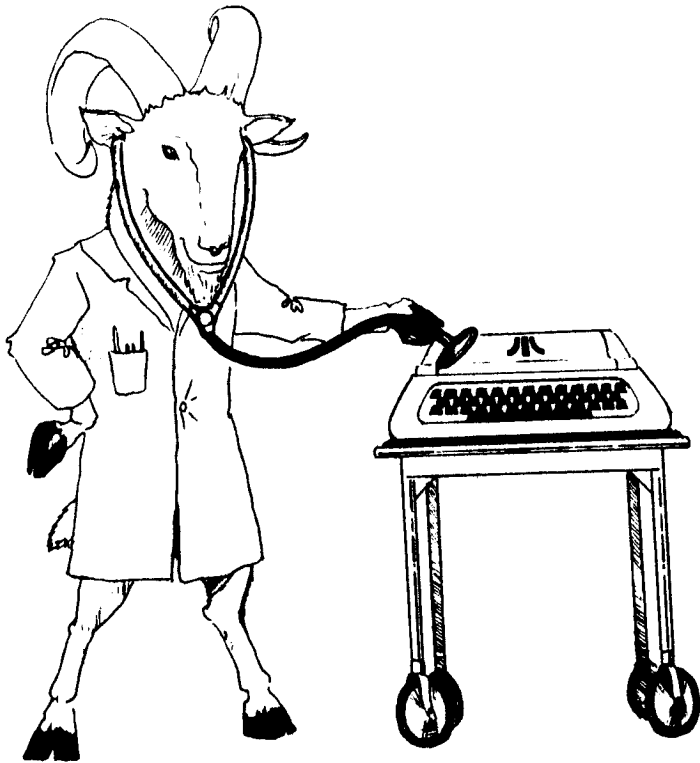


RAM TEST II

By Mark Chasin
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INTRODUCTION

OVERVIEW

This **RAM TEST II** will allow you to test all memory locations of your ATARI 400 or 800 computer. Written entirely in machine language, it runs without any cartridges being present in the normal slot, so that it can test even the top 8K of a 48K ATARI, something other programs, written in BASIC, cannot do. Additionally, the program executes very rapidly, testing every memory location in a 48K ATARI in just over four minutes.

SPECIAL NOTATION USED

The memory addresses printed to the screen by the program (see *Functions* below) are in hexadecimal notation. Briefly, four-digit numbers will be printed. The first two are the page number, and the last two are the location on that page of memory. In hexadecimal notation, the digits 0-9 and letters A-F are used to represent the decimal numbers 0-15. For example, hexadecimal E = decimal 14. To convert from hexadecimal to decimal numbers, use the following formula:

$$\text{DECIMAL} = 4096 * (\text{1st digit}) + 256 * (\text{2nd digit}) + 16 * (\text{3rd digit}) + (\text{4th digit})$$

Example: Convert hexadecimal A3BC to decimal.

$$\text{Decimal} = 4096 * (10) + 256 * (3) + 16 * (11) + 12 = 41916$$

In practice, you probably will not have to interconvert hexadecimal to decimal, since if the program detects a memory problem, knowing the hexadecimal address of the problem will be sufficient to get it fixed.

GETTING STARTED

Open your ATARI computer, and remove any game or language cartridges which may be present (such as BASIC). Close the top firmly, and be sure the latch has caught. Turn on your ATARI 810 Disk Drive, and when the top red light goes out, insert the diskette with the **RAM TEST II** into the drive. Close the door to the drive turn on your TV or monitor, and turn on your ATARI computer. For the tape version, after removing all cartridges, place the **RAM TEST II** tape in your recorder and securely close the top. Hold down the START button of your computer while simultaneously turning on the power to the computer. The internal speaker will sound once, and you should depress the PLAY button on the recorder, and then hit RETURN to load the program.

The program will load itself and begin running automatically. **LEAVE THE TAPE OR DISK IN THE UNIT!!** The second half of the program will need to be loaded shortly.

THE FIRST DISPLAY SCREEN

RAM TEST II, Program #1

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PAGE BEING TESTED	PROBLEM PAGE
1000	

The initial address (1000 in the example shown above) will change in increments of one page, as the program works its way through memory. This way you always know exactly how far the program has progressed. Any bad memory locations will be printed out on the right side of the screen, under the **PROBLEM** heading (for more on this, see the **FUNCTIONS** section following).

FUNCTIONS

This program will write every possible bit combination to every memory location, and read the contents of that location, to insure the integrity of each memory location. If it finds no errors, it continues from one location to another, and then from that page of memory to the next, and so on, through all of memory. In addition, it tests the memory addressing system as it proceeds. As mentioned above, the current page being tested will be displayed on your screen, so you can follow the process of the testing. If no errors are found anywhere in memory, the screen will turn green, and the message to *CONTINUE TESTING, PLEASE HIT RETURN* will appear on the screen for the disk version. For the tape version, having left the tape in the recorder exactly where the first **LOAD** stopped, you will now need to reboot the system. When *RETURN* is executed, the second part of the program will be loaded and will run, testing the remaining areas of memory.

If any bad memory locations are encountered during testing, the address will be displayed on the right side of the screen, as described above. A short tone will also sound to let you know a bad location has been found, and the screen will turn red, and stay red through the remainder of the execution of the program.

The addresses of the final page displayed for various memory configurations are shown below:

MEMORY	FINAL ADDRESS SHOWN
16K	3F00
24K	5F00
32K	7F00
40K	9F00
48K	BF00

Once both **RAMTEST #1** and **RAMTEST #2** are run and no errors are detected, your memory is fine. Periodic testing, especially if unexplained errors crop up during executions of your programs, will insure that your computer memory is not at fault. If the program detects problems with your memory, MMG Micro Software strongly suggests that you take your computer to an authorized ATARI Service Center, describe the problem to them (including the address of any problem areas identified by these programs), and let them repair the problem. In addition to voiding any warranty you may have remaining, you can seriously damage your computer by trying to repair this kind of problem yourself.

TROUBLESHOOTING

PROGRAM OPERATION LIMITATIONS

There are provisions in the program for displaying up to 33 different bad pages of memory. If a greater number of problem locations are detected, the program will not test to completion, but will hang up, and you will have to reboot to start again. However, in practice, this should not be a major limitation, since if you have 33 different malfunctioning pages of memory, you'd better get your ATARI fixed as soon as possible, and whether or not there are actually more bad locations is not too important!

ADVANCED TECHNICAL INFORMATION

The lowest page of memory tested by these programs is page four. Below this area of memory are four pages of memory (including page 0) used by your ATARI for a variety of system uses. If **RAM TEST II** tried to test these locations, your ATARI would stop working, and even these programs could not complete testing. However, in general, if you have some serious problem in the first four pages of your memory, you'll know about it by the malfunctioning of your computer.

During the execution of these programs, the display list and screen memory are both relocated into an already tested area of memory, so that the screen continues to display useful information while the program overwrites the original locations of these areas.