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Apple III Hardware: Motherboard Identification & Hints

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There are two types of Apple III main logic and memory board combinations. They are typically referred to as either being "5-volt" or "12-volt".

Since there are two types of boards in the field, the first step in servicing an Apple III is to identify whether the system contains 5 or 12-volt boards. Apple III systems above serial number 100,000 are 5-volt systems. When the Apple III was first introduced, 64K random-access memory (RAM) chips were too expensive to incorporate into the Apple III design. Approximately a year later they became economically feasible and began to replace the mixture of 16K and 32K RAM chips used until then. An additional advantage was that a 256K system would actually draw less power than the original "mixed" 128K system.

The first and best way is to look at the part numbers of the ROM chips at locations C11 and C13. Here is what to look for:

12-volt

Location	Part #
C11	341-0044
C13	341-0042

5-volt

Location	Part #
C11	341-0061
C13	341-0062 (128K) or
C13	341-0063 (256K)

The 342-0063 part number works for either a 128K or 256K configuration. The second method of verifying which main logic you are working with is to look at R58, which is located just above location C13. On a 12-volt logic board a 27 ohm, 1/4 watt resistor will be present. On a 5-volt logic board R58 will be missing and a solder bridge will connect the small solder pads on the logic board under R58's mounting position on the board.

There are also two different types of Apple III memory boards. The 12-volt board has three rows of RAM on it. Two rows are filled with 16K RAM (Apple part # 334-0002) and one row with 32K RAM (part # 333-0002). A 256K 5-volt board has two rows of 64K RAM (part # 334-0003) mounted on it. A 128K 5-volt board has one row filled with RAM and one row empty. Five-volt boards are also marked "5-Volt Memory Board" on the top center of the card.

The two memory boards and the two logic boards are not totally interchangeable. Always remember that logic and memory boards of the same voltage must be used together. Main logic boards can be modified to work with either type of memory board, but memory boards cannot.

256K Upgrade Kits are available from Apple for both types of systems.

Additional Service Hints:

The keyboard encoder chip on the Apple III main logic board is a static-sensitive device. Before a replacement board is sent out from Apple, a piece of conductive foam is secured on the solder-side of the board covering the pins of the encoder. Before you install a replacement main logic board, be sure to remove this foam. If this is not done, either there will be no keyboard response or the Apple III will lock up and do nothing at all. Running the Apple III internal RAM test (F6E6G) with a ProFile interface card installed may cause the RAM test to fail. It is best to remove the ProFile card before running the internal RAM test.

New Apple III Diagnostic Diskette

There is a new Apple III Dealer Diagnostic diskette available from Apple Service. This single diskette offers both 12-volt and 5-volt memory board tests. The part number is 077-0013-A.

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