

PREFACE

Please take in account that your A4000 may be damaged with a bad implementation of this modification. Be sure what are you doing. I'm no responsible of any damage made to your computer.

Also this modification may not work in your Amiga. Take it as is, a free DIY that will give some extra ram to your amiga, but without any guaranty .

INGREDIENTS.

- An Amiga 4000
- Some 16 MB 60ns SIMMs
- One PLCC20 socket
- One GAL16V8 10 PLCC20
- Some wire-wrap or similar
- A cutter
- Two 4K7 resistors
- One 33 ohms resistor

QUICK GUIDE.

- Solder the socket in the position of U860
- Jumper pin 17 of the GAL with pins 19 of the simm sockets. Use a 33 ohms resistor between the GAL and the first simm.
- Disconnect pins 45 and 46 of Ramsey from address bus. The better option I think is cut the traces, but lift the pin is valid too.
- Pull-up pins 45 and 46 of Ramsey to 5V using a 4k7 resistor(other values may work too).
- Solder a wire from address bus A24 to pin 14 of the GAL and A25 to pin 13.
- Program version 6 in the GAL.
- Put the GAL in the socket and one 16 mb simm.
- It's time to test the hack. Turn on your amiga, boot without startup-sequence, and use addmem to test the memory. If you put one 16 mb simm, the amiga only add 4mb to the memory pool (0x07FF FFFF-0x07C0 0000). Try "addmem 06C00000 07000000 fast checkmem", "addmem 5C00000 06000000 fast checkmem", "addmem 04C00000 05000000 fast checkmem".
- If addmem finish ok, congratulation, your hack is working. Put another 3 16mb simm and reboot. Your amiga now has 64mb.
- If addmem fails, you can try version3 of the gal. Before use this version, you must cut traces DSACKx from the GAL pins 18 and 19.
- Difference between v6 and v3 is that v3 latch a24 and a25 when AS goes low. Try first v6.
- If you prefer 32mb and use quickramsey, you can put only 2 16mb simms, and use addmem. Be sure that addmem is at the start of your startup-sequence. I has too many problems because I has it at the end, and then my amiga didn't worked well.

HOW IT WORKS.

This modification can be split in two parts:

- Cheat to ramsey disconnecting and pulling up pins 45 and 46. Doing this, Ramsey generate signals to fastram from 0x0400 0000 to 0x07FF FFFF.
- Generate fastramaddr(10) with the GAL. For this, the gal latch the ras signals from ramsey with clk90. When all this signal are high, fastramaddr(10) is equal to amiga bus address a24, and when some of the ras line goes low, fastramaddr(10) is equal to A25. I think Ramsey generate all the signal using clk90, so latching ras signal with clk90, give to the gal a hold time about 20 ns, enough for a 60 ns simm.