



**Corsham Technologies, LLC**

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## **SYM-1, AIM-65 60K RAM Board**

### **Introduction**

Thank you for buying our 60K RAM board for the SYM-1 and AIM-65 single board computers. We hope this ends your “not quite enough memory” problem 😊

The board can fill in unpopulated regions of memory with RAM in 4K blocks which aligns with the memory map of those computers better than the 8K blocks on our KIM-1 memory expansion boards. The SYM and AIM have multiple EPROM sockets available so there was no need to add EPROM to this board.

There is a special provision for the SYM's reservation of FF80 to FFFF, so the RAM board does not respond to that region.

There are no provisions for bringing the KIM-1 style “K” lines to this RAM board as all decoding in the lower 8K is handled completely by the SYM and AIM. Being slightly later than the KIM-1, these machines made it a bit easier to add more RAM with the addition of more RAM sockets.

### **Differences Between Rev 1 and Rev 2 Boards**

I built the original Rev 1 board and used it on my SYM without problem before someone asked if it would work on his AIM... there was no obvious reason why not, so he bought one, connected to his AIM and found that reads from the new board worked properly but writes failed.

Fortunately, he was able to also test on another AIM where the Rev 1 board worked perfectly, so we began looking at the schematics and discovered early AIMs had an error in generation of the RAM\_R/W signal; an inverted Phase 2 clock was Nanded with the inverted R/W line, which is not what the KIM-1 did. Revision 4 and later AIMs fixed the problem (possibly earlier, but we know it works properly on Revision 4 AIMs).

Because of this error on the AIM, a new revision of the RAM board was developed which added a 74LS00 chip to properly generate the RAM\_R/W signal on-board. This is the current revision board and works with every AIM and SYM it has been tested on.

If you are using the board on a SYM or later model AIM then either revision RAM board should work fine.

The other change is that Rev 1 boards used jumpers to select which memory blocks select RAM, while Rev 2 boards have DIP switches to do the same function.

## Hey, Hey, 60K... Huh?

“Hey, Hey, 16K” is the name of a song written by MJ Hibbett about the good ol’ days of computers when 16K was enough memory to do many useful and fun things. I suggest you go to Wikipedia to see the entry for him and the link to the information about this particular song, or go to YouTube and search for “hey hey 16k.” One of many great lines:

*Hey, Hey, 16K, what does that get you these days?  
You need more than that for a letter,  
Old School Ram Packs are much better!*

Since “60K” sounds like “16K” I decided to pay homage to Mr. Hibbett’s great song and put that phrase on the board. I had seriously considered making a 16K board but that seemed kind of silly.

My KIM, SYM and AIM are calling me...

*Bob Applegate  
November 2020*

## Revision History

Version	Changes
1	First release. Works properly on SYMs and later AIMs.
2	Works on SYMs, and all revisions of AIMs.

## Parts List

Part	Number	Description
PCB	1	Printed Circuit Board (Corsham Tech)
P1	1	22/44 pin edge connector
C1	1	1 uf cap
C2-C3	2	.1 uf cap
R1	1	¼ resistor, 3.3K ohm
SW1, SW2	2	8 position DIP switch – only on Rev 2 boards
U1	1	628128 128Kx8 static RAM
U2	1	74LS159
U3	1	74LS30
U4	1	74LS00 – only on Rev 2 boards
	1	32 pin IC socket for U1
	3	14 pin IC socket for U2, U3, U4