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Composite SIMMs: How to Identify (2/95)

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TOPIC -----

Apple recommends against using composite SIMMs in any Macintosh. Apple hasn't tested composite SIMMs, and there are known problems with some CPUs. This article tells you what some of the problems are, and how to identify composite SIMMs.

DISCUSSION -----

A composite SIMM uses lower density components to construct a single bank of memory. It forms a large memory SIMM using many smaller DRAM chips along with additional bank-controlling circuitry and sometimes buffers for the address and control signals, deceiving the Macintosh memory controller circuitry.

Composite SIMMs are less expensive than non-composite SIMMs because they are made with less expensive components. As an example, a 16 MB composite SIMM would be made up of 32 4-megabit DRAM chips, along with the additional circuitry to control the banks. Conversely, a non-composite 16 MB SIMM would be made up of 8 16-megabit chips only. Composite SIMMs are made up of more commonly available and less expensive parts.

Composite SIMMs pose timing and electrical problems in some Macintosh computers, particularly those optimized for maximum DRAM performance, such as the Quadra 800 and 900 series. Composite SIMMs with signal buffering have caused floppy disk (especially 800K) mounting problems on the Macintosh AV computers. The additional circuitry in the composite SIMMs causes random memory failures due to:

- Higher electrical currents
- Increased system noise
- The added timing overhead (delay)

Composite SIMMs may work under some conditions, but may cause random problems such as start-up failures, system errors, or unexplained crashes. The errors can vary with different SIMMs, SIMM configurations, and vendors. Two composite SIMMs may work, but four may begin to cause random failures. One CPU might behave differently than the same model manufactured at a different time. Even temperature and supply voltages can cause minute variations.

Some SIMM vendors claim to have solved the loading and timing issues. However, the Macintosh memory system is tuned to expect the loading of standard SIMMs. Apple systems are verified to work with eight memory chips per bank, plus parity chips.

Article Change History:

- 14 Feb 1995 - Revised description of Composite SIMM.
- 11 Oct 1994 - Reviewed, made minor changes, added new keyword
- 26 Sep 1994 - Removed binary attachment.

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