Meutoxo's 112MB A4000D mobo recipe v1.0

WARNING & LEGAL NOTICE:

SUMMING UP:

-we don't and won't take any responsibility

-we give no warranties this works on your particular Amiga model

-if you damage your Amiga, yourself and/or somebody else it's your fault

-If you lack electronics skills it's very easy to kill your A4000 so you'd better leave this to an skilled amigan with electronics knowledge and lots of experience.

-If you modify the hack you must give credit to Meutoxo and share with the community (uploading your modifications to Aminet).

- If you want to sell it you can but if you sell it for more than 25€ you should donate a 10% to a charity organization (you will have to pay all the taxes derived from selling your products and/or services)

REQUIRED MATERIALS:

- An A4000D rev B
- A 20-pin GAL16V8 10ns GAL (15ns have been reported to work but no speedramsey)
- A socket for the GAL (optional)
- 2x 4k7 ohm resistors
- 2x 33ohm resistors (these could be "recycled" from the motherboard)
- 2x 64MB 5v slim simms OR 1x 128MB 5v slim simm if you want to use the 112MB version
- 1x64MB 5v slim simm if you want to use the 64MB version (and take advantage of speedramsey)

Notes:

- Using 64MB instead of 112MB requires using a different GAL program version.
- Speedramsey has been tested with 64MB configuration.
- For 112MB config you should use 2x 64MB simms connected to U852 and U853 or a single 128MB simm connected to U853 (the 2nd fastram simm)
- All the ram is autoconfig.

Let the death and destruction begin...

Firstly we'll have to isolate some pads for our new GAL that we'll fit in U860. We'll do that cutting the traces connected to the following U860 pads:

- Pin 19, it's connected to _DSACK0
- Pin 18, it's connected to _DSACK1
- Pin 12, it's connected to j850, resistor R871 and U152
- Pin 11, it's connected to pin 1
- Pin 9, it's connected to 63rd pin of Ramsey and to the first pin of this GAL

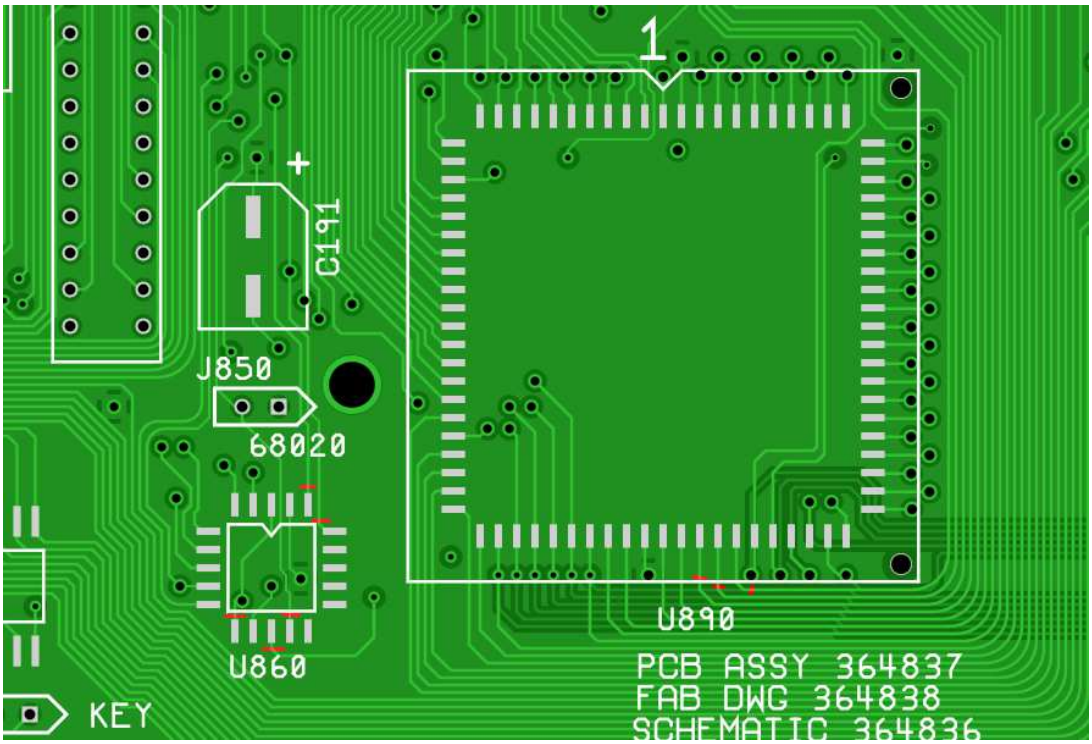


Figure 1. Cuts done in the GAL & Ramsey area

Ramsey also needs some ~~love~~ hate. Once the GAL cuts are done you'll need to disconnect pins 45, 46, 47 from the motherboard. You can do this cutting the traces.

You will also need to remove carefully 4 resistors from the bottom (R891, R892, R893, R894) in order to leave these sockets without RAS signal (As these are 33ohms you'll be able to reuse them later). See Figure 2.

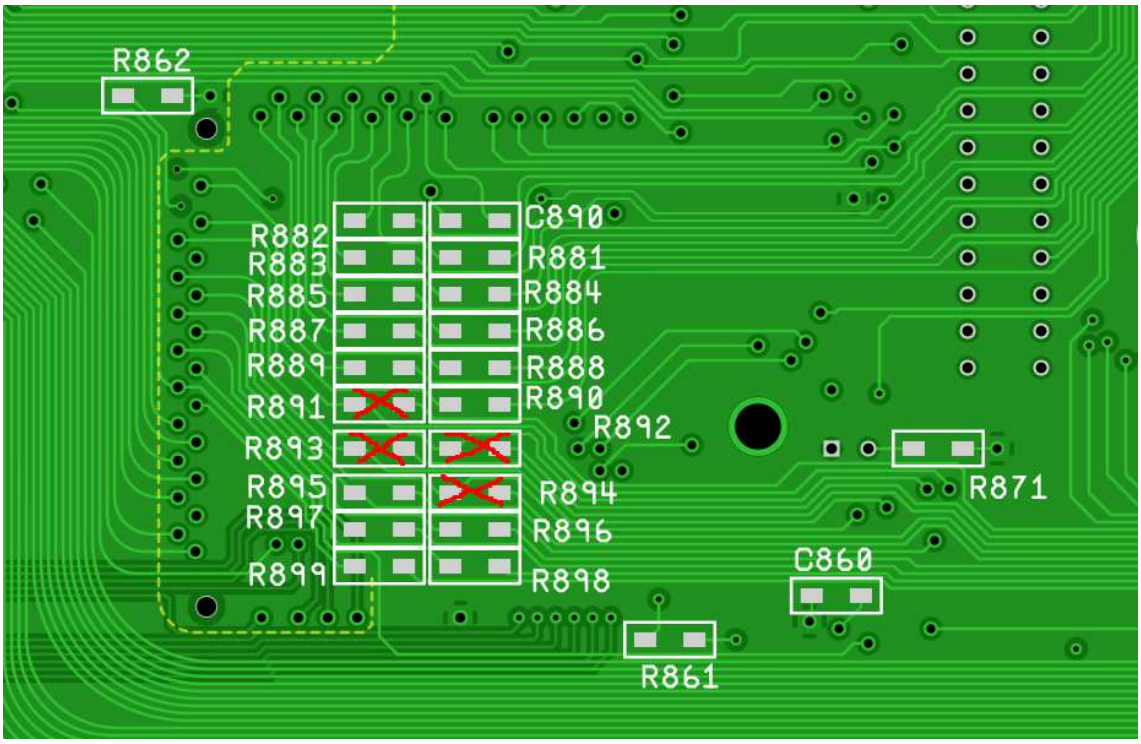


Figure 2: RAS Resistors bye bye!

Before throwing cables everywhere let's connect the 2 4k7 pullup resistors... one goes from pin 45 to pin 47 and another one from pin 46 to pin 47. See Figure 3.

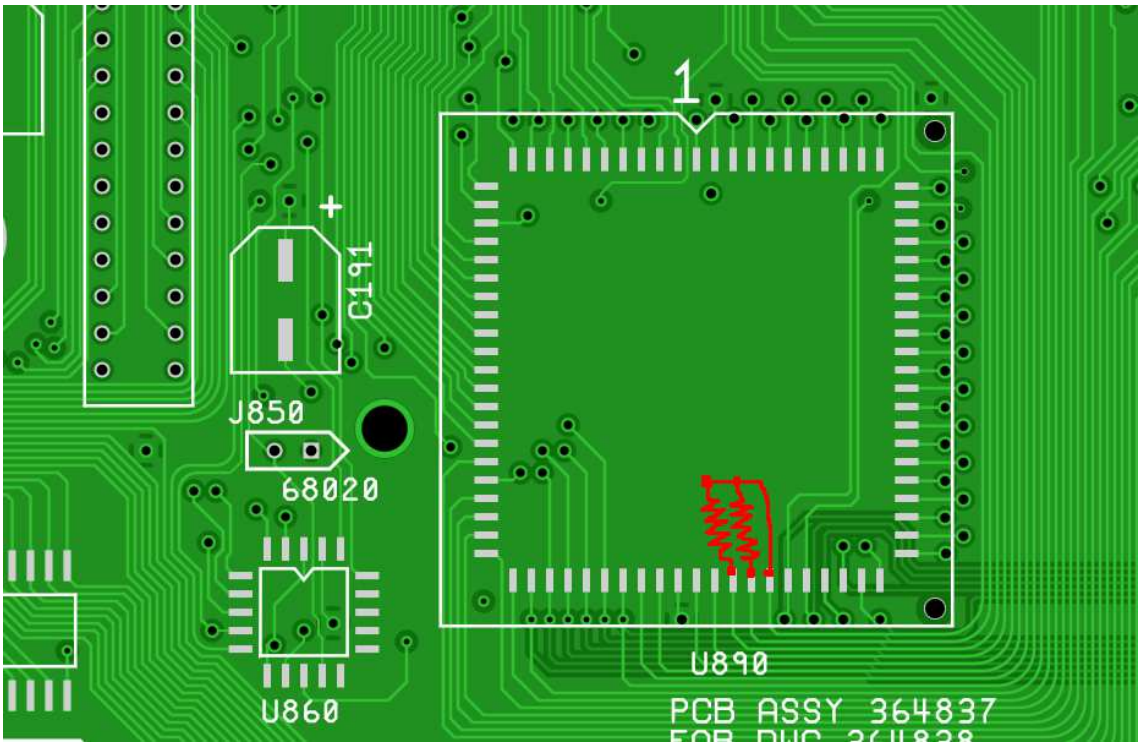


Figure 3: 4k7 pullup resistors connected to Ramsey pins 45, 46, 47

Cables flying everywhere...

Now we'll connect Ramsey pin 47 with U860 pin 14. (just before the pullup resistors). We'll also connect the motherboard address lines of these pins (see Figure 4):

- Ramsey pin 45 (A24) with GAL pin 9
- Ramsey pin 46 (A25) with GAL pin 13
- Ramsey pin 47 (A26) with GAL pin 12

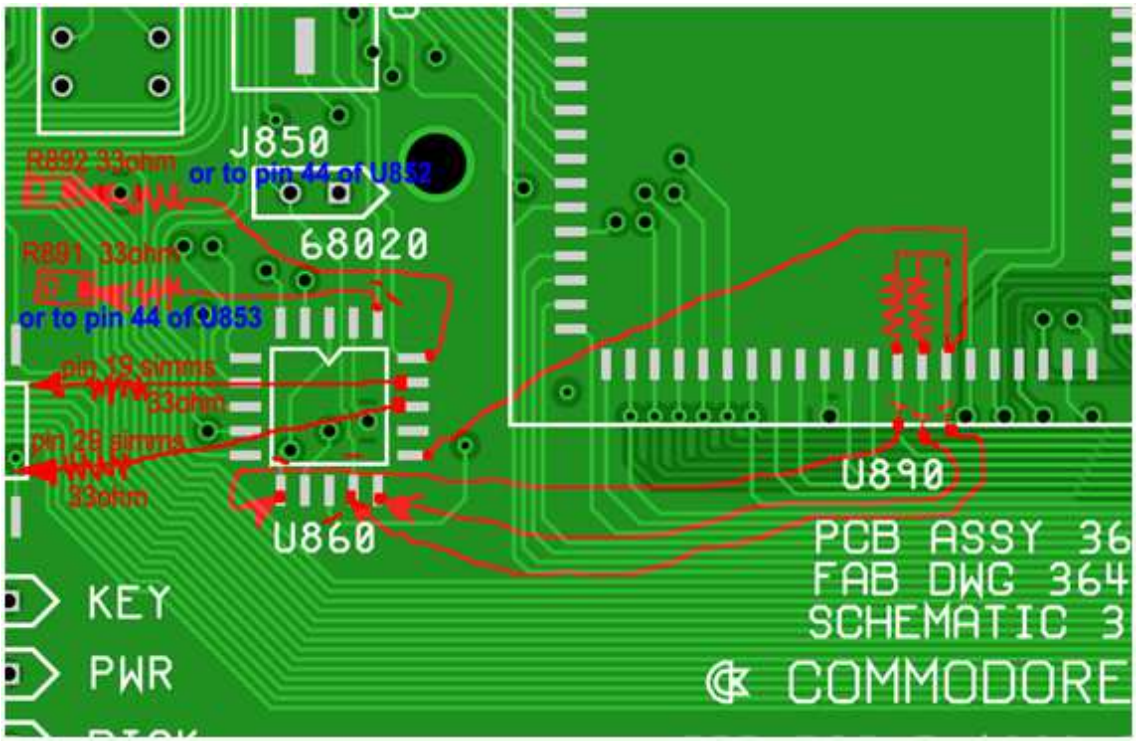


Figure 4: Nasty schematic summing up all the GAL&Ramsey changes (Blue is optional: if you choose connecting to pin 44 you won't have to solder to R891&R892)

Now we'll connect the simm pins (Beware: skip the CHIPRAM simm), see Figure 5:

- We'll connect the pin 29 of U852 (the 2nd FASTRAM simm -but the 3rd simm socket tacking into account the chipram simm-) to the pin 29 of U853 (the 1st FASTRAM simm -but the 2nd simm socket tacking into account the chipram simm-) and we'll solder a cable that will go to pin16 of the GAL (U860).
- We'll connect the pin 19 of U852 (the 2nd FASTRAM simm -but the 3rd simm socket tacking into account the chipram simm-) to the pin 19 of U853 (the 1st FASTRAM simm -but the 2nd simm socket tacking into account the chipram simm-) and we'll solder a cable that will go to pin17 of the GAL (U860).
- We'll connect pin 44 of U853 (or R891 right pad) to a 33ohm resistor and throw a cable to GAL pin 19.
- We'll connect pin 44 of U852 (or R892 right pad) to a 33ohm resistor and throw a cable to GAL pin 18.

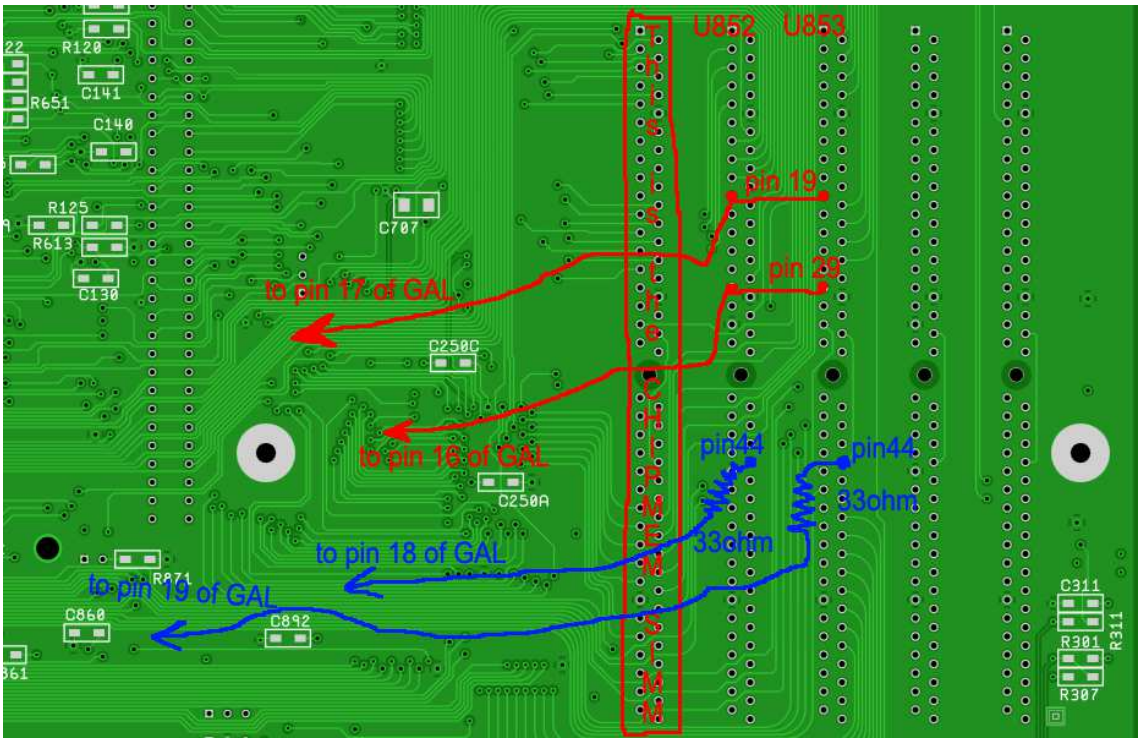


Figure5: Simm connections. Blue drawings are optional as long as you solder cables&both 33ohm resistors to R891&R892. Just in case you want to use shorter cables.

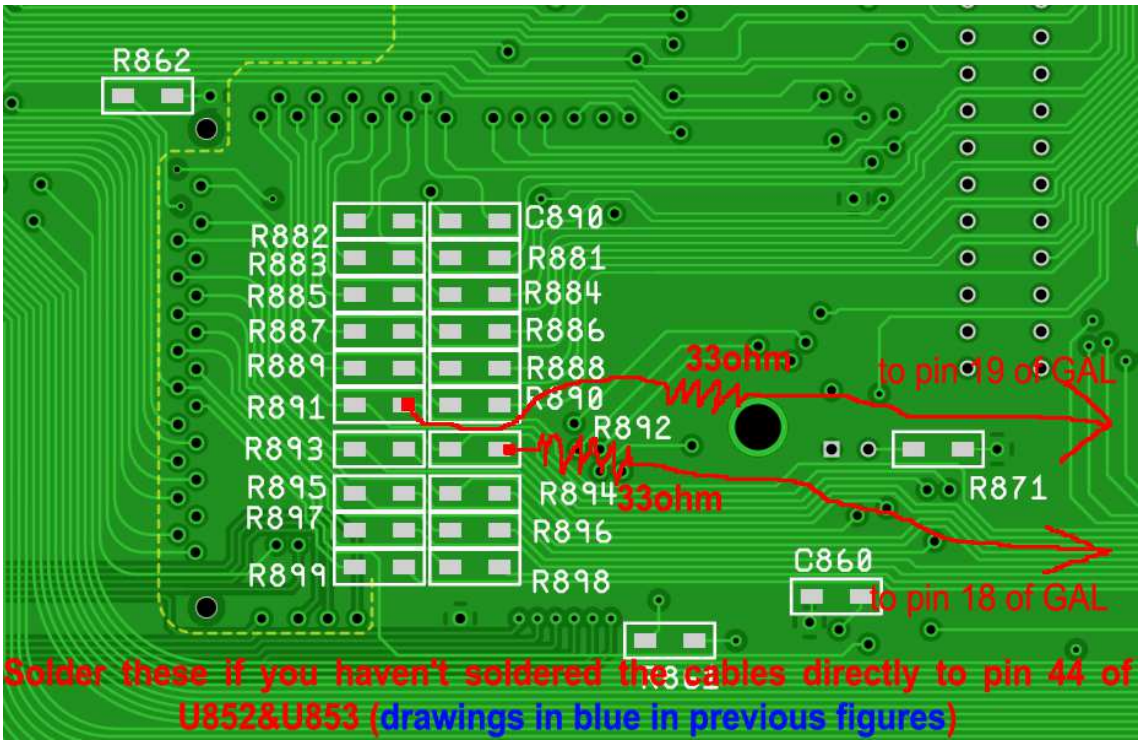


Figure6: if you haven't soldered the cables to pin 44 of U852&U853 you can solder the resistors and the cables here. These will probably be shorter

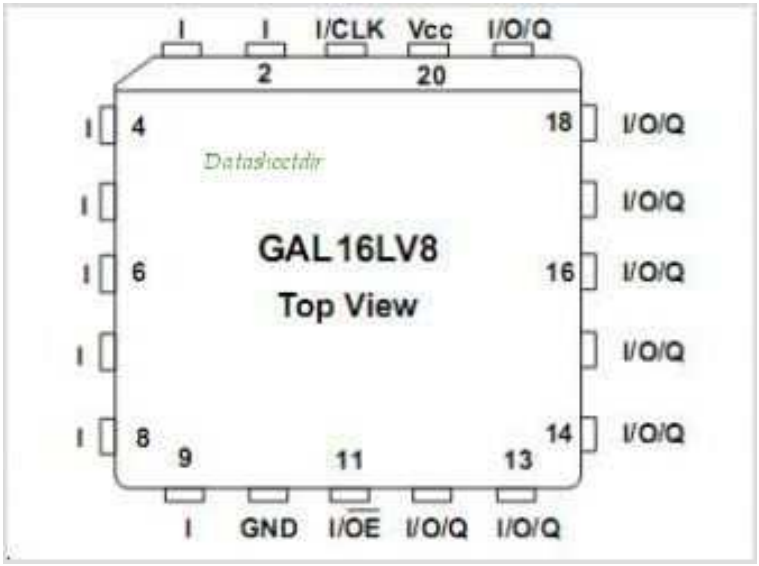
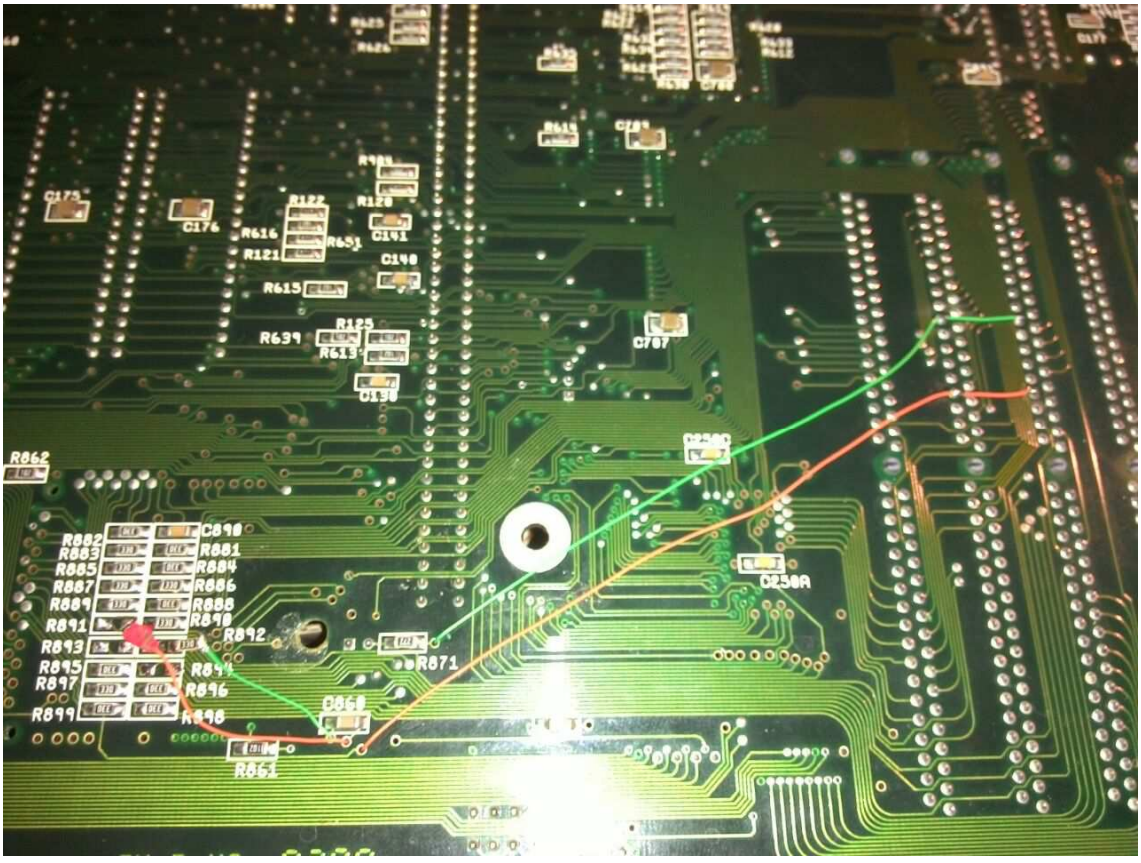
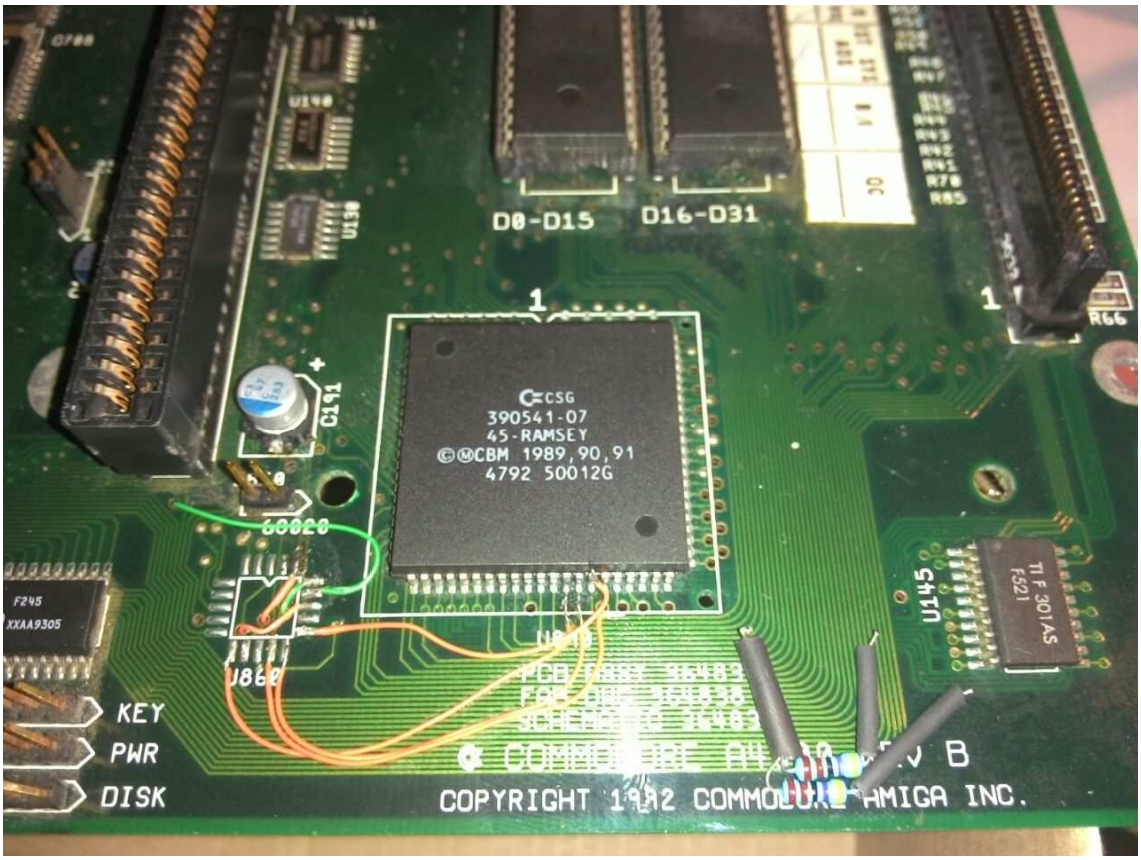


Figure 7: GAL pinout is handy.

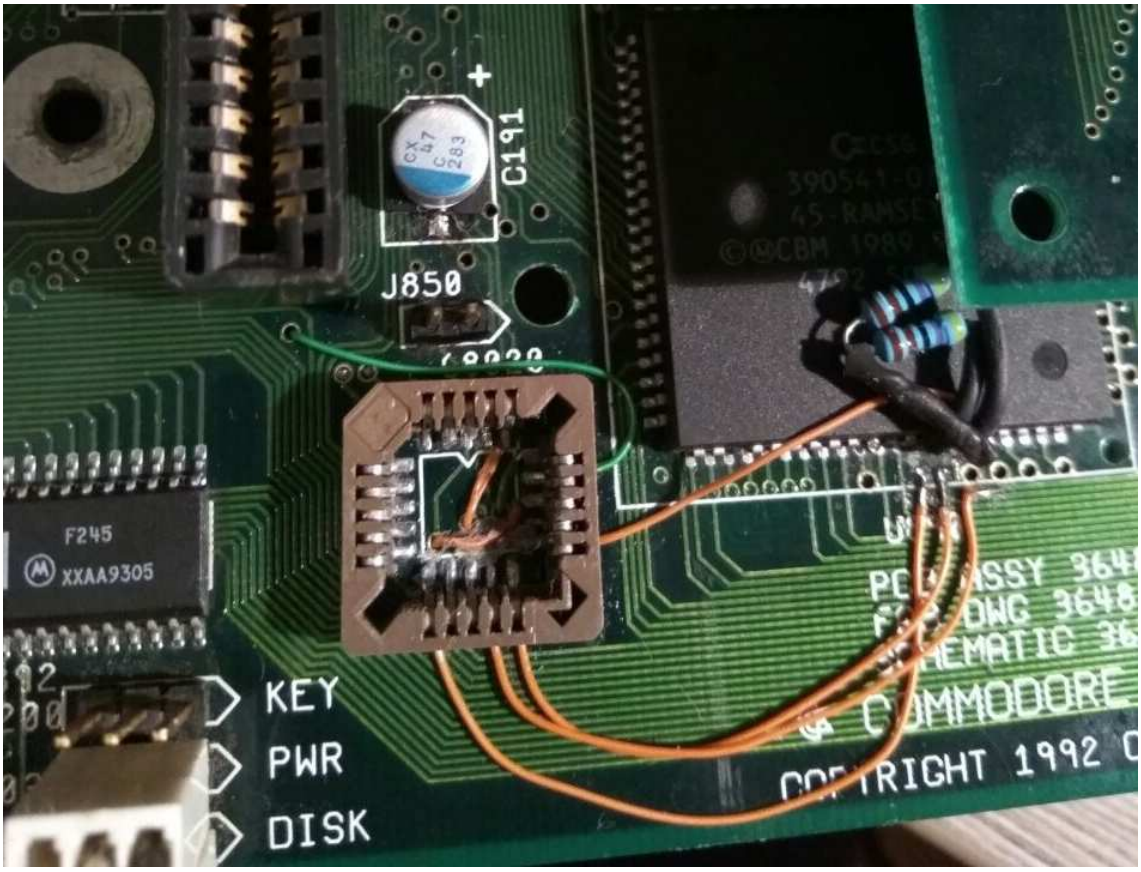
Now some real pictures:



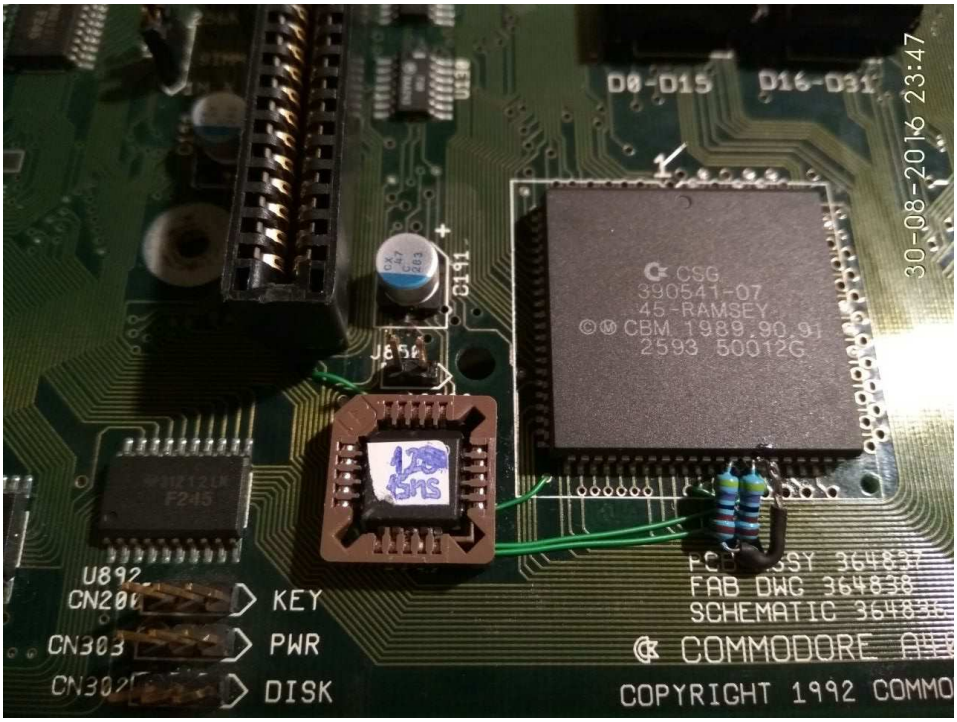
Simm cables part



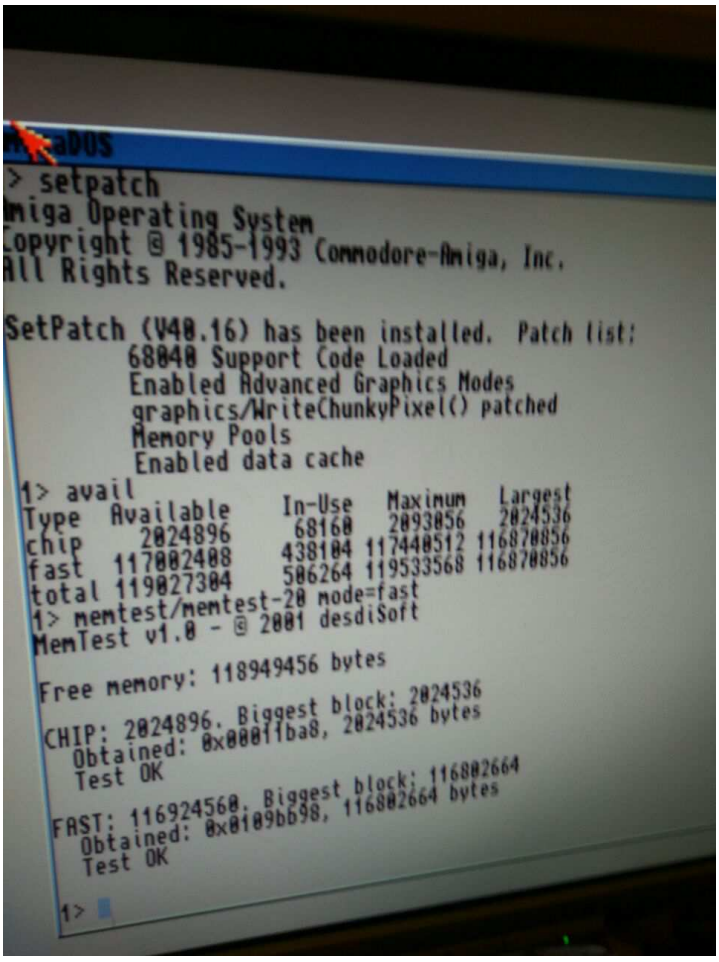
The modification nearly complete: No pullups, no socket yet



Only the GAL is missing. Don't be fooled by the funnily rotated pullups.



The modification finished. This is another board.

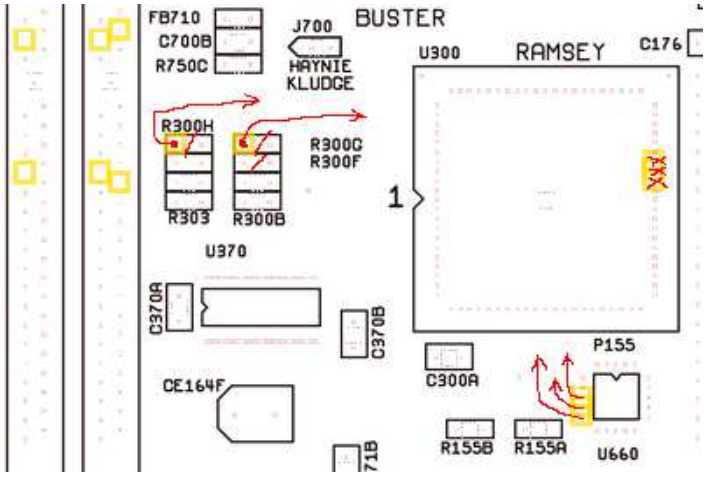


IT'S ALIVE!!!

-a4000T version

A4000T is slightly more tricky and requires an extra PCB to work, it probably needs some changes to make it fit better. On A4000T the Resistors that would require modifications are R300E (at the bottom) and R300F, R300G and R300H (at the top, the last two would give access to the signals that must go to the GAL.

Crumb's first buggy board, gently fixed by Meutoxo



The tricky part of A4000T is disconnecting ramsey addresses without damaging ramsey little legs or the pcb... and keeping cables as short as possible. There's no much room around to cut traces and connecting cables. Please be very very careful and if you don't have enough experience leave the task for somebody who does.

"Yo no creo en las ***meigas***, pero haberlas *haylas" -old saying from Galicia. Translated to english it means something like: "I don't believe in witches, but they do exist"*

CREDITS:

- All the hack idea, design, code, information, execution, geniality and all the little bits have been done by Meutoxo
- Text, ugly drawings, pictures, mistakes and bad electronics performed by Meutoxo's little helper, Crumb.
- PCB schematics taken from www.amigapcb.com and www.a1k.org (we love you!)
- Amiga component library done by Matze & company, thank you!
- Thank you Jay Miner and all his crew for creating Amiga computers

AMIGA FOREVER!!!