

This is a continuation of previous articles on the Apple /// confidence disk. In this section, the tests will be described in more technical terms, attempting to explain exactly what happens when each test is run.

## 1.0 THE MACHINE STATUS TEST

The machine status test:

1. determines the amount of RAM memory,
2. determines the number of disk drives,
3. checks each drive for a test diskette,
4. checks to see if the test diskettes are right-protected,
5. checks the baud rate and control registers of the ACIA (serial port) and
6. checks the operation of the two 6522 interface adaptors.

The check of the operation of each 6522 includes the following tests:

CLR: Tests the interrupt enable register for clear or reset.

SET: Checks the adaptor's ability to enable interrupts.

FLAGS: Checks the interrupt register flags by clearing them.

TIMERS 1 & 2: Checks the operation of the timers by loading each with a constant and comparing elapsed time as measured by the timer against the elapsed time as measured by a software timing loop.

SHIFT REG.: Loads an eight bit pattern into the shift register, then compares the shifted output to the load pattern.

IRQ: Tests the expanded interrupt logic.

I/O NMI: Verifies that no peripheral slot interrupts are asserted.

While this test is running, the screen represents the RAM that is currently in the Apple ///. The left side of the screen displays the number of each 32K bank and the associated memory addresses (64K to 256K). The numbers across the top of the screen indicate the 256 byte page within each bank. If a problem is detected, the block corresponding to a single page disappears.

The "Extension (8F)" bank is a test of the extended addressing mode that accesses bank 0.

The Memory test performs the following tests:

TEST ZPAGE/ALT STACK PAGE: This tests the zero page and its companion stack page in the \$1000 to \$1FFF range of memory.

TEST RAM: This RAM test is only performed on the RAM that does not contain the program being executed. This is not a thorough test of the RAM. The program checks to see that RAM is where it is expected to be by writing patterns of ones and zeros to all parts of memory, then by reading them back again.

The pages of memory that are present are indicated on the screen by white rectangles. Missing, or non-functional RAM shows up as missing rectangles within a bank.

If an entire bank is missing, the row for that bank is marked on the screen by a horizontal line of dashes.

TEST INDIRECT ADDRESSING: The opcode extension that provides virtual indirect addressing is tested for every functioning bank of memory.

## 2.0 THE DISK TEST - SEEK/READ/WRITE/SPEED

This test checks every function of each disk drive that is on line and that has a test diskette in it (except for the disk switch function). It will not perform the Write or Speed tests on write protected or non-test diskettes.

SEEK: This test seeks blocks 16, 128, and 248 on the diskette currently selected by the program. If the seek fails, an error message appears, but the program continues testing the other drives.

READ: This test reads data from blocks 16, 128, and 248 on the diskette currently selected by the program. If a read error is detected, an error message appears, but the program continues testing the other drives.

WRITE: After the read test is successfully completed, data is written to blocks 16, 128, 248, and then read to verify that the write was successful.

The test is repeated with an alternating data pattern to test that overwriting is successful.

SPEED: The drive's speed is compared to the current Apple /// disk drive specification.

### THE DISK TEST - THE DISK SWITCH TEST

This test checks the write-protect switch and the disk switch circuitry of the disk drives that are on-line. The screen asks you to pull out the disk in the highlighted drive. When the write-protect switch is triggered, you are prompted to re-insert the diskette and close the door. As soon as you do this, a check mark appears on the screen.

If the write-protect switch is not working, nothing happens when the diskette is removed.

### THE DISK TEST - MAKE EXTERNAL DRIVE TEST DISKETTE

This is not a test. This option allows the user to make the external drive test disks required by the Write and Speed tests. Each external test disk has a unique pattern placed in Block 0, so that the program can recognize a test disk and only write to test disk. The confidence disk is a test disk.

### THE CONTINUOUS TEST

When this test is selected, the program asks whether or not sound is wanted. After an option is selected, the program cycles through the Machine Status, Memory, and Seek/Read/Write/Speed tests until the ESCAPE key is pressed or until an error is detected. Each successful pass through the cycle causes the pass counter in the upper left corner of the screen to be incremented by one.

- Paul Barale