



IBM 7581 Computer (Passive Backplane) Setup Information



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Important:

Before using this information and the product it supports, read the general information in Appendix B, "Product Warranties and Notices" on page 31.

Be sure to read the information in "Safety Information" on page 46, and if you are going to handle electronic components, you also must read "Handling Electrostatic-Discharge-Sensitive Devices" on page 51.

First Edition (November 1999)

This edition applies to the 7581 Computer (Passive Backplane).

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About This Book and the IBM Embedded Systems CD

This book contains user setup information for a 7581 Computer that has a passive backplane.

The following terms are used throughout this book:

- 7581 Computer is shortened to **computer**.
- 586VE Single Board Computer is shortened to **SBC**.

IBM Embedded Systems CD

The IBM Embedded Systems CD contains the following directories.

MANUALS

The *IBM 7581 Computer (Passive Backplane) Installation, Operation, Hardware Maintenance* manual is available as a Portable Document Format (PDF) file, which can be printed or viewed online.

Note: The manual is also available as follows:

- PDF format under *Support Information* on the Web at:
<http://www.clearlake.ibm.com/mfg/bocaratton/Services/IC/>
- Hardcopy by ordering feature 11N9566.

SBC586VE

sisvga (video device driver)

sisenet (Ethernet device driver)

diags (diskette image to build a backup diagnostic diskette)

ATX_PIII

(Not applicable for the 7581 Computer with passive backplane)

Chapter 1. Overview of the 7581 Computer

The IBM 7581 Computer has been designed for use over a long life in an environment of constantly advancing technology. It is engineered for flexibility, growth, and upgradability. Its chassis and covers are designed to be used with many different industrial configurations. Some of the highlights are:

- It accommodates several different microprocessors.
- It can house a variety of standard-width drives (one diskette drive and four IDE drives).
- It has features for data security and power management.
- It can be set up as a desktop, floor-standing, or rack-mounted
- It uses a passive backplane with 11 expansion slots for adapters. Two other slots are used for I/O connectors and the SBC.

The passive backplane configuration has:

- One slot for the SBC
- Three full-length ISA slots
- Five PCI slots (one full-length)
- Three full-length shared slots; each slot can support either an ISA or PCI adapter

Note: An additional half-length ISA slot can be configured. However, this slot is used for the USB connectors and to make room for memory in bank 1. Using this slot prevents memory from being installed in bank 1 and limits you to one USB connector, which must be relocated to the alternative location (see Figure 3 on page 3).

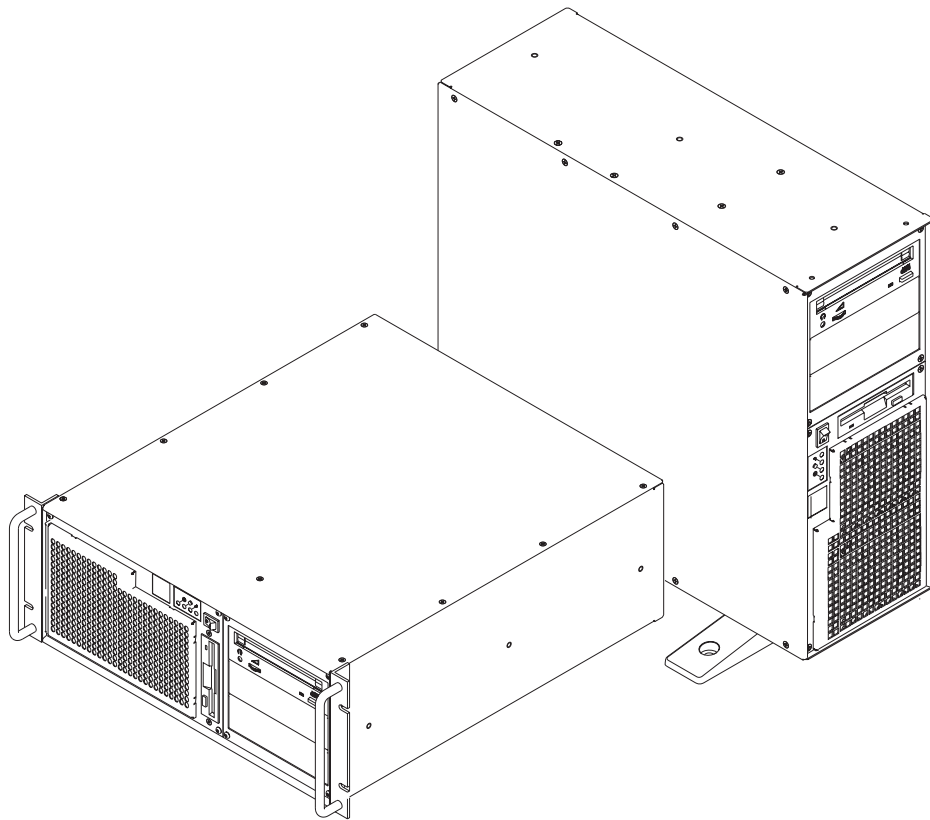


Figure 1. IBM 7581 Computer

General Layout of Components

Figure 2 and Figure 3 on page 3 show the locations of the major components in the system unit. The actual options and adapters for a specific configuration might be different from the ones listed; however, the general layout is the same for all configurations.

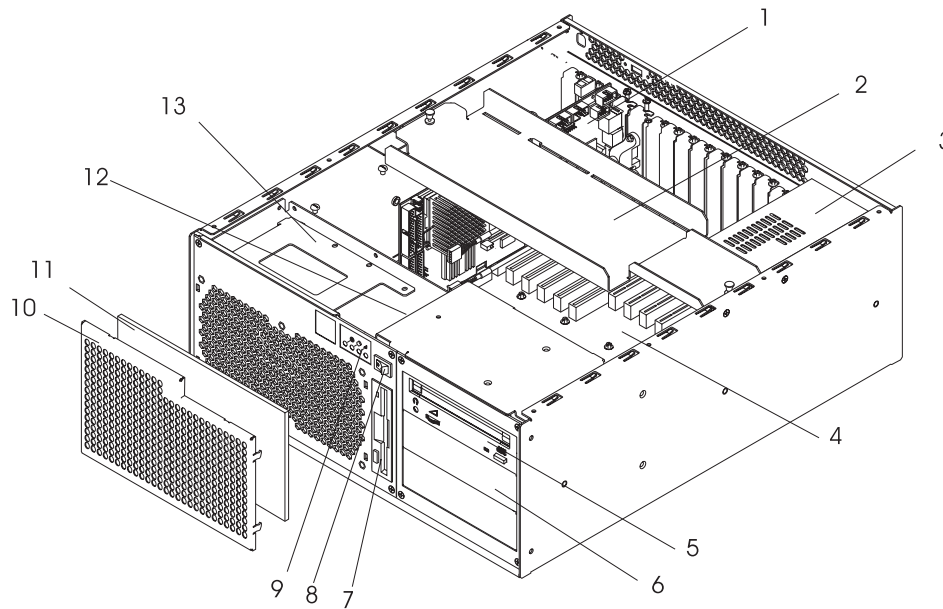


Figure 2. General Component Layout 1

- 1 SBC
- 2 Card hold-down bracket
- 3 Power supply
- 4 Backplane
- 5 CD-ROM drive
- 6 Drive cage
- 7 1.44 MB diskette drive
- 8 On/Off switch
- 9 Status light-emitting diodes (LEDs)
- 10 Filter grill
- 11 Filter
- 12 Fan-fail indicators (optional)
- 13 Alternative drive bay

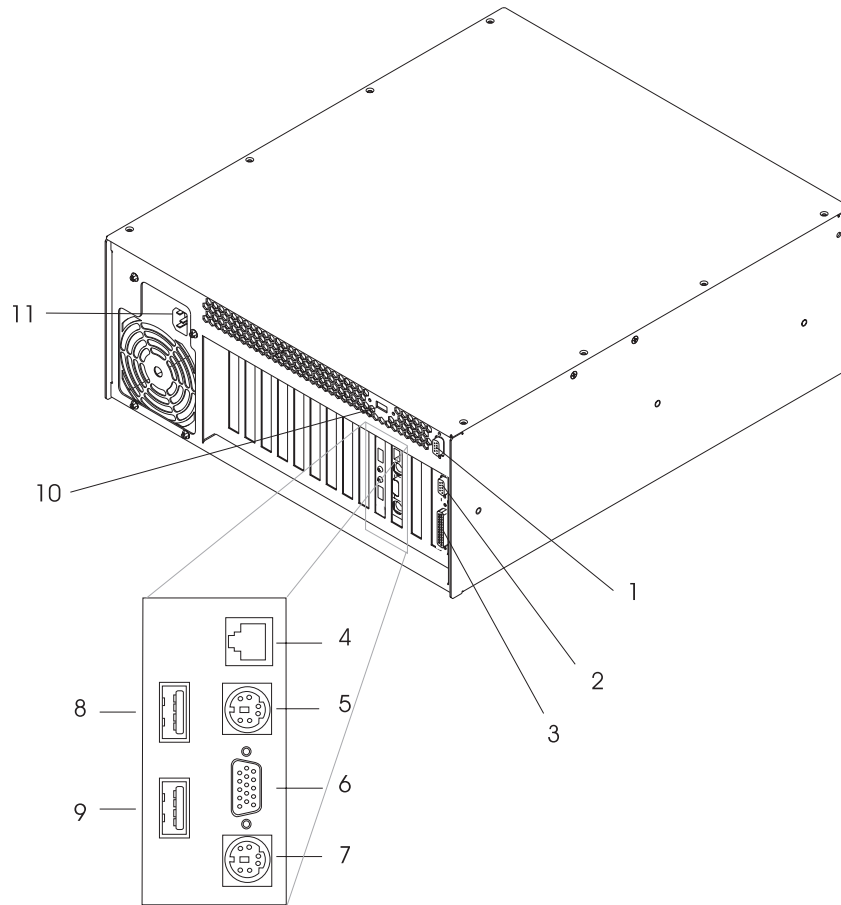


Figure 3. General Component Layout 2

- 1** Serial port B connector
- 2** Serial port A connector
- 3** Parallel port connector
- 4** 10 BaseT/100 BaseTx Ethernet port
- 5** Keyboard connector
- 6** Video connector
- 7** Mouse connector
- 8** USB port 2 connector
- 9** USB port 1 connector
- 10** Alternative USB connector
- 11** Power input connector

Specifications

The physical specifications are as follows. For more exact system-unit dimensions, see the *IBM 7581 Computer (Passive Backplane) Installation, Operation, Hardware Maintenance* manual.

- Width: 432 millimeters (17.0 inches)
- Depth: 498 millimeters (19.6 inches)
- Height: 177 millimeters (7.0 inches)
- Weight: 20.0 kilograms (44.0 pounds)
(the actual weight depends on the installed options)

Power Supply

- 330 Watts Output—ac input only; the voltage range is selected automatically. Acceptable inputs are:
 - 100 to 127 (nominal) V ac; 50/60 Hz; 8.0 Amps (maximum)
 - 200 to 240 (nominal) V ac; 50/60 Hz; 4.0 Amps (maximum)

The following is the maximum total loading allowed for all adapters and hard disk drives installed in the system unit.

Note: The limits are based on the assumption that one hard drive and one CD-ROM drive are installed.

+3.3 V dc	20.0 Amps	<i>See Note below.</i>
+5 V dc	20.0 Amps	<i>See Note below.</i>
+5 V (aux)	0.50 Amps	
+12 V dc	5.75 Amps	
–5 V dc	0.40 Amps	
–12 V dc	0.50 Amps	

Note: Maximum total power for 3.3 V dc and 5.0 V dc combined is 117 Watts.

Heat Output

The estimated heat output for the system unit with a 330-Watt power supply is 500 Watts (1700 BTU/hour).

Environment

- Ambient temperature:
 - Operating: 0° to 50°C (32° to 122°F)
 - Non-Operating: 0° to 60°C (32° to 140°F)
 - Shipping: –40° to 60°C (–40° to 140°F)
- Relative humidity while operating: 5% to 95%

Agency and Standards Compliance

- Equipment Approvals and Certifications:
 - UL 1950, 3rd Edition (CSA Certified)
 - CSA22.2 No. 950-M95 (CSA Certified)
 - VDE or TUV (EN 60950/IEC 950; 2nd Edition)
 - FCC Class A
 - VCCI Class A
 - CISPR 22 Class A (EN 55022)
 - CE Mark Class A (EN 55022)
 - AS/NZS 3548 Class A
 - Korean MIC Notice No. 1996-78
- European Standards Compliance:
 - Safety (IEC 950, EN 60950)
 - Shock while operating (IEC 68-2-27):
 - 30 G, 1/2 sine wave for 3 milliseconds duration
 - Vibration (IEC 68-2-6):
 - 5 to 500 Hz random at 0.27 G RMS
 - Electromagnetic compatibility:

Conducted immunity	ENV 50141, Level 3	
Radiated electromagnetic susceptibility	ENV 50140, Level 3	10 V/m
Power line harmonics	EN 61000-3-2	
Flicker	EN 61000-3-3	
Electrostatic discharge	EN 61000-4-2	4 kV contact 8 kV air-gap
Electrical fast transients	EN 61000-4-4, Level 3	
Power frequency magnetic field immunity	EN 61000-4-8, Level 4	

Chapter 2. Installing Your System Unit

This chapter provides instructions to help you set up your 7581 Computer. For complete system-unit dimensions, see the *IBM 7581 Computer (Passive Backplane) Installation, Operation, Hardware Maintenance* manual.

Before You Begin

- Make sure you have an adequate number of properly grounded electrical outlets for your system unit, display, and printer.
- Plan to place your system unit in a location that is dry and as clean as possible. Contaminants could cause damage to the system unit.
- Plan to leave enough space around the system unit to allow the system unit's cooling system to work properly.
- Plan to leave enough space around the system unit to allow for proper service access. (This space will vary, depending on the type of mounting to be used.)
- Have blank diskettes available to back up utility and startup programs.

Task 1. Unpack Your System Unit

CAUTION:

To avoid possible injury while moving or lifting the system unit, ask another person to help you.

Remove the 7581 Computer from its shipping carton, along with all other materials in that carton. Also unpack any components that will be attached externally to the system unit; for example, keyboard, monitor, mouse, or cables. *To prevent possible damage to adapters and internal options, do not unpack these components until you are ready to install them.*

If any items are missing, contact your place of purchase.

Task 2. Check the Voltage Range

The 7581 Computer has an automatic range-detecting power supply. There is nothing to set as long as the voltage is within the following units:

- 100 to 127
- 200 to 240

Attention

If the voltage is not within these limits, you can damage your system unit.

Task 3. Secure the System Unit

Rubber feet are included with the system unit. If you are not installing the system unit in any type of mounting (rack mount or floor stand), attach the feet to the bottom of the system unit. Make sure the system unit is standing firmly on all four padded feet; then proceed to the next task.

Task 4. Install Internal Options

Internal options are devices that are installed inside your system unit. Memory upgrade options are mounted directly to the SBC. Other internal options are installed in drive bays and expansion slots.

Note: Some options require device drivers. Refer to the instructions that came with each option to determine if a device driver is required and how to install it.

- If you do not have any options to install inside your system unit, go to “Task 5. Connect the Cables.”
- If you have options to install but you want to check out your system unit before installing the options, go to “Task 5. Connect the Cables.”
- If you have options to install, install them before the system unit is mounted and the cables are attached. For option installation instructions, use the appropriate procedures in Chapter 3, “Installing Options” on page 13 and then go to “Task 5. Connect the Cables.”

Task 5. Connect the Cables

Connect all system-unit cables in the following order.

1. Connect all cables between the system unit and the keyboard, the mouse, the display, and all other peripheral devices.
2. Connect the power cords (system-unit side only) to the system unit, the display, and all other peripheral devices.
3. Plug the power cords from the system unit, display, and other devices into properly grounded electrical outlets.

Task 6. Perform the Check-Out Procedure

Perform the check-out procedure at least once to determine whether the system unit is functioning properly and to familiarize yourself with the power-on sequence. In this way, you will become acquainted with what messages to expect.


1. Turn on your display and adjust the brightness and contrast controls to the approximate midpoint. (You can readjust these controls for personal viewing comfort after you turn on your system unit.)

2. Turn on the system unit.

The power-on light comes on.

3. Watch the display messages and listen for a single beep. A series of coded messages should appear on the screen. These messages are part of the normal power-on process that occurs each time you turn on the system unit. The following is a typical power-on sequence:

- a. A blinking cursor appears on the screen.

- b. After a short time, an icon depicting a system-unit screen () appears in the upper-right corner, and the memory-test message appears in the upper-left corner.

- c. The system unit starts the power-on self test (POST).

4. After the system completes POST, it displays the amount of available memory and indicates the status of the self tests:


- If the system completes POST successfully, the system sounds a single beep. Continue with “Task 8. Finish the Installation” on page 11.
- If the system does not complete POST successfully, an error code is displayed. Also, the system sounds either multiple beeps or does not beep at all (depending on the type of error).
 - If you have changed the configuration by adding or changing options, the screen will display an error message indicating that the Configuration/Setup Utility must be run. In that case, perform “Task 7. Run the Configuration/Setup Utility Program” on page 10, and then perform this task again to complete the system-unit check-out.
 - Record the error message and number of beeps; then go to the *IBM 7581 Computer (Passive Backplane) Installation, Operation, Hardware Maintenance* manual to resolve the problem.

Task 7. Run the Configuration/Setup Utility Program

If a configuration error occurs during POST, the Configuration/Setup Utility program displays a message that describes the errors found by POST and gives you the option to access the utility program. You also can access the Configuration/Setup Utility program any time you want to check your settings.

Note: This task assumes you have installed all options in your system unit, as instructed in “Task 4. Install Internal Options” on page 8. If you have not, install those options now. For option installation instructions, use the appropriate procedures in Chapter 3, “Installing Options” on page 13.

To access the Configuration/Setup Utility program:

1. Remove all media (diskettes, CDs, and tapes) from all drives.
2. Turn on the system unit. If it is already on, you must turn off the system unit for a few seconds, and then turn it back on.
3. While the POST memory test is counting, the Configuration/Setup Utility program symbol  appears in the upper-right corner of the display screen.

Press F1 while the memory is still counting to access the Configuration/Setup Utility program and skip the memory testing. The main screen of the Configuration/Setup Utility program appears.

You can get help information about any item on the screen by moving the cursor to the field and pressing F1. The active keys are shown at the bottom of each screen in the Configuration/Setup Utility program.

Task 8. Finish the Installation

Your system-unit hardware is now set up, and you are ready to finish the installation by installing the required software and completing the paperwork. The final steps are different for various configurations and applications, but you can use the following checklist as a guide.

— **Install your operating system.**

Refer to the documentation and instructions supplied with your operating system.

— **Install device drivers**

Refer to the information that came with the options you installed for instructions on installing device drivers.

For instructions on installing the video and Ethernet device drivers, refer to the readme files on the IBM Embedded Systems CD (see page vii). The latest updates are under *Support Information* on the Web at:

<http://www.clearlake.ibm.com/mfg/bocaraton/Services/IC/>

— **Install your application programs.**

Refer to the documentation and instructions supplied with your application programs.

— **Make any backup copies necessary.**

It is very important that you keep a backup copy of the system partition, reference diskette, hard files, and so forth, in case of possible future use.

— **Record your identification numbers.**

Your system unit might have important identification information that you might need if you have it serviced or if you need to order duplicate keys (for keylock-equipped systems). You should record all such information in Appendix A, "System Records" on page 29 or in another safe place.

Chapter 3. Installing Options

This chapter provides instructions to help you add options to your system unit.

If you have several internal options to install, you should install them all at one time, while the system unit is still open. You should install all SBC options first to prevent removing newly installed adapters or drives to access the SBC.

Use the figures in "General Layout of Components" on page 2 to locate components. Before performing any installation procedures, be sure to read the information in "Safety Information" on page 46 and in "Handling Electrostatic-Discharge-Sensitive Devices" on page 51. That information will help you work more safely with your computer and options.

CAUTION:

- **Power must always be removed before performing any removal or replacement procedures. Electrical power and any backup power source also should be disconnected. To make sure that power is off and disconnected correctly, start each removal and replacement procedure with "Turning Off Power and Disconnecting Cables."**
- **Depending on the options installed, the system unit could weigh more than one person can comfortably lift. Do not attempt to lift it by yourself; get another person to help you.**

Attention

Whenever handling electronic components, use precautions to prevent component damage due to electrostatic discharge. See "Handling Electrostatic-Discharge-Sensitive Devices" on page 51 for a list of those precautions.

Turning Off Power and Disconnecting Cables

Use the following procedure to turn off the system unit and disconnect all cables before beginning any removal or replacement procedure. If you need to remove the system unit from its mounting place, use this procedure before removing the system unit.

1. Remove any data media (diskettes, optical discs, and tapes).
2. Turn off the computer and all attached devices.
3. Record the location of all cables connected to the system unit to prevent confusing them while they are unplugged.
4. If you have an internal modem, disconnect the telephone line from the wall outlet and then from the system unit (the line can cause an electrical shock if its number is called).
5. Unplug or disconnect all electrical power cords and any backup-power source. Where applicable, unplug all cables at the outlet first, and then at the device.
6. Disconnect all other cables from the system unit.

When reassembling the system unit, reverse these steps.

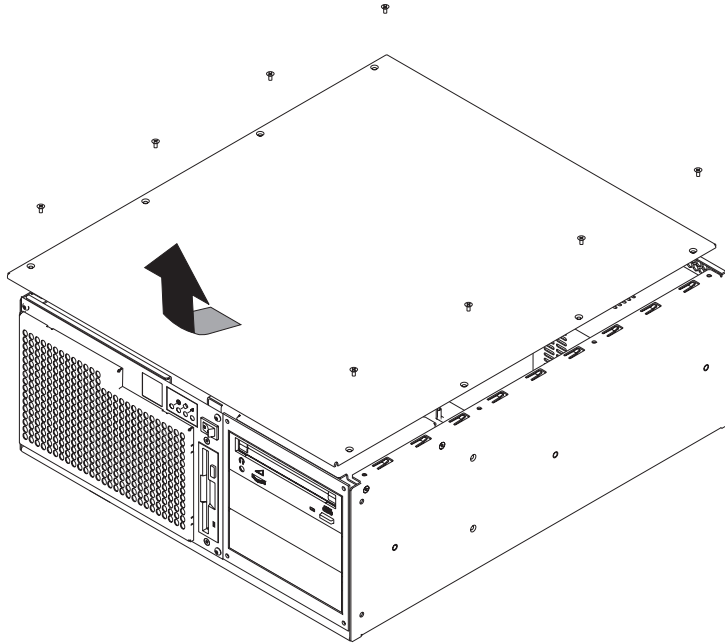
Now you are ready to proceed.

Removing the Cover

CAUTION:

Depending on the options installed, the system unit could weigh more than one person can comfortably lift. Do not attempt to lift it by yourself; get another person to help you.

To remove the cover, loosen the cover screws and slide the cover forward about two inches; then lift off the cover, as shown.



Installing Memory

The SBC has two memory connectors (bank 0 and bank 1). Each connector supports 32-MB, 64-MB, 128-MB, and 256-MB non-parity DIMMs.

DIMM Considerations

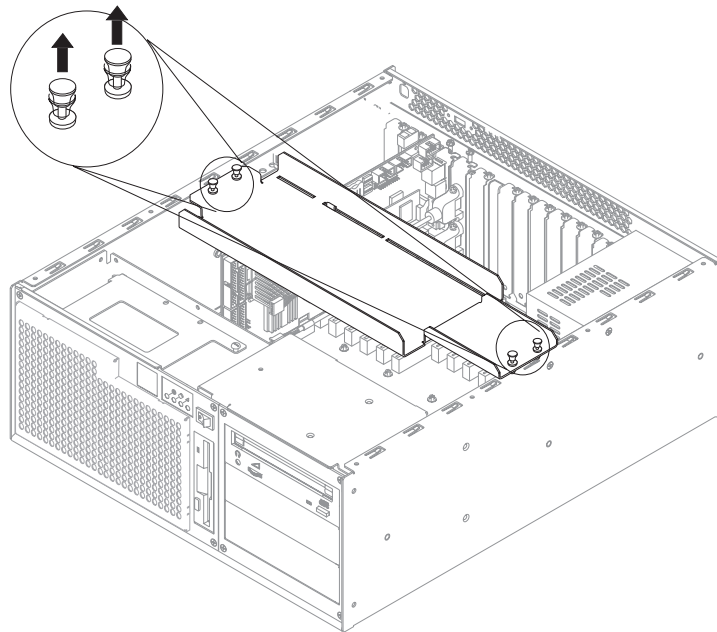
Use only IBM-approved memory. Contact your IBM representative for memory upgrades.

The DIMM in bank 0 has a height restriction of 1.5 inches (38.1 millimeters).

The DIMM in bank 1 is limited by the adapter in expansion slot 5 (slot 4 must be empty). The height restriction for bank 1 is 1.25 to 1.375 inches (31.8 to 34.9 millimeters). The dimension is affected by the adapter in slot 5.

Before installing memory, use the following procedures to remove the SBC.

1. Remove the cover (refer to page 14).
2. Release both latches; then remove the card hold-down bracket.

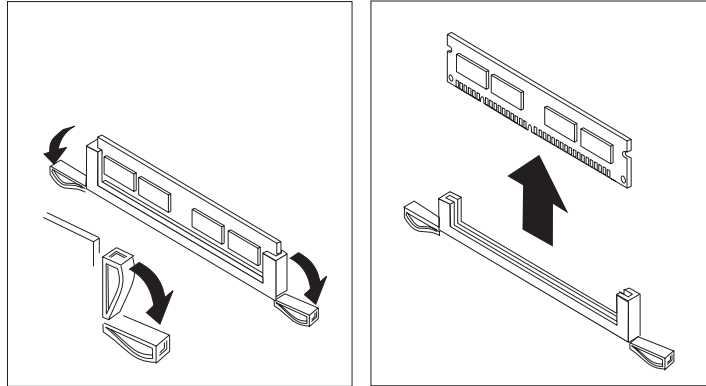


3. Remove the screw that secures the SBC to the chassis.
4. Disconnect all cables from the SBC.
5. Pull the cables away from the SBC and carefully lift the SBC out of the system unit. (You might have to rock the SBC slightly from front to rear to loosen it from the connector.)
6. Place the SBC on a flat, clean, static-free surface, with the component-side facing up and the backplane connector toward you.
7. If you are replacing the DIMM in bank 0, continue with "Installing Memory in Bank 0" on page 16. If you are installing memory in bank 1, go to "Installing Memory in Bank 1" on page 17.

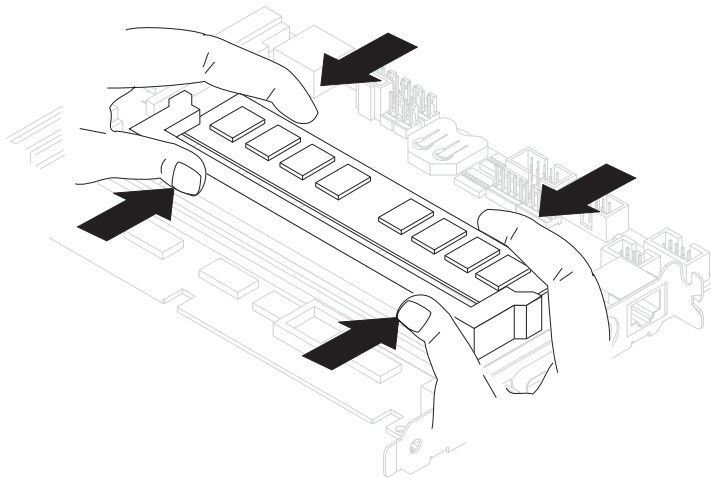
Installing Memory in Bank 0

Use the following procedures to install memory in bank 0.

1. Push outward against the release levers at both ends of the DIMM connector. The DIMM will rise about 0.25 inch.



2. Lift the DIMM out of the connector.
3. Align the centering notches on the new DIMM with the keys in the connector (the keys are in the center slot of the connector); then insert the DIMM into the connector and squeeze the DIMM into the connector as shown. The release levers will move to the closed position when the DIMM is fully seated in the connector.

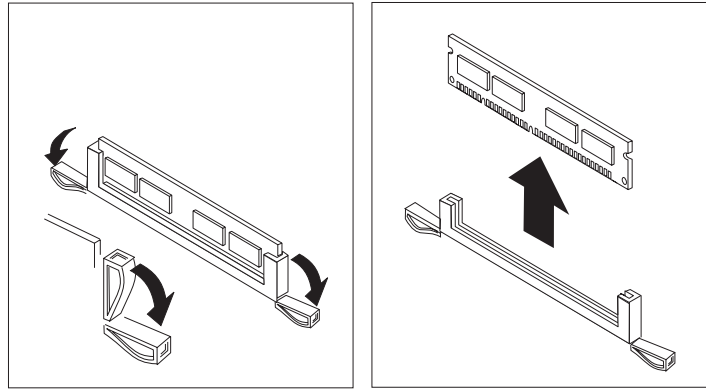


4. Record the configuration changes in Appendix A, "System Records" on page 29.
5. If you are also installing memory in bank 1, continue with "Installing Memory in Bank 1" on page 17; otherwise, reinstall the SBC and reconnect all internal cables.

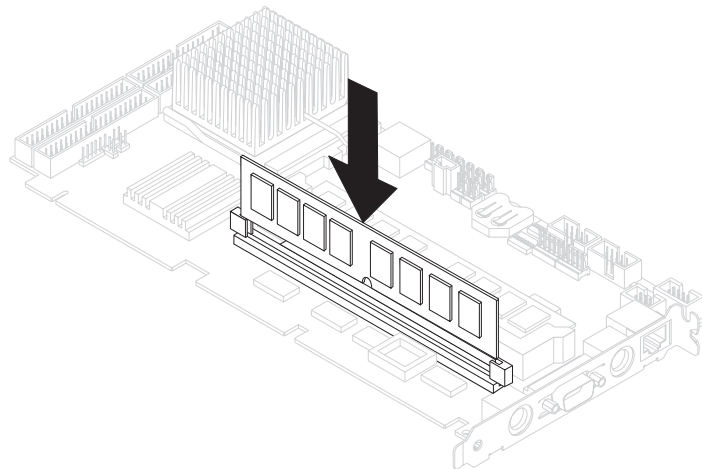
Installing Memory in Bank 1

Use the following procedures to install memory in bank 1.

1. If you are replacing the DIMM in bank 1, continue with the next step; otherwise, go to step 4.
2. Push outward against the release levers at both ends of the DIMM connector. The DIMM will rise about 0.25 inch.



3. Lift the DIMM out of the connector.
4. Align the centering notches on the new DIMM with the keys in the connector (the keys are in the center slot of the connector); then insert the DIMM into the connector and press it into the connector as shown. The release levers will move to the closed position when the DIMM is fully seated in the connector.



5. Record the configuration changes in Appendix A, "System Records" on page 29.
6. Reinstall the SBC and reconnect all internal cables.

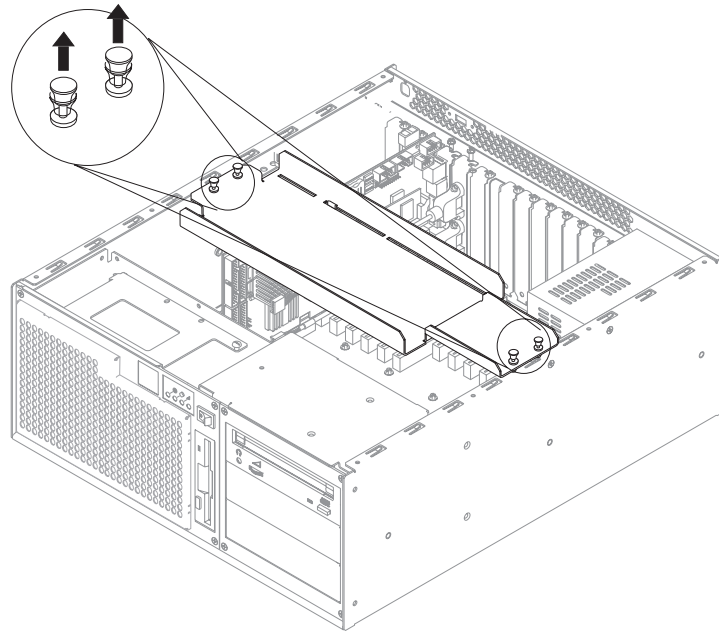
Installing Adapters

The 7581 Computer has card hold-down brackets to keep the adapters in their slots during shock or vibration. These brackets, together with the hold-down spacers, are designed to hold standard sizes of cards in the connectors.

Plastic spacers and rubber pads are included in the ship group and should be installed as indicated in Figure 4 on page 19.

To install an adapter:

1. Remove the cover (refer to page 14).
2. Release both latches; then remove the card hold-down bracket.



3. Touch the static-protective bag in which the adapter was packaged to any unpainted metal surface on the system unit; then remove the adapter from the package.
4. Read the instructions that came with the adapter for any special installation instructions.
5. Install the adapter in the system unit:
 - a. Grasp the adapter at the front and rear.
 - b. Align the adapter with the front and rear adapter guides and slide it into the guides. (Some adapters are shorter and do not extend to the front adapter guide.)
 - c. Firmly press the adapter into the expansion slot. Full-length adapters slide into the groove on the front adapter guide.
 - d. Install and tighten the screw on the adapter-retaining bracket.
6. Record the adapter information and location in Appendix A, "System Records" on page 29.

7. Refer to Figure 4 and determine the number of pads to use for each card size and whether the card requires hold-down spacers.

Note: Do not install spacers or pads for card heights of less than 3.7 inches. These adapters are too short for the bracket to work effectively; however, the adapters generally have less mass and are less likely to be affected by vibration and shock.

Card Height (inches/millimeters)	Spacer Installed	Additional Number of Pads Needed	
4.8/121.8	No	0	standard <i>tall</i> card
4.7/119.3	No	1	
4.6/116.8	No	2	
4.5/114.2	No	3	
4.4/111.7	No	4	
4.3/109.1	No	5	standard <i>short</i> card
4.2/106.6	Yes	0	
4.1/104.1	Yes	1	
4.0/101.5	Yes	2	
3.9/98.9	Yes	3	
3.8/96.4	Yes	4	
3.7/93.9	Yes	5	

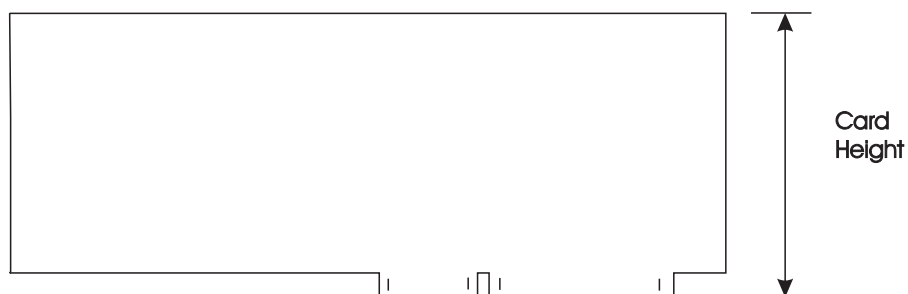
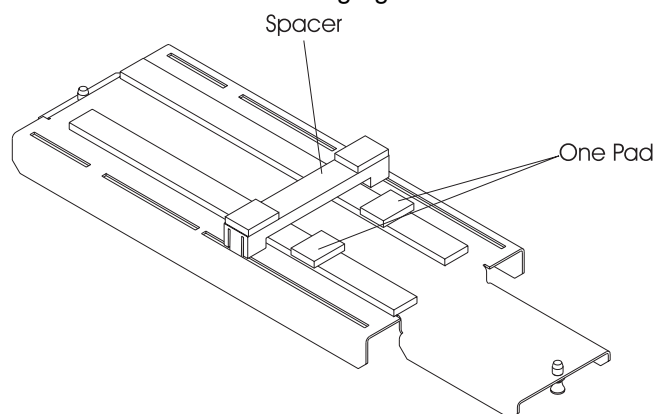


Figure 4. Requirements for Adapter Hold-Down Spacers

If spacers are required, continue with step 8; otherwise, go to step 9.

8. Install the spacer and pads as shown in the following figure.



9. Reinstall the card hold-down bracket and cover.

Installing an Internal Hard Drive

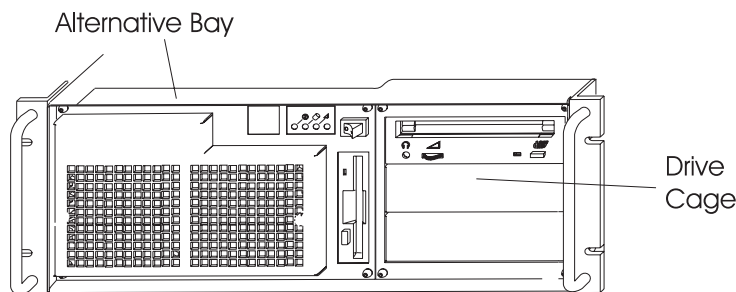
Important

Some drives do not meet the rigorous requirements for industrial-usage ratings that make up the working environment of the 7581 Computer. Before installing any drive not purchased specifically for use in a 7581 Computer, be sure the drive meets all environmental conditions to which it might be subjected.

The 7581 Computer supports four IDE hard drives, which are installed in the drive cage and alternative bay, depending on:

- The type of drives you are installing:
 - 3.5-inch or 5.25-inch drive
 - Removable-media drive or hard drive
- The type of mounting (shock or rigid)

The following figure shows the drive-mounting locations.



Typical Drive Configuration

Typically, drives are installed in the drive cage. The CD-ROM drive, and up to three 3.5-inch hard drives, can be installed in the drive cage. Shock mounting is not supported in this configuration.

Because of a restriction with the cable length, this configuration is *required* when Ultra-DMA hard drives are used.

If you are installing a drive in a typical drive configuration, go to “Installing a Drive in a Typical Drive Configuration” on page 21.

Atypical Drive Configuration

Atypically, drives can be installed in the drive cage and the alternative bay. The CD-ROM drive and two other drives can be installed in the drive cage, and a fourth drive can be installed in the alternative drive bay.

This configuration is required if you are installing a 5.25-inch drive or a removable-media drive. It also is required if you are using the shock-mount option (the CD-ROM drive cannot be shock-mounted).

If you are installing a drive in an atypical drive configuration, go to “Installing a Drive in an Atypical Drive Configuration” on page 23.

Installing a Drive in a Typical Drive Configuration

Use these instructions to install a 3.5-inch hard drive in the drive cage. Three 3.5-inch drives can be installed in the two lower bays using drive-mounting brackets to attach two drives to the hard drive in the lower bay.

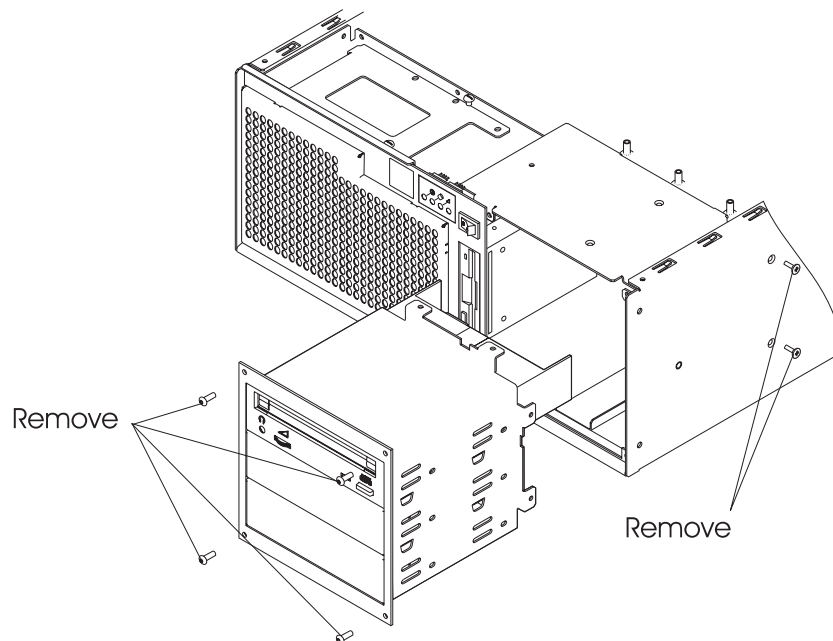
Go to “Installing a Drive in an Atypical Drive Configuration” on page 23 if you are installing one of the following:

- A 5.25-inch drive
- A removable-media drive
- A shock-mounted hard drive

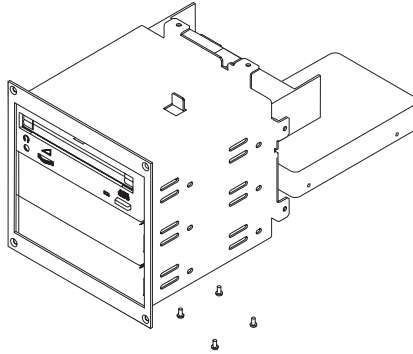
Read the instructions that came with the drive to determine any special instructions.

Note: If your hard drive cannot run in High Performance mode (the default IDE-mode selection), be sure to switch to Standard mode. See the *IBM 7581 Computer (Passive Backplane) Installation, Operation, Hardware Maintenance* manual for information about mode selection.

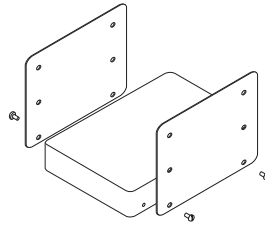
1. Remove the cover (refer to page 14).
2. Disconnect the signal and power cables from all drives in the drive cage.
3. Remove the cage-retaining screws for the drive cage; then slide the drive cage forward and out of the system unit.



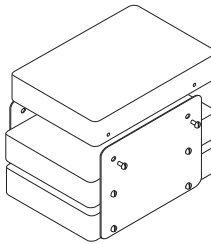
4. Place the drive cage on a clean, static-free, work area; then remove the bottom mounting screws from the drive cage.
5. Remove the hard-drive assembly from the cage (the assembly can be either a single hard drive or two hard drives and the drive-mounting brackets).



6. If the drive-mounting brackets are currently installed, go to step 7; otherwise, attach the drive-mounting brackets to the primary hard drive as shown.



7. Slide the new drive into position between the brackets, with the connector to the rear; then install the four mounting screws (two on each side).



8. Slide the hard drive assembly into the drive cage and install the bottom mounting screws.
9. Slide the drive cage into the system unit and install the cage-retaining screws.
10. Connect the power and signal cables to the drives (the cable connectors are keyed and connect only one way).
11. Record the drive information in Appendix A, "System Records" on page 29.
12. Reinstall the covers.

Installing a Drive in an Atypical Drive Configuration

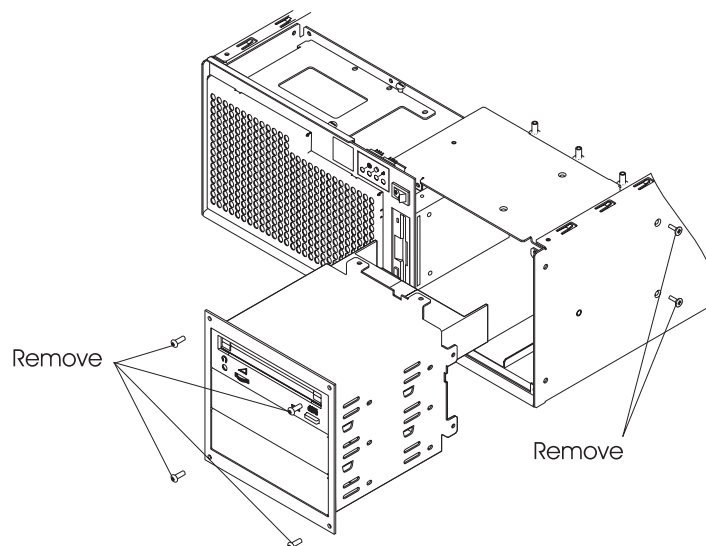
Use these instructions to install one of the following drives in the drive cage.

- A 5.25-inch hard drive
- A hard drive with the shock-mount option
- A removable-media drive

Read the instructions that came with the drive to determine any special instructions.

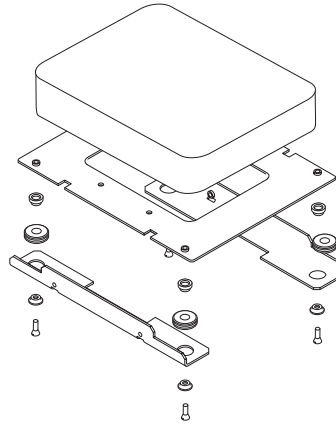
Note: If your hard drive cannot run in High Performance mode (the default IDE-mode selection), be sure to switch to Standard mode. See the *IBM 7581 Computer (Passive Backplane) Installation, Operation, Hardware Maintenance* manual for information about mode selection.

1. Remove the cover (refer to page 14).
2. Disconnect the signal and power cables to all drives in the drive cage.
3. Remove the cage-retaining screws from the drive cage. Then slide the drive cage forward and out of the system unit.

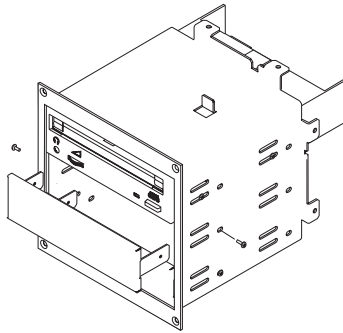


4. If you are installing a 5.25 inch hard drive, go to Step 5.

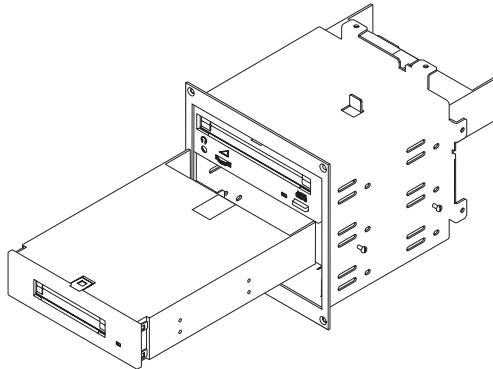
If you are installing the shock-mount option, assemble the drive and mounting as shown. Then go to Step 5.



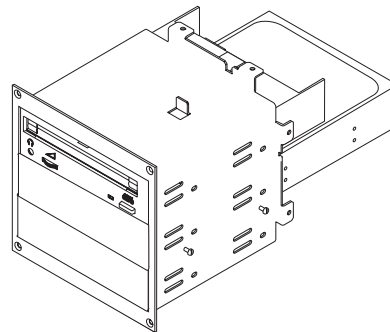
If you are installing a removable-media drive, remove the blank panel from the front of the drive bay. Then go to Step 5.



5. Slide the new drive into the bay and install the drive mounting screws. Install removable media drives through the front; install all other drives from the rear.



Removable Media Drive



All Other Drives

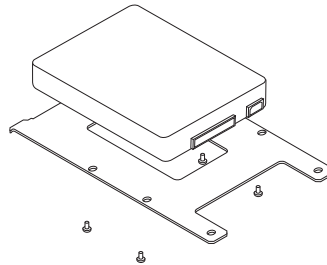
6. Slide the drive cage into the system unit and install the cage-retaining screws.
7. Connect the power and signal cables to all drives (the cable connectors are keyed and connect only one way).
8. Record the drive information in Appendix A, "System Records."
9. Reinstall the covers.

Installing a Hard Drive in the Alternative Bay

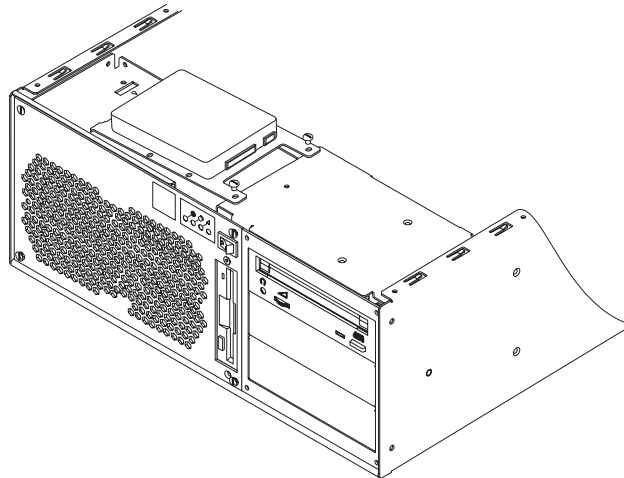
Read the instructions that came with the hard drive to determine any special instructions.

Note: If your hard drive cannot run in the High Performance mode (the default IDE-mode selection), be sure to switch to Compatible mode. See the *IBM 7581 Computer (Passive Backplane) Installation, Operation, Hardware Maintenance* manual for information about mode selection.

1. Remove the cover (refer to page 14).
2. When attaching the drive-mounting brackets to the hard drive, make sure the connectors on the drive face toward the center of the system unit. The brackets are stored in the alternative drive bay.



3. Slide the tabs on the drive-mounting bracket into the slots in the drive bay; then install the two retaining screws.



4. Connect the power and signal cables to the new drive (the cable connectors are keyed and connect only one way).
5. Record the drive information in Appendix A, "System Records" on page 29.
6. Reinstall the covers.

Installing the Mounting Options

CAUTION:

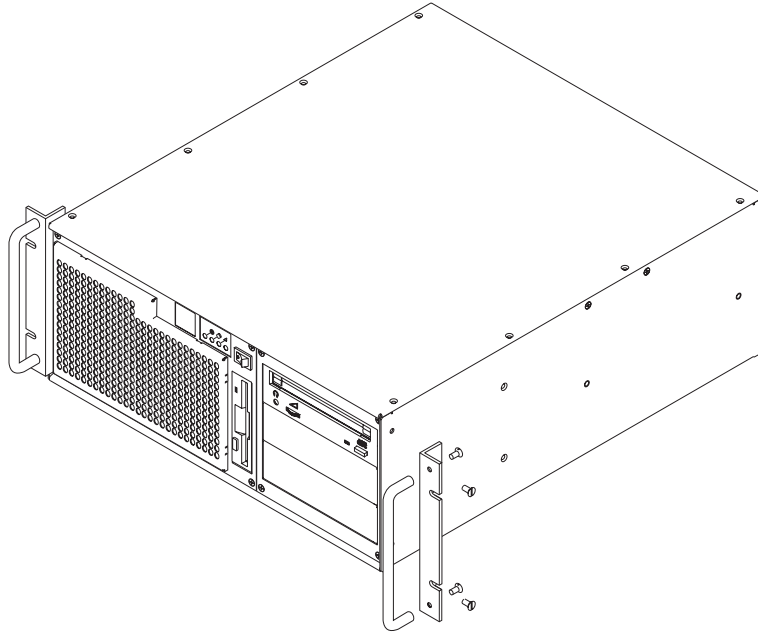
Depending on the options installed, the system unit could weigh more than one person can comfortably lift. Do not attempt to lift it by yourself; get another person to help you.

Go to the instructions for the type of hardware to install (refer to the following list).

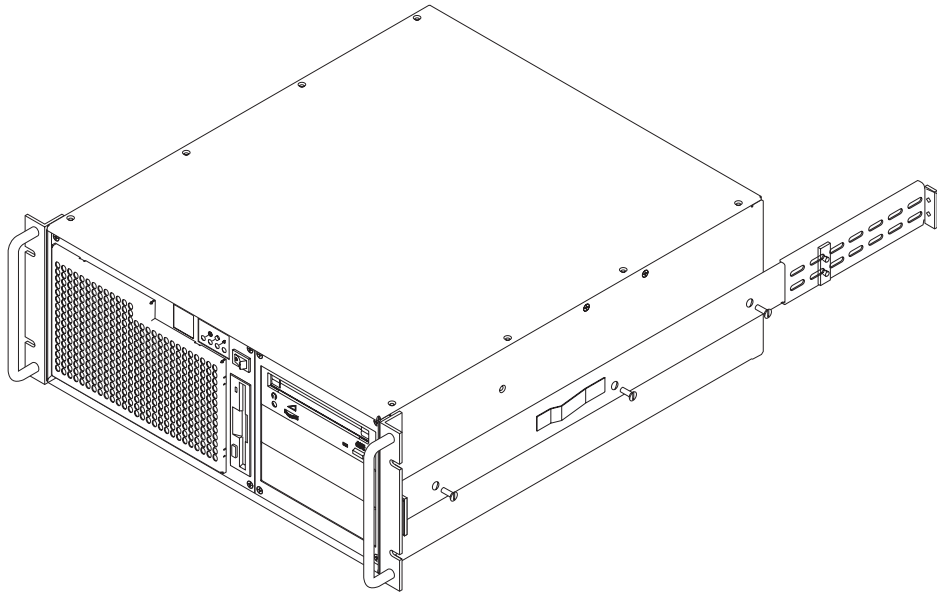
- “Installing the Rack-Mount Option” on page 27
- “Installing the Floor-Stand Option” on page 28

Installing the Rack-Mount Option

1. Assemble the handle assemblies onto the system unit as shown.

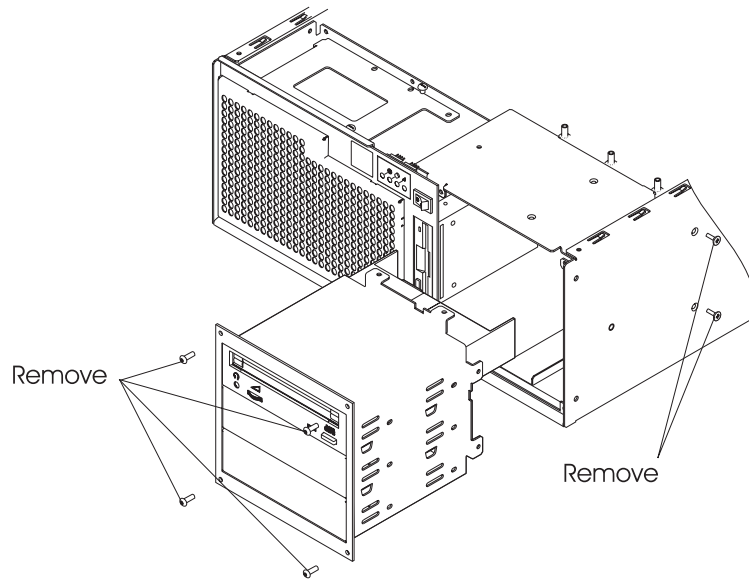


2. Install the rack-mount rails onto the system unit.

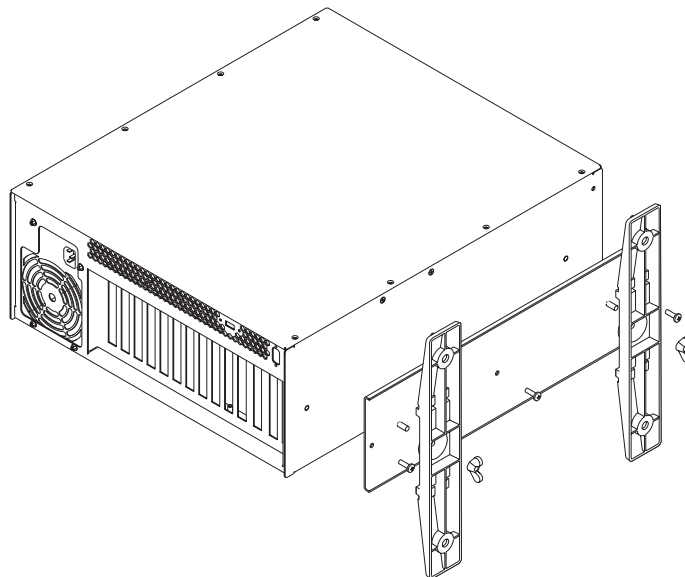


Installing the Floor-Stand Option

1. Remove the cover (refer to page 14).
2. Disconnect the signal and power cables from all drives in the drive cage.
3. Remove the cage-retaining screws for the drive cage; then slide the drive cage forward and out of the system unit.



4. Rotate the drive cage so the top of the cage is toward the top of the system unit when the system unit is in the upright position; then reinstall the drive cage and connect the signal and power cables to all drives.
5. Reinstall the cover.
6. Assemble the floor stand by placing the feet on the baseplate, using the wing nuts provided; then install the floor stand onto the system unit using the three screws supplied with the kit.



7. Make sure the orientation of the plate centers the feet on the system unit, and then stand the unit upright.

Appendix A. System Records

Use the following tables to keep a record of important information about your computer. This information can be helpful when you install additional options in your system unit or if you ever need to have it serviced.

Table 1. System Unit Identification Numbers

7581 Computer Type/Model	_____
7581 Computer Serial Number	_____
Key Serial Number	_____
Key Address	_____

Table 2. Internal and External Drives

Location	Drive Description	SCSI ID
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Note: If you attach a drive or other device to a SCSI adapter, be sure to record the expansion slot number of the adapter in the location field of this table.

Table 3. Internal and External Options

Location	Option Description
Processor Type	<u>Pentium</u> _____ <u>Pentium MMX</u> _____ <u>AMD K6-2</u> _____ <u>Other:</u> _____
Bank 1	<u>32 MB Kit</u> _____ <u>64 MB Kit</u> _____ <u>128 MB Kit</u> _____ <u>256 MB Kit</u> _____
Bank 2	<u>32 MB Kit</u> _____ <u>64 MB Kit</u> _____ <u>128 MB Kit</u> _____ <u>256 MB Kit</u> _____
Cache Memory	<u>512 KB</u>
Power Supply	<u>330 Watt</u> _____
Mouse Connector	<u>IBM Mouse</u> _____ <u>Other:</u> _____
Keyboard Connector	<u>Space Saving</u> _____ <u>Enhanced</u> _____ <u>Other:</u> _____
Display Connector	_____
Expansion 1 (ISA/PCI)	_____
Expansion 2 (ISA/PCI)	_____
SBC	_____
Expansion 3 (ISA)	_____
Expansion 4 (ISA)	_____
Expansion 5 (ISA)	_____
Expansion 6 (ISA)	_____
Expansion 7 (ISA)	_____
Expansion 8 (ISA or PCI)	_____
Expansion 9 (ISA or PCI)	_____
Expansion 10 (ISA or PCI)	_____
Expansion 11 (ISA or PCI)	_____
Expansion 12 (ISA or PCI)	_____
Expansion 13 (ISA or PCI)	_____
Parallel Connector	_____
Serial Connector A	_____
Serial Connector B	_____
USB Connector 1	_____
USB Connector 2	_____

Appendix B. Product Warranties and Notices

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 32)
- **Worldwide except Canada, Puerto Rico, Turkey, and United States (Z125-5697-01 11/97)**
(Part 1 - General Terms on page 34)
- **Worldwide Country-Unique Terms**
(Part 2 - Country-Unique Terms on page 36)

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 - IBM 7581 Computer (Passive Backplane)

Warranty Period* - Parts: Three (3) Years Labor: Three (3) Years

IBM will provide warranty service without charge for parts and labor for the above specified warranty period.

**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 and Canada, call IBM at 1-800-IBM-SERV. 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.

IBM 7581 Computer (Passive Backplane) Warranty Period* -

- Japan - Parts: One (1) Year Labor: One (1) Year
- All other countries not listed - Parts: Three (3) Years Labor: Three (3) Years

IBM will provide warranty service without charge for parts and labor for the above specified warranty period.

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

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

License Agreement for Machine Code

Regardless of how you acquire (electronically, preloaded, on media or otherwise) BIOS, Utilities, Diagnostics, Device Drivers or Microcode (collectively called "Machine Code"), you accept the terms of this Agreement by your initial use of a Machine or Machine Code. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements or accessories, or any combination of them. Acceptance of these license terms authorizes you to use Machine Code with the specific product for which it is provided.

International Business Machines Corporation or one of its subsidiaries ("IBM"), or an IBM supplier, owns copyrights in Machine Code.

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You may transfer possession of Machine Code and its media to another party only with the transfer of the Machine on which the Machine Code is used. If you do so, you must give the other party a copy of these terms and provide all user documentation to that party. When you do so, you must destroy all your copies of Machine Code.

Your license for Machine Code terminates when you no longer rightfully possess the Machine.

No other rights under this license are granted.

You may not, for example, do any of the following:

1. otherwise copy, display, transfer, adapt, modify, or distribute in any form, Machine Code, except as IBM may authorize in a Machine's user documentation;
2. reverse assemble, reverse compile, or otherwise translate the Machine Code, unless expressly permitted by applicable law without the possibility of contractual waiver;
3. sublicense or assign the license for the Machine Code; or
4. lease the Machine Code or any copy of it.

The terms of IBM's Machine warranty, which is incorporated into this Agreement by reference, apply to Machine Code. Please refer to that warranty for any questions or claims regarding performance or liability for Machine Code.

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Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

Safety Notices (Multi-Lingual Translations)

The following safety notices are provided in English, French, German, Italian, and Spanish languages.

Safety Notice 1

Before removing any FRU, power-off the system unit, unplug all power cords from electrical outlets, remove the battery pack, then disconnect any interconnecting cables.

Avant de retirer une unité remplaçable en clientèle, mettez le système hors tension, débranchez tous les cordons d'alimentation des socles de prise de courant, retirez la batterie et déconnectez tous les cordons d'interface.

Die Stromzufuhr muß abgeschaltet, alle Stromkabel aus der Steckdose gezogen, der Akku entfernt und alle Verbindungskabel abgenommen sein, bevor eine FRU entfernt wird.

Prima di rimuovere qualsiasi FRU, spegnere il sistema, scollegare dalle prese elettriche tutti i cavi di alimentazione, rimuovere la batteria e poi scollegare i cavi di interconnessione.

Antes de quitar una FRU, apague el sistema, desenchufe todos los cables de las tomas de corriente eléctrica, quite la batería y, a continuación, desconecte cualquier cable de conexión entre dispositivos.

Safety Notice 2

Some standby batteries contain a small amount of nickel and cadmium. Do not disassemble it, recharge it, throw it into fire or water, or short-circuit it. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

Certaines batteries de secours contiennent du nickel et du cadmium. Ne les démontez pas, ne les rechargez pas, ne les exposez ni au feu ni à l'eau. Ne les mettez pas en court-circuit. Pour les mettre au rebut, conformez-vous à la réglementation en vigueur. Lorsque vous remplacez la pile de sauvegarde ou celle de l'horloge temps réel, veillez à n'utiliser que les modèles cités dans la liste de pièces détachées adéquate. Une batterie ou une pile inappropriée risque de prendre feu ou d'exploser.

Die Bereitschaftsbatterie, die sich unter dem Diskettenlaufwerk befindet, kann geringe Mengen Nickel und Cadmium enthalten. Sie darf nur durch die Verkaufsstelle oder den IBM Kundendienst ausgetauscht werden. Sie darf nicht zerlegt, wiederaufgeladen, kurzgeschlossen, oder Feuer oder Wasser ausgesetzt werden. Die Batterie kann schwere Verbrennungen oder Verätzungen verursachen. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Beim Ersetzen der Bereitschafts- oder Systembatterie nur Batterien des Typs verwenden, der in der Ersatzteilliste aufgeführt ist. Der Einsatz falscher Batterien kann zu Entzündung oder Explosion führen.

Safety Notice 2 (continued)

Alcune batterie di riserva contengono una piccola quantità di nichel e cadmio. Non smontarle, ricaricarle, gettarle nel fuoco o nell'acqua né cortocircuitarle. Smaltirle secondo la normativa in vigore (DPR 915/82, successive disposizioni e disposizioni locali). Quando si sostituisce la batteria dell'RTC (real time clock) o la batteria di supporto, utilizzare soltanto i tipi inseriti nell'appropriato Catalogo parti. L'impiego di una batteria non adatta potrebbe determinare l'incendio o l'esplosione della batteria stessa.

Algunas baterías de reserva contienen una pequeña cantidad de níquel y cadmio. No las desmonte, ni recargue, ni las eche al fuego o al agua ni las cortocircuite. Deséchelas tal como dispone la normativa local. Utilice sólo baterías que se encuentren en la lista de piezas. La utilización de una batería no apropiada puede provocar la ignición o explosión de la misma.

Safety Notice 3

The battery pack contains small amounts of nickel. Do not disassemble it, throw it into fire or water, or short-circuit it. Dispose of the battery pack as required by local ordinances or regulations. Use only the battery in the appropriate parts listing when replacing the battery pack. Use of an incorrect battery can result in ignition or explosion of the battery.

La batterie contient du nickel. Ne la démontez pas, ne l'exposez ni au feu ni à l'eau. Ne la mettez pas en court-circuit. Pour la mettre au rebut, conformez-vous à la réglementation en vigueur. Lorsque vous remplacez la batterie, veillez à n'utiliser que les modèles cités dans la liste de pièces détachées adéquate. En effet, une batterie inappropriée risque de prendre feu ou d'exploser.

Akkus enthalten geringe Mengen von Nickel. Sie dürfen nicht zerlegt, wiederaufgeladen, kurzgeschlossen, oder Feuer oder Wasser ausgesetzt werden. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Beim Ersetzen der Batterie nur Batterien des Typs verwenden, der in der Ersatzteilliste aufgeführt ist. Der Einsatz falscher Batterien kann zu Entzündung oder Explosion führen.

La batteria contiene piccole quantità di nichel. Non smontarla, gettarla nel fuoco o nell'acqua né cortocircuitarla. Smaltirla secondo la normativa in vigore (DPR 915/82, successive disposizioni e disposizioni locali). Quando si sostituisce la batteria, utilizzare soltanto i tipi inseriti nell'appropriato Catalogo parti. L'impiego di una batteria non adatta potrebbe determinare l'incendio o l'esplosione della batteria stessa.

Las baterías contienen pequeñas cantidades de níquel. No las desmonte, ni recargue, ni las eche al fuego o al agua ni las cortocircuite. Deséchelas tal como dispone la normativa local. Utilice sólo baterías que se encuentren en la lista de piezas al sustituir la batería. La utilización de una batería no apropiada puede provocar la ignición o explosión de la misma.

Safety Notice 4

CAUTION

The lithium battery presents a fire, explosion, or severe burn risk. Do not recharge it, remove its polarized connector, disassemble it, heat it above 100°C (212°F), incinerate it, or expose its cell contents to water. Dispose of the battery as required by local ordinances or regulations. When replacing the battery, use only Part No. 33F8354. Use of another battery could result in ignition or explosion of the battery. Replacement batteries can be ordered from IBM or IBM Authorized Dealers.

ADVARSEL

Litiumbatteriet kan forårsage brand, eksplosion eller alvorlige brandsår. Det må ikke genoplades, åbnes, udsættes for mere end 100 grader C, brændes eller komme i berøring med vand. Desuden må man ikke fjerne forbindelsesstikket fra det. Litiumbatteriet destrueres som foreskrevet af myndighederne. Ved udskiftning af litiumbatteriet anvendes partnummer 33F8354. Brug af andre former for batterier kan medføre, at batteriet brænder eller eksploderer. Nye batterier bestilles gennem IBM eller IBM-forhandleren.

WAARSCHUWING

De lithiumbatterij kan brand- en explosiegevaarlijk zijn. De batterij mag niet worden opgeladen, gedemonteerd, verbrand of boven 100°C worden verhit. Laat de inhoud niet in aanraking komen met water en verwijder de gepolariseerde aansluiting niet. Bescherm het milieu; lever oude batterijen in bij inzamelpunten. Gebruik ter vervanging uitsluitend batterijen met bestelnummer 33F8354. Gebruik van andere batterijen kan leiden tot ontbranding of explosie. Nieuwe batterijen kunnen worden besteld bij IBM of geautoriseerde IBM-dealers.

ATTENTION !

Prenez garde aux risques d'incendie, d'explosion et de brûlures graves liés à l'utilisation d'une pile au lithium. Ne rechargez pas la pile, n'en retirez pas le connecteur et ne la démontez pas. Ne la chauffez pas au-delà de 100°C (212°F) et n'en exposez pas le contenu à l'eau. Détruisez-la conformément à la réglementation en vigueur. Si vous la remplacez, commandez une pile de rechange sous la référence 33F8354 : toute autre pile risquerait de prendre feu ou d'exploser. Les piles de rechange peuvent être obtenues auprès d'IBM ou d'un distributeur agréé IBM.

VAROITUS

Litiumparisto voi syttyä tuleen, räjähtää tai aiheuttaa vakavia palovammoja. Ölä koskaan lataa paristoa uudelleen, irrota pariston polarisoitua liitintä, pura paristoa, kuumenna paristoa yli 100°C lämpötilaan, polta paristoa tai päästä vettä pariston sisään. Hävitä paristo paikallisten määräysten mukaisesti. Vaihda pariston tilalle ainoastaan tuote 33F8354. Muun pariston käyttö voi johtaa sen syttymiseen tai räjähtämiseen. Vaihtoparistoja voi tilata IBM:stä tai valtuutetulta IBM-jälleenmyyjältä.

ACHTUNG

Lithiumbatterien sind feuergefährlich, explosiv und können schwere Verätzungen verursachen. Bei Außerbetriebsetzen (Verschrotten) des Gerätes örtliche Entsorgungsrichtlinien für Sondermüll beachten. Die Batterie darf nicht mit Wasser in Berührung gebracht, über 100 Grad erhitzt, wieder aufgeladen, repariert oder zerlegt werden. Eine verbrauchte Batterie nur durch eine Batterie mit der Teilenummer 33F8354 ersetzen. Andere Batterien können sich entzünden oder explodieren. Ersatzbatterien können von IBM oder einem IBM Vertragshändler bezogen werden.

Safety Notice 4 (continued)

ATTENZIONE

La batteria al litio può incendiarsi, esplodere o procurare serie bruciature. Evitare di ricaricarla, toglierle il connettore polarizzato, smontarla, riscaldarla ad una temperatura superiore ai 100 gradi centigradi, incendiarla o gettarla in acqua. Per eliminarla seguire le procedure di sicurezza aziendali e quanto stabilito dal DPR 915 del 10-9-82 e successive disposizioni. Sostituire solo con la parte IBM N. 33F8354. L'uso di una diversa batteria potrebbe provocare incendi o esplosioni. Ordinare le batterie all'IBM o ai rivenditori autorizzati.

ADVARSEL

På grunn av brann- og eksplosjonsfare må ikke litiumsbatterier lades opp, taes fra hverandre, brennes eller utsettes for sterk varme over 100°C. Ikke fjern de polariserte tilkoblingene eller utsett batteriene for vann. Brukte batterier bør kastes så raskt som mulig og i henhold til gjeldende forskrifter. Bruk bare batterier med delnummer 33F8354 når du bytter batteri. Bruk av feil batteri kan føre til at batteriet antennes eller eksploderer. Nye batterier kan bestilles fra autoriserte IBM PC-forhandlere.

CUIDADO

A pilha de lítio representa um risco de incêndio, explosão ou de graves queimaduras. Não a recarregue, remova o conector polarizado, desmonte, aqueça acima de 100°C (212°F), queime ou molhe o conteúdo da célula. Destrua a pilha de acordo com os regulamentos locais. Quando substituir a pilha, utilize apenas a peça com o número de referência 33F8354. A utilização de qualquer outra pilha poderá ocasionar auto-ignição ou explosão da pilha. Podem ser encomendadas pilhas sobresselentes à IBM ou aos seus Concessionários Autorizados.

VARNING:

Litiumbatterier kan explodera eller börja brinna. Ladda inte upp det, ta inte bort dess polariserade anslutningar, upphetta det inte över 100°C, ta inte isär det och utsätt inte batteriets cellinnehåll för vatten. Om du ska byta batteriet ska du byta till ett batteri med beställningsnummer 33F8354. Om du använder något annat batteri kan det antändas eller explodera. Beställ batterier från IBM eller från en av IBM auktoriserad återförsäljare.

PRECAUCION

La batería de litio representa un peligro de incendio, explosión o de graves quemaduras. No la recargue, quite su conector polarizado, desmonte, caliente a más de 100°C (212°F), la incinere o someta su contenido al agua. Deshágase de la batería según los reglamentos u ordenanzas locales. Utilice como recambio sólo el número de pieza No. 33F8354. La utilización de otra batería podría provocar su deflagración o explosión. Las baterías de recambio pueden pedirse a IBM o a Concesionarios Autorizados IBM.

Safety Notice 5

Though main batteries have low voltage, a shorted or grounded battery can produce enough current to burn combustible materials or personnel.

Bien que le voltage des batteries principales soit peu élevé, le court-circuit ou la mise à la masse d'une batterie peut produire suffisamment de courant pour brûler des matériaux combustibles ou causer des brûlures corporelles graves.

Obwohl Hauptbatterien eine niedrige Spannung haben, können sie doch bei Kurzschluß oder Erdung genug Strom abgeben, um brennbare Materialien zu entzünden oder Verletzungen bei Personen hervorzurufen.

Sebbene le batterie di alimentazione siano a basso voltaggio, una batteria in corto circuito o a massa può fornire corrente sufficiente da bruciare materiali combustibili o provocare ustioni ai tecnici di manutenzione.

Aunque las baterías principales tienen un voltaje bajo, una batería cortocircuitada o con contacto a tierra puede producir la corriente suficiente como para quemar material combustible o provocar quemaduras en el personal.

Safety Information

This section contains the safety information that you need to be familiar with before servicing an Industrial Computer.

General Safety

Follow these rules to ensure general safety.

- Observe good housekeeping in the area of the system units during and after maintenance.
 - When lifting any heavy object:
 1. Ensure you can stand safely without slipping.
 2. Distribute the weight of the object equally between your feet.
 3. Use a slow lifting force. Never move suddenly or twist when you attempt to lift.
 4. Lift by standing or by pushing up with your leg muscles; this action removes the strain from the muscles in your back. *Do not attempt to lift any objects that weigh more than 16 kg (35 lb) or objects that you think are too heavy for you.*
 - Do not perform any action that causes hazards to the customer, or that makes the equipment unsafe.
 - Before you start the system unit, ensure that other service representatives and the customer's personnel are not in a hazardous position.
 - Place removed covers and other parts in a safe place, away from all personnel, while you are servicing the system unit.
 - Keep your tool case away from walk areas so that other people will not trip over it.
 - Do not wear loose clothing that can be trapped in the moving parts of a system unit. Ensure that your sleeves are fastened or rolled up above your elbows. If your hair is long, fasten it.
 - Insert the ends of your necktie or scarf inside clothing or fasten it with a nonconductive clip, approximately 8 centimeters (3 inches) from the end.
 - Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing.
- Remember:** Metal objects are good electrical conductors.
- Wear safety glasses when you are: hammering, drilling, soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that might be hazardous to your eyes.
 - After service, reinstall all safety shields, guards, labels, and ground wires. Replace any safety device that is worn or defective.
 - Reinstall all covers correctly before returning the system unit to the customer.

Electrical Safety

CAUTION:

Electrical current from power, telephone, and communication cables can be hazardous. To avoid any shock hazard, you should disconnect all power cords and cables as described in the following information.

For your safety, always do the following *before* removing the cover:

1. Turn off the system unit and any attached devices, such as printers, displays, and external drives.

Note: Industrial computer users in the United Kingdom who have a modem or fax machine attached to your system unit must disconnect the telephone line from the system unit *before* unplugging any power cords (also known as power cables). When reassembling the system unit, reconnect the telephone line *after* plugging in the power cords.

2. Unplug all the power cords from electrical outlets.
3. Disconnect all communication cables from external receptacles.
4. Disconnect all cables and power cords from the back of the system unit.

Note: Do not reconnect any cables or power cords until you reassemble the system unit and put the cover back on.

CAUTION:

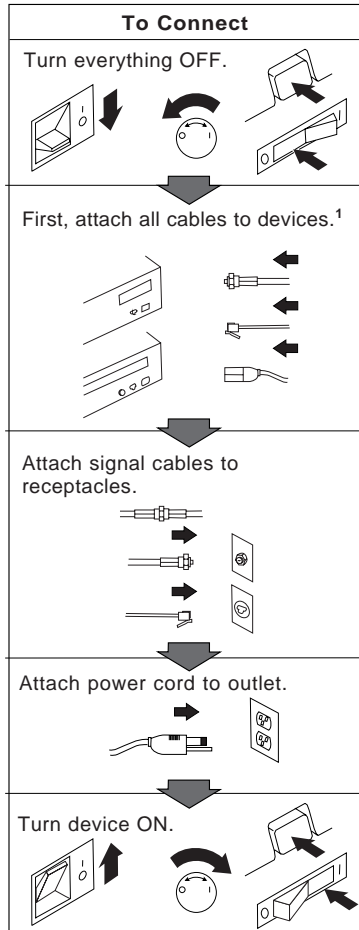
Never remove the cover on the power supply. If you have a problem with the power supply, have your system unit serviced.

CAUTION:

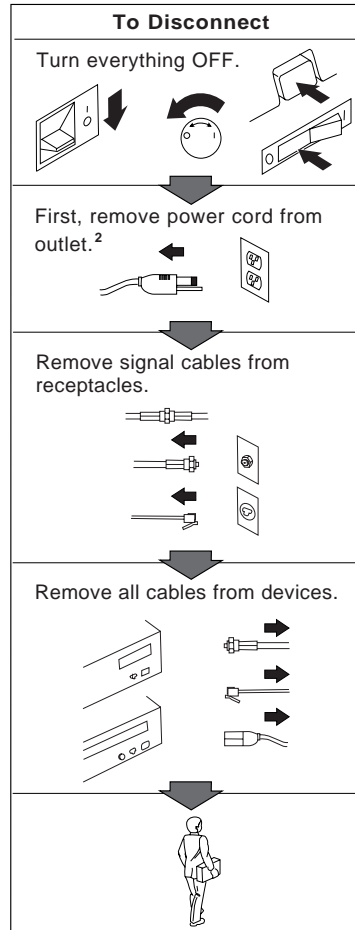
Depending on the options installed, the system unit could weigh more than one person can comfortably lift. Do not attempt to lift it by yourself; get another person to help you.

**DANGER:**

Electrical current from power, telephone, and communication cables is hazardous. To avoid shock hazard, connect and disconnect cables as shown below when installing, moving or opening the covers of this product or attached devices. The power cord must be used with a properly grounded outlet.



¹ In the U.K., by law, the telephone cable must be connected after the power cord.



² In the U.K., by law, the power cord must be disconnected after the telephone line cable.

Observe the following rules when working on electrical equipment.

Important

Use only approved tools and test equipment. Some hand tools have handles covered with a soft material that does not insulate you when working with live electrical currents.

Many customers have, near their equipment, rubber floor mats that contain small conductive fibers to decrease electrostatic discharges. Do not use this type of mat to protect yourself from electrical shock.

- Find the room emergency power-off (EPO) switch, disconnecting switch, or electrical outlet. If an electrical accident occurs, you can then operate the switch or unplug the power cord quickly.
- Do not work alone under hazardous conditions or near equipment that has hazardous voltages.
- Disconnect all power before:
 - Performing a mechanical inspection
 - Working near power supplies
 - Removing or installing main units
- Before you start to work on the system unit, unplug the power cord. If you cannot unplug it, ask the customer to power-off the wall box that supplies power to the system unit and to lock the wall box in the off position.
- If you need to work on a system unit that has *exposed* electrical circuits, observe the following precautions:
 - Ensure that another person, familiar with the power-off controls, is near you.

Remember: Another person must be there to switch off the power, if necessary.

- Use only one hand when working with powered-on electrical equipment; keep the other hand in your pocket or behind your back.

Remember: There must be a complete circuit to cause electrical shock. By observing the above rule, you may prevent a current from passing through your body.

- When using testers, set the controls correctly and use the approved probe leads and accessories for that tester.
- Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and system unit frames.

Observe the special safety precautions when you work with very high voltages; these instructions are in the safety sections of maintenance information. Use extreme care when measuring high voltages.

- Regularly inspect and maintain your electrical hand tools for safe operational condition.
- Do not use worn or broken tools and testers.
- *Never assume* that power has been disconnected from a circuit. First, *check* that it has been powered-off.
- Always look carefully for possible hazards in your work area. Examples of these hazards are moist floors, nongrounded power extension cables, power surges, and missing safety grounds.
- Do not touch live electrical circuits with the reflective surface of a plastic dental mirror. The surface is conductive; such touching can cause personal injury and system unit damage.

- Do not service the following parts (and similar units) *with the power on* when they are removed from their normal operating places in a system unit (this practice ensures correct grounding of the system units):
 - Power supply units
 - Pumps
 - Blowers and fans
 - Motor generators
- If an electrical accident occurs:
 - **Use caution; do not become a victim yourself.**
 - **Switch off power.**
 - **Send another person to get medical aid.**

Safety Inspection Guide

The intent of this inspection guide is to assist you in identifying potentially unsafe conditions on these products. Each system unit, as it was designed and built, had required safety items installed to protect users and service personnel from injury. This guide addresses only those items. However, good judgment should be used to identify potential safety hazards due to attachment of non-IBM features or options not covered by this inspection guide.

If any unsafe conditions are present, you must determine how serious the apparent hazard could be and whether you can continue without first correcting the problem.

Consider these conditions and the safety hazards they present:

- Electrical hazards, especially primary power (primary voltage on the frame can cause serious or fatal electrical shock).
- Explosive hazards, such as a damaged CRT face or bulging capacitor
- Mechanical hazards, such as loose or missing hardware

The guide consists of a series of steps presented in a checklist. Begin the checks with the power off, and the power cord disconnected.

Checklist:

1. Check exterior covers for damage (loose, broken, or sharp edges).
2. Power-off the system unit and disconnect the power cord.
3. Check the power cord for:
 - a. A third-wire ground connector in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and frame ground.
 - b. The power cord should be the appropriate type as specified in the parts listings.
 - c. Insulation must not be frayed or worn.
4. Remove the cover.
5. Check for any obvious non-IBM alterations. Use good judgment as to the safety of any non-IBM alterations.
6. Check inside the unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Handling Electrostatic-Discharge-Sensitive Devices

Any system unit part containing transistors or integrated circuits (ICs) should be considered sensitive to electrostatic discharge (ESD). ESD damage can occur when there is a difference in charge between objects. Protect against ESD damage by equalizing the charge so that the system unit, the part, the work mat, and the person handling the part are all at the same charge.

Notes:

1. Use product-specific ESD procedures when they exceed the requirements noted here.
2. Make sure that the ESD protective devices you use have been certified (ISO 9000) as fully effective.

When handling ESD-sensitive parts:

- Keep the parts in protective packages until they are inserted into the product.
- Avoid contact with other people.
- Wear a grounded wrist strap against your skin to eliminate static on your body.
- Prevent the part from touching your clothing. Most clothing is insulative and retains a charge even when you are wearing a wrist strap.
- Use the black side of a grounded work mat to provide a static-free work surface. The mat is especially useful when handling ESD-sensitive devices.
- Select a grounding system, such as those listed below, to provide protection that meets the specific service requirement.

Note: The use of a grounding system is desirable but not required to protect against ESD damage.

- Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.
- Use an ESD common ground or reference point when working on a double-insulated or battery-operated system unit. You can use coax or connector-outside shells on these system units.
- Use the round ground-prong of the AC plug on AC-operated system units.

Grounding Requirements

Electrical grounding of the system unit is required for operator safety and correct system unit function. Proper grounding of the electrical outlet can be verified by a certified electrician.

Power Cord Notice

For your safety, IBM provides a power cord with a grounded attachment plug to use with this IBM product. To avoid electrical shock, always use the power cord and plug with a properly grounded outlet.

IBM power cords used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA).

For units intended to be operated at 115 volts: Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a parallel blade, grounding-type attachment plug rated 15 amperes, 125 volts.

For units intended to be operated at 230 volts (U.S. use): Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a tandem blade, grounding-type attachment plug rated 15 amperes, 250 volts.

For units intended to be operated at 230 volts (outside the U.S.): Use a cord set with a grounding-type attachment plug. The cord set should be marked <HAR> and have the appropriate safety approvals for the country in which the equipment will be installed.

IBM power cords for a specific country are usually available only in that country:

IBM Power Cord Part Number	Used in These Countries
13F9940	Argentina, Australia, New Zealand, Papua New Guinea, Paraguay, Uruguay, Western Samoa
13F9979	Afghanistan, Algeria, Andorra, Angola, Austria, Belgium, Benin, Bulgaria, Burkina Faso, Burundi, Cameroon, Central African Rep., Chad, Czech Republic, Egypt, Finland, France, French Guiana, Germany, Greece, Guinea, Hungary, Iceland, Indonesia, Iran, Ivory Coast, Jordan, Lebanon, Luxembourg, Macau, Malagasy, Mali, Martinique, Mauritania, Mauritius, Monaco, Morocco, Mozambique, Netherlands, New Caledonia, Niger, Norway, Poland, Portugal, Romania, Senegal, Slovakia, Spain, Sudan, Sweden, Syria, Togo, Tunisia, Turkey, former USSR, Vietnam, former Yugoslavia, Zaire, Zimbabwe
13F9997	Denmark
14F0015	Bangladesh, Burma, Pakistan, South Africa, Sri Lanka
14F0033	Antigua, Bahrain, Brunei, Channel Islands, Cyprus, Dubai, Fiji, Ghana, Hong Kong, India, Iraq, Ireland, Kenya, Kuwait, Malawi, Malaysia, Malta, Nepal, Nigeria, Polynesia, Qatar, Sierra Leone, Singapore, Tanzania, Uganda, United Kingdom, Yemen, Zambia
14F0051	Liechtenstein, Switzerland
14F0069	Chile, Ethiopia, Italy, Libya, Somalia
14F0087	Israel
1838574	Thailand
20L2795	China (PRC)
62X1045	Bahamas, Barbados, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Korea (South), Liberia, Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Surinam, Taiwan, Trinidad (West Indies), United States of America, Venezuela

Required Electronic Emission and Connectivity Notices

Class A Federal Communications Commission Statement

Federal Communications Commission (FCC) Statement

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

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

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

Industry Canada Compliance Statement

This Class A digital apparatus complies with the Canadian ICES-003.

Cet appareil numérique de la classe A conform à la norme NMB-003 du Canada.

United Kingdom

Notice to United Kingdom Users

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

European Union (EU) Electromagnetic Compatibility Directive

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility.

IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22 / European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

Attention

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take adequate measures. If the Ethernet port is connected, 100 ohm category 5 shielded twisted-pair Ethernet cable must be used to reduce the potential for causing interference to radio and TV communications and to other electrical or electronic equipment. IBM cannot accept responsibility for any interference caused by other-than-recommended cables and connectors.

Germany**Zulassungsbescheinigung laut Gesetz über die
elektromagnetische Verträglichkeit von Geräten (EMVG)
vom 30. August 1995**

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Der Aussteller der Konformitätserklärung ist die:

International Business Machines
Embedded Systems Development
1798 N.W. Spanish River Boulevard
Boca Raton FL 33431
U.S.A.

Informationen in Hinsicht EMVG Paragraph 3, Abs. 2:

Das Gerät erfüllt die Schutzanforderungen nach EN 50082-1 und
EN 55022 Klasse A.

EN 55022 Klasse A Geräte bedürfen folgender Hinweise:

Nach dem EMVG:

"Geräte dürfen an Orten, für die sie nicht ausreichend entstört sind, nur mit besonderer Genehmigung des Bundesministeriums für Post und Telekommunikation oder des Bundesamtes für Post und Telekommunikation betrieben werden. Die Genehmigung wird erteilt, wenn keine elektromagnetischen Störungen zu erwarten sind." (Auszug aus dem EMVG, Paragraph 3, Abs. 4)

Dieses Genehmigungsverfahren ist nach Paragraph 9 EMVG in Verbindung mit der entsprechenden Kostenverordnung (Amtsblatt 14/93) kostenpflichtig.

Nach der EN 55022:

"Dies ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen durchzuführen und dafür aufzukommen."

Anmerkung:

Um die Einhaltung des EMVG sicherzustellen, sind die Geräte wie in den Handbüchern angegeben zu installieren und zu betreiben.

Japan

Japanese Voluntary Control Council for Interference (VCCI) Statement

This product is a Class A Information Technology Equipment and conforms to the standards set by the Voluntary Control Council for Interference by Information Technology Equipment. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Korea

Korean Communications Statement

Please note that this device has been certified for business use with regard to electromagnetic interference. If you find this is not suitable for your use, you may exchange it for one of residential use.

Taiwan

Taiwan Class A Warning Statement

This product is a Class A. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

警告使用者：
這是甲類B 資訊產品，在
居住的環境中使用時，可
能會造成射頻干擾，在這
種情況下，使用者會被要
求採取某些適當的對策。

Laser Compliance Statement

The CD-ROM drive in the system unit is a laser product. The CD-ROM drive's classification label (sample shown below) is located on the drive.

	CLASS 1 LASER PRODUCT LASER KLASSE 1 LUOKAN 1 LASERLAITE APPAREIL A LASER DE CLASSE 1 KLASSE 1 LASER APPARAT
Note: Do not open the drive; no user adjustments or serviceable parts are inside.	

The CD-ROM drive is certified in the U.S. to conform to the requirements of the Department of Health and Human Services 21 Code of Federal Regulations (DHHS 21 CFR) Subchapter J for Class 1 laser products.

In other countries, the drive is certified to conform to the requirements of EN60825.

Class 1 laser products are not considered to be hazardous. The CD-ROM drive has an internal Class I (1), 0.5-milliwatt, aluminum gallium-arsenide laser that operates at a wavelength of 760 to 810 nanometers.

The design of the laser system and the CD-ROM drive ensures that there is no exposure to laser radiation above a Class 1 (1) level during normal operation, user maintenance, or servicing conditions.

German Power Switch Statement

The 7581 Computer power switch is marked with a “–” for On and an “O” for Off.

Der 7588 Hauptschalter ist mit einem “–” für ein-, und einem “O” für ausgeschalten versehen.

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Part Number 11N9580

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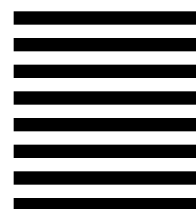
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