



Personal System/2
Model P75 486
Quick Reference





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Model P75 486
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First Edition (October 1990)

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CAUTION:

This product is equipped with a 3-wire power cord and plug for the user's safety. Use this power cord in conjunction with a properly grounded electrical outlet to avoid electrical shock.

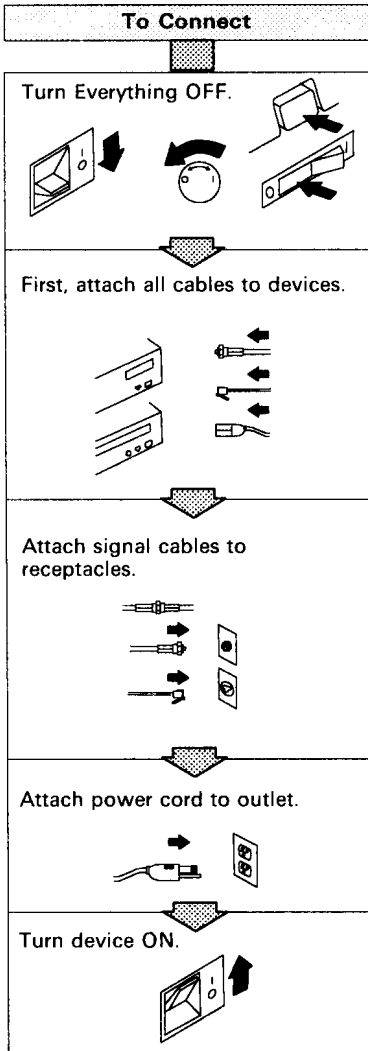
CAUTION:

The plasma display panel contains a small amount of mercury, cadmium, and lead. Follow your local ordinances or regulations for its proper disposal.

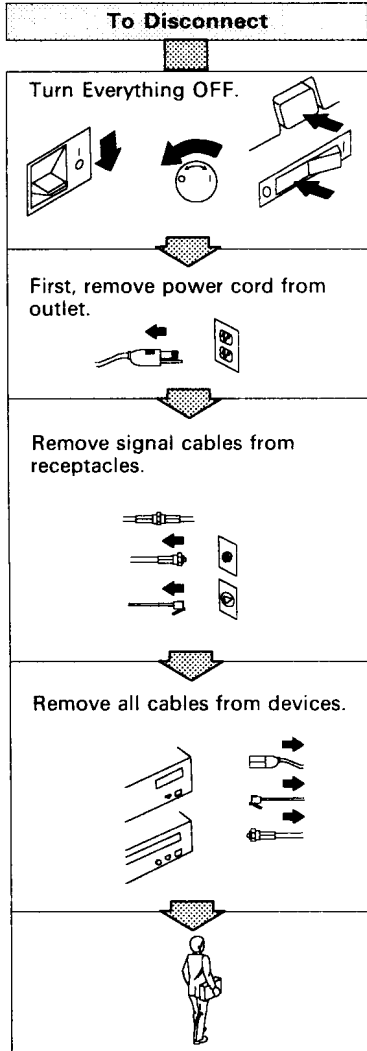
Electrical Safety



DANGER: Electrical current from power, telephone, and communications 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.



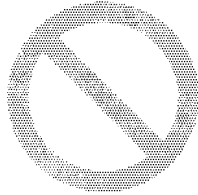
Note: In the UK, by law, the telephone cable must be connected after the power cord.



Note: In the UK, by law, the power cord must be disconnected after the telephone line cable.

Symbol Definition

The symbol below appears in the system unit label and the manuals. It is used in combination with a graphic indicating certain actions. It means that the actions shown must not be done.



Advanced Features

This computer has many advanced features. Please read the performance enhancement sections in this manual on:

The Plasma Display

The plasma display is 16-level grayscale VGA resolution gas plasma display. To obtain the most from your new display, refer to the sections on Plasma Display Information and Plasma Display Brightness.

The IBM Disk Cache

To obtain improved system performance, refer to the section on the IBM Disk Cache.

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Chapter 1. Before Using the IBM Personal System/2 Model P75 486



This chapter provides step-by-step procedures for setting up the IBM PS/2 Model P75 486.

When you complete Step 6, you can use the IBM PS/2 Model P75 486.

This chapter contains:

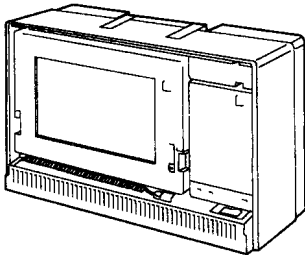
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Step 1. Checking Parts

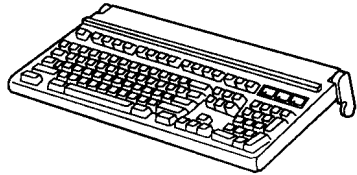
Note: Before starting, read "Electrical Safety" on page iv.

- 1** Check each box () as you identify each item. If any required items are missing, call your place of purchase.

System Unit



Keyboard



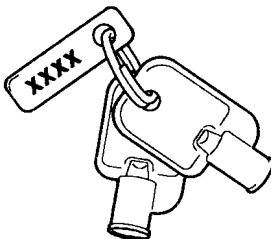
Keyboard Overlay (blank)



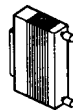
Power Cord



Rear Cover Keys

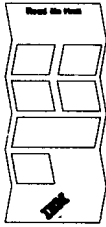


SCSI Terminator



(Continued on the next page)

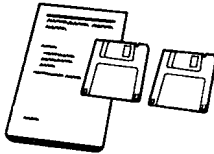
Read Me First!



Quick Reference (the present book) and Reference Diskette

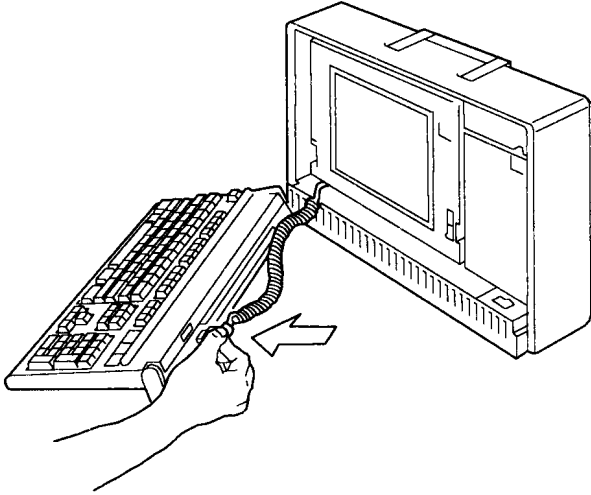


XGA Device Drivers Installation Instructions and Two Diskettes

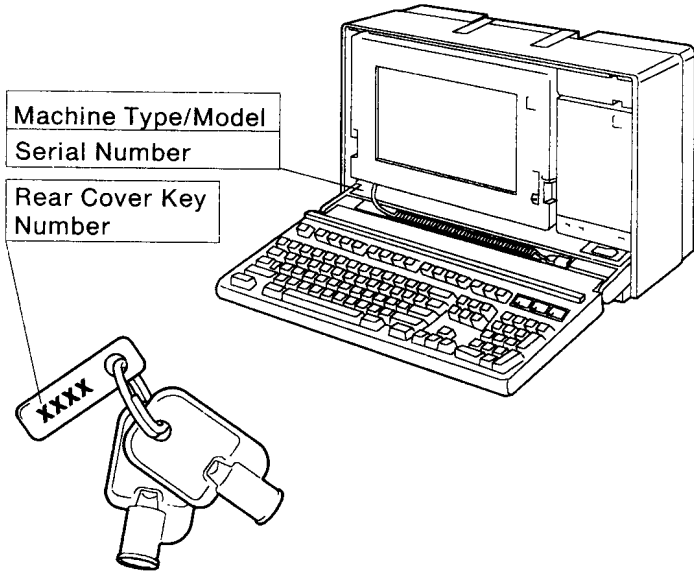


Step 2. Becoming Familiar with the Computer

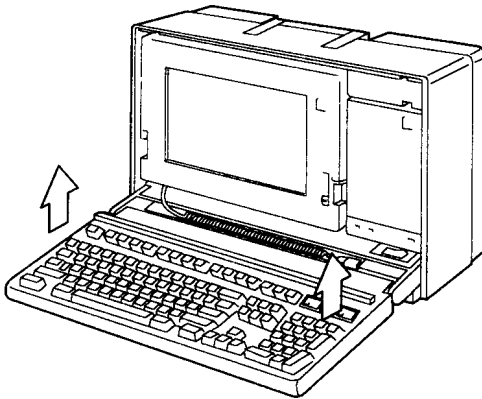
- 1 Connect the keyboard cable into the keyboard.



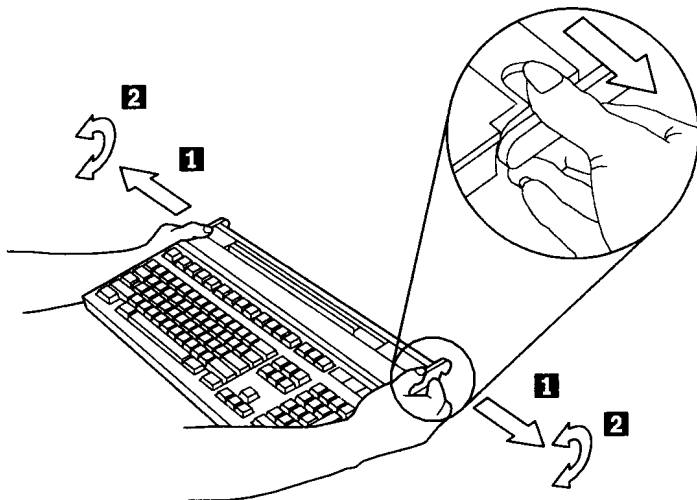
- 2** Record the model number and serial number of your system unit as well as the rear cover key number. Write the information on page 95. This information will be helpful when you have the system unit serviced.



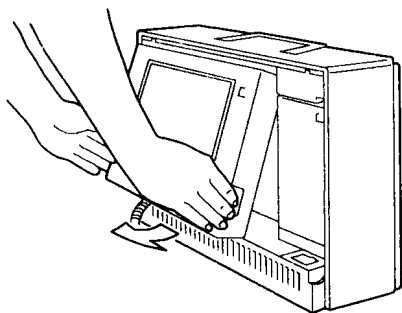
- 3** If you want to remove the keyboard from the system unit, lift it upward.



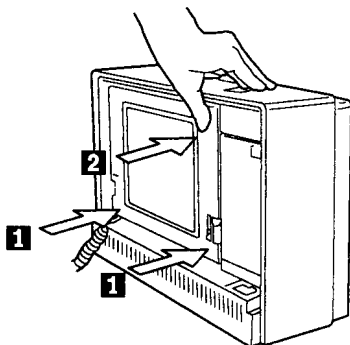
To adjust the angle of the keyboard, pull out both feet at the same time **1** and then turn them **2**.



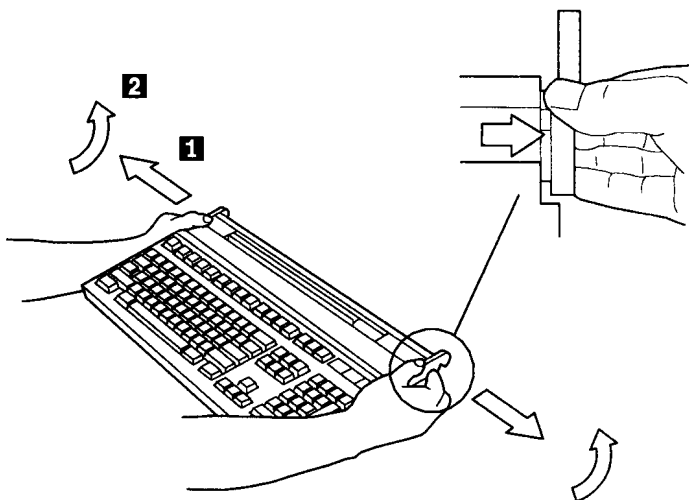
4 Set the plasma display at comfortable angle by pulling the lower edges.



- 5** Put the plasma display back into its normal place by first pushing back the lower edges **1** and then pressing the upper edge **2** until it is locked.

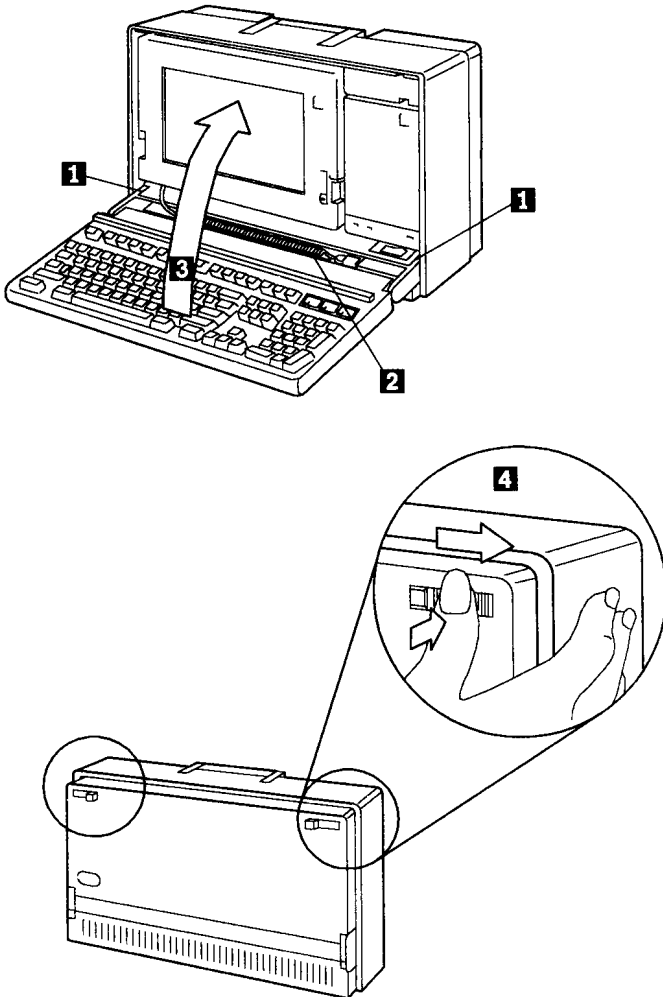


- 6** Tilt back the keyboard feet by pulling them out then turning them.



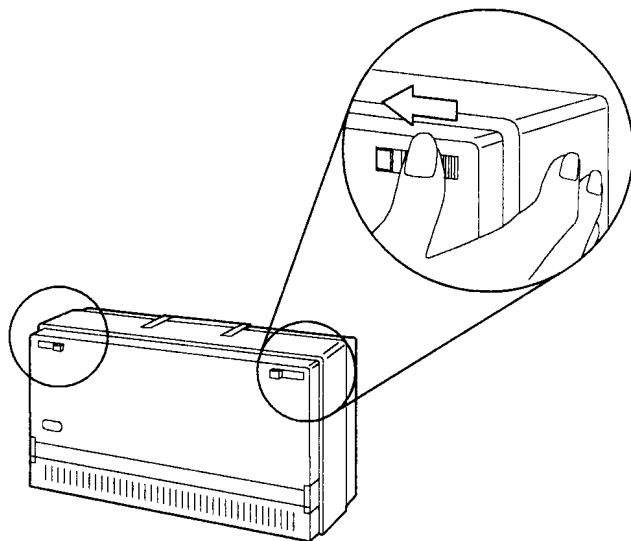
7 Set the keyboard feet in the groove of the system unit **1**, and set the keyboard cable in the keyboard cable groove **2**. Then raise the keyboard into place **3**, then push and slide its clamps outward to lock the keyboard onto the system unit **4**.

Note: The keyboard is locked on the system unit when you no longer see the yellow color next to the keyboard clamps.

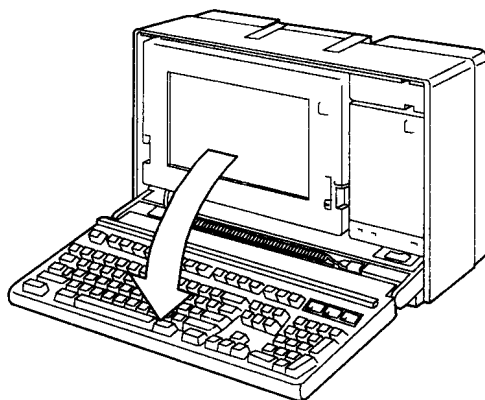


- 8** Slide the keyboard clamps inward to unlock the keyboard from the system unit.

Note: The yellow color you see as you slide the keyboard clamps indicates that the keyboard is unlocked from the system unit.



- 9** Lower the keyboard.

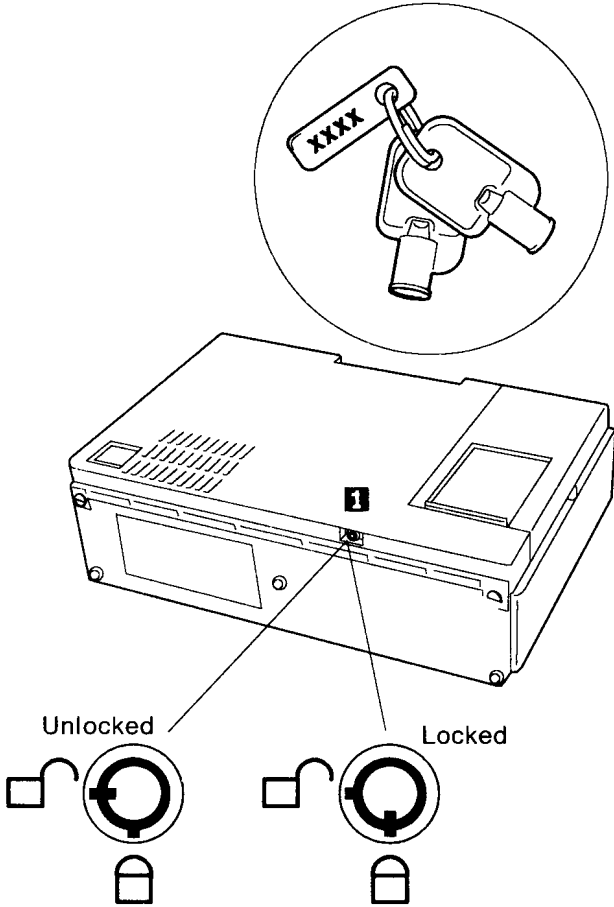


- 10** Lock the keyboard onto the system unit using the procedure provided in 7 on page 8.

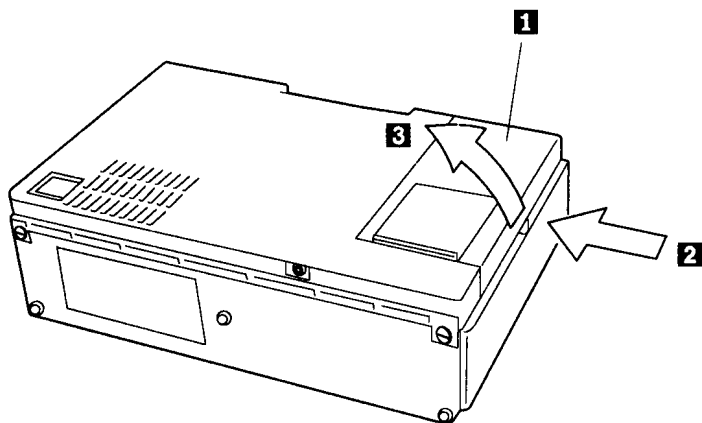
Step 3. Installing Internal Options

Step 3a. Removing the Rear Cover

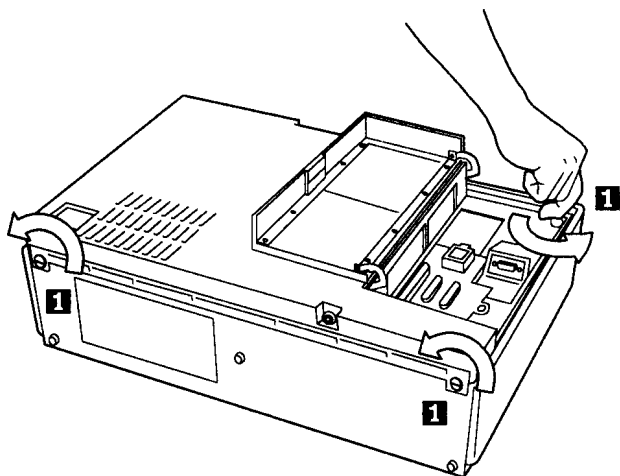
- 1 Lay the system unit on its keyboard side. Unlock the rear cover lock **1** if needed.



- 2** Open the connector housing door **1** by moving the side of the door in the direction of **2** and **3**.



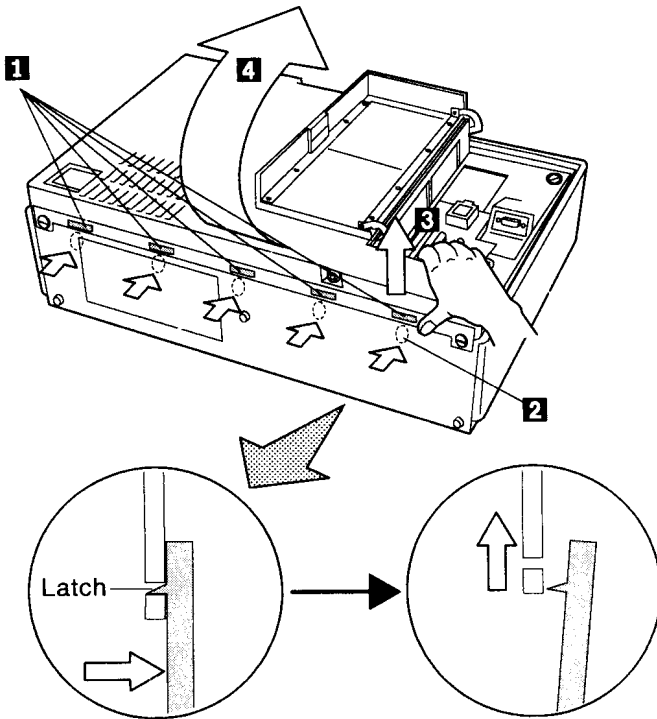
- 3** Loosen the rear cover screws **1** with a coin until they pop up.



- 4** Move the handle to the carrying position.

5 Do the following.

- a. Ensure that the rear cover lock is unlocked.
- b. Identify the five latches **1** in the following figure.
- c. Identify each point **2** (shown by dotted circle in the figure) immediately below each latch.
- d. Repeat the following from the rightmost latch to the leftmost latch, one by one.
 - 1) Strongly push the point **2** immediately below the latch to release it.
 - 2) Lift the rear cover so that the latch does not lock again (**3**).
- e. After releasing all the five latches, lift and remove the rear cover (**4**).



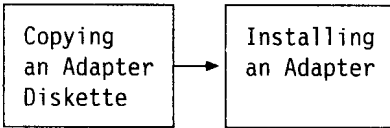
Step 3b. Installing Adapters

Non-IBM Adapters

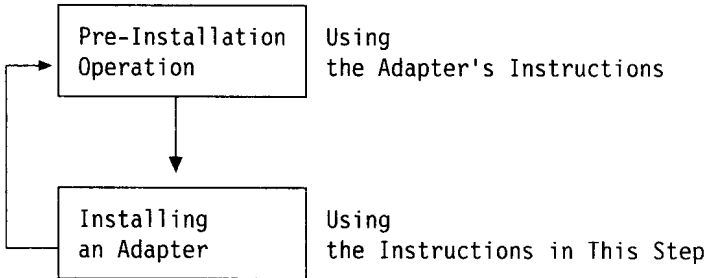
Non-IBM adapters may require different instructions. Refer to the instructions supplied with those adapters.

IBM Adapters

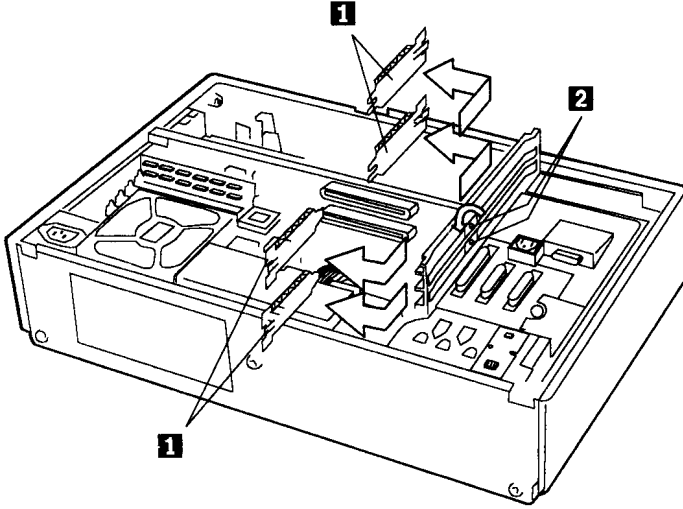
Most of the instructions that come with IBM adapters tell you to install them in the following sequence.



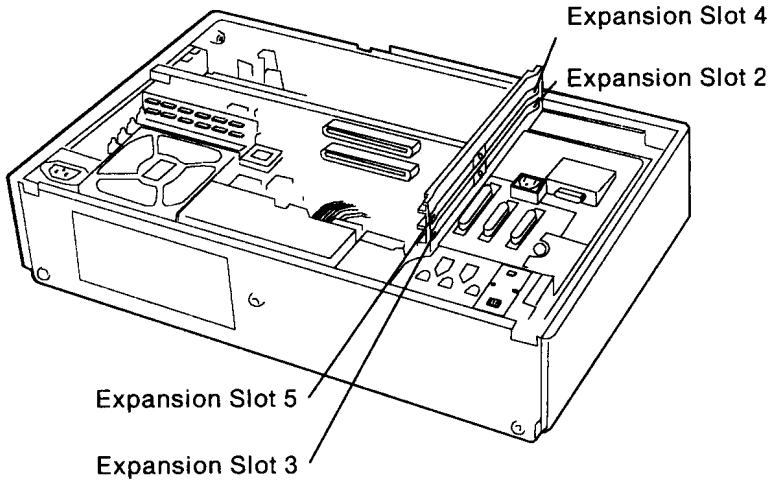
However, disregard the sequence to first install **all** IBM adapters using the instructions provided in this step. For how to do such a pre-installation operation as installing memory on a adapter, follow the adapter's instructions. For when to copy an adapter diskette, you will be instructed in later steps. Do the following in this step.



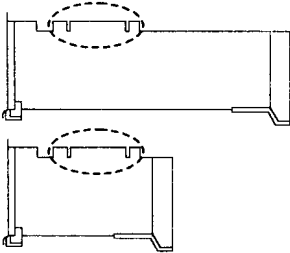
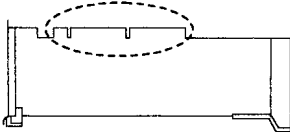
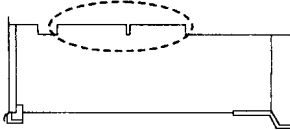
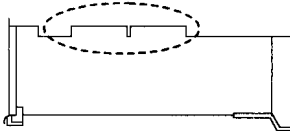
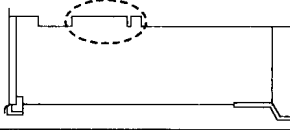
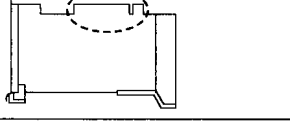
- 1** Remove the expansion slot covers **1**. To do this, loosen the thumbscrews **2** (use a coin if they are too tight), slide the expansion slot covers outward, and push them out. You may discard the expansion slot covers.



- 2** Note locations of expansion slots 4, 2, 5, and 3.



- 3** Find the picture that matches the adapter to be installed; use the prescribed expansion slot. Use the bottom of the table to know the expansion slot availability.

Adapter Type	Usable Expansion Slot								
	4 only								
	4 only								
	2 only								
	2 or 4								
	2 is recommended. 4 is also available.								
	3 is recommended. 5, 2, or 4 is also available.								
Available Expansion Slots:									
<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 15%;">4</td> <td style="width: 15%;"></td> <td style="width: 15%;">2</td> <td style="width: 15%;"></td> <td style="width: 15%;">5</td> <td style="width: 15%;"></td> <td style="width: 15%;">3</td> <td style="width: 15%;"></td> </tr> </table>		4		2		5		3	
4		2		5		3			

4 Install an adapter.

- To install an adapter into the expansion slot 3 or 5, go to sub-steps 5 and 6.
- To install an adapter into the expansion slot 2 or 4, go to sub-steps 7 and 8.

5

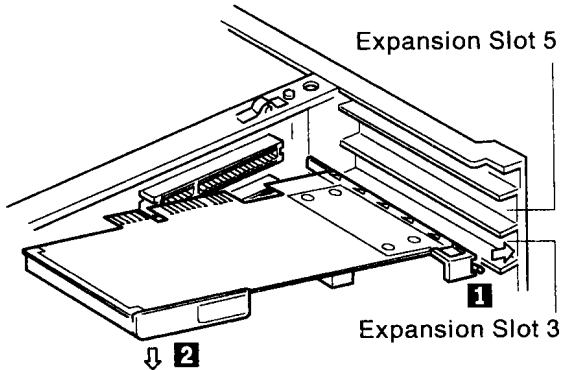
Connector Side Right

When using the expansion slots 3 or 5, place the connector side (**1**) of the adapter toward the expansion slot 3 or 5 as shown in the following figure.

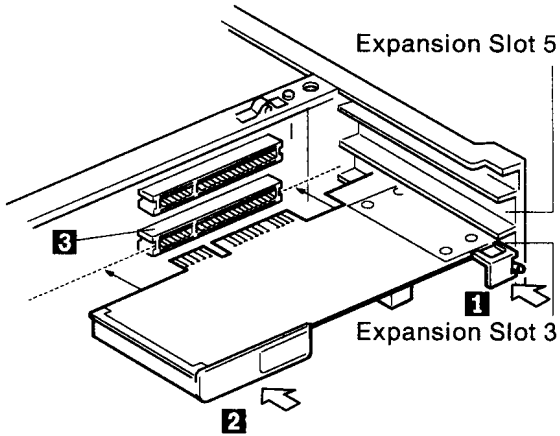
Lower Slot First

When using both expansion slots 3 and 5, first install an adapter into the expansion slot 3.

Slowly insert the right end **1** of the adapter into the expansion slot 3 while slowly lowering the left end **2** of the adapter, as shown in the figure below.



- 6** Firmly press the adapter into the expansion slot connector **3** until the adapter clicks into place, as shown in the figure below.



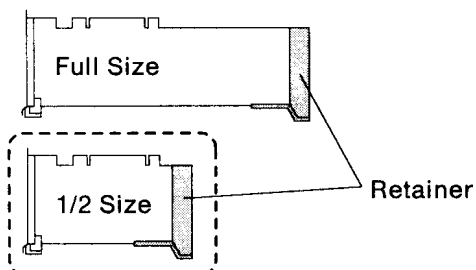
Note: After installing the adapter, record the following in the table on page 27:

- The adapter name
- What you will connect to the adapter.

This information will be helpful in later steps.

7

Remove the Retainer



When inserting a half size adapter into expansion slots 2 or 4, and the adapter has a retainer, you must remove it before insertion. For how to remove it, see page 112.

Connector Side Left

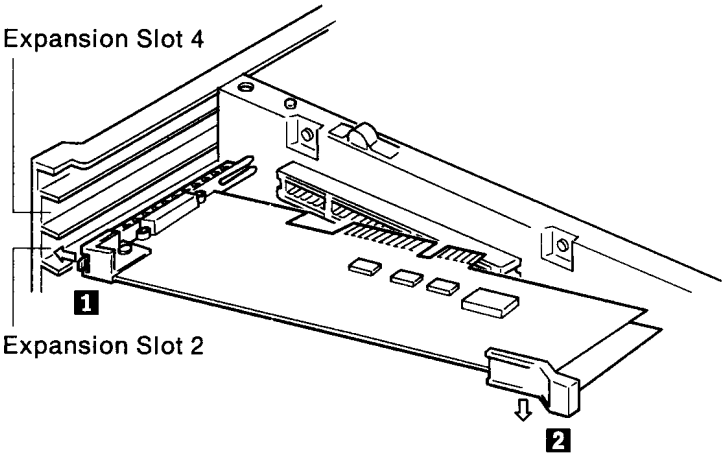
When using expansion slots 2 or 4, place the connector side (**1**) of the adapter toward the expansion slot 2 or 4 as shown in the following figure.

Lower Slot First

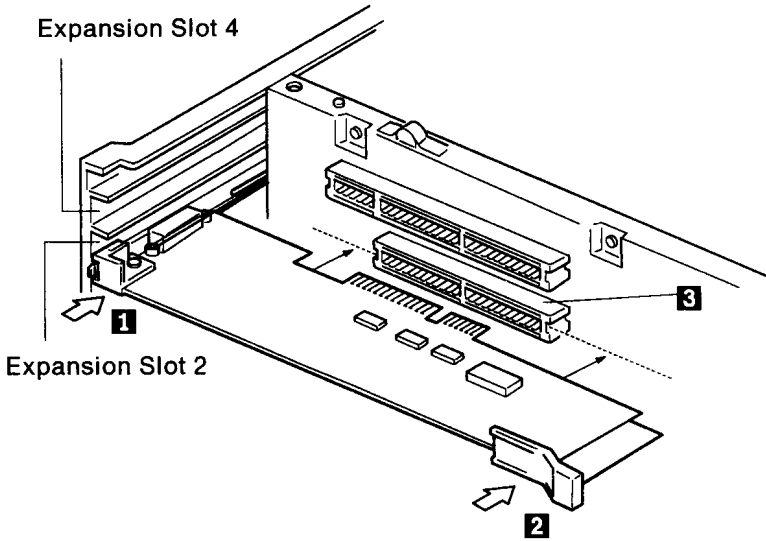
When using both expansion slots 2 and 4, first install an adapter into the expansion slot 2.

Turn the system unit so that the handle faces you.

Slowly insert the left end **1** of the adapter into the expansion slot 2 while slowly lowering the right end **2** of the adapter, as shown in the figure below.



- 8** Firmly press the adapter into the expansion slot connector **3** until the adapter clicks into place, as shown in the figure below.



Note: After installing the adapter, record the following in the table on page 27:

- The adapter name
- What you will connect to the adapter.

This information will be helpful in later steps.

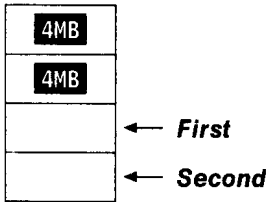
- 9** Tighten each thumbscrew. Their location is shown in the first figure on page 14.

Step 3c. Installing Memory Module Kits

Use these instructions to install memory module kits on the system board. If you are installing memory on an adapter, refer to the instructions supplied with the adapter.

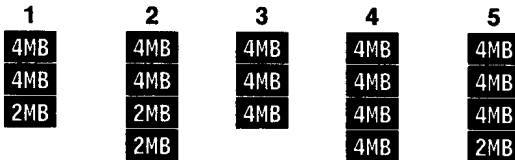
Notes:

1. If you need to know how to remove a memory module kit, refer to 5 on page 80.
2. Two 4MB memory module kits have been installed as standard items. If you install additional memory module kits, install each memory module kit in the order shown in the following figure.

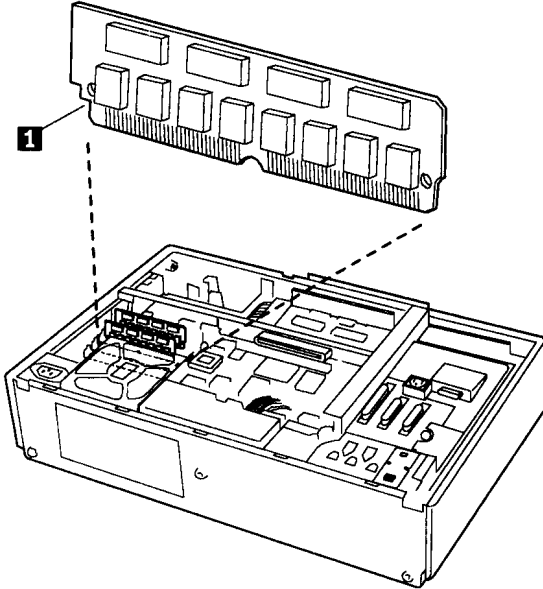


Important

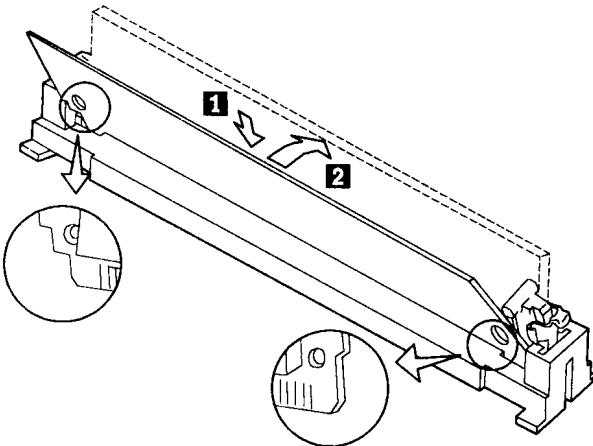
When you expand the memory capacity by installing additional 2MB or 4MB memory module kits, select one of the following arrangements 1 through 5. Arrangements other than these makes the access time slower.



1 Locate the notch **1** on the memory module kit. Hold the memory module kit with the notch facing to the left of the system unit.



2 Insert the memory module kit at an angle **1** into the connector and press it into place. Then pivot the kit **2** until it snaps into place.



Step 3d. Installing the Rear Cover

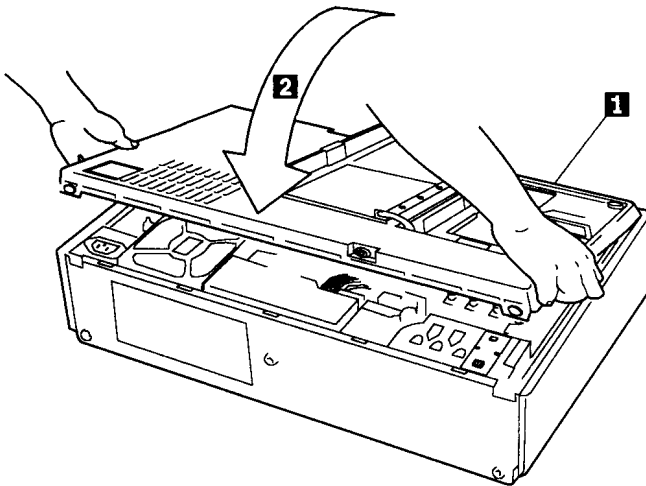
SCSI ID

If you connect external SCSI (small computer system interface) devices to the computer and want to run application programs under an operating system that resides on one of the external SCSI device, you must reset the SCSI ID of the built-in SCSI to any of 5 through 0.

If you reset the SCSI ID, go to "Connecting External SCSI Devices" on page 51 and then return here to install the rear cover.

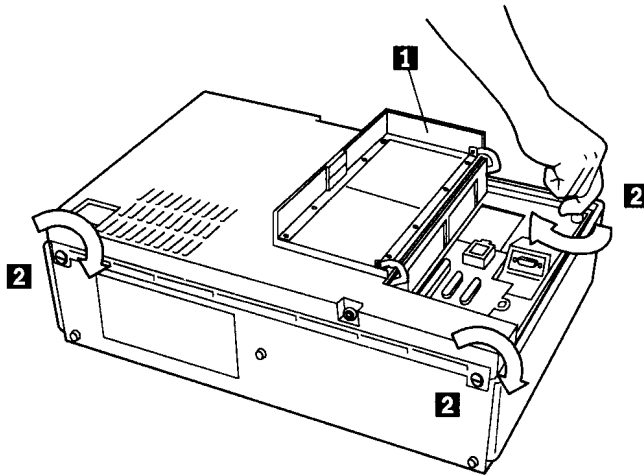
If you do not reset the SCSI ID, install the rear cover using the procedure below.

- 1 Install the rear cover by putting its far edge **1** on the system unit and pushing its near side **2** down until it clicks.



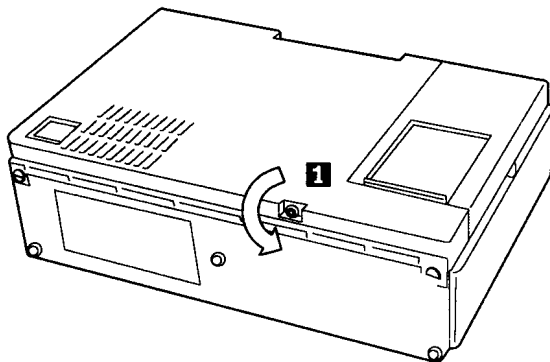
- 2** Open the connector housing door **1**. Lock the rear cover onto the system unit by turning the rear cover screws **2** with a coin.

Warning: Do not overtighten the screw.



- 3** Close the connector housing door.

- 4** Lock the rear cover lock **1**.



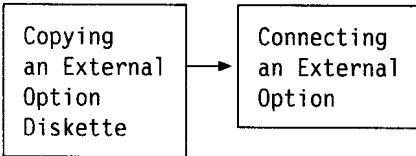
Step 4. Connecting External Options

Non-IBM External Options

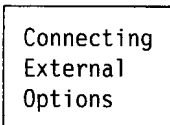
Non-IBM external options may require different instructions. Refer to the instructions supplied with those external options.

IBM External Options

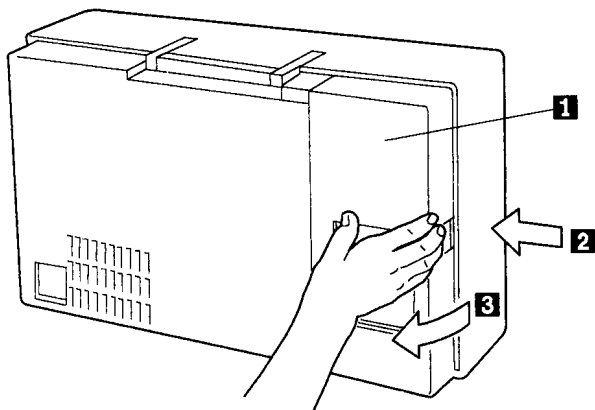
Most of the instructions that come with IBM external options tell you to connect them in the following sequence.



However, disregard the sequence to first connect **all** IBM external options using the instructions provided in this step. For when to copy an IBM external option diskette, you will be instructed in later steps. Do the following in this step.



- 1** Open the connector housing door **1** by moving the side of the door in the direction of **2** and **3**.



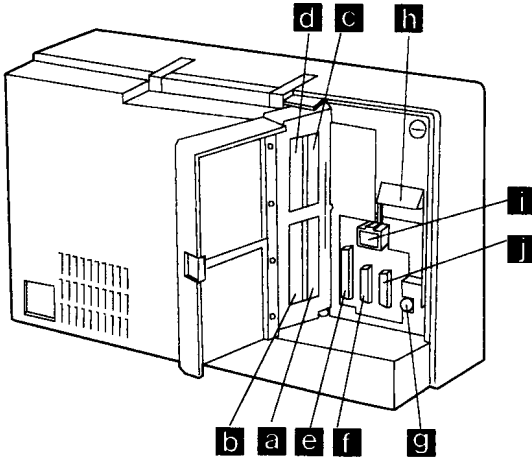
2

The Terminator for the Internal SCSI



If you do not use an external SCSI device, you must connect the SCSI terminator that was shipped with the computer to **e**. This terminator is used for the internal (built-in) SCSI.

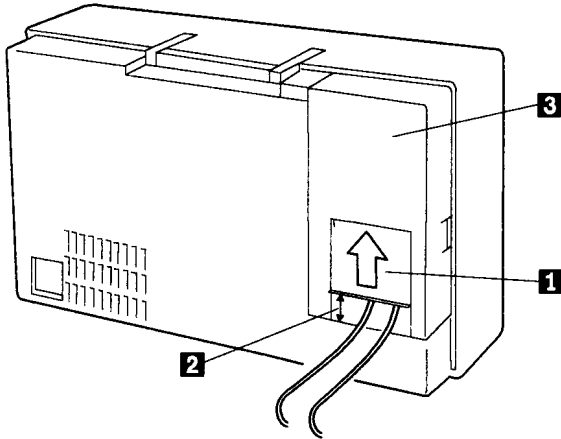
Connect devices into the connectors in alphabetical order as shown in the following table. Tighten each thumbscrew.



<i>If you use</i>	<i>Connect it to:</i>	<i>Note</i>
	a	Expansion slot 3:
	b	Expansion slot 5:
	c	Expansion slot 2:
	d	Expansion slot 4:

<i>If you use</i>	<i>Connect it to:</i>	<i>Note</i>
External SCSI Devices	e	<ol style="list-style-type: none"> 1. See "Connecting External SCSI Devices" on page 51. 2. Keep the SCSI terminator that was shipped with the computer. 3. Called Slot 1 in the system configuration.
Printer or scanner	f	If you use the data migration facility (part number 1501224), connect it to a sending system; not to f .
Mouse or other pointing device	g	
External PS/2 display	h	<ol style="list-style-type: none"> 1. If you installed a PS/2 display adapter, you should connect a PS/2 display to the connector (d) of the adapter; not to h. 2. The external PS/2 display should be located over five inches from the diskette drive.
5.25 inch External Diskette Drive	i	A conversion cable may be required in some cases. The conversion cable can be ordered as an option (part number 23F2716).
Modem or plotter, etc.	j	

- 3** Move the connector housing shield **1** upward to provides an opening for the plugged-in cables. Route the plugged-in cables through the opening **2** . Close the connector housing door **3** .



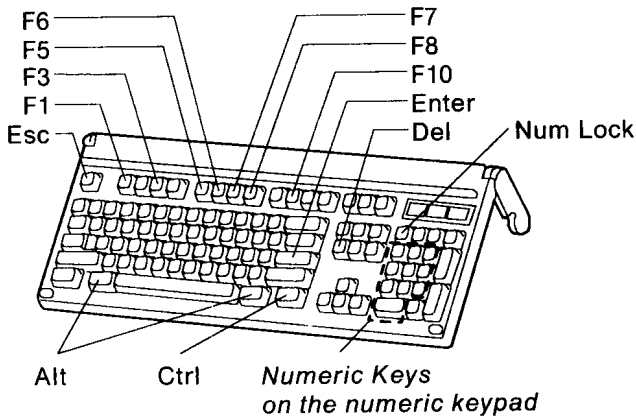
Step 5. Starting the Reference Diskette

Before Starting

Unlike the previous steps, you will interact with the computer in this step guided by the screen instructions. Before starting, read this step from beginning to end. Knowing beforehand what to do in this step will make the interaction easier.

Keyboard Key Location

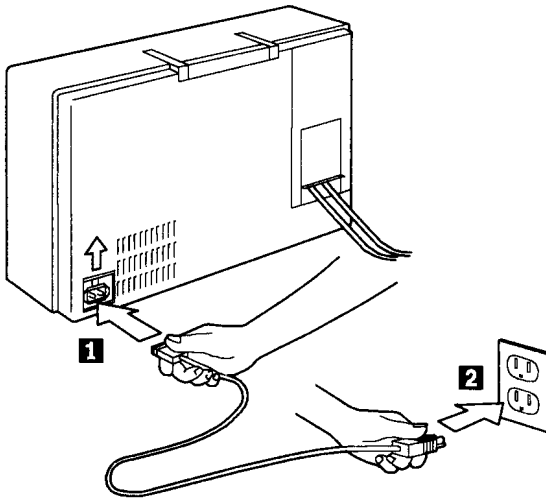
The following figure shows the location of keys that are used in this step.



1 DANGER

Do not perform this sub-step during an electrical storm. The power cord can conduct lethal charges of electricity.

Plug the display power cord into the system unit **1**; plug the other end into an electrical outlet **2**.



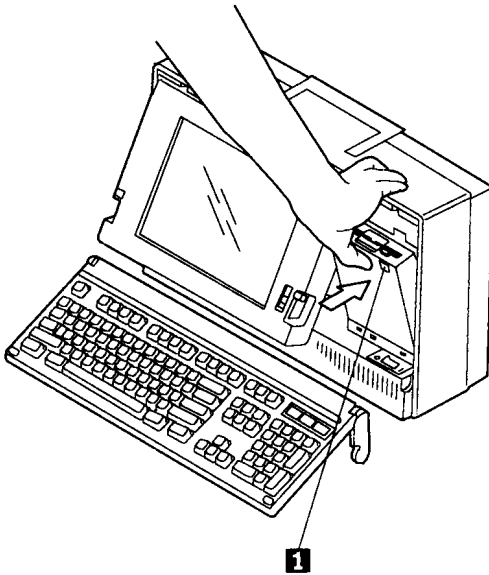
- 2** Turn on all the devices connected to the computer. **However, do not turn on the computer at this point of time.**
- 3** Obtain a working diskette whose storage capacity is 2MB (Megabytes). To identify a 2MB diskette, see page 99.
- 4** Make sure that the working diskette is write-enabled by referring to page 100.
- 5** Gather the following diskettes in one place:
 - The working diskette
 - The Reference Diskette
 - Option diskettes that came with adapters or external devices.

6 Lower the keyboard by using the procedure on page 4.

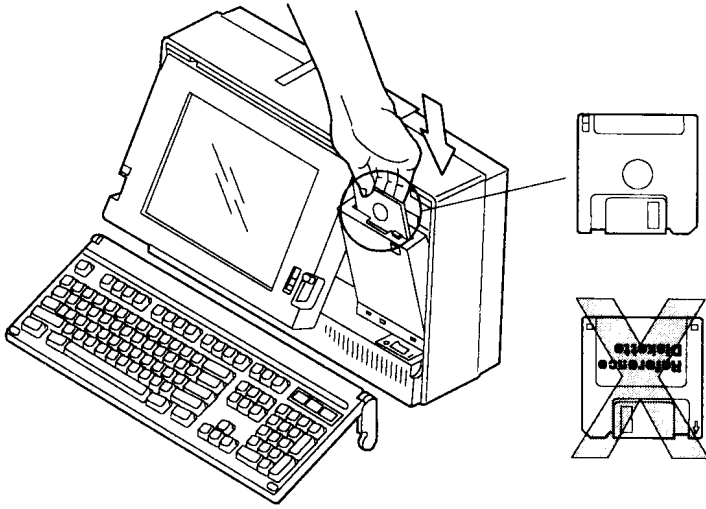
7 Push the diskette drive stand-off **1**; the diskette drive will move out.

Notes:

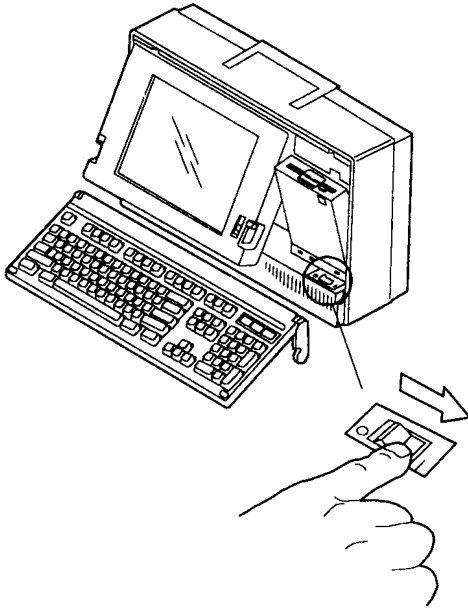
- a. This diskette drive is called **Drive A**.
- b. Pushing the stand-off moves the diskette drive in and out.
- c. The diskette drive can be used either at the open or the closed positions. However, to avoid the accidental dropping of foreign material into the drive, it is recommended to use it in the closed position.



- 8** Insert the Reference Diskette, with the label facing toward the system unit and metal-shutter end first, into the drive. Make sure the diskette clicks into place.



9 Turn on the computer.



10 The following screens appear.

Note: When an external PS/2 display is connected to the external PS/2 display connector, the plasma display of your computer goes blank. However, continue this setup using the screen of the external PS/2 display. You will be instructed how to turn on both displays in a later step.

XXXXX KB OK

XXXXX KB OK
161

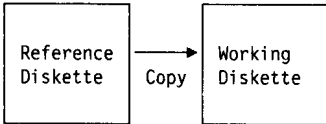
XXXXX KB OK
161
163

11 Then the following screen appears.



12 Press Enter and follow the instructions on the screen.

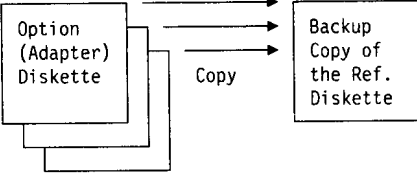
The following illustrates the sequence of what you will do guided by the instructions.

Copying the Reference Diskette	Note
	After the backup copy of the Reference Diskette is made, put the original Reference Diskette in a safe place and always use the backup copy.

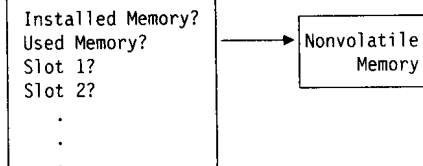


Setting the Date and Time	Note
<p>Current date : <input type="text" value="25-05-1990"/> ←</p> <p>Current time : <input type="text" value="08:00:01"/> ←</p>	If you use numeric keys on the numeric keypad during this operation, press the Num Lock key to enter num lock mode. To exit from num lock mode, press the Num Lock key again.

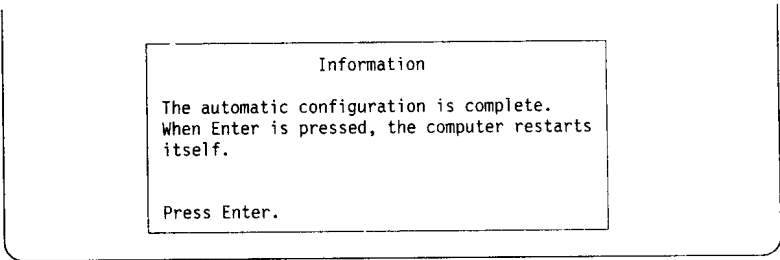


Copying Option Diskette	Note
	<p>If the backup copy of the Reference Diskette already has the same contents as an option (adapter) diskette, the backup copy skips the copying. Therefore, this step may not happen.</p>



Automatic Configuration	Note
	<p>The computer identifies its configuration and writes the information onto its nonvolatile memory. You do not need to do anything.</p>

13 After the automatic configuration is complete, the following screen appears.



14 Press Enter; the following screen appears.



15 Press Enter; the following screen appears.

```

Main Menu

Select one:

1. Backup the Reference Diskette
2. Set Configuration
3. Set Features
4. Copy an Option Diskette
5. Test the Computer
6. Display Revision Levels

```

16 Select **Set Configuration** and press Enter; the following screen appears.

```

Set Configuration

Select one:

1. View Configuration
2. Change Configuration
3. Backup Configuration
4. Restore Configuration
5. Run Automatic Configuration
6. Set and View SCSI Device Configuration
7. Display Memory Map

```

17 If you installed (an) external SCSI device(s), select **Set and View SCSI Device Configuration** and press Enter; the following screen appears.

Confirm that the SCSI information includes your installed device(s). The **e** in the following screen corresponds to the **e** on page 27.

```

Set and View SCSI Device Configuration

e Slot1 - IBM PS/2 SCSI Adapter
  SCSI Adapter Address (ID) . . . . . : 7
  SCSI Device
    Device Type. . . . . : Fixed Disk
    Device Address (ID, LUN) . . . . . : 6,0
    Device Size. . . . . : 160MB

  SCSI Device
    Device Type. . . . . : Fixed Disk
    Device Address (ID, LUN) . . . . . : 5,0
    Device Size. . . . . : 480MB

```

18 Select **View Configuration** and press Enter; the following screens appear.

Confirm that the configuration information includes your installed or connected options. In the following screens the reversed numeric characters (**i**, **j**, etc.) correspond to the ones on page 27.

Note: If you connected or installed any device or memory and “Not Installed” or “Empty” is displayed, it indicates that the connection or installation is not complete. You must re-connect or re-install it.

```
View Configuration

Total System Memory
  Installed Memory. . . . . : 8192KB (8.0MB)
  Usable Memory . . . . . : 8064KB (7.9MB)

Built In Features
  Installed Memory. . . . . : 8192KB (8.0MB)
  Diskette Drive 0 Type . . . . . : 1.44MB 3.5"
  i Diskette Drive 1 Type . . . . . : Not Installed
  Math Coprocessor. . . . . : Installed
  j Serial Port . . . . . : SERIAL_1
  Parallel Port . . . . . : PARALLEL_1
  Parallel Port Arbitration Level . . . : Level 7
  Preempt Enable/Disable. . . . . : Enable
  Video I/O Address . . . . . : Instance 6: 2160h - 216Fh
  Video ROM Address Space . . . . . : D6000 - D7FFF
  Video Arbitration Level . . . . . : Arbitration Level 14
  Video Fairness. . . . . : Fairness On

F1=Help   F3=Exit                               F8=Fwd
```



```
View Configuration

Auto-Dim Time . . . . . 10 Minutes
Auto-Dim Reset. . . . . Keyboard and Aux. Device
Color to Gray Mapping . . . . . RGB Mixed Signals
Turned-on Display . . . . . Primary

[e] Slot1 - IBM PS/2 SCSI Adapter
    I/O Address . . . . . 3540-3547
    DMA Arbitration Level . . . . . Level C
    Fairness On/Off . . . . . On
    ROM Wait State Disable. . . . . Enable Wait State
    SCSI Adapter Address (ID) . . . . . 7

[c] Slot2 - Empty

[a] Slot3 - Empty

[d] Slot4 - IBM 300/1200/2400 Internal Modem/A
    Serial Configuration. . . . . SERIAL_2

F1=Help    F3=Exit                                F7=Bkwd    F8=Fwd
```

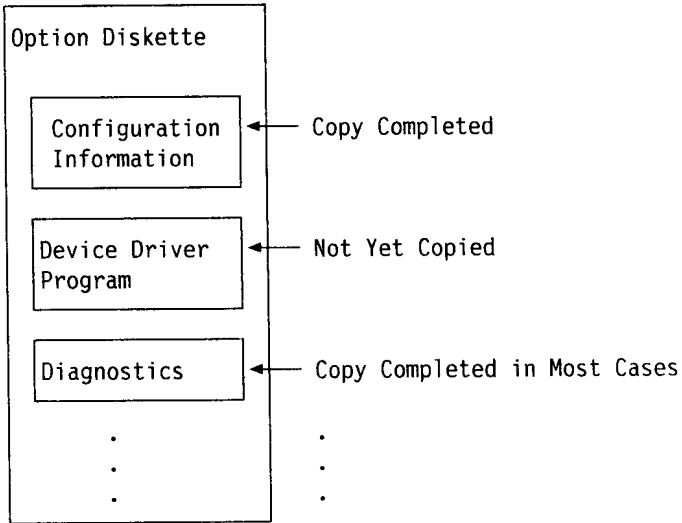
19 Remove the backup copy of the Reference Diskette from the diskette drive. Store it in a safe place.

20 Read the following before going to step 6.

Very Important

You have completed step 5. This means that the computer's nonvolatile memory copied information on the configuration of each option from the diskettes that came with the adapters or external options. Some of those diskettes have other information, such as, a device driver program and diagnostics. For example, an external CD-ROM drive will not work without its device driver program installed. Read the instructions that came with the adapters or external options, but do not start the installation now. For when to install such programs, you will be instructed in a later step.

Inside of an Option Diskette



Step 6. Installing an Operating System and Application Programs

1 If you install DOS, do the following.

Install DOS .	Using the DOS manuals and the instructions on the screen.
Install device driver programs (if any) that are contained in the diskette(s) that came with adapters or external options.	See page 40.
Install diagnostics programs (if any) that are contained in the diskette(s) that came with adapters or external options.	See page 40.
If you use one or some of the following, install programs needed . If not, go to 2 on page 42. <ul style="list-style-type: none">• High-resolution color displays• An application that uses a mouse• The Microsoft Windows on the high resolution color displays• The AutoCAD. <p>Note: Microsoft is a trademark of Microsoft Corporation, and AutoCAD is a trademark of Autodesk Inc.</p>	<ol style="list-style-type: none">1. Using the <i>IBM Personal System/2 P75 486 XGA Device Drivers Installation Instructions</i>.2. To use both an external PS/2 display that is connected to the external PS/2 connector and the plasma display, the external PS/2 display must be in VGA mode and Plasma and External must be specified for the Turned-on Display. For the Turned-on Display, see page 56.

2 If you install OS/2, do the following.

<p>Install OS/2.[*] During the installation, do the following when the screen asks you to install them.</p> <ol style="list-style-type: none">1. Install the IBM PS/2 XGA Device Drivers Programs.^{**}2. Install device driver programs (if any) that are contained in the diskette(s) that came with adapters or external options.^{***}	<p>[*] Using the OS/2 manuals and the instructions on the screen.</p> <p>^{**} Using the <i>IBM Personal System/2 P75 486 XGA Device Drivers Installation Instructions</i>.</p> <p>If you need to use both an external PS/2 display that is connected to the external PS/2 connector and the plasma display, the external PS/2 display must be in VGA mode and Plasma and External must be specified for the Turned-on Display. For the Turned-on Display, see page 56.</p> <p>^{***} See page 40.</p>
<p>Install diagnostics programs (if any) that are contained in the diskette(s) that came with adapters or external options.</p>	<p>See page 40.</p>

3 Install your application programs.

Setup Procedures are complete. You can now use the computer.

Chapter 2. Introducing the IBM Personal System/2 Model P75 486

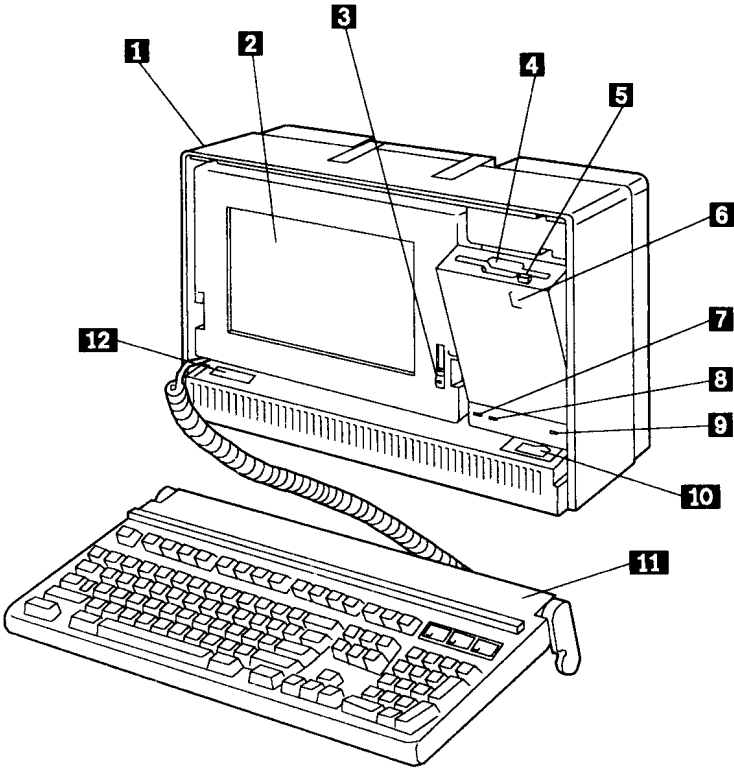


The IBM Personal System/2 Model P75 486 is a high-performance, compact, portable computer. It offers a number of advanced hardware design features and is compatible with a large selection of software programs. The IBM PS/2 Model P75 486 comes with a keyboard and system unit. The system unit has several built-in connectors so that you can add options easily. An option is an accessory piece of hardware that can be attached to or installed inside the system unit to expand the computer's capabilities. Many options are available to meet your present and future needs.

This chapter contains:

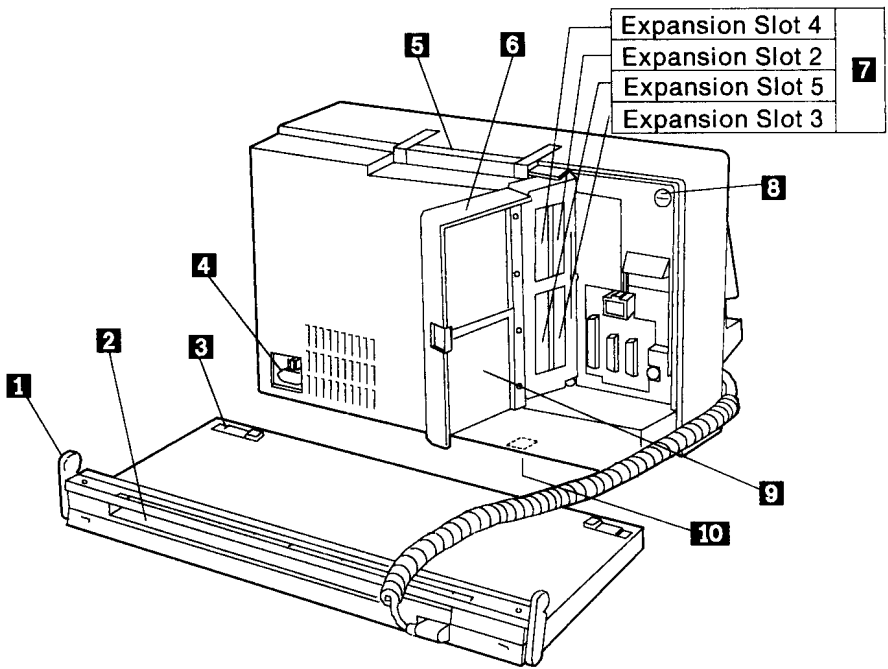
Identifying the Computer Features	46
Connecting External SCSI Devices	51
Options	53
Plasma Display Information	54
What Happens When the Computer Starts?	57
What Does the Error Prompt Mean?	58
What Does the Diskette Prompt Mean?	58
What Does the Password Prompt Mean?	59
What Is the Reference Diskette?	60
Program Flow of the Reference Diskette	63
Starting the Backup Copy of the Reference Diskette	64
How to Set Passwords	68
The IBM Disk Cache	71
Before Installing the IBM Disk Cache	71
How to Install (or Remove) the IBM Disk Cache	71
Using IBM DOS Shell and IBM Presentation Manager on the Plasma Display	72
Plasma Display Brightness	74
How to Install the Brightness Program	74
To Change the Brightness Level	74

Identifying the Computer Features



- 1 System Unit** contains the microprocessor, memory, plasma display and drives.
- 2 Plasma Display** displays information from the computer.
- 3 Intensity Adjustment** adjusts the brightness on the plasma display.
- 4 Diskette Drive** reads data from or writes data to a diskette. For information about using the correct diskettes, see page 97.

Note: Because the diskette drive may be affected by electromagnetism, you should not use the system unit near electric appliances like a TV or a speaker. If you use a PS/2 display near the system unit, set it over 5 inches away from the diskette drive.
- 5 Diskette Eject Button** releases a diskette from the drive. "1.44" is printed on the button to indicate that it is a 1.44MB diskette drive (see page 97 for more information).
- 6 Diskette Drive Stand-off** locks and unlocks the diskette drive. You can unlock it by pushing the stand-off. When the diskette drive is unlocked, you can lock it by pushing the stand-off.
- 7 Diskette Drive In-Use Light** comes on when the drive is reading data from or writing data to a diskette.
- 8 Fixed Disk Drive In-Use Light** comes on when the drive is reading data from or writing data to the fixed disk.
- 9 Power-Good Light** comes on when the system unit is turned on.
- 10 Power Switch** turns the system unit on and off.
- 11 Keyboard** is used to enter information into the computer. The keyboard cable connects the keyboard to the system unit.
- 12 Serial Number** is the system unit's unique identification number. You should record this number on page 95 in this book.

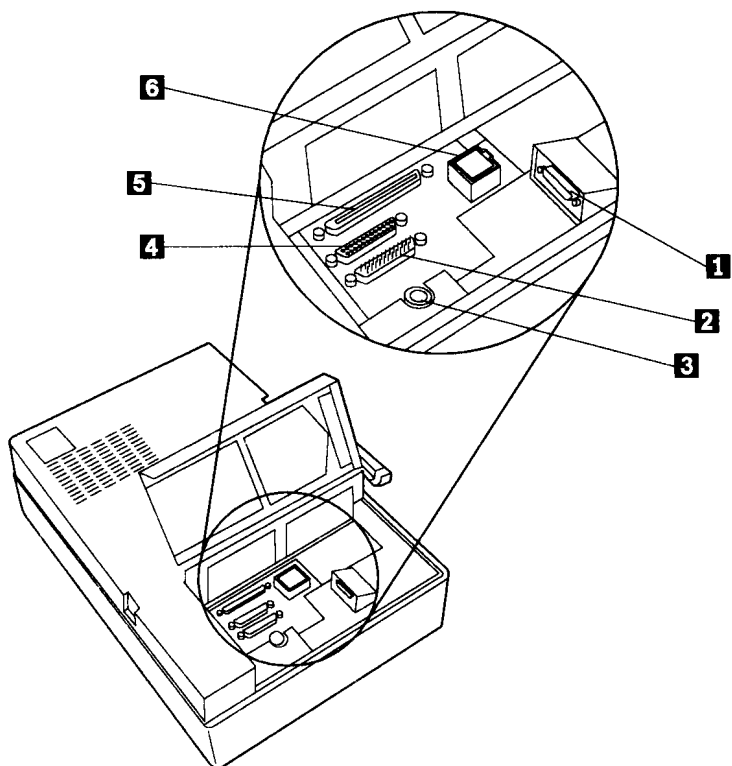


- 1** **Keyboard Feet** adjust the angle of the keyboard. The feet can be tilted by pulling them to the outside and turning them.
- 2** **Keyboard Cable Groove** stores the keyboard cable when you fit the keyboard into the system unit.
- 3** **Keyboard Clamps** hold the keyboard when you fit the keyboard into the system unit.
- 4** **Power Cord Connector** is where the system unit power cord plugs in.
- 5** **Handle** is used to carry the computer.
- 6** **Connector Housing Door** covers the connectors.
- 7** **Expansion Slots** allow the installation of four adapters inside the system unit so you can expand the computer's capabilities. For where to install an adapter, see page 15.

Note: Some half size adapters may not be able to use the lower slots, because of the large size of the connector that plugs into these adapters.

- 8** **Rear Cover Screw** locks the rear cover. There are also two more screws on the bottom.
- 9** **Connector Housing Shield** is used as an entrance for the cables that plug into the connectors.
- 10** **Rear Cover Lock** provides additional protection to prevent unauthorized access to the inside of the computer.

Note: This lock secures the rear cover physically and does not enable nor disable input functions or the power-on function.



1 External PS/2 Display Connector is where a display signal cable plugs in if you use an external PS/2 display.

2 Serial Connector is fully programmable and supports asynchronous communications.

3 Mouse or Pointing Device Connector is where a mouse or other pointing device cable plugs in.

4 Parallel Connector is where a printer (or scanner) signal cable plugs in.

5 External SCSI (small computer system interface—ANSI X3.131) Connector is where the cable from a storage device like a 3.5 inch 160MB or 400MB Hard Disk Drive or an external CD-ROM drive can plug in. Up to six SCSI devices can be connected to this connector. For more information, see “Connecting External SCSI Devices” on page 51.

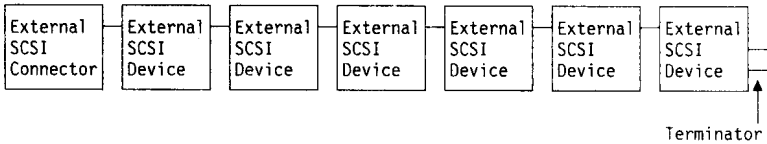
- 6 External Storage Device Connector** is where the cable from a storage device like the 5.25 inch External Diskette Drive can plug in. (A conversion cable may be required in some cases.)

Connecting External SCSI Devices

Terminator

If you connect to the external SCSI device connector one through six external SCSI devices, you must attach a terminator to an end SCSI.

The following figure shows an example of connecting six external SCSI devices to this connector.



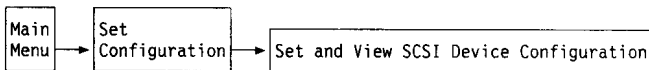
SCSI ID

When you connect one through six external SCSI devices, you must assign a different SCSI ID (5 through 0) to each external SCSI device. The SCSI ID, 6 (the default), is assigned to the internal SCSI hard file.

Changing a SCSI ID

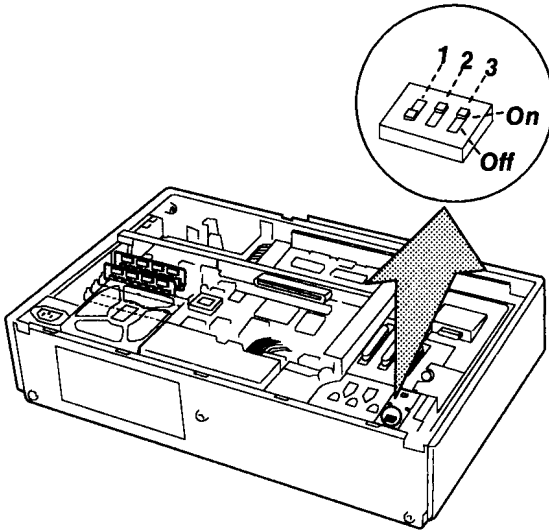
If you want to run application programs under an operating system that resides on one of the external SCSI devices, you must assign 6 to the external SCSI device. To change the SCSI ID, do the following.

Note: To confirm the newly assigned SCSI IDs after the change, see the screen of the Set and View SCSI Device Configuration by using the backup copy of the Reference Diskette. The following shows the path to the Set and View SCSI Configuration.



However, if you are setting up the computer the first time, you will be instructed when to confirm it in a later step within the setup procedures.

1. For instructions how to change the SCSI ID of any **external** SCSI device from **5** through **0** to **6**, refer to the SCSI device's instructions.
2. To change the SCSI ID of the **internal** SCSI device from **6** to any ID, **5** through **0**, do the following:
 - a. Ensure that the computer is turned off.
 - b. Look at the following figure to locate three switches (1, 2, and 3) and note the switch positions, Off and On.



- c. Using the following table, change to any SCSI ID, **5** through **0**. To change a switch from Off to On and vice versa, slide it.

Internal SCSI Device Address ID	Switch Positions		
	1	2	3
6 (the default value set in the factory)	Off	On	On
5	On	Off	On
4	Off	Off	On
3	On	On	Off
2	Off	On	Off
1	On	Off	Off
0	Off	Off	Off

Options

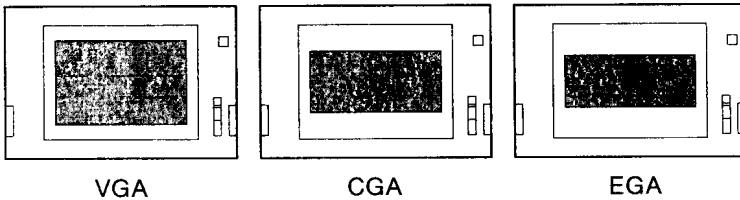
The following options can be ordered in addition to many other IBM Personal System/2 common options.

- External Storage Device Cable (part number 23F2716)
- 2.5 m (8 ft) Keyboard Extension Cable (part number 79F3210).

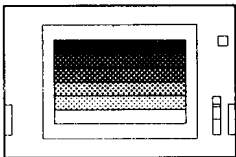
Plasma Display Information

The computer has a gas plasma display that shows program colors in up to 16-level monochrome shades with a video graphics array (VGA) of 640 X 480 resolution. Some programs may not be designed to take full advantage of the plasma display, or could benefit from minor changes. Here are some tips for best results.

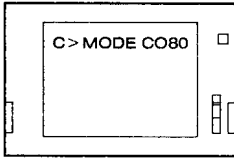
- **CGA and EGA resolutions**—Programs using color graphics adapter (CGA) and enhanced graphics adapter (EGA) resolutions are supported by this display; however, program screens will not use the entire plasma display area, and graphics shapes could be slightly distorted. How much area of the plasma display is used by VGA, CGA, and EGA is illustrated in the figure below. For best results, use the version of a program that supports VGA resolution.



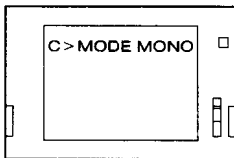
- **Color graphics contrast**—The plasma display automatically converts program colors into different monochrome shades. Some programs start with colors that lose contrast when converted. You can usually change colors from within the program to help increase the contrast. See the program documentation for information on how to do this.



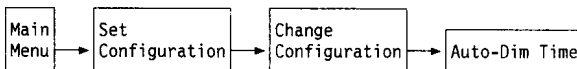
- **A program will not start; parts of a program screen are missing—** Some graphics programs, for example, Microsoft Windows/386 versions 2.1 and below, may not recognize the graphics capabilities of the plasma display and other PS/2 monochrome displays. This could appear as start-up difficulty, or faded/missing information. To correct this situation, put the plasma display (or the attached PS/2 monochrome display) in graphics mode before starting the program. To do this, type **MODE CO80** at the DOS prompt, then press Enter.



- **Text mode contrast—**The contrast in text (non-graphics) programs is best when the plasma display is in two-shade text mode. The display is in this mode when the computer is turned on, but could be put into graphics mode by a program. To return the display to text mode, type **MODE MONO** at the DOS prompt, then press Enter.



- **Auto-dim feature—**The plasma display is automatically turned off to extend its life if no data is received from the system or entered from the keyboard or an auxiliary device for 10 minutes (default value). The default value can be changed by using the backup copy of the Reference Diskette. To change the default value, go to the Auto-Dim Time. The following shows the path to the Auto-Dim Time.

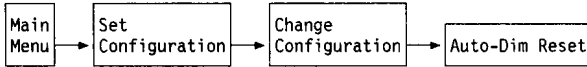


There are two ways to turn on the display again:

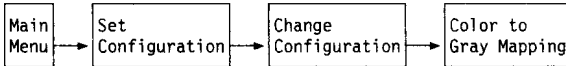
1. Pressing SHIFT
2. Moving the mouse.

If the mouse picks up vibration from a desk which turns on the display again, change the Auto-Dim Reset from **Keyboard and Aux. Device** to **Keyboard Only**.

The following shows the path to the Auto-Dim Reset.

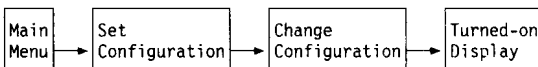


- **External PS/2 displays**—The computer supports all PS/2 displays with VGA resolution. If you use the same program with the plasma display or an external PS/2 display, the best choice for program colors could change depending on the display you are using.
- **Color to Gray Mapping**—There are some applications that are developed for color displays but can be used on monochrome displays. When using such applications, reset the Color to Gray Mapping to **Green Signal Only**. Setting **RGB Mixed Signals** (default value) may result in an unpredictable display image. The following shows the path to the Color to Gray Mapping.



- **Turned-on Display**—The default value, **Primary**, turns on only one display that is considered by the system to be the primary display. When no external PS/2 display is connected to the system unit, the plasma display is considered the primary display and only VGA mode is supported. But when an external PS/2 display is connected, it is considered the primary display and VGA or XGA mode is supported for the external PS/2 display.

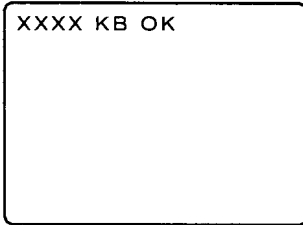
The value, **Plasma and External**, turns on both the plasma display and an external PS/2 display. Only VGA mode is supported. The following shows the path to the Turned-on Display.



What Happens When the Computer Starts?

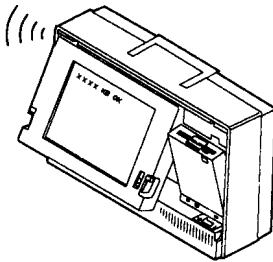
The following sequence occurs when you turn on the computer:

- 1** You see a KB OK message on the screen.



The computer's memory is being tested. The number increases until it matches the amount of usable memory.

- 2** You hear one beep.



The computer has successfully completed its internal self-tests.

- 3** You see one of these on the screen:

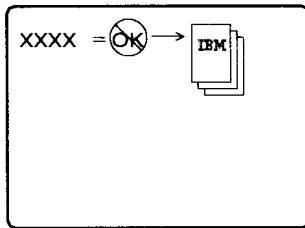
- F1 and Diskette Prompts
- Password Prompt
- The beginning of your program.

If something other than the above happens, there is a problem. To fix the problem, go to "Solving Computer Problems" on page 85.

What Does the Error Prompt Mean?

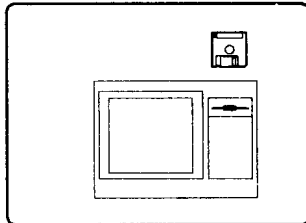
When the computer is turned on, it performs a series of checks that verifies correct system operation. If an error is found, the computer displays the Error Prompt. This prompt is telling you that there is a problem with the computer or the computer's configuration is not set correctly with the backup copy of the Reference Diskette. If the configuration is set correctly, go to "Solving Computer Problems" on page 85.

Note: Locking the rear cover lock will not cause the Error Prompt.



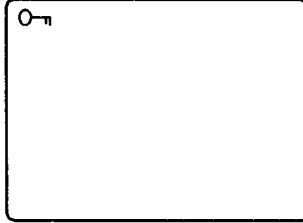
What Does the Diskette Prompt Mean?

This prompt is requesting you to insert a diskette into the drive to start the diskette. When the computer is turned on, it tries to read from a diskette in the drive or from the fixed disk drive. If there is no diskette in the drive and if there is no operating system installed on the fixed disk drive, the computer displays the Diskette Prompt.

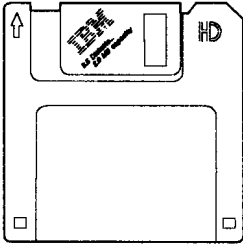


What Does the Password Prompt Mean?

If a power-on password is set, the Password Prompt appears each time the computer is turned on. To use the computer you must type the correct password and press Enter. (See “Set a Power-On Password” on page 68 for more information.)



What Is the Reference Diskette?



The Reference Diskette is a permanently write-protected diskette. You can *read* information from the diskette, but you cannot *write* (record) information onto the diskette. Make a backup copy of the diskette as soon as possible. Once the copy is made, put the original diskette in a safe place and always use the backup copy.

The Reference Diskette contains the following programs:

1. **Backup the Reference Diskette** makes a copy of the original Reference Diskette onto another diskette, but not onto a fixed disk drive. To make the backup copy, you will need a blank 2.0MB capacity diskette that is not write-protected (see “Write-Protecting Diskettes” on page 100).

Whenever you need to use the Reference Diskette, always use the backup copy. This ensures that the backup copy contains your computer’s current configuration information and testing programs.

2. **Set configuration** is used to view, change, back up, or restore the computer’s configuration, and run automatic configuration. When you install the computer for the first time or after you change, remove, or install an IBM option or the battery, you must start the backup copy of the Reference Diskette and follow the instructions on the screen to automatically configure the computer.

During automatic configuration, the computer makes a list of what it sees as being installed and assigns those items to operate a certain way. This configuration information is then stored in the computer’s memory and is kept current by the battery even when the computer is turned off.

The configuration lists the computer’s:

- Installed memory size
- Built-in connectors and their assignments

- Installed *IBM* options with their location and assignments.

View configuration shows you the present configuration stored in the computer's memory.

Change configuration is used to make changes to the configuration stored in memory. Changing the configuration lets you tailor the computer's operation to your needs.

Backup configuration copies the configuration stored in memory onto the backup copy of the Reference Diskette. If you have made changes to the configuration then you should back up (copy) the configuration in the event the battery is removed or replaced.

Remember, the computer's configuration is stored in memory and kept current by the battery. If the battery is removed or replaced, the configuration information is lost.

Restore configuration retrieves the configuration copied by "Backup configuration" and restores it back into the computer's memory. Use "Restore configuration" after the battery is removed or replaced.

Run automatic configuration enables the computer to automatically configure itself. During automatic configuration, the computer makes a list of what it sees as being installed and assigns those items to operate a certain way.

Set and view SCSI device configuration is used to view and change the SCSI device configuration.

3. **Set features** is used to:

Set date and time so that you have the convenience of recording the date and time of your computer activities. Once the date and time are set, the computer's battery keeps both current, even when the computer is turned off.

Set passwords to help restrict the use of the computer by unauthorized persons. Three passwords are available:

- Power-on password
- Keyboard password
- Network server password.

Set keyboard speed to change the speed at which the keyboard responds when you type.

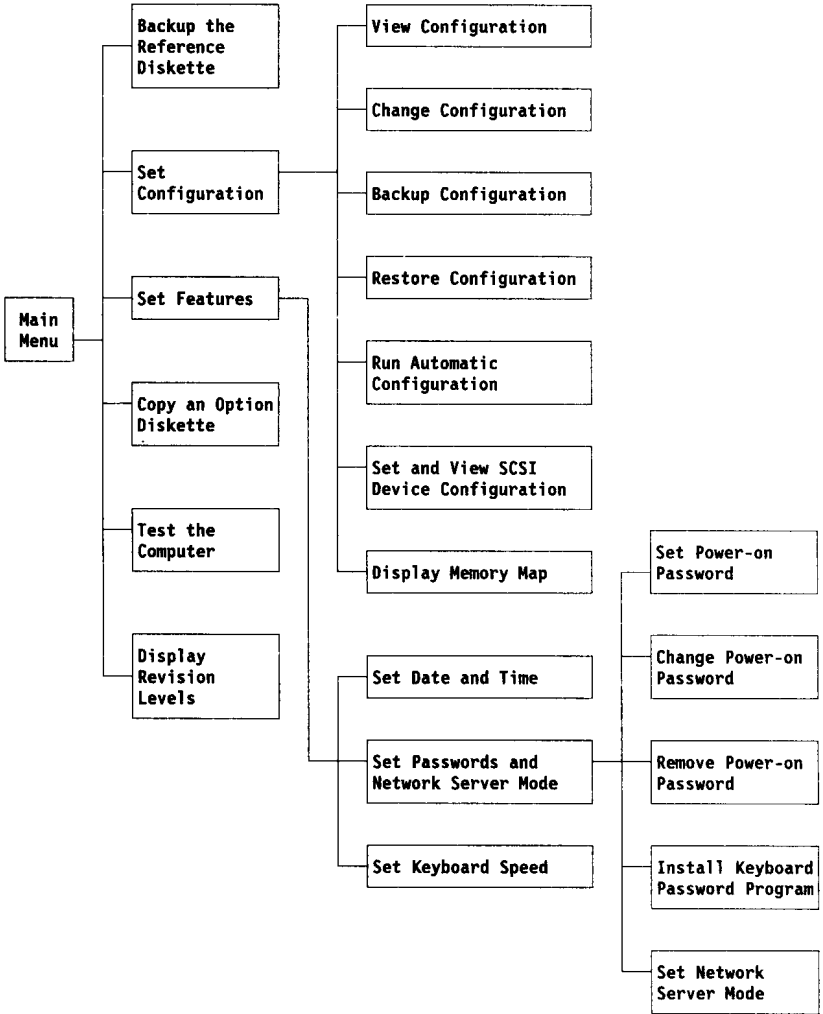
4. **Copy an option diskette** is used if you are installing an *IBM* option that comes with a diskette and instructions to update the backup copy of the Reference Diskette.

This option diskette contains the option's testing program and configuration information. Be sure to follow the instructions supplied with the option.

5. **Test the computer** tests the computer hardware. If a problem occurs during this testing, an error message appears with the cause of the problem and the action to take.
6. **Display Revision Levels** shows you the revision levels of the system ROM (read-only memory) and the Reference Diskette.

Program Flow of the Reference Diskette

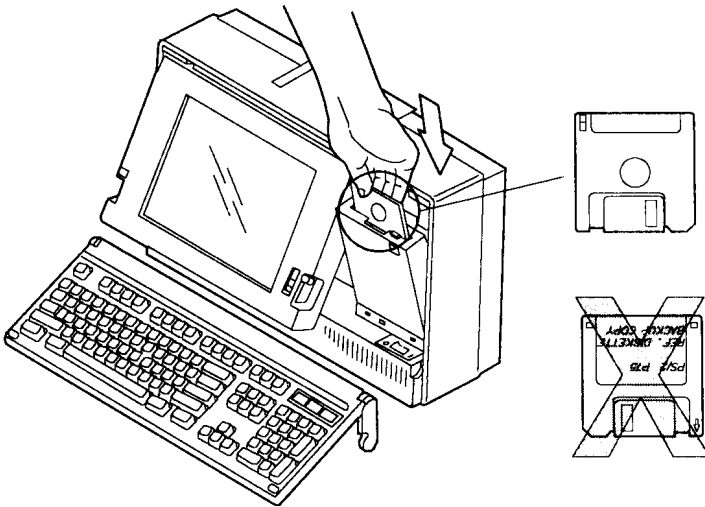
The following summarizes the program flow of the Reference Diskette.



Starting the Backup Copy of the Reference Diskette

Note: For the location of keys that are used in this procedure, see page 30.

- 1** Turn on all the devices that are connected to the computer. **However, do not turn on the computer at this point of time.**
- 2** Make sure that the **backup copy** of the Reference Diskette is write-enabled.
- 3** Insert the backup copy of the Reference Diskette, with the label facing toward the system unit and metal-shutter end first, into the drive. Make sure the diskette clicks into place.

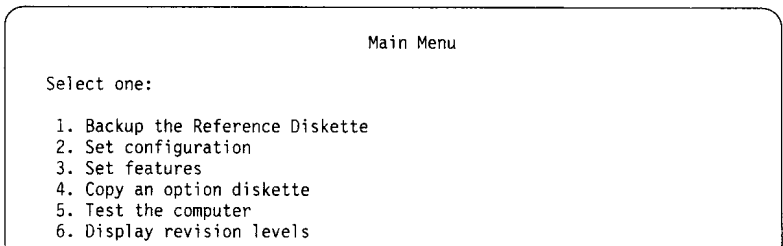


- 4** Is the computer turned on?
 - Yes** Press Ctrl, Alt, and Del at the same time, then release them.
 - No** Turn on the computer.

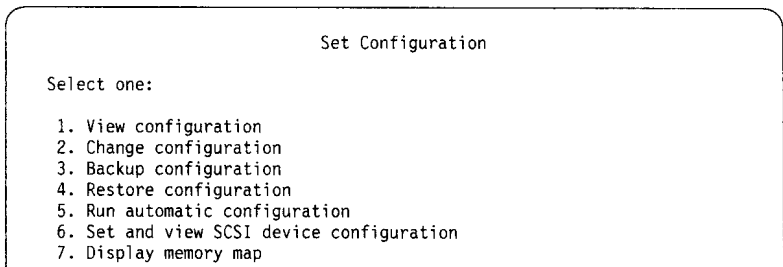
5 The following screen appears.



6 Press Enter; the following screen appears.

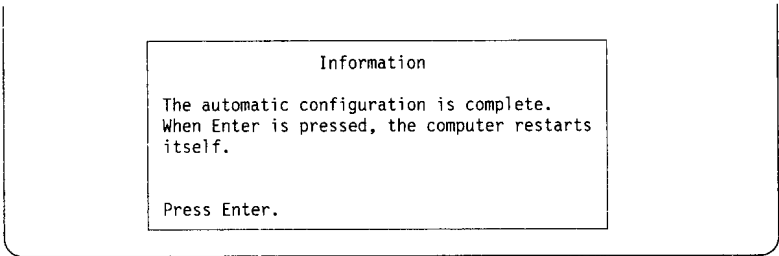


7 Select **Set Configuration** and press Enter; the following screen appears.



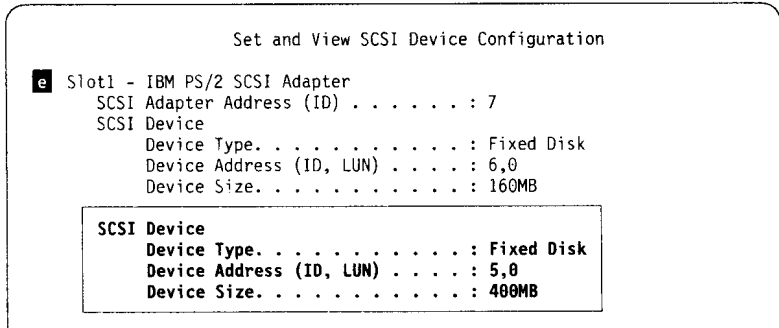
8 Select **Run Automatic Configuration** and press Enter; the automatic configuration starts.

9 After the automatic configuration is completed, the following screen appears.



10 If you installed (an) external SCSI device(s), select **Set and View SCSI Device Configuration** and press Enter.

Confirm that the SCSI information includes your installed device(s). The **e** in the following screen corresponds to the **e** on page 27.



11 Select **View Configuration** and press Enter; the following screens appear. Confirm that the configuration information includes your installed or connected options. In the following screens the reversed numeric characters (**i**, **j**, etc.) correspond to the ones on page 27.

Note: If you connected or installed any device or memory and “Not Installed” or “Empty” is displayed, it indicates that the connection or installation is not complete. You must re-connect or re-install it.

```

View Configuration

Total System Memory
  Installed Memory. . . . . : 8192KB (8.0MB)
  Usable Memory . . . . . : 8064KB (7.9MB)

Built In Features
  Installed Memory. . . . . : 8192KB (8.0MB)
  Diskette Drive 0 Type . . . . . : 1.44MB 3.5"
  i Diskette Drive 1 Type . . . . . : Not Installed
  Math Coprocessor. . . . . : Installed
  j Parallel Port . . . . . : SERIAL_1
  f Parallel Port Arbitration Level . . . . . : PARALLEL_1
  Parallel Port Arbitration Level . . . . . : Level 7
  Preempt Enable/Disable. . . . . : Enable
  Video I/O Address . . . . . : Instance 6: 2160h - 216Fh
  Video ROM Address Space . . . . . : D6000 - D7FFF
  Video Arbitration Level . . . . . : Arbitration Level 14
  Video Fairness. . . . . : Fairness On

F1=Help   F3=Exit                               F8=Fwd

```

```

View Configuration

Auto-Dim Time . . . . . 10 Minutes
Auto-Dim Reset. . . . . Keyboard and Aux. Device
Color to Gray Mapping . . . . . RGB Mixed Signals
Turned-on Display . . . . . Primary

e Slot1 - IBM PS/2 SCSI Adapter
  I/O Address . . . . . 3540-3547
  DMA Arbitration Level . . . . . Level C
  Fairness On/Off . . . . . On
  ROM Wait State Disable. . . . . Enable Wait State
  SCSI Adapter Address (ID) . . . . . 7

c Slot2 - Empty
a Slot3 - Empty
d Slot4 - IBM 300/1200/2400 Internal Modem/A
  Serial Configuration. . . . . SERIAL_2

F1=Help   F3=Exit                               F7=Bkwd   F8=Fwd

```

12 Remove the backup copy of the Reference Diskette from the diskette drive. Save it in a safe place.

How to Set Passwords

The following instructions are also on the Reference Diskette. Because the computer must be turned off, then on again to follow some of the password instructions, the information is provided here for your convenience.

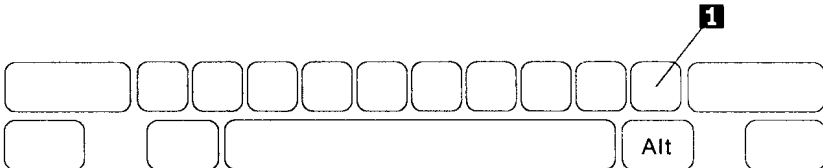
Setting a Power-On Password

Setting a power-on password helps restrict the use of the computer by unauthorized persons. The password cannot be longer than seven characters and does not appear when typed. Once the power-on password is set, whenever you turn on the computer, the password prompt (a small key) appears. (See "What Does the Password Prompt Mean?" on page 59). To use the computer, you must type the correct password and press Enter. When the password is entered correctly, an OK appears momentarily. If the password is entered incorrectly, a key with an X over it appears. If you have not entered the password correctly after three tries, you must turn off the computer, then on, and try again.

To set a power-on password, start the backup copy of the Reference Diskette (see page 32). Go to the main menu and select "Set features," then "Set passwords." And then select "Set power-on password" and follow the instructions on the screen.

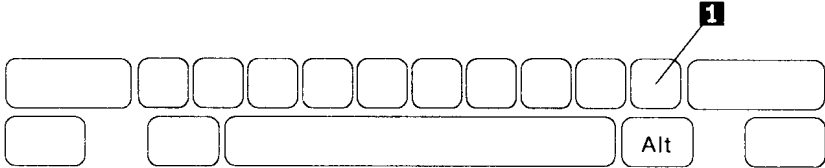
Changing a Power-On Password

To change your power-on password, turn on the computer. When the password prompt appears, type your current password, then press the key **1** located above the right Alt key. Type your new password (no more than seven characters), and press Enter.



Removing a Power-On Password

To remove your power-on password, turn on the computer. When the password prompt appears, type your current password, then press the key **1** located above the right Alt, and press Enter. This also removes the network server mode.



Forgot the Power-On Password?

To delete your power-on password because you forgot it, you must remove the battery from inside the system unit and wait at least **20 minutes** to erase the memory containing your password. (See page 106 for instructions on removing the battery.)

Setting the Network Server Mode

If your computer is a server on a network, you can set network server mode. Your computer can now be turned on so other computers can access your fixed disk drive while your keyboard is locked.

To set the network server mode you must first set a power-on password (see page 68). Then, go to the main menu of the

Reference Diskette and select "Set features," then "Set passwords." Next, select "Set network server mode" and follow the instructions on the screen.

Remove the Network Server Mode

To remove the network server mode, start the backup copy of the Reference Diskette. Go to the main menu and select "Set features," then "Set passwords." Then select "Set network server mode." When you are asked "Set network server mode?" type **N** and press Enter.

Installing a Keyboard Password Program

You must first install the keyboard password program from the Reference Diskette onto the fixed disk drive or diskette that contains your disk operating system (DOS), before a keyboard password can be set.

Start the backup copy of the Reference Diskette. Go to the "Main Menu" to select "Set features," then "Set passwords." Next, select "Install keyboard password program" and follow the instructions on the screen.

Setting and Using a Keyboard Password

Setting a keyboard password lets you lock the keyboard without turning the computer off. If a power-on password has been set (see page 68), it also serves as your keyboard password. You may set a different keyboard password by following the "change the keyboard password" instructions below.

Make sure the keyboard password program is installed on the fixed disk or diskette that contains DOS. Go to the DOS prompt (usually "A >" or "C >"), then:

- To **lock the keyboard**, type **KP** and press Enter. The keyboard is locked when you hear a beep.
- To **unlock the keyboard**, type your keyboard password (usually the same as your power-on password) and press Enter. The keyboard is unlocked when you hear a beep.
- To **remove the keyboard password**, turn off the computer.
- To **change the keyboard password**, type **KP /c** and press Enter. Follow the instructions on the screen. This procedure allows you to set a keyboard password that is different from your power-on password.

Notes:

1. The keyboard password program does not work with OS/2.
2. If you reset the computer (using the Ctrl, Alt, and Del keys) and then lock the keyboard, the computer will act as if you typed **KP /c**.

The IBM Disk Cache

The Reference Diskette contains the **IBM Disk Cache** and its installation program. Performance of application programs can be improved when the **IBM Disk Cache** is installed on a fixed disk drive containing the IBM Disk Operating System (DOS).

Before Installing the IBM Disk Cache

Set up the computer and install IBM DOS, Version 3.3 or later, on fixed disk drive C. Refer to this book, and the DOS manual for instructions, if necessary.

How to Install (or Remove) the IBM Disk Cache

Follow these steps:

- 1** Remove any diskette from the diskette drive.
- 2** Start the computer. If the computer is already started, continue with the next step.
- 3** When the DOS prompt (usually "C> ") appears, insert the backup copy of the Reference Diskette into the diskette drive.
- 4** Type **A:IBMCACHE** and press Enter.
- 5** Follow the instructions on the screen.

The installation program copies a file to, and changes a file on, fixed disk drive C. It also creates a file named CONFIG.BAK. (See "The IBM Disk Cache" on page 101 for technical information.)

Using IBM DOS Shell and IBM Presentation Manager on the Plasma Display

- If you are using IBM DOS 4.0 on this machine, read the following paragraph:

IBM DOS Shell - The DOS shell looks best if you add the parameter `/CO2` to the `DOSSHELL` command. Do not use the `/CO1`, `/CO3`, or `/TEXT` parameters at the same time. See the DOS manual for more information about the `DOSSHELL` command.

- If you are using IBM OS/2 Release 1.2 (Standard Edition or Extended Edition), refer to the following paragraphs:

IBM OS/2 Presentation Manager (PM) - An optional program named `OS2COLOR` is included on the P75 Reference Diskette. This program lets you change PM colors simply and quickly.

To install `OS2COLOR`:

- 1** Install OS/2 on the P75 fixed disk drive.
- 2** Start OS/2 and select the OS/2 command prompt window.
- 3** When the OS/2 prompt (usually "C:\") appears, insert the P75 Reference Diskette into the diskette drive.
- 4** Type **A:OS2COLOR INSTALL** and press Enter.

To use `OS2COLOR` after it is installed:

- 1** Start OS/2 and select the OS/2 command prompt window.
- 2** Type **OS2COLOR <PARAMETER>** when the OS/2 prompt appears. The parameters are explained in the following table.

Parameter	Meaning
PLASMA	Change colors to look best on the plasma display.
CRT	Change to the default Presentation Manager colors. These look best on a color display.
UNDO	Remove the OS2COLOR program so you can customize Presentation Manager colors yourself.
INSTALL	Copy OS2COLOR.EXE from the P75 Reference Diskette to the P75 fixed disk drive.

- If you are using the IBM AIX/386, refer to the related manuals.

Plasma Display Brightness

You can reverse the brightness of standard text and emphasized text in DOS through a simple command, **BRT**. This command lets you set standard text brighter than emphasized text, or vice versa. The Reference Diskette contains this command program and a program to install it. When you attach an external PS/2 display or use certain programs, the brightness is not selectable. That is, emphasized text is always displayed with brighter characters.

How to Install the Brightness Program

To change the brightness levels, you must first install the brightness program from the Reference Diskette onto the fixed disk drive or diskette that contains the IBM Disk Operating System (DOS).

- 1** Start the computer using the fixed disk drive or diskette that contains your operating system.
- 2** Insert a backup copy of the Reference Diskette into the diskette drive.
- 3** Type **A:BRIGHT** and press Enter.
- 4** Follow the instructions on the screen.

After installing the brightness program, continue with the following instructions on how to change the brightness level.

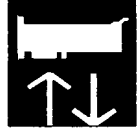
To Change the Brightness Level

Go to the DOS prompt (usually "A >" or "C >"), then:

- To have the standard text brighter than emphasized text, type **BRT /H** and press Enter.
- To have the emphasized text brighter than standard text, type **BRT** and press Enter.

Note: The brightness program is used only in the default monochrome text mode of the plasma display. It is not used with graphic modes, color modes, or an external PS/2 display.

Chapter 3. Removing and Adding Options



This chapter provides instructions for removing and adding options from the system unit.

Note: After removing or adding options, re-configure the computer using the backup copy of the Reference Diskette.

IMPORTANT

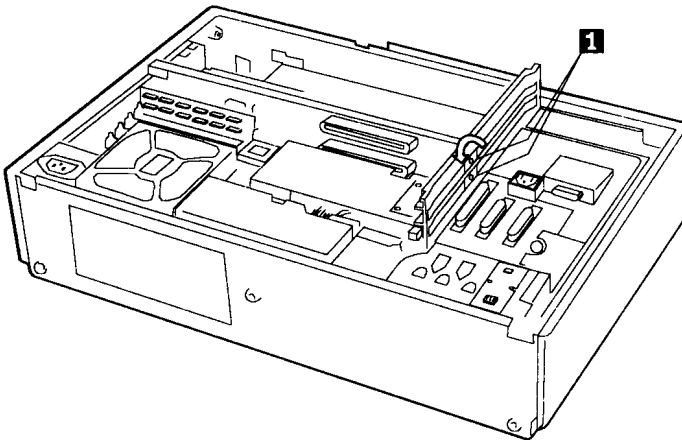
Use this chapter to remove only *IBM* options that are designed for this computer. Non-*IBM* options may require different instructions. Refer to the instructions supplied with those options.

This chapter contains:

- Removing Adapters 76
- Removing and Adding Memory Module Kits 80
- Removing External Options 81

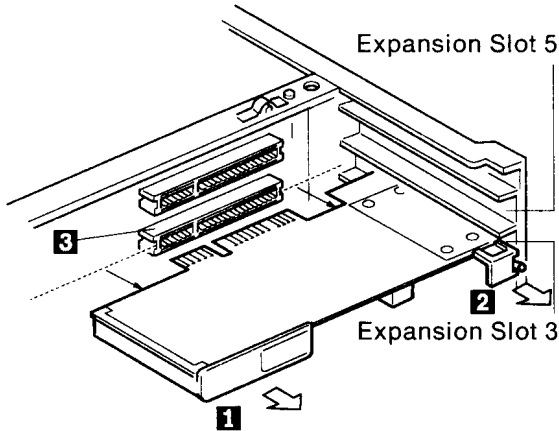
Removing Adapters

- 1** Turn off the computer (the system unit and all attached options such as the external PS/2 display and printer).
- 2** Put the plasma display, the diskette drive, and the keyboard back into their normal places as you would if moving the computer (see "Moving the Computer" on page 109 for more information).
- 3 CAUTION:**
Unplug all computer power cords from electrical outlets.
Then make a note of all cables and cords connected to the rear of the system unit on the table on page 27 and disconnect them.
- 4** Remove the rear cover by using the procedure on page 10.
- 5** Loosen the screws **1**.

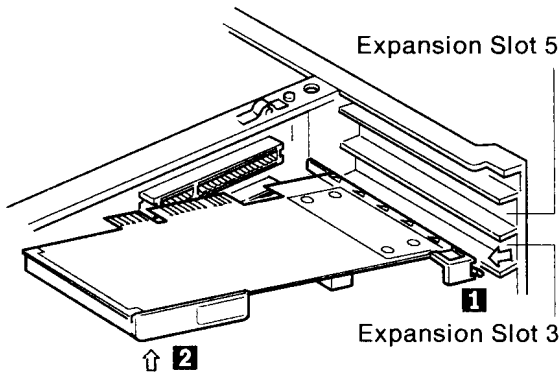


- 6** If you do not remove nor install any adapter from/into the expansion slots 3 and 5, go to 10 on page 77.
- 7**
Note: You can use this sub-step to remove an adapter from the expansion slot 5.

Pull **1** and **2** of the adapter from the expansion slot connector **3** to slide it outward to the position shown in the following figure.



8 Slowly remove the right end **1** of the adapter from the expansion slot 3 while slowly lifting the left end **2** of the adapter, as shown in the figure below.



Note: After removing the adapter, record the following in the table on page 27:

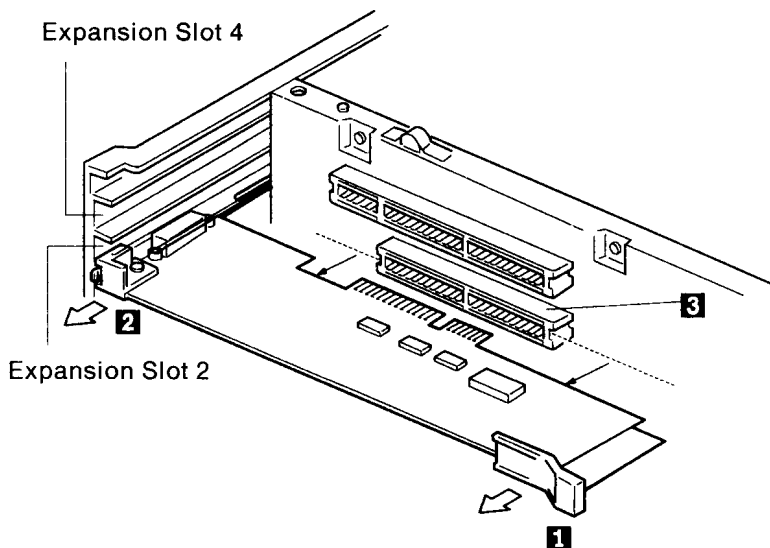
- The adapter name
- What had been connected to the adapter.

9 If you do not remove nor install any adapter from/into the expansion slots 2 and 4, go to 12 on page 79.

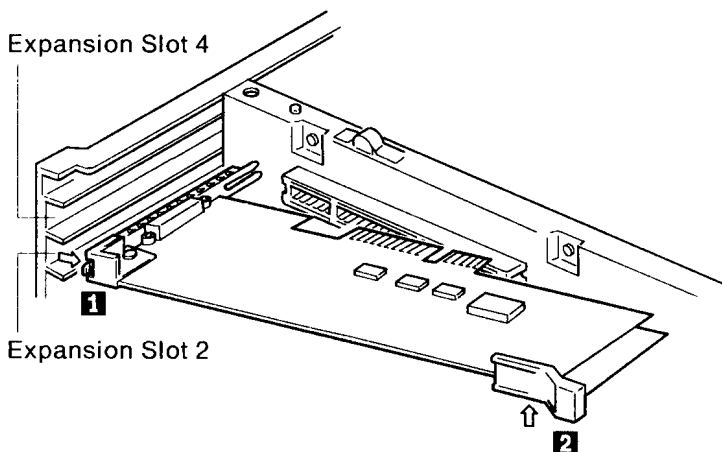
10 Turn the system unit so that the handle faces you.

Note: You can use this sub-step to remove an adapter from the expansion slot 4.

Pull **1** and **2** of the adapter from the expansion slot connector **3** to slide it outward to the position shown in the following figure.



- 11** Slowly remove the left end **1** of the adapter from the expansion slot 2 while slowly lifting the right end **2** of the adapter, as shown in the figure below.



After removing the adapter, record the following in the table on page 27:

- The adapter name
- What had been connected to the adapter.

12 If you are installing a new adapter, do “Step 3b. Installing Adapters” on page 13.

13 Tighten the screws. Their location is shown in the figure on page 76.

14 Are you removing a memory module kit?

or

Are you removing a memory module kit and installing a new memory module kit?

Yes Go to 5 on page 80 and do all the the remaining steps. After going to the step, you do not need to return to this page.

No Go to 15.

15 Install the rear cover by using the procedure on page 23.

16 Start the backup copy of the Reference Diskette to automatically re-configure the computer. (See “Starting the Backup Copy of the Reference Diskette” on page 64 and “Set configuration” on page 60 for more information.)

Removing and Adding Memory Module Kits

1 Turn off the computer (the system unit and all attached options such as the external PS/2 display and printer).

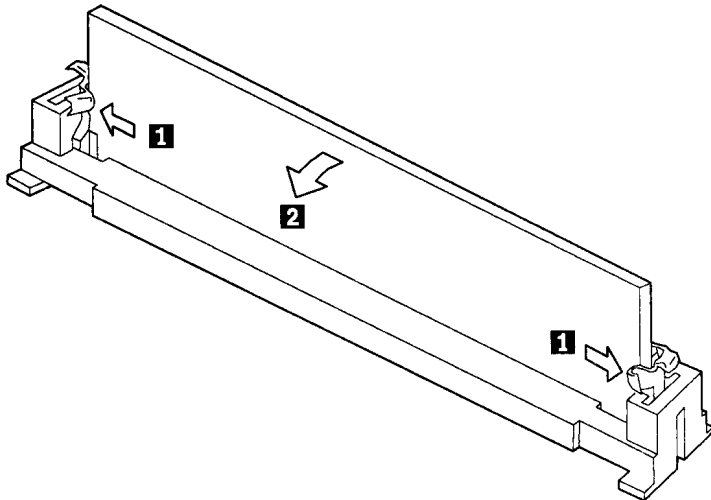
2 Put the plasma display, the diskette drive, and the keyboard back into their normal places as you would if moving the computer (see “Moving the Computer” on page 109 for more information).

3 CAUTION:
Unplug all computer power cords from electrical outlets.

Then make a note of all cables and cords connected to the rear of the system unit on the table on page 27 and disconnect them.

4 Remove the rear cover by using the procedure on page 10.

5 While pushing out on the latches **1**, tilt the memory module kit toward the bottom side of the system unit **2**. After the memory module kit is tilted, remove it from the connector.



6 If you are installing a new memory module kit, do “Step 3c. Installing Memory Module Kits” on page 21.

- 7** Are you removing an adapter?
or
Are you removing an adapter and installing a new adapter?
- Yes** Go to 5 on page 76 and do all the remaining steps.
After going to the step, you do not need to return to this page.
- No** Go to 8.
- 8** Install the rear cover by using the procedure on page 23.
- 9** Start the backup copy of the Reference Diskette to automatically re-configure the computer. (See “Starting the Backup Copy of the Reference Diskette” on page 64 and “Set configuration” on page 60 for more information.)

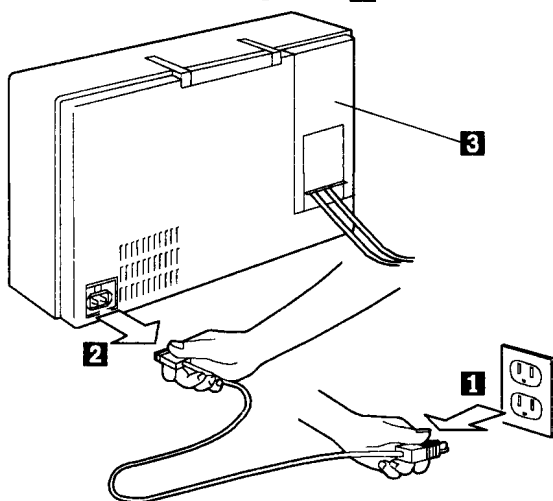
Removing External Options

- 1** Turn off the computer (the system unit and all attached options).

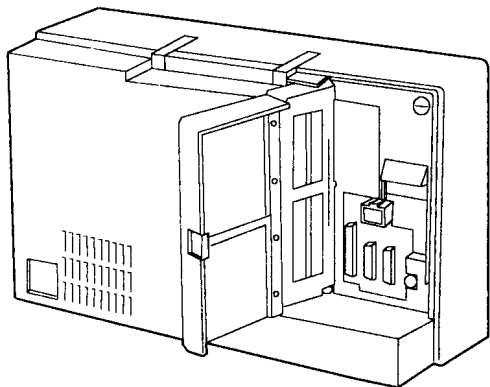
2 DANGER

**Do not perform this sub-step during an electrical storm.
The power cord can conduct lethal charges of
electricity.**

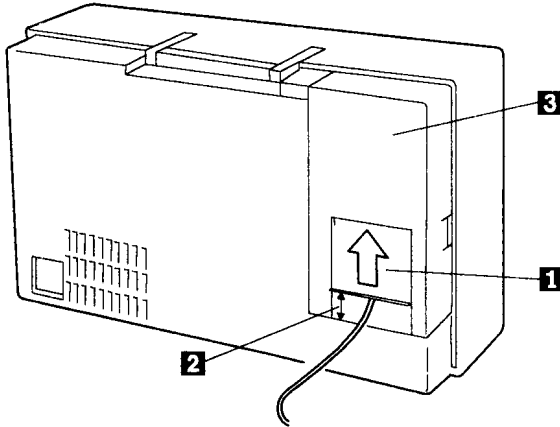
Unplug the display power cord from an electrical outlet **1** ;
Unplug the display power cord from the system unit **2** . Open
the connector housing door **3** .



3 Loosen the thumbscrews of the cable of a device that you are removing. Unplug the cable. Make a note of the removed device in the table on page 27.



- 4** Move the connector housing shield **1** upward to provide an opening for the plugged-in cables. Route plugged-in cables through the opening **2**. Close the connector housing door **3**.



- 5** Start the backup copy of the Reference Diskette to automatically re-configure the computer. (See “Starting the Backup Copy of the Reference Diskette” on page 64 and “Set configuration” on page 60 for more information.)

Chapter 4. Solving Computer Problems



Problems with your computer can be caused by software, hardware, or both. You can test the hardware yourself with the assistance of the computer's internal self-tests and the testing programs on the backup copy of the Reference Diskette. If a hardware problem occurs during this testing, an error message appears with the cause of the problem and the action to take.

By using the Reference Diskette, the Troubleshooting Charts, and the other information in this chapter, you should be able to solve the problem yourself or provide a considerable amount of information to the service technician.

Always use the backup copy of the Reference Diskette. The backup copy should contain your computer's current configuration information and testing programs.

IMPORTANT

Use this chapter to test only *IBM* products. Non-IBM products may give misleading errors or incorrect computer responses. Refer to the instructions supplied with those products for testing information.

This chapter contains:

How to Start Testing	86
Troubleshooting Charts	87
Plasma Display Problems	87
Messages on the Screen	88
What If Testing Cannot Find the Problem?	89
Diskette Drive Problems	89
Keyboard, Mouse, Pointing Device Problems	89
Printer Problems	90
External PS/2 Display Problems	90

Option Problems	91
Software Problems	92
Intermittent Problems	92
Reference Diskette Problems	93
How to Get Service	94
Record of My System Unit	95

How to Start Testing

- 1** Start the backup copy of the Reference Diskette (see page 32).
- 2** Look at the display. Does this screen appear?






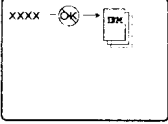
- Yes** The computer has successfully completed its internal self-tests. To start the testing programs follow the instructions on the screen and select "Test the computer."
- **If the computer did not beep**, the speaker is not working and you should have the system unit and keyboard serviced. If you are not sure about the beep, turn the computer off, then on again.
 - **If you cannot go beyond the IBM screen**, have the system unit and keyboard serviced. For instructions, see "How to Get Service" on page 94.
 - **If the testing stops and does not continue**, have the system unit and keyboard serviced. For instructions, see "How to Get Service" on page 94.
- No** Locate the problem in the Troubleshooting Charts on page 87 and follow the prescribed actions.

Troubleshooting Charts

Plasma Display Problems

PLASMA DISPLAY PROBLEMS	ACTION
Blank screen plus no beeps. Note: If you are not sure about the number of beeps, turn the computer off, then on again.	Check to see if: <ol style="list-style-type: none">1. The system unit's power cord is plugged into a working electrical outlet and into the system.2. Cables connected to the system unit are tight. (For information on where cables connect, see page 50.)3. Power switch is on. If the above items are correct and the screen remains blank, have the system unit and keyboard serviced.
Blank screen plus 1 beep.	<ol style="list-style-type: none">1. When an external display is attached, the plasma display is turned off unless Plasma and External is set for the Turned-on Display. (For more information, see page 56.)2. Auto-Dim Time may be running. In this case, the screen will reappear by pressing SHIFT.3. If the external display is in XGA mode, the plasma display is turned off. If the above items are correct and the screen remains blank, have the system unit and keyboard serviced.
Blank screen plus 2 or more beeps.	Have the system unit and keyboard serviced.
Only the cursor “_” appears.	Have the system unit and keyboard serviced.
Screen is unreadable or distorted.	Have the system unit and keyboard serviced. Note: If the plasma display is forced to display 9 dot fonts by an application program (without using BIOS), the screen will be distorted.
Wrong characters appear on the screen.	Have the system unit and keyboard serviced.

Messages on the Screen

MESSAGES ON THE SCREEN	ACTION
<p>Numbers.</p> 	<p>The computer's internal self-test found an error. Check to see:</p> <ol style="list-style-type: none"> 1. That you have the backup copy of the Reference Diskette in the drive. 2. That the diskette is inserted correctly—with the label up and metal-shutter end first—into the drive. <p>If you cannot start the Reference Diskette and get the screen shown in step 2 on page 86, have the system unit and keyboard serviced.</p>
<p>Diskette Prompt.</p> 	<p>Check to see:</p> <ol style="list-style-type: none"> 1. What the Diskette Prompt means on page 58. 2. That you have the backup copy of the Reference Diskette in the drive. 3. That the diskette is inserted correctly— with the label facing toward the system unit and metal-shutter end first—into the drive. <p>If the above items are correct and the prompt remains, have the system unit and keyboard serviced.</p>
<p>Password Prompt.</p> 	<p>A power-on password is set. To use the computer, you must type the correct password and press Enter (see pages 59, 68 and 69).</p> <p>If the power-on password is not working properly, have the system unit and keyboard serviced.</p>
<p>Error Prompt</p>  <p>—or—</p> <p>A screen or message that is not listed above.</p>	<p>Check to see:</p> <ol style="list-style-type: none"> 1. What the Error Prompt means on page 58. 2. That you have the backup copy of the Reference Diskette in the drive. 3. That the diskette is inserted correctly—label facing toward the system unit and metal-shutter end first—into the drive. <p>If the above items are correct and you cannot get the screen shown in step 2 on page 86, have the system unit and keyboard serviced.</p>
<p>ROM error.</p>	<p>Have the system unit and keyboard serviced.</p>

What If Testing Cannot Find the Problem?

If the testing programs on the backup copy of the Reference Diskette cannot find the problem, then use the troubleshooting charts that follow to find your computer's problem.

Diskette Drive Problems

DISKETTE DRIVE PROBLEMS	ACTION
Diskette drive in-use light stays on.	If there is a diskette in the drive, check to see that: <ol style="list-style-type: none">1. The diskette is good and not damaged. Try a backup copy if you have one.2. The diskette is inserted correctly—label facing toward the system unit and metal-shutter end first—into the drive.3. Your software program is OK (see page 92). If the above items are correct and the diskette drive in-use light stays on, have the system unit and keyboard serviced.

Keyboard, Mouse, Pointing Device Problems

KEYBOARD, MOUSE, or POINTING DEVICE PROBLEMS	ACTION
All or some keys on the keyboard do not work.	If the testing programs on the Reference Diskette do not find the problem, have the system unit and keyboard serviced.
The mouse or pointing device does not work.	If the testing programs on the Reference Diskette do not find the problem, check the instructions supplied with the mouse or pointing device for additional testing information. If no testing information is available, have the mouse or pointing device serviced.

Printer Problems

PRINTER PROBLEMS	ACTION
The printer does not work.	<p>Check to see that:</p> <ol style="list-style-type: none"> 1. The printer is turned on and is "Online." 2. The printer signal cable is plugged into the correct connector on the system unit. (For the location of the printer connector, see page 50.) <p>If the above items are correct and the printer still does not work, run the tests described in the printer manual. If the tests show the printer is OK, have the system unit and keyboard serviced.</p>

External PS/2 Display Problems

EXTERNAL PS/2 DISPLAY PROBLEMS	ACTION
Blank screen.	<p>Check to see if the:</p> <ol style="list-style-type: none"> 1. Display's power cord is plugged into a working electrical outlet and into the display. 2. Display is turned on and the display's Brightness and Contrast controls are turned up. 3. Display's signal cable is plugged into the correct connector on the system unit. The correct connector depends upon the type of display you have. Some displays' plugs may not plug into the display connector. <p>If the above items are correct and the screen remains blank, run the display tests described in the instructions supplied with the display. If those tests show the display is OK, have the system unit and keyboard serviced.</p>
Screen is unreadable or distorted.	<p>Run the display tests described in the instructions supplied with the display. If those tests show the display is OK, have the system unit and keyboard serviced.</p>
Wrong characters appear on the screen.	<p>Have the system unit and keyboard serviced.</p>

Option Problems

OPTION PROBLEMS	ACTION
<p>An IBM option that was just installed does not work.</p>	<p>Check to see that:</p> <ol style="list-style-type: none"> 1. The option is designed for the computer. 2. The option is installed correctly. 3. You did not loosen any other installed options or cables. 4. After installation of the option, the backup copy of the Reference Diskette was started for the computer to automatically configure itself. <p>If the above items are correct and the testing programs on the Reference Diskette found no problem, have the system unit, keyboard and option serviced.</p>
<p>An IBM option that used to work does not work now.</p>	<p>Check to see:</p> <ol style="list-style-type: none"> 1. That all of the option's hardware and cable connections are tight. 2. If the option came with its own testing instructions. Use those instructions to test the option. 3. If the option came with a diskette and instructions to update the backup copy of the Reference Diskette. Be sure to check the instructions supplied with the option. (See "Copy an option diskette," on page 62, for more information.) <p>If the above items are correct and the testing programs on the Reference Diskette found no problem, have the system unit, keyboard, and option serviced.</p>

Software Problems

SOFTWARE PROBLEMS	ACTION
Is your software program OK?	<p>To determine if problems are caused by the software, check to see if:</p> <ol style="list-style-type: none">1. Your computer meets the minimum requirements to use the software. Refer to the manuals supplied with the software to verify this.2. The software is designed to operate on your computer.3. Other software works on your computer.4. The software you are using works on another computer.5. You received any error messages when using the software program, and that you referred to the manuals supplied with the software for a description of the messages and solutions to the problem. <p>If the above items are correct and the problem remains, contact your place of purchase or service technician for help.</p>

Intermittent Problems

INTERMITTENT PROBLEMS	ACTION
Does your computer have an intermittent problem?	<p>A problem may be difficult to find because it occurs only occasionally. If your computer has such a problem, check to see that:</p> <ol style="list-style-type: none">1. All cables and cords are tightly connected to the rear of the system unit and attached options.2. When the computer is turned on, air is flowing from the rear of the system unit at the fan grill. If there is no air flow, the fan is not working. This causes the system unit to overheat and turn itself off. <p>If the above items are correct and the problem remains, write down what the problem is and what the computer is doing when the problem occurs. Then contact your place of purchase or service technician for help.</p>

Reference Diskette Problems

REFERENCE DISKETTE PROBLEMS	ACTION
Is your backup copy of the Reference Diskette current?	<p>Always use your backup copy of the Reference Diskette as it should contain the current configuration information and testing programs for your computer. (See "Set configuration" on page 60 for more information.) If the backup copy is not current, problems with the computer may not be found if you are running the testing programs.</p> <p>Some options come with a diskette and instructions to update the backup copy of the Reference Diskette. This option diskette contains the option's testing program and configuration information. If you installed an option, check its instructions to see if it came with such a diskette.</p>

How to Get Service

If the computer needs service, you can:

- Call an *IBM* authorized service technician to come and repair it
- Take it to an *IBM* authorized service center for repair
- Call your place of purchase.

When obtaining service, describe the error message or problem to the service technician. Error messages help identify what service action is required and help the service technician provide quick and efficient service to you.

Notes:

1. If the message "have the system unit serviced" or "have the keyboard serviced" appears on the screen, have both the system unit and the keyboard serviced.
2. The product name, type/model number, serial number, and rear cover key number of your system unit are recorded on page 95.

For your convenience, write down service phone numbers here:

Record of My System Unit

The following information should be recorded and retained.

IBM Product Name	<i>IBM Personal System/2 Model P75 486</i>
IBM Model Number	
IBM Serial Number	
IBM Rear Cover Key Number	

Notes:

1. For the location of the type/model number and serial number, see 2 on page 5.
2. The model number will have a preface of:
 "*Type*" or
 "*Model.*"
3. The serial number will have a prefix of **S/N**.
4. For the location of the number of the rear cover key, see page 3.

Appendix A. Additional Information



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Diskette Drives and Diskettes

There are two types of diskette drive:

- 1.44MB (megabytes) diskette drive
- 720KB (kilobytes) diskette drive.

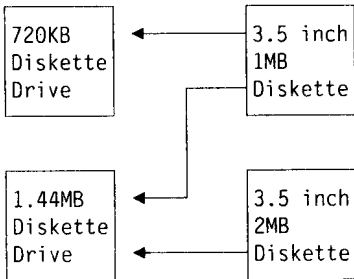
Notes:

1. 1.44MB and 720KB indicate their storage capacity.
2. 1MB equals 1 048 576 bytes of storage.
3. 1KB equals 1024 bytes of storage.

The IBM Personal System/2 Model P75 486 operates with the 1.44MB diskette drive.

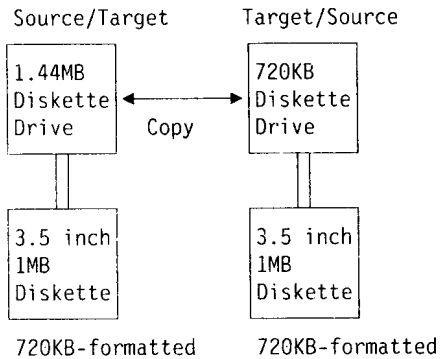
Usable Diskettes

The following figure illustrates which diskette drive can use which diskette.



Usable Diskettes in Diskette-to-Diskette Operation

The following figure illustrates which diskette can be used in diskette-to-diskette operation between different diskette drives.

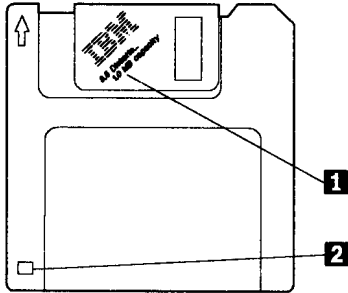


Identifying Diskette Drives

A 1.44MB diskette drive has "1.44" printed on the diskette eject button. A 720KB diskette drive has no identification mark.

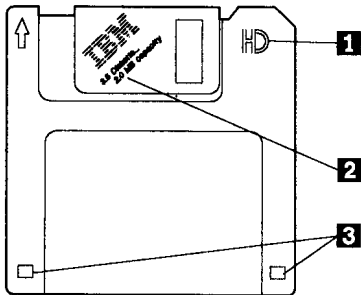
Identifying Diskettes

A 1MB diskette looks like this:



It is usually labeled "1.0MB . capacity" or "2DD" **1**, and has a square cutout **2**.

A 2MB diskette looks like this:



It has the letters "HD" **1**, is usually labeled "2.0MB capacity" **2**, and has two square cutouts **3**.

Formatting Diskettes

A diskette must be formatted to prepare it for use. Your operating system manual describes the commands for formatting diskettes. When formatting a diskette, be sure it has the appropriate storage capacity.

1MB Diskettes must be formatted to 720KB. You can do this with either a 720KB or a 1.44MB diskette drive. When you use a 1.44MB diskette drive, be sure to specify a format of 720KB; otherwise the diskette will be formatted to 1.44MB with unpredictable results.

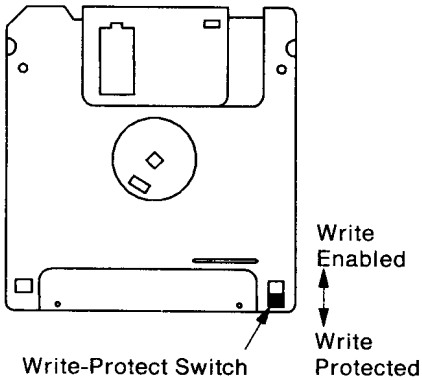
2MB Diskettes must be formatted to 1.44MB. To do this, you must use a 1.44MB diskette drive.

Write-Protecting Diskettes

It is possible to format a diskette or write (record) information onto a diskette unintentionally. Important information could be lost. For this reason, you should write-protect important diskettes. When diskettes are write-protected, you can read from the diskettes, but you cannot write onto them. Some diskettes, such as the Reference Diskette, are permanently write-protected.

To locate the write-protect switch, turn the diskette over with the label facing down.

- **To prevent writing** onto a diskette, slide the switch down.
- **To enable writing** onto a diskette, slide the switch up.



The IBM Disk Cache

Technical Information

IBMCACHE.SYS is a device driver that allows a portion of the computer memory to be used as a fixed disk cache. It speeds up application programs by keeping a buffer storage of frequently accessed data. When an application program requests data from the cache, it is sent directly to the application program. Thus, the access time is quicker than if the data had to be read from the fixed disk again. Only one IBMCACHE.SYS device driver can be installed. It uses about 8KB of memory plus the size of the cache. All fixed disks attached to the computer are supported.

For more information about device drivers and buffer commands, refer to the DOS manual.

The installation program IBMCACHE.COM copies IBMCACHE.SYS from the backup copy of the Reference Diskette (where it is a hidden file) to the root directory of fixed disk drive C. It then creates or modifies the fixed disk CONFIG.SYS file to contain a statement with this format:

device = \ibmcache.sys [sssss] [/E] [/Pn]

[sssss] is the cache size in (KB)K Bytes, and is specified as a decimal value. The valid range is 16 to 512 if low memory is used, 16 to 15360 if extended memory is used. The default cache size is 64KB for low memory, 128KB for extended memory.

[/E] tells IBMCACHE.SYS to use extended memory. The default condition is low memory.

Note: High-speed communications may overrun and create data errors if the cache is in extended memory. Also, IBMCACHE.SYS is compatible with VDISK.SYS, but may conflict with other extended memory applications.

[/Pn] is the cache page size in sectors. Valid values for n are 2, 4, and 8. The default page size is 4 sectors. Some application programs may perform better with different page size values.

What Is IBM Cassette BASIC?

IBM Cassette BASIC (Beginner's All-Purpose Symbolic Instruction Code) is built into the IBM Personal System/2 Model P75 486 to help maintain software compatibility with other *IBM* computers. Cassette BASIC is the lowest version of BASIC and is not intended for production use as no information can be saved. For more information about BASIC, refer to the *IBM BASIC* manual (not included with this product).

If your computer has a fixed disk drive with an operating system already installed, you will not be able to start Cassette BASIC.

To start Cassette BASIC:

- 1** Remove the diskette from the diskette drive.
- 2** Turn on the computer.
- 3** When the Diskette Prompt appears, press F1.
- 4** When the following screen appears, Cassette BASIC is loaded and ready to use:

```
The IBM Personal Computer Basic  
Version CX.XX Copyright IBM Corp. XXXX  
XXXXX Bytes free  
Ok
```

```
1LIST 2RUN 3LOAD" 4SAVE" 5CONT 6LPT1 7TRON 8TROFF 9KEY 0SCREEN
```

IBM Power Cords

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 Underwriters Laboratories (UL) and certified by the Canadian Standards Association (CSA).

Note: UL is a registered trademark of Underwriters Laboratories Inc.

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 (domestic 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 of a minimum 18 AWG, and a grounding-type attachment plug rated 15 amperes, 250 volts. The cord set should be marked HAR and have the appropriate safety approvals for the country in which the equipment will be installed.

Notice for Customers in Chicago, Illinois: Use the 1.8 m (6 ft) power cord.

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

Country	IBM Power Cord Part Number
Abu Dhabi	6952356

Country	IBM Power Cord Part Number
Albania	6952356

Country	IBM Power Cord Part Number
Antigua	6952356
Argentina	6952291
Australia	6952311
Austria	6952320
Bahamas	38F4694
Bahrain	6952356
Bangladesh	6952347
Barbados	38F4694
Belgium	6952320
Bermuda	38F4694
Bolivia	38F4694
Brazil	38F4694
Brunei	6952356
Bulgaria	6952320
Burma	6952347
Canada	38F4694
Cayman Islands	38F4694
Chile	6952374
Colombia	38F4694
Costa Rica	38F4694
Czechoslovakia	6952320
Denmark	6952329
Dominican Republic	38F4694
Dubai	6952356
Ecuador	38F4694
Egypt	6952320
El Salvador	38F4694
Fiji	6952356

Country	IBM Power Cord Part Number
Finland	6952320
France	6952320
German Democratic Republic	6952320
Germany	6952320
Greece	6952320
Guatemala	38F4694
Guyana	38F4694
Haiti	38F4694
Honduras	38F4694
Hong Kong	6952356
Hungary	6952320
Iceland	6952320
India	6952356
Indonesia	6952320
Ireland	6952356
Israel	6952383
Italy	6952374
Jamaica	38F4694
Japan	38F4694
Jordan	6952356
Kenya	6952356
Korea (South)	38F4694
Kuwait	6952356
Lebanon	6952320
Macao	6952356
Malaysia	6952356
Mexico	38F4694

Country	IBM Power Cord Part Number
Netherlands	6952320
Netherlands Antilles	38F4694
New Guinea	6952311
New Zealand	6952311
Nicaragua	38F4694
Nigeria	6952356
Norway	6952320
Oman	6952356
Pakistan	6952347
Panama	38F4694
Papua	6952311
Paraguay	6952291
People's Republic of China	6952356
Peru	38F4694
Philippines	38F4694
Poland	6952320
Portugal	6952320
Qatar	6952356
Romania	6952320
Saudi Arabia	38F4694
Singapore	6952356
South Africa	6952347
Spain	6952320
Sri Lanka	6952347
Sudan	6952320
Suriname	38F4694

Country	IBM Power Cord Part Number
Sweden	6952320
Switzerland	6952365
Syria	6952320
Taiwan	38F4694
Thailand	1838575
Trinidad (West Indies)	38F4694
Turkey	6952320
U.K.	6952356
U.S.A.	38F4694
Uruguay	6952291
Venezuela	38F4694
Yugoslavia	6952320

Battery

Removing and Installing

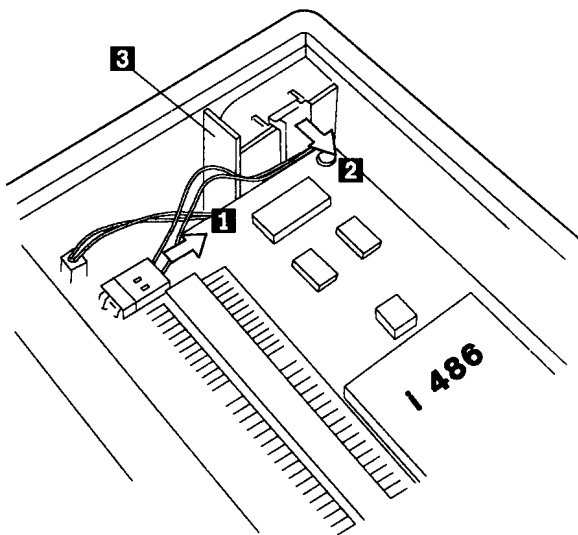
CAUTION:

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. 64F9987. Use of another battery could result in ignition or explosion of the battery. Replacement batteries can be ordered from IBM or IBM Authorized Dealers.

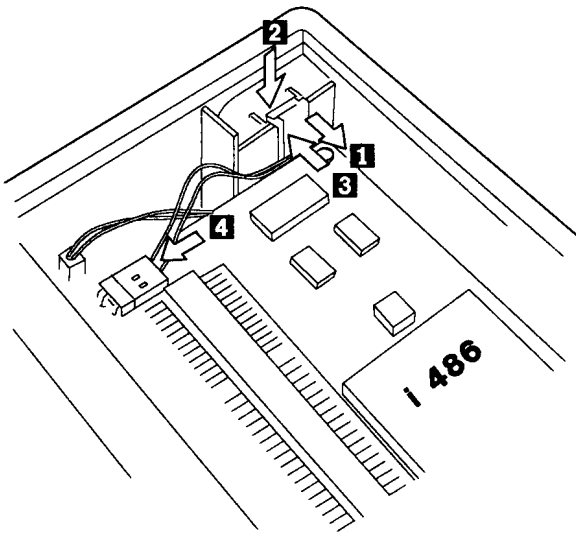
Warning: The configuration information is lost from the computer memory when the battery is removed or replaced. After removing and installing the battery, you must start the backup copy of the Reference Diskette for the computer to automatically configure itself.

- 1** Remove the rear cover by using the procedure on page 10.
- 2** If there is an adapter installed in the expansion slots 2 or 4, you may need to temporarily remove the adapter. (See page 76 for instructions on removing the adapter.)

- 3** Remove the old battery kit in order of **1**, **2**, and **3** as shown in the following figure.



- 4** Install the new battery kit in order of **1**, **2**, **3**, and **4** as shown in the following figure.



- 5** Install the adapter, if it was removed in step 2 (see page 13).
- 6** Install the rear cover by using the procedure on page 23.
- 7** Start the backup copy of the Reference Diskette to automatically configure the computer. (See "Starting the Backup Copy of the Reference Diskette" on page 64. For more information, see "Set configuration" on page 60.)

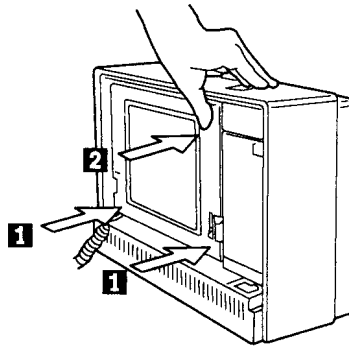
If you previously backed up your computer's configuration, then go to the main menu of the backup copy of the Reference Diskette and select "Set configuration". Next, select "Restore configuration" and follow the instructions to restore your original configuration. (See "Restore configuration" on page 61 for more information.)

Note: If four 4MB memory module kits have been installed, it may take about 10 minutes for the IBM logo screen to appear.

Moving the Computer

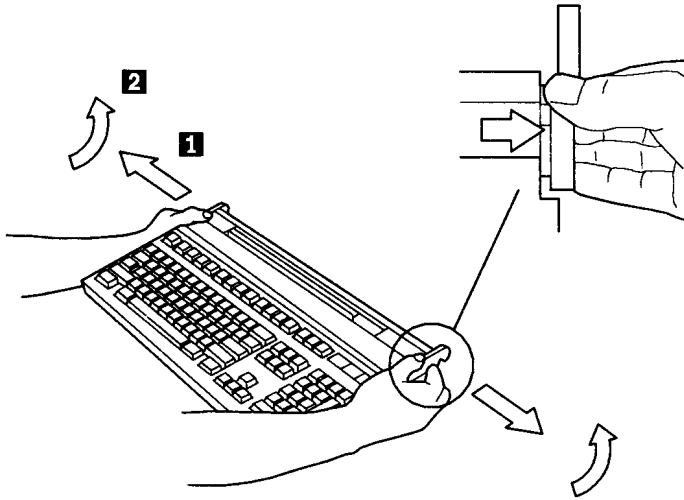
When you move the computer, follow these instructions.

- 1** Remove any diskette from the diskette drive.
- 2** Turn off the computer (the system unit and all attached options such as the external PS/2 display and printer).
- 3** Put the plasma display back into its normal place by first pushing back the lower edge **1** and then pressing the upper edge **2** until it is locked.



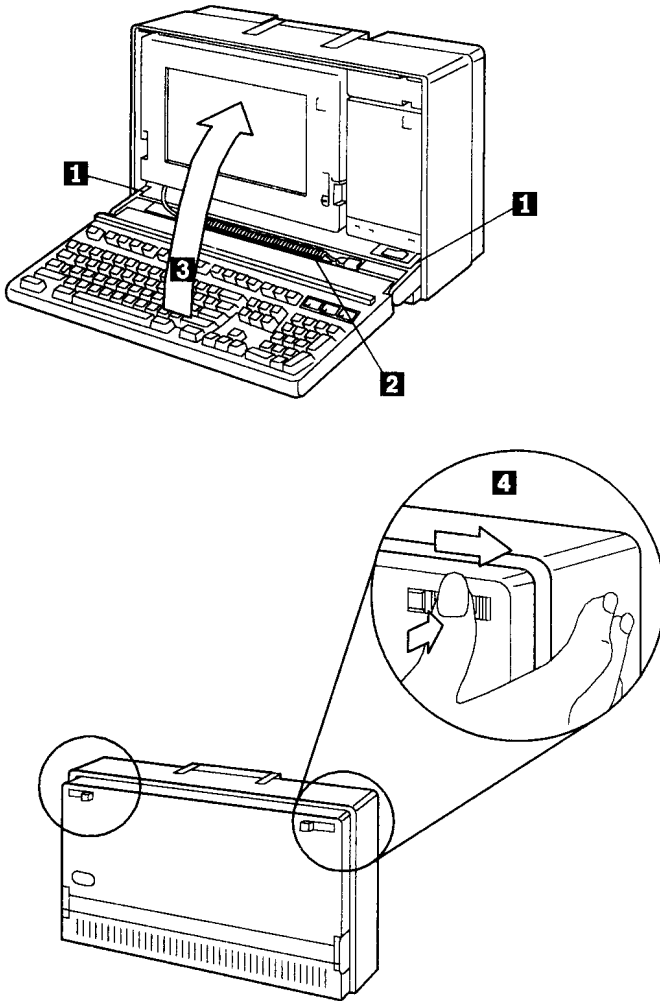
- 4** Put the diskette drive back into its normal place by pushing its stand-off.

5 Tilt back the keyboard feet by pulling them out then turning them.



- 6** Set the keyboard feet in the groove of the system unit **1**, and set the keyboard cable in the keyboard cable groove **2**. Raise the keyboard into place **3**, then push and slide its clamps outwards to lock the keyboard onto the system unit **4**.

Note: The keyboard is locked on the system unit when you no longer see the yellow color next to the keyboard clamps.



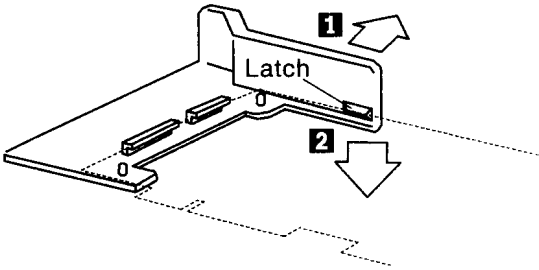
7 Unplug all computer power cords from the electrical outlets. Then make a note of all cables and cords connected to the rear of the system unit and disconnect them.

8 Raise the handle on the topside of the computer. Now you can move the computer.

Note: For shipping long distances, it is recommended that you pack the computer. If you saved the original boxes and packing material, use them to pack the computer. If you are using different boxes, cushion the computer well to avoid any damage. Shipping the computer a long distance without packing it properly may result in damage. If you have any questions or need help, call your place of purchase.

Removing the Retainer of an Adapter

1 Push the retainer outward **1** to release the latch. Then lower the retainer **2**.



2 Remove the retainer from the adapter.

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Note:



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