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Apple II Memory Expansion Card: Diagnostics (11/96)

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Apple II Memory Expansion Card: Diagnostics (11/96)

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TOPIC -----

This article describes the Apple II Memory Expansion Card diagnostics. These procedures can be used for any RAM configuration.

DISCUSSION -----

Always verify the card size and the positioning of the ICs before running the internal diagnostics.

A card failure is indicated if the internal diagnostics will not run. In that case, remove the RAM, install them on an exchange module, and retest.

1. Install the Memory Expansion Card in any slot except 3 in a known good Apple IIe. No disk drive is necessary.
2. Power on the Apple IIe.

The words Apple II will be displayed at the top of the screen. The prompt and cursor will be displayed on the screen in the upper left hand corner.

3. Enter CALL -151 and press RETURN. The monitor prompt, *, will appear.
4. Verify which slot the Memory Expansion Card is in by entering cX0AG, where X is the slot number, and press RETURN.
5. The following display will appear. Verify the card size (RAM configuration) which appears is the actual size for the card installed (in this case a 256K card is installed). The dots appear on the screen as the card is tested. The test will repeat until an error is encountered or the ESC key is pressed.

MEMORY CARD TEST

ESC TO EXIT

TEST WILL TAKE 45 SECONDS

Seconds: 45 90 135 180

CARD SIZE = 256K

Card size: 256K 512K 768K 1024K

PASSES = 0001

....

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CARD OK

Error Code Interpretation

The Memory Expansion Error Code Chart in the December 1985 mailing was incorrect. This article and the January 1986 mailing contain a corrected chart.

If an error is found during the internal diagnostic it will be displayed in one of the following formats: ADDRESS ERROR XXYYYY-ZZ or DATA ERROR XXYYYY-ZZ. There are, in fact, 4 error situations: address error, data error, non-existent RAM error, and card size error.

Address Error

An address error usually indicates a card failure. Remove all the customer's RAM, install them on an exchange module, and run the test again.

Data Error

Data errors usually indicate a RAM failure. The ZZ in the error code specifies the section of the card where the error took place. The XX in the error code specifies the suspected faulty RAM within that section. Ignore the YYYY.

Memory Expansion Error Code Chart

| RAM locator in specified section | Section of card |
|-------------------------------------|--------------------|
| | |
| XXXXYY-ZZ | |
| | |
| ignore | |

Range of RAM Locator in specified

| Card section | Chip number | Card section | Chip number | Card section |
|-----------------|----------------|-----------------|----------------|-----------------|
| ZZ | | XX | | ZZ |
| 10 | C1 | 0C - 0F | A1 | 01 |
| | C2 | 08 - 0B | A2 | |
| | C3 | 04 - 07 | A3 | |
| | C4 | 00 - 03 | A4 | |
| 20 | C5 | 0C - 0F | A5 | 02 |
| | C6 | 08 - 0B | A6 | |
| | C7 | 04 - 07 | A7 | |
| | C8 | 00 - 03 | A8 | |
| 40 | C9 | 0C - 0F | A9 | 04 |
| | C10 | 08 - 0B | A10 | |
| | C11 | 04 - 07 | A11 | |
| | C12 | 00 - 03 | A12 | |
| 80 | C13 | 0C - 0F | A13 | 08 |
| | C14 | 08 - 0B | A14 | |
| | C15 | 07 - 04 | A15 | |
| | C16 | 00 - 03 | A16 | |

To locate DATA ERROR 08000 - 40 using the chart,

The bad chip is in section 40.

| Card section | Chip number |
|-----------------|----------------|
| ZZ | |
| 40 | C9 |
| | C10 |
| | C11 |
| | C12 |

The bad chip is located where the RAM locator falls into the range that includes 08.

Range of RAM Locator in specified

| Card section | Chip number | Card section |
|-----------------|----------------|-----------------|
| ZZ | | XX |
| 40 | C10 | 08 - 0B |

The position of the bad chip is C10. Replace the RAM chip on the card.

A x x x x x x x x x x x x x x x x

B x x x x x x x x x x X x x x x x x

C 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Re-run the diagnostic.

Non-Existent RAM Error

Any other section ZZ codes, for example 0B, 0E, FC, and so on, usually indicate a card failure. Remove all RAM and install it on an exchange module.

Other error codes might point to a RAM chip which is not installed, for example, if a 256K Memory Expansion Board gave an error of 0C0000 - 40, change the RAM which is installed in that section. If the test still gives the same error message, change the RAM in the adjoining sections.

Card Size Error

If the actual card size does not correspond to the card size listed on the built-in diagnostic, you will need to exchange eight RAMs. For example, if the card size indicated on the internal diagnostic is 768K, and the actual RAM on the card is 1 megabyte, remove the RAM at locations A1, C1, A5, C5, A9, C9, A13, and C13. Reinstall known good RAM and run the diagnostics.

If the card size is now correct, there may be one or more bad ICs among the RAM removed. Replace the removed RAM one at a time, testing after each installation, until the bad RAM is located.

If the card size is still incorrect, this will indicate a card failure. Remove all the RAM and install it on an exchange module and retest.

Article Change History:

15 Nov 1996 - Reviewed for technical accuracy, revised formatting.

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