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Apple III: 12-volt 128K Internal Diagnostic

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There is a RAM diagnostic built into the monitor ROMs of all Apple IIIs that's useful for testing the memory of a 12-volt 128K Apple III (typically, Apple IIIs with serial numbers less than 100,000).

NOTE: Before running this test, remove all peripheral cards from the Apple III, especially any ProFile interface cards and Grappler printer cards.

To run the diagnostic:

1. Hold down the CTRL and OA keys, and then press and release RESET key. The MONITOR prompt, a right arrow and a flashing underline, should then appear in the upper left corner of the screen.
2. Type F6E6G and then press the RETURN key.
3. The test should now begin to cycle: in the upper left hand corner of the screen you'll see, about every 20 seconds, a pattern of dots like this:

```

DIAGNOSTIC RAM
. . . . .
. . . . .
. . . . .
. . . . .
. . . . .
. . . . .
. . . . .
. . . . .
. . . . .
. . . . .

```

If the test runs for 20 minutes and displays only dots, the RAM isn't defective. If characters or inverse blocks show up in the matrix, however, the diagnostic has found defective memory chips.

The position of the non-dot character in the display (usually an inverse "1") above corresponds with the chart below, which lists the chip location on the 12-volt memory board.

```

B9 B8 B7 B6 B5 B4 B3 B2
B17 B16 B15 B14 B13 B12 B11 B10
B9 B8 B7 B6 B5 B4 B3 B2

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B17 B16 B15 B14 B13 B12 B11 B10
C17 C16 C15 C14 C13 C12 C11 C10
D9 D8 D7 D6 D5 D4 D3 D2
D17 D16 D15 D14 D13 D12 D11 D10
C9 C8 C7 C6 C5 C4 C3 C2

Replace the bad memory chip(s) and run the test again. If the system once again fails the memory board test, replace the memory board itself. If that doesn't help, replace the main logic board. (Error messages displayed below the DIAGNOSTIC RAM grid, by the way--such as "ACIA", "ROM", or "VIA"--indicate a problem with the logic board.)
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