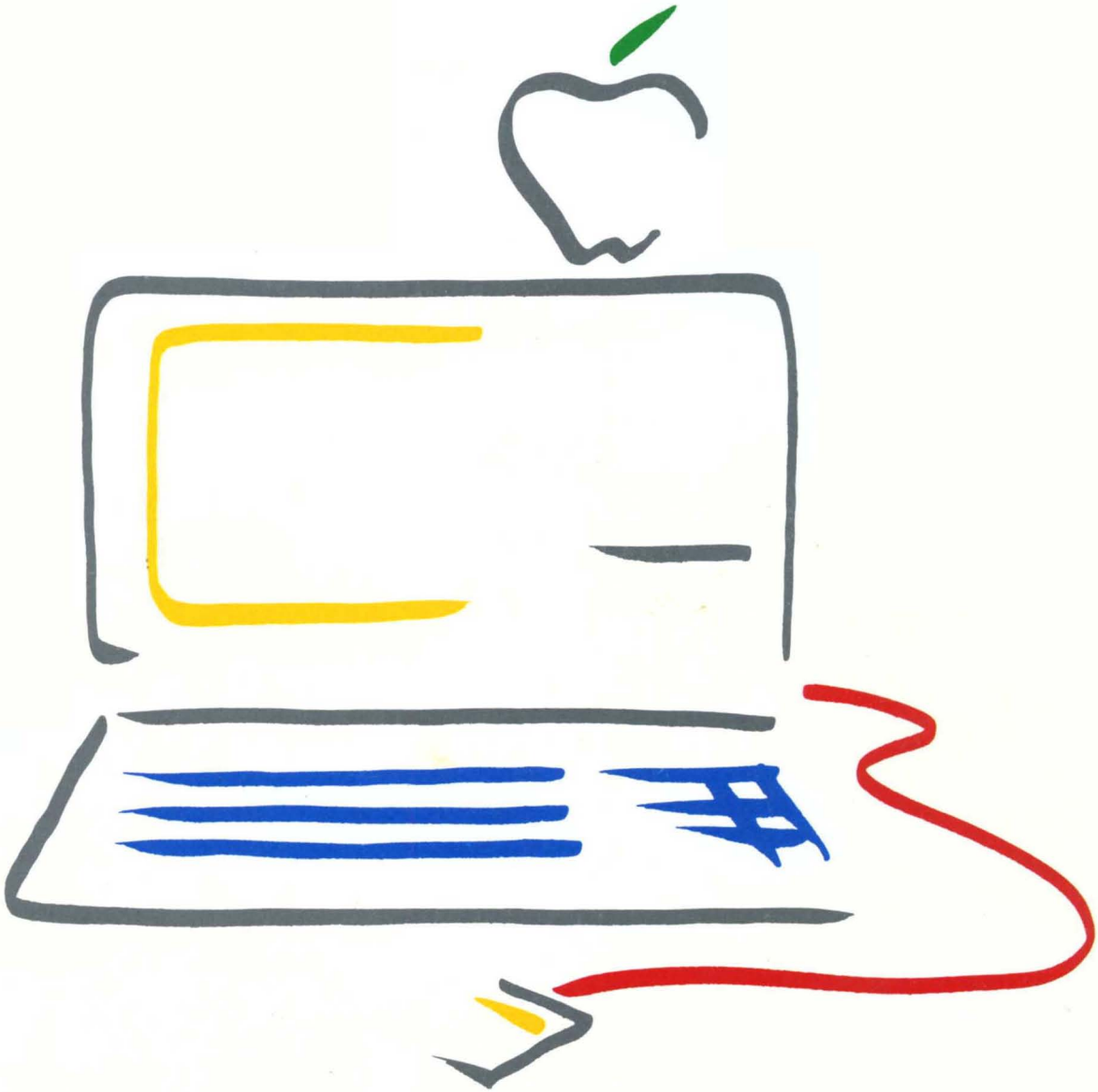
Lisa 2 Owner's Guide



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Owner's Guide

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Do You Have the Right Manual?

This manual, the *Lisa 2 Owner's Guide,* gives guidelines on using and maintaining the hardware that makes up your Lisa® 2 system. *Hardware* consists only of the physical parts of your system—parts like the cabinet, keyboard, and disk drive.

For guidelines on software, which consists of the instructions your Lisa uses to do work, refer to the manual that comes with the software you're using. If you purchased the Lisa Office System software, see the *Lisa Office System* manual for more information on that software.

Which Lisa 2 System Do You Have?

The *Lisa 2 Owner's Guide* covers all the Lisa 2 systems: The Lisa 2, the Lisa 2/5, and the Lisa 2/10. If you aren't sure which of these you have, read the descriptions below. When you've determined which Lisa 2 system you have, you'll be ready to use this manual effectively.

The **Lisa 2** has no hard disk. It has an external parallel port to which you may add a parallel device later.

The **Lisa 2/5** has an external 5-megabyte hard disk connected to the external parallel port.

The **Lisa 2/10** comes with a 10-megabyte internal hard disk. The internal hard disk connects to an internal parallel port; the Lisa 2/10 has no external parallel connector.

Photographs of the different kinds of Lisa 2 systems can be found in Chapter 4, Lisa 2 Hardware.

Chapter 1

Getting Ready

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7 Setting Up the Lisa 2

8 Turning the Lisa On and Off

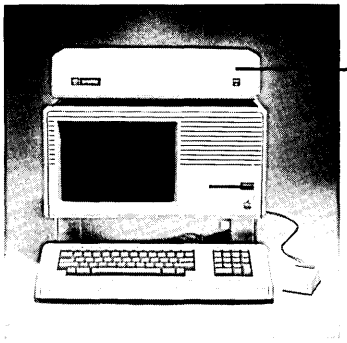
8 Doing Work for the First Time

Setting Up the Lisa 2

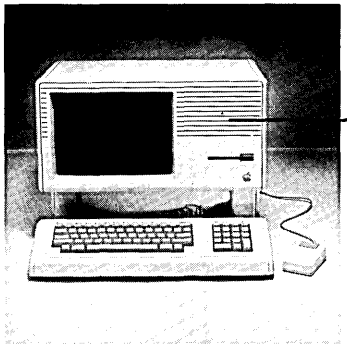
Your Lisa dealer or Lisa service representative probably has set up your system for you. The Lisa should be put together and plugged in, and your software should be installed on your startup disk, before you begin work.

If your system is not set up, refer to Appendix A, Setup Procedures, for instructions on setting up the hardware. Next, if you've purchased the Lisa Office System software, refer to Chapter 6, Setting Up Your System, in the *Lisa Office System* manual. If you are using other software, see the manual that comes with that software.

To connect an extra device that is not covered in the *Lisa 2 Owner's Guide,* refer to the manual that comes with that device.



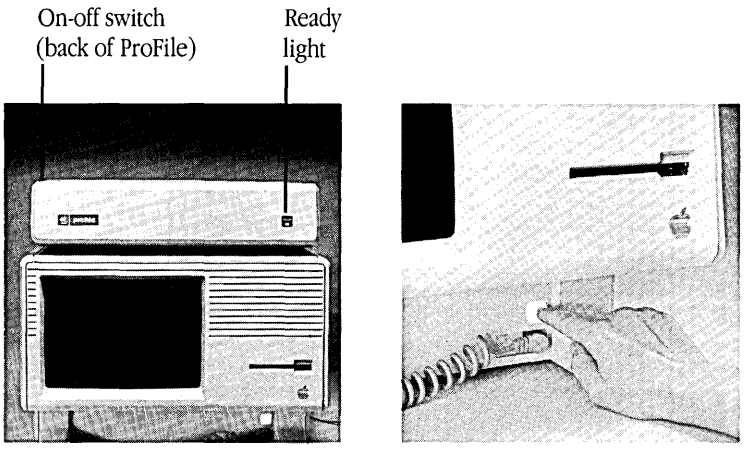
Lisa 2/5



Lisa 2 or 2/10

Turning the Lisa On and Off

If your Lisa system uses an external hard disk for startup, turn the disk on first. Wait a few moments until the disk is up to speed—most external disks have a ready light that shines continuously when the disk is ready for use. Now press the Lisa on-off button. The button is lit when the system is on. If you encounter a problem during startup, refer to Chapter 2, Troubleshooting.



Pressing the on-off button tells the Lisa either to prepare for working or to put your work away. After pressing the button, there's a slight delay as the system readies the Lisa to work for you or prepares to shut down.

There's another reason for the delay when you turn on the Lisa. The system runs a series of internal tests to make sure the Lisa is ready to go to work. If you're interested, Appendix B, Automatic Startup Tests, gives the details.

Warning The Lisa on-off button is a *soft* switch; that is, it turns off the system but does not cut off the power supply. If you need to service the Lisa, be sure to unplug the system.

Doing Work for the First Time

Now that your Lisa 2 is set up, you're ready to put your system to work. The manual that comes with your software should tell you how to put in information and how to respond to the menus and messages that appear on your screen. Now is the time to refer to the *Lisa Office System* manual or the guide that comes with the software you're using.

Chapter 2

Troubleshooting

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11 Are You Using the Lisa Office System Software?
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What's in Troubleshooting?

This chapter contains suggested troubleshooting paths to help you identify problems when certain parts of your Lisa system seem not to be working properly. If you are using the Lisa 2 with the Lisa Office System software, refer to Chapter 8, Troubleshooting, in the *Lisa Office System* manual. There you will find troubleshooting paths for both the Lisa 2 hardware and the Lisa Office System software.

This troubleshooting guide can be used in two ways:

- If you need help identifying which part of the system is causing the problem, start by answering the questions below. Each possible answer directs you either to another question or to a diagnostic procedure.
- If you think you already know which module is at fault, skip the troubleshooting guide and go to the diagnostic procedure for that module.

Every time you turn on the Lisa, it automatically tests enough of the system to verify that startup is possible. For a complete description of the startup tests, see Appendix B, Automatic Startup Tests.

This troubleshooting guide covers only the most likely problems. If the procedures suggested here do not solve your problem, take the system to a qualified service representative for more thorough testing.

Start Here

Are You Using the Lisa Office System Software?

Go to Chapter 8, Troubleshooting, in the *Lisa Office System* manual.

When Did the Problem Arise?

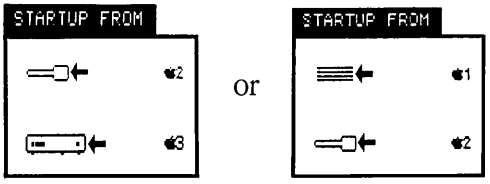
- While you were starting up the Lisa. *Go to Problems during Startup, page 12.*
- While you were working on the Lisa. *Go to Problems while Working, page 14.*
- While you were turning off the Lisa. *Go to Problems while Powering Off, page 15.*

Did the On-Off Button Light Up?

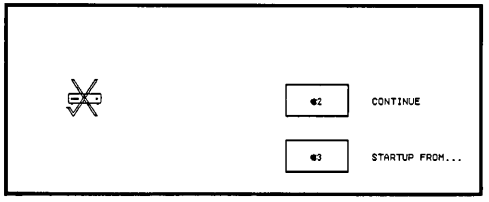
- No. *Go to Procedure A, Power Problems, page 15.*
- Yes. *Go to What Is on Your Screen?, below.*

What Is on Your Screen?

- Nothing. *Go to Procedure M, Startup Symptoms and Error Messages, page 29.*

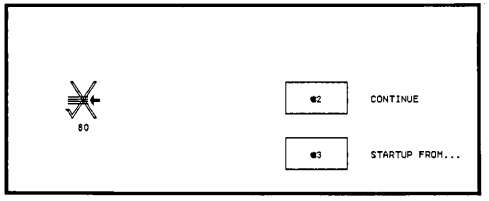


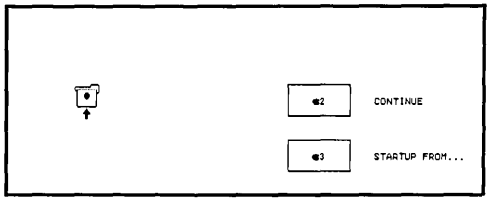
*Go to Procedure N, **Startup From** Menu, page 34.*



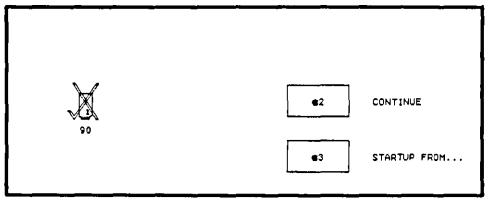
Go to Procedure I, Startup Disk Problems, page 24.

or

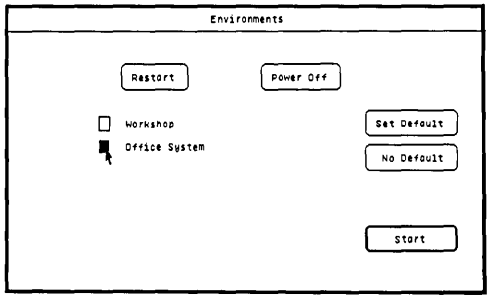




Go to Procedure J, Startup Micro Diskette Problems, page 26.



Go to Procedure K, Startup Expansion Card Problems, page 28.



Go to Procedure P, Environments Window, page 35.

- Some other unexpected display.

  Go to Procedure M, Startup Symptoms and Error Messages, page 29.

- Normal display on the screen.

  Go to How Does the System Respond to Input from You?, page 14.

What Is on Your Screen?

- Nothing. *Go to What Happened When You Pressed the On-Off Button?, page 15.*
- An error message, or some other unexpected display on the screen. *Go to the manual that came with your software.*
- Unstable picture, lines on screen, or display at an angle. *Go to Procedure B, Specific Video Problems, page 17.*
- Normal display on the screen. *Go to How Does the System Respond to Input from You?, below.*

How Does the System Respond to Input from You?

- It ignores everything: Keyboard, on-off button, menu items, commands, and mouse button (though moving the mouse may still move the arrow on the screen). *Go to Procedure D, System Hangs, page 19.*
- Responds correctly to everything except mouse. *Go to Procedure E, Mouse Problems, page 20.*
- Responds correctly to everything except keyboard. *Go to Procedure F, Keyboard Problems, page 21.*
- Responds correctly to everything except command to eject the micro diskette. *Go to the manual for the software you are using.*

- Will not print. — *Go to Procedure G, Daisy Wheel Printer Problems, page 21, or Procedure H, Imagewriter Printer Problems, page 23.*

Problems while Powering Off

What Happened When You Pressed the On-Off Button?

- The system did not respond at all. — *Go to Procedure D, System Hangs, page 19.*
- Powering-off proceeded normally, but the micro diskette was not ejected. — *Go to Procedure L, Ejecting Micro Diskettes, page 29.*

Procedure A: Power Problems

This procedure diagnoses problems where the system does not seem to be getting any power.

1▶ Make sure all cables are firmly in place and the Lisa is plugged in. If the power cord is loose, insert it correctly and try to start the system again.

Warning This equipment is intended to be electrically grounded. This product is equipped with a three-wire grounding-type plug, a plug having a third grounding pin. This plug will fit only into a grounding-type AC outlet. This is a safety feature. If you are unable to insert the plug into the outlet, have a licensed electrician replace the outlet and, if necessary, install a grounding conductor. DO NOT DEFEAT THE PURPOSE OF THE GROUNDING-TYPE PLUG.

2▶ Make sure both front and back panels of the cabinet are installed securely. Each panel is equipped with a safety interlock switch that automatically turns off all power if the panel is not in place.

3▶ Make sure the wall outlet is actually receiving electricity. Try plugging in a lamp and turning it on. If the lamp works, you know that the outlet is working.

4▶ Make sure there are at least 2 inches of air space on all sides of the Lisa and that nothing is blocking the flow of air around the bottom edge of the cabinet.

▶▶▶

A thermostat in the power supply shuts off the system automatically if the temperature surpasses about 90 degrees centigrade (195 degrees Fahrenheit). If the system may have overheated, unplug the Lisa, remove any obstructions to air flow, and let the system cool down for 10 minutes. Try again to turn it on after everything has cooled.

If this procedure reveals a temperature problem, rearrange your system setup to allow for adequate ventilation.

If the system setup, the electrical supply, and the cables all check out, the likely sources of the problem, in order of probability, are

- A bad power supply.
- A bad I/O board.
- A bad on-off switch.

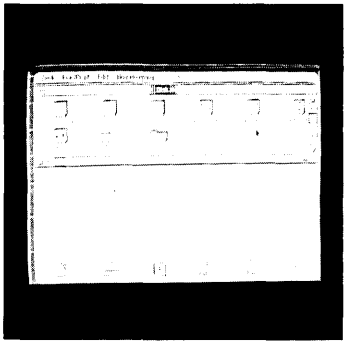
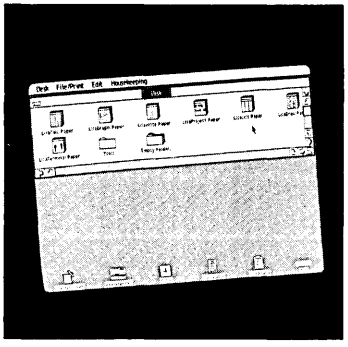
The power supply is the most likely cause of the problem, but the only way to verify the diagnosis is to replace the old power supply. You'll probably need to take the system in for repair. Call a qualified service specialist.

If the power for your system goes off unexpectedly—during a power failure, for example—your work may be left in an unusable state. Look in the manual that comes with your system software to learn how to put your documents back into a usable state. Because documents are stored on disks, this information may appear under the heading *disk repair.* If not, try *records, files,* or *documents.*

Procedure B: Specific Video Problems

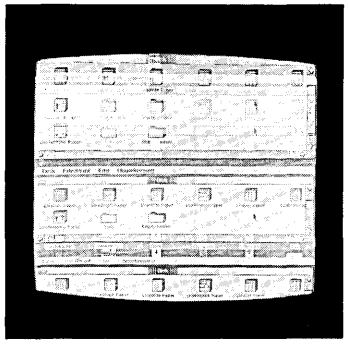
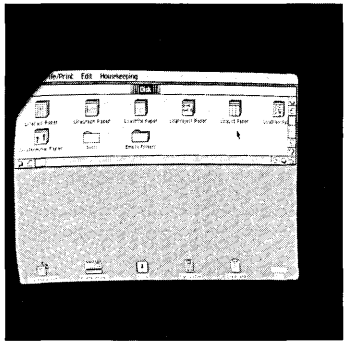
Table 1 shows symptoms that indicate video problems. Except for adjusting the screen brightness, all repairs to the video system must be done by a qualified service technician. Do not try to service the video system yourself; it can be dangerous even when the Lisa is unplugged.

Table 1. Specific Video Problems

If Your Screen Looks like This	Follow This Procedure
 Too bright	Adjust the screen brightness. (See Procedure C, Dark Screen.)
 Crooked picture	Take the system to a qualified service specialist.

▶▶▶

Table 1. Specific Video Problems, continued

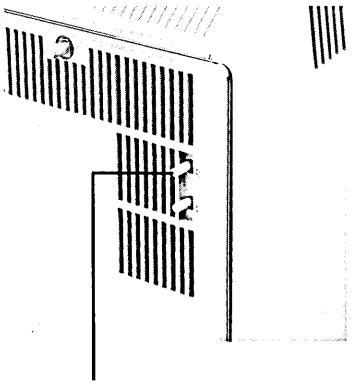
If Your Screen Looks like This	Follow This Procedure
 Rolling picture	Take the system to a qualified service specialist.
 Picture off center	Take the system to a qualified service specialist.

Procedure C: Dark Screen

If your screen goes blank while you are working, your video system may have failed. Before you conclude that you have a hardware problem, however, check for other causes.

1 ▶ Try moving the mouse or pressing the Shift key. The Lisa screen automatically dims if no activity has taken place for several minutes. If this automatic dimming is the cause of your dark screen, moving the mouse or pressing any key should return the screen to its normal contrast level.

2▶ Try adjusting the screen brightness, using the higher of the two white knobs extending from the back of the Lisa. Follow the procedures given in Setting Brightness in Appendix A, Setup Procedures.



Brightness control

3▶ Try turning off the system to let it cool. If the system overheats, the screen darkens. If the problem reoccurs, move the system to a spot where it will get proper ventilation.

If none of these procedures solves the problem, take the Lisa in to a qualified service center. Working on the video system can be dangerous, even when the Lisa is turned off and unplugged.

Procedure D: System Hangs

Sometimes, usually because of software failures, a computer "hangs"—that is, it ignores all input. The usual solution is to turn off the system and start over. Because the Lisa on-off button is channeled through the computer, however, turning the system off is not always possible.

If your screen looks like the screen shown below, type *g* to continue. If the same screen pattern reappears, then type *osquit* and then press the Return key.

```
BUS ERROR in process of gid       3
Process is about to be terminated.
access address =       -8 = mmu#        0  ,   offset   -65544
 inst reg =   11615 sr =  -32764  pc = 3156114
 saved registers at 13369270
Going to Lisabug, type g to continue.

Level 7 Interrupt
KEYCOMMA+0016 4267                    CLR.W   -(A7)
PC=00302892 SR=8004  0  US=00F7C824 SS=00CBFED8 D0=2 P#=00003
D0=000A2700 D1=00000000 D2=0000001B D3=000088E3
D4=FFFFFFFF D5=FFFFFFFF D6=FFFFFFFF D7=FFFFFFFF
A0=003040E0 A1=00CC7F6C A2=00CE004C A3=FFFFFFFF
A4=00F7C866 A5=00F7FA8E A6=00000000 A7=00F7C824
>
```

Your system should restart. Refer to the *Workshop User's Guide for the Lisa* for more detail.

Pushing the reset button on the back of the Lisa is another technique for restarting the system when the software hangs. However, pushing the reset button should be done as a last resort because a reset clears the computer's memory and reinitiates the system startup procedures. This means you'll lose any new document and any revisions that have not been saved on a disk. *Before you push the reset button, make sure you have made every effort to save your work on the disk.* For instructions on how to save your work, refer to the manual that comes with your software. If you are using the Lisa Office System software, see System Hangs, in Chapter 8, Troubleshooting, in the *Lisa Office System* manual.

To reset the system:

1 ▶ Press the reset button once.

Because you pressed the reset button, your disks may have been left in a state the Lisa cannot use. The procedure for repairing your disks—that is, returning the disks to a state the system can use—should be in the manual that comes with the software you are using. If you are using the Lisa Office System software, see Repairing a Disk Damaged while Working, in Chapter 8, Troubleshooting, in the *Lisa Office System* manual.

2 ▶ If the Lisa displays an error message or sounds an error tone, refer to Procedure M, Startup Symptoms and Error Messages.

3 ▶ If the Lisa doesn't respond even to the reset button, unplug the system from the wall outlet. Plug the Lisa back in, turn it on, and listen carefully for error tones. To interpret the error tones, see Table 2, Startup Error Tones, in Procedure M, Startup Symptoms and Error Messages. If the system starts, see items 1 and 2 above.

Procedure E: Mouse Problems

If the screen pointer doesn't respond at all, make sure the mouse is securely connected to the Lisa. Other mouse problems fall into two categories.

Generally Sluggish Response If the screen pointer responds sporadically or unevenly to mouse movement, dirt has probably gotten inside the mouse. Clean the mouse, following the instructions in Chapter 3, Maintenance. While you have the mouse open, check to see if the ball is damaged. If the ball has been gouged, replace it.

If the ball is neither dusty nor worn, and response is still sluggish, the surface on which you are using the mouse may be too uneven. If your desk or table has a particularly uneven surface finish, you can put a clipboard or other flat object under the mouse. If none of these efforts solves the problem, call a qualified service specialist.

Sluggish Response in One Direction Only, or No Response If the pointer moves in one direction only, or if the mouse button doesn't seem to work at all, the mouse probably has a mechanical problem. First, make sure the mouse cable is plugged securely into the back of the cabinet. If this does not solve the problem, call a qualified service specialist.

Procedure F: Keyboard Problems

1▶ First, make sure the keyboard is plugged securely into the cabinet. Pull out the plug entirely and replace it; don't just jiggle it in the socket.

2▶ If the system still does not respond, call a qualified service specialist.

Procedure G: Daisy Wheel Printer Problems

1▶ Check the power to the printer and make sure the printer is turned on.

2▶ Check the cables connecting the Lisa to the printer. Also make sure the modem eliminator and printer cables are connected securely.

3▶ Make sure the printer has been properly connected through the software. Refer to the manual that comes with your software. If you are using the Lisa Office System software, check the Device Connections portion of the Preferences window to make sure the Lisa knows where your printer is attached. A daisy wheel printer must be attached to a serial connector.

See Daisy Wheel Printer Problems in Chapter 8, Troubleshooting, in the *Lisa Office System* manual for more details.

4▶ Make sure the front panel is securely in place on the printer. The printer will not run if the front panel is askew.

5▶ If the Attend light is on, check the ribbon and paper. The daisy wheel printer will not run if the ribbon or paper has run out.

▶▶▶

6▶ Check to see if the ready light is steady. If it isn't, press the button next to it.

7▶ Check the settings on Switch 1, which is in the back of the printer. Make sure Switch 1 is set as shown here.

Switch 1

Number	Position
1	Closed
2	Closed
3	Closed
4	Open
5	Open
6	Closed
7	Closed
8	Closed

For more detail, see Appendix A, Setup Procedures, under Setting Up the Apple Daisy Wheel Printer.

8▶ Run the printer self-check:

a. Turn off the printer.

b. While pressing the form feed switch, turn the printer back on.

c. Release the form feed switch.

The printer should start printing a test display that looks something like the pattern shown here. The test continues until you turn the printer off.

```
$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcd
%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcde
&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdef
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+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijk
,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijkl
-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklm
./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmn
/0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmno
0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnop
123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopq
```

9▶ If printer problems persist, call a qualified service specialist.

Procedure H: Imagewriter Printer Problems

1▶ Make sure the printer is plugged in and turned on and that the green select light is on. If the select light is not lit, press the select button. If the select light doesn't stay on, make sure the printer cover is on securely.

2▶ Check the cables connecting the Lisa to the printer. Also make sure the modem eliminator and printer cables are connected securely.

3▶ Make sure the printer has been properly connected through the software. Refer to the manual that comes with your software.

Warning This equipment is intended to be electrically grounded. This product is equipped with a three-wire grounding-type plug, a plug having a third grounding pin. This plug will fit only into a grounding-type AC outlet. This is a safety feature. If you are unable to insert the plug into the outlet, have a licensed electrician replace the outlet and, if necessary, install a grounding conductor. DO NOT DEFEAT THE PURPOSE OF THE GROUNDING-TYPE PLUG.

4▶ Check the settings on Switches 1 and 2, which are inside the printer. Make sure the switches are set as shown here.

Switch 1	
Number	**Position**
1-1	Open
1-2	Open
1-3	Open
1-4	Open
1-5	Open
1-6	Closed
1-7	Open
1-8	Open

Switch 2	
Number	**Position**
2-1	Closed
2-2	Closed
2-3	Open
2-4	Open

For more detail, see Appendix A, Setup Procedures, under Setting Up the Apple Imagewriter Printer.

▶▶▶

5▶ Run the printer self-check:

a. Turn off the printer.

b. While pressing the form feed button, turn the printer back on.

c. Release the form feed button.

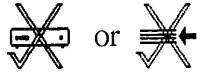
The printer should start printing a test display that looks something like the one shown here. The test continues until you turn the printer off.

```
[\]^_`abcdefghijklmnopqrstuvwxyz{|}~ !"#$%&'()*+,-./0123456789
\]^_`abcdefghijklmnopqrstuvwxyz{|}~ !"#$%&'()*+,-./0123456789:
]^_`abcdefghijklmnopqrstuvwxyz{|}~ !"#$%&'()*+,-./0123456789:;
^_`abcdefghijklmnopqrstuvwxyz{|}~ !"#$%&'()*+,-./0123456789:;<
_`abcdefghijklmnopqrstuvwxyz{|}~ !"#$%&'()*+,-./0123456789:;<=
`abcdefghijklmnopqrstuvwxyz{|}~ !"#$%&'()*+,-./0123456789:;<=>
abcdefghijklmnopqrstuvwxyz{|}~ !"#$%&'()*+,-./0123456789:;<=>?
bcdefghijklmnopqrstuvwxyz{|}~ !"#$%&'()*+,-./0123456789:;<=>?@
cdefghijklmnopqrstuvwxyz{|}~ !"#$%&'()*+,-./0123456789:;<=>?@A
defghijklmnopqrstuvwxyz{|}~ !"#$%&'()*+,-./0123456789:;<=>?@AB
efghijklmnopqrstuvwxyz{|}~ !"#$%&'()*+,-./0123456789:;<=>?@ABC
fghijklmnopqrstuvwxyz{|}~ !"#$%&'()*+,-./0123456789:;<=>?@ABCD
ghijklmnopqrstuvwxyz{|}~ !"#$%&'()*+,-./0123456789:;<=>?@ABCDE
hijklmnopqrstuvwxyz{|}~ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEF
ijklmnopqrstuvwxyz{|}~ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFG
```

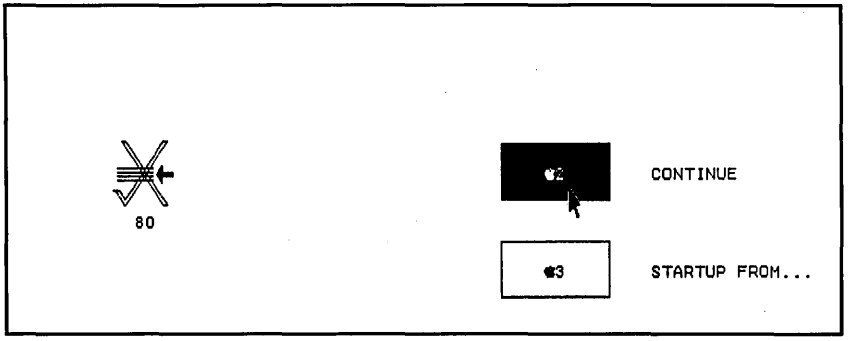
Examine the test pattern. All the characters should be complete (no dots missing) and neatly aligned. The lines should appear equally black from end to end. Spacing between characters and between lines should be even. Check for correct ribbon insertion, paper loading, and thickness setting if the test pattern lacks any of these characteristics.

Procedure I: Startup Disk Problems

The presence of one of these icons on your screen means that the Lisa is looking unsuccessfully for the startup instructions on the hard disk.



First try clicking Continue.



If this works, it may be that your disk was not up to speed so the Lisa could not find the startup instructions. If you are using an external disk as your startup disk, be sure the ready light is steady before turning on the Lisa.

If you're trying to use the disk represented by the icon as your startup device, read step 1, below. If you're trying to start up from an external hard disk and you have more than one disk attached, make sure the system is trying to start from the right disk (see step 2, below). If you're trying to use some other disk, see step 2, below.

1▶ To see if the problem happens again:

a. Turn off the Lisa.

b. Turn on the Lisa.

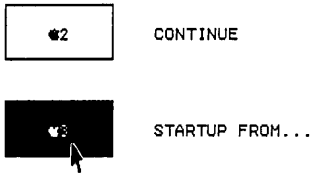
If the problem reoccurs, note the error message number that appears under the icon. Error message number 75 or 84 indicates a possible software problem. Refer to the manual that comes with your software. If you are using the Lisa Office System software, try reinstalling the Office System software. (See Repairing a Startup Disk and Reinstalling the Office System, under Disk Repair, Chapter 8, Troubleshooting, in the *Lisa Office System* manual.)

If reinstalling the Lisa Office System does not fix the problem or if another error number appears, this may indicate a hardware problem.

Any error number other than 75 or 84 indicates a possible hardware problem. Contact a qualified service specialist.

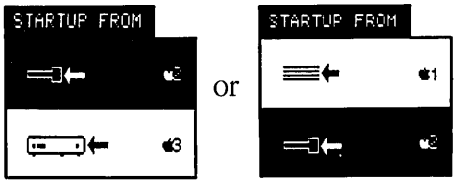
2▶ If you are trying to start up from any device other than the hard disk, the Lisa is looking for the startup instructions in the wrong place.

a. Click Startup From.



▶▶▶

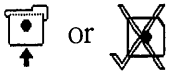
b. When the **Startup From** menu appears, use the mouse to select the startup device you are trying to use.



Depending on which Lisa 2 system you have, the Lisa uses either the internal hard disk (for the Lisa 2/10) or the ProFile (for the Lisa 2/5) as the default startup device—that is, the device the Lisa uses if you do not specify otherwise. If you usually start up from a different device, the startup specifications in your system may be set incorrectly. If you are using the Lisa Office System software, open the Preferences icon and check the specifications for Startup. For other software, check the manual that comes with that software.

Procedure J: Startup Micro Diskette Problems

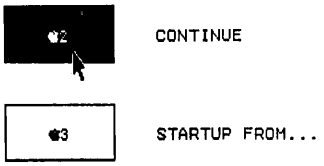
The presence of either of these icons means that the Lisa is looking unsuccessfully for a startup micro diskette (left) or is having a problem reading—that is, using—the startup diskette (right).



If you are trying to start up from a micro diskette, read step 1, below. If you are trying to start up from a hard disk, read step 2, below.

1▶ Make sure the micro diskette is properly inserted and the diskette is a startup micro diskette (a Lisa Office System 1 diskette or a Development System 1 diskette, for example).

a. After checking the micro diskette, click Continue.



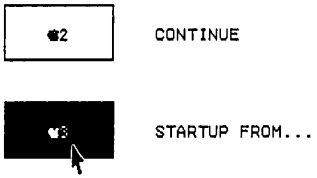
b. If the same message appears, eject the diskette and try using another micro diskette in your Lisa. If you determine that your micro disk drive needs servicing, call a qualified service specialist.

A diskette may be damaged physically, or the information stored on the diskette may not be usable. If your diskette is physically damaged, use its backup copy. If your diskette is unusable, you'll need to repair it. Refer to the manual that comes with your system's software for information on how to repair the diskette. If you are using the Lisa Office System software, see Repairing a Disk Damaged while working, in Chapter 8, Troubleshooting, in the *Lisa Office System* manual.

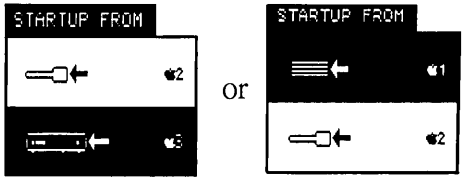
2▶ If you are not trying to start up from a micro diskette, the presence of its icon on your screen means that the Lisa is trying to start up from the wrong device.

To start up from your usual device:

a. Click Startup From.



b. When the **Startup From** menu appears, use the mouse to select your startup disk drive.



If this procedure works, the startup specifications set through your software have probably been altered. If you are using the Lisa Office System software, open the Preferences icon and check the startup specifications. If they are correct, the Lisa probably received an alternative startup command during the initial startup. You may have caused this inadvertently by pressing keys while the system was starting up.

Procedure K: Startup Expansion Card Problems

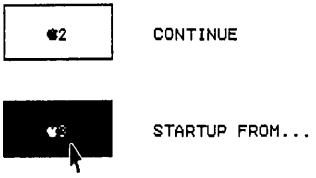
The presence of this icon on your screen means that the Lisa is looking unsuccessfully for the system startup software on a device connected to an expansion card. If your startup device is in fact attached to an expansion card, read step 1, below. If your startup device is not attached to an expansion card, read step 2, below.

1▶ Make sure the expansion card is securely in place and the cable between the expansion card and the startup device is firmly attached. Verify that the startup device is turned on. Try again to start up the Lisa. If the same message appears, call a qualified service specialist.

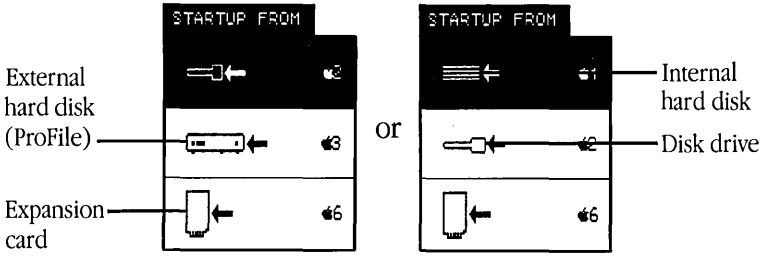
2▶ If your startup device is not attached to an expansion card, the presence of the expansion card icon on your screen means the Lisa is trying to start up from the wrong device.

To start up from your usual device:

a. Click Startup From.



b. When the **Startup From** menu appears, use the mouse to select your startup disk drive.



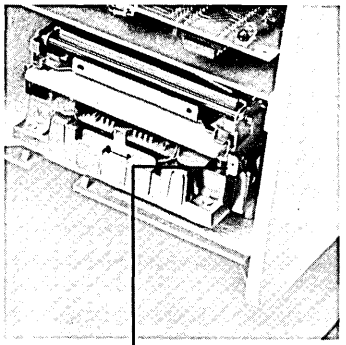
If this procedure works, the startup specifications set through your software have probably been altered. If you are using the Lisa Office System software, open the Preferences icon and check the startup specifications. If they are correct, the Lisa probably received an alternative startup command during the initial startup. You may have

caused this inadvertently by pressing keys while the system was starting up.

Procedure L: Ejecting Micro Diskettes

The Lisa automatically ejects the micro diskette before powering off. If something goes wrong and your diskette is trapped in the drive, turn on your system and try to eject the micro diskette as you would normally. If you are using the Lisa Office System software, open the **Housekeeping** menu and choose **Eject "Micro Diskette"**, or press the Apple key and the letter *E*.

If neither procedure works, turn off the Lisa and unplug it from the wall socket. Next, remove the front panel and push the manual disk-eject button.



Disk-eject button

If the Lisa still fails to eject the micro diskette, the micro disk drive probably has a mechanical problem. Do not try to pry the diskette out of the drive. The diskette is clamped in place; forcing it out of the drive will probably damage the drive and destroy the diskette. Call a qualified service specialist.

Procedure M: Startup Symptoms and Error Messages

Every time you turn on the Lisa, the system automatically runs a series of internal tests. These tests fall into two categories:

- The *kernel* tests, which are designed to catch problems serious enough to interfere with the rest of the sequence. After the kernel tests, the Lisa emits one click.
- The *module* tests, which may result in specific error messages. After the module tests, the Lisa emits a double click.

Errors detected during the tests can result in screen messages, error tones, or both. If your screen shows a dialog box, read the discussion following the tables below.

Table 2 lists the error tones generated by various startup tests and their meanings. If you do not remember whether or not the Lisa sounded any error tones during startup, press the reset button once to repeat the tests.

▶▶▶

Table 2. Startup Error Tones

Tones	Icon	Meaning
Low	None	CPU or memory error. Must be diagnosed by a qualified service specialist.
Low, Low	None	Memory failure in preliminary test. Call a qualified service specialist to replace one or both memory boards.
Low, High	Card cage	A problem somewhere in the card cage. Call a qualified service specialist to run a complete system check to identify which board is causing the problem.
Low, Low, High	CPU board	Call a qualified service specialist to run CPU board diagnostic.
Low, High, Low	I/O board	Call a qualified service specialist to run I/O board diagnostic.
Low, High, High	Memory board	Call a qualified service specialist to replace specified memory board.
High, Low, Low	Expansion card	Call a qualified service specialist to replace expansion card in specified slot.

Table 2. Startup Error Tones, continued

Tones	Icon	Meaning
High, Low, High	Keyboard	Call a qualified service specialist to run keyboard diagnostic.
High, High, Low	Keyboard/ mouse	Keyboard or mouse disconnected. Continue without keyboard or mouse, or attach keyboard or mouse. If both are attached, call a qualified service specialist to run keyboard or mouse diagnostic.
High, High, High	Disk drive, disk, or expansion card	Startup failure. Insert startup disk, specify a different startup drive, or check startup drive. See Procedure J, K, or L.

Table 3 lists the most common kernel test failures and the likely solutions. For a more complete discussion of the kernel tests and a list of the specific error messages and their meanings, see Appendix B, Automatic Startup Tests.

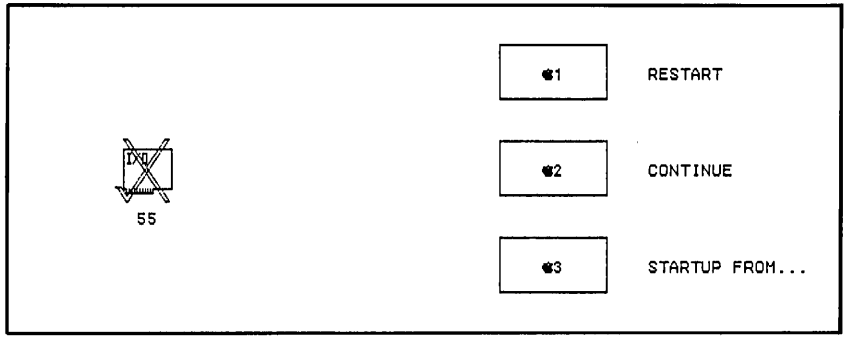
▶▶▶

Table 3. Kernel Test Failures

Symptom	Possible Fix
Blank screen, no error tones	Call a qualified service specialist to (1) replace CPU board, (2) replace I/O board, or (3) replace card cage.
White screen with white lines showing, no error tones	Call a qualified service specialist to replace CPU board.
Random display, no error tones	Call a qualified service specialist to replace CPU board.
Random display, two low error tones	Call a qualified service specialist to (1) replace memory board, (2) replace CPU board, or (3) replace card cage.
Flashing screen and repeated error tone, alternating low and high pitch	Call a qualified service specialist to (1) replace I/O board, (2) replace CPU board, or (3) replace card cage.
Blank screen or random display, with error tones	Call a qualified service specialist to replace board according to error tone sequence. See Table 2, Startup Error Tones.

Some of the error messages indicate hardware problems with the Lisa; others indicate a problem with the system setup. In general, the presence of an icon with or without a numeric code means that the module represented by the icon should be checked.

Some startup error messages are presented to you in a dialog box, which offers you up to three choices, as shown here.



Make your choice either by clicking one of the boxes or by holding down the Apple key while pressing the number displayed in the box.

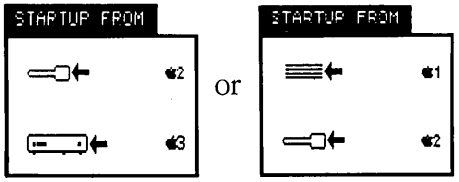
Restart If you click Restart, the Lisa repeats the startup tests. Choose Restart if you want to verify the test results.

Continue The Continue option appears only if the problem is one that allows startup to continue. If, for example, your system is set to start up from a micro diskette and you've forgotten to insert the diskette, simply insert the diskette and click Continue. The Lisa continues the startup procedures.

Startup From When you click Startup From, the Lisa displays the **Startup From** menu and waits for you to specify a startup device. Choose this option when you want to use a startup device different from the one set through your software.

To choose a startup device different from the one normally used:

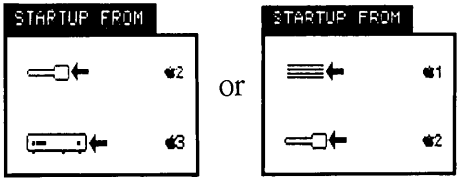
1▶ Click on the device you want to use, or hold down the Apple key while pressing the key listed in the menu next to the device you want to use.



As soon as you choose a device, the Lisa continues the startup procedures.

Procedure N: Startup From Menu

The **Startup From** menu appears any time you press any key except Caps Lock during the module test sequence of the automatic startup tests.



The **Startup From** menu allows you to specify a different startup device from the one you usually use.

If you unintentionally interrupted the startup sequence by pressing a key, simply select your startup device from the **Startup From** menu. The Lisa will continue normal startup procedures.
To bring up the **Startup From** menu during startup:

1▶ Turn on the Lisa.

2▶ When the cabinet emits a single click, and before it emits a double click, press any key except Caps Lock.

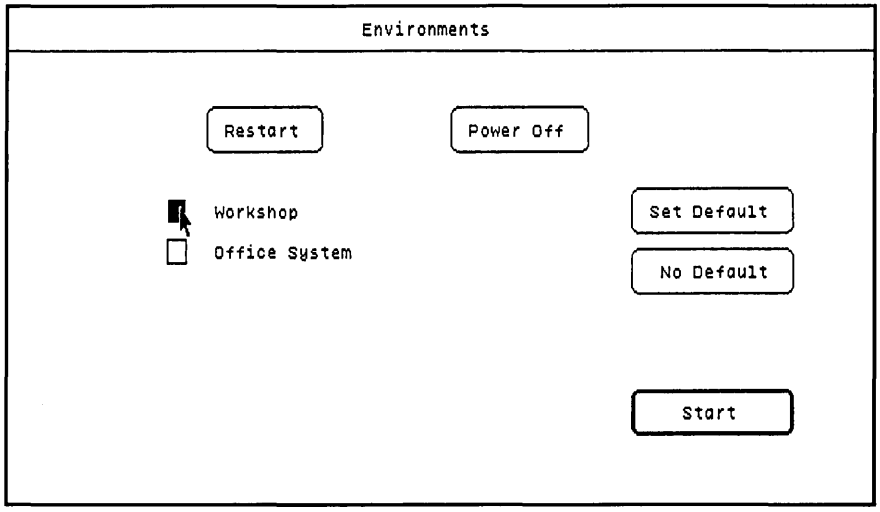
Procedure O: Operating System Errors

This icon on your screen means that the Lisa Office System has failed. There is probably nothing wrong with your hardware; you have encountered a problem with the software.

See the manual that comes with your startup software. If you are using the Lisa Office System software, refer to Operating System Errors in Chapter 8, Troubleshooting, in the *Lisa Office System* manual.

Procedure P: Environments Window

If your startup disk contains any software other than the Lisa Office System, you may encounter a screen similar to the one shown here when you start up the Lisa.



This display, known as the Environments window, allows you to specify which software you want to use. Refer to Appendix C, Environments Window, for more detail.

Chapter 3

Maintenance

Contents

39 What's in Maintenance?

39 Cleaning the Glare Filter

40 Cleaning or Replacing the Mouse Ball

43 Cleaning the Housing

What's in Maintenance?

The Lisa requires almost no day-to-day maintenance. Most of the procedures recommended in this section, such as cleaning the glare filter, are for your comfort and convenience.

It's a good idea to review Table 1, Suggested Maintenance, soon after you set up your system so that you will know which parts of the Lisa you can clean. Later, when you have spilled something on the housing or you think the mouse may be dirty, look up the procedures in this section.

Table 1. Suggested Maintenance

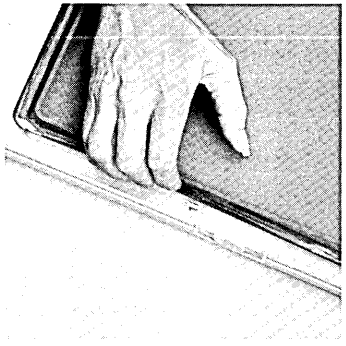
What	When	Page
Clean glare filter	Screen dusty	39
Clean mouse ball	Mouse response unreliable; ball sticky or dusty	40
Clean housing	Housing dirty	43

Cleaning the Glare Filter

Whenever the Lisa's video display is on, the screen has a slight static charge, which acts as a dust magnet. The accumulated dust will eventually make the display hard to read. You can keep the screen fairly dust free by wiping it gently every few weeks with the specially treated cloth that came with your Lisa. If dust has worked its way under the glare filter, or if the screen has spots from liquid spills, use the following procedure to clean the glass and filter.

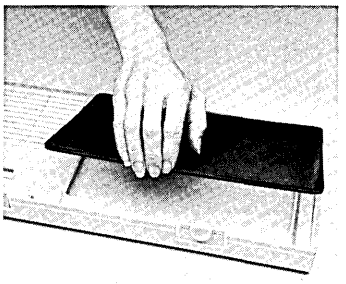
1▶ To turn off the system and remove the front panel, follow steps 1 through 4 under Installing the Glare Filter, Appendix A, Setup Procedures.

2▶ Push the frame of the glare filter out from under the metal clip at the bottom center of the frame.



▶▶▶

3▶ Grasp the frame by the lower edge and lift the lower edge up until the top edge pops out from beneath the upper clip.



4▶ Wipe both the front and the back of the glare filter with the treated cloth that came with your Lisa.

5▶ Shake out the cleaning cloth to remove the dust. Do not wash the cloth.

6▶ If the glare filter has spots from liquid spills, clean it in warm, soapy water. The filter can be torn, so treat it gently. Dry the filter with a towel before installing it over the video screen. (Do not use the treated cleaning cloth to dry the filter.)

7▶ Clean the glass on the video screen with any glass cleaner and a soft cloth (don't use the specially treated cleaning cloth). Do not spray any liquid directly onto the glass because stray drops could get into other parts of the cabinet. Instead, spray the cleaner onto the cloth, and then wipe the glass.

8▶ Replace the glare filter and front panel, following steps 5 through 8 under Installing a Glare Filter, Appendix A, Setup Procedures.

Cleaning or Replacing the Mouse Ball

If the mouse runs over a sticky spill, or if it is in an environment with a lot of dust or eraser crumbs, dirt may accumulate inside the mouse and make it unreliable. A simple cleaning of the ball will eliminate the problem.

1▶ Detach the mouse cord from the Lisa, following this procedure:

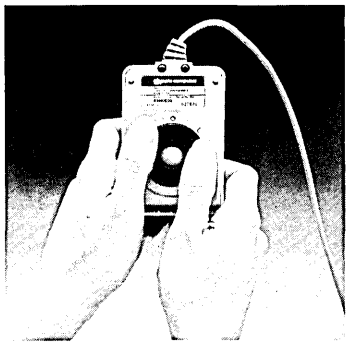
a. Loosen the two screws that hold the mouse cord connector to the back of the Lisa.

b. Pull the cord free from the Lisa.

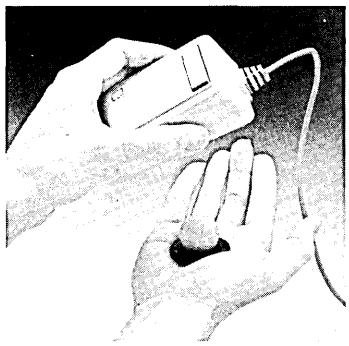
2▶ Open up the mouse, following this procedure:

a. Turn the mouse over, exposing the black plastic ring around the ball.

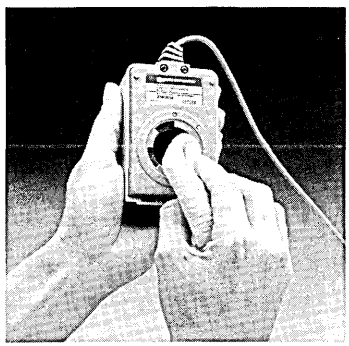
b. Pressing down on the ring, turn it counterclockwise 45 degrees until the marker on the ring lines up with the *O* (for *Open*) on the mouse case.



3▶ Turn the mouse over and let the ring and ball fall into your hand.

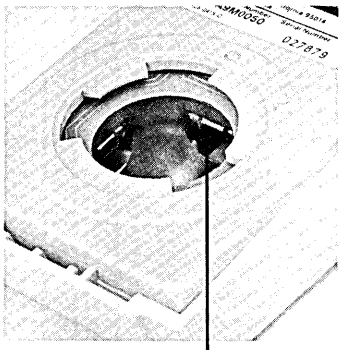


4▶ If the ball is sticky, rinse it off gently and dry it thoroughly.



▶▶▶

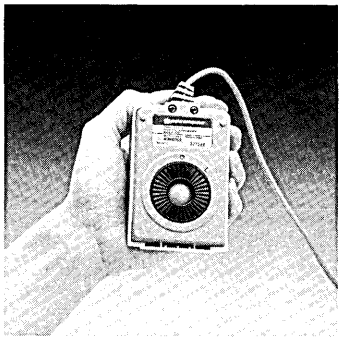
5▶ Wipe the inside of the case with a clean, dry cloth. Be sure to thoroughly clean the two rollers inside the case.



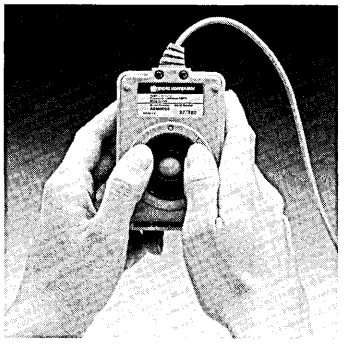
6▶ Reassemble the mouse, following this procedure:

a. Drop the ball gently into the hole.

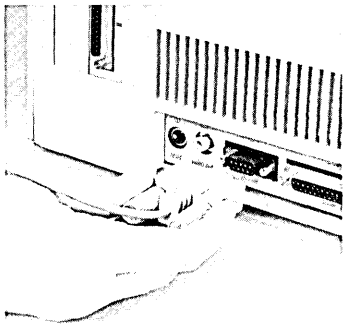
b. Place the ring over the ball, lining up the marker with the *O* (for *Open*) on the case.



c. Pressing down on the ring, turn it clockwise 45 degrees until the marker lines up with the *L* (for *Locked*) on the mouse case.



7▶ Reattach the mouse cord to the back of the Lisa.



Cleaning the Housing

The cabinet, keyboard, and mouse housing can be cleaned with most commercial cleaning solutions, but don't use any solvent containing kerosene or pine oil. These chemicals will damage the plastic.

When you clean the housing, follow these safety procedures:

- Turn off and unplug the Lisa before using any liquid on it.
- Don't spray anything into or near the air vents or the slot of the micro disk drive.
- Don't spray solvents on the keys.
- Don't try to clean anything inside the housing or the keyboard. You can clean the inside of the mouse, following the procedure given earlier in this section.

Chapter 4

Lisa 2 Hardware

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What's in Lisa 2 Hardware?

This chapter is about *hardware* —that is, the physical parts of the Lisa 2 system. *Software* —the instructions the Lisa uses to do work—is covered in the manual that comes with the software. Appendix A, Setup Procedures, gives directions for setting up your Lisa 2.

In this chapter, you'll find general information about the three possible kinds of Lisa 2 systems. You'll also find information about the major Lisa 2 components, their roles in the system, and the physical specifications for these components.

If you are using the Lisa Office System software, refer to the *Lisa Office System* manual for background information on using this software. If you are a programmer using the Development System, refer to Chapter 3, The System Manager, in the *Workshop User's Guide for the Lisa* for detailed descriptions of utility programs and standard interfaces.

Lisa 2 Systems

The Lisa 2, the Lisa 2/5, and the Lisa 2/10 are all Lisa 2 systems. The essential difference among these Lisa 2 systems is memory capacity. Different memory size reflects the type of hard disk your system has or whether it has one at all.

The Lisa 2/10 comes with a 10-megabyte internal hard disk connected to an internal parallel connector.

The Lisa 2/5 comes with an external 5-megabyte hard disk, but no internal hard disk. The disk connects to an external parallel port.

The Lisa 2 comes with no hard disk. Like the Lisa 2/5, the Lisa 2 has an external parallel port.

This is the Lisa 2 family of systems. If you add another kind of hard disk, one not mentioned above, refer to the manual that comes with the disk.

System Parts

The Lisa 2 system consists of three separate parts: The keyboard; the mouse; and the cabinet containing the computer itself, the video screen, and the micro disk drive. If you have a Lisa 2/10 system, the cabinet also contains an internal hard disk. If you have a Lisa 2/5, you have an external hard disk instead. Figure 1 shows the Lisa 2 and all possible components. Figure 2 shows the back of the Lisa 2 or 2/5. The backs of the Lisa 2 and the Lisa 2/5 look the same as the back of the Lisa 2/10, except that the Lisa 2 and the Lisa 2/5 have parallel ports to the left of the mouse connector. Figure 3 gives a back view of the Lisa 2/10.

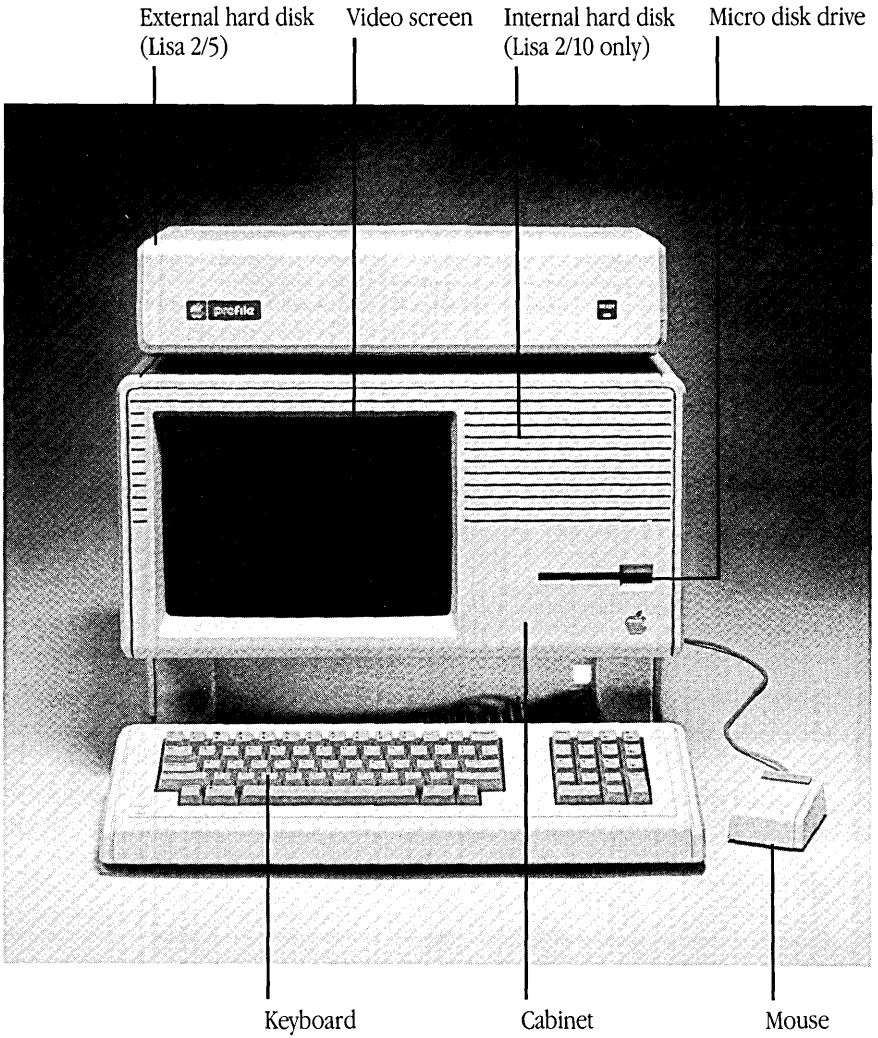


Figure 1. Lisa 2, Front View

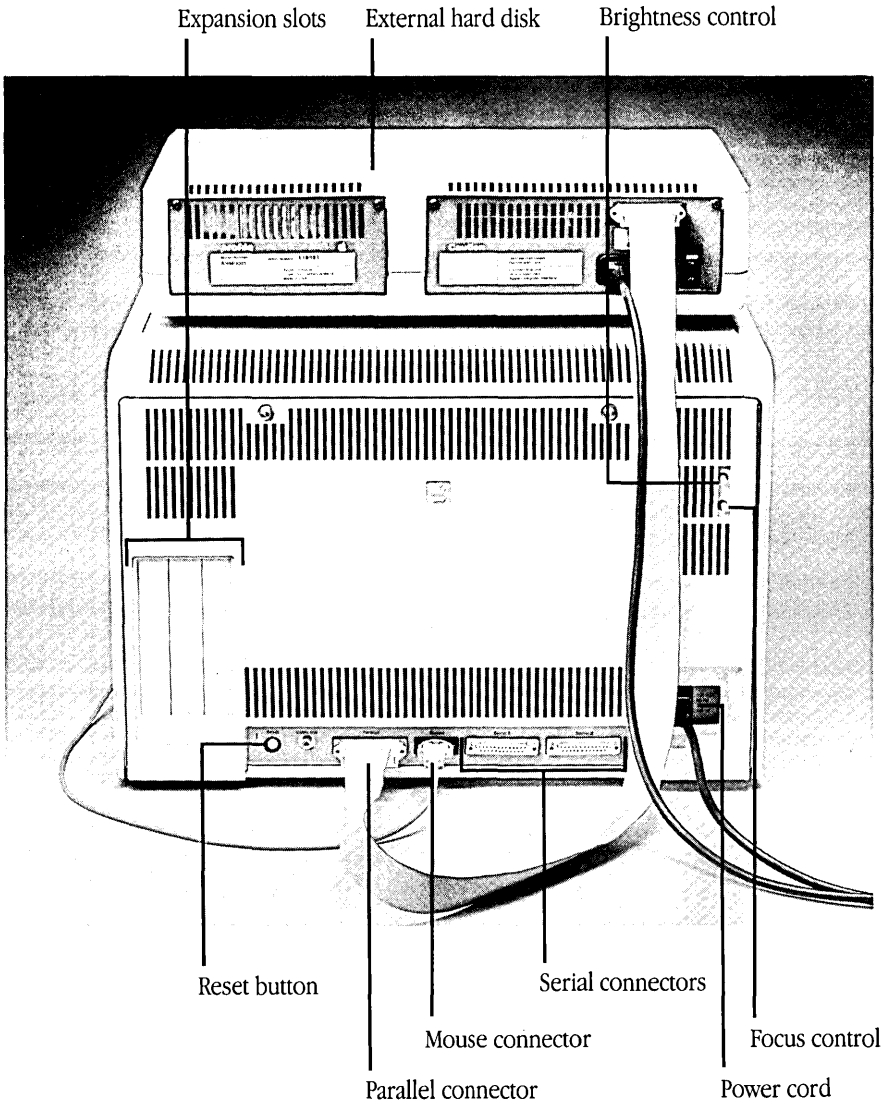


Figure 2. Lisa 2 or 2/5, Back View

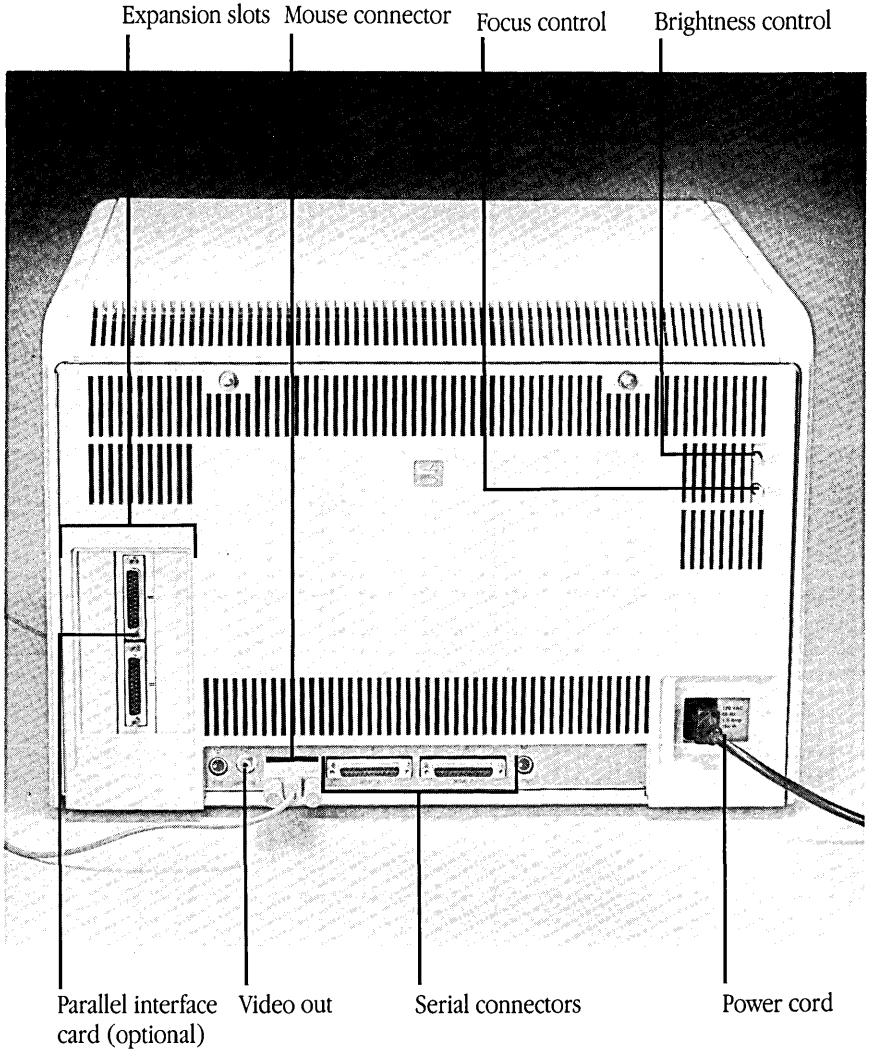
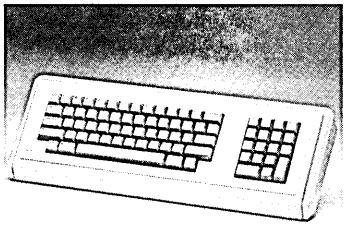


Figure 3. Lisa 2/10, Back View

Keyboard

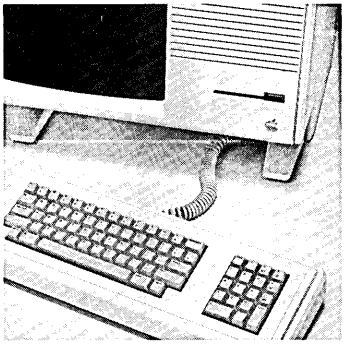


The Lisa keyboard is much like a typewriter keyboard, with a few additional keys.

The functions of the Clear, Enter, Apple, and arrow keys (up arrow, down arrow, left arrow, right arrow) depend on the tool you're using. These functions are described in the manuals that come with the Lisa tools. The Caps Lock key is like a shift lock key, except that the Caps Lock key affects only the letter keys, not the number or punctuation keys.

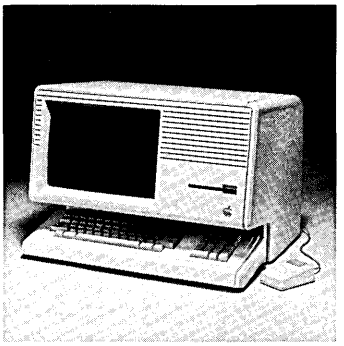
The Option keys, which work like the Shift keys, give you access to a set of special symbols and international characters. The specific set of option keys available to you depends on what software is installed in your system. Refer to the manual that comes with your software. To type one of the special characters, hold down either Option key while pressing the key for the character you want.

All letter and number keys on the Lisa keyboard repeat automatically when held down. Depending on what software you are using, you may be able to specify the time lag before the keys start to repeat and the rate at which they repeat. Instructions for making these adjustments appear in Chapter 6, Setting Up Your System, in the *Lisa Office System* manual and in Chapter 3, The System Manager, in the *Workshop User's Guide for the Lisa.* If you are using other software, refer to the manual that comes with that software.



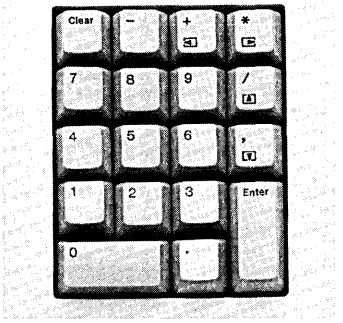
The keyboard is attached to the Lisa by a flexible cable that lets you put the keyboard on your lap or wherever the keyboard is most comfortable and convenient while you're working. The maximum safe extension of the cable is 4 feet.

When you are not using the Lisa, you can save space and protect the keyboard by sliding it under the front of the cabinet.



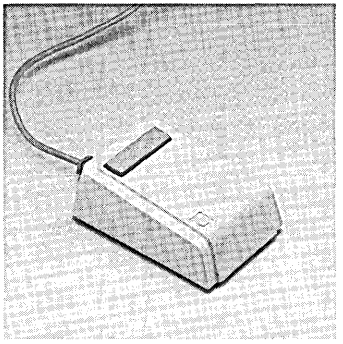
Numeric Keypad

The numeric keypad on the right side of the keyboard is for your convenience when entering numbers and equations. The Clear, Enter, and arrow keys are discussed in the tool manuals.



Mouse

Like the keyboard, the mouse is a device for communicating with the Lisa. Rolling the mouse along a flat surface moves a pointer on the video screen; pressing the button on top of the mouse signals the Lisa that the pointer is in the location you want. If you are using the Lisa Office System software, use of the mouse is covered in LisaGuide in the *Lisa Office System* manual. If you are using software other than the Lisa Office System, see the manual that comes with that software.



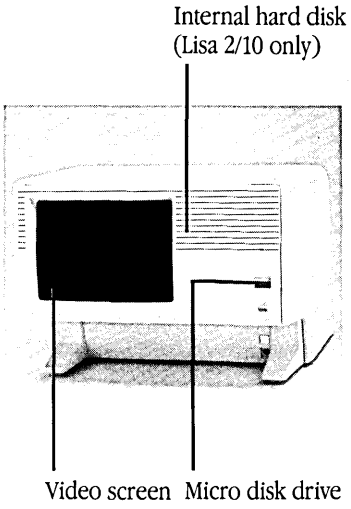
The mouse is quite sturdy and can tolerate a lot of rolling and button-pressing. However, a sudden impact could damage the sensors inside. Avoid dropping the mouse or hitting it against hard objects.

After several hundred hours of use, the inside of the mouse can accumulate enough dust to make pointer control uneven. Instructions for cleaning the mouse appear in Chapter 3, Maintenance.

Cabinet

The cabinet contains the computer itself, the video screen, and the micro disk drive. The cabinet of the Lisa 2/10 contains an internal hard disk.

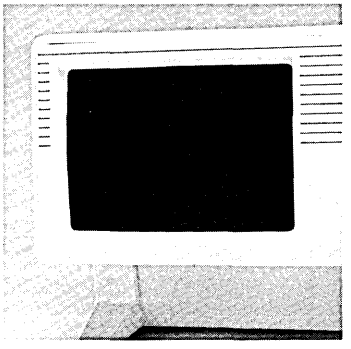
The cabinet also contains the power supply. To prevent electrical accidents, both the front and the back panels of the cabinet are equipped with safety interlock switches. If you remove either panel while the Lisa is running, the safety switches immediately cut off power to the system. Without power, the computer loses everything in its memory, including any documents you were working on.



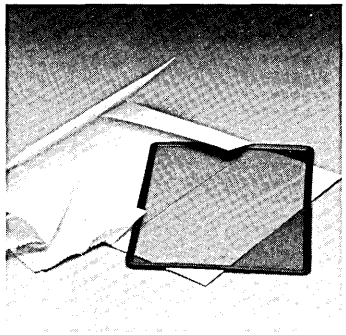
Note: The safety interlock switches do not cut off power to the power supply. Always turn off and unplug the Lisa before opening the cabinet.

Video Screen

The brightness and focus of the Lisa video screen are controlled mechanically; the contrast is set through software. Instructions for setting the focus appear under Screen Controls, later in this chapter. For instructions on setting the contrast, refer to the manual that comes with your software.



A special glare filter comes in the Lisa accessories box. In most environments the filter is unnecessary, but sometimes windows or overhead lights cause irritating reflections on the screen. If screen glare is a problem for you, install the filter according to the instructions in Appendix A, Setup Procedures. After you install the filter, you will have to readjust the screen contrast and brightness.

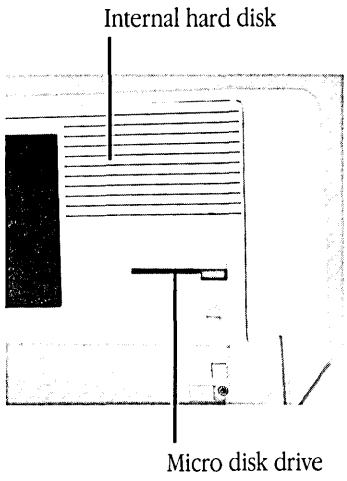


After many hours of exactly the same display, screens are subject to burn-in: The screen picks up a permanent image that is the negative of the display. To protect against burn-in, the Lisa dims the screen if no activity has taken place for several minutes. Once the screen has dimmed, any key press or mouse movement returns the screen to the normal contrast level. Instructions for setting the time lag before dimming and the contrast level of the dim display should be in the manual that comes with your software. If you are using the Lisa Office System software, see Chapter 6, Setting Up Your System, in the *Lisa Office System* manual. Convenience settings are also covered in Chapter 3, The System Manager, in the *Workshop User's Guide for the Lisa.*

With the Lisa Office System and some other software, you can dim the screen yourself at a moment's notice, using the screen's privacy feature. To dim the screen, hold down both the right-hand Option key and the right-hand Shift key while pressing the *0* on the numeric keypad. To return the screen to its normal contrast level, press the same combination of keys.

Internal Hard Disk

The Lisa 2/10 internal hard disk can store the Lisa software and the documents you create with the Lisa.



External Hard Disk (ProFile)

The Lisa 2/5 comes with an external 5-megabyte hard disk that connects to the back of the Lisa. The external hard disk stores the software and the documents you create with the Lisa. Refer to your software manual for more information about using your hard disk.

Micro Disk Drive

The Lisa's micro disk drive accepts special 3.5-inch micro diskettes. When you buy blank diskettes, be careful to get diskettes that are compatible with the Lisa's micro disk drive.

Insert a micro diskette into the drive slot with the label facing up and the metal plate leading. The arrow embossed on the diskette should point toward the drive.

Push the diskette into the micro disk drive until it clicks into place. When the diskette is in place, you can hear the micro disk drive clamp onto the diskette. Once a diskette is in place and clamped, do not try to pull it out.

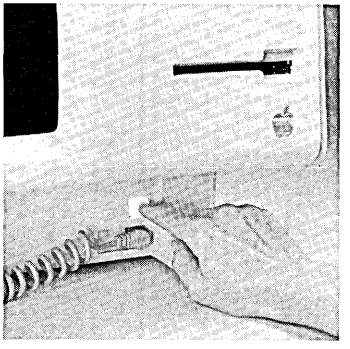
To learn about caring for micro diskettes, refer to Appendix D.

Ejecting a micro diskette from the drive can be controlled by software. If you are using the Lisa Office System software, open the **Housekeeping** menu and choose **Eject "Diskette"**, or press simultaneously the Apple key and the letter *E*. To eject a micro diskette using other software, see the manual that comes with that software.

Another way to eject a diskette is to press the on-off button. Either way, there may be a delay while the computer updates and releases the micro diskette.

On-Off Button

If your Lisa has an external startup disk, turn the disk on first. Wait a few minutes until the disk is up to speed. (Most external disks have a ready light that shines continuously when the disk is ready for use.) Then, press the on-off button when you want to turn the Lisa on or off. The button is lit when the Lisa is on.



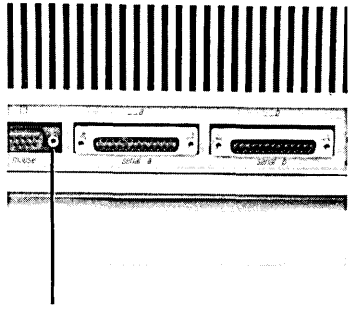
Warning The Lisa on-off button is a *soft* switch; that is, it turns off the system but not the power supply. If you intend to service the Lisa, turn it off and unplug it from the wall socket.

To prolong the life of the power system, leave the Lisa on continually as long as you are using it every day. Turn it off on weekends or any other time you will not be using it for a day or more.

Generally, pressing the on-off button when the Lisa is on does not instantly turn the Lisa off. The on-off button triggers a series of disk-storage procedures, followed by a cutback of power to standby levels. As long as the Lisa is plugged into a working outlet, the system draws a small amount of current, whether or not the on-off button is lit.

Reset Button

The reset button is a backup device for use when the normal shutdown procedures go awry or when the Lisa doesn't respond to the keyboard, mouse, or on-off button. The use of the reset button is discussed in Chapter 8, Troubleshooting, in the *Lisa Office System* manual, and in the *Workshop User's Guide for the Lisa.* Under ordinary circumstances, do not press the reset button.

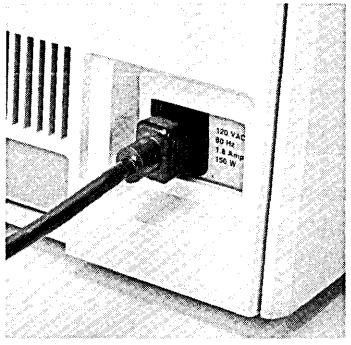


Reset button

Power Cord

Warning This equipment is intended to be electrically grounded. This product is equipped with a three-wire grounding-type plug, a plug having a third (grounding) pin. This plug will fit only into a grounding-type AC outlet. This is a safety feature. If you are unable to insert the plug into the outlet, have a licensed electrician replace the outlet and, if necessary, install a grounding conductor. DO NOT DEFEAT THE PURPOSE OF THE GROUNDING-TYPE PLUG.

As long as the Lisa is plugged into a working outlet, it draws a small amount of current, which it uses to power a small amount of memory known as parameter memory. Parameter memory contains your specifications regarding external devices, repeating keys, and screen contrast. If your software uses a clock/calendar, the current also keeps these up to date.



When you must unplug the Lisa, make sure the light in the on-off button is off before you pull the plug.

Connectors for Extra Devices

The Lisa is equipped with built-in connectors for attaching extra devices: Printers, additional disk drives, telephone-connect modems, and any other equipment that interacts with the Lisa. See the manual that comes with your software for instructions on telling the Lisa that you have attached a piece of equipment.

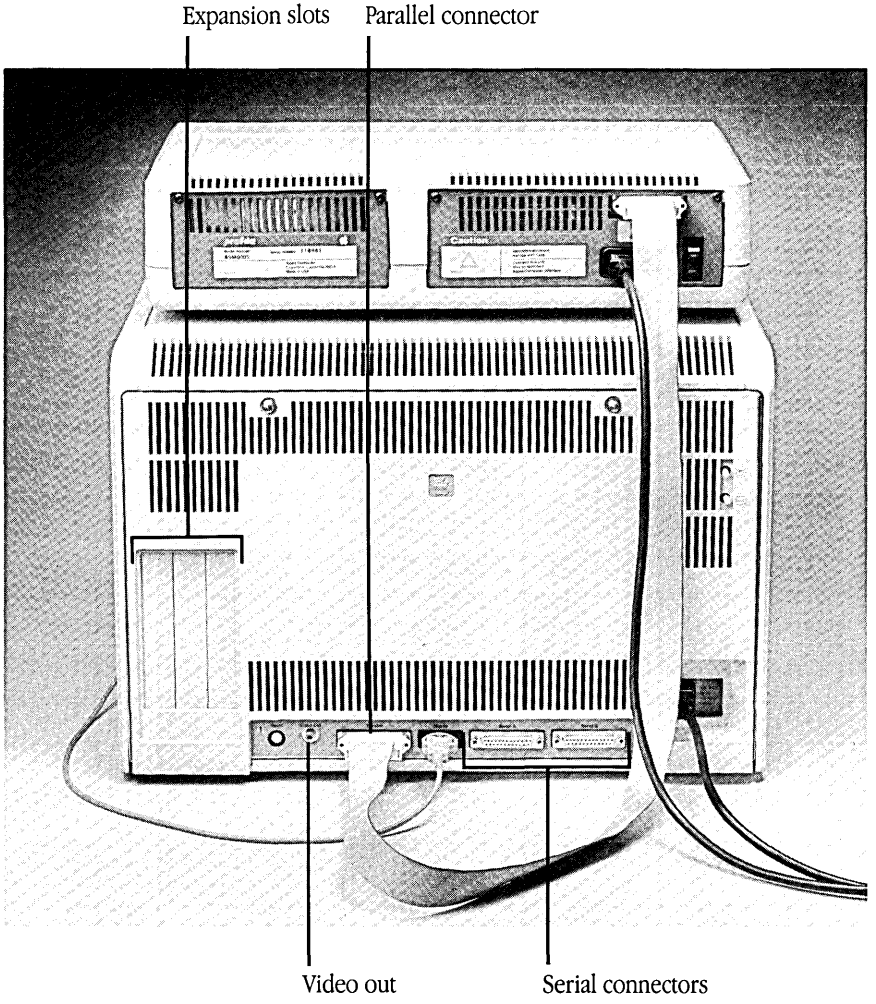


Figure 4. Lisa 2 or 2/5

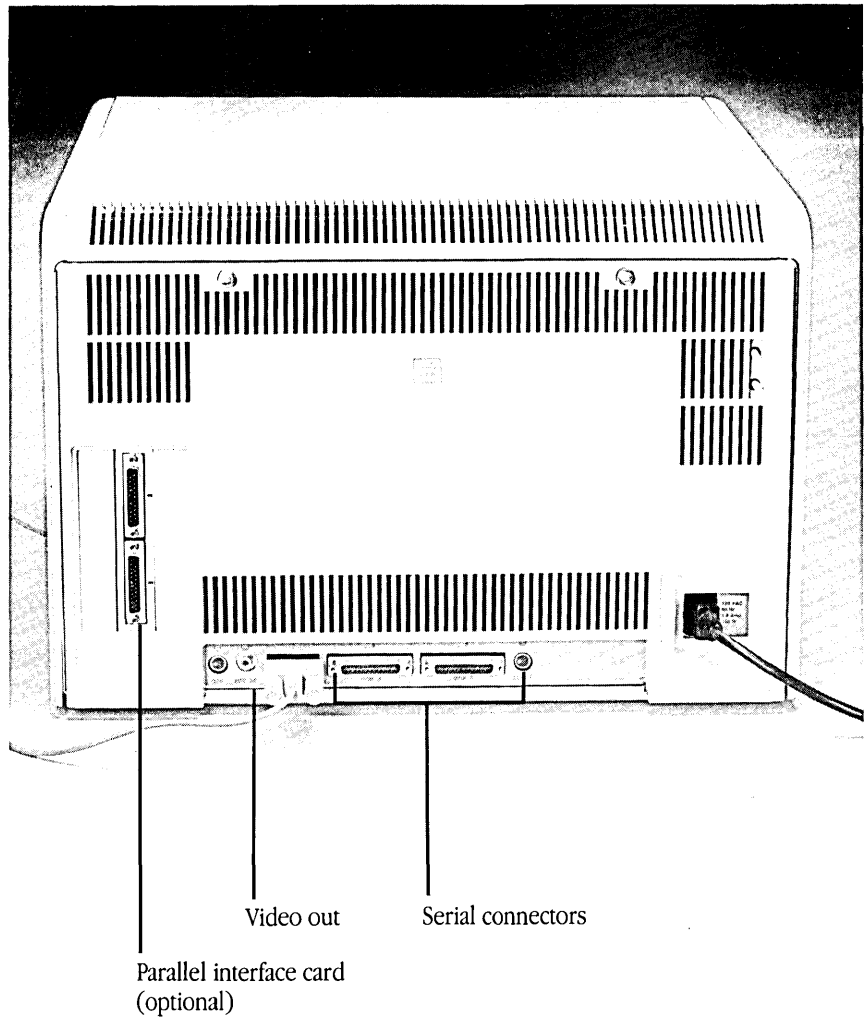


Figure 5. Lisa 2/10

Serial Connectors The Lisa's two serial device connectors accept 25-prong, D-shaped plugs for devices that use serial signals. If you do not know whether a device you want to attach is serial or parallel, see the manual that came with the device.

If you are using a high-speed modem (9600 baud), attach the modem to the connector labeled Serial Device A.

Parallel Connectors The Lisa 2 and the Lisa 2/5 both have external parallel ports. If you have more than one parallel device you want connected, or if you have a Lisa 2/10 system, you can add parallel connectors through the expansion slots on the left side of the back panel. The parallel device connectors accept 25-prong, D-shaped plugs for parallel devices.

Expansion Slots The three expansion slots accommodate expansion cards for a variety of general and special functions. Special instructions for installing expansion cards come with all Apple-supplied cards. The general procedure for installing and removing cards appears in Appendix A, Setup Procedures.

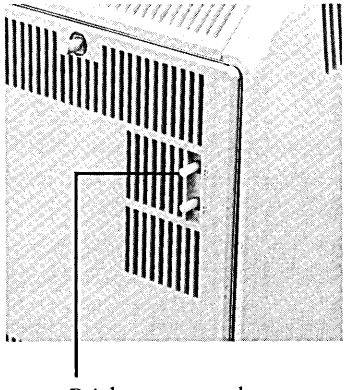
Video Out The video out connector is compatible with standard video plugs. You can use this connector to send the screen display to an external high-resolution video monitor. The monitor must be compatible with the Lisa video specifications listed later in this section under Lisa 2 Hardware Specifications.

Screen Controls

You can adjust three aspects of your screen display: Brightness, contrast, and focus. The exact setting of each depends on lighting conditions, the age of the video tube, and your personal preference.

You can avoid eye strain by keeping your screen adjusted at all times and by occasionally looking away from the screen and focusing on something across the room.

Brightness The brightness control knob is the higher of the two white knobs extending from the top right corner of the back panel.



Brightness control

To set the screen brightness:

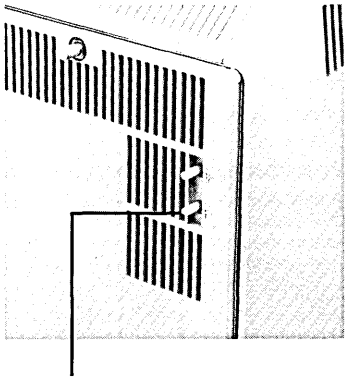
1▶ Turn the brightness control knob until your screen is entirely black.

2▶ Turn the knob back up until the screen brightens and video scan lines appear.

3▶ Slowly turn the knob back down, just until the screen has no video scan lines visible, and there is a clean line on all borders.

Contrast Screen contrast is controlled through software. Instructions for setting the contrast appear in Chapter 6, Setting Up Your System, in the *Lisa Office System* manual, and in Chapter 3, The System Manager, in the *Workshop User's Guide for the Lisa.* If you are using other software, refer to the manual that comes with that software.

Focus The focus control knob is the lower of the two white knobs extending from the top right corner of the back panel.



Focus control

Extra Devices (Peripherals)

Extra devices (peripherals) for the Lisa include external hard disks, micro disk drives, modems, and printers.

Devices need to be connected to your system in two ways: Mechanically and through the software. Instructions for mechanically connecting Apple printers and the ProFile appear in Appendix A, Setup Procedures. For other devices, follow the instructions that come with the device.

If you are using the Lisa Office System software, software connections for Apple printers and the ProFile are covered in the *Lisa Office System* manual. If you are using software other than the Office System, see the manual that comes with that software.

Lisa 2 Hardware Specifications

Shape and Size

Cabinet

Height: 350 mm (13.8 in.)
Depth: 388 mm (15.2 in.)
Width: 475 mm (18.7 in.)
Weight: 22 kg (48 lbs.)
Cord length: 1.8 m (6 ft.)

Keyboard

Height: 68 mm (2.7 in.)
Depth: 165 mm (6.5 in.)
Width: 475 mm (18.7 in.)
Weight: 1.8 kg (4 lbs.)
Cord length: 1.2 m (4 ft.) safe extension

Mouse

Height: 38 mm (1.5 in.)
Depth: 94 mm (3.7 in.)
Width: 62 mm (2.4 in.)
Cord length: 1.2 m (4 ft.)

Capacity of Memory Sizes

Micro disk drive: 400 kilobytes formatted
Internal hard disk: 10 megabytes formatted
External hard disk: 5 megabytes formatted

Power Levels

European/Asian Systems

Voltage: 180 to 260 V.AC
Cycles: 48 to 68 Hz
Power: 150 watts

United States/Canadian Systems

Voltage: 90 to 130 V.AC
Cycles: 48 to 68 Hz
Power: 150 watts

Temperature Ranges

Storage: −22°C to 65°C (−8°F to 149°F)
Operation: 5°C to 40°C (40°F to 104°F)

Humidity Ranges

Storage: 5% to 95% noncondensing
Operation: 10% to 80% noncondensing

Video

Screen dimensions:	30 cm diagonal (15 cm by 22 cm active) 12 in. diagonal (6 in. by 8.5 in. active)
Resolution:	364 lines by 720 dots per line
Screen refresh rate:	60 Hz
Horizontal line rate:	22,900 Hz
Dot rate:	20.375 MHz

Compatibilities

Format: Standard ASCII plus additional Apple characters

Recommended printers: Apple Imagewriter and Apple Daisy Wheel

Radio and Television Interference

Warning This equipment generates and uses radio frequency energy and, if not installed and used properly (that is, in strict accordance with instructions given in the *Lisa 2 Owner's Guide*), may cause harmful interference to radio communications. This equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when equipment is operated in a commercial environment.

Operation of this equipment in a residential area is likely to cause interference, in which case the user at his or her own expense will be required to take whatever measures may be required to correct the interference.

You can determine whether your computer is causing interference by turning it off. If the interference stops, it was probably caused by the computer or its peripherals.

To further isolate the problem, disconnect the peripheral devices and their I/O cables one at a time. If the interference stops, it is caused by either the peripheral or its I/O cable. These devices usually require shielded I/O cables. For Apple peripherals, you can obtain the proper shielded cable from your dealer. For non-Apple peripherals, contact the manufacturer or your dealer for assistance.

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- 95 *Screen Memory Test*
- 95 *I/O Board Tests*
- 96 *CPU Board Test Completion*
- 96 *Memory Test*
- 96 *I/O Board Test Completion*

97 Expansion Slot Configuration Status Check
97 Startup Error Messages and Tones

100 **Appendix C. Environments Window**

102 **Appendix D. Caring for Micro Diskettes**

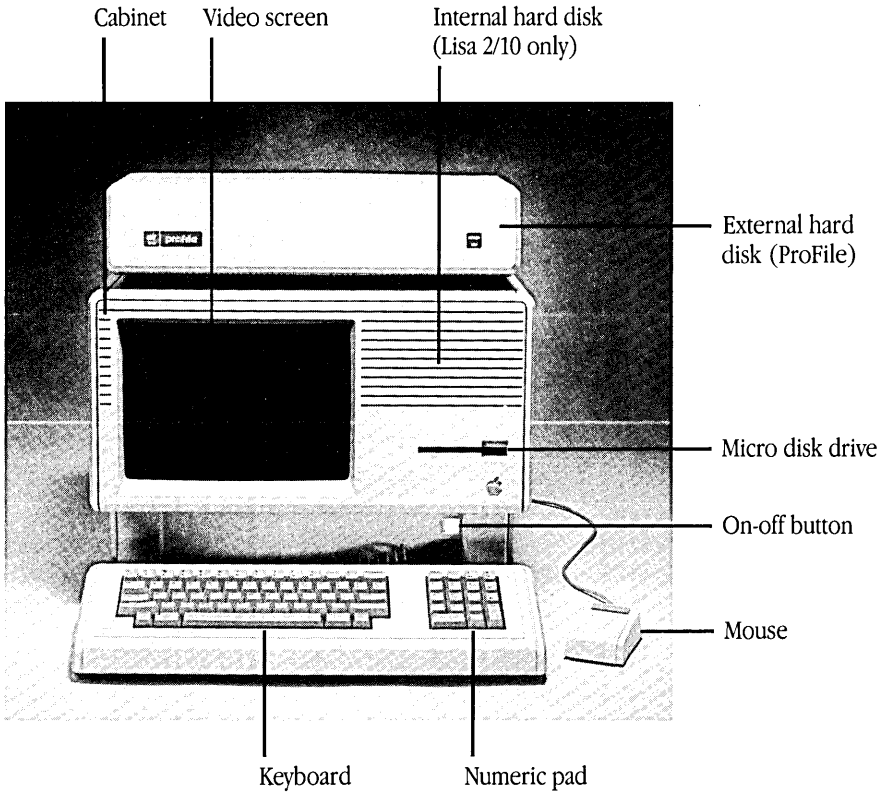
Appendix A Setup Procedures

This appendix gives instructions for setting up your Lisa hardware. Before you can use your Lisa, a software system must also be installed. After setting up the Lisa hardware, go to the manual that comes with your software. If you will be using the Lisa Office System, consult the *Lisa Office System* manual for information on how to install the Lisa Office System software.

Unpacking the Lisa

The Lisa 2 system comes in two or more boxes. The system includes the following:

- Lisa 2 cabinet.
- External Hard Disk (ProFile) with the Lisa 2/5 or as an extra option.
- Add-on memory card (optional).
- Keyboard.
- Mouse.
- *Lisa 2 Owner's Guide.*



To unpack your Lisa:

1▶ As shown in the diagrams printed on the large box, turn the carton on its side and slide the Lisa cabinet out of the box. Remove the foam padding.

2▶ Set the cabinet on a hard, flat surface. Leave at least 2 inches of clearance on each side to allow for proper ventilation.

3▶ Unpack the keyboard, power cord, and mouse from the accessories box.

To identify your Lisa 2 system:

There are three Lisa 2 systems: the Lisa 2, the Lisa 2/5, and the Lisa 2/10. The primary difference among these systems is the amount of disk storage each contains.

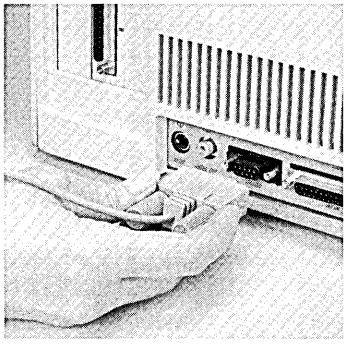
Lisa 2 Contains an internal 3.5-inch micro disk drive and a parallel connector at the rear of the cabinet.

Lisa 2/5 Contains an internal 3.5-inch micro disk drive, an external hard disk, and a parallel connector at the rear of the cabinet.

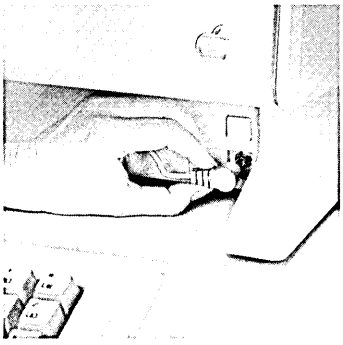
Lisa 2/10 Contains an internal 3.5-inch microdisk drive and an internal hard disk. The Lisa 2/10 does not have a built-in external parallel connector.

Installing the Mouse, Keyboard, and Power Cord

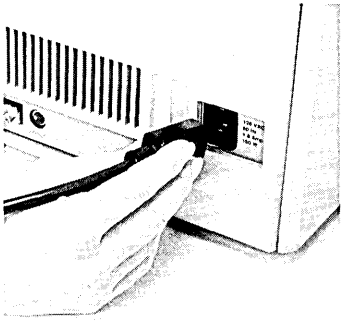
1▶ Plug the mouse cord into the back of the cabinet.



2▶ Plug the keyboard cord into the front of the cabinet.



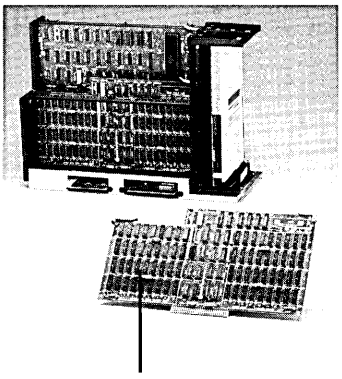
3▶ Plug the power cord into the back of the Lisa, and then into a grounded, 115-volt electrical outlet.



Warning This equipment is intended to be electrically grounded. The Lisa is equipped with a three-prong grounding-type plug, which is a plug having a third round grounding pin. This pin will fit only into a grounding-type AC outlet. If you are unable to insert the plug into the outlet, have a licensed electrician replace the outlet and, if necessary, install a grounding conductor. DO NOT DEFEAT THE PURPOSE OF THE THREE-WIRE PLUG.

Installing a Memory Card

To increase the memory capacity of your system, you can purchase an add-on memory card.



Add-on memory card

To install an add-on memory card:

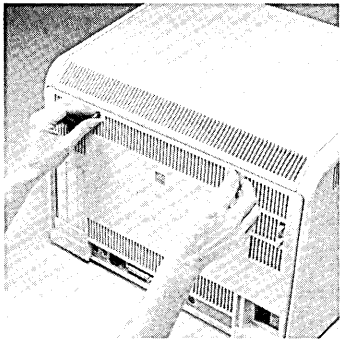
1▶ If the Lisa is on, turn it off by pressing the on-off button. Wait until the power light goes off.

2▶ Unplug the Lisa's power cord at either the back panel or the wall outlet.

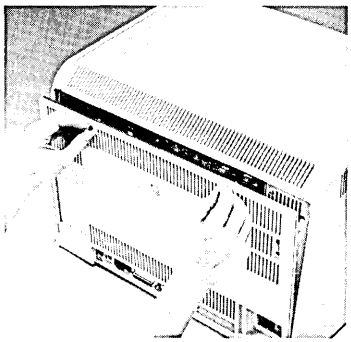
3▶ Unplug the cords and cables of all attached devices.

4▶ Remove the back panel, following this procedure:

a. Turn the two thumbscrews along the upper edge counterclockwise until they won't turn any further. These screws loosen but do not come free from the back panel.



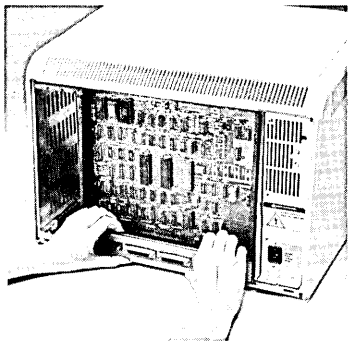
b. Pull the panel slightly toward you and up. Place it to one side.



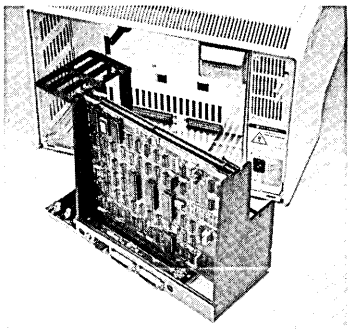
5▶ Remove the card cage by pulling the round black bar that runs just above the row of connectors along the bottom of the cage.

Brace your thumbs against the very bottom edge of the cabinet and pull hard on the bar to free the card cage from the interior connectors.

Be careful not to put any pressure on the small components just behind and below the bar.

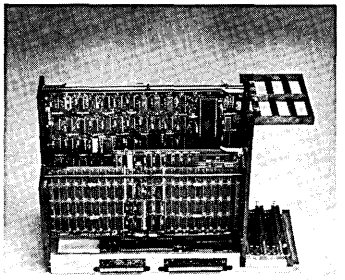


6▶ Pull the cage out and set it upright on the table.

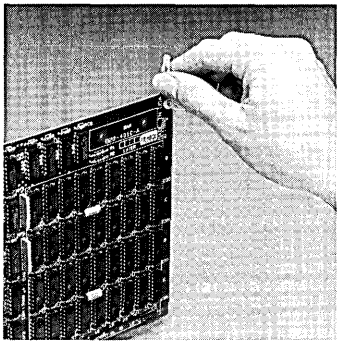


▶▶▶

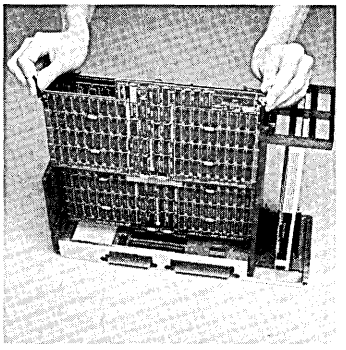
7▶ Turn the cage around so that the preinstalled memory board is facing you.



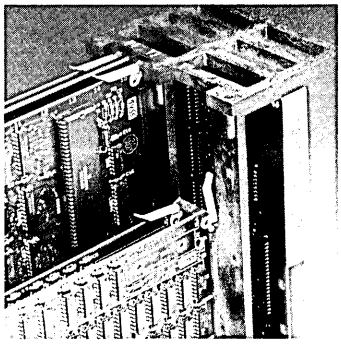
8▶ Make sure the two colored levers on each side of the new memory board you are going to install are in an "up" position. Handle the board only by these levers and the board's plastic edges. Do not touch any of the components on the board.



9▶ Match the colored lever to the same colored triangle on the card cage (yellow clip to yellow triangle, for example). Slide the board into the thin grooves along the sides of the card cage.

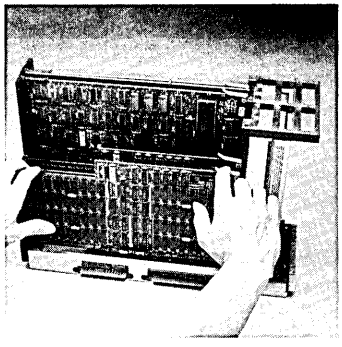


The tabs on the memory boards should be resting on the black plastic frame.

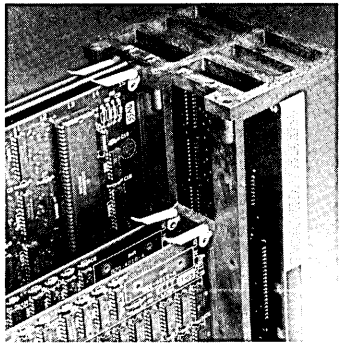


10▶ Carefully push down the levers simultaneously to lock the board into place.

Caution: If the board doesn't lock easily, make sure the board is centered over the slot. Don't touch the gold strips at the bottom of the board or the bottom of the cage; use your finger to move the board so that the gold strips are aligned over the slot.

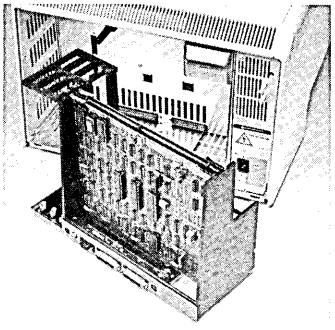


11▶ At this point, the rounded tabs below the levers should be set in the lower notches on the plastic card cage.

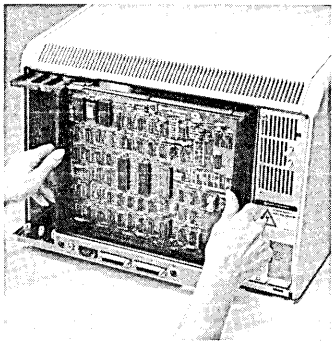


▶▶▶

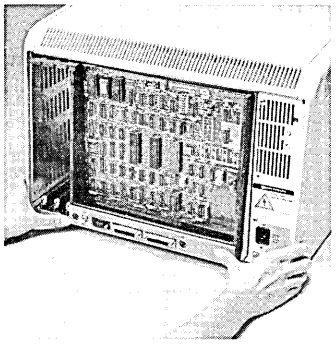
12 ▶ Turn the card cage around again so that the memory board you just installed is away from you and closer to the cabinet.



13 ▶ Holding the card cage by the black plastic frame, slide it back into the cabinet.



14 ▶ The cage will offer some resistance for the last 1/4 inch as the card cage connectors slide into their slots inside the cabinet. Hold the outside of the cabinet with your fingers and press with your thumbs against the bottom of the cage. The cage is installed when the panel along the bottom is just inside the bottom edge of the cabinet.

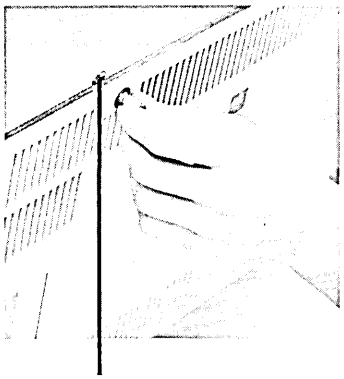


Expansion Cards If you are installing peripheral devices that connect to the Lisa through expansion cards, install the cards before replacing the back panel. Look at the documentation that comes with the device to determine whether or not the device requires an expansion card. Instructions for installing an expansion card are given in this appendix under Installing an Expansion Card. See also the instructions that come packaged with the card.

Apple Printers Neither the Apple Daisy Wheel nor the Apple Imagewriter printer requires an expansion card. Brief instructions for installing these printers come later in this section. More detailed documentation comes packaged with the printers.

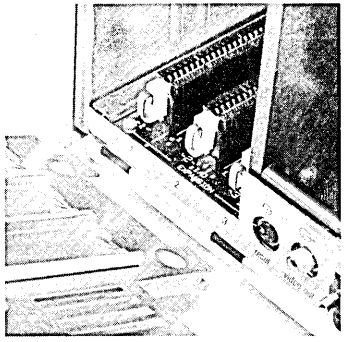
15▶ Replace the back panel, following this procedure:

a. Make sure the metal prongs attached to the two screws on the panel are pointed to the left.

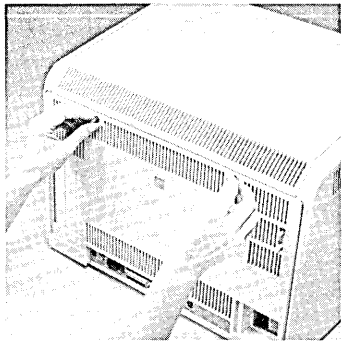


Metal prong

b. Insert the four tabs along the lower edge of the back panel into the slots at the base of the cabinet.



c. Push the panel flat against the back of the cabinet. Turn the two thumbscrews clockwise until they are snug.



Installing a ProFile Hard Disk

A 5-megabyte ProFile external hard disk drive must be connected to the Lisa 2/5 to use the Lisa Office System software. Additional ProFiles may be attached to any Lisa for added storage.

Unpacking the ProFile

The ProFile external hard disk comes in two shipping cartons. The larger of the two contains a ProFile hard disk drive and unpacking instructions. The smaller carton is the ProFile accessory kit, which contains the ProFile interface cable, power cable, and documents.

Warning Be sure to read and follow the unpacking instructions. Your ProFile is a delicate instrument. Be very careful when you remove it from the shipping carton. Extensive damage may result if the unit is accidentally jarred, bumped, dropped; or handled roughly.

Testing the ProFile

Once you've unpacked the ProFile you should start it up before connecting it to the Lisa to make sure the ProFile is functioning properly.

1 ▶ Turn the power switch on the back of the ProFile off.

2 ▶ Plug the ProFile power cord into a grounded, 115-volt electrical outlet.

Warning This equipment is intended to be electrically grounded. It is equipped with a three-prong grounding-type plug, which is a plug having a third round grounding pin. This pin will fit only into a grounding-type AC outlet. If you are unable to insert the plug into the outlet, have a licensed electrician replace the outlet and, if necessary, install a grounding conductor. DO NOT DEFEAT THE PURPOSE OF THE GROUNDING-TYPE PLUG.

3 ▶ Plug the power cord into the recessed three-pin connector on the back of the ProFile.

4 ▶ Turn on the power switch at the back of the ProFile.

The red ready light on the ProFile's front panel will come on for about 2 seconds, go off for about 20 seconds, and then start to flash for about 40 seconds while the drive runs internal tests. When the tests are sucessfully completed, the light will remain on continuously without flashing. Under some conditions the ProFile may take up to 3 minutes to complete the startup sequence.

Failure of the ready light to stay on after a maximum of 3 minutes indicates a possible malfunction. If this occurs, turn off your ProFile and contact your dealer.

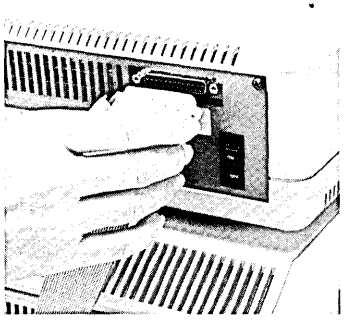
5▶ Turn off the Lisa and the ProFile.

If the Lisa is on, turn it off by pressing the on-off button. Wait until the power light goes off.

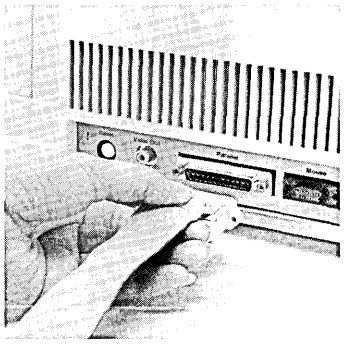
Connecting the ProFile to the Lisa

To connect the ProFile to the Lisa:

Take the flat interface cable from your accessory kit and plug either end into the connector at the back of the ProFile. The connector socket is above the ProFile's on-off switch and the cable can go into the socket only one way.

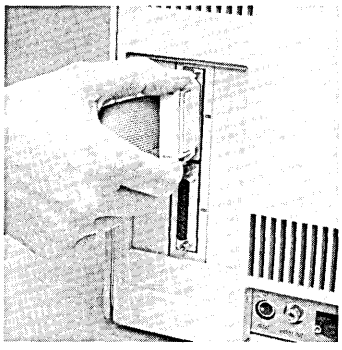


If you have a Lisa with a built-in external parallel connector (Lisa 2 or Lisa 2/5), attach the cable from the ProFile to that connector.



▶▶▶

If you have a Lisa with no parallel connector (Lisa 2/10), or if you have already attached a device to your built-in parallel connector, connect the new ProFile to a parallel interface card. (See Installing an Expansion Card.) A parallel interface card gives your system additional parallel connectors.



Starting Up the ProFile

To start up the ProFile:

1▶ Plug in the power cords for both the Lisa and the ProFile.

2▶ Turn on the ProFile. When the ProFile's red ready light stays on continuously without flashing, turn on the Lisa.

Note: Whenever the ProFile is communicating with the Lisa (when saving a document, for example), the ready light flashes rapidly. At all other times it should burn steadily.

Warning Do not turn off the ProFile when you turn off the Lisa. In normal operation, the ProFile remains on at all times. See the ProFile manual for more information on using the ProFile.

Connecting the ProFile to Your Software

To connect the ProFile to your software:

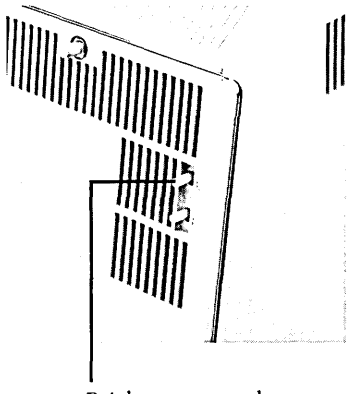
Before you can use your ProFile (or any other peripheral device), your software must be informed that the ProFile (or other device) is connected to your Lisa. If you are using the Lisa Office System, you use Preferences to establish the link between device and software. For further information, refer to the *Lisa Office System* manual. If you are using the Lisa Workshop software, see the *Workshop User's Guide for the Lisa.* If you are using some other software, consult the appropriate manual.

Setting Screen Brightness

The brightness of the Lisa screen is adjusted through the brightness control knob at the back of the cabinet; the screen contrast is adjusted through software.

To set the screen brightness:

1▶ Locate the brightness control knob (the higher of the two white knobs extending from the back of the cabinet). Turning the knob clockwise darkens the screen, and turning it counterclockwise brightens the screen.



Brightness control

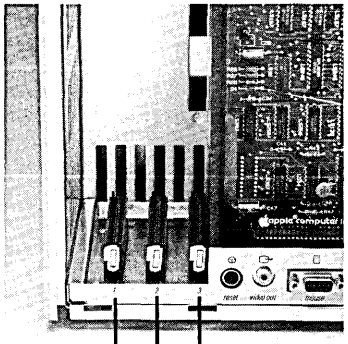
Installing an Expansion Card

If you want to connect a peripheral device such as an additional ProFile hard disk, you may first need to add an expansion card to the Lisa to accommodate the device. The documentation that comes with the device should tell you whether you need and expansion card. If you don't need an expansion card, skip these instructions.

1▶ To install an expansion card, first remove the back cover of the Lisa cabinet, as described in the previous section.

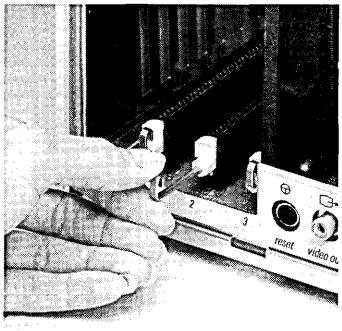
2▶ Expansion cards are installed in the expansion slots in the card cage. Determine which of the three expansion slots on the lower left of the card cage will hold the card.

In general, parallel interface cards should be installed in slot 2 or slot 3. See the documentation that comes with your expansion card.

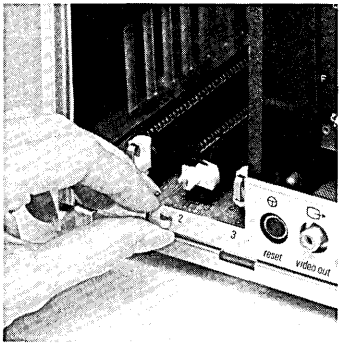


▶▶▶

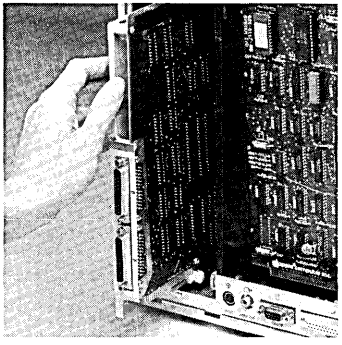
3▶ Pull out the metal lever extending from the plastic cap in front of the card slot.



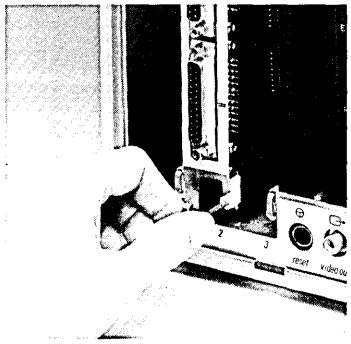
4▶ Turn the lever clockwise 90 degrees, to the 3 o'clock position. In a new system, this lever is very tight, and you may need small pliers to turn it.



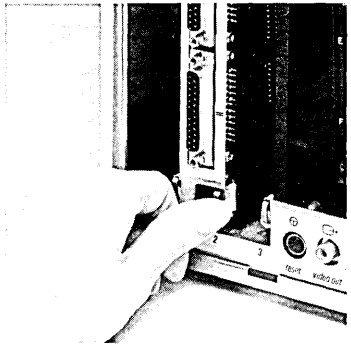
5▶ Hold the expansion card by the metal edge, with the gold strips facing down and the chips and connectors facing left. Insert the bottom of the card into the connector slot and the top of the card into the plastic slot above the connector. Slide the card evenly into the cage as far as it will go.



6▶ Turn the metal lever counterclockwise 90 degrees, back to the 12 o'clock position.



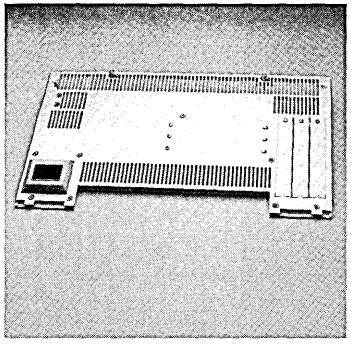
7▶ Push the lever back into the plastic cap.



8▶ A set of slot covers on the Lisa's back panel blocks the electromagnetic emissions from inside the cabinet. If you have just installed a card into a slot that did not previously contain a card, follow steps a through g for removing the cover that protects that slot.

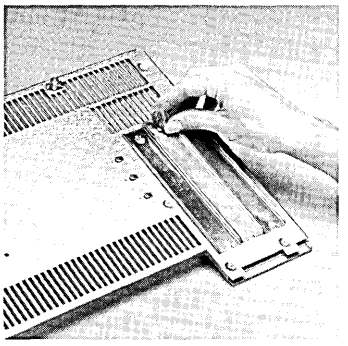
Otherwise, replace the back panel as explained in step 14 of the previous section (Installing an Expansion Card).

a. On the back panel, locate the slot cover for the slot in which you just installed a card.

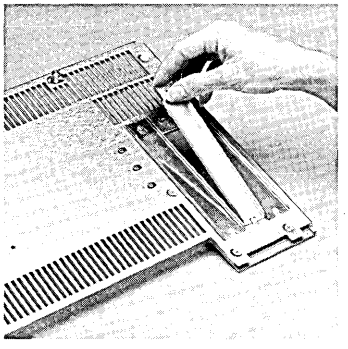


▶▶▶

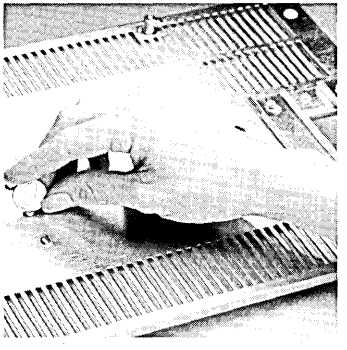
b. Loosen the screw at the top of the metal plate. (If you don't have a screwdriver, a coin will work nicely.)



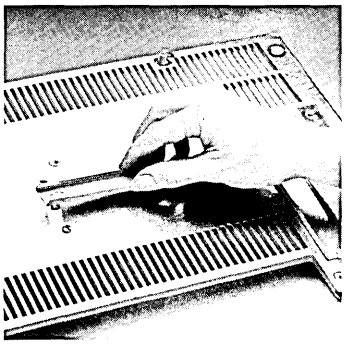
c. Pull the plate over the screw head and out from behind the retaining tab.



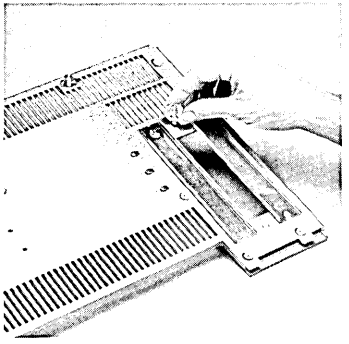
d. Attach the plate to the inside of the cabinet cover so that it will not get lost. To do so, loosen one of the three screws in the middle of the back panel.



e. Slide the metal plate behind the retaining tab and over the head of the screw.



f. Tighten both screws.



g. Replace the back panel as explained in Step 15 of Installing a Memory Card.

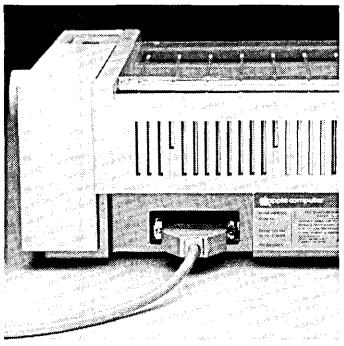
Setting Up the Apple Imagewriter Printer

Skip this part if you are not connecting an Imagewriter printer. A brief outline for how to set up your printer follows. If you need more detailed instructions, refer to the documentation that comes with your printer.

1 ▶ Unpack the printer and its power cable. Unpack the modem eliminator cable (sometimes called a *null modem cable*) and printer connector cable from the accessories box.

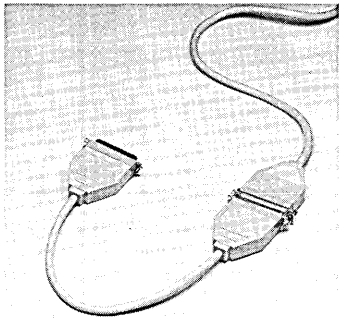
▶▶▶

2▶ Attach the printer connecting cable (the longer of the two cables) to the serial interface connector, which is at the lower left corner of the back when you are facing the back of the printer.

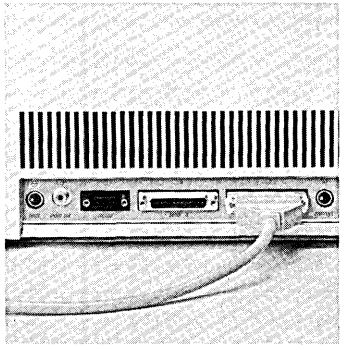


Note: A shielded interface cable must be used when attaching devices to the Lisa. Use only the cables that come with the Apple device.

3▶ Attach the other end of the printer cable to the modem eliminator cable (the shorter cable).



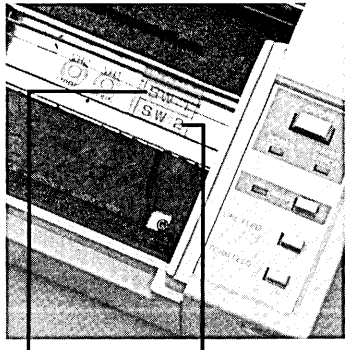
4▶ Plug the modem eliminator cable into either of the serial ports in the back of the Lisa. (If you are using Macintosh software, you can only use serial port B.)



5▶ Check the DIP switch settings. You'll find the DIP switches just inside the carrier cover on the right side. Set switch 1 as shown here. The settings for switch 2 are shown here for your information, but you should not need to adjust switch 2.

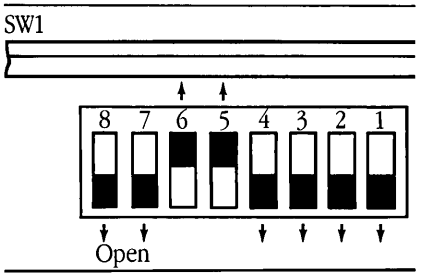
Switch 1

Number	Position	Function
1-1	Open	Character Set
1-2	Open	Character Set
1-3	Open	Character Set
1-4	Open	Page Length
1-5	Closed	Parity
1-6	Closed	Character Pitch
1-7	Open	Character Pitch
1-8	Open	Line Feed



DIP switch 1 (SW1)

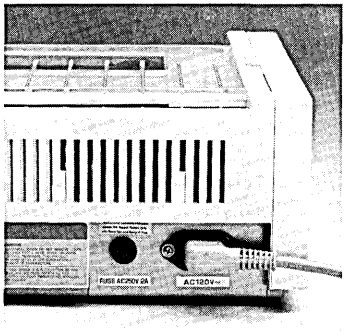
DIP switch 2 (SW2)



▶▶▶

Switch 2		
Number	**Position**	**Function**
2-1	Closed	Baud rate
2-2	Closed	Baud rate
2-3	Open	Protocol
2-4	Open	—

6▶ Make sure the printer is off. Do not run the printer without installing ribbon and paper or you may damage the print head. Attach the power cable to the back of the printer and plug it into a standard three-prong electrical outlet.



For your own safety, and to protect your Lisa and printer, always make sure that your printer is grounded. If you don't have a three-prong grounded wall outlet, then use a three-prong to two-prong adapter, making sure to connect the ground wire on the adapter to the metal mounting screw on the wall outlet. If you must use an extension cord, make sure it's a three-wire cord.

7▶ Your printer will not work with your Lisa unless you tell the Lisa what type of printer you're using and where it is connected. Consult the appropriate software manual for information on connecting printers. If you're using the Lisa Office System software, refer to the *Lisa Office System* manual.

If you're using the Lisa Workshop, refer to the *Workshop User's Guide for the Lisa.*

Setting Up the Apple Daisy Wheel Printer

Skip this part if you are not installing a daisy wheel printer.

Brief instructions for setting up the Apple Daisy Wheel printer with the Lisa are given here. If you need more detailed instructions, see the documentation that comes with the printer. Put the printer documentation in the empty binder that comes with the Lisa.

1▶ Unpack the printer.

2▶ Remove the shipping restraints.

a. Remove the metal shipping strip.

b. Remove the protective paper covering under the access cover.

c. Remove the package of water-absorbing material from the inside of the printer. Also remove the sheet of paper that shows a test printout; you will want to refer to the printout later.

d. Cut and remove the rubber bands that serve as tie-downs to hold the paper bail and carriage in place.

e. Remove the yellow nylon restraining bar from the metal track the carriage rides on.

3▶ Find internal configuration Switch 1 in the back of the printer.

a. If the printer is on, turn it off.

b. Remove the access cover.

c. Undo the two top screws under the access cover that hold the top panel.

d. Undo the two back screws that hold the top panel.

e. Take off the platen knob.

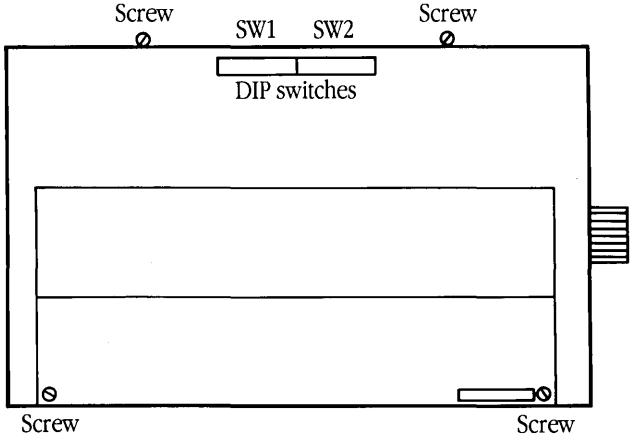
f. When facing the printer, Switch 1 is the left switch on the back of the printer.

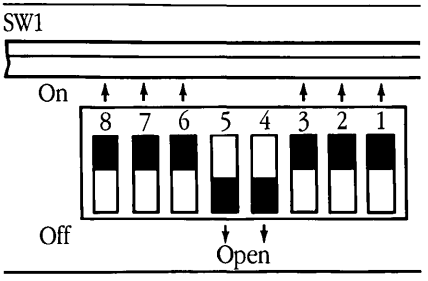
▶▶▶

4▶ Reset Switch 1 to match this configuration.

Switch 1

Number	Position	Function
1	Closed	Baud rate
2	Closed	Baud rate
3	Closed	Baud rate
4	Open	Protocol
5	Open	Protocol
6	Closed	Modem
7	Closed	Parity
8	Closed	Parity





The Apple Daisy Wheel Printer has two additional DIP switch panels you may use to configure your printer. These switches are preset at the factory for the most common uses with the Lisa; you can alter them, however, if your needs change. The front panel controls the number of lines printed per inch, length of the pages you are using, and type pitch (characters per inch). Switch 2 at the back of the printer conveys a variety of instructions to the printer: Unidirectional or bidirectional printing, use of a foreign-language daisy wheel, duplex settings, paper-out instructions, and auto linefeed. Consult the manual that comes with your printer for further information.

5▶ Install the print wheel.

6▶ Install the ribbon.

7▶ Replace the top panel and the access cover.

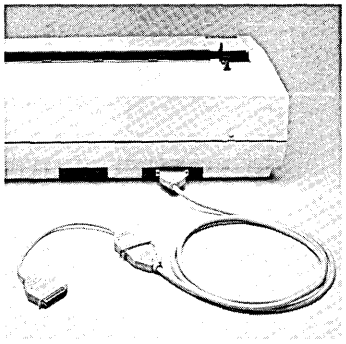
8▶ Attach the platen knob to the printer.

9▶ Connect the printer.

a. If you haven't already done so, unpack the communications interface cable and the modem eliminator cable, if there is one, from the accessories box.

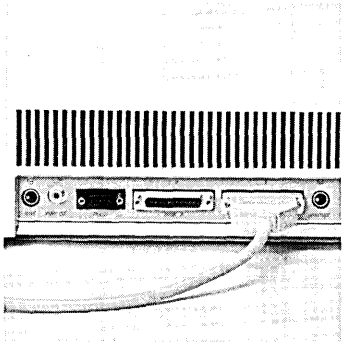
   If you have a modem eliminator cable (also known as a *null modem cable*), attach it to the communications interface cable. (In some cases the modem eliminator function is built into the communications interface cable, so the modem eliminator cable is not included.) For the purpose of this installation procedure, these two connected cables are referred to simply as the communications interface cable.

b. Connect one end of the communications interface cable to the back of the printer.



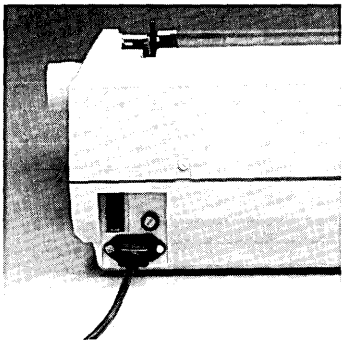
▶▶▶

c. Plug the other end of the printer connecting cable into the Serial B port in the back of the Lisa.



Note: A shielded interface cable must be used when attaching devices to the Lisa. Use only the cables that come with the Apple device.

d. Attach the power cord to the back of the printer.



10▶ Your printer will not work with your Lisa unless you tell the Lisa what type of printer you are using and where it is connected. If you are using the Lisa Office System or Lisa Workshop, inform the system that you have connected a daisy wheel printer by setting Preferences, as described in your *Lisa Office System* manual or in the *Workshop User's Guide for the Lisa.* If you are using some other software, consult the appropriate manual for information on connecting printers.

Installing the Glare Filter

Under some lighting conditions, reflections can make the video screen hard to read. If glare is a problem on your Lisa, install the glare filter.

1▶ If the Lisa is on, turn it off by pressing the on-off button. Wait until the power light is off.

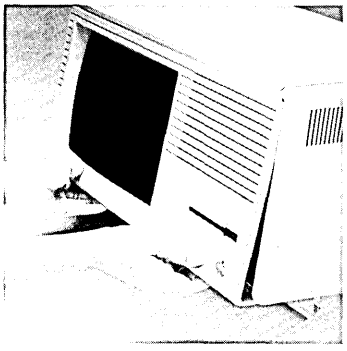
2▶ Unplug the Lisa at either the back panel or the wall outlet.

3▶ Remove the front panel, following this procedure:

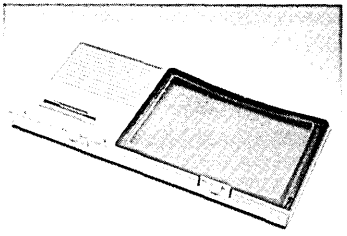
a. Place one finger on each of the two finger pads beneath the front panel.

b. Push the pads up to unlatch the panel.

c. Pull the panel forward and out.

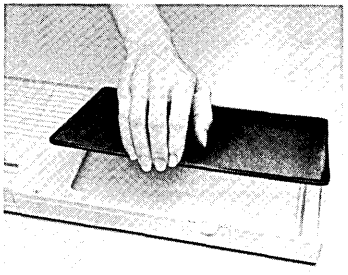


4▶ Set the panel face down on a flat surface.



5▶ Center the glare filter over the opening inside the front panel.

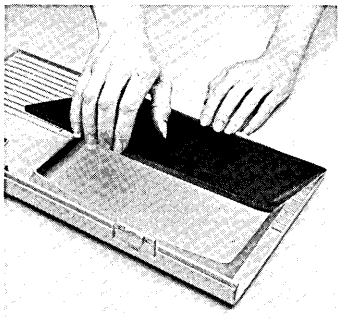
Hold the glare filter against the clip along the upper edge of the front panel, at a 45-degree angle.



▶▶▶

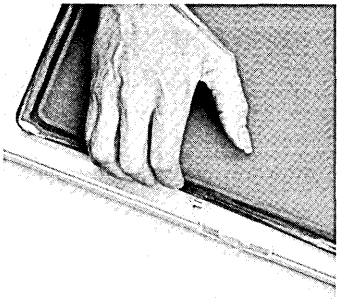
6▶ While pressing down on the frame at the upper clip, rotate the lower edge until the frame slides under the upper clip.

Continue rotating the screen until it lies flat against the panel.



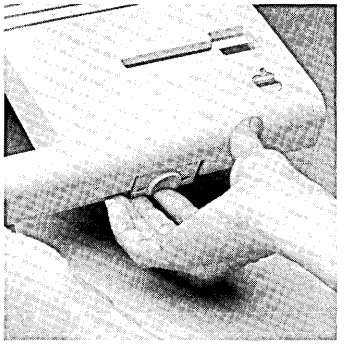
7▶ Push the lower edge of the frame in until it clears the lower clip, and then let it slide into place behind the clip.

Make sure the filter fits neatly around the frame and under the clips.

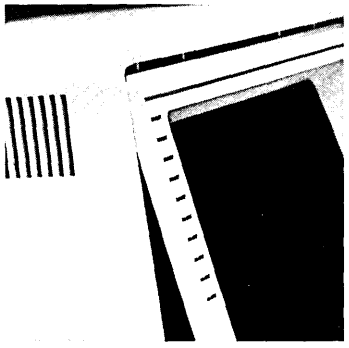


8▶ Replace the front panel, following this procedure:

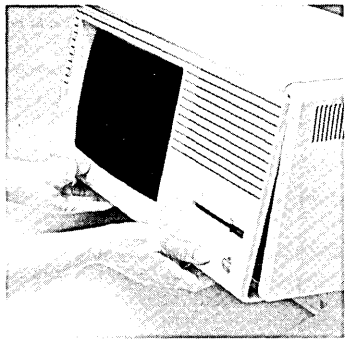
a. Hold the panel with one finger on each pad along the bottom edge.



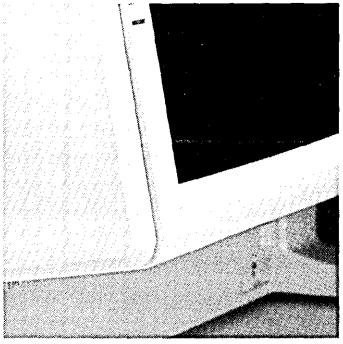
b. Insert the upper edge of the panel behind the lip of the top housing on the cabinet.



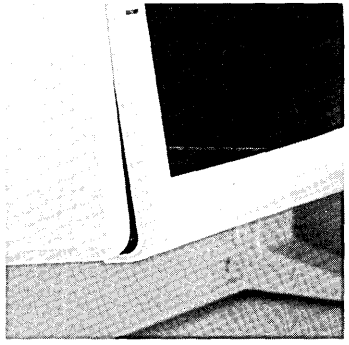
c. Pressing the finger pads up, push the bottom edge of the panel against the cabinet until the panel clicks into place.



Make sure the front panel is securely in place as shown in the photo. If the front panel is not securely in place, a safety interlock switch will prevent you from turning the Lisa on.



Correct installation



Incorrect installation

Appendix B Automatic Startup Tests

Every time you turn the Lisa on, the system runs a series of tests to verify that startup can proceed. This appendix describes the tests in the order in which they are run and provides a table explaining the detailed error messages generated by the tests. A less detailed table of the most common messages and a discussion of the procedures for responding to startup test error messages appear in Chapter 2, Troubleshooting.

Startup Test Sequence

If everything is working correctly during startup, the startup tests proceed in the following sequence.

ROM Checksum

This test computes a 16-bit checksum of the entire ROM to check its validity. If the checksum is successful, the system passes on to the next test.

If the system fails the ROM checksum, the system hangs. The screen may be blank, or it may display a random pattern at a very bright contrast level.

MMU Register Test

This is a read/write and address test of the static RAMs in the memory management unit. Successful completion is followed by the next test.

An early failure causes the test to repeat indefinitely, with a blank display on the screen.

If this test reaches its final stages and then encounters a failure, the screen displays the CPU board icon, with error code 40.

Memory Sizing

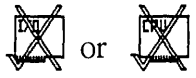
This test determines the amount of memory in your system to facilitate further testing. If an error is found, the error is saved but testing continues. If memory cannot be accessed at all, the speaker beeps once with a low tone and the system hangs with a series of vertical lines on the screen.

Preliminary Memory Test

Next the system tests the first 2048 bytes of memory to ensure that some memory is available for use by the startup ROM. If an error occurs, the Lisa sounds the speaker twice and then hangs in a test loop, with a random display on the screen.

VIA Test

This test verifies that the I/O board can be accessed. Failure results in the appearance of either the I/O board icon, with error code 58, or the CPU board icon, with error code 41.



If this test proceeds without problems, the Lisa turns the screen contrast all the way down.

Screen Memory Test

This test facilitates the reporting of errors that are found during other tests. Errors do not interrupt the tests but are reported at the end of startup as a memory failure.

I/O Board Tests

The contrast is set to midrange, and the keyboard and mouse connections are checked. If either the keyboard or the mouse is not connected, the Lisa alerts you to the situation at the end of the startup sequence. If those tests proceed normally, the speaker emits a click. This click tells you that all tests up to this point have been executed and that the keyboard is ready to accept alternative startup device commands. The procedure for giving an alternative startup command is described in Setting Startup Specifications, in Chapter 6 of the *Lisa Office System* manual.

From this point, the screen displays a series of icons showing which test is in progress, as shown in Figure 1. While a board is being tested, its icon is highlighted on the screen. As each board passes the tests, the Lisa displays a check mark over the icon. Often, the video screen has not had time to warm up at this point, so you may not see this display.

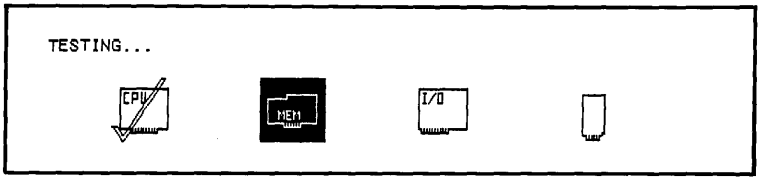


Figure 1. Startup Module Test Display

Errors detected during the following tests are reported both by a screen message and by a two- or three-note error tone. A table of error tones appears in Startup Symptoms and Error Messages, in Chapter 2, Troubleshooting.

CPU Board Test Completion

The remaining two CPU board tests partially check the video circuitry and write wrong parity circuitry. If either test fails, testing is terminated, and the CPU board icon is displayed with one of two error codes:

42—Video logic error

43—Parity logic error

Memory Test

The final memory check is a full read/write and address check of all RAM not yet tested. The brief test takes about 18 seconds for a full megabyte of memory. If you have specified a thorough test in your startup specifications, the test takes twice as long.

Errors detected in this test are displayed at the end of the startup sequence. The memory board icon with error code 70 indicates read/write errors, and the memory board icon with error code 71 indicates parity errors.

I/O Board Test Completion

This test verifies that the disk controller is ready, checks shared memory, and then disables the disk interrupts until startup is complete. Errors are displayed as an I/O board icon with error code 57.

The Lisa then tests the serial port controller. Errors are displayed as an I/O board icon, with error code 55 for port A errors and error code 56 for port B errors.

After these tests, the speaker emits a double click and the Lisa scans the keyboard for any keystrokes entered since the first click. The Lisa then reads the clock/calendar and saves the time and date information for later use.

Errors in reading the keyboard or the clock are displayed as an I/O board icon, with error code 52 for the I/O board COPS, which controls the keyboard and mouse interfaces, or with error code 54 for the clock/calendar.

Expansion Slot Configuration Status Check

Finally, the system scans each expansion slot to see if a card is present. The results are stored for future use but are not compared with the information in parameter memory.

If this check detects a bootable device in any slot, the Lisa scans the required ROM on the card to ensure that it can be read properly. An error here is displayed as an expansion card icon, with error code 92.

In addition, the ROM of the card in the slot may contain its own diagnostic routine. If an error is found when that check is run, error code 93 is displayed.

Startup Error Messages and Tones

Each startup error message can consist of three parts:

- An icon representing the module that caused the problem.
- A numeric code indicating the kind of problem.
- A one-, two-, or three-note error tone indicating either which module caused the problem or what kind of problem it is.

Some of the error messages indicate a physical problem with the Lisa; others indicate a problem with the system setup. In general, the presence of an icon with or without a numeric code means that the module represented by the icon should be checked or replaced. For recommended troubleshooting procedures, see Chapter 2, Troubleshooting.

The meanings of the numeric codes are summarized in Table 1. The meanings of the error tones are summarized in Startup Symptoms and Error Messages, in Chapter 2, Troubleshooting.

Table 1. Startup Error Messages

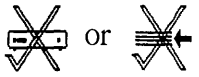
Icon	Code	Meaning
Disk drive		No diskette in startup drive.
Diskette	23	Unable to read diskette.
	38	No startup file on diskette.
	39	Disk controller timeout.
CPU board	40	MMU error.
	41	CPU selection logic error.
	42	Video circuitry error.
	43	Parity circuitry error.
System	44	Unexpected NMI interrupt.
	45	Bus error.
	46	Address error.
	47	Other unexpected exception.
	48	Illegal instruction error.
	49	Line 1010 or 1111 trap.

Table 1. Startup Error Messages, continued

Icon	Code	Meaning
I/O board	50	Keyboard VIA error.
	51	Parallel port VIA error.
	52	I/O board COPS error.
	53	Keyboard COPS error.
	54	Clock error.
	55	Serial port A (RS232) error.
	56	Serial port B (RS232) error.
	57	Diskette controller error.
	58	I/O board access error.
	59	I/O board COPS code error.
	60	I/O or keyboard error.
Memory board	70	Memory read/write error.
	71	Memory parity error.
Startup device	75	Startup failure; startup file on disk probably bad.
or		

▶▶▶

Table 1. Startup Error Messages, continued

Icon	Code	Meaning
Hard disk	80	Hard disk not attached.
	81	Disk not ready.
	82	Bad response from disk.
	83	Nonzero status bytes returned from disk.
	84	Invalid boot file on disk.
	85	Disk timeout.
Expansion card	90	No expansion card installed.
	91	Expansion card not bootable.
	92	Bad ROM checksum on expansion card.
	93	Bad status returned from expansion card.

Appendix C Environments Window

If your startup disk contains any software other than the Lisa Office System, you may encounter a screen something like the one shown in Figure 2 when you start up the Lisa.

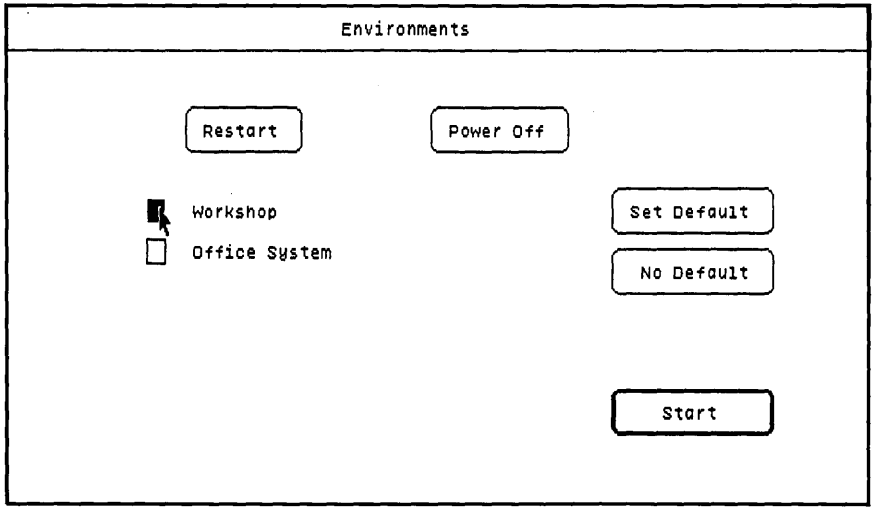


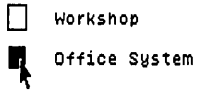
Figure 2. Environments Window

This display, known as the Environments window, allows you to specify which software you want to use. To start up the Lisa Office System, click Office System, and then click Start.

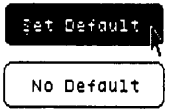
You can specify a default, or automatic, environment so that the same environment will be in effect every time you turn on the Lisa.

If, for example, you always want to use the Lisa Office System:

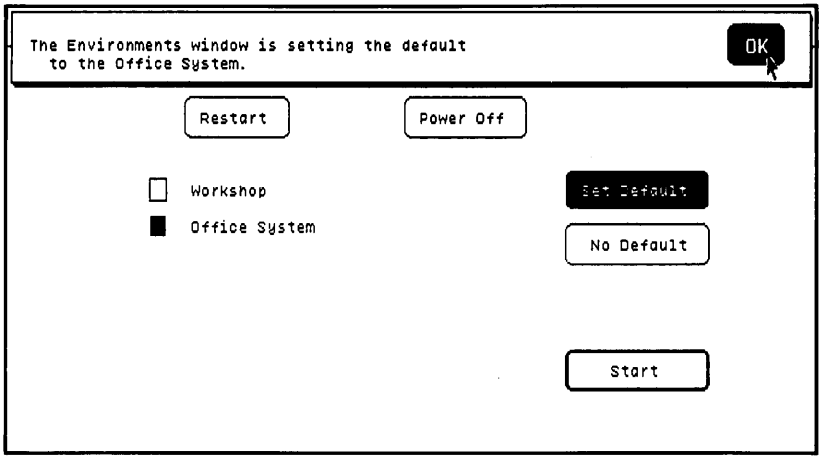
1▶ Click Office System.



2▶ Click Set Default.

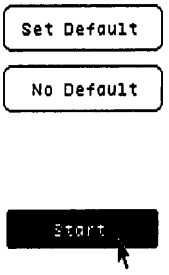


3▶ When this message appears, click OK.



▶▶▶

4▶ Click Start.



If you normally want the Lisa to start up a different software environment, see the manual that came with that software.

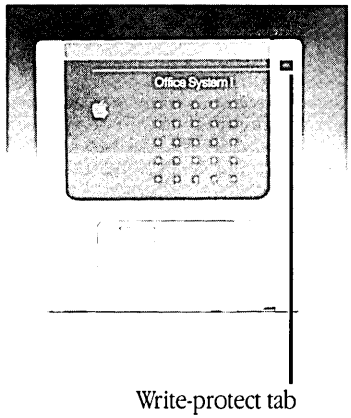
Once you have chosen the default setting, you will never see the Environments window unless you specifically request it. To call up the Environments window from the Lisa Office System, hold down the Apple key while pressing the on-off button. To call up the Environments window during system startup, press and hold down the Apple key and then press the period after you hear the double click from the cabinet.

Appendix D Caring for Micro Diskettes

The plastic-encased micro diskettes that come with your Lisa 2 are less sensitive than "floppy" disks, but you must still be careful about a few things.

- Keep micro diskettes away from magnetic fields. Note that a number of articles common in office environments emit electromagnetic fields strong enough to erase a disk. Avoid leaning diskettes against, for example, high-intensity desk lamps, electric staplers, clocks, magnetic paper clip holders, telephones, or printers.
- Store diskettes in a dry place at temperatures between 10 and 52 degrees centigrade (between 50 and 125 degrees Fahrenheit). Do not leave diskettes on top of the Lisa or in direct sunlight.
- A micro diskette has no exposed recording surface. Instead, the metal slide on the top of the diskette opens when the diskette is inserted in the drive. To keep the recording surface protected, do not open the slide yourself.

- The micro diskette has a write-protect tab to prevent accidental erasure. The write-protect tab is the little window to the right of the label. If the write-protect tab is open (that is, you can see through it), the Lisa Office System software cannot use the diskette. If the micro diskette is inserted in the drive with its write-protect tab open, the system ejects the diskette and asks that you close the write-protect tab. If the window shows red, then it's closed, and the micro diskette can be used.



Write-protect tab

Note: Because micro diskettes can be damaged or erased accidentally—and because they eventually wear out with use—you should keep backup copies of all critical documents that are stored on diskettes. See Backing Up Disks and Diskettes, in Chapter 4, Using the Desktop, in the *Lisa Office System* manual. If you are using other software, see the manual that comes with that software.

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