

EPSON[®]
Equity[™] I
User's Guide

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This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular 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 computer with respect to the receiver
- Move the computer away from the receiver
- Plug the computer into a different outlet so that computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

“How To Identify and Resolve Radio-TV Interference Problems”

This booklet is available from the U.S. Government Printing Office, Washington DC **20402**, Stock No. 004-000-00345-4.

Note: If the interference stops, it was probably caused by the computer or its peripheral devices. To further isolate the problem:

Disconnect the peripheral devices and their input/output cables one at a time. If the interference stops, it is caused by either the peripheral device or its I/O cable. These devices usually require shielded I/O cables. For Epson peripheral devices, you can obtain the proper shielded cable from your dealer. For non-Epson peripheral devices contact the manufacturer or dealer for assistance.

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.

The connection of a non-shielded equipment interface cable to this equipment will invalidate the FCC Certification of this device and may cause interference levels which exceed the limits established by the FCC for this equipment.

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Introduction

Your Epson® Equity'™ personal computer is a versatile, expandable, and economical system which offers you a wide variety of choices. Its flexibility lets you create your own system; first you choose from three models of the Equity main unit, then you select the accessories you want to use with it to assemble the configuration that does the most for you.

The Equity main unit (CPU) is available in three configurations:

- One floppy disk drive
- Two floppy disk drives
- One floppy disk drive and one internal hard disk drive.

You also choose which monitor you want to use.

Optional cards and external devices further expand the capabilities of your Equity. Its built-in serial and parallel interfaces let you connect virtually any peripheral device you choose. Here are a few of the devices that you can use with your system:

- Memory expansion card
- Mouse and mouse interface card
- Monochrome video card
- Monochrome monitor
- Color/graphics video card
- RGB color monitor.

And you can connect your Equity to any one of 16 Epson printers.

Check with your Epson dealer from time to time to find out which external devices and option cards are available. You can use most of the cards designed for the IBM® personal computer on your Equity.

How to Use this Manual

This user's guide provides the basic information you need to set up and care for your Equity. It also describes how to connect optional equipment and start using your operating system. Although this book contains a lot of information, it won't take you long to set up your system and get started.

Follow the instructions in Chapter 1 to unpack and set up your system. Then connect the various components as Chapter 2 describes.

Chapter 3 tells you how to turn on your Equity and describes some of the general operational procedures. Chapter 4 contains information on disks which you should read to gain a general understanding of how they work, and Chapter 5 explains how to install and remove option cards.

The appendixes provide additional information on troubleshooting, hardware specifications, and a glossary of some of the computer terms this book uses. Refer to the glossary whenever you come across an unfamiliar word. You may even want to glance through it before you start reading.

You do not need to read everything in this book; some sections describe a particular option or accessory you may not have.

The Equity comes with the MS-DOS operating system and GW™-BASIC. You may have purchased other software as well. Although this manual explains how to load your software disks, refer to the manuals that come with your software applications to learn how to use them.

If you have used MS-DOS before on another computer, you will find that it works the same on your Equity. You may want to refer to your Equity MS-DOS manual, however, for the special menu utilities added by Epson.

Chapter 1

Setting Up Your System

It won't take you long to get your Epson Equity personal computer up and running. This chapter shows you how to set up the computer and peripherals and make any necessary adjustments.

Unpacking

When you unpack your Equity, you should find the following items:

- The main unit and power cord
- The keyboard with cable
- An MS-DOS operating system disk with an MS-DOS manual
- A GW-BASIC programming language disk with a GW-BASIC manual
- This ***Equity I User's Guide***.

In addition to these items, you may have purchased one of the following video monitors:

- Epson monochrome monitor MBM-2095-E and monochrome video card
- Epson RGB color monitor MCM-4035N-E and color/graphics video card
- Any other compatible video monitor and appropriate video card.

After you remove the components from their cartons, be sure to inspect each unit. If anything is missing, looks damaged, or seems wrong, consult your Epson dealer.

You'll find two registration cards: one with the main unit and one with the keyboard. Fill these cards out now and mail them to Epson. With your registration cards on file, Epson can continue to support your hardware and software.

Don't throw away your packing materials. They are designed to provide the best protection possible, and you may need them later, whenever you move or ship your system.

Choosing a Location

An important part of setting up your Equity is deciding where to locate it. Whether you use your computer at home or in the office, you want to choose a comfortable, convenient location.

Before you set up your system, be sure the location you've selected provides the following:

- A large, sturdy desk or table. Make sure the surface you select for your system is sturdy enough to easily support the weight of all its components.
- A flat, hard surface. Soft surfaces like beds and carpeted floors attract static electricity, which can actually erase data from your disks and cause problems in the computer's circuitry. Soft surfaces also interfere with proper ventilation.
- Good air circulation. Air must be able to circulate freely under the system as well as behind it. Leave several inches behind the computer clear to allow ventilation.
- Moderate environmental conditions. It's important to protect your computer from extremes in temperature, humidity, dust, and smoke. Avoid direct sunlight or any other type of heat source. Don't use your Equity in damp areas-excessive humidity can hinder operation. Dust and smoke are especially damaging to the the magnetic surfaces of your disks and to the heads in your disk drives (which can damage the data on your disks).
- Appropriate power source. To prevent static charges, connect all your equipment to 3-prong, 120-volt grounded outlets. You need one outlet for the computer main unit, one for the video monitor, and additional outlets for your printer and other peripheral devices.
- Freedom from electromagnetic interference. Keep your computer away from any electrical device that can generate an electromagnetic field. Surprisingly, even your telephone can cause trouble, especially if you keep your diskettes right next to it.

Once you've found the ideal location for your Equity, you're ready to set up your system.

Arranging the Components

First decide how you want to arrange the different parts of your system. The most common setup, shown in Figure 1-1, is to lay the main unit flat and set the video monitor on top of it with the keyboard directly in front (leaving enough space to insert disks into the disk drives).

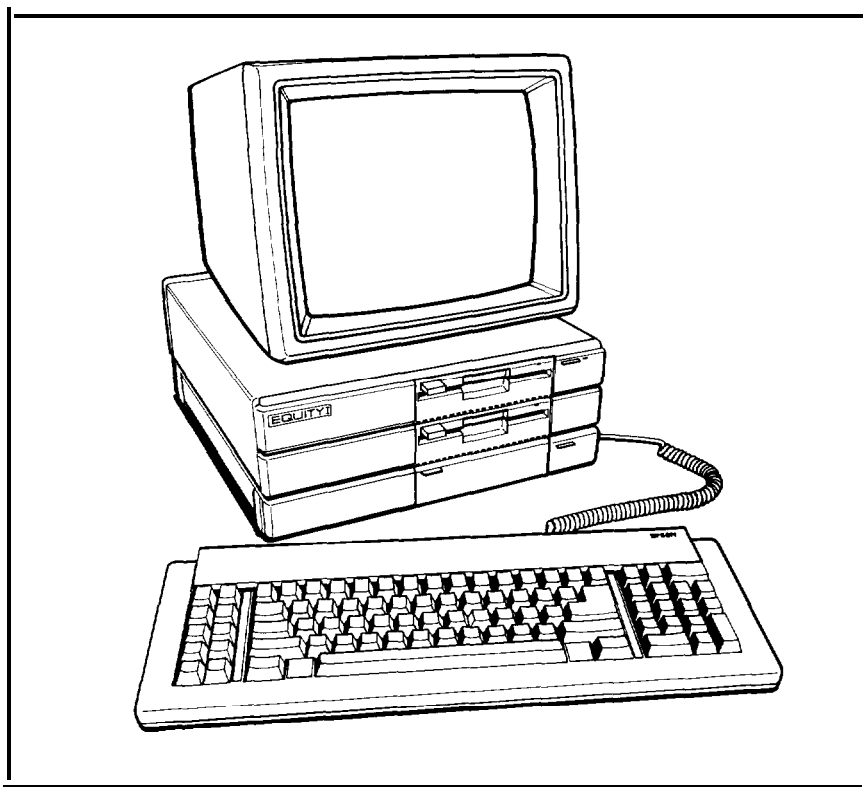


Figure 1-1. System arrangement

Of course, if you have special computer furniture or want to customize your setup, you can arrange your Equity components to suit your own particular needs.

The Rear Panel

Before you connect your system components, take a quick look at **the** rear panel to familiarize yourself with the locations of the various Equity input/output ports. Figure 1-2 shows where you connect the various peripheral devices.

WARNING: Do not connect the power cord until you have connected all peripheral devices. Once you connect the power cord, always check to see that the power switch is OFF whenever you connect or disconnect any peripheral devices.

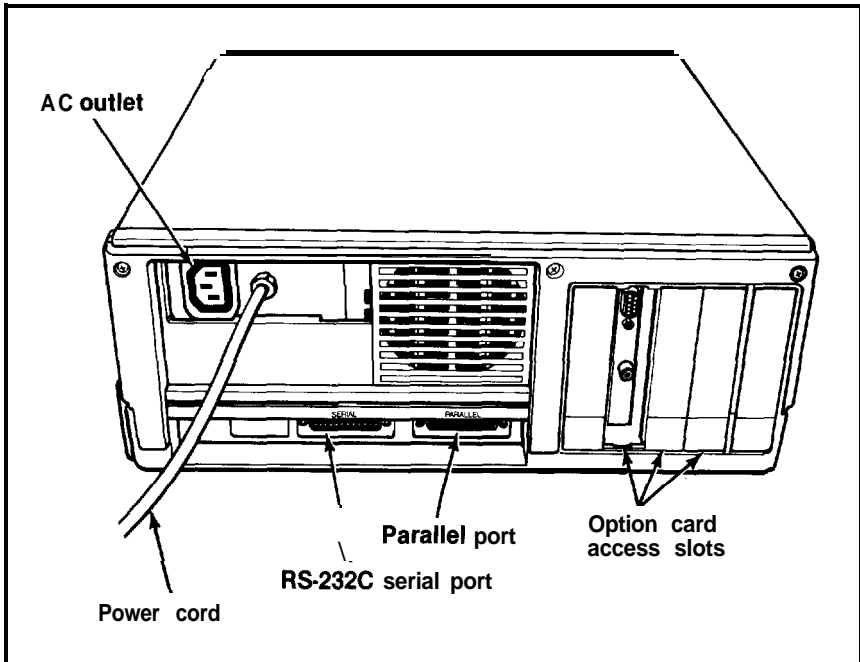


Figure 1-2. Rear panel

Here are brief descriptions of each of the ports:

- AC outlet. Auxiliary power outlet. Power consumption should not exceed 65 watts.
- **Power** cord. Supplies electrical power to the computer. Always turn the power switch OFF before you plug the power cord into an outlet.
- RS-232C serial port. Allows you to connect an external device with a serial interface, such as a modem, another computer or a printer with a serial interface.
- Parallel printer port. Allows you to connect an external device that uses a parallel interface, such as a printer or plotter.
- Option card access slots. The Equity has space for three option cards (which control your peripherals). One of these slots is always occupied by either your monochrome or color/graphics video card. You can use the other two to add special devices such as a mouse card or hard disk controller. You do not need to use any of the option slots to add extra memory.

The Front Panel

Now take a look at the front panel. The components on the front panel are shown in Figure 1-3 with the covers open to reveal the switches and the keyboard cable socket. To open each cover, press down gently on the small handle.

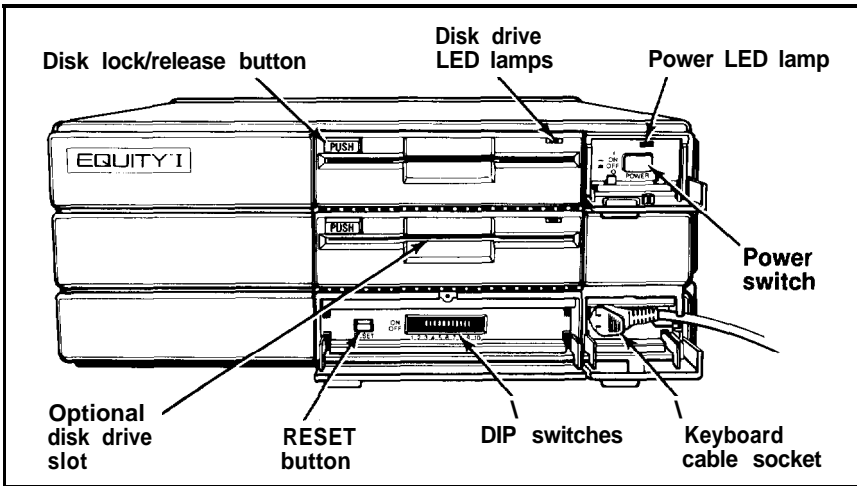


Figure 1-3. Front panel

The front panel components work as follows:

- Disk lock/release button. Press to lock a diskette in place. Press again to eject it.
- Disk drive LED lamps. A red light indicates that the drive is being accessed.
- Slot for optional disk drives. You can insert a second floppy disk drive or a hard disk drive in this optional slot. All Equity units come with at least one floppy disk drive. The main unit above is shown with a second floppy disk drive.
- Power LED lamp. A red light indicates the power is ON.
- Power switch. Turns the main unit ON and OFF.
- Keyboard cable socket. The keyboard plugs into the main unit here.
- RESET button. Resets the main unit. When an operating system disk is in the top drive, you can press the reset button to start it.
- DIP switches. These tell the computer its memory size, monitor type, number of floppy disk drives, and interface types. You set them to match your system requirements.

Removing the disk drive protector sheets

A cardboard sheet occupies the disk slot in the floppy-disk drive. This sheet is inserted at the factory to protect the recording heads.

Remove the sheet before you connect any cable. Press the button labelled PUSH on the left side of the drive. The button pops out when you press it, along with the edge of the protector sheet. Carefully pull out this sheet.

Save the protector sheet and reinsert it whenever you move the computer, even if you are just moving it to another part of the room. If you are not going to use your computer for a week or more, such as when you go on vacation, reinsert the protector sheet to help keep dust from entering the disk drive.

Chapter 2

Connecting the Components

Once you set up the various components of your system, you need to connect the necessary cables. If you follow the instructions and refer to the figures in this section, you should have no trouble.

Connecting the Video Monitor

The video monitor should be on top of or near the Equity main unit. It is easier to connect the cable if the back of the monitor and the main unit are facing you. This may not be possible, however, if your system is set up on computer furniture.

The exact procedure for connecting your monitor depends on the model you have. Refer to your monitor manual for detailed instructions. Here are some basic guidelines for connecting your video monitor to the Equity main unit:

1. If necessary, connect the video monitor cable to your monitor. Some cables are permanently attached to the monitor at one end.
2. Connect the appropriate end of the video monitor cable to your monochrome or color/graphics card connector at the back of the main unit. If the plug has retaining screws, tighten them with a screw driver.

The monitor type must match the video card in the main unit. If you have a color card, there are two types of connectors provided—a nine-pin female D-connector for RGB monitors and an RCA connector for composite video monitors.

3. Plug the monitor power cable into an electrical outlet.

Note: Many monochrome monitors can be plugged into the auxiliary outlet at the back of the main unit provided the plug fits into the outlet and the monitor's power consumption does not exceed 65 watts.

Figure 2-1 gives you an idea of how to connect the monitor,

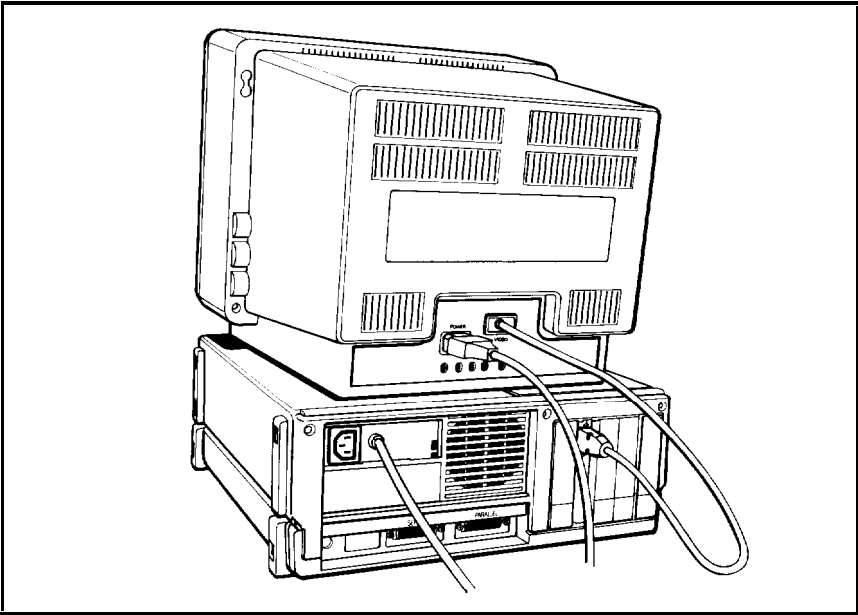


Figure 2-1. Connecting the monitor cable

4. When you check the DIP switch settings later in this chapter, be sure they are set correctly for the type of monitor you have.
5. If you have trouble getting a display, check that the brightness and contrast controls on the monitor are set correctly. Monitors usually have their own power switch. Make sure it is ON.

Connecting the Keyboard

Once your Equity main unit and video monitor are connected, you can connect the keyboard. The keyboard cable is coiled like a telephone cord with the connector on one end.

With the front of the main unit facing you, open the **cover** at the lower right front corner. Insert the keyboard connector as shown in Figure 2-2. Do not force the connector, but make sure you insert it all the way. See that the cable exits to the right of the main unit. Gently push the cable into the retaining clip, and close the cover.

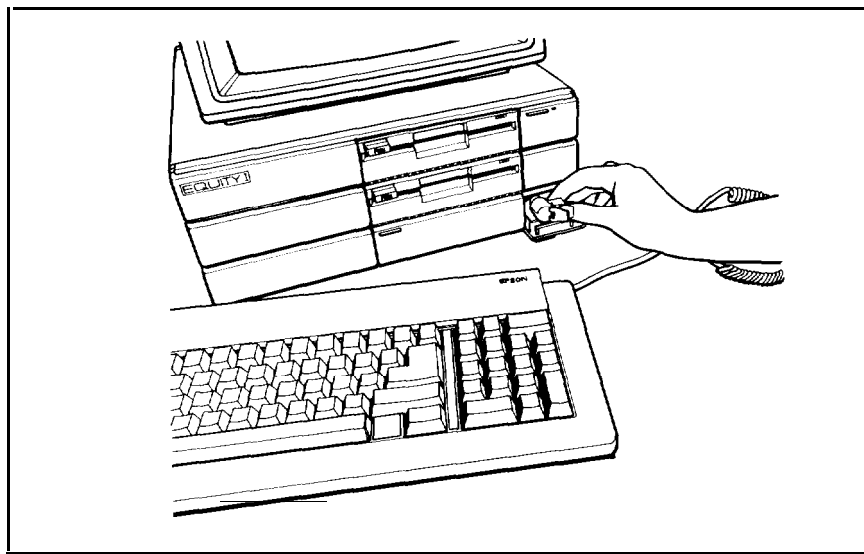


Figure 2-2. Keyboard cable connection

You can use the keyboard at different angles such as laying it flat on a desk or placing it on your lap. You can also tilt the keyboard by adjusting the legs on the bottom. Adjust the keyboard legs by turning the keyboard over, reaching under the lip and lifting each of the legs upward until they lock into place. See Figure 2-3 .

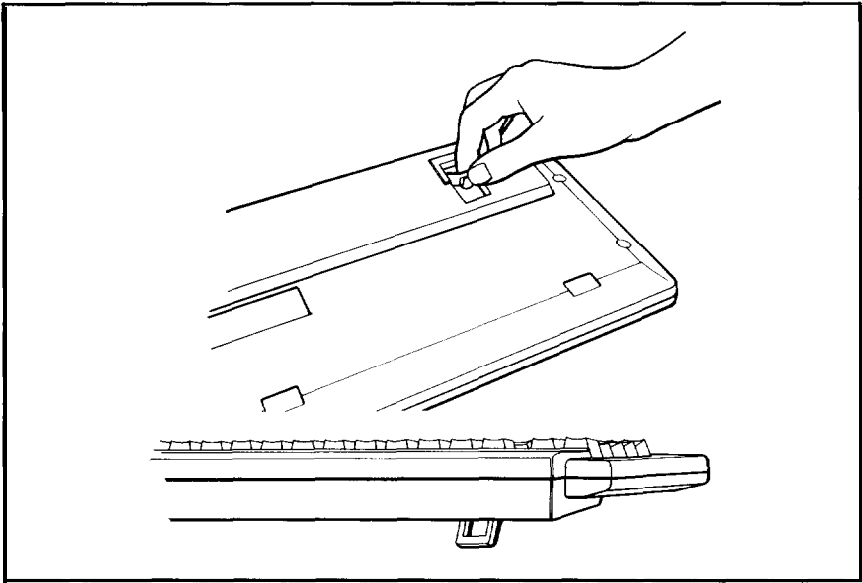


Figure 2-3. Adjusting the keyboard legs

To disconnect the keyboard, open the cover on the main unit and press down on the retaining clip to release the cable. Lift the tab on the connector, and pull it straight out from the main unit.

Special keys

The dark gray keys have special functions and are used in various ways by applications programs. Some of the more important keys are shown in Figure 2-4 and described below:

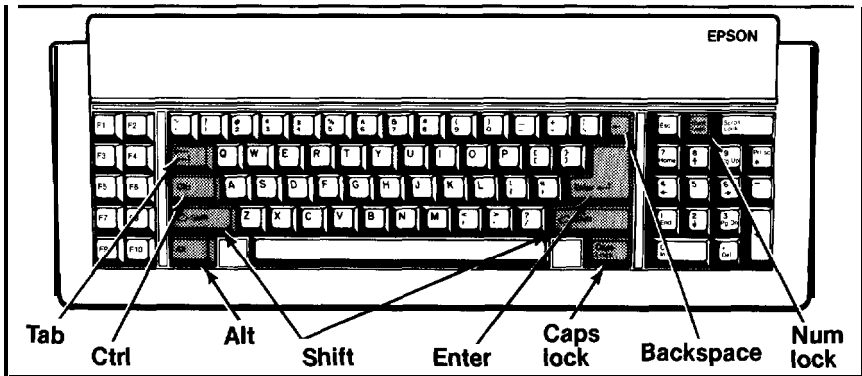


Figure 2-4. Special keys

Key	Purpose
← →	Moves the cursor to the right in normal mode and to the left in Shift mode. Referred to as the tab key.
Ctrl	Works with others keys to perform special (control) functions such as editing functions in MS-DOS and GW-BASIC.
Alt	Lets you input alternate character codes not otherwise available.
Shift	Produces uppercase characters or symbols when used with the main character keys. Produces lowercase characters if Caps Lock is on.
Caps Lock	Changes the letter keys from lower- to uppercase; changes back to lowercase when pressed again.
Num Lock	Changes the function of the numeric/cursor keys from numeric to cursor; changes back when pressed again.
Enter	Ends a line of keyboard input.
←	Moves the cursor back one space, deleting the character to the left. Referred to as the back-space key.

Connecting your Printer

Your Equity has serial and parallel interfaces built-in. You can easily connect a printer or plotter that has either a serial or parallel interface.

Parallel interface

The parallel connector on the Equity is a Centronics compatible connector but uses a DB-25 socket, the same type as the RS-232C serial port on many other computers. Most Epson printers have a parallel interface.

To connect your printer to a parallel interface:

1. Place the printer in a convenient location next to your system so that the power and data cables do not interfere with the paper. See Figure 2-5.

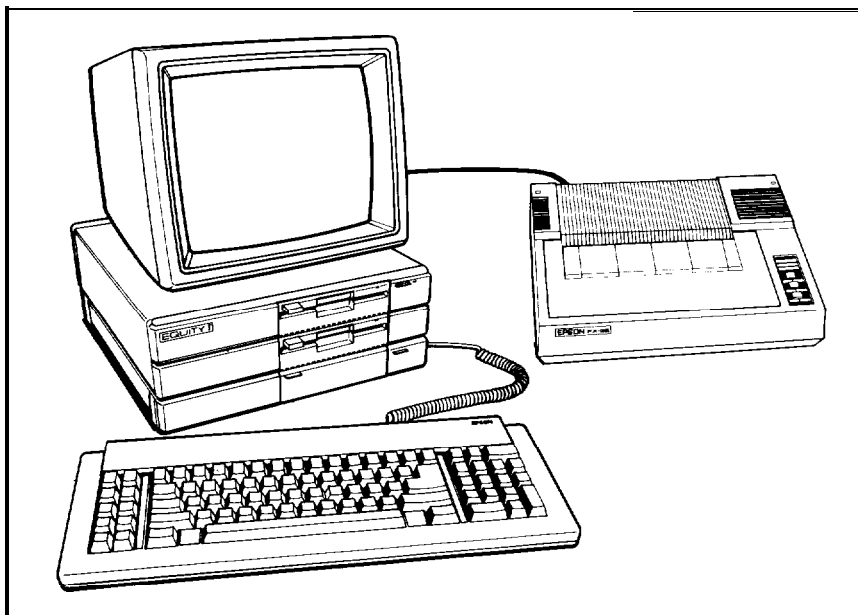


Figure 2-5. Printer placement

2. Before connecting any cables, make sure the power switches to both the main unit and the monitor are switched OFF. If you are not sure which cable you need, consult your dealer.
3. One end of the printer cable has a 25-pin male D-connector. (Refer to your printer manual to determine which end this is.) Connect this end to the socket marked PARALLEL on the back panel of the main unit. If the plug has retaining screws, tighten them with a small screwdriver.
4. Connect the other end of the cable to the printer. Secure the cable by placing the squeeze locks at each side of the printer port into the connectors on each side of the cable. See Figure 2-6.

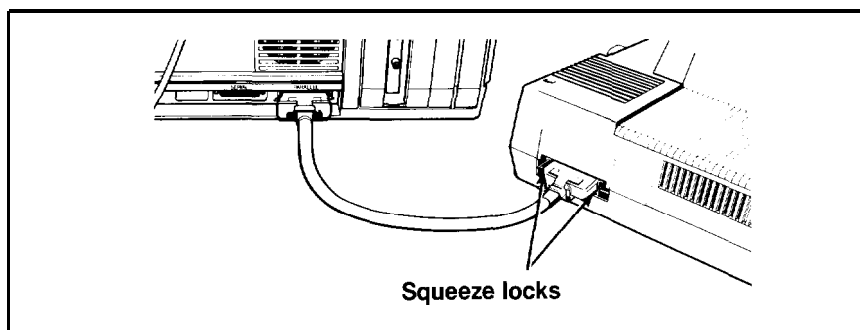


Figure 2-6. Printer connection

5. Plug the printer's power cable into a separate electrical outlet.

Serial Interface

If you have a device, such as a modem, that has a serial interface, connect it to the port marked SERIAL at the back of the main unit. If your cable is the non-standard type, with a male D-connector at both ends, you need an adapter to connect it to the computer. To connect your serial device, follow the same steps above for connecting a parallel device.

The RS-232C serial port needs to be configured properly in order for it to function correctly. The printer output must also be redirected to the SERIAL port, instead of the PARALLEL port. Use the MS-DOS SETUP utility (or the MODE command in the SETUP utility) to make these changes. See your MS-DOS manual for instructions on how to use these commands.

Using Epson printers with the Equity special character set

The Equity uses a special character set that assigns graphics and international characters to some of the ASCII codes. In most cases, if you try to print these characters on a standard printer, you get italic characters instead. Many Epson printers support the IBM character set (like those used on the Equity) as a standard feature, and other printers can be adapted. In addition, some applications programs print the special graphics characters on a standard printer using a special printer driver program. Ask your dealer for more information.

DIP Switch Settings

When you first turn on your system, it checks the DIP switch settings to determine the memory size, the monitor type, the number of floppy disk drives, and the built-in interfaces being used.

Your dealer should have set these switches for you. However, read the descriptions carefully and make sure the switches are set to meet your system requirements. If you upgrade your system at a later date-by adding a second disk drive for example-you may need to alter the switch settings.

Note: Set the DIP switches with the power OFF because software programs check the settings only when you turn on the system. Incorrect settings do not damage your computer, but a program may not operate properly if it finds the settings do not match the hardware.

The DIP switches are located underneath the cover below the floppy disk drive on the front panel of your main unit, as shown in Figure 2-7. Open the cover.

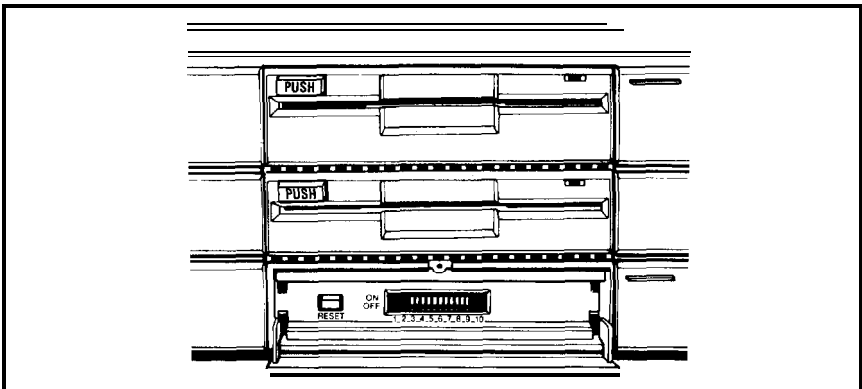


Figure 2-7. Location of DIP switches

Notice the switches are numbered from 1 to 10. When a switch is Up it is ON. When the switch is DOWN, it is OFF. To change the switch settings, use a hard, thin object, such as a small screwdriver or the back of a ballpoint pen.

DIP switch functions

Inside the DIP switch cover is a label that identifies each of the DIP switches and shows the different ways they can be set (see Figure 2-8). The paragraphs below describe the various possible settings for your DIP switches.

DIP SWITCH SETTING										
SWITCH #		1	2	3	4	5	6	7		8 9 10
RAM SIZE	256KB	ON	OFF	OFF	ON	ON	—	—	FDD(s)	SINGLE ON — —
	512KB	ON	OFF	OFF	OFF	ON	—	—		DUAL OFF — —
	OTHERS	—	Refer to Table 2-1				—	—	PARALLEL	ENABLE — ON —
MONITOR	MONOCHROME	—	—	—	—	—	—	—	OFF OFF	DISABLE — OFF —
	COLOR(80×25)	—	—	—	—	ON	OFF	—	SERIAL	ENABLE — — ON
	COLOR(40×25)	—	—	—	—	OFF	ON	—		DISABLE — — OFF

Figure 2-8. DIP switch functions

Switches 1-5 (memory size)-tell your computer how much memory is available. The system always checks the amount of memory when it is reset, but some software programs may not operate correctly if the switch settings do not agree with the amount of memory installed. Use Table 2-1 to set these switches for your system's memory

Table 2-1. DIP switch memory

Memory	1	2	3	4	5
256K	ON	OFF	OFF	OFF	ON
288K	OFF	OFF	OFF	ON	ON
320K	ON	ON	ON	OFF	ON
352K	OFF	ON	ON	OFF	ON
384K	ON	OFF	ON	OFF	ON
416K	OFF	OFF	ON	OFF	ON
448K	ON	ON	OFF	OFF	ON
480K	OFF	ON	OFF	OFF	ON
512K	ON	OFF	OFF	OFF	ON
544K	OFF	OFF	OFF	OFF	ON
576K	ON	ON	ON	ON	OFF
608K	OFF	ON	ON	ON	OFF
640K	ON	OFF	ON	ON	OFF

If you are not sure how much memory your computer has, set these switches after you turn the computer ON for the first time. The initial messages on the screen tell you the memory size. You can then set the switches accordingly. Before you change the switch settings, however, turn the computer OFF.

Switches 6-7 (monitor type)-tell your system what type of monitor you are using. Set them accordingly. Although it is not shown above, the display type can be set with both switches ON for an enhanced color graphics card. Only set both these switches to ON if you are sure of what you are doing.

Switch 8 (floppy disk drive)-indicates how many floppy disk drives your system has. This switch is very important. If you only have one drive, set this switch ON (UP) so the operating system knows to provide help when a second disk drive is normally used. If you have two floppy disk drives, set this switch OFF (down), so the operating system does not ignore the lower drive.

Switches 9-10 (built-in interface)-tell your system what type of interface you are using. You can leave both these switches ON.

Some option cards contain serial or parallel interface ports. If you want to use the port on the card, turn OFF the appropriate DIP switch. For example, if you have installed an option card with a serial interface that needs to be used as COM1: (the device name usually assigned to the built-in serial port), you need to turn OFF DIP switch 10. Similarly, to disable the built-in parallel port, turn OFF DIP switch 9.

Chapter 3

Using Your Equity

Once you have connected the monitor, keyboard, and peripheral devices to your computer, you are ready to turn your computer on. Plug the power cord into an electrical outlet. But, before you turn on the computer, read the following safety rules which help you avoid accidental damage to the computer, or injury to yourself.

1. Never turn the computer ON or OFF with the disk drive protector sheets in the disk drives.
2. Do not attempt to dismantle any part of the computer. You should only remove the top cover to install and remove option cards. If there appears to be a hardware problem that you cannot solve after reading the Troubleshooting section, or if you wish to install an 8087 math coprocessor, consult your Epson dealer.
3. Always turn off the power, disconnect the main power cord, and wait for a few minutes before removing the cover from the computer (to install or remove option cards only).
4. Never unplug any cables from the computer while the power switch is turned ON.
5. Never turn the computer OFF when a disk is turning in a floppy disk drive or while one of the red drive select lamps is on. This causes data to be lost and may make the whole disk unusable. The same can happen to hard disk drives, and even more data can be destroyed.
6. Always wait at least 5 seconds after switching the power OFF before switching it ON again. Turning it OFF and ON rapidly can damage the computer's circuitry.
7. Do not leave any glass of liquid beverage on top of your peripherals. Spilled liquid damages the circuitry of your unit(s).

Powering Up

If necessary, turn on the monitor to warm up the screen display so you can see the messages displayed as the computer starts up. The computer can be turned on with or without a system disk in drive A (the upper disk drive). For now, open the cover at the top right of the front

panel, and turn on the power switch **without** a system disk inserted. The red indicator next to the power switch lights up, and the cooling fan inside the main unit starts. The computer then begins performing an internal self-diagnostic test.

The initial screen display

As the system performs its self-test, you see a message similar to the one:

```
ROM Rev. X.XX mm/dd/yy
Copyright (c) Epson Corporation
1985 All Rights Reserved
```

When the computer has tested the memory circuits, you see a message telling you how much RAM is available:

```
XXX KB RAM AVAILABLE
```

Then, after a few seconds, the following message appears:

```
Non-System disk or disk error
Insert system diskette in drive A:
and strike any key when ready
```

If your system has a hard disk which has not been prepared for instead of the message above, you see:

```
INVALID PARTITION TABLE FOUND
```

Refer to your MS-DOS manual for instructions on how to prepare your hard disk for use.

The computer is now ready to load an operating system from a disk in the upper drive. If you have a hard disk, and it has been set up to start MS-DOS, this message does not display, and the operating system loads right away. In this case, the next thing you see is:

```
C>
```

```
OPERATING SYSTEMS
```

The Equity cannot function without a disk operating system (DOS). Different operating systems can be used including MS-DOS, CP/M-86®, and Concurrent DOS. The computer comes with MS-DOS. If you want to use another operating system, consult your dealer.

To load an operating system, turn on the computer, then insert the system disk you want to use, as described below. Refer to the appropriate operating system manual for details on how to use the system.

Note: It is good practice to use a backup copy of the system disk for daily use and keep the original in a safe place. See the operating system manual for details of how to make a backup copy.

Inserting and Removing Disks

To insert a floppy disk into a disk drive, hold the disk with the label face up and the write-protect notch to the left (so that the read/write slot is away from you). Then slide it into the disk drive as shown in Figure 3-1. Be careful not to force the disk into the slot. When the disk is all the way in, push in the button marked PUSH.

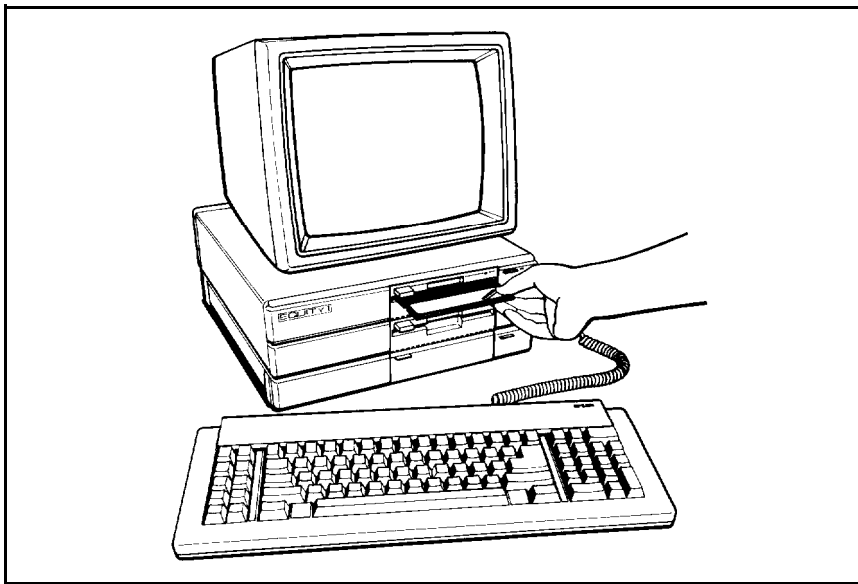


Figure 3-1. Inserting disks

To remove the disk, press the button again. As you release the button, the labelled edge of the disk pops out. Carefully pull out the disk, place it in its protective envelope and store it properly.

Note: You need to format your blank floppy disks before you can use them with your operating system. Refer to your MS-DOS or other operating system manual for instructions on how to format your blank disks.

Resetting the Computer

You may occasionally need to reset the computer, either to load a different operating system, or because a program has failed and the computer does not respond to your keyboard commands. However, resetting the computer causes all data in memory to be lost, so if you have a problem, you should reset the computer only as a last resort.

There are three ways to reset, and you should use them in this order:

1. If you are using MS-DOS, press **Ctrl** and **Alt** together with the **Del** key in the numeric keypad at the right of the keyboard. The display screen goes blank for a moment, and any system disk in drive A reloads. If the problem is not corrected after trying this, try the second method.
2. Press the reset button under the hinged flap beneath the disk drives. This has the same effect as the first method, but works even when the keyboard is not responding. If this fails to have any effect, try the third method.
3. Remove any disks from the floppy disk drives. Switch the Equity off with the power switch under the hinged flap at the top right of the front panel. Wait for 5 seconds, then switch it back on.

WARNING: Some applications programs perform certain procedures whenever you exit the program properly. If you reset the computer in the middle of the program, these operations cannot be performed, and you may lose data. This means that you should not exit a program by resetting the computer unless you have to.

Chapter 4

Using Disks

The disk drives in your computer let you store your work and programs on removable floppy disks for future use. All Equity systems have at least one floppy disk drive; others may also have a hard disk drive, either built-in or as an external unit.

The disk you insert in the floppy disk drive is a round piece of flexible plastic covered with a magnetic coating. It is enclosed in a square protective jacket with holes to allow the disk drive to read and write to it. The computer stores your information as a coded pattern in the magnetic coating of the disk in the same way music is stored on magnetic tapes.

A hard disk drive works the same as a floppy disk drive, but the hard disk has a larger storage capacity and is usually locked in a permanent position. On a hard disk, the magnetic coating covers a polished metal disk. Even hard disks are vulnerable, so you should always make backup copies of important information on floppy disks.

The following sections give you some background information on how disks work and tell you how to:

- Choose floppy disks
- Care for your disks and disk drives
- Protect your data
- Use a single floppy disk drive
- Use a hard disk drive.

How Disks Work

Disk drives function like a combination of a record player and a tape recorder. They store your information on the disk as patterns of magnetized areas which are arranged into a set of circular tracks on each side of the disk. A small read/write head in the disk drive interprets these magnetic patterns. When you insert a disk in the drive, the read/write head is right over the large oval slot in the disk sleeve. When you access or write to data on a disk, it spins at high speed so the read/write head can look at different parts of the disk and move quickly between the edge and center.

Because the data is stored magnetically, you can read it, write to it, and erase it many times like a magnetic tape. The tracks on a disk are arranged so any item of data can be reached very quickly. Although the processes involved in controlling the disk drives are complex, you do not need to worry about them because the disk operating system looks after all the details.

Choosing Floppy Disks for the Equity

The Equity uses floppy disk drives that are double-sided, double-density, soft-sectored, 48 TPI (Tracks Per Inch) certified track units. These disks are compatible with those used for the IBM PC. You can use disks prepared and used with one computer on the other.

For best results, use only high-quality disks with reinforced hub rings-the added reliability is well worth the extra cost. Be sure to select disks that are double-sided, double-density and soft-sectored. Each disk can hold 360K of data, the equivalent of about 150 pages of text.

Taking Care of your Disks and Disk Drives

Both floppy and hard disks are vulnerable to damage, and you need to care for them properly. Follow these basic precautions when you use floppy disks:

- Never touch the magnetic surface. The oils on your fingertips can damage the surface of **the** disk.
- Handle disks carefully. Always hold disks by their protective jackets. Keep them in their protective envelopes when they are not in use, and return them to their storage box making sure they are not bending or sagging.
- Do not place anything on top of your disks. They bend easily and do not rotate properly in their sleeves if they are damaged.
- Keep disks away from dust and dirt. Small particles of dust or dirt scratch the magnetic surface (destroying data) and can also ruin the read/write head in the disk drive.

- Be careful when you place labels on your disks. Attach labels firmly but gently, and only along the top of the disk (next to the manufacturer's label). Avoid placing several labels on top of one other. They may prevent the disk from spinning freely in the disk drive. It is best to write on the label before placing it on the disk. Use only soft-tip pens, not ballpoint pens or pencils, to write on a label that is already attached to a disk.
- Keep disks away from magnetic fields. Remember that disks store their information magnetically, just like cassette tapes. There are many sources of magnetism in and around your home or office, such as electrical appliances and telephones, and particularly loudspeakers. Keep disks away from these items.
- Keep disks in a moderate environment. Disks work best in normal room-temperature and humidity conditions. Never leave them sitting in the sun, or in extreme cold or heat. The temperature changes inside a car in the middle of summer or the dead of winter can cause severe damage.

If you have a hard disk drive, you should also take the following precautions:

- Never attempt to open the hard disk unit. The disk itself is enclosed in an air-tight container to protect it from dust.
- Never turn off the power to the computer or hard disk unit when the SELECT lamp is ON. This LED indicates that the hard disk is in the middle of reading from or writing to the disk. Turning the hard disk off in the middle of a write operation can make all the information on the disk unusable.
- If you plan to move the hard disk unit, the read/write head must be moved away from the disk recording area. Each operating system has its own program to do this. The MS-DOS program to protect the read/write head is called HDSIT. Refer to the MS-DOS manual for details.

Protecting your Data

There are two ways to make sure you do not lose the valuable information stored on your disks; write-protect your floppy disks and make backup copies. Both of these methods are described below.

Write-protecting floppy disks

The right edge of a floppy disk has a small, rectangular notch as shown in Figure 4-1. If this notch is not covered, you can write new data to the disk. If it is covered with an adhesive write-protect tab, you can read data on the disk but you can not write new information to it or delete any files. If you try to change the information on a write-protected disk, an error message usually displays a warning that the disk is write-protected. Write-protect tabs are usually included with new disks.

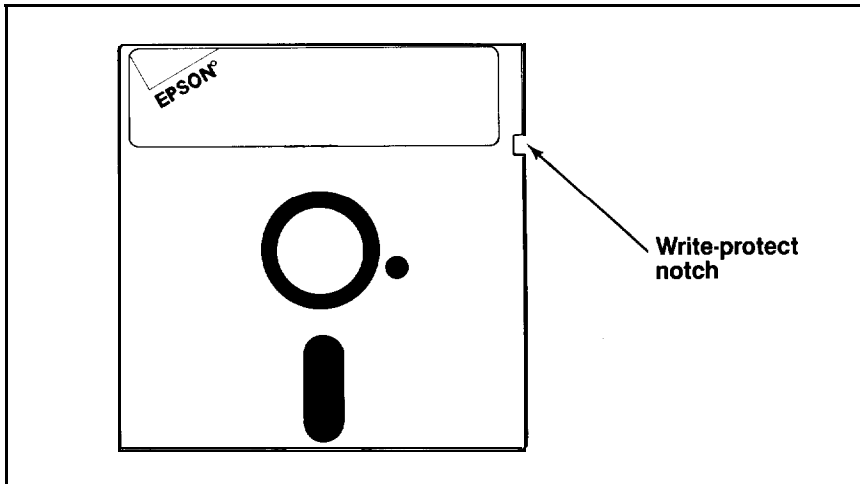


Figure 4-1. Write-protect notch

Making backup copies

It is a good idea to keep a second backup copy of all your important data and program disks. With program disks, or the system master disks supplied with your Equity, you should make backup copies to use, and keep the originals in a safe place—away from your working disks. With data disks, you should make up-to-date backups regularly (preferably daily), and keep them apart from the originals.

Your MS-DOS manual describes how to make a backup of your MS-DOS system disk. To make regular backups of other MS-DOS disks, use the DU (Disk Utility) program or the DISKCOPY command. "Using a Hard Disk Drive," below, gives more information on backing up hard disks.

Using a Single Floppy Disk Drive

Some versions of the Equity have only one floppy disk drive. There is a DIP switch (switch SW1-8) under the flap beneath the disk drives which tells the computer how many floppy disk drives you have. This switch should be DOWN (OFF) if you have two drives or UP (ON) if you have just one drive. If you have only one floppy disk drive, make sure this switch is UP correctly so the operating system can help you perform those operations that normally require two drives.

Operating systems usually expect the computer to have at least two physical disk drives. MS-DOS recognizes drives A and B for two floppy disk drives, or A and C for a floppy and a hard disk drive. Some operations, such as copying files from one disk to another, require two drives. With MS-DOS, if you have only one physical disk drive, the operating system lets you treat it logically as two drives.

For example, if you give a command to copy from drive A to drive B, MS-DOS copies from the first disk you place in the drive (A) to the computer's memory. Then it prompts you to insert the disk for drive B. It copies from memory to the B disk you place in the drive. When the copy is complete, the screen prompts you to reinsert the disk for drive A.

You may be swapping disks this way quite often, and it is easy to forget which disk is which. To avoid accidentally losing your data, here is a tip for keeping the disks straight: always hold the disk for the A drive in your left hand and the disk for the B drive in your right. Another way to avoid writing on the wrong disk is to place a write-protect tab on your source disk. This allows you to read information, but not write over it.

For more information on using a single floppy disk drive with MS-DOS, see your MS-DOS manual.

Using a Hard Disk Drive

The internal hard disk which comes with certain configurations of the Epson Equity has a capacity of 20 megabytes-about 20 million characters. This is equivalent to around 60 floppy disks. Using the hard disk greatly reduces the number of floppy disks you need and eliminates much of the disk-swapping you have to do. You can do almost all your work on the hard disk and copy your files to floppy disks as needed (to make backups, for example).

Although it has a lot of storage space, you should keep only the files you use regularly on the hard disk, to make sure you always have plenty of space available. Store your other files on floppy disks (you can use the ARCHIVE utility in MS-DOS to back up your hard disk files). It is very important to back up all your hard disk files on floppy disks. The hard disk is very reliable, but you should always have backup copies in case you lose any of your data from the hard disk.

You need to prepare your hard disk before you can use it. If you are using a hard disk other than Epson's, follow the preparation instructions provided with your hard disk.

Before you can use the Epson internal hard disk, you must do four things to prepare it:

- Format the entire hard disk with the MS-DOS program `HDFMTALL`.
- Partition it to run the MS-DOS operating system with the MS-DOS program `HDPART`.
- Format the MS-DOS partition with the MS-DOS program `HDFORMAT` and include the `/S` option to copy the MS-DOS operating system to the system tracks on the hard disk.
- Copy the MS-DOS system utilities to the hard disk using `XTREE` or the `Copy` command.

All of these programs are on your MS-DOS system disks and instructions for using them are in your MS-DOS manual.

Note: If you plan to use an operating system other than MS-DOS, you need to use that operating system to partition the hard disk and copy the system files to it.

Chapter 5

Using Option Cards

Option cards are accessories that can be added to the computer to provide extra capabilities. Examples of option cards you may want to purchase are:

- Memory expansion card
- Auto-dial modem
- Mouse card.

Up to three option cards can be installed in the Equity at one time, but one position is always occupied by the color or monochrome video card that operates your monitor.

Option cards are available from Epson and several other vendors. In addition, multifunction boards (available from other vendors) allow you to add other features without using additional slots.

Installing an Option Card

Some option **cards**, such as your video monitor card, come with outlets for connecting external devices, while others are designed to work directly within the Equity or to be used with built-in devices. If you use an option card that has a connector for other equipment, (your video monitor, for example) you need to remove the access slot cover on the back panel of the computer that corresponds to the option card slot. Otherwise, the installation procedure is the same for both types.

Removing the cover

WARNING: Never open the case of the Equity while it is plugged into an electrical outlet. Turn off the power switch to the main unit and any other peripheral devices connected to it, let the machine stand for a few minutes, then unplug the power cable before removing the case.

1. If the monitor is on top of the computer, move it to one side. Turn the main unit around so that the back panel faces you.

2. The back panel is secured with three screws as shown in Figure 5-1. Remove the screws with a Phillips screwdriver, and put them to one side. Slip the back panel off the main unit.

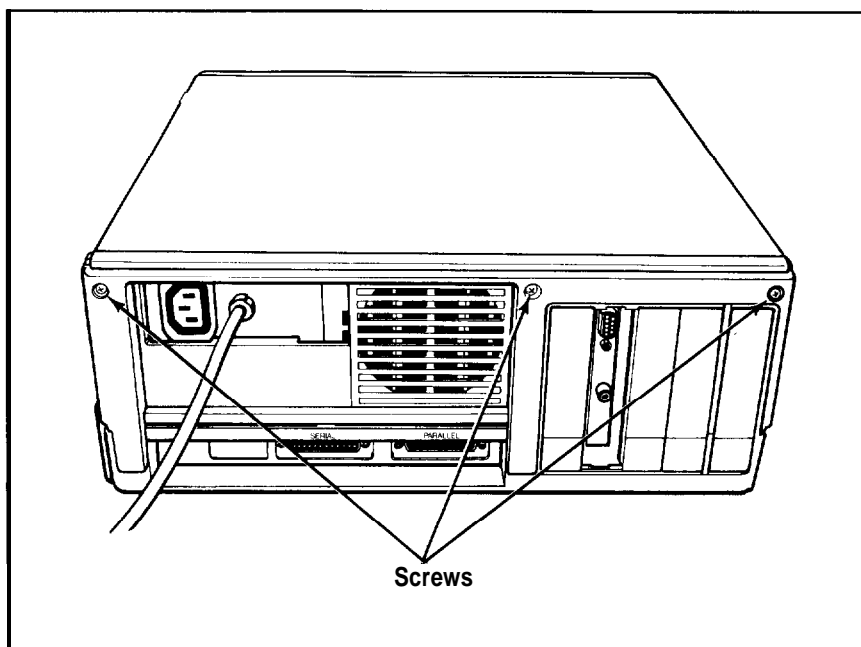


Figure 5-1. Back panel screws

3. The top cover is secured by two screws on each side of the computer as shown in Figure 5-2. With the back of the unit facing you, the two screws on the left side of the unit are covered by small plastic inserts. Gently remove the inserts with a small screwdriver, then remove the screws on both sides of the computer. Put all the screws safely to one side.

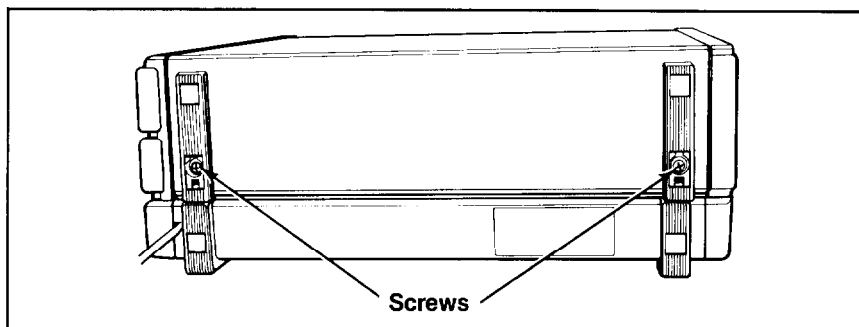


Figure 5-2. Side screws under plastic inserts

4. Figure 5-3 shows how to tilt the cover up slightly and move it away from the main unit. Set the cover aside for now.

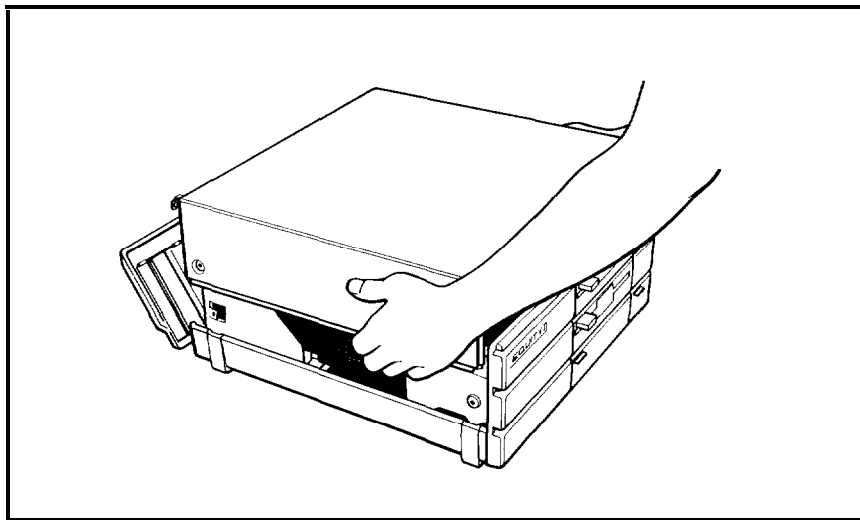


Figure 5-3. Removing cover

Inserting the option card

Most option cards can be placed into any of the three option slots. Some cards may need to be installed in a specific slot. Check the option card manual to find out if the option card has to be in a specific slot.

Even though option cards are designed to fit only one way, it is a good idea to examine the card first and follow the instructions closely.

1. Decide which option slot you want to use, then remove the retaining screw and washer from the metal cover plate at the back of the slot. Lift out the metal cover and put it in a safe place in case you later remove the option card. Keep the screw and washer to secure the option card to the computer.
2. Unpack the option card and adjust any switches or jumper connections that are necessary. When you handle the card, be careful not to touch any of the contacts on the circuit board, especially along the gold edge connections. If you need to put it down before installing it, place it with the component side facing down on top of the original packing.

Note: Pay specific attention to the warnings in your option board instructions. Some devices have delicate CMOS chips that should not be touched.

3. Grip the card firmly by the top corners and position it as shown. The contact pins should be pointing down and the components should be facing toward the inside of the main unit.
4. Slide the card into the slot as shown in Figure 5-4, placing the tab at the bottom of the retaining bracket into the corresponding notch at the back of the computer.

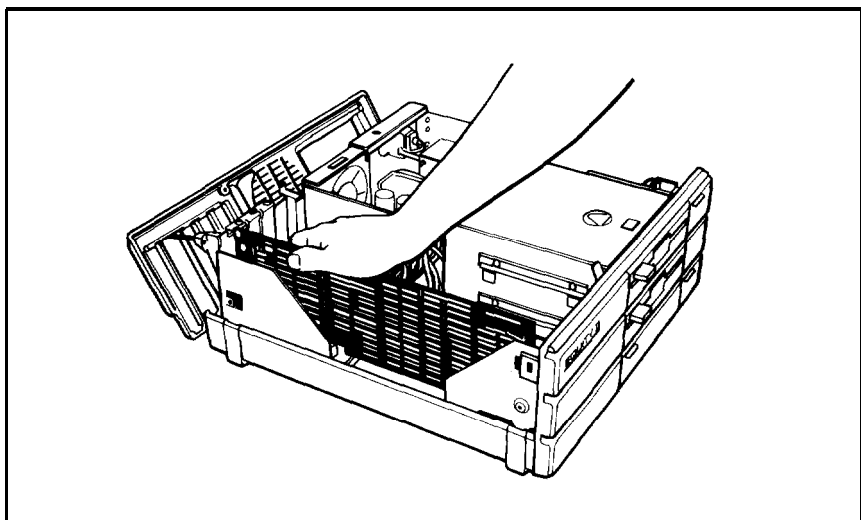


Figure 5-4. Option card installation

5. Once the connector pins are sitting in the connector slot, push firmly (but carefully) to fully insert the card. If the connector does not seem to be going in smoothly, do not force it; pull it all the way out and try again, being sure to keep it straight.
6. Secure the retaining bracket to the frame of the computer with the small screw and washer. Long option cards are held in position at the free end by the piece of foam inside the top of the lid of the main unit.
7. When you have finished installing the card, keep the packing in case you need to remove the card.

Removing an access slot cover

If the option card has an external device connection, such as your video monitor, remove the access slot cover that corresponds to the position of the option card.

1. Hold the back panel of the computer with the inside facing you. The individual access slot covers are held in position by a tab at the bottom and a clip at the top.
2. Remove the appropriate cover by pushing down on the clip and pushing out. See Figure 5-5.

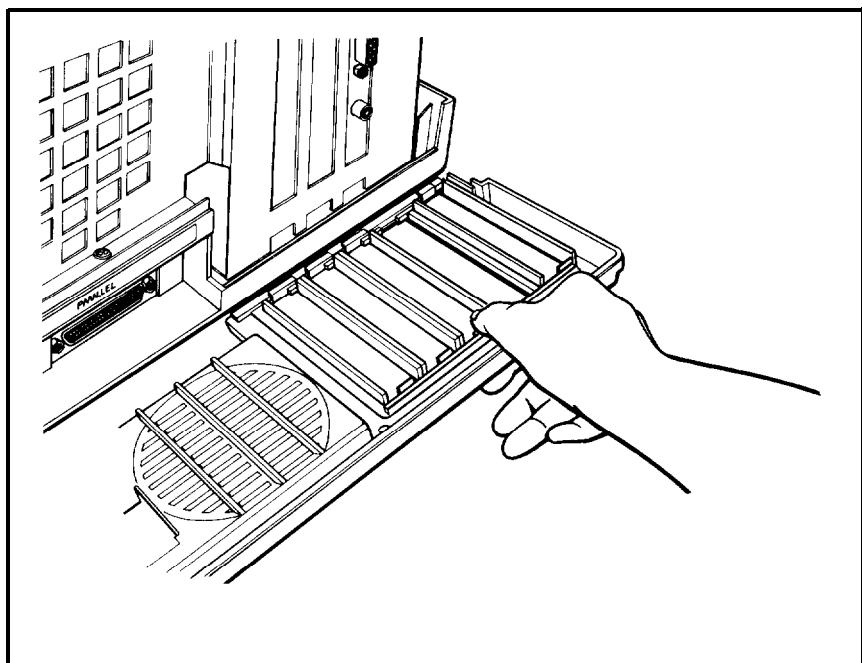


Figure 5-5. Removing access slot cover

Replacing the cover

With the option card properly installed, the last step is to replace the cover of the main unit:

1. With the back of the main unit facing you, hold the cover over the computer with the side feet to the left of the main unit and the front edge pointing slightly downward.
2. Lower the cover onto the bottom half of the case making sure that the bottom edges fit inside the case. At the same time, slide the front

edge beneath the top edge of the front panel. Finally, lower the back of the cover so that it is in position.

3. Secure the cover by replacing the two screws on both sides of the main unit. Replace the plastic inserts in the side feet by snapping them into place.
4. Replace the back panel and the three screws along the top edge.
5. Return the computer to its original position and reconnect it to the monitor, the keyboard, and any other peripherals you have.
6. Check to make sure the power switch is OFF. Reconnect the power cable to the back of the main unit and to an electrical outlet. Change the DIP switches if necessary.

Perform any additional procedures in the option card manual. For example, if the option card needs a program to control it, you may need to add a command to the programs which start the operating system.

Removing option cards

To remove an option card, first detach any cable connected to the card and remove the main unit cover; then follow the option card insertion instructions in reverse.

Follow the same safety instructions and make sure you slide the card straight up and out of the connector to avoid damaging it. Rewrap the card (preferably with the original packing materials) and place it inside the box for safe storage. Replace the metal access plate before replacing the cover of the computer. When you have reassembled the unit, snap in the plastic access slot cover. Remember to reset any DIP switches if necessary.

Some option cards which support devices like hard disk drives need special commands to be included in the configuration of the operating system. If you remove one of these cards, you need to reconfigure the system.

Installing Memory Expansion Cards

If you have an Equity with 256K of memory, you can add extra memory in two ways. A number of option cards are available to expand the memory up to 640K, and a special Epson memory expansion card is available from your Epson dealer to expand memory to 512K without using an option slot.

You install a memory option card the same way you install other option cards. Installing an option card is described at the beginning of this chapter. The procedure to install the Epson 256K expansion card is as follows:

1. Remove the main unit cover as described earlier in this chapter.
2. The memory expansion connector is located at the front of the main unit, to the left of the disk drives, as shown in Figure 5-6.

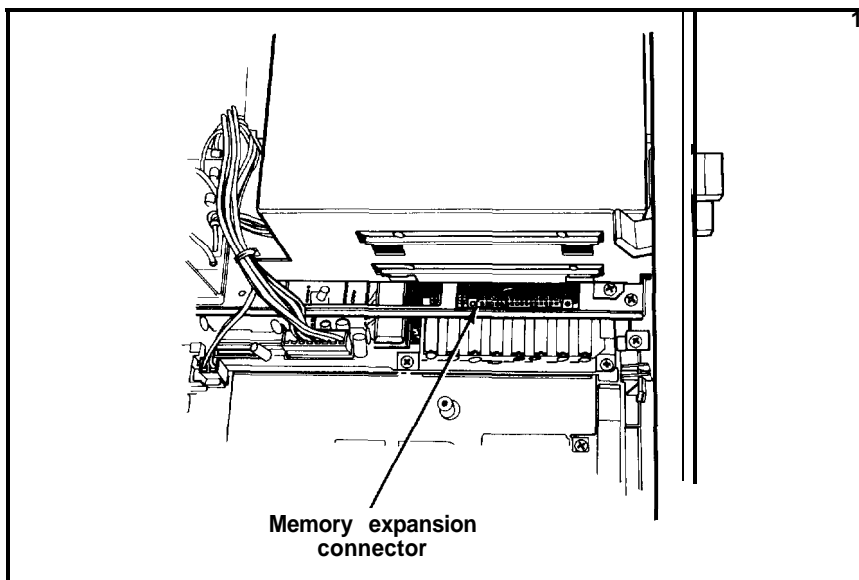


Figure 5-6. Memory *expansion connector*

3. Unpack the memory card. Hold it by the top corners with the component side to the right (facing the disk drive units).
4. Lower the card into position and push it firmly into the socket on the main circuit board. Be careful to align the connector correctly, and do not force it into place. The card is held in position by the piece of foam inside the cover of the main unit.
5. Replace the cover of the computer as previously described and reconnect the system.

6. Adjust the DIP switches under the panel beneath the disk drives to tell the computer how much memory is available.
7. Turn ON the computer. You should see a message confirming the amount of memory in the machine. If this is not correct, check the DIP switch settings and reset the computer. If it is still incorrect, check that the board is installed properly.

Using a mouse

The mouse is an accessory which is used with special software to allow you to manipulate data on the screen. By moving the mouse over your desktop, you direct a pointer on the screen. This enables you to control an application program much easier than with a keyboard. By pointing to an instruction on the screen and pressing one of the buttons on the mouse, you carry out a command instantly, without having to remember and type a complicated sequence of keys. Refer to the software manual or the program you are using with the mouse for exact details on how to use it.

You may need to install an option card to use the mouse. Follow the instructions at the beginning of this chapter to install the option card if necessary. Connect the mouse's tail to the connector at the end of the card. If your mouse does not require a card, connect the tail to the serial port.

When you want to use the mouse, remove the velcro strip that covers the roller; replace it when the mouse is not in use to keep out dust and dirt. Use the mouse only on a hard, flat surface, never on carpet-like material or on a wet surface.

During periods of frequent use, clean the roller on the mouse about every two weeks. To clean the roller on an Epson mouse, turn it over and remove the roller cover by pushing it to the side and lifting it out. For another mouse, turn it over and remove the roller cover by turning it counterclockwise. Remove the roller and wipe it with a clean, dry cloth, then replace the roller and cover. There are no other user-serviceable parts inside the mouse.

Appendix A

Troubleshooting

You should not encounter any serious difficulties with the Equity, but if anything out of the ordinary happens, this section should help. Usually, such a situation requires nothing more than repeating a software procedure, correcting an operating system error (see the operating system manuals), or resetting the computer.

Most of the minor difficulties you might encounter can be resolved by one of the suggestions below. If none of these solve the problem, consult an Epson dealer about servicing the computer.

WARNING: If the computer has to be turned OFF for any reason, always wait at least 5 seconds before switching it back ON. Turning it OFF and ON rapidly can damage the computer.

The Computer Fails to Start Up

If the computer does not start up when the power switch is moved to the ON position, follow these steps until you find a solution:

1. Check to see if the power indicator on the main unit is lit. If it is not, remove any disks and turn the power OFF. Wait 5 seconds and turn the power back ON.
2. If the lamp still does not come on, turn the power switch OFF. Then check to see that the power cable is securely connected to the electrical outlet. Try turning the power switch ON again.
3. If this fails, check the electrical outlet. Plug a portable lamp into the outlet you are using for the computer, and turn it on to see if there is power.

The Video Display Does Not Appear

If the computer starts up but the display screen image does not appear, follow these steps until you find a solution:

1. Increase the settings of the brightness and contrast controls on the monitor.
2. Check DIP switches 1-6 and 1-7 on the front of the main unit to make sure they are set correctly for your monitor.

3. Check to see that the power indicator on the monitor is lit. If it is not, turn the power OFF, wait 5 seconds, then turn the power back ON. Wait to see if the display screen appears.
4. Remove any disks, then turn the monitor and main unit power switches OFF. Check that the monitor power cable is securely connected to the electrical outlet, and that the monitor cable is properly connected to both the monitor and the main unit. Turn both power switches ON again.
5. With the computer turned OFF check the electrical outlet for power. Plug a portable lamp into the outlet you are using for the monitor and turn it on to see if it supplies power.

The Computer Hangs Up or Freezes

If the computer appears to be locked up and does not respond to the keyboard, try the following:

1. Wait a few seconds. Some operations take longer to perform than others. For example, a spreadsheet program takes longer to recalculate an entire spreadsheet than to simply enter a figure. Also, some BASIC programs that have a lot of calculations to perform can take several minutes, or even hours. Be aware of the task the computer is performing and judge the time period accordingly.
2. If the computer remains locked up, follow the reset sequences described in Chapter 5 .

Floppy Disk Problems

There are many kinds of disk problems that could occur, and just as many reasons for them happening. If you are having trouble with your disks, check the following questions:

1. Is your disk damaged? If you are getting bad results of any type, the disk could be damaged. Just to be sure, try your backup disk to see if the same problem occurs. If the backup works, the first disk was probably damaged. Make another copy from your backup.
2. Do you have the right type of disk? You should be using a double-sided, double-density, 48 TPI, soft-sectored disk. The disk type is normally shown on the manufacturer's label.

3. Is the disk write-protected? A write-protect tab may be placed over the notch on the side of the disk. Think twice before removing it. It might be a new disk, but it might also be a disk with information you do not want to change or lose. Check the disk directory to determine what files it contains. The operating system manual gives the proper directory command. Although you should normally write-protect program disks, there are some programs which use the program disk for temporary files, and these do not work if the disk has been write-protected.

Software Problems

There are various kinds of software problems, more so than there are disk problems. If you are having trouble with a piece of software, here are some of the basic problems, and the troubleshooting procedures that you can use to help track them down:

1. The software program does not start. First check that you are following the right procedure for the operating system you are using. Make sure that a system disk has been placed in drive A.
2. An application routine is not working. Refer to the software manual and complete the routine according to the instructions in the manual. If this does not work:
 - Start from the beginning by following the reset procedure described in Chapter 5. Restart the program and try the routine again after the computer has been reset.
 - Some software may need the DIP switches to be set a particular way to work properly. Make sure that the DIP switches are set correctly for the type of monitor, the amount of memory, and the number of disk drives you have. The DIP switch settings are listed in Chapter 2. Always turn OFF the computer before changing the DIP switches. The new settings are not read by the computer until you turn it back ON.

Printer Problems

Most of the problems encountered while using a printer can be solved by checking the manual that came with the printer. If the printer is not working correctly and has just been installed, first make sure the printer has power and is correctly connected to the computer. The printer manual provides instructions on cable connections.

If you have a serial printer, or if you have problems with paper feeding, you may also need to check the printer manual for the correct DIP switch settings. The DIP switches on a printer help it communicate properly with the computer.

Option Card Problems

If you have installed an option card and get unexpected results, double-check the following points:

1. Is the option card installed correctly?
2. Did you follow the set up and operating instructions described in the option card manual?

Hard Disk Problems

Hard-disk units are extremely reliable, and most problems occur due to accidentally repartitioning or reformatting part or all of the hard disk. However, if the hard disk does not function properly, have it checked immediately by an authorized Epson service center. The recording disk is enclosed in an air-tight container that you should never open.

Appendix B

Specifications

CPU and Memory

16-bit CPU	8088 microprocessor, 4.77 MHz clockrate
Main memory	256k or 512k; expandable to 640k
ROM	16k

Controllers

Video/Graphic	IBM compatible monochrome and color/graphics controller
Disk	Double-density floppy disk controller
DMA	Programmable DMA controller with 4 channels-two main systems (one for refreshing and one for floppy disk controller), two available for user peripherals
Interrupt	Programmable interrupt controllers, 8 interrupt levels
Control/Timer	One programmable interrupt timer
Printer I/O	Programmable parallel interface
Serial I/O	Multi-protocol serial controller

Interfaces

Serial	RS-232C, programmable, asynchronous, DB-25 male connector
Printer	Standard 8-bit parallel, DB-25 female connector
Option slots	Three (one used by video card)
Speaker	Internal, controlled by counter/ timer

Power Supply

Switching type, fan-cooled, -5 VDC, +5VDC, + 12 VDC, -12 VDC, 115 VAC, 55 w

Mass Storage

Single/Dual 5¼-in. floppy disks, double-sided, double-density, multiple format 360K per disk

Capacity Optional 5¼ in. hard disk, 20 MegaBytes

Keyboard

Detachable, two positions, 83 sculpted keys

Layout 56-key QWERTY main keyboard, 17-key numeric pad, 10 function keys x 3 levels (normal/shift/alternate), user definable

Environmental Requirements

Temperature Operating range: 25° to 90°F (-4° to 35°C)

Storage range: 0° to 149°F (-20° to 65°C)

Humidity Operating range: 20 % to 80 %, non-condensing

Storage range: 10% to 90%, non-condensing

Physical Characteristics (CPU only)

Width, in. (mm) 14.3 (360)

Depth, in. (mm) 15.1 (380)

Height, in. (mm) 5.6 (142)

Weight, lb. (kg) 24 (52.8)

Power Requirements

104 VAC - 132 VAC, 50 to 60 Hz, MAX 144 VA

Appendix C

Glossary

ASCII

American Standard Code for Information Interchange. A standard way of assigning numerical codes to characters and control codes. The character set on the Equity is based on the US ASCII code system, with the addition of a large number of international and graphics characters.

Backup copy

A copy of a disk or file kept in case your working copy is damaged.

Baud rate

The number of signal/data bits that can be transmitted per second during serial communications: it should be the same for the two communicating devices.

Bit

All computer information-whether words, figures or program instructions-is stored as sets of numbers. Each individual number is recorded in binary form, as either one or zero. A bit, short for binary digit, is one of these numbers.

Booting

The process of loading the computer's operating system.

Byte

A group of eight bits, which operate as a unit. A byte usually corresponds to one character of text, but may also be part of a computer word (a larger number). The size of the computer's memory, and the capacity of a disk, are normally expressed in kilobytes. One kilobyte contains 1024 bytes.

Character

Any letter, number or symbol on the keyboard.

Chip

An integrated circuit, combining the functions of a large number of individual components.

Configuring

Preparing a piece of equipment or a program so that it suits your way of working and the other equipment you are using.

CPU

The unit inside a microcomputer that processes data and performs calculations.

Device

A piece of equipment forming part of a computer system such as disk drives, monitor, printer and so on.

DIP switch

One switch on a set of small switches (on the front panel of the computer) which give the system information about itself. DIP stands for Dual In-line Package.

Disk

A device that stores information for future use. A disk may be a floppy disk made of a flexible plastic magnetic coating, or a hard disk, made of metal coated with a magnetic material. Unlike floppy disks, hard disks cannot normally be taken out of their disk drives.

Disk drive

A unit in which a disk is held, so that the computer can read from it and write to it.

File

A collection of data stored on a disk.

Formatting

Preparing a new disk to receive data similar to ruling lines on a blank piece of paper before writing on it.

Hard copy

A printed copy of text or messages, or program, as opposed to a display on a video monitor.

Hardware

The mechanical units that make up your computer system.

Interface

The software or hardware connecting two devices, computers, or programs.

Mouse

A device which you roll over your desktop to control a pointer on the screen and operate a program.

Operating system

A set of software routines which control the way programs run on a computer, and supervise all input and output to and from the system.

Parallel

A method of organizing communications between two pieces of computer equipment in which the signals that make up each character are sent simultaneously.

Partitioning

Dividing a hard-disk drive into sections for use by different operating systems.

Port

A connector for one of the computer's interfaces.

Program

The complete sequence of computer instructions necessary to do certain functions.

RAM (Random Access Memory)

A memory device, usually a set of chips, structured so that any item of data can be accessed quickly. RAM is usually volatile- that is, data stored in RAM is lost when the power is turned off. The programs you use and write, and the data they create, are temporarily stored in RAM while you work.

Resetting

Reloading the computer's operating system, so you can restart work after a serious error, or begin using a different operating system. Resetting clears the computer's memory, so you should reset only when it is really necessary.

ROM (Read Only Memory)

A memory chip that can only be read and cannot be used for temporary storage. ROMs retain their contents even while the power to the computer is off.

RS-232C

A widely-used standard for serial interfaces. Devices that are RS-232C compatible can be connected to the Equity with very little difficulty.

Serial

A method of communications between two pieces of computer equipment in which the signals that make up each character are sent one bit at a time.

Software

The programs you run on your computer.

System disk

A disk containing the files which make up the operating system for the computer.

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