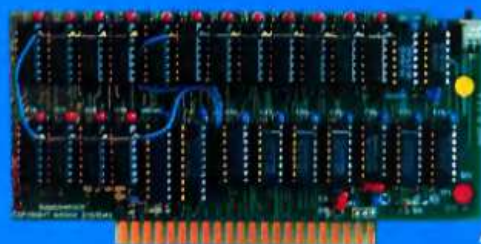


R E V I E W



Left,
1 meg
Ramcharger
board,
right, 256K
Ramcharger board



Ramcharger Memory Board
Magna Systems
147-05 Sanford Ave., Suite 4E
Flushing, NY 11355
256K board—\$339.95
512K board—\$469.95
Price includes MYDOS ramdisk software

Reviewed by Charles Bachand

I've always had a fondness in my heart for the old Atari computers, having originally started out with a model 400, complete with its membrane keyboard. That membrane keyboard was a unique experience, although I've almost forgotten that it was the major cause of many a bruised fingertip. It was great for non-typing applications like running a Bulletin Board System or as a cartridge-based game-playing machine.

But my needs at the time required the extensive use of a keyboard; so I was practically forced to move up to an Atari 800 after only a few months. I still have, use and love that "good old" 800 that sits next to my ST computer at home.

Now, even though there are newer Atari 8-bit computers with more memory than this one, the 800 had several attractive features that made it special. First, the computer was built like a tank, with cast aluminum parts everywhere inside its plastic case. This being one of their first

two models of home computers—the flat-keyboarded 400 being the other—Atari went overboard in shielding the machine in order to prevent them from generating stray radio interference. Today, you're more likely to find only sheet metal and plastic between you and the printed circuit boards.

Four-player games were all the rage back then and could be played via the two extra joystick ports, with up to eight players competing in games that use paddle controllers, as was done in game cartridges like *Super Breakout*. This machine also had two cartridge slots under the hood, but unfortunately only two or three software companies ever marketed anything that plugged into the right-hand slot.

The 800 was also blessed with a replaceable OS (Operating System) board, the idea here being that upgrades would just plug in. This never really came about, although having the OS on a separate board did make the switch to the later Revision B ROMS easier. Instead of disassembling the entire computer, the OS board was pulled out and the ROM chips on it replaced.

Lastly, the 800 had three slots to hold its memory boards. The first machines came with either an 8 or 16K RAM board, but you could easily upgrade your computer's memory capacity by changing and/or adding boards to it. The maximum potential of the machine was supposedly

48K, made up of three 16K boards, but several third-party companies proved that this limit of 16K of RAM per board did not, in fact, exist. Board manufacturers of 32K and 48K like Intec, Axlon, Austin Franklin, Mosaic, Bit-3 and others soon flourished. Axlon went one step further, producing a 128K memory board for the then inexpensive price of \$299. There were even two companies—Austin Franklin and Bit-3—that produced 80-column cards.

Now, you are probably wondering why I'm giving you this short lesson in history concerning the venerable Atari 800? After all, no one is still building computers based along the design specifications of a Sherman tank (except for maybe the military), no one is still writing four- or eight-player computer games, and no one is still producing memory boards for that classic computer of mine.

Well, folks, one new company, Magna Systems, has pleasantly proved me wrong by coming out with not one, but three memory boards for your vintage Atari!

Powering up with 256K memory chips

For the last few months, I'd been considering retiring my 800 for something with more memory, namely an Atari 130XE. Now, due to the immergence of Magna Systems onto the 8-bit scene, I no longer need to do that. Magna Systems produces three memory-board upgrades for the 800 which are designed along the

bank-switching scheme used by the 130XE while using higher density 256K-bit RAM chips, allowing for an elegant no-solder method of memory upgrade.

It is a simple matter to add one of Magna's Ramcharger memory expanders. In most cases it involves only a board swap—pulling out the 16K board that currently resides in the computer's third slot (I'm assuming that you have a 48K machine which is comprised of three 16K memory boards) and replacing it with the Magna board. Further, in the case of the one-meg board which draws more current in its operation, you must verify that the transformer used to power the computer is the type rated at 31VA and not 15VA. (The term VA used here stands for Volts x Amps, merely another way of saying Watts.) The 31VA transformers were employed almost exclusively to operate the older model 810 disk drives, the additional current being needed to power the two motors that spin the disks and move the read/write back and forth.

The design of the Ramcharger boards utilizes three layers of copper instead of two, with the center layer being connected to ground. This interior layer electrically isolates the top and bottom traces from each other. More importantly though, it insulates the two faces of the printed circuit board from spurious RF noise. This means that the traces on either side of the board can no longer act as an antenna, picking up "signals" from traces on the opposing side. The implementation using the three-layer board makes for quiet and error-free circuitry.

Programming the Ramcharger yourself

After reading the manual that comes with the board, I've opted to quote from it directly in order to explain the Ramcharger's operation. In other words, I don't think that I could have said it any better:

"The Ramcharger's memory is organized into 16K bank segments, all of which can be switched in and out at memory addresses \$4000 to \$7FFF. This is done because the 6502 microprocessor was not designed to address anything beyond a maximum of 64K. When the bank-switching method is used, the computer is tricked into using more memory (the 130XE operates the same way.) The Ramcharger 256K has 16 banks, the 512K has 32 banks and the 1MEG has 64 banks. Bank switching is accomplished by storing a bank number to any address in the range \$0FC0 through \$0FFF or \$CFC0 through \$CFFF, with the location \$CFFF being the preferred and standardized lo-

cation that all commercial software uses. Bank \$00 is the default bank that main memory uses. Banks \$01 through \$0F (512K = \$1F or 1MEG = \$3F) are used for extended memory. Writing a \$03 to \$CFFF will select bank 3. The selected bank is now addressable between \$4000 and \$7FFF.

Software Support

The following is a list of software that directly supports the Magna Systems Ramcharger boards, with more to be added in the future:

- MYDOS—Version 4.0 and up
- TOPDOS—Version 1.5 and up
- DOS XL—AXLON version
- SPARTA DOS—with AXLON ramdisk handler
- ATARI DOS 2.5—with disk software that comes with Ramcharger
- HAPPY SECTOR COPIER—makes sector copies to and from the RAMdisk
- OMNIMONR or OMNIMON8K—built in RAMdisk handlers
- FILEMANAGER 800+—supports copy function to the RAMdisk
- SYNFILE+—gives you over 15000 record capacity
- SYNCALE—gives you up to 7000 calculation boxes
- ATARIWRITER PLUS—supports 48K of text buffer
- OMNIWRITER 80—80-column WP supports 208K of text buffer
- PRINT SHOP COMPANION—runs in AXLON compatible mode

Magna Systems supplies a disk with their boards which contains Version 4 of MYDOS, as well as over a dozen miscellaneous programs to aid you in integrating the Ramcharger board into your system.

"Daddy, what is the switch on top for?"

Microsoft BASIC or Atari Writer, examples of 16K cartridges which move the screen's display list and RAM space down into the bank-switch area will more than likely flicker or display garbage on the screen for a short period of time while the banks are switched. This will happen when you access files in the RAMdisk that you establish using the Ramcharger and its supplied software in order to allow for faster access to your data. While this flicker is annoying, it is not fatal—unless you have DLIs (Display List Interrupts) enabled. With DLIs running it is anybody's guess.

If you try to use the Ramcharger with non-DOS software such as games, you might run into strange problems. These

programs might have other plans for the board's bank-select addresses, especially those in the range \$0FC0 through \$0FFF. These problems can be cured by temporarily disabling the Ramcharger. Simply open up the top of your Atari 800 and flip a switch located on top of the Magna board. The Ramcharger will then act just like the Atari 16K memory module that it replaced.

There is a permanent fix to this problem outlined in the owner's manual, but it does involve some soldering and wire jumpering on your part. This will, of course, void your 90-day warranty from Atari (the one that expired several years ago), but not the one from Magna Systems. If you are not sure which end of a soldering iron to hold, the people at Magna Systems will do the modification for you at a charge of \$15.

Inflation on the RAM front

Some of you are probably aware of the current price fluctuations in the RAM chip market. Devices like the 256K which went for about \$2 only a year ago are now fetching \$10 to \$12 apiece. Because of this unstable pricing structure, the costs of the Ramcharger boards will likely change between the time that I'm writing this review and when you pick up the issue at the newsstand. I therefore suggest that those who are interested should call Magna Systems for their current prices.

Of course, if you have been stockpiling 256K 150ns dynamic RAM chips as an investment in the future (I wish that I had), Magna Systems will sell you an "unpopulated" board (one that contains no RAM chips) at a greatly reduced price. Again, call Magna Systems for details.

And so it goes....

I've always had a fascination for elegant and unusual hardware, and Magna Systems' Ramcharger boards certainly qualify in that regard; plus I now have the best of both worlds embodied in my 8-bit system.

If you are like me and just can't bear to part with your Atari 800, consider a Ramcharger memory upgrade—you'll be glad you did.

Starting in the mid-70s when he owned an Altair 8800, Charles Bachand has been fascinated with the hardware aspects of personal computers. He worked as a Technical Editor for ANALOG Computing and STI for seven years. When not typing like mad or burning his fingers on hot soldering irons, Charles can usually be found hanging around the Atari SIGs on DELPHI.