



*Personal Computer
Hardware Reference
Library*

Guide to Operations

First Edition (Revised January 1983)

Changes are periodically made to the information herein; these changes will be incorporated in new editions of this publication.

Products are not stocked at the address below. Requests for copies of this product and for technical information about the system should be made to your authorized IBM Personal Computer dealer.

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WARNING: This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC rules. Only peripherals (computer input/output devices, terminals, printers, etc.) certified to comply with the Class B limits may be attached to this computer. Operation with non-certified peripherals is likely to result in interference to radio and TV reception.

INSTRUCTIONS TO USER

This equipment generates and uses radio frequency energy and if not installed and used properly, i.e., in strict accordance with the operating instructions, reference manuals, and the service manual, may cause interference to radio or television reception. It has been tested and found to comply with the limits for a Class B computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a residential installation.

If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the equipment with respect to the receiver.
- Move the equipment away from the receiver.
- Plug the equipment into a different outlet so that equipment and receiver are on different branch circuits.
- Ensure that card mounting screws, attachment connector screws, and ground wires are tightly secured.
- Ensure that card slot covers are in place when no card is installed.

If necessary, consult your dealer service representative for additional suggestions.

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. It is the responsibility of the user to correct such interference.

Notice: As sold by the manufacturer, this Prototype card does not require certification under the FCC's rules for Class B devices. The user is responsible for any interference to radio or TV reception which may be caused by a user-modified prototype card.

CAUTION: This product is equipped with a UL listed and CSA certified plug for user's safety. It is to be used in conjunction with a properly grounded 115 VAC receptacle to avoid electrical shock.

Notes:

Preface

The Guide to Operations introduces you to the IBM Personal Computer. If you will be setting up, using, or writing programs for the Personal Computer, this publication is for you. It has six sections.

Section 1, 'Introduction,' is an overview of some of the configurations, hardware, and software that is available.

Section 2, 'Setup,' directs you from installation through testing of the Personal Computer.

Section 3, 'Operations,' introduces you to the IBM Personal Computer. If you are a newcomer or an experienced operator, this section will become a ready reference. You will have instructions about the displays, printer, keyboard, diskettes, and language.

Section 4, 'Problem Determination Procedures.' The easiest and quickest way to check your system is to follow this procedure. It can be used to verify the proper operation, or determine where your problem is located.

Section 5, 'Options,' any additions to your unit will have various information that should be inserted in this section.

Section 6, 'Relocate,' as the name implies, you are moving the system. Recommendations for you to follow in order to move the unit(s) and prevent damage to them.

There are protruding tabs you may use to find the section you are looking for. Each section has a content page. The content page lists the chapters in the section and has bleeder tabs that you can use to get to that chapter quickly.

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SECTION 1. INTRODUCTION

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Introduction

The basic IBM Personal Computer consists of a system unit and keyboard. You may add a display, printer, expansion unit, additional memory, and other options to expand your system to meet your particular needs.

The system unit is the central part of your Personal Computer and supports a variety of options.

The keyboard, which is the primary input to the system, attaches to the system unit with a six foot coiled cable. The keyboard is divided into three major sections: the typewriter area, the numeric keypad and the function keys.

The IBM 80 CPS Matrix/Graphics Printer provides bidirectional printing, in several character sizes on single- or multi-part forms.

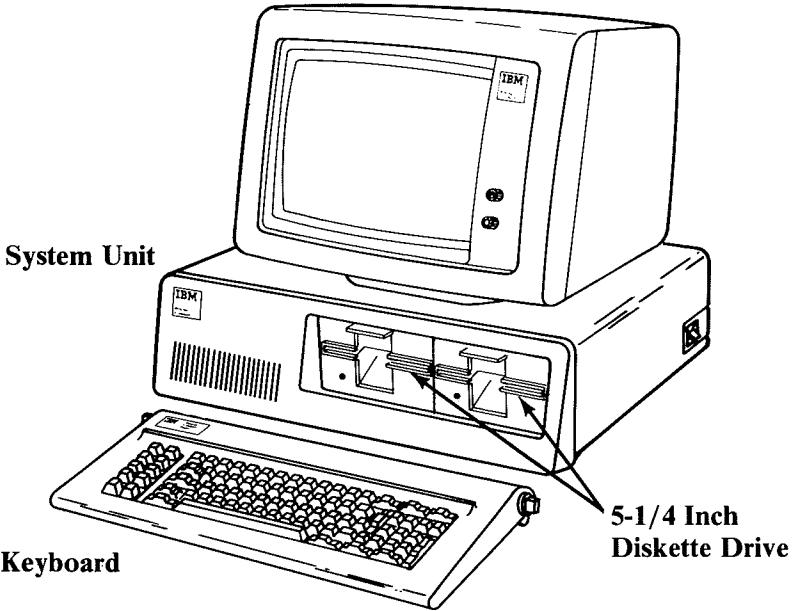
The expansion unit provides space for additional options to be attached to your IBM Personal Computer.

The IBM Personal Computer supports the attachment of the IBM Monochrome Display and IBM Color Display plus a variety of display devices either color or black and white.

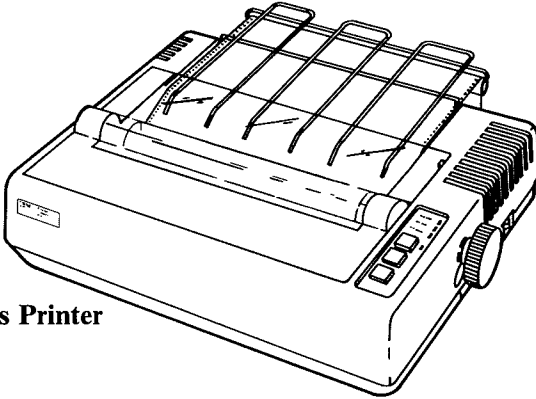
The non-IBM devices in this manual are for illustration only, and their use here does not constitute a recommendation or an endorsement by IBM. Selection, interconnection, and use of another manufacturer's device, are the sole responsibility of the customer.

Configuration Examples

IBM Monochrome Display

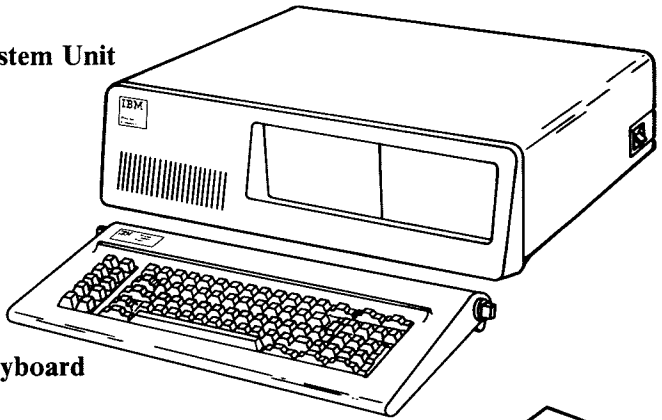


IBM 80 CPS Matrix/Graphics Printer



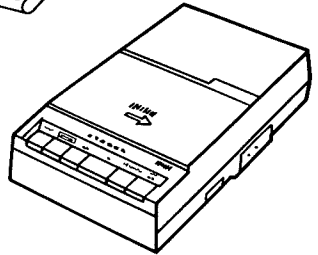
This example shows the system unit, keyboard, IBM Monochrome Display, and IBM 80 CPS Matrix/Graphics Printer. Two 5-1/4 inch diskette drive units are used to store programs and data.

System Unit



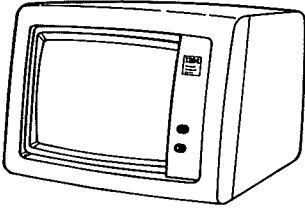
Keyboard

**Cassette Recorder
(Supplied by User)**

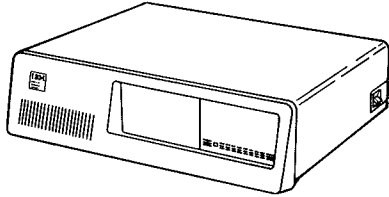


This example shows the system unit, keyboard, and cassette recorder. You can use your cassette recorder for the storage of programs and data.

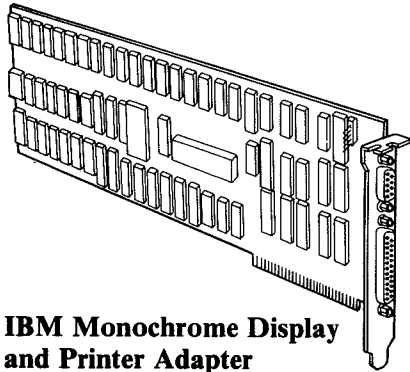
Option Examples



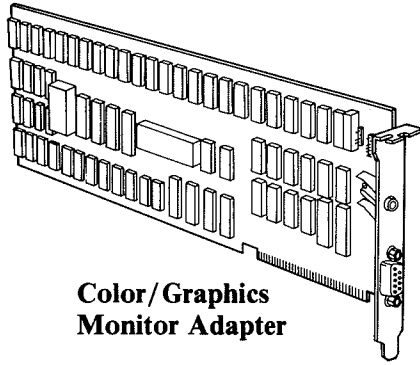
IBM Monochrome Display



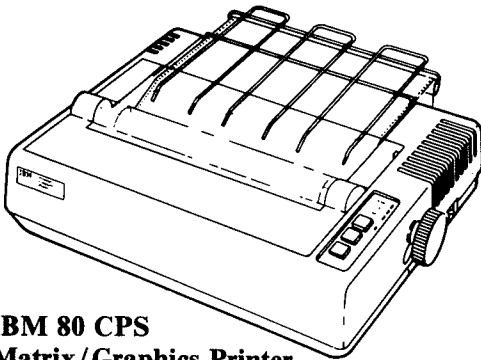
Expansion Unit



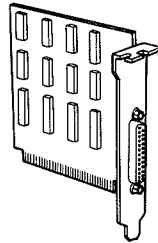
**IBM Monochrome Display
and Printer Adapter**



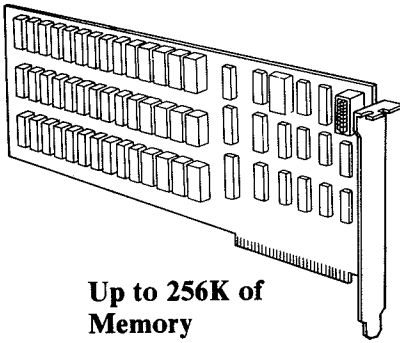
**Color/Graphics
Monitor Adapter**



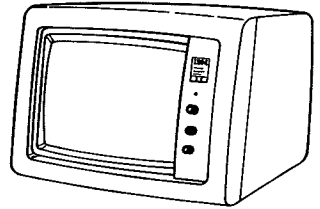
**IBM 80 CPS
Matrix/Graphics Printer**



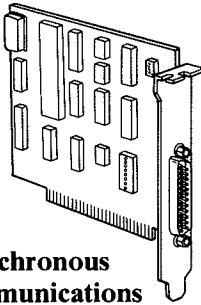
Printer Adapter



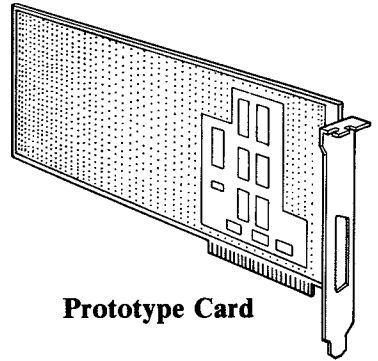
**Up to 256K of
Memory**



IBM Color Display



**Asynchronous
Communications
Adapter**



Prototype Card

Notes:

SECTION 2. SETUP

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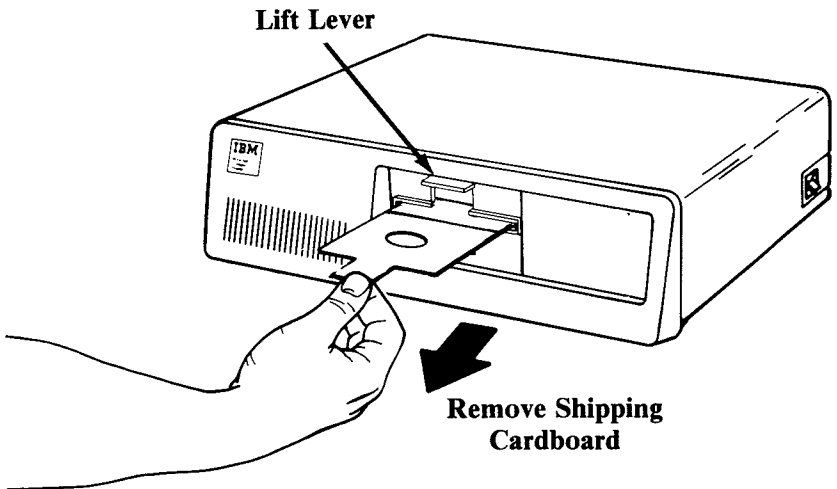
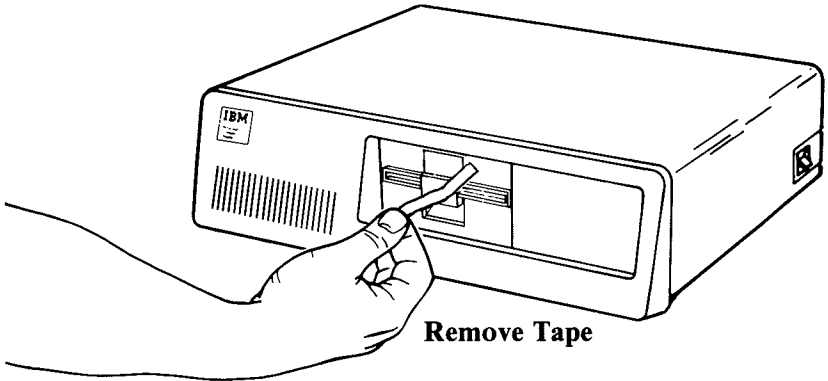
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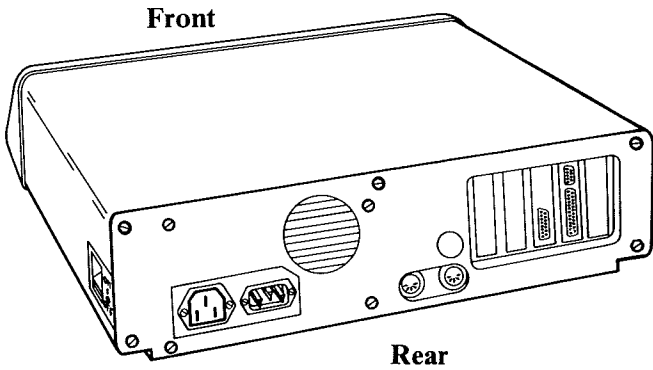
Cabling Your IBM Personal Computer

1. If your Personal Computer came with a 5-1/4 inch Diskette Drive installed in the system unit, remove the shipping cardboard.

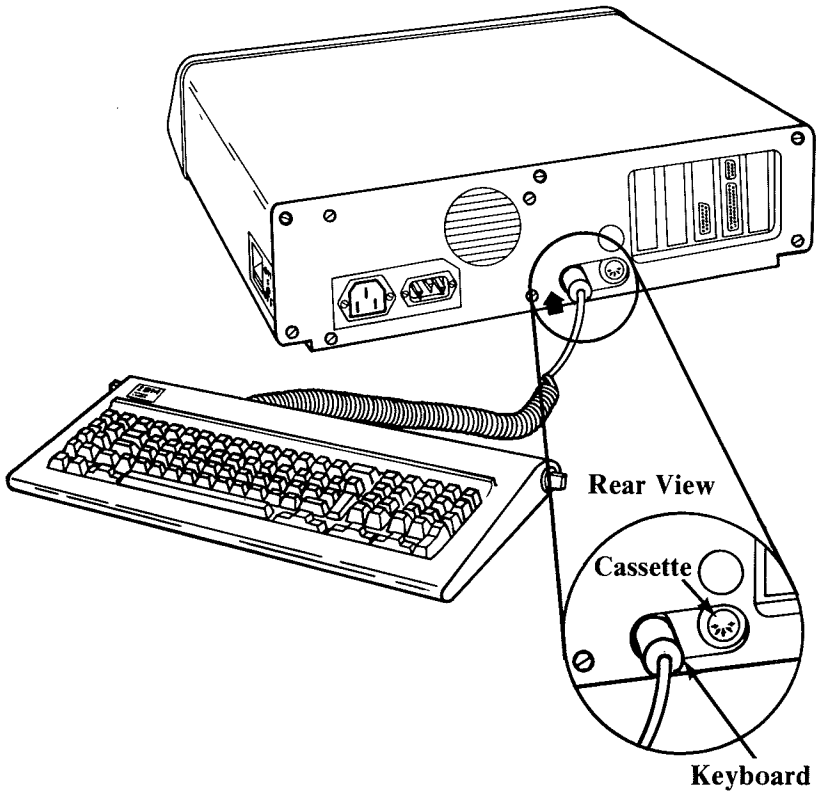
System Unit



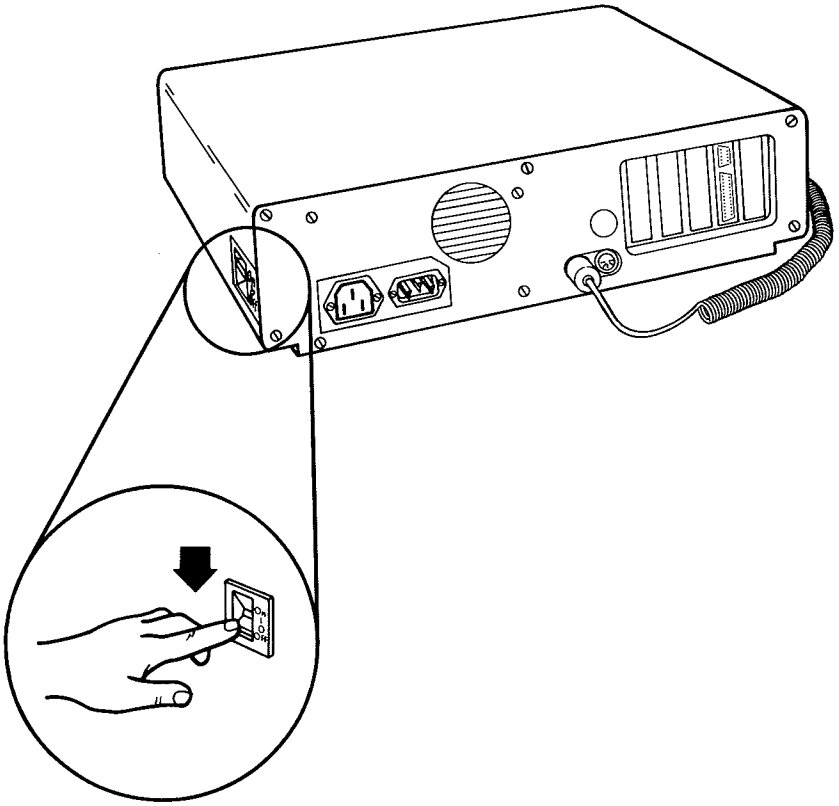
2. Place the system unit on the work area in the position as shown.



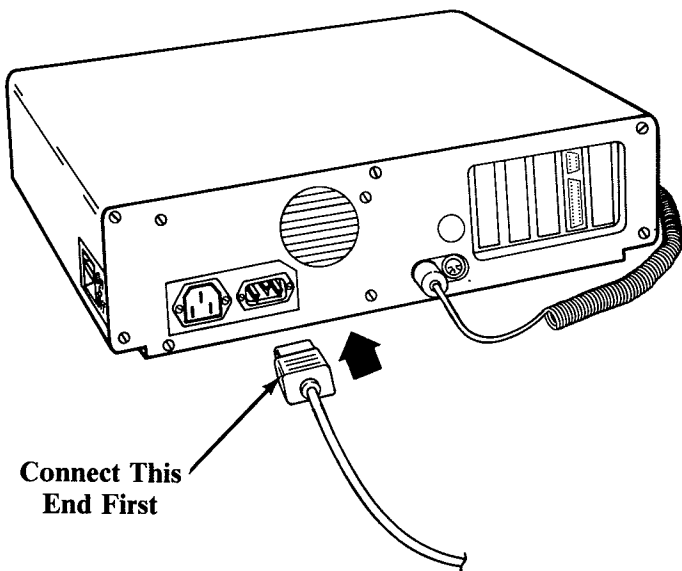
3. Place the keyboard next to the system unit and connect the cable as shown.



4. Set the system unit's Power switch to Off.



5. Connect the system unit's power cord to the system unit, then to the wall outlet.

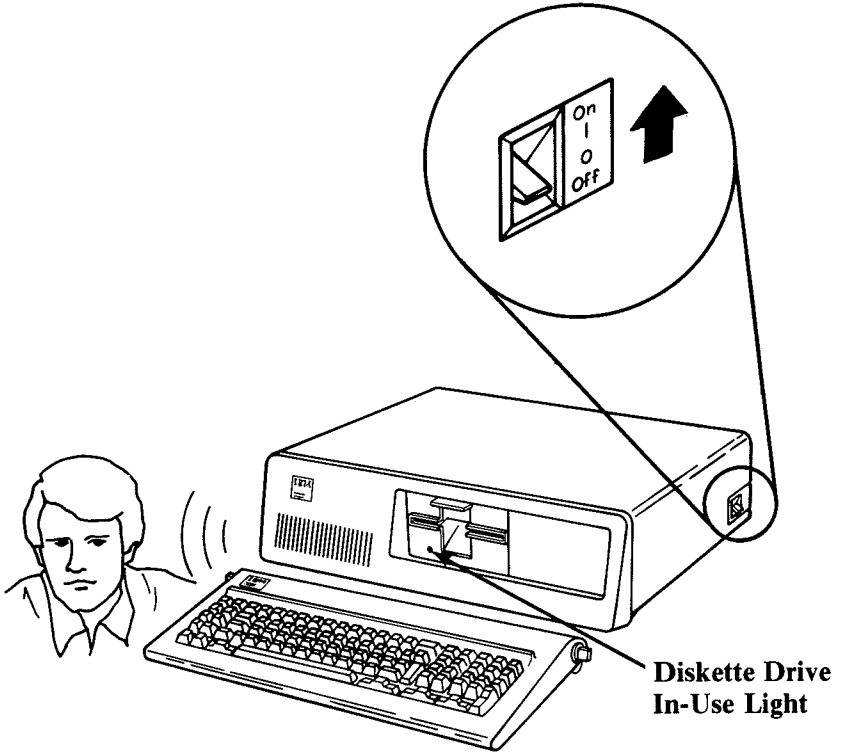


CAUTION: Connect to a properly grounded 115 Vac receptacle.

Mini Power-On Self Test

6. Set the system unit's Power switch to On. You should hear one short beep after the memory is checked. This will take between 3 and 90 seconds depending on the amount of memory installed.

If you have a diskette drive installed, it is normal to hear motor noise and see the in-use light for a short period of time.



If you heard one short beep, your system unit has completed the Mini Power-On Self Test.

If you heard nothing or anything other than the short beep and the diskette drive, return your IBM Personal Computer to your place of purchase.

If you have any options you would like to install, go to Section 5, "Options." You may save time if you follow the sequence listed below when installing your options.

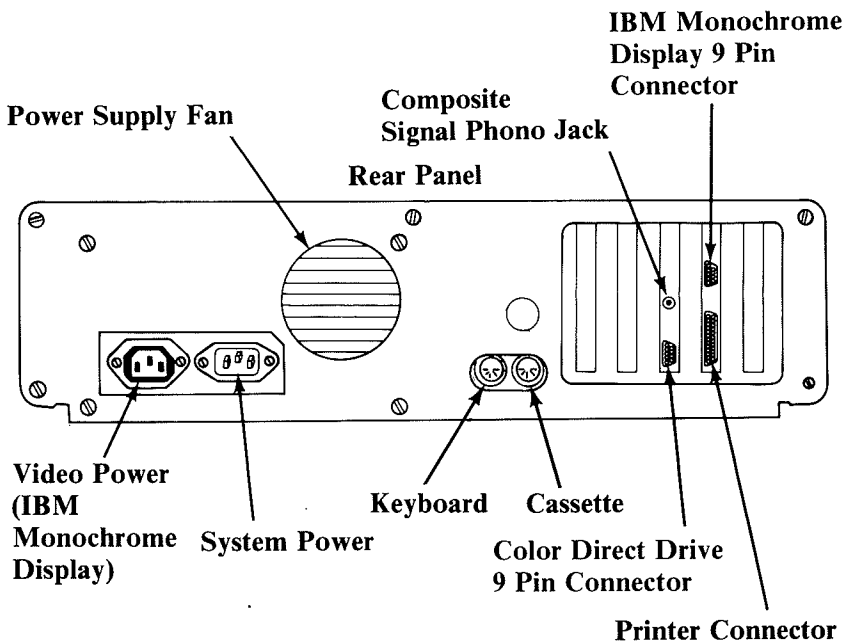
- 16KB Memory Expansion Kit
- 5-1/4 inch Diskette Drive(s)
- All other Option Adapter(s)

When you are finished, return to this section and continue.

Rear Panel Reference

7. Use the reference diagram below and connect all of the cables and cords.

If you have an expansion unit connected to your Personal Computer, refer to Section 5, "Options" and locate the IBM Personal Computer Expansion Unit Option Instruction to cable the expansion unit to the system unit.



Before going to Step 8, read the note below.

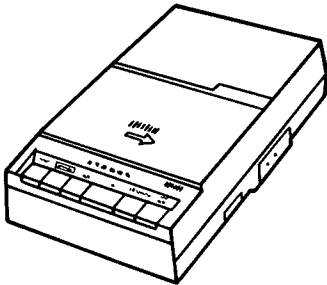
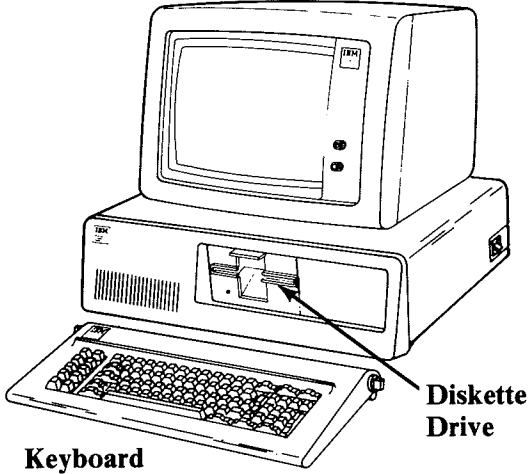
Note: If you are using a home television or other display, you could experience data errors while using the 5-1/4 inch Diskette Drive. This problem is easily cured by moving the television or display at least 12 inches (35 cm) away from your IBM Personal Computer.

- 8.** If you have an expansion unit connected to your IBM Personal Computer, plug the expansion unit's power cord into a properly grounded 115 Vac receptacle.

Component Arrangement

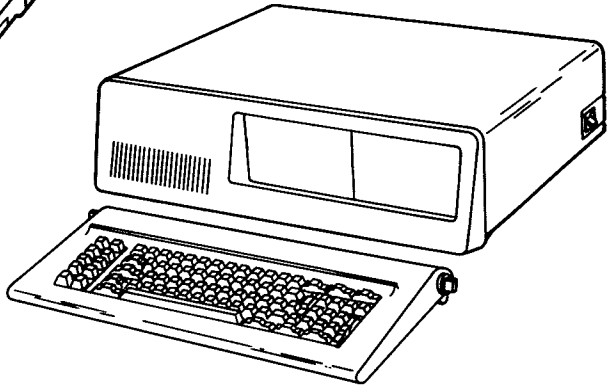
9. Position your system components so you can use them (TV should be 12 inches (35 cm) from the diskette drive). Two of the more common arrangements are as follows.

IBM Monochrome Display



Cassette Recorder
(Supplied by User)

System Unit

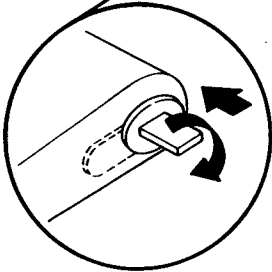
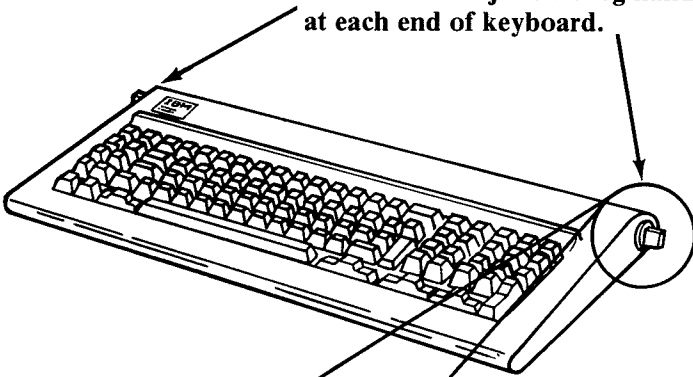


Keyboard and Display Adjustment

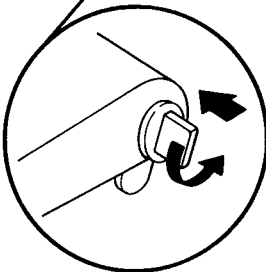
- 10.** The keyboard has adjustable tilt positions for typing comfort.

WARNING: Hold the keyboard when changing positions.

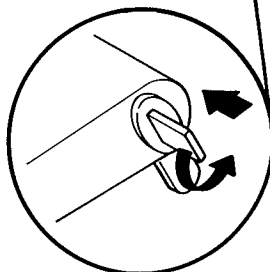
There is one adjustable leg handle at each end of keyboard.



Level Position
Firmly push in the adjustable leg handles and turn.

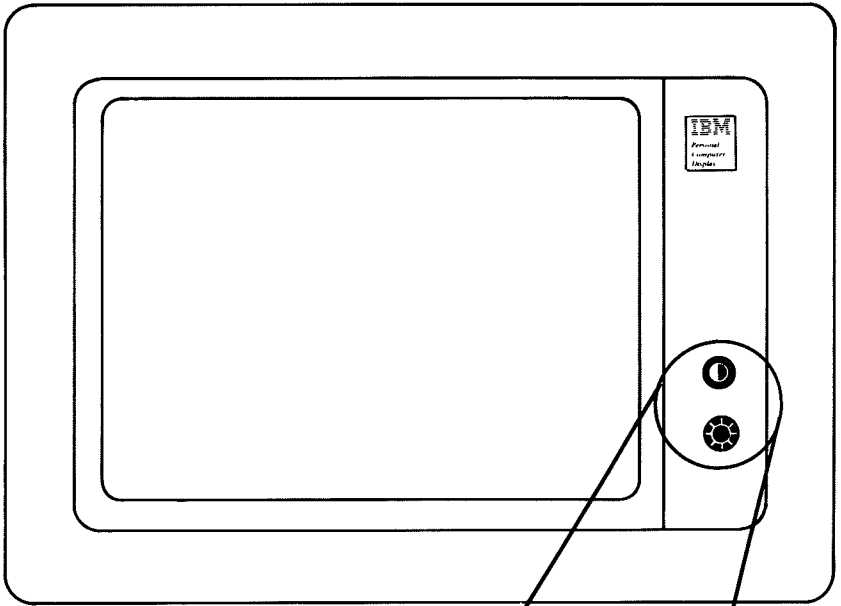


Tilt Position 1
Firmly push in the adjustable leg handles and turn.

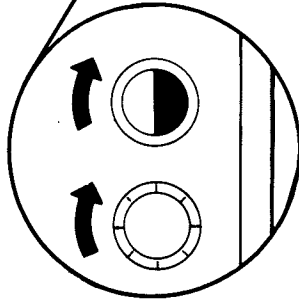


Tilt Position 2
Tilt Position 2 may not be available on your keyboard.

11. Turn the display or television contrast and brightness controls fully clockwise.



**IBM Monochrome
Display**



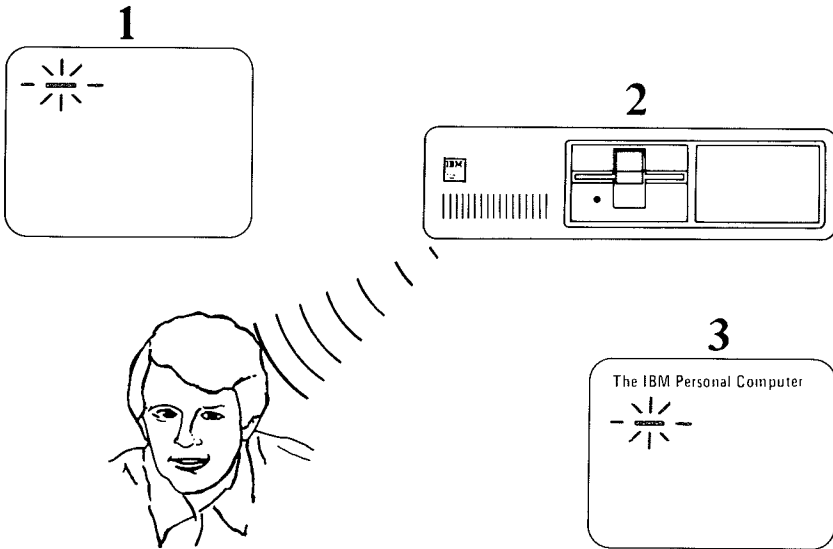
Your new IBM Personal Computer is ready for a Power-On Self Test.

Power-On Self Test (POST)

If you have an expansion unit attached to your Personal Computer, the expansion unit must always be turned on first unless otherwise indicated.

When you first set the system unit's Power switch to On a power-on self test (POST) occurs. The POST takes 3 to 90 seconds depending on the amount of memory installed.

- 12.** Set the Power switch on the expansion unit (if attached) to On.
- 13.** Set the Power switch on the system unit to On.
There will normally be three responses:
 - a. The cursor will appear on the screen in approximately 4 seconds.
 - b. One short beep will be heard after the memory is tested.
 - c. The IBM Personal Computer Message will appear on the screen.

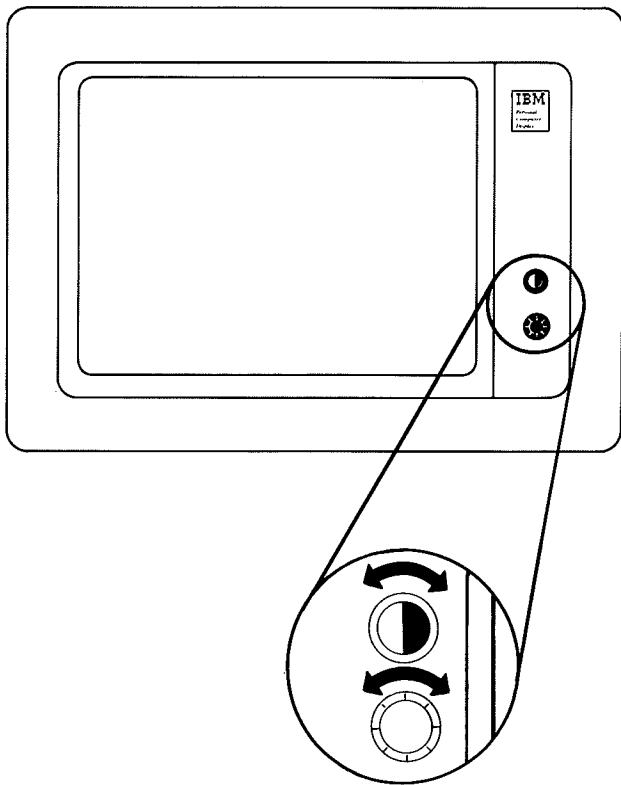


Note: These three responses tell you that the POST has successfully completed. Other information will appear on the screen but this is not important at this time. If you have diskette drive(s) and/or a printer (that you powered on), you will also hear and see responses from these; ignore these responses.

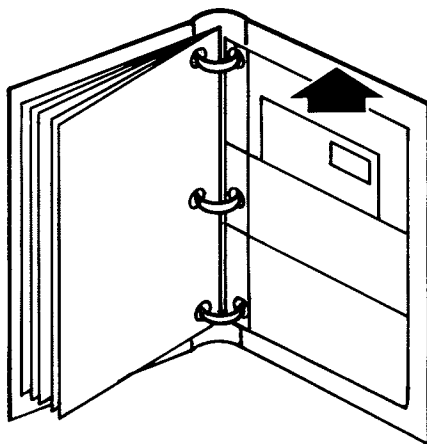
If the responses were incorrect, go to Section 4, "Problem Determination Procedures."

If the responses were correct, go to Step 13.

- 14.** Adjust contrast and brightness controls for eye comfort.



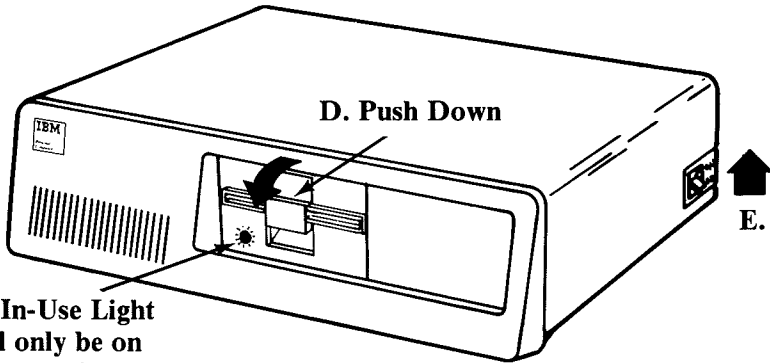
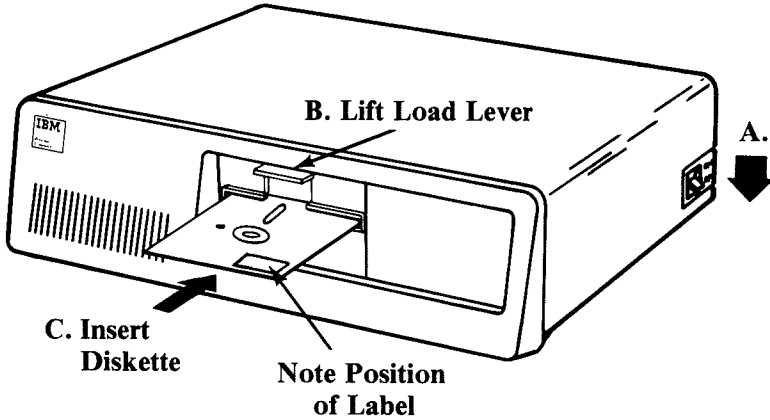
- 15.** Get the diskette or cassette labeled “Diagnostics” from the rear cover of this manual.



16. Loading Diskette Diagnostics

Note: If you are using the cassette, go to Step 17.


- A. Set the system unit's Power switch to Off.
- B. Lift the load lever.
- C. Insert the diskette as shown until the rear stop is felt.
- D. Push the load lever down and it will latch closed.
- E. Set the system unit's Power switch to On.



The In-Use Light
(Will only be on
when the diskette
drive is performing
a "read" or "write"
function.)

If you are using a home television or other displays with your IBM Personal Computer, and the information on the screen is shifted to the left or right, as in the example below, press Function key



to move the information to the right, or Function key  to move the information to the left.

e IBM Personal Computer DIAGNOSTICS
rsion xxx (C) Copyright IBM Corp xxxx, xxxx

LECT AN OPTION

- RUN DIAGNOSTIC ROUTINES
- FORMAT DISKETTE
- COPY DISKETTE
- PREPARE FIXED DISK FOR RELOCATION
- EXIT TO SYSTEM DISKETTE

SERT DIAGNOSTIC DISKETTE IN DRIVE
AND ENTER THE ACTION DESIRED

—

If the information on your screen is not centered, center it at this time and go to Step 20.

17. Loading Cassette Diagnostics

If you are using a cassette recorder to test your system, follow the procedures below.

1. Read the cassette recorder's user manual before continuing.
2. Insert the Diagnostics cassette.
3. Rewind the cassette to the beginning.
4. Set the system unit's Power switch to On.
5. Turn the volume on the cassette recorder to high.
6. Press Play on the cassette recorder.
7. Type load"ldcass.

8. Press  .


9. Ensure your cassette is turning.
10. Wait for ldcass .B to appear on the screen, then wait for Ok to appear on the screen.
11. Type RUN.

12. Press  .

13. Wait for "THE INSTALL DEVICES ARE" frame to appear on the screen (approximately 90 seconds).

If you are using a home television or other displays with your IBM Personal Computer, and the information on the screen is shifted to the left or right, as in the example below, press Function key



to move the information to the right, or Function key  to move the information to the left.

INSTALLED DEVICES ARE

EM BOARD

B MEMORY

BOARD

MOCHROME & PRINTER ADAPTER

MONITOR/GRAPHICS ADAPTER

DEVICE LIST CORRECT (Y/N) ?

If the information on your screen is not centered, center it this time and continue.

- 18.** When the cassette is loaded, the screen will be similar to this figure.

**THE INSTALLED DEVICES ARE
SYSTEM BOARD
128KB MEMORY
KEYBOARD
MONOCHROME & PRINTER ADAPTER
COLOR/GRAPHICS ADAPTER**

IS THE LIST CORRECT (Y/N)?

19. Press  then  . This screen will appear.

SYSTEM CHECKOUT

0 - RUN TESTS ONE TIME

1 - RUN TESTS MULTIPLE TIMES

2 - LOG UTILITIES

9 - EXIT DIAGNOSTIC ROUTINES

ENTER THE ACTION DESIRED

?

- 20.** Using the Diagnostics diskette compare the screen; if the screen is not similar go to Section 4, "Problem Determination Procedures."

The IBM Personal Computer DIAGNOSTICS

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SELECT AN OPTION

0 - RUN DIAGNOSTIC ROUTINES

1 - FORMAT DISKETTE



2 - COPY DISKETTE

3 - PREPARE FIXED DISK FOR RELOCATION

9 - EXIT TO SYSTEM DISKETTE

**INSERT DIAGNOSTIC DISKETTE IN DRIVE
A AND ENTER THE ACTION DESIRED**

—

- 21.** Press  then  .

22. Summary

This completes your system mini-test. Return the Diagnostics cassette or diskette to the back of this manual.

IBM recommends you perform a complete system checkout whenever you recable your system or install an option. The system checkout is in Section 4, "Problem Determination Procedures."

You are now ready to learn the fundamentals of your system. Go to Section 3, "Operations."

Notes:

SECTION 3. OPERATIONS

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