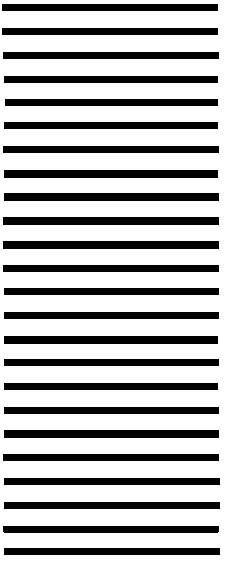
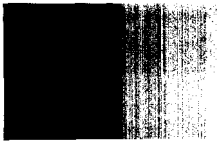
EQUITY™ LT

User's Guide



EPS



Y16499100301

IMPORTANT SAFETY INSTRUCTIONS

1. Read all of these instructions and save them for later reference.
2. Follow all warnings and instructions marked on the product.
3. Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
4. Do not use this product near water.
5. Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
6. Slots and openings in the cabinet and the back or bottom are provided for ventilation; to ensure reliable operation of the product and to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation unless proper ventilation is provided.
7. This product should be operated from the type of power source indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
8. This product is equipped with a 3-wire grounding type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the purpose of the grounding-type plug.
9. Do not locate this product where the cord will be walked on.

10. If an extension cord is used with this product, make sure that the total of the ampere ratings on the products plugged into the extension cord do not exceed the extension cord ampere rating. Also, make sure that the total of all products plugged into the wall outlet does not exceed 15 amperes.

11. Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the product.

12. Except as specifically explained in the User's Manual, do not attempt to service this product yourself. Opening or removing those covers that are marked "Do Not Remove" may expose you to dangerous voltage points or other risks. Refer all servicing in those compartments to service personnel.

13. Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

    A. When the power cord or plug is damaged or frayed.

    B. If liquid has been spilled into the product.

    C. If the product has been exposed to rain or water.

    D. If the product does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.

    E. If the product has been dropped or the cabinet has been damaged.

    F. If the product exhibits a distinct change in performance, indicating a need for service.

EPSON®

Equity™ LT

User's Guide

IMPORTANT NOTICE
DISCLAIMER OF WARRANTY

Seiko Epson Corporation makes no representations or warranties, either express or implied, by or with respect to anything in this manual, and shall not be liable for any implied warranties of merchantability and fitness for a particular purpose or for any indirect, special, or consequential damages. Some states do not allow the exclusion of incidental or consequential damages, so this exclusion may not apply to you.

COPYRIGHT NOTICE

TRADEMARKS

Epson is a registered trademark of Seiko Epson Corporation.
Equity is a trademark of Epson America, Inc.
Centronics is a registered trademark of Centronics Data Computer Corp.
IBM is a registered trademark and AT and XT are trademarks of International Business Machines Corp.
Microsoft, MS-DOS, and GW-BASIC are registered trademarks of Microsoft Corp.
Hayes is a registered trademark of Hayes Microcomputer Products Inc.
V30 is a trademark of NEC Corporation.

Y16499100301

FCC COMPLIANCE STATEMENT FOR AMERICAN USERS

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 the 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:

"Television Interference Handbook"

This booklet is available from the U.S. Government Printing Office, Washington DC 20402. Stock No. 0044-000-00450-7.

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.

Contents

Appendixes

Tables

Introduction

Your Epson® Equity™ LT portable computer is a compact high-performance system you can use just about anywhere: at the office, at home, or on the road. Its rechargeable battery lets you use it in remote locations when you don't have access to an electrical outlet. With the AC adapter connected, you can use the computer as long as you like, and recharge the battery in the process.

There are two Equity LT models:

- Dual diskette drive system, with two 3 $\frac{1}{2}$ -inch diskette drives
- Hard disk drive system, with one 3 $\frac{1}{2}$ -inch diskette drive and one 20MB (megabyte) internal hard disk drive.

You probably also chose either the standard or backlit model LCD (liquid crystal display) screen. The backlit model features an electroluminescent element that illuminates the background of the screen.

The Equity LT includes 640KB (kilobytes) of internal memory and comes with built-in serial and parallel interfaces. These interfaces let you connect an Epson printer or almost any other peripheral device you choose.

If you have a color monitor, you can connect it to the Equity LT to take advantage of the color and the larger display. If you have the hard disk drive system, you can also connect an external 5 $\frac{1}{4}$ -inch diskette drive to the computer; this enables you to use 360KB diskettes from a computer that has a 5 $\frac{1}{4}$ -inch drive.

Epson offers a 300/1200 baud auto-dial modem which you can install inside the Equity LT to communicate over the phone lines with other computers. You can also buy a soft case for carrying your computer and a cigarette lighter adapter for an alternate power source. Ask your Epson dealer for information.

The Equity LT comes with the MS-DOS operating system and the GW-BASIC programming language. If you have used MS-DOS before on another computer, you'll find that it works the same on the Equity LT. The main commands are explained in this manual and full information, including descriptions of the special utility programs added by Epson, is in your MS-DOS manual.

You can use almost all application programs designed for the IBM PC, PC XT and PC AT on your Equity LT.

How to Use This Manual

This user's guide explains how to set up and care for your Equity LT. It also describes how to use your computer and run diagnostics checks. You do not need to read everything in this book; some sections may describe a particular option you do not have. In fact, if you are familiar with computers, you may need to read only Chapters 1 and 3, and Chapter 2 if you have the hard disk model.

Complete the 10 steps in Chapter 1 to set up your computer and prepare it for use.

If you have the hard disk model, you must follow the instructions in Chapter 2 to prepare the hard disk before you try to use it. If you have the dual diskette drive model, skip Chapter 2.

Chapter 3 describes general operating procedures and explains how to use and care for your disks and disk drives.

Chapter 4 provides basic instructions for using MS-DOS with the Equity LT.

If you need to connect a color monitor or replace the backlit screen element, see Appendix A.

If you encounter any problems while using your Equity LT, check the troubleshooting guidelines in Appendix B.

Appendix C provides information on the power-on diagnostics in case your computer has trouble powering up. Appendix D outlines the system diagnostic checks you can perform on your computer. If you are having trouble with any part of the hardware, you may want to run some or all of these diagnostic checks.

Appendix E presents the Equity LT hardware specifications, and Appendix F is a glossary of computer terms used in this manual. Check the glossary whenever you come across an unfamiliar word.

Chapter 1

Setting Up Your System

Setting up your Epson Equity LT portable computer is easy. Just follow the steps in this chapter. They describe how to set up your computer, copy the system diskettes that come with your Equity LT, and run the initial Setup program on your reference diskette.

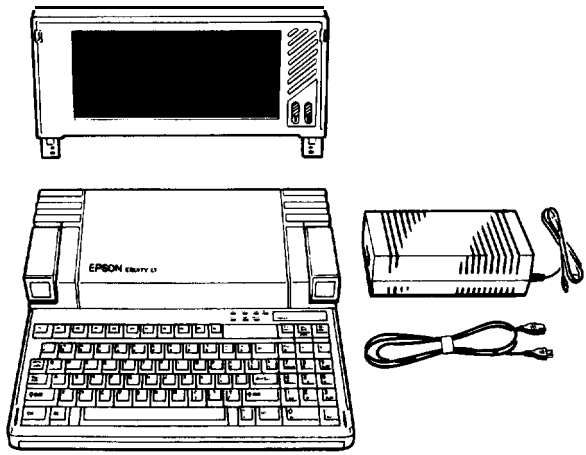
You'll find a quick reference guide to these steps on the inside back cover.

Do not turn on the computer, printer, or any other peripherals until the instructions tell you to. Otherwise, you may damage some part of your equipment.

If you have the hard disk model, go on to Chapter 2 when you complete the steps in this chapter.

1 *Unpacking*

As you remove the different parts of your system from their cartons, be sure to inspect each piece. If anything is missing or looks damaged, consult your Epson dealer.



Besides this manual, you should have the following items:

- The computer
- AC adapter and power cord
- An MS-DOS operating system diskette (version 3.20), which also contains the GW-BASIC programming language
- A reference diskette
- An MS-DOS manual and a GW-BASIC manual.

You should also have either the standard or backlit LCD screen or a color monitor to use with your computer.

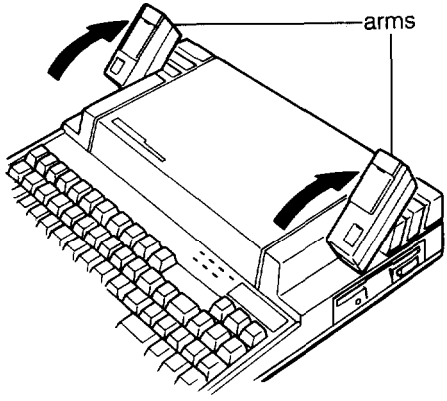
You'll find a registration card with the computer. Fill this card out now and mail it to Epson. With your registration card on file, Epson can send you update information.

Be sure to keep your packing materials. They provide the best protection for your computer if you need to ship it later.

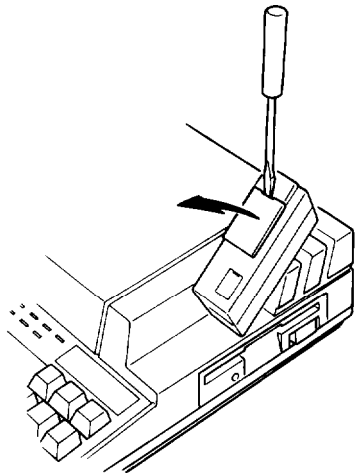
2 *Connecting the Screen*

Follow these steps to connect either the standard or backlit screen to the computer:

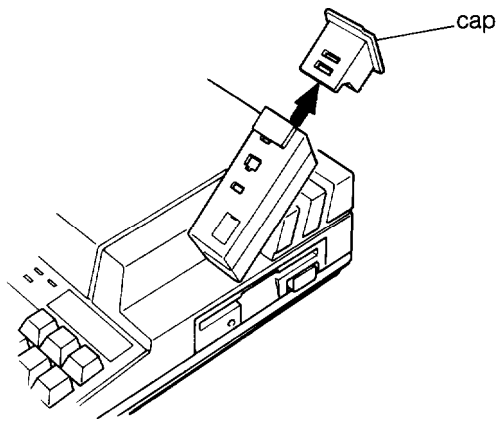
1. As shown below, push back the arms on the computer so they rest against the back edge of the computer.



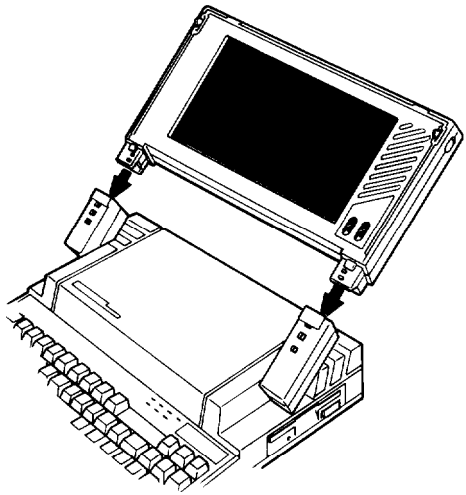
2. Use a flat blade screwdriver to lift off the plastic cover on the front of each arm, as shown below. Set the covers aside.



3. There is a plastic insert cap inside each of the arms; lift it out as shown below. You may want to keep these caps in case you need to store or ship your computer later.



4. Pick up the screen with both hands and insert it into the arms of the computer.



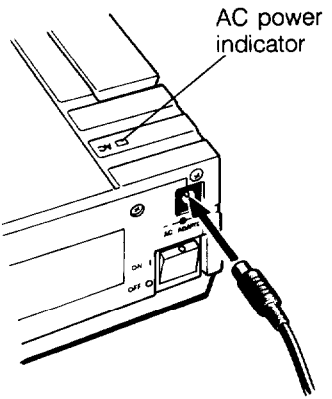
5. When the screen is securely seated in both arms, replace the plastic covers on the front of the arms by snapping them back into place. These secure the screen to the computer.

You can pull the screen forward or push it back to adjust the viewing angle.

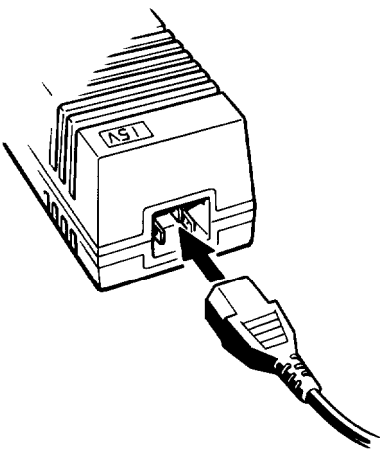
3 *Connecting the AC Adapter*

Follow these steps to connect the AC adapter:

1. Insert the round end of the adapter cable into the jack marked AC ADAPTER on the back panel of the computer.



2. Connect one end of the power cord to the adapter's input socket.



3. Plug the other end of the power cord into a 120 volt electrical wall outlet.

When the adapter is connected to both the computer and an electrical outlet, the AC power indicator light turns on. This light is a convenient way to verify that the AC adapter is providing power to the computer.

Be sure to read 'Using the Adapter" in Chapter 3 for information on powering the computer with the AC adapter.

4 *Charging the Battery*

The Equity LT contains a rechargeable NiCad (nickel cadmium) battery pack that powers the computer when you are not using the AC adapter. Before you can use the computer the first time, you must charge the battery.

When you plugged in the AC adapter in step 3, it started charging the battery. This happens whenever the adapter is connected to the computer and plugged into an electrical outlet. Let the battery charge for at least five minutes before you start using the computer for the first time and leave the AC adapter connected while you use the computer.

Be sure to read "Using the Battery" in Chapter 3 for information on using the computer with the battery. It explains how to fully charge the battery; you should do this as soon as possible with your new computer.

5 *Connecting a Printer*

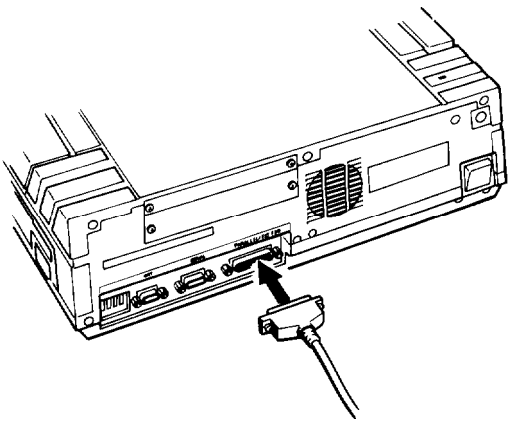
The Equity LT has both parallel and serial interfaces. You can easily connect a printer or plotter that has either type of interface-just follow the instructions below. Of course, Epson offers a full range of printer products; consult your dealer for more information.

Parallel interface

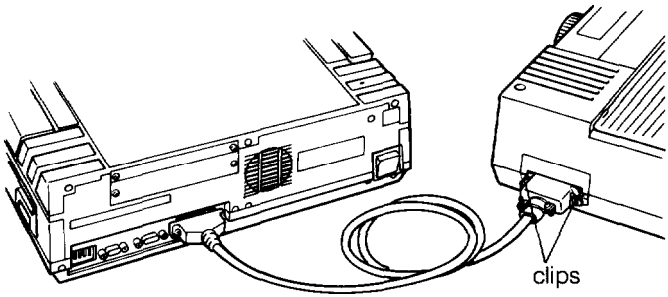
The Equity LT parallel interface is Centronics-compatible and uses a DB-25S connector. Most Epson printers have parallel interfaces.

To connect a printer to the computer, you need an IBM-compatible printer cable. If you are not sure which one you need, consult your Epson dealer. Once you have a printer cable, follow these steps to connect your printer to the parallel interface on the computer:

1. Place the printer next to your computer.
2. Before you connect the printer, be sure the power switches on the computer and printer are off.
3. Connect the appropriate end of the printer cable to the parallel port on the back panel of the computer, as shown below. If the plug has retaining screws, tighten them with a small screwdriver.



4. Connect the other end of the cable to the printer as shown below. To secure the cable, squeeze the clips at each side of the printer connector and click them into place.



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

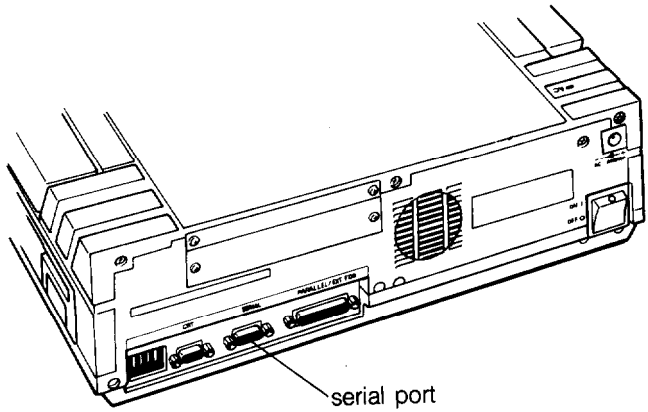
6. Be sure to turn off DIP switch 1 on the back panel as described below under "Setting the DIP Switches" to let your computer know a printer is connected.

Note

If you plan to use an external 5 $\frac{1}{4}$ -inch diskette drive with your Equity LT, it must be connected to the parallel port. Therefore, you cannot have both a parallel printer and the diskette drive connected at the same time. Be sure to turn on DIP switch 1 on the back panel to select the external drive. See "Setting the DIP Switches" below.

Serial interface

If you have a printer or another peripheral with a serial interface, connect it to the serial (RS-232C) port at the back of the computer.



The Equity LT uses a DB-9P connector, so be sure you have an IBM AT-compatible cable (or an adapting cable that converts the 9-pin output to the standard 25-pin output). To connect a serial device, follow the same steps given above for connecting a parallel device.

You need to ensure that the serial port is set up to function properly. If you are using the port for a serial printer, you must also redirect printer output to the serial instead of the parallel port. To make these changes, use the MS-DOS SETMODE program (or the MODE command), described in your MS-DOS manual.

Note

If you plan to connect a color monitor or an external diskette drive to your computer, do it at this point. For instructions on connecting the monitor, see Appendix A, "Options and Maintenance." For instructions on connecting an external drive, see the instructions that came with the drive you bought. If your computer already has two internal diskette drives and you connect an external drive, the internal diskette drive on the left side of the computer is disabled.

Be sure to set the computer's DIP switches correctly if you connect either of these devices to your Equity LT. See 'Setting the DIP Switches" below.

6 *Setting the DIP Switches*

The DIP switches on the Equity LT are set to provide your computer with information about itself. Each time you turn it on, the computer checks the DIP switch settings to determine the LCD mode in use, whether an external diskette drive is connected, the number of diskette drives in use, and the type of serial connection.

The Equity LT has two sets of DIP switches: one just above the keyboard and one on the back panel of the computer. The set above the keyboard has four switches that control the LCD screen. The set on the back panel has four switches that control the diskette drive and parallel and serial interface configuration.

Your dealer may have set these switches for you. Read this section, however, to be sure the settings match your system setup.

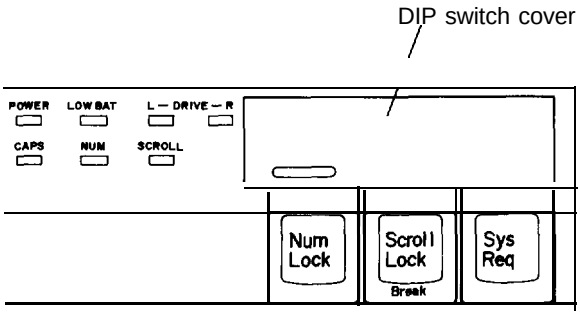
Note

Change the DIP switches only while your computer is off. Otherwise, the new settings may not take effect until you turn the computer off and then on again.

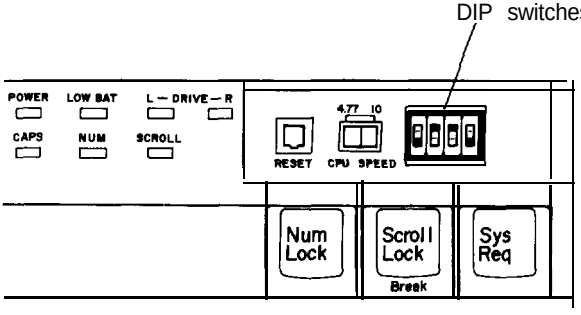
A DIP switch is either on (up) or off (down). To change a setting, use a hard, thin object, such as a small screwdriver.

Keyboard DIP switches

To access the DIP switches above the keyboard, you need to open the cover shown below.



Press the raised tab back and lift up at the same time to expose the DIP switches.



The system functions controlled by these switches are listed in Table l-l and then described below.

Table 1-1. ***Keyboard*** DIP switch functions

	1	2	3	4
LCD normal	ON			
LCD reverse	OFF			
Mode 0		ON	ON	
Mode 1		ON	OFF	
Mode 2		OFF	ON	
Mode 3		OFF	OFF	
Select LCD				ON
Select monitor				OFF

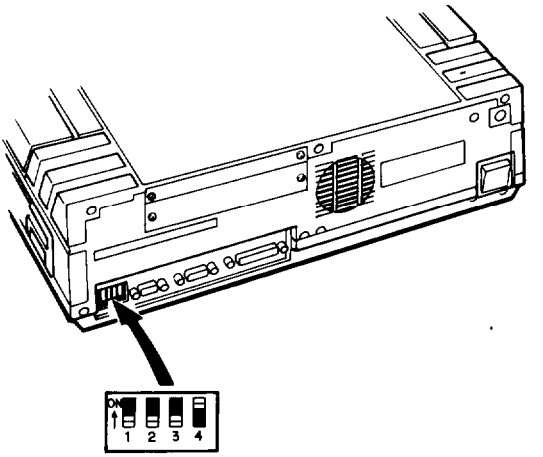
Switch 1, LCD reverse or normal- This switch tells your computer whether to display text on the screen in normal mode or reverse. In normal mode on the standard model **LCD,** characters are dark on a light background. In normal mode on the backlit model LCD, the characters are light on a dark background. In reverse mode on the standard model LCD, characters are light on a dark background. In reverse mode on the backlit model LCD, the characters are dark on a light background. Turn this switch on for normal mode or off for reverse mode.

Switches 2 and 3, LCD mode-These switches control how the text displays on the screen. If you cannot see text clearly, try changing these switches to select another mode.

Switch 4, LCD or monitor selection-This switch tells the computer whether to display text on the LCD screen or on a monitor screen you have connected to the computer. If you have connected a color monitor to your computer, turn this switch off. Otherwise, leave it on.

Back panel DIP switches

The second set of DIP switches are on the left side of the back panel.



The system functions controlled by these switches are listed in Table 1-2 and then described below.

Table* 1-2.** *Back panel* ***DIP *switch functions*

	1	2	3	4
Use external diskette drive	ON			
Use parallel printer	OFF			
External diskette drive is B		ON		
External diskette drive is A		OFF		
1 diskette drive			ON	
2 diskette drives			OFF	
Serial port is secondary				ON
Serial port is primary				OFF

Switch 1, use of parallel port-This switch tells your computer whether a diskette drive or a parallel printer is connected to the external parallel port. If you connected a parallel printer to this port, turn this switch off. If you connected an external 5 $\frac{1}{4}$ -inch diskette drive to the port, turn this switch on.

Switch 2, external drive assignment-If you have connected an external diskette drive to the computer, this switch determines whether MS-DOS and your application programs access the drive as drive A or drive B. The external drive should be drive B, unless you are using a copy-protected application program that requires the diskette to be loaded in drive A. In this case, you can assign the external drive as A by turning switch 2 off. If you want it to be drive B, turn the switch on.

Switch 3, number of diskette drives-This switch tells the computer how many diskette drives it has. If you have one diskette drive, turn this switch on. If you have two drives (either two internal or one internal and one external) turn it off.

Switch 4, primary or secondary serial port-This switch tells the computer whether the built-in serial port is primary or secondary. If you install the optional modem card, which has an external serial port, you can use this DIP switch to select which port is to be primary and which is to be secondary.

If you do not have a modem installed or if you want the built-in port to be the primary port, turn switch 4 off. If you want the modem port to be the primary port and the built-in port to be secondary, turn switch 4 on,

7 *Turning On the Computer*

After you complete steps 1 through 6, you're ready to turn on the power and start using your Equity LT computer. But before you turn it on, read the following safety rules.

Safety rules

Follow these rules to avoid accidentally damaging your computer or injuring yourself:

- Do not attempt to dismantle any part of the computer. If there is a hardware problem you cannot solve after reading Appendix B on troubleshooting or performing the system diagnostics in Appendix D, consult your Epson dealer.

- Never turn off your computer while a disk drive light is on. This can destroy data stored on disk or make a whole disk unusable.
- Always wait at least five seconds after you turn the power off before you turn it on again. Turning the power off and on rapidly can damage the computer's circuitry.
- Do not leave a beverage near your computer or any of its components. Spilled liquid can damage the circuitry of your equipment.

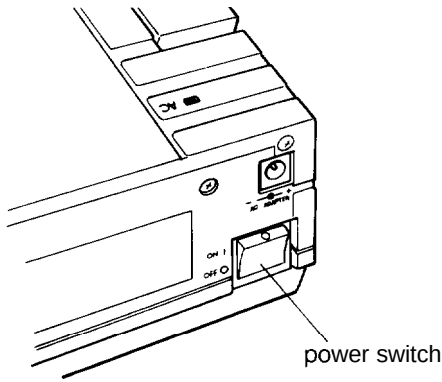
Turning on the power

After you have charged the battery (by connecting the AC adapter to the computer) for at least five minutes, you are ready to turn on your computer. Be sure to leave the AC adapter connected while you use the computer for the first time.

1. Before you turn on the computer, turn on any peripheral devices such as a printer, an external diskette drive, or a color monitor.

2. If your computer has a hard disk, turn it on with the switch on the back panel. It is best to leave this switch on at all times.

3. You can turn on your computer with or without a system diskette in the drive. For now, leave the drive empty. To turn on the computer, press the power switch on the back panel.

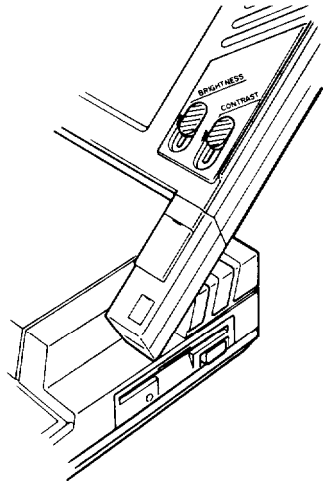


The power indicator above the keyboard lights up, and after a few seconds, the computer begins to perform an internal self test. This is a diagnostics program the computer runs whenever you turn it on. The power-on diagnostics self test checks the RAM (random access memory), keyboard, system board, and peripherals before the computer begins normal operation.

For a complete description of the power-on diagnostics, see Appendix C.

Adjusting screen contrast and brightness

If you cannot see text on the screen clearly, use the switch or switches on the right side of the screen to adjust the screen's contrast (and brightness). The standard model has only the contrast switch. The backlit model has a contrast switch and a brightness switch, as shown below.



The contrast switch determines how brightly the characters display against the background. To increase the contrast, move the switch up. To decrease it, move the switch down.

If your screen is the backlit model, you can use the brightness switch to adjust the intensity of the backlighting. To make the backlighting brighter, move the switch up. To decrease the brightness, move the switch down. To preserve the life of the screen (and the computer's battery), do not make the screen any brighter than you need to see the text clearly.

Initial screen display

After the computer completes its self test, a message tells you how much RAM is available:

640 KB 0K

Then the screen displays the following message:

Non-System disk or disk error
Replace and strike any key when ready

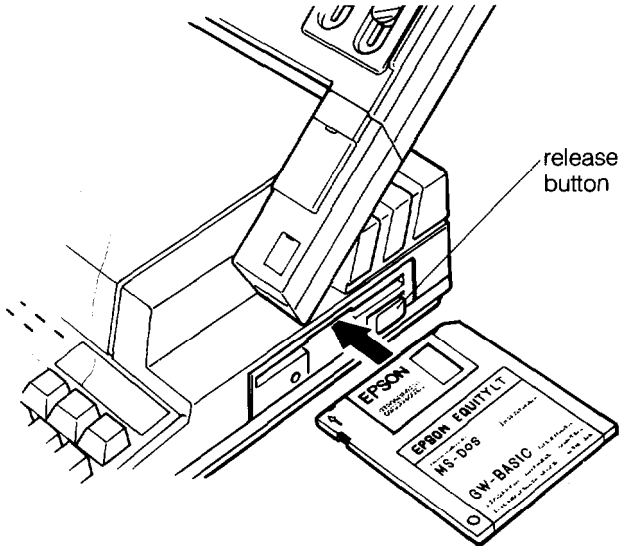
This tells you the computer can now load an operating system from a diskette in the right drive, drive A, The Equity LT needs a disk operating system (DOS) to function. It comes with MS-DOS version 3.20. If you want to use another operating system, consult your dealer.

Chapter 4 provides the basic information you need to use MS-DOS; so be sure to read that chapter before you start using the operating system with your Equity LT. But for now, follow the instructions below to load MS-DOS and make working copies of your MS-DOS and reference diskettes.

8 *Loading MS-DOS*

Follow these steps to load MS-DOS:

1. Hold the MS-DOS diskette with the label facing up and the arrow on the left side of the diskette pointing into drive A on the right side of the computer, as shown in the following illustration.



2. Insert the diskette into the drive until it clicks into place. When the diskette is all the way in, the release button pops out. (For more instructions, see "Inserting and removing diskettes" in Chapter 3.)

3. Press any key. The computer automatically loads the operating system. The screen displays the system title and version number and then a date prompt similar to this:

```
Current date is Sat 10-24-87
Enter new date (mm-dd-yy)
```

   You do not need to enter the date because you will soon be entering the correct date and time when you run the Setup program below. Once you enter the correct date and time, the Equity LT retains them unless you change them again in the Setup program.

4. Press Enter to accept the displayed date. The screen then displays the time:

```
Current time is 09:10:33
Enter new time:
```

5. Press Enter to accept the displayed time.

The screen displays the MS-DOS version number and copyright information, and then the MS-DOS command prompt:

A >

This means the operating system is ready for you to enter a command. The command prompt identifies the current operating drive: A, B, or C. It displays on the screen whenever you load MS-DOS, complete an MS-DOS command, or exit an application program.

9 *Copying System Diskettes*

Follow the steps below to make copies of your two system diskettes. It is very important that you use only the copies (usually called "working" copies) for daily use and store the originals in a safe place.

The procedure for copying a diskette depends on whether your computer is the dual diskette drive model or the hard disk model, which has only one 3 $\frac{1}{2}$ -inch diskette drive. Follow the procedure for your model, described below. You will need two blank, 3 $\frac{1}{2}$ -inch, 720KB, double-sided diskettes.

When you finish making the copies, be sure to put the originals away.

Copying with two diskette drives

1. If it is not already in the drive, insert your MS-DOS system diskette in drive A (and press any key, if necessary). The A> prompt should be on the screen.
2. Insert a blank 3 $\frac{1}{2}$ -inch 720KB diskette in drive B, on the left side of the computer.

3. Type:

   DISKCOPY A: B:

   and press Enter. The screen displays these prompts:

   Insert SOURCE diskette in drive A:
   Insert TARGET diskette in drive B:
   Press any key when ready . . .

4. Drive A already contains the diskette you want to copy (the source) and drive B contains the blank diskette (the target), so just press any key. If the diskette in drive B is not formatted, the DISKCOPY program formats it. Then the program begins copying the data from drive A to the formatted diskette in drive B.

5. When the copy is complete, the screen displays this prompt:

   Copy another diskette (Y/N)?

   Press Y so you can make a copy of the reference diskette. Remove the diskettes from drives A and B (press the release button on each drive to remove the diskette). Then insert the reference diskette in drive A and another blank diskette in drive B. Follow the prompts on the screen to copy the reference diskette.

6. When you finish and the Copy another diskette (Y/N)? prompt displays, press N to return to the MS-DOS A> prompt.

Copying with one diskette drive

1. If it is not already in the drive, insert your MS-DOS system diskette in drive A (and press any key, if necessary). The A> prompt should be on the screen.

2. Type:

   DISKCOPY

   and press Enter. The screen displays the following prompts:

```
Insert SOURCE diskette in drive A:
Press any key when ready . . .
```

3. Drive A already contains the diskette you want to copy (the source), so just press any key. The DISKCOPY program copies the contents of the diskette to the computer's memory.

Note

Because the 720KB MS-DOS diskette holds more data than can fit in the computer's 640KB of memory, the computer needs to copy the contents of the diskette in two passes. The screen prompts you when to insert and remove the diskettes.

Then the screen displays these prompts:

```
Insert TARGET diskette in drive A:
Press any key when ready . . .
```

4. Remove the MS-DOS system diskette from drive A (press the release button to release the diskette) and insert the blank diskette (the target) in the drive. Then press any key.

   If the diskette in drive A is not formatted, the DISKCOPY program formats it. Then the program begins copying the data from the computer's memory to the formatted diskette. When it has copied all the files from memory, DISKCOPY displays these prompts on the screen:

```
Insert SOURCE diskette in drive A:
Press any key when ready . . .
```

5. Remove the copy diskette from the drive and insert the original MS-DOS diskette. Press any key.

   The program copies the rest of the files from the original diskette to the computer's memory and then displays these prompts on the screen:

```
Insert TARGET diskette in drive A:
Press any key when ready . . .
```

6. Remove the MS-DOS system diskette from drive A and insert the copy diskette in the drive. Then press any key. The program copies the remaining files from the computer's memory to the copy diskette.

   When the copy is complete, you see this prompt:

   Copy another diskette (Y/N)?

7. Press Y so you can make a copy of the reference diskette. Follow the instructions above and the prompts on the screen to copy the reference diskette. When you finish and the Copy another diskette (Y/N)? prompt appears, press N to return to the MS-DOS A> prompt.

10 *Running the Setup Program*

If this is the first time your Equity LT has been used, you need to run the Setup program on the reference diskette to give the computer information about the way it is set up. This is a simple procedure that you must do at least once. You may need to do it again later if you want to change something.

The Setup program lets you set (or change) the following:

- Real-time clock's date or time
- Backlight period for the backlit model screen
- Default settings for the serial (RS-232C) port or ports.

The information you define with the Setup program is stored in the CMOS RAM, which is permanent because it is backed up by a battery. Whenever you turn on the computer, it searches the CMOS RAM for the correct installation information. If the computer discovers a difference between the information in CMOS RAM and your computer, it prompts you to run the Setup program.

To start the Setup program, insert the working copy of your reference diskette in drive A. At the A> prompt, type:

setup

and press Enter. The Setup menu displays on the screen:

```
          Exit
    Real-time clock
   Backlight period
  Primary serial port
Secondary serial port

↓ select function, Enter exit program
```

Setting the real-time clock

Your computer automatically keeps track of the time and date using a real-time clock. Because the clock is backed up by a separate battery, it keeps track of the time and date even while the computer is turned off.

The MS-DOS TIME and DATE commands, as well as many application programs, display the time and date held in the clock, but they cannot make permanent changes to the time and date settings.

Use the Real-time clock option if you need to change the time and date permanently-for daylight saving time, for example. Your computer automatically adjusts for leap years. Note that even though MS-DOS and your application programs may use a different format, the real-time clock uses a 24-hour time format to store the time.

To set the real-time clock, follow these steps:

1. On the main menu, press ↓ to move the cursor block to Real-time clock and press Enter. You see the time and date displayed like this:

   ```
   17:45:55      Time
   12-31-1987    Date
   ```

2. To set the time, press Enter (while the cursor block is on Time). You see the following:

   ```
   hh:mm:ss
   ```

Enter the time in the exact form shown in the box, using two digits for each part; the program automatically inserts the colons (:). For example, to set the time for 3:15 pm, enter the following:

151500

When the time is correct, press Enter. If you enter an invalid time (a number greater than 23 for the hours or 59 for the minutes or seconds), the time does not change.

3. To set the date, press ↓ to move the cursor block to Date and press Enter. You see the following:

mm-dd-yyyy

Enter the date in the exact form shown in the box, using two digits for the month and the day and four digits for the year; the program automatically inserts the dashes (-).

When the date is correct, press Enter. If you enter an invalid date (such as a number greater than 12 for the month), the computer beeps, and the date does not change.

4. When both the time and date are correct, press ↑ to return to the main menu to change other settings.

Changing the backlight period

The backlight period is the length of time a backlit screen remains illuminated before the computer turns it off automatically. Although this power-saver feature is designed mainly for the backlit model screen, follow these instructions if you have the standard model to select no time limit. This makes your computer run more efficiently.

The backlit screen draws power from the battery to stay illuminated, and should last a long time. However, it gradually loses some of its brightness, and may eventually need to be replaced.

To help conserve the battery's charge and extend the life of the screen, the computer turns the backlighting off automatically if you have not pressed a key for a certain length

of time. The default time period is two minutes. You can change it to a time between one-half minute to five minutes, in half-minute increments. If you do not want the backlighting to be turned off at all, select no time limit so it remains on unless you turn off the computer.

After the backlighting goes off, it remains off until you press any key on the keyboard. As soon as you press a key, the backlighting comes back on.

To change the backlight period, follow these steps:

1. Press ↓ to select Backlight period and press Enter. You see:

   ```
   2.0      Minutes
   * SAVE A SETTING *
   ```

2. To increase the time period, press +. To decrease the time period, press -. The time increases and decreases in half-minute increments: .5, 1.0, 1.5, etc. If you reach 5.0 and press +, the screen displays the following:

   No time limit

   This means that the computer will not turn the backlighting off at all.

3. After you select the time period you want, press ↓ to move the cursor block to * SAVE A SETTING * and press Enter to return to the Setup menu.

Changing the serial port (RS-232C) settings

Use the Primary serial port and Secondary serial port options to change the default parameters for the serial port(s) in your computer. If you are not using the serial port at all, you don't need to do anything with this part of the Setup program, and you can go on to "Leaving the Setup program" below.

If you are using only the built-in serial port, you need to be concerned only with the primary serial port-and only then if you want to change the default parameters for communication. For example, if you have a serial printer attached to the built-in serial port, you can use the Primary serial port option to match the computer's parameters to the printer's switch settings so that you do not need to use the MS-DOS MODE command to set up the serial port each time you want to use it.

The primary serial port is the one designated in MS-DOS as COM1:-normally the built-in serial port. The secondary serial port is the one you address as COM2:-normally the serial port on the optional modem card. If your computer has a modem card installed and you turn on DIP switch 4 on the back panel so the built-in port is secondary, COM1: and COM2: are reversed. Consider this if you alter the serial port settings in the following instructions.

The procedure for changing the serial port settings is identical for the primary and secondary serial ports. To alter the primary serial port parameters, press ↓ to select Primary serial port and press Enter. To alter the secondary serial port parameters, press ↓ twice to select Secondary serial port.

You see a menu of the serial parameters with their default values:

```
Baud rate       9600 bps
Parity          None
Data length     8 bits
Stop bits       1 bit(s)
* * * SAVE SETTINGS * * *
```

Note

Check the manual that came with the serial device you are using to determine which settings to use for these parameters.

The cursor block is on the Baud rate option. To change the speed of communication, press Enter. The screen displays the following:

110 bps
150 bps
300 bps
600 bps
1200 bps
2400 bps
4800 bps
9600 bps
19200 bps
38400 bps

Use ↓ and ↑ to move the cursor block to the desired communication speed and press Enter.

To set the type of parity check, press 1 to select Parity and press Enter. The screen displays the following:

None
Odd
Even

Use the arrow keys to move the cursor block to the correct type of parity check and press Enter.

To change the data length, move the cursor block to Data length and press Enter. The number changes to either 7 or 8, whichever was not displayed before. Press Enter again if you want to reselect the previous number.

To change the number of stop bits, move the cursor block to Stop bits and press Enter. The number changes to either 1 or 2, whichever was not displayed before. To reselect the previous number, press Enter again.

When you finish changing the serial port settings, move the cursor block to the * * * SAVE SETTINGS * * * option and press Enter.

Leaving the Setup program

When you finish using the Setup program, press ↑ until the cursor block is on Exit and press Enter. The screen displays a list of the current settings you just made. Check the list to make sure all the information is correct.

Below the list you see this menu:

```
Change settings
Exit without saving
* * EXIT AND SAVE * *
```

If any setting is incorrect, press Enter. The main Setup menu is displayed again, and you can correct the setting.

If you did not make any changes or if you want to cancel the changes you made, press ↓ to select Exit without saving, and press Enter.

When the settings are correct, press ↓ to select * * EXIT AND SAVE * *, and press Enter. At this point, the program resets the computer using the new configuration. If the reference diskette is in drive A, remove it and insert the MS-DOS diskette in the drive.

If the computer displays a Setup error message during the power-on self test, run Setup again and check all your settings.

Note

If you have the hard disk model Equity LT, go on to Chapter 2 and complete all the procedures there to prepare your hard disk for use. If you do not have a hard disk, go on to Chapter 3.

Chapter 2

Preparing a Hard Disk for Use

If you have the hard disk model Equity LT, follow the instructions in this chapter to prepare it before using it for the first time.

WARNING
Do not perform any of these procedures if your hard disk has already been prepared for use or has data stored on it; otherwise, you will erase all the data on the hard disk. These instructions apply only to a new hard disk.

The hard disk inside the Equity LT has a capacity of 20 megabytes-about 20 million characters. This is equivalent to approximately 30 720KB diskettes. Using a hard disk reduces the number of diskettes you need and eliminates much of the disk-swapping you do when you use diskettes. You can do almost all of your work on the hard disk and copy your files to diskettes as needed (to make backups, for example).

Although the hard disk is very reliable, it is essential to back up all your hard disk files on diskettes in case you lose some data accidentally. Use the MS-DOS BACKUP program (described in your MS-DOS manual) to back up your hard disk files.

Even though the hard disk has a lot of storage space, it is best to keep only those files you use regularly on the hard disk. Store your other files on diskettes.

Before you can use the hard disk, you must do the following things to prepare it:

- Use the FDISK program to partition the hard disk to run the MS-DOS operating system.
- Use the SELECT program to format the MS-DOS partition and to copy the MS-DOS utility programs to the hard disk.

Then you can use the COPY command to copy files from the reference diskette to the hard disk.

All of these procedures are described in this chapter.

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.

In the following procedures you will be using the working copies of your MS-DOS system diskette and reference diskette, and entering MS-DOS commands. If you are new to computers and MS-DOS, this may be the first time you have used an operating system. But the steps are simple and you should not have any problems. If you do have any questions, see Chapter 4 for basic information about using MS-DOS or see your MS-DOS manual for complete information on the operating system.

Creating the MS-DOS Partition

You need to partition the hard disk so it can run the MS-DOS operating system. Follow the steps below to create one partition on your hard disk for MS-DOS.

1. Turn on the hard disk (if it is not on already).
2. Insert the working copy of your MS-DOS system diskette in drive A.
3. Turn on the computer (if it is not on already).
4. At the A> prompt, type FDISK and press Enter. The screen displays the FDISK Options menu.
5. Press 1 to select the Create DOS Partition option and press Enter. The screen displays the following prompt:

```
Do you wish to use the entire fixed
disk for DOS (Y/N). . . . . ?[Y]
```

6. Press Y to use the entire hard disk for MS-DOS and press Enter. The screen displays the following message and prompt:

```
System will now restart
Insert DOS diskette in drive A:
Press any key when ready . . .
```

7. Press any key to restart the system (the MS-DOS diskette is already in drive A). Your computer begins reloading MS-DOS. After the preliminary copyright information displays on the screen, the date prompt displays.

8. Press Enter twice to accept the date and time shown.

The system now recognizes the MS-DOS partition and the A > prompt redisplays.

Formatting the MS-DOS Partition

Once you have created the MS-DOS partition, you must format it for MS-DOS. You use the SELECT command, which automatically does the following:

- Formats the MS-DOS partition
- Labels the root directory
- Copies the MS-DOS system files to the hard disk.

After you have done this, MS-DOS boots automatically from the hard disk every time you turn on or reset your computer. (See Chapter 3 for a complete description of the reset function.)

Follow these steps to format the MS-DOS partition:

1. Insert the working copy of your MS-DOS system diskette in drive A (if it is not there already).

2. At the A> prompt, type the following and press Enter:

```
SELECT C: 001 US
```

Note

001 and US are the country code and keyboard code, respectively, for the United States. If you want to substitute other codes, see your MS-DOS manual.

The screen displays this message and prompt:

```
SELECT is used to install DOS the first time. SELECT
erases everything on the specified target and then
installs DOS. Do you want to continue (Y/N)?
```

3. Press Y. Formatting does not begin immediately. The screen displays the following:

```
WARNING, ALL DATA ON NON-REMOVABLE DISK
DRIVE C: WILL BE LOST!
Proceed with Format (Y/N)?
```

4. Press Y to format the DOS partition, erasing any stored files. Then press Enter. MS-DOS begins formatting your hard disk's DOS partition. The screen continuously displays the changing head and cylinder numbers.

   Besides formatting the hard disk partition, MS-DOS also copies the operating system files to the hard disk.

   When the procedure is complete, the screen displays the following:

```
Format complete
System transferred
Volume label (11 characters, ENTER for none)
```

5. It is a good idea to enter a name (label) for the hard disk to protect it from being accidentally formatted later. If you want to name the hard disk, type up to 11 characters and press Enter. If you do not want to name it, just press Enter.

   The screen first displays disk space information and then displays the following message:

```
Reading source files(s). . .
```

When all the files are copied, the A> prompt redisplays. The SELECT procedure is complete.

Note

The SELECT procedure described above copies all the files from your system diskette to the root directory of drive C. You may, however, want to store these files in separate subdirectories so they are easier to find. For information on subdirectories, see Chapter 4 of this manual and your MS-DOS manual.

Copying the Reference Files to the Hard Disk

Follow the instructions below to copy the files on your reference diskette to the hard disk. If you want to store them in a separate subdirectory, see Chapter 4 for instructions.

1. Remove the MS-DOS diskette from drive A and insert the reference diskette in the drive.

2. You should still be logged on to drive A. If not, type A: and press Enter.

3. At the A> prompt, type the following and press Enter:

   ```
   COPY *.* C:
   ```

   MS-DOS copies all the files from the diskette to your hard disk. The file names appear on the screen as they are copied.

4. After copying, remove the reference diskette. Store all your diskettes in a safe place.

Booting From the Hard Disk

Now you can boot your system (load MS-DOS) from drive C, your hard disk. Be sure there is no diskette in drive A; if a system diskette is in the drive, MS-DOS boots from drive A.

Turn off the computer, wait at least five seconds, and then turn it back on. After the computer completes the power-on self test, the screen displays the date prompt. Press Enter twice to accept the date and time shown.

The C> prompt displays, indicating that the system has successfully loaded from your hard disk.

From now on, each time you turn on or reset your computer, it automatically loads MS-DOS from the hard disk. Just make sure drive A is empty.

Drive Assignments

MS-DOS always recognizes the hard disk as drive C. The diskette drive on the right side of the computer is drive A. If you have connected an external diskette drive to your Equity LT, MS-DOS identifies it as drive B, unless you have turned off DIP switch 2 on the back panel to make the external drive A.

Hard Disk Power Switch

The hard disk in your Equity LT has its own power switch. Leave this switch on at all times unless you will be using the computer without the AC adapter; in this case you may want to turn off the hard disk when you are not using it to conserve the battery's charge. If so, see "Turning Off the Hard Disk" in Appendix A.

When you turn off the computer, it automatically turns off the hard disk even though the switch is on.

Chapter 3

Using the Equity LT

This chapter covers some basic procedures for using your Equity LT computer.

Using the AC Adapter

The Equity LT can be powered by either its internal battery pack or the AC adapter. When you connect the AC adapter to the computer and to an electrical outlet, the power to the computer is supplied by the outlet. Use the AC adapter whenever you have access to an electrical outlet to conserve the internal battery's charge. It recharges the battery whenever it is connected to the computer.

You can connect or disconnect the AC adapter while you are using the computer without interrupting any operation. For example, if you are not using the adapter and the low battery light starts flashing (see below), connect the AC adapter as soon as possible to avoid losing data.

When the adapter is connected to both the computer and an electrical outlet, the AC indicator light (on top of the computer, toward the back), is illuminated.

Because the adapter can operate at 100 to 120 and 200 to 240 volts, you can use your Equity LT in other countries (with the appropriate adapter plug).

Use the adapter to recharge the battery as described in the next section.

Using the Battery

The battery pack inside the Equity LT contains eight NiCad (nickel cadmium) batteries that power the computer when the AC adapter is not connected. The battery is rechargeable and you should never have to replace it.

You need to recharge the battery at these times:

- Before you use the computer for the first time
- If the battery has not been used for a long time
- If the low battery indicator light starts flashing (see "LED Indicators" below).

After the low battery light starts to flash, you have a maximum of 15 minutes before the power is completely gone. If you continue using the computer without connecting the adapter, power runs out and you lose data.

To recharge the battery, connect the AC adapter to the computer and to an electrical outlet. You can charge the battery whether the computer is on or off. For the maximum charge, leave it connected for 12 hours. The battery pack cannot be overcharged; so don't worry if you leave it connected for more than 12 hours.

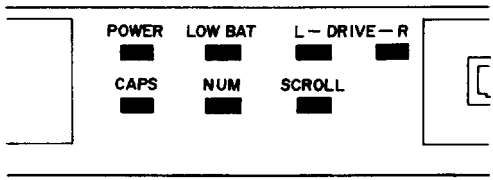
Remember the following when you are charging the battery:

- Use only the AC adapter that comes with the Equity LT. Using a different one can damage the computer.
- It is best to charge the battery for at least five hours at a time. If you charge the battery for only short periods, it tends to run low sooner.

The length of time the battery can provide power after being charged depends on how you are using the computer. A fully-charged battery provides approximately five to seven hours of use for simple operations. If you are using a hard disk, the backlit screen, or an external diskette drive, however, the time is shorter.

LED Indicators

Above the keyboard on the right side are seven LED (light emitting diode) indicators that provide information about the computer's operation.



The POWER LED is on whenever the computer is on. The color of the light indicates the current execution speed. (See "Selecting Execution Speed" below.)

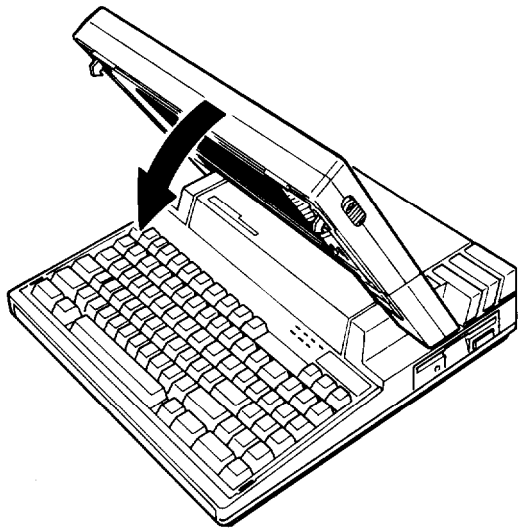
The LOW BAT LED flashes when the battery is low. (See "Using the Battery" above.)

The two DRIVE LEDs, labeled L (left) and R (right), indicate which of the drives is being accessed, if any. If you have a hard disk, the LED labeled L is for the hard disk. When one of these lights is on, the computer is writing to or reading from the disk in that drive. Never turn off the computer or remove a diskette from the drive if the light is on. If you connected an external diskette drive, it should have its own LED.

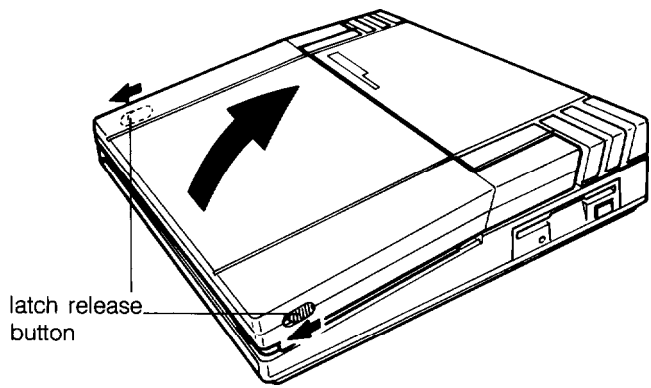
The CAPS, NUM, and SCROLL LEDs indicate whether the Caps Lock, Num Lock, and Scroll Lock key functions are enabled. (See "Special Keys on the Equity LT Keyboard" below.)

Opening and Closing the Screen

When you are not using the computer or you want to move it, turn it off and then close the screen, as shown below, so it locks into the bottom part of the computer.

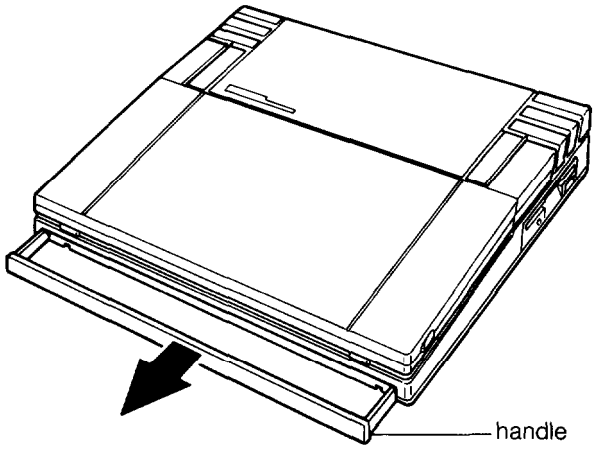


When you want to open the screen, slide the latch release button on either side (shown below) toward you. Then lift the screen back.



Using the Handle

The Equity LT has a convenient carrying handle. To use the handle, pull it out from the bottom of the computer as shown below.

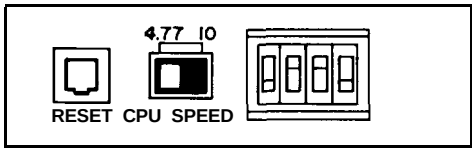


Be sure the screen is closed whenever you carry the computer by its handle.

Selecting Execution Speed

The Equity LT can operate at two execution speeds: 4.77 MHz or 10 MHz. At the higher speed, the computer performs all tasks faster. Leave the speed at 10 MHz unless your application program must be run at the slower speed.

To change the speed, move the CPU SPEED switch above the keyboard.



When the computer is running at 4.77 MHz, the power LED is orange. At 10 MHz, the light is green.

Resetting the Computer

You can reset the computer to reload the operating system or to restart a program. You may also need to reset if an error occurs and the computer does not respond to anything you type. Resetting, however, erases any data in the computer's temporary memory (RAM) that you have not stored; so be careful when you reset your computer.

In MS-DOS, you can hold down Ctrl and press C to stop a program's operation and return to the MS-DOS command prompt. If an error occurs, try this method before you reset the computer.

WARNING
Do not reset the computer to exit a program unless you have to. Some application programs classify and store new data whenever you exit the program properly. If you reset the computer while such a program is running, you may lose data.

There are three ways to reset. Because each is more powerful than the last, try them in the order listed here:

1. If you are using MS-DOS, hold down Ctrl and Alt and press the Del key on the numeric keypad at the right of the keyboard. The screen goes blank for a moment and then MS-DOS reloads. (MS-DOS must either be on the diskette in drive A or on the hard disk.) If this does not correct the problem, try the second method.

2. Use a pencil or a similar type of thin pointed object to press the RESET button above the keyboard. This method works even when the keyboard does not respond to your commands. If this does not correct the problem, try the third method.

3. Turn off any peripheral devices and then turn off the Equity LT. Wait five seconds and then switch the power back on.

Caring for the Backlit Screen

If you have the backlit model of the LCD screen, you need to be aware of a few things.

The electroluminescent element in the screen that provides the backlighting draws more power from the battery than the standard screen. Eventually, the screen loses some of its brightness and may need to be replaced.

To preserve the life of the screen as well as the computer's battery, the computer turns the backlighting off automatically if you have not touched the keyboard for a certain length of time. The default time is two minutes. When you ran the Setup program in Chapter 1, you may have changed this backlight period. (For instructions see "Changing the backlight period" in Chapter 1.)

The computer also turns the screen off if you connect a color monitor to the computer or turn off DIP switch 4 above the keyboard.

Another way to extend the life of the screen is to keep it only as bright as you need to see the screen clearly. Use the brightness switch on the right side of the screen to adjust the brightness.

If you notice the screen losing its brightness, you may need to replace the element inside the screen. Contact your dealer for a new element and then follow the instructions in Appendix A to install it. If you do not want to replace it yourself, ask your dealer to do it for you.

Special Keys on the Equity LT Keyboard

Certain keys on your keyboard serve special functions when your computer is running application programs. Table 3-1 describes the special keys.

Table 3-1. Special keys

Key	Purpose
⇤ ⇥	Moves the cursor one tab to the right in normal mode and one tab to the left in Shift mode.
Caps Lock	Changes the letter keys from lower- to uppercase; changes back to lowercase when pressed again. The numeric/symbol keys on the top row of the keyboard are not affected.
Shift	Produces uppercase characters or the top symbols on the keys when used with the main character keys. Produces lowercase characters when Caps Lock is on.
Ctrl	Works with other keys to perform special (control) functions, such as editing operations in MS-DOS and GW-BASIC.
Alt	Works with other keys to enter alternate character codes.
←	Moves the cursor back one space, deleting the character to the left.
Enter	Ends a line of keyboard input or executes a command.
Ins	Turns the insert function on and off.
Del	Deletes the character at the cursor.
Home, End, PgUp, PgDn, ↑ ← ↓ →	Within application programs, control cursor location.
Num Lock	Changes the function of the cursor/numeric keys from cursor positioning to numeric. For example, when the Num Lock function is on and you press the 1 key, you get the number 2. Press Num Lock again to change back to normal cursor functions.
Esc	Depending on the application program, may cancel the current command line or operation.
F1 - F10	Perform special functions within application programs.
Prtsc	Prints on a printer the text currently displayed on the screen.
Sys Req	Generates the System Request function.
Scroll Lock	In some applications, controls scrolling.
Break	In some applications, terminates the current operation.

The Num Lock, Caps Lock, and Scroll Lock keys work as toggles; press them once to turn on the function and again to turn it off. When the function is enabled, the corresponding LED above the keyboard is on; when the function is disabled, the light is off.

The Equity LT Character Set

The Equity LT uses an extended character set that assigns graphics and international characters to some ASCII codes. In some cases, if you try to print these characters on a standard printer, you get italic characters instead. Most Epson printers support this character set used by IBM and compatible computers (the character set the Equity LT uses) as a standard feature, and you can adapt others. Also, some application programs can print the special graphic characters on a standard printer when you use a special printer driver program. Ask your Epson dealer for more information.

Using Disks and Disk Drives

The disk drives in your computer allow you to store data on disk, and to retrieve and use stored data. All Equity LT systems have at least one 720KB diskette drive; you also have either a second diskette drive or a hard disk drive in your system. This section explains how disks work and tells you how to do the following:

- Choose diskettes
- Care for your disks and disk drives
- Insert and remove diskettes
- Make backup copies
- Write-protect your diskettes
- Use a single diskette drive.

It also explains how the diskette drives are assigned in the different system configurations.

How disks work

The diskettes you insert in your computer's diskette drives are round pieces of flexible plastic coated with magnetic material and enclosed in protective plastic cases. Like a record, a diskette has circular tracks on both sides. The computer

stores the data you enter as magnetic patterns on these circular tracks.

A small read/write head in the disk drive interprets the magnetic patterns. When a diskette is in a drive, the metal plate above the access area moves aside to expose the diskette surface to the read/write head. The read/write head accesses this part of the diskette when you store, retrieve, and delete data.

Unlike a diskette, a hard disk is rigid and fixed in place. It is sealed in a protective environment free of dust and dirt; so you cannot see it. A hard disk stores data the same way as a diskette, only it works faster and has a much larger storage capacity.

Because data is stored magnetically, you can retrieve it, record over it, and erase it-just as you play, record, and erase music on cassette tapes.

Choosing diskettes for the Equity LT

Be sure to buy high-quality diskettes to use in your Equity LT. Choose 3 $\frac{1}{2}$ -inch diskettes that are 720KB (kilobytes), soft-sectored, double-sided, 135 TPI (tracks per inch). Each diskette can hold 720KB of data, or about 300 pages of text. (One kilobyte equals 1024 bytes.)

If you have an external 5 $\frac{1}{4}$ -inch diskette drive, use 5 $\frac{1}{4}$ -inch, 360KB, double-sided, double-density, soft-sectored, 48 TPI diskettes in this drive. These diskettes can hold 360KB of data, the equivalent of about 150 pages of text. They are compatible with those the IBM PC uses, so you can use diskettes prepared by one computer on the other.

Because of their size difference, you cannot use a 3 $\frac{1}{2}$ -inch diskette in a 5 $\frac{1}{4}$ -inch drive or vice versa. However, if you have both types of drives, (720KB and 360KB), you can copy individual files from one drive to the other with the COPY command. See Chapter 4 in this manual or your MS-DOS manual for instructions on the COPY command.

You need to format new diskettes before you can use them with an operating system. Formatting erases all the data on a diskette and prepares it to receive new data, so be sure to format only new blank diskettes or diskettes that contain data you want to erase. See Chapter 4 or your MS-DOS manual for instructions on how to format diskettes.

Caring for disks and disk drives

To avoid damaging your diskettes and hard disk, you need to care for them properly. Take these precautions to avoid losing data:

- Do not remove a diskette, turn off the computer, or turn off an external diskette drive while the drive light is on. This light indicates that the computer is copying data to or from a disk. If you interrupt this process, you can destroy data.
- Remove all diskettes before you turn off the computer.
- Keep disks away from dust and dirt. Small particles of dust or dirt can scratch the magnetic surface and destroy data. Dust can also ruin the read/write heads in a disk drive.
- Keep disks away from magnetic fields. (Remember that disks store data magnetically.) There are many sources of magnetism in your home or office, such as electrical appliances, telephones, and loudspeakers.
- Keep disks in a moderate environment. They work best at room temperature and in normal humidity. Never leave diskettes sitting in the sun, or in extreme cold or heat. The temperature in a car in the middle of summer or winter can cause severe damage.
- Do not expose the diskette's surface by sliding the metal plate and never touch a diskette's magnetic surface. The oils on your fingertips can damage it.
- Do not place anything on top of your diskettes and make sure they do not get bent.

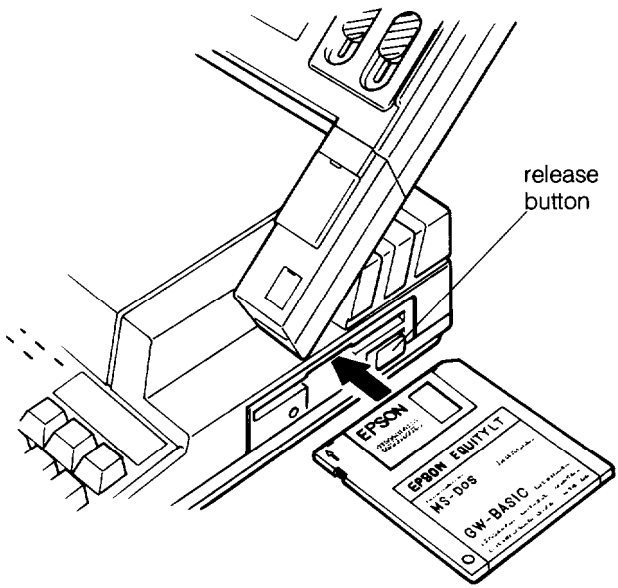
- Never wipe, brush, or try to clean diskettes in any way.
- Store diskettes properly in their plastic cases.

If your computer has a hard disk, take these additional precautions:

- Never turn off the power to the computer or the hard disk when the hard disk drive light is on. This light indicates that the computer is currently copying data to or from the hard disk. If you interrupt this process, you can lose data.
- Never attempt to open the hard disk unit. The disk itself is enclosed in an air-tight container to protect it from dust.
- Do not turn off the hard disk drive unless you are not using the AC adapter and you want to conserve the computer battery's charge. See "Turning Off the Hard Disk" in Appendix A.

Inserting and removing diskettes

To insert a diskette into a disk drive, hold it with the label facing up and the arrow on the left side pointing into the computer as shown below.



Slide the diskette into the drive until it clicks into place.

To remove a diskette, press the release button to release the diskette. When it pops out of the drive, pull out the diskette and store it properly, such as in a special diskette container.

WARNING
Never remove a diskette or turn off the computer while the drive indicator light is on. You could lose data. Also be sure to remove all diskettes before you turn off the computer.

Making backup copies

Make copies of all your data and system diskettes. Copy all diskettes that contain programs, as you did the master system diskettes that come with the Equity LT, and use only the copies. Store your original system diskettes in a safe place away from your working diskettes. Copy your data diskettes regularly (preferably every day) to keep them up-to-date, and store them away from your originals.

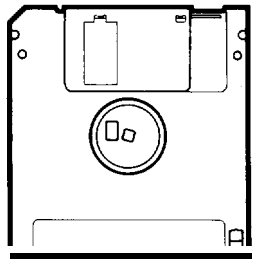
Chapter 1 describes how to make a backup copy of your MS-DOS and reference diskettes. For general instructions on copying diskettes, see Chapter 4.

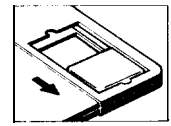
If you have a hard disk, keep backup copies of all your program files on diskettes and regularly copy important data files to diskettes as well. You can use the MS-DOS BACKUP command to copy all or part of the files on the hard disk. For more information, see your MS-DOS manual.

Write-protecting diskettes

You can write-protect a diskette to prevent its data from being altered. When a diskette is write-protected, you can copy data from it, but you cannot store new data on the diskette or delete any files it contains. If you try to change data stored on a write-protected diskette, an error message displays.

The write-protect device is a small switch on the lower-right corner on the back, shown in the figure below. To write-protect the diskette, slide the switch down toward the edge of the diskette so there is a hole where the switch used to be.





write-protect switch

To remove the write-protection, move the switch up toward the center of the diskette so the hole is covered.

Using a single diskette drive

An operating system expects the computer to have at least two physical diskette drives, and it displays prompts and messages accordingly. If your system has only one diskette drive, MS-DOS treats the single drive as two logical drives. This helps you perform operations that normally require two diskette drives.

For example, if you give a command to copy from one drive to another, MS-DOS copies from the first diskette you place in the drive to the computer's memory. Then MS-DOS prompts you to insert another diskette and copies from memory to the diskette you place in the drive. When copying is complete, you see a prompt to insert the original diskette.

You may swap diskettes this way often, and you don't want to forget which diskette is which. One way to avoid accidentally losing data is to hold the diskette for one drive in your left hand and the diskette for the other in your right. You should also write-protect your source diskette so you don't accidentally copy on to it. For more information on using one diskette drive with MS-DOS, see Chapter 4.

Turning Off the Computer

Before you turn off your computer, save your data, exit the program you are using, and then remove all diskettes from the disk drives. Turn off any peripherals (such as a printer, a monitor, or an external diskette drive), and then turn off the computer. If you have the hard disk system, do not turn off the hard disk.

Chapter 4

Using MS-DOS With the Equity LT

Your Equity LT comes with version 3.2 of MS-DOS, the disk operating system by Microsoft? In this chapter, you'll learn some of the basic procedures for using MS-DOS with your computer.

MS-DOS manages the routine work of your system, such as keeping the computer's memory organized, controlling screen displays, accepting keyboard input, and directing external communication. Your software cannot communicate with the computer's hardware without instructions from the operating system. The operating system controls system input and output and the operation of all disk drives.

Before you can use an MS-DOS application program, MS-DOS must be running in your computer's memory. This means that you must first load MS-DOS so that the operating system can accept your instructions and make the right connections.

To communicate with the operating system, you need to enter MS-DOS commands. How much you need to know about the MS-DOS commands depends on how you plan to use your Equity LT. If you plan to use it only for running application programs, you'll use very few MS-DOS commands. If you plan to use advanced features or create your own programs, you'll want to know as much as possible about MS-DOS.

If you plan to use your computer primarily for running application programs, you'll find that this chapter introduces you to the MS-DOS features you'll use the most. For more in-depth information about MS-DOS, see your MS-DOS manual.

The basic procedures you must know include how to do the following:

- Start and exit MS-DOS

- Enter an MS-DOS command
- Store data
- Change the default drive
- Format a diskette for storing data
- Copy an entire diskette or selected files
- List the contents of a diskette
- Create and use subdirectories
- Start an application program.

Starting and Exiting MS-DOS

Remember, before you can run an MS-DOS application program, MS-DOS itself must be running in memory. Follow these steps to load MS-DOS:

1. Turn on any peripherals, such as the printer or an external diskette drive.
2. If your system has a hard disk, be sure its power switch is turned on.
3. If your system does not have a hard disk, insert the working copy of your MS-DOS system diskette into drive A, on the right side of the computer.
4. Turn on your computer.

Note
If your system has a hard disk that is set to boot MS-DOS automatically, be sure that no diskette is in drive A. MS-DOS loads automatically from the hard disk when you turn on the computer. See Chapter 2 for more information on the hard disk.

---

5. Press Enter twice to accept the date and time shown.

Now you see the MS-DOS command prompt, which tells you that MS-DOS is loaded and indicates the current drive followed by a greater-than symbol:

A >

If MS-DOS loads from the hard disk, the screen displays:

c >

This prompt tells you that you can now enter commands to instruct MS-DOS to perform tasks and run application programs.

Before you turn off the computer, be sure you are at the A > or C> prompt. Then it is safe to remove your diskettes, turn off any peripherals, and then turn off the computer.

Entering MS-DOS Commands

You can enter an MS-DOS command whenever you see the MS-DOS command prompt. This means that you type the command name and any necessary parameters, and then press Enter to execute the command. Parameters include items that identify the data to be processed and switches that alter the effects of a command.

You can enter command names and parameters in either uppercase or lowercase letters. You must, however, separate command names and parameters with delimiters; most commands require spaces or commas as delimiters.

If you make a mistake when typing a command and you notice it before pressing Enter, you can do one of two things:

- Use the backspace key to back up and correct the error
- Press Esc to cancel the command line.

If you press Enter when a command line has an error in it, you see this message:

Bad command or file name

Then MS-DOS re-displays the command prompt so you can try again. Just type the correct command line and press Enter.

Storing Data

All your work and programs are stored in files on your diskettes or hard disk. Each file must have a unique filename so you can retrieve it when you need to. The filename consists of two parts: the name and the extension.

You can choose a name up to eight characters long indicating what the file contains. The name can contain any characters or numbers except for the following:

" \ / { } : | < > + = ; , . ? *

The extension is optional and can be up to three characters long. It describes what type of file it is, such as a text file or program file. When you use an extension, separate it from the file name with a period. For example, an MS-DOS filename might look like this:

D A T A . T X T

Sometimes you have to further identify your files by telling MS-DOS on which drive the file is stored. To do this, you type the letter-A, B, or C-of the disk drive where the file is located, followed by a colon, and then the filename. For example:

B : D A T A . T X T

You can type the drive identifier and filename in upper- or lowercase letters. MS-DOS does not differentiate between the two, but converts everything to uppercase letters.

MS-DOS stores your files in directories. A directory contains specific information about each file stored there, such

as its name, size, location, and the date and time you last updated the file.

If you do not create any other directories on your diskette, you will always be working in the root directory. This is often the case when using a diskette rather than a hard disk. The root directory is the main directory on a disk and is identified by a backslash (\). The directory you are working in is called the current directory. When you first load MS-DOS the root directory is the current directory.

If you want to access a file or program stored in a subdirectory, you need to log on to that drive or identify it when entering the command. For more information, see "Creating and Using Subdirectories" later in this chapter or see your MS-DOS manual.

Changing the Default Drive

When you see the A> prompt, you know that MS-DOS is operating from drive A and you can now enter a command.

If, however, you want to run a program or find a file on a different drive, you must specify that drive. You can do this by including the drive letter with the filename or by logging onto that drive. To log onto drive B, follow these steps:

1. At the A > prompt, type:

   B:

   Be sure to type the colon.

2. Press Enter.

Your screen now displays the B> prompt. This means that MS-DOS is now using drive B. The system continues to read from drive B, which is now the default drive, until you log back onto drive A.

Formatting Diskettes

Before you can store data on a new diskette, the diskette must be formatted. Formatting prepares the diskette so MS-DOS can write to it. You need to do this only once, before you use the diskette for the first time.

You can also reformat previously used diskettes. Reformatting, however, erases all data on that diskette. Always be sure that you do not want to save any of the data on a used diskette before you format it.

The formatting procedure you use depends on the configuration of your system:

- Two diskette drives
- One diskette drive (and one hard disk).

Follow the instructions below for your system.

Formatting with two diskette drives

Follow this procedure to format a diskette in drive B. The drive can be either the internal drive on the left side of the computer or an external 5 $\frac{1}{4}$ -inch diskette drive.

1. Insert your working copy of the MS-DOS system diskette in drive A (and press any key if necessary).

2. When you see the A> prompt, type:

   FORMAT B:

   and press Enter. You see this prompt:

   Insert new diskette for drive B:
   and strike ENTER when ready

3. Insert the diskette you want to format into drive B, and press Enter to start formatting. MS-DOS displays the head and cylinder numbers as it formats each cylinder of the diskette.

4. When the diskette is completely formatted, you see messages such as these (for a 720KB diskette):

```
Format complete
  730112 bytes total disk space
  730112 bytes available on disk
Format another (Y/N)?
```

At this point, you can either press Y and Enter to format another diskette, or press N and Enter to return to the MS-DOS system prompt.

Formatting with one diskette drive

1. Insert your working copy of the MS-DOS system diskette in drive A (and press any key if necessary) or log on to drive C (the hard disk) by typing C:.

2. When you see the A> or C> prompt, type:

```
FORMAT A:
```

and press Enter. You see this prompt:

```
Insert new diskette for drive A:
and strike ENTER when ready
```

3. If the MS-DOS diskette is in drive A, remove it. Then insert the diskette you want to format in drive A, and press Enter to start formatting. MS-DOS displays the head and cylinder numbers as it formats each cylinder of the diskette.

4. When the diskette is completely formatted, you see these messages:

```
Format complete
  730112 bytes total disk space
  730112 bytes available on disk
Format another (Y/N)?
```

At this point, you can either format another diskette by pressing Y and Enter, or return to the MS-DOS system prompt by pressing N and Enter.

Copying Data

It's very important to have backup copies of the files you create on your diskettes or hard disk. You can copy data and program files several ways: you can back up an entire diskette using the DISKCOPY command, or you can back up individual files using the COPY command. Epson also provides a disk utility program called DU that you can use to copy diskettes; this utility is described in your MS-DOS manual.

Using the DISKCOPY command

The three procedures below explain how to copy the entire contents of one diskette to another. Follow the procedure for your system configuration:

- Two 3 $\frac{1}{2}$ -inch diskette drives (copying from A to B)
- One 3 $\frac{1}{2}$ -inch diskette drive (copying from A to A)
- One 5 $\frac{1}{4}$ -inch diskette drive.

Note

You cannot use DISKCOPY to copy from a 3 $\frac{1}{2}$ -inch drive to a 5 $\frac{1}{4}$ -inch drive or vice versa. You must use the COPY command (described below) to copy individual files. And you cannot use the DISKCOPY command to back up files on the hard disk. Use either the COPY command or the BACKUP command, which is described in your MS-DOS manual.

Copying with two 3 $\frac{1}{2}$ -inch diskette drives

1. First be sure your original diskette is write-protected. (See Chapter 3 for instructions.)
2. Insert the working copy of your MS-DOS system diskette in drive A.
3. At the A> prompt, type:

   DISKCOPY A: B:

and press Enter. MS-DOS prompts you to insert your diskettes:

```
Insert SOURCE diskette in drive A:
Insert TARGET diskette in drive B:
Press any key when ready . .
```

4. Insert the diskette you want to copy from in drive A and the diskette you want to copy to in drive B. Then press any key.

   DISKCOPY checks to see if the target diskette is formatted. If it is not, DISKCOPY formats the diskette. You see the message:

   ```
   Formatting while copying
   ```

   The copy operation begins when the format is complete. You see this message:

   ```
   Copying 80 tracks
   9 Sectors/Track, 2 Side(s)
   ```

5. When the copy is complete, you see this message:

   ```
   Copy another diskette (Y/N)?
   ```

   Your diskette has now been copied and you can either make another copy or leave the DISKCOPY command. Press Y to perform another copy or N to end the DISKCOPY command.

Copying with one 3 $\frac{1}{2}$ -inch diskette drive

1. First be sure your original diskette is write-protected. (See Chapter 3 for instructions.)

2. Insert the working copy of your MS-DOS system diskette in drive A or type C: to log on to drive C, the hard disk.

3. At the A> or C> prompt, type:

   ```
   DISKCOPY
   ```

   and press Enter.

MS-DOS displays these messages:

```
Insert SOURCE diskette in drive A:
Press any key when ready . . .
```

4. If the MS-DOS diskette is in drive A, remove it. Then insert the diskette you want to copy from in the drive and press any key.

   DISKCOPY copies the contents of the diskette to the computer's memory. The screen displays these messages while copying:

   ```
   Copying 80 tracks
   9 Sectors/Track, 2 Side(s)
   ```

   When all the files have been copied or the memory is full, the screen displays these messages:

   ```
   Insert TARGET diskette in drive A:
   Press any key when ready . . .
   ```

5. Remove the diskette from drive A and insert the blank diskette in the drive.

   DISKCOPY checks to see if the new diskette is formatted. If it is not, DISKCOPY formats the diskette. You see the message:

   ```
   Formatting while copying
   ```

   The copy operation begins when the format is complete. You see these messages:

   ```
   Copying 80 tracks
   9 Sectors/Track, 2 Side(s)
   ```

   If the source diskette contains more data than can be stored in the computer's memory (which is 640KB), the screen prompts you to insert the source diskette again to copy the remaining data to memory. Then it prompts you to insert the target diskette again to copy the remaining data from memory to the diskette. Follow the instructions on the screen.

6. When the copy is completed, you see this message:

   Copy another diskette (Y/N)?

   Your diskette has now been copied and you can either make another copy or leave the DISKCOPY command. Press Y to perform another copy or N to end the DISKCOPY command.

Copying with one 5 $\frac{1}{4}$ -inch diskette drive

Follow the steps below to make a copy of a 360KB diskette in an external 5 $\frac{1}{4}$ -inch diskette drive. These instructions assume the external drive is assigned as drive B. If you turned off DIP switch 2 on the back panel to make the external drive A, substitute A for B in the instructions.

1. First be sure your original diskette is write-protected. (There should be a write-protect tab over the write-protect notch.)

2. Insert the working copy of your MS-DOS system diskette in drive A (or type C: to log on to drive C if you have a hard disk).

3. At the A> or C> prompt, type:

   DISKCOPY B: B:

   and press Enter. MS-DOS displays these messages:

   Insert SOURCE diskette in drive B:
   Press any key when ready . . .

4. Insert the diskette you want to copy from in the external diskette drive (B) and press Enter.

   DISKCOPY copies the contents of the diskette to the computer's memory. Then the screen displays these messages:

   Insert TARGET diskette in drive B:
   Press any key when ready . . .

5. Remove the diskette from drive B and insert the blank diskette in the drive.

   DISKCOPY checks to see if the new diskette is formatted. If it is not, DISKCOPY formats the diskette. You see the message:

   ```
   Formatting while copying
   ```

   The copy operation begins when the format is complete. You see these messages:

   ```
   Copying 40 tracks
   9 Sectors/Track, 2 Side(s)
   ```

6. When the copy is complete, the screen displays this message:

   ```
   Copy another diskette (Y/N)?
   ```

   Your diskette has now been copied and you can either make another copy or leave the DISKCOPY command. Press Y to perform another copy or N to end the DISKCOPY command.

Using the COPY command

You can use the COPY command to copy files in several ways. You can do the following:

- Copy individual files from one diskette to another or to the same diskette
- Copy a group of files using wildcard characters
- Copy one or more files and give them new names.

A few simple rules apply when copying files:

- You must tell MS-DOS where to find the source file and where to store the target file.
- You cannot create a new file with the same name as an existing file.

- If an existing file on the target diskette has the same name as the file you are copying from the source diskette, the copy replaces the file on the target diskette. Because there is no warning that the file on the target diskette is being replaced, be very careful that you do not accidentally erase a file you want to keep.
- The target diskette cannot be an unformatted diskette.

To use the COPY command, type COPY, the drive identifiers, and the necessary filenames, and then press Enter. In the following examples, you substitute your own filenames for the items in italics.

Suppose you want to copy a particular file from the diskette in drive A to the diskette in drive B using the same name. Type:

COPY A: file1.ext B:

If you want to copy a file from the diskette in drive A to the diskette in drive B using a new name, type:

COPY A:file1.ext B:file2.ext

To copy a file onto the same diskette with a new name, type:

COPY file1 file2

In this case, you do not need the drive identifiers.

An easy way to copy a group of files is by using a ***wildcard*** character in the filenames. You can use two wildcard characters: * and ?. The asterisk represents any group of characters and the question mark represents any single character. To copy all the files on the diskette in drive A to the diskette in drive B, type:

COPY A:*.* B:

To copy to drive B all the files on drive A that begin with the same four letters but are followed by a single letter that varies, type:

COPY A:file? B:

Listing the Contents of a Diskette

You will often want to see which files are stored on your diskettes or hard disk. For example, before you format a used diskette and erase its contents, always check the contents of the diskette to be sure you will not erase any valuable files.

The DIR command lists the names of all files in the selected directory on a diskette or hard disk. At the MS-DOS prompt (A>, B>, or C>), type:

DIR

and press Enter. MS-DOS lists the names of the files in the current directory on the current drive.

If you are logged on to drive A but want to see a directory of the files on the diskette in drive B, type:

DIR B:

and press Enter.

The DIR command lists the names of the files, and also lists any subdirectories, the sizes of the files in bytes, and the date and time each file was last modified. At the end of the directory listing is the number of files and available bytes on your diskette.

Creating and Using Subdirectories

Because a diskette or hard disk can store many files, you need a way of organizing them. Trying to find a particular file in a directory list of dozens or hundreds is difficult.

The simple solution to this problem is to divide a directory into subdirectories. There are four basic operations you need to know to create and use subdirectories:

- Creating subdirectories
- Changing subdirectories
- Using pathnames

- Copying from one subdirectory to another.

Each subdirectory has a name, and any file in any subdirectory can be identified and accessed using a pathname. The root directory is always designated by a backslash (\). The name of the subdirectory can have up to eight characters, using letters or numbers or both, but not punctuation marks.

To see how all four basic subdirectory operations work, follow the instructions below. These examples use a few MS-DOS commands that you may not know. You can do the examples without knowing anything about the commands, but if you need more information, see your MS-DOS manual.

Creating subdirectories

Starting at the A> prompt (for the dual diskette model) or the C> prompt (for the hard disk model), first type CD\ and press Enter to make sure that you are in the root directory. Then type the following and press Enter:

```
MD \LETTERS
```

MD stands for Make Directory (you can also type MKDIR), the backslash ensures that the new directory is a subdirectory of the root directory, and LETTERS is the name of the new subdirectory.

Next type the following and press Enter:

```
MD \MEMOS
```

This command creates another subdirectory called MEMOS. Now you have two subdirectories (LETTERS and MEMOS) in your root directory.

Next, create a sample file in each of these subdirectories for the purpose of this example. Type the following and press Enter at the end of each line:

```
COPY CON: \LETTERS\LETTER1
This is the first letter.
```

Press F6. Then type the following and press Enter at the end of each line:

```
COPY CON: \ MEMOS \ MEMO1
This is the first memo.
```

Press F6.

Now you have one file in each of the subdirectories. (The COPY command with CON: copies what you enter from the keyboard to a file.)

To display the names of these new subdirectories in the root directory, type DIR and press Enter. In the list of files in the root directory, you should see the following:

```
LETTERS        <DIR>
MEMOS          <DIR>
```

The <DIR> after a name identifies this as a subdirectory of the current directory.

If you want to access either of the new files you created, you must first do one of the following:

- Change directories
- Specify the pathname.

Changing directories

To change directories, merely type CD followed by a backslash and the name of the subdirectory. For example, to change to the LETTERS subdirectory, type the following and press Enter:

```
CD \ LETTERS
```

CD is for Change Directory (you can also type CHDIR), the backslash (for root directory) specifies that the new directory is a subdirectory of the root directory, and LETTERS is the name of the new directory.

Type DIR and press Enter to show that you are now in the LETTERS subdirectory. You should see the following:

```
<DIR>
<DIR>
LETTER1
```

Now you can use the LETTER1 file. For example, to display the contents of the file on the screen, type the following and press Enter:

```
TYPE LETTER1
```

You should see the following:

```
This is the first letter.
```

Now type CD\ and press Enter to return to the root directory.

Using pathnames

You can also use the LETTER1 file without leaving the root directory. All you have to do is specify the pathname along with the filename. For example, type the following and press Enter:

```
TYPE \ LETTERS \ LETTER1
```

The pathname \ LETTERS \ LETTER1 is the full pathname for the file LETTER1. You can use it no matter what directory you are in (as long as it is on the same disk). The first backslash (for root directory) signifies that the path to the file starts in the root directory, and LETTERS is the name of the subdirectory.

In a pathname, the filename is always last and is always preceded by a backslash. A backslash at the beginning of a pathname signifies the root directory, but subsequent backslashes merely separate directory levels.

Putting files in separate subdirectories is almost the same as putting them on separate disks. You have to specify the pathname or change directories to access files in different

subdirectories just as you have to specify the drive or log onto a different drive to access files on different disks.

Copying from one subdirectory to another

You can also copy files from one subdirectory to another with the COPY command. Simply specify the pathname for the file you want to copy and for the subdirectory to which you want the copy to go. For example, to copy LETTER1 from the LETTERS subdirectory to the MEMOS subdirectory, type the following and press Enter:

```
COPY \ LETTERS 1 LETTER1  \ MEMOS
```

Your word processing or other application program may have other methods of creating and changing directories, but the descriptions of commands and pathnames above should help you organize your files in any application program.

If you want to make extensive use of subdirectories, see the following subjects in your MS-DOS manual: XTREE, PATH, and AUTOEXEC.BAT files.

Starting an Application Program

After you have loaded MS-DOS, you can start using an application program. Remove your MS-DOS diskette from drive A and insert your application program diskette. From this point on, the documentation that comes with your application program will give you instructions on how to use it.

Once you start using your application program, the MS-DOS command prompt disappears. Instead, you see the prompts and screens that are unique to the application program. When you finish using and exit the application program, the MS-DOS command prompt reappears. Be sure to exit the application program properly to return to this command prompt before you turn off your computer.

MS-DOS Commands and the Equity LT

Your MS-DOS manual describes all the commands on the MS-DOS diskette that you can use on the Equity LT. Three commands described in the manual are not on your MS-DOS diskette: HELP, ROMBIOS, and SYSTAT. These files are on your reference diskette. If you want to use them, be sure to insert the reference diskette in the drive or log on to the directory on your hard disk where they are stored.

If you want these files to be on your MS-DOS diskette or in a particular directory, use the COPY command to copy them.

Additionally, you may find that a particular MS-DOS command does not work on your Equity LT; this is because of the computer's hardware. For example, you cannot use some parts of the MODE command because they have to do with a monochrome monitor.

Using the backlit screen with memory resident programs

If you use memory resident programs such as the popular desk top accessories or the MS-DOS KEYBxx commands, you may find that you cannot turn on the screen's backlighting once it has automatically turned itself off. If this happens, save any data files you are working on and reset your computer.

You can prevent this problem from occurring by using the Epson LIGHTON utility (on your Reference diskette). First load your memory resident program and then enter the LIGHTON command (type LIGHTON and press Enter); this order is very important. Another solution is to select no time limit for the backlight period in the Setup program. (See Chapter 1 for instructions.)

If you use memory resident programs that interfere with the backlit screen's operation, it is best to install them with a batch file that also includes LIGHTON as the last command.

Appendix A

Options and Maintenance

This appendix describes how to connect a color monitor to the computer and how to replace the backlit screen element. It also explains how to turn off the hard disk if you are running the computer on its battery.

Connecting a Color Monitor

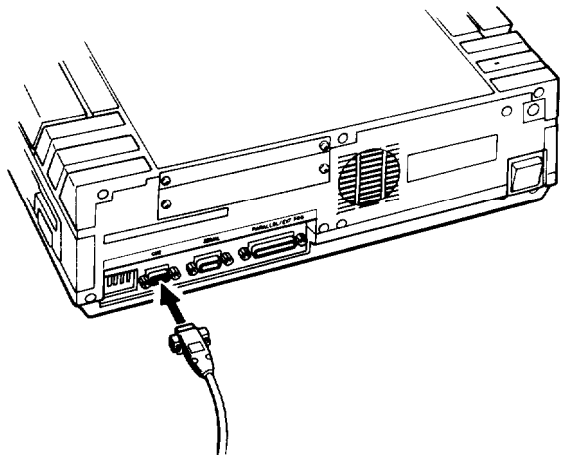
If you bought a color monitor to use with your Equity LT, follow the instructions below to connect it to the computer.

1. Be sure both the computer and monitor (as well as any other peripherals) are turned off.

2. Place your monitor near the Equity LT main unit. It is easiest to connect the monitor cable if the backs of the monitor and computer face you.

3. If necessary, connect the monitor cable to the monitor. (Some monitors come with permanently attached cables.)

4. Connect the appropriate end of the monitor cable to the CRT connector at the back of the computer, as shown below.



If the plug has retaining screws, tighten them with a screwdriver.

5. If necessary, plug the monitor's power cable first into the power inlet on the monitor. (Some monitors come with permanently attached power cables.) Then plug the power cable into an electrical outlet.

6. Turn off DIP switch 4 above the keyboard to let the computer know you will be using a monitor instead of the LCD screen. (See "Setting the DIP Switches" in Chapter 1.)

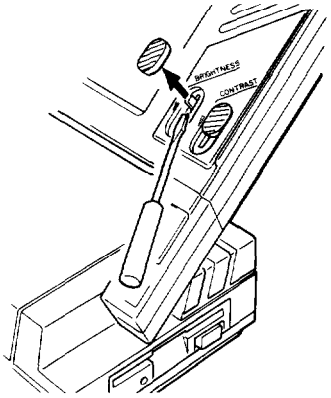
When you are ready to use the computer, turn on the monitor and any other peripherals, and then turn on the computer. Text will be displayed on the monitor screen instead of the computer screen.

Replacing the Backlit Screen Element

If you need to replace the electroluminescent element in the backlit screen, follow the instructions below. The procedure has many steps, but they are not difficult. Still, you must be very careful not to damage any components on or inside the screen. If you have any reservations about doing this yourself, ask your dealer to install it for you.

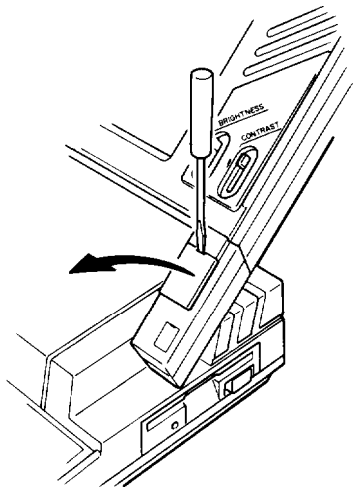
1. Turn off all peripherals and the computer before you begin.

2. Use a flat blade screwdriver to remove the plastic tops of the brightness and contrast switches.

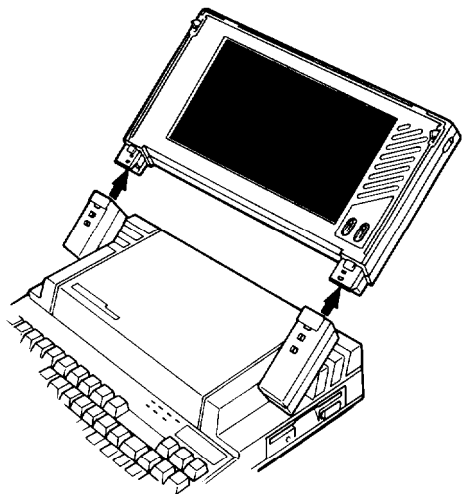


Set the switch tops aside in a safe place.

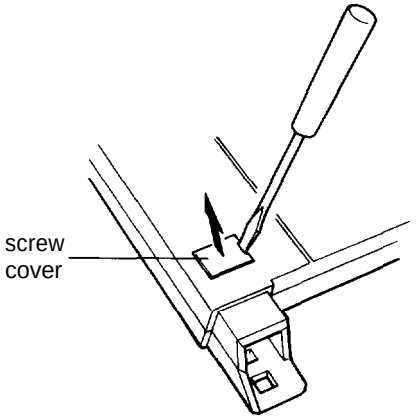
3. Use the screwdriver to remove the plastic cover on each of the arms that hold the screen, as shown below.



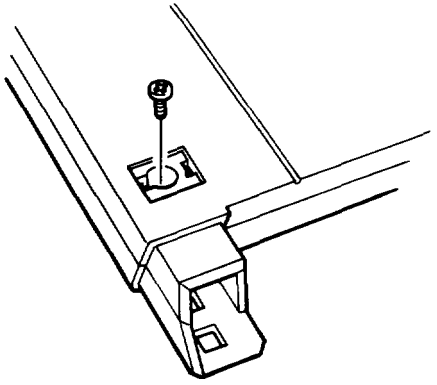
4. When the covers on both arms are off, pull the screen straight up, out of the arms.



5. Turn the screen over and lay it on a flat surface (such as a table) so you are looking at the back. Locate the small plastic screw cover on each side of the screen, near the bottom. As shown below, use a small screwdriver to lift out each of the covers.

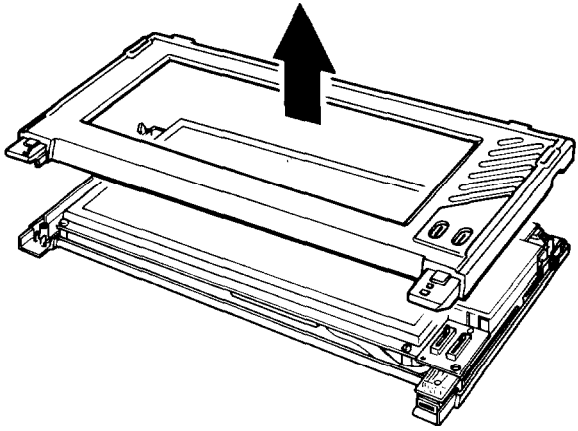


6. Use a Phillips screwdriver to remove both screws and set them aside.

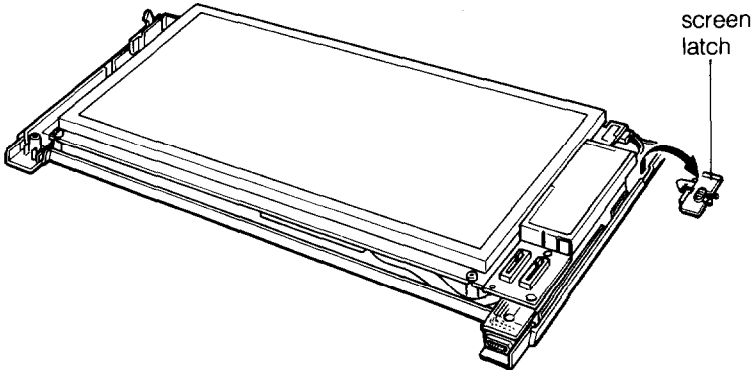


7. Holding the screen carefully to keep it together, turn it over so it is face up and lay it flat on the table.

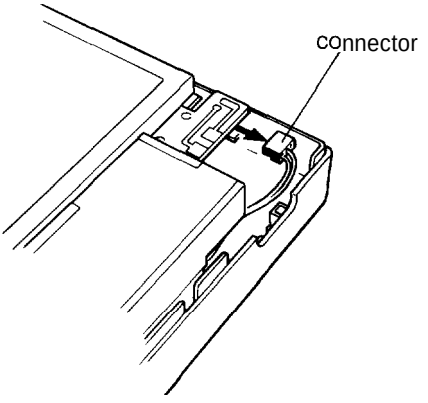
8. Carefully lift off the front cover of the screen as shown below and set it aside.



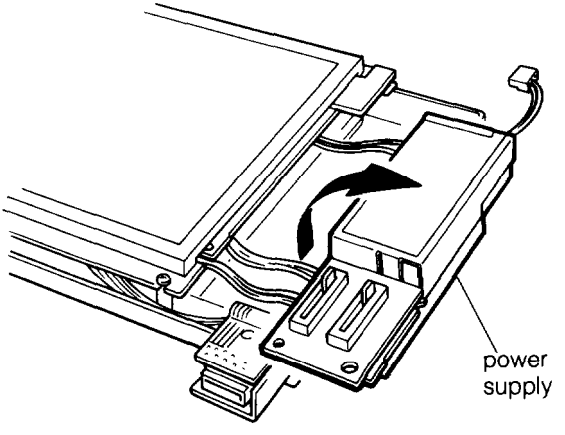
9. On either side of the screen is a screen latch mechanism (shown below). Lift out the one on right side and set it aside in a safe place. You can leave the one on the left side in place.



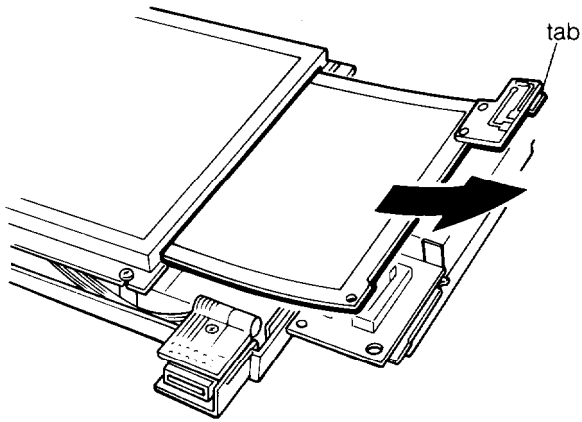
10. Also on the right side, near the top, is a connector that connects the power supply to the screen. Unplug it as shown below.



11. Carefully lift up the power supply and set it next to the screen as shown below. It is connected by cables so you cannot remove it completely. Be careful not to strain any of the cables.



12. Grasp the tan-colored tab from which you unplugged the connector and carefully pull it out of the screen. This removes the electroluminescent element, as shown below. The element is flexible, so it is all right if you bend it slightly as you pull it out.

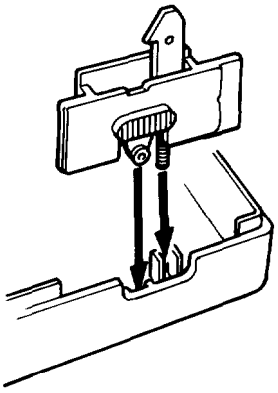


13. Slide the new element into the screen.

14. Replace the power supply you removed in step Il. Be sure it is seated properly and be careful to tuck any cables inside the frame of the screen. Also be sure the screw hole in the power supply, below the screen control switches, is aligned properly with the screw post inside the screen.

15. Reconnect the connector you unplugged in step 10.

16. Replace the latch mechanism you removed in step 9. Be careful to seat it properly, as shown below. Also be sure the one on the left side is properly aligned.



17. When all the components are seated inside the screen, replace the front cover you removed in step 8. Be sure the cover fits correctly and the edges of the front and back meet squarely; if not, lift off the cover, re-align the inside components, and try again.

18. Hold the screen firmly so both sides stay together and turn it over so the back faces up.

19. Replace the screws you removed in step 6.

20. Replace the plastic screw covers you removed in step 5; insert the outside tab first and then snap them back into place.

21. Turn the screen over and slide it back into the computer's two arms.

22. Replace the plastic covers on the front of the arms.

23. Replace the screen switch tops you removed in step 2; you can just push them back on to the plastic stems.

Turning Off the Hard Disk

To avoid drive access problems, it is best to leave the hard disk switch on at all times. However, if you are using the computer without the AC adapter, you may want to turn the hard disk off when you are not using it to conserve the charge of the computer's battery. The hard disk drive uses more of the battery's charge than a diskette drive.

You can turn off the hard disk either before you turn on the computer or after:

- If you do not plan to use the hard disk at all, turn it off before you turn on the computer.
- If you need to load MS-DOS or an application program or access files on the hard disk, leave the hard disk switch on when you turn on the computer and turn it off later as described below.

Turning off the hard disk first

If you will not be using the hard disk at all, turn off the switch before turning on the computer. When you turn on the computer, the screen displays this error message:

1701-C

Press F1 to continue. Insert the MS-DOS diskette in drive A and load the operating system from that drive. Then you can use the computer just as you would if it had no hard disk drive. Remember, if you do this, you cannot access the hard disk even if you turn it on.

Turning off the hard disk later

If you want to use the hard disk at any time during your session, turn on the computer with the hard disk switch turned on. You do not need to use the hard disk all the time, and you can turn it off after the operating system has loaded or after you have loaded an application program from drive C. However, there are a few things you need to know about using the hard disk this way.

When you load MS-DOS from the hard disk, the operating system is copied to the computer's memory; however, all the MS-DOS programs remain only on drive C and are not copied to memory. When you turn off the hard disk, the computer no longer has a drive C. This means that if you type a command such as DISKCOPY, the operating system will not be able to find it because there is no drive C.

This may not matter if you are using an application program (such as a word processing or spreadsheet program) because once it is loaded, you will use the commands provided by the program. However, if you want to store data on the hard disk, you need to turn it back on.

Note

Some application programs have overlays which must be on the current drive. For these types of programs, you need to run them from drive A.

The following example shows the proper procedure for turning the hard disk off while the computer is on.

1. Suppose you turn on the computer with the hard disk switch on. MS-DOS loads from the hard disk.
2. Next type A: and press Enter to log on to drive A.
3. If you want to load an application program from the hard disk, do it now. Be sure to type C: and the pathname of any subdirectories, as necessary, in front of the name of the application program.

   You must to do this before you turn off the hard disk. You may also want to copy any files you will be using from drive C to drive A.

   Note

   If you are still logged on to drive C when you turn off the hard disk, the next time you enter a command, the screen displays an error message. If this happens, turn the hard disk back on and then log on drive A.

   ---

4. After you log on to drive A, you can turn off the hard disk.

5. Continue using the application program, working on drive A.

6. When you want to save your text on the hard disk, turn it on. Enter the command for saving the text on drive C. The hard disk may take up to 10 seconds to perform the operation because it needs to reinitialize itself.

Appendix B

Troubleshooting

You should not encounter any serious difficulties as you set up and use your Equity LT. But if anything out of the ordinary happens, read this appendix. Usually, such a situation requires nothing more than adjusting a cable connection, repeating a software procedure, or resetting the computer.

You can use the suggestions here to solve most problems you may encounter. If you suspect there is a problem with some part of your hardware, try running some or all of the system diagnostics, described in Appendix D. If you cannot resolve the problem, consult an Epson dealer about servicing the computer.

WARNING
If you need to turn off the computer for any reason, always wait at least five seconds before you turn it back on. You can damage the Equity LT if you turn it off and on rapidly.

Error Messages

If the screen displays an error message during the power-on diagnostics, see Appendix C. If the screen displays an error message while you are running system diagnostics, described in Appendix D, check the error message table at the end of that appendix for the cause. Then give the information to your Epson dealer.

The Computer Fails to Start Up

If the computer does not start up when you turn on the power switch, follow these steps to find a solution:

1. Check to see if the power light above the keyboard is on. If it is not, remove any diskettes and then turn off the power. Wait five seconds, then turn the power back on.

2. If the power light still does not come on, turn off the power switch. Check to see that the AC adapter is securely connected to both the computer and an electrical outlet. Then turn the power back on.

3. If the computer still does not start up, check the electrical outlet. Plug a portable lamp into the outlet you are using for the computer and turn it on to see if the outlet supplies power.

The LCD Screen is Blank

If the computer starts up but no image appears on the LCD screen, follow these steps to solve the problem:

1. Use the contrast switch (and brightness switch if your screen has one) to adjust the screen display.

2. Be sure DIP switch 4 above the keyboard is turned on to select the LCD screen as the display device. (See 'Setting the DIP Switches" in Chapter 1 for instructions.)

3. Remove any diskettes, then turn off the computer. Check that the LCD screen is properly connected to the computer. (See Chapter 1 for instructions.) Wait at least five seconds and then turn the computer back on.

4. If you have the backlit model screen, you may need to replace its electroluminescent element. See 'Caring for the Backlit Screen" in Chapter 3 and also see Appendix A.

The Monitor Screen is Blank

If you are using a color monitor with the computer but no image appears on the screen, follow these steps to solve the problem:

1. Be sure the power switches on the computer and monitor are turned on.

2. Use the controls on the monitor to adjust the brightness and contrast.

3. Remove any diskettes, then turn off the power switches on the monitor and the main unit. Check that the monitor's power cable is securely connected to the monitor and to an electrical outlet, and that the monitor cable is properly connected to both the monitor and the main unit. Then turn both power switches back on.

4. Be sure DIP switch 4 above the keyboard is turned off to select the monitor as the display device. (See "Setting the DIP Switches" in Chapter 1 for instructions.)

5. Turn off the power switches on both the main unit and the monitor. Then 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 the outlet supplies power.

The Computer Does Not Respond

If the computer does not respond to something you enter from 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 record one figure. Also, BASIC programs that have many calculations to perform can take several minutes, or even hours. Be aware of the task the computer is performing and judge the time accordingly.

2. If the computer remains locked up, follow the steps in Chapter 3 under 'Resetting the Computer."

Low Battery Problems

If the battery runs low, recharge it according to the instructions in Chapter 3.

The battery inside the Equity LT should last as long as the computer does. If, however, the battery seems to be running low sooner than it should after being recharged, you can test it by following the steps on the next page.

1. Turn off the computer.

2. Connect the AC adapter to the computer and to an electrical outlet and let the battery charge for at least 12 hours.

3. Disconnect the AC adapter.

4. Turn on the computer, but do not insert a diskette and do not use the computer. Leave the computer in this condition for three hours. If the low battery (LOW BAT) indicator light comes on before the three hours are up, the battery is faulty. Take your computer to your dealer to have the internal battery pack replaced.

Diskette Problems

If you have trouble with a diskette, check the following questions:

1. Is the diskette damaged? Copy the diskette and repeat the operation that caused the problem using the copy. (If you have trouble copying the entire diskette, some of the sectors may be bad. Try to copy single files with the COPY command.) If the operation works using the copy, the original diskette is probably damaged. Make another copy to use as a backup.

2. Have you inserted the right type of diskette? The diskette type is normally shown on the manufacturer's label. In the computer's internal drives, which have a storage capacity of 720KB, use 3 $\frac{1}{2}$-inch, 720KB, double-sided, 135 TPI (tracks per inch), soft-sectored diskettes.

   If you have a 5 $\frac{1}{4}$-inch external diskette drive, use 360KB, double-sided, double-density, 48 TPI, soft-sectored diskettes in this drive.

3. Is the diskette write-protected? The write-protect switch may be set on a 3 $\frac{1}{2}$-inch diskette or there may be a write-protect tab over the notch of a 5 $\frac{1}{4}$-inch diskette. Before you move the switch or remove the tab, check the directory

to see what files the diskette contains; it may contain information you do not want to change or lose. (Chapter 4 describes how to display a directory.) Although you should normally write-protect all program diskettes, some application programs store temporary files on the diskette. These programs do not work if you write-protect the diskette.

Hard Disk Problems

If you have problems with your hard disk when you first start to use it, make sure it has been set up properly. See Chapter 2, "Preparing a Hard Disk for Use." Also be sure the switch on the back panel is on. See "Hard Disk Power Switch" in Chapter 2.

If you cannot access data stored on your hard disk, you may have accidentally repartitioned or reformatted part or all of the disk. If you have not done so and your hard disk does not function properly, have an authorized Epson service center check your hard disk. Never open the airtight container that encloses the recording disk.

Software Problems

If you have trouble with a software program, check the following possible problems and solutions:

1. The software program does not start. Check that you are following the correct procedure for your operating system. Be sure you insert the system diskette in drive A (on the right side of the computer).

2. An application program does not work. Check the software manual and complete the routine according to the instructions. If this does not work, reset the computer (as described in Chapter 3 under "Resetting the Computer"), reload the program, and try the routine again.

To operate properly, some programs require the computer to run at 4.77 MHz. Try changing the CPU speed with the switch above the keyboard. See “Selecting Execution Speed” in Chapter 3.

Printer Problems

Your printer manual describes methods to solve most printer problems. If your printer does not work correctly right after you install it, make sure the printer has power and is properly connected to the computer. The printer manual tells you how to connect your printer.

If you have printing problems, check the printer manual for the printer’s DIP switch settings. The DIP switches on a printer help it communicate properly with the computer.

Be sure your software is set up for your printer. Carefully follow all the instructions in your software manual on installing a printer.

Appendix C

Power-on Diagnostics

The built-in memory (ROM) of your computer contains a series of diagnostics programs. These programs are run automatically by the system every time you turn on the power. The diagnostics programs check the internal devices such as ROM, RAM, keyboard controller, timer, video controller, and floppy disk driver.

When you turn on the power, the computer performs the tests described in this appendix. If an error is found, a specific error number and error message are displayed. If the error is serious, the computer cancels further checking and halts system initialization. The error message remains on the screen but the computer is inoperable.

If the error is not serious, the computer displays an error message and waits for you to resume further checking. You see this prompt:

F1 key to resume

Write down the error message and code number, and then press F1 to resume. Report the error message and code number to your dealer when requesting repairs.

System Device Check

The computer first checks its internal devices such as the ROM. If a malfunction is found, the computer displays an error message. In some cases, it may halt with no further information. If this happens, contact your dealer as soon as possible.

If a fault in the main board is found, the computer stops and this error message is displayed:

101 -System board error

If an I/O or checksum error occurs, you see this message:

xxxx0 ROM error

where xxxx is the number of the segment of the bad I/O ROM on an option card.

Clock and CMOS RAM Check

When the system device check is completed successfully, the computer checks the timer and CMOS RAM. If the information contained in the RAM does not match the actual system installation, you see this message:

161-System options not set
(Run SETUP in DIAGNOSTICS)

The information stored in the CMOS RAM must be corrected. Run the Setup program provided on the reference diskette to correct the installation information.

If the system clock has not been set, this message is displayed:

163-Time & Date not set
(Run SETUP in DIAGNOSTICS)

RAM Check

The computer now begins to check the computer's RAM. During this check, this message is displayed:

xxxKB OK

where xxx indicates the amount of memory in which no malfunction is found. This value increases continuously by 64KB up to the amount of RAM installed on the main board, which is 640KB. If the computer detects an error in the first 64KB area, an error message is displayed and the computer halts with no further information.

If there are faulty RAM chips in your system, you see this message:

xxxx0 201 -Memory error

Keyboard Controller and Keyboard Check

The computer checks the keyboard controller and keyboard for problems such as failure of one of the keys to release. If there are any errors in the connection between the keyboard and the computer, this error message is displayed:

301 -Keyboard stuck error

When a number precedes this message, the number represents the key (in hexadecimal) that is causing the error. This message may occur after a keyboard reset (Ctrl Alt Del) and does not necessarily indicate a problem.

Floppy Disk Drive Seek Check

The computer checks its floppy disk (diskette) drives by searching the read/write heads for any malfunction. If any seek errors are found, you see this message:

601 -Diskette error

If this error occurs, confirm that the system diskette is inserted into drive A. If this number still appears after you insert the diskette, you may then want to run the System Diagnostics and select option 6 from the DEVICE LIST. If the error persists, consult your dealer about having the drive repaired.

Hard Disk Controller and Hard Disk Check

The computer next checks the hard disk controller and drive unit. If a malfunction is found in the hard disk controller, you see one of these error messages:

1701-A
1701-B
1701-E

If an error is found in the hard disk drive unit, one of these error messages is displayed:

1701-C
1701-D

Appendix D

Performing System Diagnostics

This appendix describes how to check the operation of the main unit and peripheral devices of your Equity LT. You check these devices using the diagnostics program on your reference diskette.

Run diagnostics if you are unsure whether a device is performing correctly. Table D-l at the end of this appendix lists the possible error messages you may see when testing these devices.

Starting System Diagnostics

To start the system diagnostics program, follow these steps:

1. Insert the reference diskette in drive A.

2. Turn on or reset the computer. The diagnostics program loads automatically and displays the main menu:

```
OPERATION MENU

1 - Setup
2 - Format diskette
3 - System diagnostics

0 - Exit to DOS for more utilities

Enter selection number:
```

3. Press 3 to select System diagnostics and press Enter.

When you start the System diagnostics, the computer checks the following:

- The setting of the DIP switches above the keyboard and on the back panel
- The positions of the internal jumpers
- The peripheral devices that are connected to the system.

After these items are checked, you see a list of the devices available for testing:

```
DEVICE LIST

 1 - System board
 2 - Memory
 3 - Keyboard
 5 - Video adapter and display
 6 - Floppy disk drives and controller
 9 - Parallel port (printer interface)
11 - Serial port (RS-232C port)
14 - Dot-matrix printer
17 - Hard disk drive and controller

 0 - Exit

Enter selection number:
```

Selecting a Test

From the DEVICE LIST, select the device to be tested. Type the number of the device, then press Enter.

Before the test begins, you are asked how many times to perform the test. You see this menu:

```
Number of times to test device

1 - Run test one time
2 - Run test multiple times

0 - Exit

Enter selection number:
```

You can specify that the test be performed one time only or any number of times in the range from 1 to 9999. Running a test multiple times is for reliability testing of essential functions only; in most cases, running a test only once is sufficient.

To perform the test once only, press 1 then Enter. The program displays a submenu of more detailed tests for the device you are checking.

To perform the test multiple times, press 2 and Enter. You see this prompt:

Terminate checking if an error detected (Y/N)?

Press Y and Enter to terminate checking if the device produces an error, or press N and Enter to repeat the tests regardless of an error.

You see this prompt:

How many times (1-9999):

Type the number of times you wish to repeat the test; then press Enter. The tests for the device now start.

Resuming From an Error

If an error occurs during a test, the test stops at that point, and an error code and error message are displayed. If you want to record the problem, you can print out the message on your printer. You see this prompt:

Do you want a printout of the error message(s) (Y/N)?

To continue without printing the error message, press N and Enter.

Before you request a printout, be sure your printer is turned on and on-line, and the paper is installed correctly. Then press Y and Enter. If the printer is not ready, the following message and prompt are displayed:

Printer is not installed correctly.
Install correctly and enter Y, or
Enter N to cancel printing.

Correct the problem and press Y and Enter to continue printing, or press N and Enter to cancel printing.

After printing the error message, the program displays this prompt:

Printout is finished. Press Enter to return to the menu.

The program continues after an error in one of the following ways:

- It returns to the DEVICE LIST, or
- If you are running multiple tests and are not terminating on an error, the program repeats the test that caused the error.

The remainder of this appendix describes the tests you can run on the system's internal devices and on the optional devices installed in your computer. The program displays the title of each check on the screen.

For a complete list of the error codes and messages that are displayed by these tests, see Table D-l at the end of this appendix.

System Board Check

Use this option to check the operation of each major component on the system board, including the following:

- The V30™ CPU chip
- The real-time clock, CMOS RAM, and battery
- The main integrated circuits.

The checks made on the V30 CPU chip are extremely comprehensive. They ensure that the CPU instruction set is functioning correctly.

If an error occurs, write down the error code and message, or print them out, and contact your Epson dealer. Attempting to correct system board errors yourself may violate your warranty agreement.

Memory Check

Use this option to check the computer's built-in memory.

Note
This option does not check expanded memory above the 640KB memory limit imposed by MS-DOS.

For this check, the program writes specific data into memory and then reads it back. The data is written and read in blocks of 64KB. A parity check is also made on each block. A memory count is displayed after each block that is tested without an error. The final message is usually:

640 KB OK

If an error is reported, write down the error code and message, or print them out, and contact your Epson dealer. Attempting to correct memory errors yourself may violate your warranty agreement.

Keyboard Check

Use this option to check the operation of the keyboard. The program first checks the keyboard controller; during this check, you see the indicator lights above the keyboard flash. If no errors are detected, you can then choose the correct keyboard layout.

Before checking the operation of the keys, you must select the appropriate keyboard layout so that the test display matches the keys on your keyboard. You see this menu:

KEYBOARD SELECT MENU

1 - US ASCII
2 - United Kingdom
3 - French
4 - German
5 - Italian
6 - Spanish

0 - Exit

Enter selection number:

Type the number of your keyboard layout and press Enter. You can exit the keyboard test by pressing 0 and Enter.

After you select a keyboard layout, the program displays the layout on the screen. Press each key on the keyboard to be sure the corresponding character is displayed on the screen. If the character displayed on the screen does not match the key you pressed, there is a problem with your keyboard. Test each key.

The status of the Num Lock, Caps Lock, and Scroll Lock indicators is shown on the upper right side of the keyboard layout.

These messages appear on the screen:

KEYBOARD CHECK

Press Y followed by ENTER to exit.
Press N followed by ENTER if screen and keyboard do not match.

If all the keys function correctly and match the characters displayed, press Y and then Enter.

If all the keys function, but the characters displayed do not match the keys, press Y and then Enter. Then re-select the keyboard test from the DEVICE LIST and check that you selected the correct keyboard layout. You can find diagrams of all the international keyboard layouts in the MS-DOS manual.

If any key is incorrect, press N and Enter. Make a copy of the error code and message, or print them out, and contact your Epson dealer.

Video Adapter and Display Check

Use this option to check the operation of the LCD or monitor connected to your computer. This test includes several checks that allow you to identify particular problems related to the color display. If you are using the LCD screen, you cannot see any color; so the colors are displayed in monochrome tones.

You can select the individual checks from this menu:

VIDEO ADAPTER AND DISPLAY CHECK MENU

1 - Video adapter check
2 - Attribute check
3 - Character set check
4 - 40-column character set check
5 - 320X200 graphics mode check
6 - 640X200 graphics mode check
7 - Screen paging check
8 - Color video check
9 - Sync check
10 - Run all above checks

0 - Exit

Enter selection number:

If you specified to run the video check multiple times, this menu does not display and only the first test (Video adapter check) is performed.

If an error occurs during any of these tests, record the error code and message, or print them out. Then contact your Epson dealer.

When you finish running the video adapter and display check, press 0 and Enter to return to the DEVICE LIST.

Video adapter check

To check the video adapter, press 1 and then Enter.

The computer checks the video RAM (display memory) on the display adapter by writing test data to memory and then reading it back and comparing it to the written data. The computer also tests the video enable signal of the display controller chip.

Attribute check

To check the display attributes of the video adapter, press 2 and Enter.

Several messages are displayed showing examples of all the possible display attributes and colors. Check the information displayed on your screen and respond to the following prompt:

Is the display correct (Y / N)?

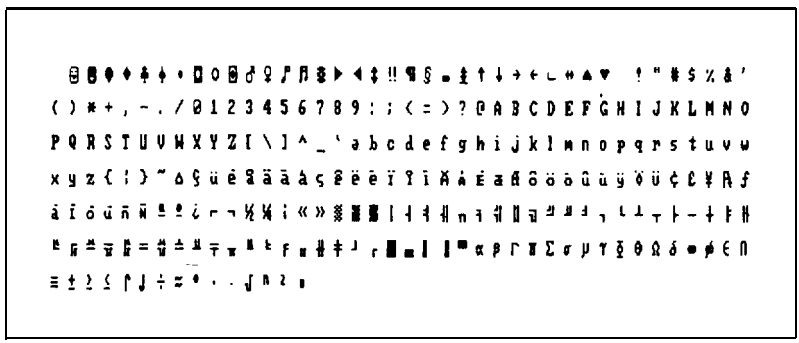
Press Y and then Enter if the display is correct.

If the colors are not correct, adjust the controls on your display monitor. If they are still incorrect, press N and Enter.

Contact your Epson dealer to verify any monitor problems.

Character set check

To check your 80-column character set, press 3 and Enter. The character fonts that are included in the internal character generator are displayed. Check the characters displayed on your screen against this illustration:



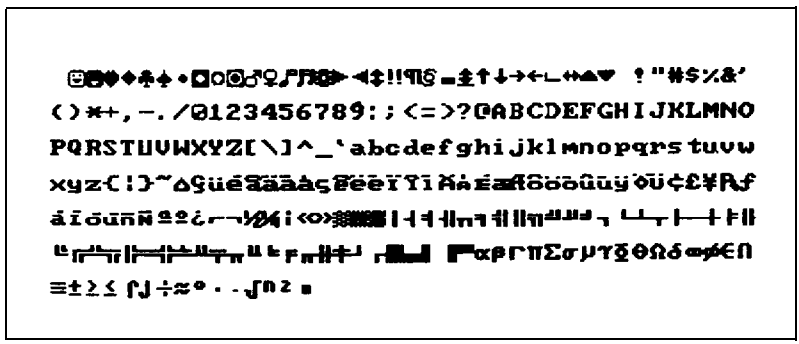
After checking the character fonts, respond to the following prompt:

Is the display correct (Y / N)?

If the characters displayed match the illustration, press Y and then Enter. If you find a problem with the characters on the screen, press N and Enter to display the error message.

40-column character set check

To check your 40-column character set, press 4 and then Enter. The character fonts that are included in the internal character generator are displayed. Check the characters displayed on your screen against this illustration:



After checking the character fonts, respond to the prompt:

Is the display correct (Y/N)?

If the characters displayed match the illustration, press Y and Enter. If you find a problem with the characters on the screen, press N and Enter to display the error message.

320 x 200 graphics mode check

To check your 320 x 200 graphics mode, press 5 and then Enter.

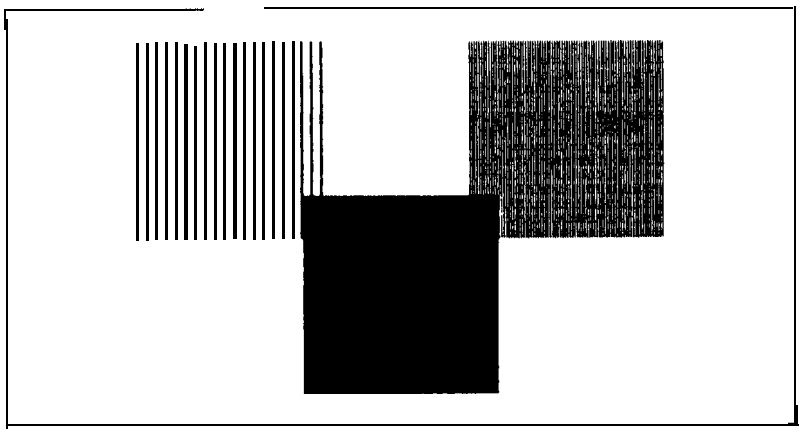
The screen displays three colored squares-light green, brown, and red-against a cyan background. These four colors are Color Set 0. If they are correct, press Y and then Enter.

The same pattern is displayed again; this time the squares are cyan, white, and magenta, and the background is red. These colors are called Color Set 1. If these are also correct, press Y and then Enter to end the test.

If any colors are displayed incorrectly, check the adjustment of your monitor and be sure that both ends of the cable are plugged in firmly. If a problem still exists, press N and Enter to display the error message.

640 x 200 graphics mode check

To check your 640x200 graphics mode, press 6 and Enter. The screen displays three patterned squares against a black background, as shown below.



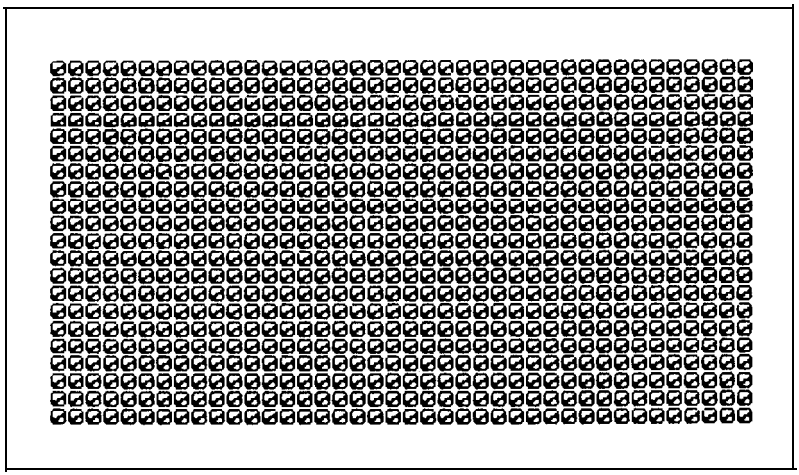
If the patterns on your screen are clear and distinct, press Y and then Enter.

If any pattern is not displayed clearly, check the adjustment of your monitor and be sure that both ends of the cable are plugged in firmly. If a problem still exists, press N and Enter to display the error message.

Screen paging check

To check the screen paging of your monitor, press 7 and Enter.

The video RAM on the video adapter is divided into eight independent display pages. This test checks the eight pages by first filling all eight with a number corresponding to the page, and then displaying each page in turn. You see this pattern for screen 0:



When you have examined this screen, press any key to display the next page. The eight display pages, numbered 0 to 7, are displayed sequentially.

After the eighth page is displayed, you see this prompt:

Is the display correct (Y/N)?

If all eight pages are correct, press Y and Enter. If any page is filled with an incorrect number, press N and Enter to display the error message.

Color video check

Option 8, Color video check, displays 16 different screens, each a different color, and a message indicating the color. The screens show the following colors in the order specified below:

1 - Black	9 - Gray
2 - Blue	10 - Light blue
3 - Green	11 - Light green
4 - Cyan	12 - Light cyan
5 - Red	13 - Light red
6 - Magenta	**14** - Light magenta
7 - Brown	15 - Yellow
8 - White	16 - White (high intensity)

To start this test, select option 8 from the menu; the first screen is displayed. Press any key to display the next screen. On the last screen, you see this prompt:

Is the display correct (Y/N)?

If all the colors are correct, press Y and Enter to end the test. If any color is displayed incorrectly, check the adjustment of your monitor and be sure that both ends of the cable are plugged in firmly. If a problem still exists, press N and Enter to display the error message.

Sync check

This test is provided for service purposes only. If you accidentally select this option, press any key to end the test.

Run all above checks

To run all the tests on the menu in sequence, press 10 and Enter.

When you choose this option, all checks for the color adapter and CRT are performed automatically in sequential order. Although you do not start each test, you must still supply the appropriate responses to progress from one test to the next.

Floppy Disk Drives and Controller Check

Use this option to test the performance of the floppy disk (diskette) drives inside or connected to your computer. This test includes several checks that allow you to identify particular problems related to your diskette drives.

To run these tests, you need a formatted diskette so the tests can write data on the disk in the drive. In a 720KB drive, you can use only a 720KB floppy disk. In a 360KB drive, use only a 360KB diskette. If you need to format a diskette, you can do it without leaving the diagnostics program; see "Formatting a diskette" below. If you already have a formatted diskette, go on to "Starting the floppy disk drive check."

Formatting a diskette

To format a diskette without leaving diagnostics, follow these steps:

1. From the DEVICE LIST menu, press 0 to exit. The OPERATION MENU appears on the screen.

2. Press 2 and Enter to select Format diskette. If you have two diskette drives, you see this message and prompt:

   ```
   Format Diskette
   Format in which drive (A/B)?
   ```

   Press A or B and Enter. If you select A, this prompt is displayed:

   ```
   Insert new diskette for drive A:
   and strike ENTER when ready
   ```

3. If you have only one diskette drive, remove the reference diskette from drive A.

4. Insert the diskette to be formatted in the drive you selected and press Enter. The screen displays the head and cylinder numbers as the diskette is formatted.

When the format is complete, you see these messages (for a 720KB diskette):

```
Format complete
  730112 bytes total disk space
  730112 bytes available on disk
Format another (Y/N)?
```

You can format another diskette or return to the OPERATION MENU. Then press 3 and Enter to select System diagnostics.

Starting the floppy disk drive check

To run the floppy disk drive check, select option 6 from the DEVICE LIST. After you choose the number of times to run the test, the screen displays this menu:

```
FLOPPY DISK DRIVE(S) AND CONTROLLER CHECK MENU

1 - Sequential seek check
2 - Random seek check
3 - Write, read check
4 - Speed check
5 - Run all above checks

0 - Exit

Enter selection number:
```

Before any checks are performed, the program determines the number of diskette drives installed in or connected to your computer. If you have more than one drive, you see this prompt each time you select a test:

```
Check which drive (A/B)?
```

Press A or B and then Enter.

If any errors occur during the checks, record the error code and message and contact your Epson dealer. Always have the diskette drive serviced by your Epson dealer.

When you finish running the floppy disk drive check, press 0 and Enter to return to the OPERATION MENU.

Sequential seek check

This test checks the ability of the read/write heads to locate any part of the diskette. This action by a read/write head is called a seek. During this test, each head seeks sequentially from the innermost track to the outermost track. The innermost track is track 79 for 720KB diskettes and track 39 for 360KB diskettes.

Select option 1 from the menu to start this test. The program displays the number of each track it finds, counting down from 79 or 39 to 0.

The seek is performed by each head, so you see the count twice. If no errors occur, the menu is displayed.

Random seek check

This test is identical to the sequential seek check, except that the seek operation is performed on each track in random order instead of sequential order. Select option 2 from the menu to start this test.

Write, read check

This test checks the ability of the selected disk drive to read and write data from a diskette. The test writes to and reads from each cylinder on the diskette, starting at the center.

Note
This test destroys all data on the diskette in the selected drive.

Select option 3 from the menu to start this test.

If you have only one diskette drive, you are prompted to replace the reference diskette with a blank diskette before running the test. You see the following messages.

Use only a formatted blank diskette for this test.
Any data present may be erased.
If using drive A, remove your Reference Disk.
Enter Y to start this check.
Enter N to return to the menu.

If you are using drive A, remove the reference diskette and insert the blank diskette you prepared in the drive; then press Y and Enter.

The program displays the current track number as each cylinder is tested. For example, with a 720KB diskette, this is the first message you see:

Current track is 79

Speed check

This test checks the revolution speed of the specified disk drive. Select option 4 from the menu to start this test. You see a message similar to this:

The disk rotation speed should be more than 294.0 rpm and less than 306.0 rpm.

The computer spins the diskette for a few seconds then displays a message like this:

The disk rotation speed is now 300.0 rpm.

Note
The speed for a 3 $\frac{1}{2}$ -inch or 5 $\frac{1}{4}$ -inch drive should be 300 rpm. This check permits a tolerance of $\pm 2\%$.

The diskette continues to spin, and the display is updated every few seconds. To stop the test, press any key; the program returns to the menu.

If you try to perform a speed test without inserting a diskette, or if a read error occurs, you see this message and prompt:

Disk is defective or not installed properly.
Press Enter to return to the menu.

Run all above checks

To run all the tests on the menu in sequence, press 5 and Enter.

When you choose this option, all checks for the diskette drive(s) and controller are performed automatically in sequential order. Although you do not start each test, you must still supply the appropriate responses to progress from one test to the next.

Parallel Port (Printer Interface) Check

Use this option to test the operation of the parallel printer port.

To perform the test, you must insert a special loop-back connector into the parallel port so that the computer can check individual pins of the port. Contact your dealer if you need a loop-back connector. Note that a different connector is required to test the serial port.

When you select option 9 from the DEVICE LIST, you see these prompts:

> Attach loop-back connector to parallel port.
> Enter Y to start this check when connector is attached,
> or Enter N to return to the menu.

Insert the loop-back connector. Then press Y and Enter to start the check.

The computer checks the port by writing and reading data and control information and reports errors for any pins that are faulty. Note that if you connect a printer cable instead of a loop-back connector, you get errors.

Serial Port (RS-232C) Check

Use this option to test the functions of the serial communications (RS-232C) port if you have turned off DIP switch 4 on the back panel. To perform the test, you must

insert a special loop-back connector into the RS-232C port so that the computer can check individual pins of the port. Contact your dealer if you need a loop-back connector. Note that a different connector is required to test the parallel port.

When you select option 11 from the DEVICE LIST, you see these prompts:

```
Attach loop-back connector to serial port.
Enter Y to start this check when connector is attached,
or Enter N to return to the menu.
```

Insert the loop-back connector. Then press Y and Enter to start the check.

First, the computer checks the serial port control lines to see that they are able to change from high to low and vice versa. No messages are displayed during this part of the test unless an error occurs.

The second test is an echo back check during which the port sends data to itself in a fixed data format, at all the possible baud rates. When this test begins, you see these messages:

```
RS232C echo back check - at various baud rates
Current baud rate is 75
Current test data is 0 0
```

Each baud rate is tested in turn, and the display informs you of the progress of the test. If the port does not become ready correctly, a timeout error occurs. If any data received does not match the data sent, a verify error occurs, and the computer reports the transmitted and received data at the time of the error.

The final test is an echo back check during which the port sends data to itself at 9600 baud, using various data formats. At the start of the test, you see these messages:

```
RS232C echo back check - with various data formats
Current data format: 5 data bits, 1 stop bits,
                                    parity - NONE
Current test data is 0 0
```

Once again, if any data received does nor march the data a verify error occurs, and the computer reports the transmitted and received data at the rime of the error.

Alternate Serial Port Check

If you have turned on DIP switch 4 on the back panel, select option 12 to test the serial communications (RS-232C) port. To perform the test you must insert a special loop-back connector into the alternate serial port so that the computer can check individual pins of the port. This test is identical to the check for the primary serial port. For derails, see the description of the Serial port (RS-232C) check above.

Dot-matrix Printer Check

Use this option to check:

- The operation of your printer in IBM-compatibility mode
- The compatibility of your printer with the extended character set your computer uses
- The ability of your printer to produce dot graphics and print images of the graphics screen.

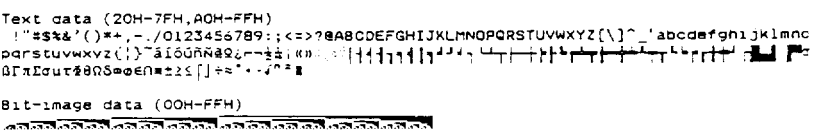
When you select option 14 from the DEVICE LIST, you see this prompt:

Is dot-matrix printer on-line (Y/N)?

Check that your printer is connected to the computer, and that it is turned on, loaded with paper, and on-line. Press Y and then Enter to continue, or press N and Enter to return to the menu.

When you continue the test, the computer checks that the printer is responding correctly. This test detects whether the printer is off-line or whether an interface error exists. If no errors occur, the computer sends a repeating sequence of ASCII characters and dot graphics data to the printer until you press any key.

The pattern looks like this:



The text data includes all the characters commonly used by programs that require foreign languages or graphic characters. If your printer prints different characters than you see in the illustration, you may need to take care with certain software. The dot graphics data is sent to the printer using a command (ESC K) compatible with Epson and IBM printers. If this pattern is printed correctly, you can use the MS-DOS GRAPHICS program to print our copies of graphics screens.

Note

Even if the test runs only for a short time, your printer may store many characters in its buffer. To stop printing, set the printer off-line.

Hard Disk Drive and Controller Check

Use this option to test the performance of the hard disk drive installed in your computer. If any errors occur, have your dealer check and service the drive. When you select option 17 from the DEVICE LIST, you see this menu:

HARD DISK DRIVE AND CONTROLLER CHECK MENU

1 - Seek check
2 - Write, read check
3 - Error detection and correction check
4 - Read, verify check
5 - Run all above checks

0 - Exit

Enter selection number:

If you specified to run the hard disk drive check multiple times, this menu does not display and only the first three tests are performed.

Seek check

This test checks the ability of the read/write heads to locate any part of the hard disk. This action by a read/write head is called a seek. During this test, each head seeks each cylinder of the disk in sequence, starting from the center.

Select option 1 from the menu to start this test. The program displays the number of each cylinder it finds, counting down from 614 (for a 20MB hard disk) to 0.

The seek is performed by the read/write heads simultaneously, so you see the cylinder numbers only once. If no errors occur, the menu is displayed.

Write, read check

This check tests the ability of the hard disk drive to read and write data. The test writes to and reads from each sector of the innermost cylinder of the disk, using each head.

Note

This test destroys all data on the innermost cylinder of the hard disk drive. This cylinder is reserved for diagnostics and is never used for storage by MS-DOS. Therefore, data created by MS-DOS is not destroyed.

Select option 2 from the menu to start this test. You see these messages:

> The data on the highest physical cylinder may be destroyed by this check.
>
> Enter Y to start this check.
> Enter N to return to the menu.

Press Y and then Enter to continue with the test.

You do not see a cylinder count during the test. If no errors occur, the program returns to the menu.

If an error is reported, consult your dealer.

Error detection and correction check

This test checks the ability of the hard disk drive to detect a read/write error and to correct the data accordingly.

Note
This test destroys some data on the innermost cylinder of the hard disk drive. This cylinder is reserved for diagnostics and is never used for storage by MS-DOS. Therefore, data created by MS-DOS is not destroyed.

Select option 3 from the menu to start this test. You see these messages:

> The data on the highest physical cylinder may be destroyed by this check.
>
> Enter Y to start this check.
> Enter N to return to the menu.

Press Y and then Enter to continue with the test. If no errors occur, the menu is displayed.

An error occurs only if the drive is malfunctioning. In this case, back up all your files and have the drive serviced immediately. (The drive may be corrupting your data.)

Read, verify check

This test reads and verifies data from all tracks of the disk, checking each cylinder and using both heads.

Select option 4 from the menu to start this test. The program displays the number of each cylinder it finds. For example, with a 20MB hard disk, the first message you see is:

> Current cylinder is 614

The cylinder number counts down to 0.

At the end of the test, you see a table of the results of the test. For example, for a 20MB hard disk with three bad tracks, you see the following:

```
BAD TRACKS..... 0
READ ERROR TRACKS.. . ..... 3
GOOD TRACKS ..... 2457

Press Enter to return to the menu
```

Press Enter when you have viewed the table. Don't worry if there are some bad tracks on the disk. They have been registered by the manufacturer and will not be used to store data.

Run all above checks

To run all the tests on the menu in sequence, press 5 and then Enter.

When you choose this option, all checks for the hard disk drive and controller are performed automatically in sequential order. Although you do not start each test, you must still supply the appropriate responses to progress from one test to the next. This is the first prompt you see:

```
The data on the highest physical cylinder may be
destroyed by this check.

Enter Y to start this check.
Enter N to return to the menu.
```

Press Y and then Enter to continue with the test.

Exiting System Diagnostics

When you finish running the system diagnostics, press 0 to exit the program. When the MS-DOS command prompt reappears, remove the reference diskette.

Error Codes and Messages

Table D-1 lists all the error codes and messages that may appear during diagnostic checks.

Table D-1. Error codes and messages

Error code	Message
System board	
101	V30 CPU ERROR
103	8254 TIMER COUNTER REGISTER ERROR
104	8254 TIMER COUNTER ERROR
105	8237 DMA CONTROLLER REGISTER ERROR
105	8237 DMA REFRESH ERROR
108	8048 SELF DIAGNOSTIC ERROR
109	8259 INTERRUPT CONTROLLER ERROR
111	146818 CMOS BATTERY ERROR
112	146818 CMOS CHECKSUM ERROR
113	V30 INSTRUCTION ERROR
Memory	
201	MEMORY/PARITY ERROR
Keyboard	
301	8048 ERROR
302	KEYBOARD IS DEFECTIVE
Video adapter and display	
501	V-RAM ERROR
503	ATTRIBUTE ERROR
504	CHARACTER SET ERROR
505	40-COLUMN CHARACTER SET ERROR
506	320 x 200 GRAPHICS MODE ERROR
507	640 x 200 GRAPHICS MODE ERROR
508	SCREEN PAGING ERROR
510	COLOR VIDEO ERROR
Floppy disk drives and controller	
601	FLOPPY DISK CONTROLLER ERROR
602	SEQUENTIAL SEEK ERROR
603	RANDOM SEEK ERROR
604	WRITE ERROR
605	READ ERROR
Parallel port	
901	ERROR PIN p
Serial port (RS-232C)	
1101	ERROR DTR DSR, DSR ALWAYS HIGH/LOW
1101	ERROR RTS CTS, CTS ALWAYS HIGH/LOW
1102	TIME OUT ERROR
1103	VERIFY ERROR

Error code	Message
Alternate serial port	
1201	ERROR DTR DSR, DSR ALWAYS HIGH/LOW
1201	ERROR RTS CTS, CTS ALWAYS HIGH/LOW
1202	TIME OUT ERROR
1203	VERIFY ERROR
Dot-matrix printer	
1401	status: error-type
Hard disk drive and controller	
1701-A	hard disk controller error (RAM)
1701-B	hard disk controller error (interrupt)
1701-C	drive not ready
1701-D	track 0 error
1701-E	hard disk controller error

Appendix E

Equity LT Specifications

CPU and Memory

16-bit CPU	μPD70116 V30 microprocessor; 4.77 or 10 MHz clockrate, switch-selectable
	20-bit address and 16-bit data bus
Main memory	640KB RAM (with parity) on main board
ROM	16KB

Controllers

Floppy disk	Supports up to two drives; two 3 $\frac{1}{2}$-inch drives or one 3 $\frac{1}{2}$-inch drive and one external 5 $\frac{1}{4}$-inch drive
Hard disk	Supports one 20MB hard disk; supplied in top option slot

Interfaces

Parallel	Standard 8-bit parallel, DB-25S female connector for parallel printer or external 5 $\frac{1}{4}$-inch diskette drive
Serial	RS-232C, programmable, asynchronous, DB-9P male connector
CRT	Color monitor port, DB-9P connector
Option slots	Two proprietary 8-bit input/output slots; one for hard disk drive, one for optional modem card

Clock/calendar/ RAM	Real-time clock, calendar, and 50-byte CMOS RAM for configuration; battery backup

Power Supply

Internal, rechargeable NiCad battery pack; 5 to 7 hours usage

AC adapter; 15 volts

Mass Storage

Three drives maximum: two internal 3 $\frac{1}{2}$ -inch diskette drives or one internal 3 $\frac{1}{2}$ -inch diskette drive plus one 20MB hard disk drive; hard disk drive system can support an external 5 $\frac{1}{4}$ -inch diskette drive

Keyboard

Attached; 85 sculpted keys: 58-key QWERTY main keyboard, 17-key numeric/cursor pad, 10 function keys (user-definable)

Environmental Requirements

Temperature	Operating range: 41° to 95° F (5° to 35° C)
	Storage range: -4° to 122° F (-20° to 50° C)
Humidity	Operating range: 20% to 80% (non-condensing)
	Storage range: 5% to 90% (non-condensing)

Physical Characteristics

Depth	12.2” (310 mm)
Width	13.6” (345 mm)
Height	**3.2” (79** mm)
Weight	Dual diskette drive system: 12.6 lb (5.72 kg) with standard LCD 13.1 lb (5.94 kg) with backlit LCD Hard disk drive system: 13.7 lb (6.22 kg) with standard LCD 14.2 lb (6.44 kg) with backlit LCD

Power Requirements

100/120 VAC, 200/240 VAC, 50/60 Hz

NiCad rechargeable battery pack, 9.6 volts

Options

LCD screen	Standard (reflective type) or backlit (full transmissive type); supertwisted, 1.4 aspect ratio, 200 x 640 pixels; 25 line x 80 characters display
Modem	300/1200 full duplex, Hayes@-compatible
Carrying case	Soft case for carrying computer
Cigarette lighter adapter	

Glossary

Application program
A software program designed to perform a specific task, such as a word processing or spreadsheet program.

ASCII
American Standard Code for Information Interchange. A standardized coding system for representing characters, such as numbers, letters, and graphic symbols. An ASCII character occupies one byte of storage. Files transmitted in ASCII code can be used by many different computers, printers, and programs.

Asynchronous
A method of data transmission in which one machine sends data one character at a time to another, without either machine preparing for the transmission.

Backlighting
The method by which the electroluminescent element in a backlit LCD screen illuminates the background of the screen.

Backup
An extra copy of a program, data file, or disk, kept in case your working copy is damaged or lost.

Baud rate
A measure of the speed of data transmission. Usually equivalent to bits per second.

Bit
A binary digit (0 or 1). The smallest unit of computer storage. The value of a bit represents the presence (1) or absence (0) of an electric charge.

Boot
To load a program or an operating system.

Byte

A sequence or group of eight bits that represents one character.

Character

Anything that can print in a single space on the page or the screen. Includes numbers, letters, punctuation marks, and graphic symbols.

CMOS

Complementary Metal-Oxide Semiconductor. A method for making silicon chips.

Code

A system of symbols for representing data or instructions. Also any software program or part of a program.

Command

An instruction you enter on the keyboard to direct your computer to perform a specific function.

Configuration

The particular setup of a group of components. For example, a typical system configuration consists of a main unit with two diskette drives and an LCD screen, connected to a printer.

Control code

A command (generated when you hold down Ctrl and press another key on the keyboard) that instructs your computer to perform a specific function.

C P U

Central Processing Unit. The piece of hardware that interprets instructions, performs the tasks you indicate, keeps track of stored data, and controls all input and output operations.

Cursor

The highlighted marker that shows your position on the screen and moves as you enter and delete data.

Cylinder

See Track.

Data
Information stored or processed by a computer.

Data diskette
A formatted diskette used to store files.

Data length
The number of bits per character in serial communications.

Default
Values or settings that take effect when the computer is turned on or reset. A default value stays in effect unless you override it temporarily by changing a setting or you reset the default value itself.

Delimiter
A character or space used to separate different parts of an MS-DOS command, usually a space or a semicolon.

Device
A piece of equipment that is part of a computer system and performs a specific task, such as a disk drive, a monitor, or a printer.

Diagnostics
The tests and procedures the computer performs to check its internal circuitry and set up its configuration.

DIP switches
Small switches on a piece of hardware such as the computer, a printer, or the modem. DIP switch settings control various functions and provide a system with information about itself. DIP stands for Dual In-line Package.

Directory
A list of the files stored on a disk or a part of a disk.

Disk
The collective term for both diskettes and hard disks.

Disk drive

The physical device that allows the computer to read from and write to a disk. A diskette drive has a disk slot into which you insert a diskette. A hard disk is permanently fixed inside the main unit.

Diskette

A flat piece of flexible plastic coated with magnetic material and used to store data permanently. Also called floppy disk.

DOS

The Disk Operating System that controls the computer's input and output functions. See Operating system.

Double-density

A type of diskette format that allows you to store twice as much data as the standard-density format.

Extension

A suffix of up to three characters that can be added to a file name to better identify it.

File

A group of related pieces of information called records, or entries, stored together on disk. Text files consist of words and sentences. Program files consist of code and are used by computers to interpret and carry out instructions.

File name

A name of up to eight characters that MS-DOS uses to identify a file.

Floppy' disk

See Diskette.

Format

To prepare a new disk (or erase an old one) so that it can store information. Formatting a disk divides it into tracks and sectors and creates addressable locations on it.

Graphics

Lines, angles, curves, and other nonalphanumeric data.

GW-BASIC

Microsoft's extended version of the Beginner's All-purpose Symbolic Instruction Code. A programming language designed to be easy to use and understand.

Hard disk

The enclosed unit used to store data permanently. Unlike a diskette, it is fixed in place. It can process data more rapidly and store many more files than a diskette.

Hardware

Any physical component of a computer system, such as a monitor, printer, keyboard, or CPU.

Hexadecimal

A base 16 numbering system frequently used by programmers. Any decimal number between 0 and 255 can be represented by a two-digit hexadecimal number.

Input/output (I/O) port

See Port.

Interface

A physical or software connection used to transmit data between equipment or programs.

Kilobyte (KB)

A unit used to measure storage space (in a computer's memory or on a disk). One kilobyte equals 1024 bytes.

LCD

Liquid Crystal Display. The technology that displays characters on the Equity LT screen.

LED

Light Emitting Diode. A substance that illuminates when electricity passes through it, like the indicator lights above the Equity LT's keyboard.

Main unit

The Equity LT computer.

Megabyte (MB)

A unit used to measure storage space (in a computer's memory or on a disk). One megabyte equals 1,048,576 bytes.

Memory

The area where your computer stores data. Memory contents can be permanent and inalterable (ROM) or temporary (RAM).

Microprocessor

A small version of a CPU contained on one semiconductor chip.

Modem

A device that allows a computer to transmit signals over telephone lines so it can send and receive data. Modem stands for MOdulator/DEModulator.

Monitor

The piece of hardware that contains the screen and displays information.

MS-DOS

An operating system from Microsoft. See DOS, Operating system.

NiCad

Nickel Cadmium. The rechargeable battery pack inside the Equity LT contains eight nickel cadmium batteries.

Operating system

A collection of programs that allow a computer to control its operations. The operating system determines how programs run on the computer and supervises all input and output-for example, MS-DOS.

Parallel

The type of interface that transmits data in groups of bits. See Interface, Serial.

Parameter

A qualifier added to a command that tells the computer what particular conditions to look for.

Parity

Data signals sent during communications to detect errors in transmitting or receiving data.

Partition

To divide a hard disk drive into separate sections for use by different operating systems.

Peripheral

A device (such as a printer or a modem) connected to a computer that depends on the computer for its operation.

Port

A physical input/output socket on a computer where you can connect a peripheral.

Power-on diagnostics

See Diagnostics.

Program

A disk file that contains coded instructions and tells a computer what to do and how to do it.

Prompt

A message displayed on the computer screen that tells you what action you need to perform next.

RAM

Random Access Memory. The portion of the computer's memory used to run programs and store data while you work. All data stored in RAM is erased when you turn off the computer; so you must store any data you want to save on a diskette or hard disk.

Read

To copy data from one area to another. For example, when you open a text file stored on disk, the computer reads the data from the disk and displays it on the screen.

Read/write head

The physical device inside a disk drive that reads and records data on the magnetic surface of a disk.

Reset

To reload a computer's operating system so you can retry a task or begin using a different operating system. Resetting clears RAM.

ROM

Read Only Memory. A portion of memory that can only be read and cannot be used for temporary storage. ROM retains its contents even when you turn off the power.

Root directory

The top level directory in MS-DOS, designated by a \ (backslash). All other directories are subdirectories of the root directory.

RS-232C

A widely-used, standard type of serial interface. You can easily connect an RS-232C-compatible device to the Equity LT.

Sector

A contiguous section of a disk track that provides an address at which the computer can access data.

Self. test

The initial diagnostics procedures a system performs to check its hardware.

Serial

The type of interface that transmits data one bit at a time. See Interface, Parallel.

Software

The programs that enable your computer to perform the tasks and functions you indicate.

Source diskette

The diskette that you are reading or copying data from during a copy or backup operation.

Stop bit

A signal sent in serial communications to mark the end of a character.

Subdirectory

A directory or group of files that branches down from another subdirectory or from the root directory.

Switch

An option added to an MS-DOS command that redirects the way the command works. Switches must be preceded by a / (forward slash). For example, if you add the /S switch to a FORMAT command, MS-DOS installs the operating system on the diskette as it formats it.

System diagnostics

A series of checks you can perform on the computer to make sure the hardware is functioning correctly.

System diskette

A diskette that contains the operating system.

Target diskette

The diskette that you are writing or copying data to during a copy or backup operation.

Tracks

Addressable, concentric circles on a diskette, resembling the grooves on a record, which help to divide the diskette into separate accessible areas. There are 80 tracks on each side of a double-sided 720KB diskette and 40 tracks on each side of a double-sided 360KB diskette.

Wildcard

A character that represents an unknown character or group of characters. The wildcard character * (asterisk) represents a group of characters, and the wildcard character ? (question mark) represents a single character.

Write

To store data on a disk.

Write-protect

To prevent a diskette from being overwritten by setting the write-protect switch on a 3 $\frac{1}{2}$-inch diskette or by placing a write-protect tab over the notch on the side of a 5 $\frac{1}{4}$-inch diskette. When a diskette is write-protected, you cannot erase, change, or record over its contents.

Index

A

B

C

D

E

F

G

H

I

K

L

M

N

O

P

R

S

T

U

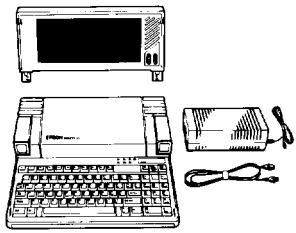
V

W

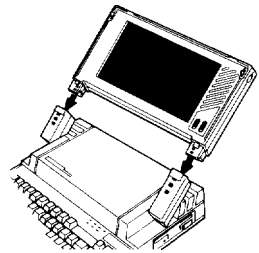
X

10 Steps to Setting Up the Equity LT

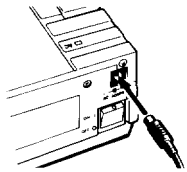
1 Unpacking



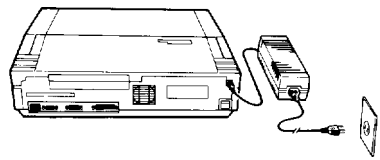
2 Connecting the Screen



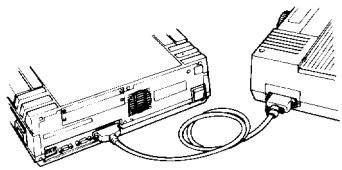
3 Connecting the AC Adapter



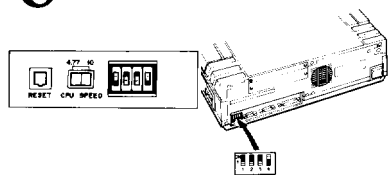
4 Charging the Battery



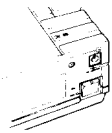
5 Connecting a Printer



6 Setting the DIP Switches



7 Turning On the Computer



8 Loading MS-DOS

```
A>
```

9 Copying System Diskettes

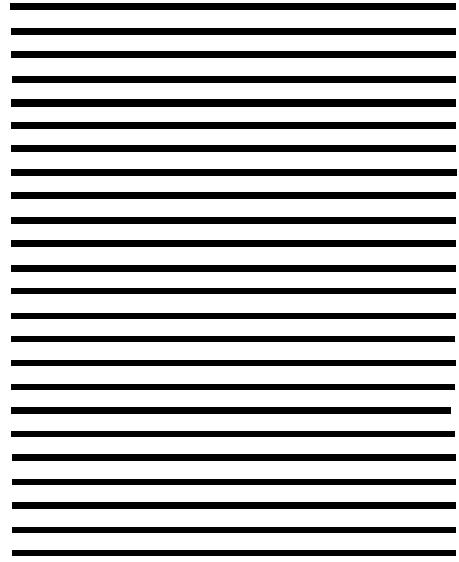
```
DISKCOPY A: B:
```

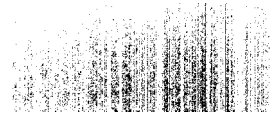
10 Running Setup

Exit
Real-time clock
Backlight period
Primary serial port
Secondary serial port

EQUITY™ LT

EQUITY™ LT User's Guide





Reader Comment Card

MS-DOS 3.3 Reference Manual

Please use this card to evaluate this manual. Your comments and suggestions will help us improve our publications.

Please rate the following.	Excellent	Good	Fair	Poor
Organization of this manual	☐	☐	☐	☐
Technical accuracy	☐	☐	☐	☐
Completeness of instructions	☐	☐	☐	☐
Clarity of concepts and wording	☐	☐	☐	☐
Quality of examples	☐	☐	☐	☐
Quantity of examples	☐	☐	☐	☐

Comments: _____

_____

_____

_____

_____

Name: _____

Address: _____

City: _____

State: _____ Zip: _____

Please cut out and mail in.
Thank you!
EPSON

PLACE STAMP HERE

EPSON America, Inc.
2780 Lomita Blvd.
Torrance CA 90505

MS 4-1

Fold here