



Apple //e Diagnostics Card
Operations Manual

Apple //e Technical Procedures

Section 2

Diagnostics

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INTRODUCTION

The Apple //e Diagnostic ROM is a troubleshooting aid for the Apple //e. This job aid briefly covers its content and use.

To use the Diagnostic ROM, insert it in any slot. Set the red switch on the ROM so it slants away from the keyboard. On power-up it will boot and automatically proceed to the menu (see below). If the Diagnostic ROM does not boot check the switch to see if it is slanting away from the keyboard.

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Apple //e Diagnostics
1982 Apple Computer

Enter the Letter of
the Desired Test

<P> PROCESSOR TEST
<R> READ ONLY MEMORY TEST
<M> RANDOM ACCESS MEMORY TEST
<C> CHARACTER SET TEST
<K> KEYBOARD TEST
<V> VIDEO TESTS
<L> LOOP ROM RAM AND PROCESSOR TESTS
<S> SPEAKER TEST

SPACE BAR TO RETURN TO MENU

MICROPROCESSOR IS OK

ROM AT MOTHERBOARD LOCATION D8 IS OK

ROM AT MOTHER BOARD LOCATION D10 IS OK
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Rom Card

To run a test enter the letter of the desired test. To exit a test and return to the menu the general rule is to press the SPACE BAR.



PROCESSOR AND READ ONLY MEMORY TESTS

The Processor and Read Only Memory Tests are executed on powering up the system with the ROM installed. Messages regarding the integrity of the microprocessor and the ROMs are displayed on the last few lines of the menu screen.

Selecting "P" or "R" from the menu will retest the processor and memory. The menu screen is replotted when the test is initiated from the menu screen.

RANDOM ACCESS MEMORY TEST

Each RAM on the motherboard is tested.

The screen clears and alternates three times between two graphics pages and then the screen alternates three times between a graphics page and a blank page.

CURRENTLY TESTING MEMORY AT \$D000-\$FFFF

is painted at the top of an otherwise blank screen. The screen then clears and the menu reappears.

If an error is detected a message is displayed in the same format as the following:

SUSPECTED FAILURE AT LOCATION F13
SPACE BAR TO RETURN TO MENU

The probable motherboard location of the failed RAM in this example is F13. If no errors are found the test returns to the menu screen.

CHARACTER SET TEST

The Character Set Test is largely self explanatory. Four sets of characters are displayed with the line above them describing how they should look.

Note: The characters are in the same order in each set to make it easy to spot a missing or incorrect character.

Failure Indications: If the characters are not as described something is probably wrong with the character set ROM.

Press SPACE BAR to return to the menu.

KEYBOARD TEST

The instructions for operating the Keyboard Test are displayed on the screen upon selection of that option.

The keyboard is represented on the screen. If the characters displayed on the screen do not match those on the keyboard the character Generator IC is probably bad.

You must press each key to test it. As you press the key the corresponding character on the screen will disappear. When you have tested each key (the characters are gone from the screen) press CONTROL-C to return to the menu.

- Note:**
1. The shift or CAPS key must be depressed to test the alphabetic characters. If you fail to do so the CAPS LOCK key on the lower left of the keyboard representation will flash.
 2. The SHIFT and CAPS LOCK keys do not disappear.
 3. The tilde "~" and question mark "?" disappear when typed in conjunction with the SHIFT key.

Failure Indications: Keys that bounce will sound an alarm and be highlighted in inverse video. If all or none of the characters cannot be made to disappear from the screen, the key switch of that character's key or the Encoder ROM might be at fault.

Press CONTROL-C to return to the menu after completing the test.



VIDEO TESTS

Both the high and low resolution graphics of the monitor are tested by video tests.

The "lores" (low resolution) test alternates between two identical "lores" graphic pages that have different messages on the bottom of the screen. The graphics should remain constant regardless of the displayed message.

Press SPACE BAR to continue to the "hires" (high resolution) test. The two "hires" pages should be identical except for the "1" or "2" alternating in the upper left corner of the grid.

Failure Indications: Any difference between the two pages would indicate a failure either in RAM or the display mechanism of the high or low resolution graphics.

Press SPACE BAR to proceed from one test to another and to return to the menu from the second test.

LOOP ROM RAM AND PROCESSOR TESTS

This test is a continuous successive execution of the first three tests listed on the menu.

It is useful in finding intermittent ROM, RAM, and processor problems.

Press SPACE BAR to return to the main menu.

SPEAKER TEST

The speaker test does what it says it does. That is, it plays five tones incrementing from low to high. If this does not occur the failure is in either the speaker or the motherboard.