

MEG XL
1-4 MEGABYTE
RAM CARD
FOR ATARI
800XL
1200XL
COMPUTERS
INCLUDES
UTILITIES
SOFTWARE

< RAM NOT INCLUDED >

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MEG XL INSTALLATION REV. C

CAUTION: This product should only be installed by persons with proper training in the art of soldering. Newell Industries will not be held responsible for damage to the computer due to neglect or carelessness. Read these instructions completely before beginning.

The MEG upgrade can be installed using different combinations of bits of the \$D301 address port of the 6520 PIA. The 130XE uses bit 4 (low) to enable Main CPU banking, and bit 5 to enable ANTIC (screen pro.) banking. It uses bits 2 & 3 to determine which of the four 16K banks is active. The 130XE uses 2 sets of RAM banks and flip flops the CAS line to activate the banked memory. We use the same method to bank into the 1 MEG of RAM. See below. After installation, your XL will be functionally compatible with the upgraded XE.

\$D301 PIA PORT B BIT ASSIGNMENTS (UNMODIFIED 130XE)

BIT 0-O.S. ROM CONTROL, 1=ROM, 0=RAM
BIT 1-BASIC ROM CONTROL; 1=RAM, 0=ROM/NO CONNECT ON 1200XL
BIT 2-RAM BANK SELECT, 1=RAM, 0=RAM/NO CONNECT ON XL
BIT 3-RAM BANK SELECT, 1=RAM, 0=RAM/NO CONNECT ON XL,
BIT 4-CPU BANK ENABLE, 1=NOT ENABLED, 0=ENABLED/NO CONNECT ON .XL
BIT 5-ANTIC BANK ENABLE, . 1=NOT ENABLED, 0=ENABLED/NO CONNECT ON XL
BIT 6-NOT USED
BIT 7-DIAG.ROM CONTROL, 1=RAM, 0=ROM

GENERAL INSTALLATION

The ribbon cable H2 wires:

(RED)1=HALT, 2=DEL, . 3=REF, 4=AB0, 5=AB1, 6=AB2, 7=AB3, 8=AB4, 9=AB5, 10=AB6, 11=CASO, 12=CASI, 13=MAP, 14=AB7.

The ribbon cable H3 wires:

(RED)1=A14, 2=A15, 3=A6, 4=A7, 5=SPARE, 6=S, 7-14=D7-D0.

1200XL ONLY, REFER TO DRAWING

- A. Cut trace to pin 3 of U7. Cut trace to pin 11 of U10. Cut trace to pin 13 of U10. NOTE: Make these changes on the bottom of the mother board.
- B. Install jumper wire from CPU address A7 to U10 pin 11. A7 is the trace that was going to U7 pin 3.
- C. Install jumper wire from CPU address A13 to U7 pin 3. A13 is the trace that was going to U10 pin 13.
- D. Install jumper wire from CPU address A14 to U10 pin 13. A14 is the trace that was going to U10 pin 11.
- E. Test computer before preceding.

1. Remove the RAM chip from U13(800XL), U6(1200XL) . Install H1 cable in U13 or U6. Make sure that pin 1 matches up. Solder or socket. Install the 64K RAM chip in U17. Fold the cable and place the MEG board on top of the motherboard component side up.
2. On the PIA, remove pins PB1(11), and PB7(17) from the motherboard and bend them out. Be careful not to damage the motherboard or break the pins off at the IC.
3. Remove pin 8 of 74LS51, U30 (800XL), U25 (1200XL,). See 800XL alternate hook ups.
4. Connect the ribbon cable wire connections below: (see alternate hook up drawing)

Wire to Location	Wire to Location
H2	
1 - ANTIC IC PIN 9	8 - PIA IC PIN 14
2 - CO60472 PIN 12 (DELAY IC)	9 - PIA IC PIN 15
3 - ANTIC IC PIN 8	10 - PIA IC PIN 16
4 - PIA IC PIN 17	11 - U30 'HOLE' 8 (800XL), U25 (1200XL)
5 - PIA IC PIN 11	12 - U30 PIN 8 (800XL), U25 (1200XL)
6 - PIA IC PIN 12	13 - PIA 'HOLE' 17 (1 MEG ONLY)
7 - PIA IC PIN 13	14 - PIA IC PIN 10 (4 MEG ONLY)

H3

1 - ANTIC IC PIN 19	8 - ANTIC IC PIN 31
2 - ANTIC IC PIN 20	9 - ANTIC IC PIN 32
3 - ANTIC IC PIN 26	10 - ANTIC IC PIN 33
4 - ANTIC IC PIN 25	11 - ANTIC IC PIN 40
5 - N/C	12 - ANTIC IC PIN 39
6 - U29 (800XL) 10, U22 (1200XL)	13 - ANTIC IC PIN 38
7 - ANTIC IC PIN 30	14 - ANTIC IC PIN 37

N/C= No Connection; For 4 meg installation see 4 MEG INSTALLATION below.

5. To be able to select the internal basic, connect a toggle switch between ground and the motherboard where PB1 was removed (PIA 'HOLE' 11). The switch, is not much different than the <OPTION> Key, and I found it more versatile.
6. Install the 8 DRAMs (1 or 4 meg x 1, 120ns min., CAS before RAS refresh). Notch towards the capacitors.
7. Make sure that the meg board is not shorting to anything and turn the computer on. If installation was done properly the computer- should come up in the same manner that it did before this installation was done. If not, correct the problem (see trouble shooting) and try **again**.
8. When putting the computer back together, use extreme caution to make sure that the meg board does not short out anything. If you used sockets, you may not be able to install the top RF shield without modifying it. Don't force it.

Compatibility

This method is compatible with Basic XE, the translator disk, and any other software that requires bit 0 to remain in its normal configuration. This method does allow ANTIC control via bit 5. With this method, internal basic is lost via software control. This is probably the most compatible method, and the one that I use and recommend.

\$D301 PIA PORT B BIT ASSIGNMENTS:

- BIT 0 - O.S. ROM CONTROL, 1=ROM, 0=RAM
- BIT 1 - RAM BANK SELECT, 1=RAM, 0=RAM
- BIT 2 - RAM BANK SELECT, 1=RAM, 0=RAM
- BIT 3 - RAM BANK SELECT, 1=RAM, 0=RAM
- BIT 4 - CPU BANK ENABLE, 1=NOT ENABLED, 0=ENABLED
- BIT 5 - ANTIC BANK ENABLE, 1=DISABLED, 0=ENABLED / RAM BANK SELECT, 1=RAM, 0=RAM
- BIT 6 - RAM BANK SELECT, 1=RAM, 0=RAM
- BIT 7 - RAM BANK SELECT, 1=RAM, 0=RAM

4 MEG INSTALLATION

This method is NOT compatible with Basic XE, the translator disk, or any other software that requires bits 0, and/or 1 to remain in its normal configuration. This method does not allow ANTIC control. If Antic addresses the banked memory area (\$4000-\$7FFF), it will see the banked memory currently there. With this method, internal BASIC is lost via software control. Access to the RAM under the OS is also lost.

We are going to connect the lines that normally go to the enable bits to ground. This will mean that the 4 meg banked memory area is always active, so we are going lose the 16K bank of main memory, and replace it with 16K of the banked memory. This will cost you 16K of RAMDisk for a total of 4080K available.

1. Remove PIA pin 10 from motherboard (see notes). Install the board following the above instructions. Note wires 13 & 14.
2. On the meg board, (refer to drawing) cut traces J1 & J2 marked 'x' and strap to ground (G) as indicated. Install a 74LS158 chip in U13.
3. Connect a toggle, or momentary switch between PB7 (PIA pin 17) and 'HOLE' 17. This switch is not required with the 1200XL OS unless you want to maintain the internal diagnostics. NOTE: This switch must be closed during power up (ATARI and Omniview OS's) until you get a screen. It can be left off with OSNXL. If you want to use the internal diagnostics, or if you go into Omnimon or OSNXL, the switch must be on (closed). It must also be on while you go into 80 columns of Omniview. Turn it off (open) all other times. For other OS's, refer to their documentation.

\$D301 PIA PORT B BIT ASSIGNMENTS (4 MEG) - all bits control RAM, 256 banks of 16K each.

Notes

1. It is possible to maintain OS banking using 4 megs. It requires moving the OS into the RAM before any banking of that bit occurs, but remember that when you manipulate bit 0 to low to bring the RAM in under the OS, it will also change the bank at \$4000-\$7FFF. If you wish to do this, leave PIA pin 10 connected to the mother board and use to the AUTORUN.SYS file if you like.
2. As you noticed in note 1, these installation instructions cover what I believe to be the best installation method of the MEG upgrade. By no means does it cover all the methods of installation. Contact us if you have questions about other methods.

Helpful hints:

If you have read these instructions and do not understand them, then do not attempt this installation without assistance. For assistance, you may call Newell Industries between 9 and 5 CT. Collect calls will not be accepted.

Plan the routing of the jumper wires before you start. If you feel that you cannot do the installation yourself, and cannot find anyone locally to do it, Newell Industries will install the upgrade for \$40.00 (includes shipping).

TROUBLE SHOOTING

1. BLANK SCREEN

This could be caused by numerous things. Did you close the PB7 switch (4 meg)? Check wires H2-11, 12, & 13. Check all ICs for bent pins. Check for shorts in soldering. Check motherboard where pins were removed.

2. MYDOS WILL NOT BOOT RAM DISK - ERROR MESSAGES DURING TEST RUN

Check solder connections for bad solder joints or shorts. Check AB0-AB7 to proper pins. Check REF to pin B of ANTIC. Check data lines to proper locations, opens, or shorts.

3. UNKNOWN

The chances of your having a defective meg board are very small. THE MOST COMMON CAUSE FOR PROBLEMS ARE IMPROPER INSTALLATION. If you have double checked your installation and it still does not work, contact Newell Industries for further assistance.

WARRANTY

Newell Industries will, repair or replace any defective part for a period of ninety days from date of purchase at no charge. This excludes parts that have been mishandled or modified in any way.

If you have installed the meg upgrade in your computer and cannot get it to function properly, you may send your computer to Newell Industries and it will be repaired and returned to you at no charge if it is determined that the upgrade parts are defective. If improper installation is the cause of the failure, Newell Industries will correct the installation and return the tested board to you COD for charges.

USING YOUR MEG BOARD

There is a simple program that checks one byte of each bank of memory to insure that they are working. It is on the disk furnished. The filename is "M1TEST1M.BAS". When this program is ran, it should come back with "TEST COMPLETE, 0 ERRORS". If you get any ERROR messages back, refer to the trouble shooting section. CAUTION, reboot your system after running this program. It alters memory, and may have some undesirable affects if the system is not rebooted.

MYDOS DISK OPERATING SYSTEM

The MYDOS disk operating system 4.50 M1 furnished with the meg upgrade is a patched version of 4.50. The patch was made to correct a problem in the RAMdisk handler that would not allow the use of bits 0 and 1. Refer to the MYDOS manual, for setting up the various types of RAMdisks available. The MYDOS manual is in .ARC files on the disk along with the unarc program. Move the files to the RAMdisk to unarc them. The page sequence table in MYDOS starts at \$0BBA and is high nibble C,A,8,6.4,2,0,E by low nibble 1,3,5,7,9,B,D,F as shipped with this upgrade configured for method 1 installation.

M1COPY SECTOR COPIER

This program was designed to be used with the general installation of the meg upgrade. It should not be used with any other computer unless it is verified that it uses the same bank switching methods. The program resides at \$8500, once loaded may be reran using the M option of DOS to run at \$8500 (assuming it has not be overwritten by another program),

The RAMdisk page sequence of the MYDOS with the upgrade is such that the copy program may be ran and copy as many disk as you like and return to DOS without loosing the RD directory including DUP.SYS and MEM.SAV. The RAMdisk will not even know that part of it was used. Of course, if the RAMdisk is full, you will loose the files in the last portion depending on the size of disk you copy. The page sequence for m1copy is high nibble 0, 2, 4, 6, 8, A, C, E by low nibble 1, 3, 5, 7, 9, B, D, F. Copying a 720K disk will only go up to the A7 bank thus leaving the normal 130XE banks and the DOS lower RAMdisks alone.

Use the 'L' command from DOS to load M1COPY. If you are going to copy 80 track or double sided diskettes, your disk drives must be configured prior to running the program. The program can be loaded from the RAMdisk if you need to configure your drives. M1copy uses ONLY the banked memory area for copying, so nothing special is required.

The first prompt. HOW MANY COPIES?

Enter how many copies you want (1-99) and, if needed, the special characters to pass information to the program.

SPECIAL CHARACTERS

A "D" entered after the number of copies (exp. 25D) indicates that the diskette you are going to copy is a double density diskette.

A "Q" indicates that you want to copy 1440 sectors per diskette, (exp, 25DQ) This could be a 40 track double sided, 80 track single sided, or 80 track double sided diskette that you only want to copy the first 1440 sectors. Remember that the format option will format the new diskette to the configuration of the drive.

An "O" indicates that the diskette you are going to copy has 2880 sectors, (exp. 25D0). This would be an 80 track double sided diskette.

An "H" indicates that you just want to copy the first portion of the diskette, including the directory (369 sectors). (exp. 25H) This example would copy the first 369 sectors of any single density diskette.

NOTE: The last character entered will be the one used by the program, (exp. 1DHQ translates to 1DQ, 99QOHD translates to 99HD) A "Return" without a specified number of copies will be interpreted as 153. (exp. H translates to 153H) "Return" must be after entry, (exp. 1H"Return")

SOURCE DRIVE

Enter the drive number where you will put the diskette to be copied. (1-4) Do not press "Return". Drive density is automatically set on source disk.

DESTINATION DRIVE

Enter the drive number that you will use to write the copies to. (1-4) Do not press "Return". Drive density must match source diskette. Using the same drive for source and destination will insure that the,defts4ty-'matchesi

VERIFY WRITES (Y OR N)

Press "Y" if you want to write with verify. This takes about 3 times longer to copy a diskette and is normally not used unless you have some very important diskettes to back up.

FORMAT(Y or N)?:

Press "Y" if you want the destination diskette formatted automatically with every copy.

Otherwise press "N". Do not press "Return".

INSERT SOURCE DISK, PUSH START

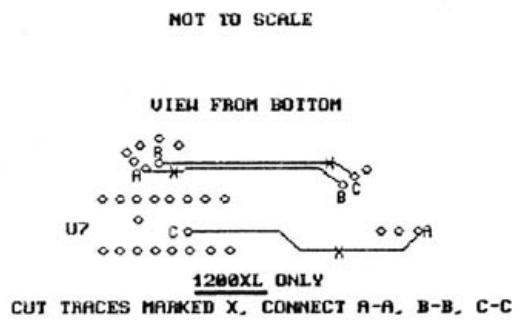
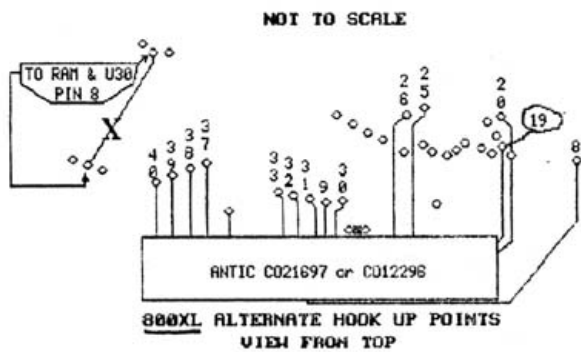
Follow this prompt to read your source diskette.

INSERT DESTINATION DISK, PUSH START

Follow this prompt to write your copies.

UNREADABLE SECTORS

If unreadable sectors are encountered, after a few tries, the program will continue to the next sector, using whatever data it got from the bad sector to write to the destination disk, until the end sector is reached. This program is not intended to copy copy protected diskettes. Be aware that it is illegal to copy copyrighted software for any purpose other than backup.



This is the most compatible MEG upgrade on the market today. Designed to run XE software the others won't. It comes with a DOS that doesn't cost extra. And there is even a disk copy program at no extra cost.

All you need is a soldering iron, some solder, and eight 1 MEG ram chips to start experiencing the world of ramdisk, and all the XE software designed to use the extra memory.

Don't be fooled by other upgrades. If they don't have Antic banking, they can't run all the XE software properly. Ask before you buy and we think you will agree that our MEG upgrade is the right choice.

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