serial-numbered Machine and 2) at an engineering-change level compatible with the feature, conversion, or upgrade. Many features, conversions, or upgrades involve the removal of parts and their return to IBM. A part that replaces a removed part will assume the warranty service status of the removed part.

Before IBM or your reseller exchanges a Machine or part, you agree to remove all features, parts, options, alterations, and attachments not under warranty service.

You also agree to

1. ensure that the Machine is free of any legal obligations or restrictions that prevent its exchange;
2. obtain authorization from the owner to have IBM or your reseller service a Machine that you do not own; and
3. where applicable, before service is provided
 - a. follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provides,
 - b. secure all programs, data, and funds contained in a Machine,
 - c. provide IBM or your reseller with sufficient, free, and safe access to your facilities to permit them to fulfill their obligations, and
 - d. inform IBM or your reseller of changes in a Machine's location.

IBM is responsible for loss of, or damage to, your Machine while it is 1) in IBM's possession or 2) in transit in those cases where IBM is responsible for the transportation charges.

Neither IBM nor your reseller is responsible for any of your confidential, proprietary or personal information contained in a Machine which you return to IBM or your reseller for any reason. You should remove all such information from the Machine prior to its return.

Production Status

Each IBM Machine is manufactured from new parts, or new and used parts. In some cases, the Machine may not be new and may have been previously installed. Regardless of the Machine's production status, IBM's appropriate warranty terms apply.

Limitation of Liability

Circumstances may arise where, because of a default on IBM's part or other liability, you are entitled to recover damages from IBM. In each such instance, regardless of the basis on which you are entitled to claim damages from IBM (including fundamental breach, negligence, misrepresentation, or other contract or tort claim), IBM is liable for no more than

1. damages for bodily injury (including death) and damage to real property and tangible personal property; and
2. the amount of any other actual direct damages, up to the greater of U.S. \$100,000 (or equivalent in local currency) or the charges (if recurring, 12 months' charges apply) for the Machine that is the subject of the claim.

This limit also applies to IBM's suppliers and your reseller. It is the maximum for which IBM, its suppliers, and your reseller are collectively responsible.

UNDER NO CIRCUMSTANCES IS IBM LIABLE FOR ANY OF THE FOLLOWING: 1) THIRD-PARTY CLAIMS AGAINST YOU FOR DAMAGES (OTHER THAN THOSE UNDER THE FIRST ITEM LISTED ABOVE); 2) LOSS OF, OR DAMAGE TO, YOUR RECORDS OR DATA; OR 3) SPECIAL, INCIDENTAL, OR INDIRECT DAMAGES OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFITS OR SAVINGS), EVEN IF IBM, ITS SUPPLIERS OR YOUR RESELLER IS INFORMED OF THEIR POSSIBILITY. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

IBM Statement of Warranty Worldwide except Canada, Puerto Rico, Turkey, United States (Part 1 - General Terms)

This Statement of Warranty includes Part 1 - General Terms and Part 2 - Country-unique Terms. The terms of Part 2 may replace or modify those of Part 1. The warranties provided by IBM in this Statement of Warranty apply only to Machines you purchase for your use, and not for resale, from IBM or your reseller. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them. The term "Machine" does not include any software programs, whether pre-loaded with the Machine, installed subsequently or otherwise. Unless IBM specifies otherwise, the following warranties apply only in the country where you acquire the Machine. Nothing in this Statement of Warranty affects any statutory rights of consumers that cannot be waived or limited by contract. If you have any questions, contact IBM or your reseller.

Machine - Netfinity Four-Way Processor Upgrade Kit

Warranty Period* - Three Years

**Contact your place of purchase for warranty service information. Some IBM Machines are eligible for On-site warranty service depending on the country where service is performed.*

The IBM Warranty for Machines

IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications. The warranty period for a Machine is a specified, fixed period commencing on its Date of Installation. The date on your sales receipt is the Date of Installation, unless IBM or your reseller informs you otherwise.

During the warranty period IBM or your reseller, if approved by IBM to provide warranty service, will provide repair and exchange service for the Machine, without charge, under the type of service designated for the Machine and will manage and install engineering changes that apply to the Machine.

If a Machine does not function as warranted during the warranty period, and IBM or your reseller are unable to either 1) make it do so or 2) replace it with one that is at least functionally equivalent, you may return it to your place of purchase and your money will be refunded. The replacement may not be new, but will be in good working order.

Extent of Warranty

The warranty does not cover the repair or exchange of a Machine resulting from misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by you, or failure caused by a product for which IBM is not responsible. The warranty is voided by removal or alteration of Machine or parts identification labels.

THESE WARRANTIES ARE YOUR EXCLUSIVE WARRANTIES AND REPLACE ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THESE WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM JURISDICTION TO JURISDICTION. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF EXPRESS OR IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION OR LIMITATION MAY NOT APPLY TO YOU. IN THAT EVENT, SUCH WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD.

Items Not Covered by Warranty

IBM does not warrant uninterrupted or error-free operation of a Machine.

Unless specified otherwise, IBM provides non-IBM machines **WITHOUT WARRANTIES OF ANY KIND.**

Any technical or other support provided for a Machine under warranty, such as assistance via telephone with "how-to" questions and those regarding Machine set-up and installation, will be provided **WITHOUT WARRANTIES OF ANY KIND.**

Warranty Service

To obtain warranty service for the Machine, contact your reseller or IBM. You may be required to present proof of purchase.

IBM or your reseller provides certain types of repair and exchange service, either at your location or at a service center, to keep Machines in, or restore them to, conformance with their Specifications. IBM or your reseller will inform you of the available types of service for a Machine based on its country of installation. IBM may repair the failing Machine or exchange it at its discretion.

When warranty service involves the exchange of a Machine or part, the item IBM or your reseller replaces becomes its property and the replacement becomes yours. You represent that all removed items are genuine and unaltered. The replacement may not be new, but will be in good working order and at least functionally equivalent to the item replaced. The replacement assumes the warranty service status of the replaced item.

Any feature, conversion, or upgrade IBM or your reseller services must be installed on a Machine which is 1) for certain Machines, the designated, serial-numbered Machine and 2) at an engineering-change level compatible with the feature, conversion, or upgrade. Many features, conversions, or upgrades involve the removal of parts and their return to IBM. A part that replaces a removed part will assume the warranty service status of the removed part.

Before IBM or your reseller exchanges a Machine or part, you agree to remove all features, parts, options, alterations, and attachments not under warranty service.

You also agree to

1. ensure that the Machine is free of any legal obligations or restrictions that prevent its exchange;
2. obtain authorization from the owner to have IBM or your reseller service a Machine that you do not own; and
3. where applicable, before service is provided
 - a. follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provides,
 - b. secure all programs, data, and funds contained in a Machine,
 - c. provide IBM or your reseller with sufficient, free, and safe access to your facilities to permit them to fulfil their obligations, and
 - d. inform IBM or your reseller of changes in a Machine's location.

IBM is responsible for loss of, or damage to, your Machine while it is 1) in IBM's possession or 2) in transit in those cases where IBM is responsible for the transportation charges.

Neither IBM nor your reseller is responsible for any of your confidential, proprietary or personal information contained in a Machine which you return to IBM or your reseller for any reason. You should remove all such information from the Machine prior to its return.

Production Status

Each IBM Machine is manufactured from new parts, or new and used parts. In some cases, the Machine may not be new and may have been previously installed. Regardless of the Machine's production status, IBM's appropriate warranty terms apply.

Limitation of Liability

Circumstances may arise where, because of a default on IBM's part or other liability, you are entitled to recover damages from IBM. In each such instance, regardless of the basis on which you are entitled to claim damages from IBM (including fundamental breach, negligence, misrepresentation, or other contract or tort claim), IBM is liable for no more than

1. damages for bodily injury (including death) and damage to real property and tangible personal property; and
2. the amount of any other actual direct damages, up to the greater of U.S. \$100,000 (or equivalent in local currency) or the charges (if recurring, 12 months' charges apply) for the Machine that is the subject of the claim.

This limit also applies to IBM's suppliers and your reseller. It is the maximum for which IBM, its suppliers, and your reseller are collectively responsible.

UNDER NO CIRCUMSTANCES IS IBM LIABLE FOR ANY OF THE FOLLOWING: 1) THIRD-PARTY CLAIMS AGAINST YOU FOR DAMAGES (OTHER THAN THOSE UNDER THE FIRST ITEM LISTED ABOVE); 2) LOSS OF, OR DAMAGE TO, YOUR RECORDS OR DATA; OR 3) SPECIAL, INCIDENTAL, OR INDIRECT DAMAGES OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFITS OR SAVINGS), EVEN IF IBM, ITS SUPPLIERS OR YOUR RESELLER IS INFORMED OF THEIR POSSIBILITY. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

Part 2 - Worldwide Country-Unique Terms

ASIA PACIFIC

AUSTRALIA: The IBM Warranty for Machines: The following paragraph is added to this Section:

The warranties specified in this Section are in addition to any rights you may have under the Trade Practices Act 1974 or other legislation and are only limited to the extent permitted by the applicable legislation.

Extent of Warranty: The following replaces the first and second sentences of this Section:

The warranty does not cover the repair or exchange of a Machine resulting from misuse, accident, modification, unsuitable physical or operating environment, operation in other than the Specified Operating Environment, improper maintenance by you, or failure caused by a product for which IBM is not responsible.

Limitation of Liability: The following is added to this Section:

Where IBM is in breach of a condition or warranty implied by the Trade Practices Act 1974, IBM's liability is limited to the repair or replacement of the goods or the supply of equivalent goods. Where that condition or warranty relates to right to sell, quiet possession or clear title, or the goods are of a kind ordinarily acquired for personal, domestic or household use or consumption, then none of the limitations in this paragraph apply.

PEOPLE'S REPUBLIC OF CHINA: Governing Law: The following is added to this Statement:

The laws of the State of New York govern this Statement.

INDIA: Limitation of Liability: The following replaces items 1 and 2 of this Section:

1. liability for bodily injury (including death) or damage to real property and tangible personal property will be limited to that caused by IBM's negligence;
2. as to any other actual damage arising in any situation involving nonperformance by IBM pursuant to, or in any way related to the subject of this Statement of Warranty, IBM's liability will be limited to the charge paid by you for the individual Machine that is the subject of the claim.

NEW ZEALAND: The IBM Warranty for Machines: The following paragraph is added to this Section:

The warranties specified in this Section are in addition to any rights you may have under the Consumer Guarantees Act 1993 or other legislation which cannot be excluded or limited. The Consumer Guarantees Act 1993 will not apply in respect of any goods which IBM provides, if you require the goods for the purposes of a business as defined in that Act.

Limitation of Liability: The following is added to this Section:

Where Machines are not acquired for the purposes of a business as defined in the Consumer Guarantees Act 1993, the limitations in this Section are subject to the limitations in that Act.

EUROPE, MIDDLE EAST, AFRICA (EMEA)

The following terms apply to all EMEA countries.

The terms of this Statement of Warranty apply to Machines purchased from an IBM reseller. If you purchased this Machine from IBM, the terms and conditions of the applicable IBM agreement prevail over this warranty statement.

Warranty Service

If you purchased an IBM Machine in Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland or United Kingdom, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM.

If you purchased an IBM Personal Computer Machine in Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, Hungary, Kazakhstan, Kirghizia, Federal Republic of Yugoslavia, Former Yugoslav Republic of Macedonia (FYROM), Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, or Ukraine, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM.

The applicable laws, Country-unique terms and competent court for this Statement are those of the country in which the warranty service is being provided. However, the laws of Austria govern this Statement if the warranty service is provided in Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Federal Republic of Yugoslavia, Georgia, Hungary, Kazakhstan, Kirghizia, Former Yugoslav Republic of Macedonia (FYROM), Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, and Ukraine.

The following terms apply to the country specified:

EGYPT: Limitation of Liability: The following replaces item 2 in this Section:

2. as to any other actual direct damages, IBM's liability will be limited to the total amount you paid for the Machine that is the subject of the claim.

Applicability of suppliers and resellers (unchanged).

FRANCE: Limitation of Liability: The following replaces the second sentence of the first paragraph of this Section:
In such instances, regardless of the basis on which you are entitled to claim damages from IBM, IBM is liable for no more than: (items 1 and 2 unchanged).

GERMANY: The IBM Warranty for Machines: The following replaces the first sentence of the first paragraph of this Section:
The warranty for an IBM Machine covers the functionality of the Machine for its normal use and the Machine's conformity to its Specifications.

The following paragraphs are added to this Section:
The minimum warranty period for Machines is six months.

In case IBM or your reseller are unable to repair an IBM Machine, you can alternatively ask for a partial refund as far as justified by the reduced value of the unrepaired Machine or ask for a cancellation of the respective agreement for such Machine and get your money refunded.

Extent of Warranty: The second paragraph does not apply.

Warranty Service: The following is added to this Section:
During the warranty period, transportation for delivery of the failing Machine to IBM will be at IBM's expense.

Production Status: The following paragraph replaces this Section:
Each Machine is newly manufactured. It may incorporate in addition to new parts, re-used parts as well.

Limitation of Liability: The following is added to this Section:
The limitations and exclusions specified in the Statement of Warranty will not apply to damages caused by IBM with fraud or gross negligence and for express warranty.

In item 2, replace "U.S. \$100,000" with "1.000.000 DEM."

The following sentence is added to the end of the first paragraph of item 2:
IBM's liability under this item is limited to the violation of essential contractual terms in cases of ordinary negligence.

IRELAND: Extent of Warranty: The following is added to this Section:
Except as expressly provided in these terms and conditions, all statutory conditions, including all warranties implied, but without prejudice to the generality of the foregoing all warranties implied by the Sale of Goods Act 1893 or the Sale of Goods and Supply of Services Act 1980 are hereby excluded.

Limitation of Liability: The following replaces items one and two of the first paragraph of this Section:
1. death or personal injury or physical damage to your real property solely caused by IBM's negligence; and 2. the amount of any other actual direct damages, up to the greater of Irish Pounds 75,000 or 125 percent of the charges (if recurring, the 12 months' charges apply) for the Machine that is the subject of the claim or which otherwise gives rise to the claim.

Applicability of suppliers and resellers (unchanged).

The following paragraph is added at the end of this Section:
IBM's entire liability and your sole remedy, whether in contract or in tort, in respect of any default shall be limited to damages.

ITALY: Limitation of Liability: The following replaces the second sentence in the first paragraph:
In each such instance unless otherwise provided by mandatory law, IBM is liable for no more than: (item 1 unchanged) 2) as to any other actual damage arising in all situations involving non-performance by IBM pursuant to, or in any way related to the subject matter of this Statement of Warranty, IBM's liability, will be limited to the total amount you paid for the Machine that is the subject of the claim.

Applicability of suppliers and resellers (unchanged).

The following replaces the second paragraph of this Section:
Unless otherwise provided by mandatory law, IBM and your reseller are not liable for any of the following: (items 1 and 2 unchanged) 3) indirect damages, even if IBM or your reseller is informed of their possibility.

SOUTH AFRICA, NAMIBIA, BOTSWANA, LESOTHO AND SWAZILAND: Limitation of Liability: The following is added to this Section:
IBM's entire liability to you for actual damages arising in all situations involving nonperformance by IBM in respect of the subject matter of this Statement of Warranty will be limited to the charge paid by you for the individual Machine that is the subject of your claim from IBM.

TURKIYE: Production Status: The following replaces this Section:

IBM fulfils customer orders for IBM Machines as newly manufactured in accordance with IBM's production standards.

UNITED KINGDOM: Limitation of Liability: The following replaces items 1 and 2 of the first paragraph of this Section:

1. death or personal injury or physical damage to your real property solely caused by IBM's negligence;
2. the amount of any other actual direct damages or loss, up to the greater of Pounds Sterling 150,000 or 125 percent of the charges (if recurring, the 12 months' charges apply) for the Machine that is the subject of the claim or which otherwise gives rise to the claim.

The following item is added to this paragraph:

3. breach of IBM's obligations implied by Section 12 of the Sale of Goods Act 1979 or Section 2 of the Supply of Goods and Services Act 1982.

Applicability of suppliers and resellers (unchanged).

The following is added to the end of this Section:

IBM's entire liability and your sole remedy, whether in contract or in tort, in respect of any default will be limited to damages.

NORTH AMERICA

CANADA: Warranty Service: The following is added to this Section:

To obtain warranty service from IBM, call **1-800-465-6666**.

UNITED STATES OF AMERICA: Warranty Service: The following is added to this Section:

To obtain warranty service from IBM, call **1-800-IBM-SERV**.

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Part Number: 01K7672

Printed in U.S.A.

01K7672

