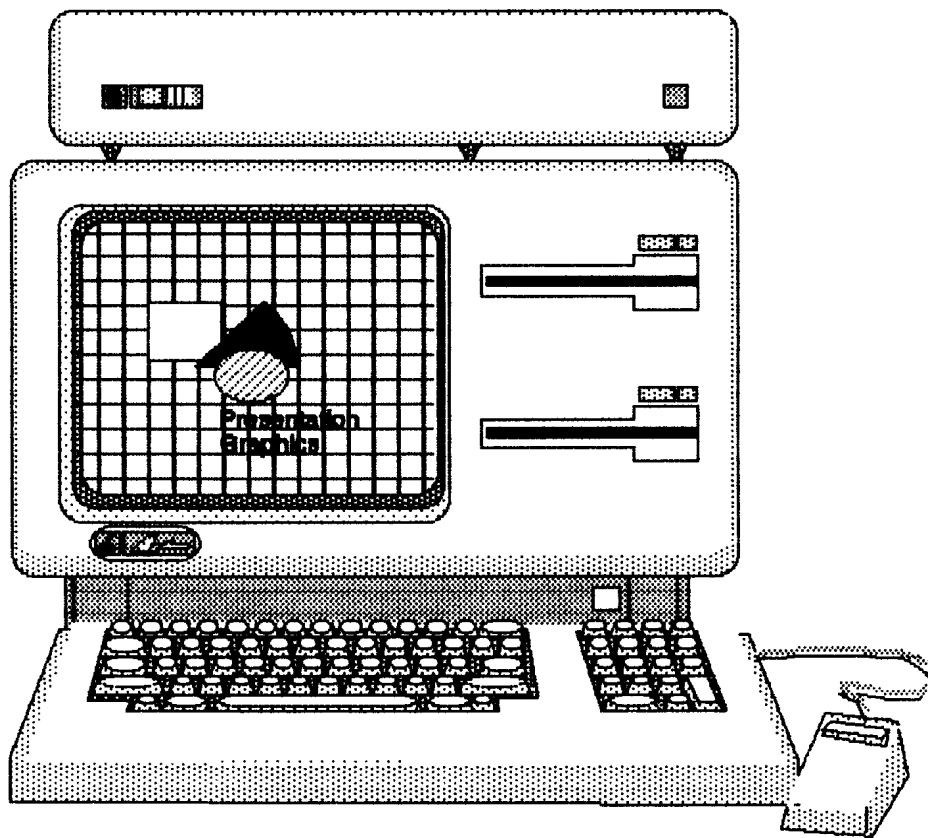




# Apple Lisa Personal Computer 1983 to 1985

# LisaTest Information



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**Lisa/Macintosh XL Technical Procedures**

**Section 5**

**Diagnostics**

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### VITAL INFORMATION

The Lisa/Macintosh XL has two diagnostic test series available for Level I service: the **boot ROM** and the **diagnostic test diskette**. The boot ROM on the CPU board acts as the first test of the Lisa 2/Macintosh XL system. It contains diagnostics that are executed each time the system is turned on.

The Lisa/Macintosh XL Test diagnostic diskette is used for testing Lisa 2, Lisa 2/5, and those Macintosh XL's (Lisa 2/10's) that have not been upgraded with the Macintosh XL Screen Modification Kit. It will not work on a system that has been upgraded with the Screen Modification Kit.

The Macintosh XL Screen Modification Kit diagnostic diskette is an identical test for use in testing Modified Lisa/Macintosh XL's (Lisa 2/10's) that have been upgraded with the Screen Modification Kit. It will not work on a system without that modification.

Both diagnostic diskettes contain tests for the CPU, memory boards, I/O board, diskette drive, built-in hard disk, ProFile, and expansion cards, as well as tools for video adjustments (the video grid and gray screen).

Both the modified and unmodified Lisa/Macintosh XL require two memory boards in order to use the diagnostic diskette.



**INTERPRETING THE BOOT ROM AND I/O ROM**

Upon power up, the Lisa/Macintosh XL will automatically perform a self-test using the program in its boot ROM. As the CRT warms up (approximately 30 seconds after power-up), the monitor will display four icons representing the CPU, I/O, memory, and expansion cards as they are being tested. Each icon will be highlighted in sequence as the boot ROM checks it.

The Boot ROM and I/O ROM code numbers are displayed at the upper right corner of the screen once the board icons have been tested. These ROM code numbers are displayed for only a few seconds, so it is important that you watch the upper right corner of the screen until you can record the code numbers for the Boot ROM and I/O ROM. The correct ROM code numbers for unmodified Lisa/Macintosh XL and Modified Lisa/Macintosh XL are listed on the table below. If the numbers you record do not match the numbers given on the table, install the correct ROM immediately.

	Unmodified		Modified	
	Boot ROM	I/O ROM	Boot ROM	I/O ROM
Lisa 2 and 2/5	H	A8	3A	A8
Macintosh XL	H	88	3A	88

The boot ROM diagnostics are an overview of the system. If one of the cards is faulty, its icon will be presented on the screen with an "X" through it. The testing will stop. Upon failure you should reseal the board, power-up, and if you get that error message again, swap out the board. If the system passes, and the ROM code numbers are correct, you can use the Lisa/Macintosh XL Test diagnostic (for unmodified system) or Macintosh XL Screen Modification Kit diagnostic (for modified system) for further testing.

**THE FOLLOWING PROCEDURES ARE WRITTEN FOR THE LISA/MACINTOSH XL TEST DIAGNOSTIC (P/N 077-0140), AND FOR THE MACINTOSH XL SCREEN MODIFICATION KIT DIAGNOSTIC (P/N 077-0206).**



## USING THE DIAGNOSTIC DISKETTES

The Lisa/Macintosh XL Test and Macintosh XL Screen Modification Kit diagnostic can be used in two ways, in the "Customer Level" or the "Service Level." Customer Level allows you to set up and run a continuous sequence of tests. In Service Level you can choose to test individual modules. When you boot up either diagnostic diskette you are in the Customer Level. To enter the Service Level, hold down the <APPLE> and <SHIFT> keys and press S. You can enter Service Level before running the first Customer Level test.

Here are some important things to remember about using the diagnostic diskettes.

1. First determine whether the system to be tested is a modified Macintosh XL (with Screen Kit installed) or not. (See "Interpreting the Boot ROM and I/O ROM.") Be sure to use the appropriate diagnostic diskette.
2. In order to use the diagnostic diskette, the computer must have two memory boards.
3. If you attempt to use the diagnostic while any application is running, the computer will display a "damaged diskette" error message.
4. The diagnostic diskette will report an I/O error if the CPU board boot ROM are prior to rev. F. It is recommended that such boards be upgrade to the latest rev.

## BOOTING THE DIAGNOSTIC DISKETTE

1. Make sure the diagnostic diskette is not write protected.
2. If the computer is turned on, turn it off by pressing the on-off button once.
3. Insert the proper diagnostic diskette.
4. Power up the computer. When you hear the first click (when the four boot ROM icons are on the screen but have not yet all been checked off) hold down the <APPLE> key and press 2 on the alphanumeric keyboard.

After completing its self-test, the computer will read the diskette. You are then presented with a series of menu screens offering several options for the configuration of the test sequence.



## CUSTOMER LEVEL

The first screen you see after starting up from the test diskette is part of the "Customer Level" of the test program. Use Customer Level to run a continuous test of the Lisa or Lisa/Macintosh XL system. You can choose either a "Short" or an "Overnight" (long) test sequence. (The overnight test is preferable for intermittent problems.) You can also choose to test the disk drive, the built-in hard disk (for Lisa 2/10), and the ProFile. To make these choices, select the appropriate decision box using the mouse.

If you abort a test early (i.e., hold down the "APPLE" key and press the main keyboard's ".") you will be given the options "Continue", "Summary", or "Turn Off".

"Continue" proceeds with the testing of the next module in the sequence.

"Summary" lists the modules tested and whether they passed or failed.

If you want to test individual modules one at a time, see the instructions for "Service Level" on the next page.



*Note (DTC/March 1993) - Double-clicking on a Service Level icon produces a list of the specific tests performed by that icon (eg: Sony disk test icon → Surface Test and Scissor Read).*

## SERVICE LEVEL

Use the "Service Level" to run tests of individual modules. This is useful when you have some idea where in the system the problem may be located. From the Service Level you can also set diagnostic controls and run a system check.

To enter the Service Level from the first screen after startup, hold down the "APPLE" and "SHIFT" keys and press "S". Then, to see the Options menu, pull it down with the mouse or press any key on the keyboard. The choices listed in the Options menu are defined below:

- a) **Check** - to run individual tests.
- b) **Run System Check** - to enter the first menu of the Customer Level.
- c) **Eject Diskette** - to eject Lisa/Macintosh Test.
- d) **Set Diagnostic Controls** - to set testing modes and error controls.
- e) **Set Customer Level** - to get out of the Service Level.
- f) **Turn Off** - to turn off the computer.

Service Level lets you use either mouse or keyboard input. To use the keyboard, hold down the "APPLE" key while pressing the letter or number indicated at the right of the option you want to select.

**NOTE: AFTER THE LISA/MACINTOSH XL TEST DISKETTES VERIFY THAT THE SYSTEM IS GOOD, RUN A FUNCTIONAL TEST BY:**

a. **BOOTING THE LISA OFFICE SYSTEM AND RUNNING ANY OFFICE SYSTEM APPLICATION (FOR A LISA)**

**OR**

b. **BOOTING UP A MACWORKS DISKETTE AND RUNNING A MACINTOSH APPLICATION (FOR A MACINTOSH XL).**



### Running Individual Tests

1. Select "Check" from the Options menu.

Lisa or Macintosh XL now displays the icons for the diagnostics.

2. Selecting the test. (See **Brief Test Descriptions** for specific tests and additional instructions on how to run them.)
  - a) Select the icon for the test you are interested in by moving the pointer over the icon, and pressing the mouse button **once**.
  - b) Select "OK." (Selecting "Cancel" would return you to Options.)
3. Test results are displayed either as an icon with a check by it, indicating the module passed, or as an error message suggesting which modules may be at fault and the order in which to swap them.

The "Gray" and "Crosshatch" tests are use for video adjustments. When either of these icons is selected, the Lisa displays the corresponding pattern. You must push the mouse button to return to the Options menu.

4. To return to the "Check" menu to continue testing, select "OK" from the results screen and then select "OK" from the subsequent Note. To see the Options menu use the mouse to pull it down or press any key on the keyboard.

**NOTE:** Results from previous tests may be displayed on the screen while you are returning to the Options menu. Don't be confused. Ignore this and follow the above instructions to return to the "Check" menu.





### Brief Test Descriptions

Below are brief explanations of what each diagnostic examines and instructions that help clarify its use.

**CPU** verifies the logic on the CPU: the operation of the boot ROM, the memory management unit of the CPU board, the video timing circuitry, and the error logic.

**MEMORY** tests all the RAM chips in both memory boards. The memory board test takes about sixteen minutes, so have patience. This test does not destroy any memory data.

**IO BOARD** test verifies the operation of the Clock/Calendar, versatile interface adaptor, and diskette controller logic. While this test is running, do not move the mouse or press any keys on the keyboard.

**DISKETTE DRIVE** test verifies the operation of the disk drive, testing that certain parameters are within specifications (e.g., the motor speed). It also verifies the diskette drive operation with a complete nondestructive diskette surface test. This test takes a while, so have patience.

**GRAY** can be used for video adjustments.

**CROSSHATCH** is used for video adjustments. (See Section 4, "Lisa Video Adjustments," in the Lisa Technical Procedures.)

**BUILT-IN HARD DISK** test scans the entire data surface, checking for bad blocks. This test lasts about five minutes and is nondestructive.

**PARALLEL INTERFACE CARD** tests the first parallel interface card that is installed in an expansion slot (scanning for a card from innermost to outermost slot).

**PROFILE** test verifies the Lisa/Macintosh XL - ProFile communication and the RAM buffer; it also checks the status block and does a block scan.



### Run System Check

You would use this selection if you had no idea what was causing an error and therefore wanted to run a test sequence.

-- To run this test, select "Run Complete System Check" from the Options menu.

You are then presented with the same series of menu screens offered in the Customer Level. These include several options about how you want the test sequence to run. You can choose either a short or long (overnight) test sequence. The long test is preferable for intermittent problems. You are also given the choice of testing or not testing the disk drives. To make these choices, select the appropriate decision box using the mouse.

If you abort a test early (hold down the "APPLE" key and press "."), you are given the options "Continue" or "Turn Off". "Continue" allows you to make further selections from the Options menu.

### Set Diagnostic Controls

Here you can change how a test is run, that is, once or continuously. You would select "continuously" to find intermittent errors.

1. Select Set Diagnostic Controls from the Options menu.  
The defaults are numbers 1, 3, 5, 8, and 9.
2. To change a default setting select the box to the left of your choice.
3. To cancel changes select "Cancel". To accept changes select "OK".