# Atari CO25953 EMMU replacement

## *Installation instructions*

Enclosed in the package is a soldering kit to build a replacement for the CO25953 delay line that is used in the Atari 130XE and can be used to upgrade Atari 65XE and 800XE computers to 128KB RAM.

The package contains:
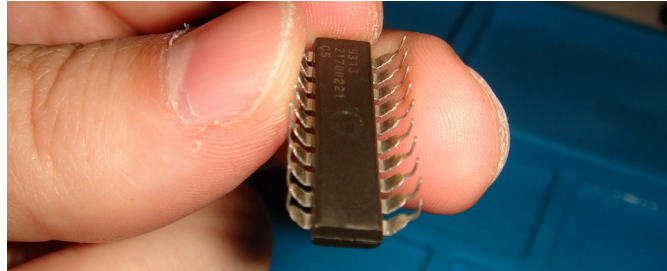- Pre-programmed GAL16V8 chip and label
- PCB
- 2 * 10-pin header

### Instructions for assembly

In order to the assembly, the following tools and materials are recommended:

- Soldering iron
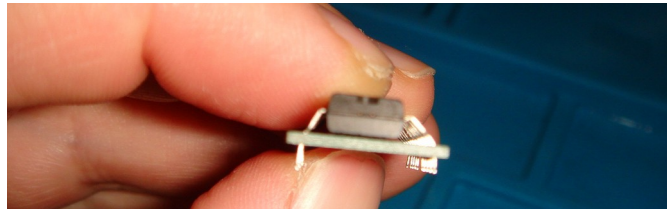- Soldering tin
- Flush cutters
- Flat nose pliers

In order to avoid a mechanical conflict with the RF-shield, the GAL must be mounted tightly against the board. In order to do this, the PCB has been designed in a way that the IC pins should be bent outwards.

With flat nose pliers, first bend the pins outward about 60°. Then, bend the end of the pins downwards:





**Warning**: Unlike on the photo's, the included label should not yet be attached to the IC, because heat from the soldering iron will <u>make it turn brown</u>. Attach the label after soldering is finished.
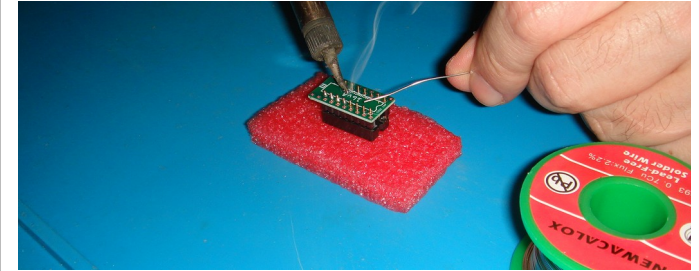
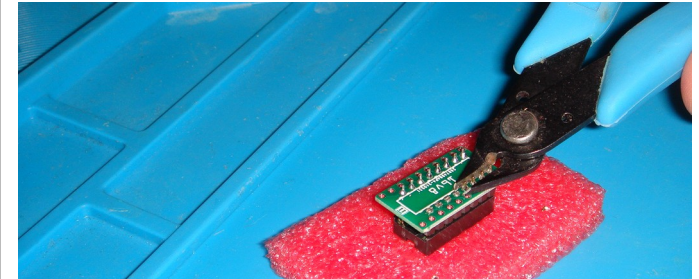Spend some time until the IC can fit flat or almost flat to the PCB:



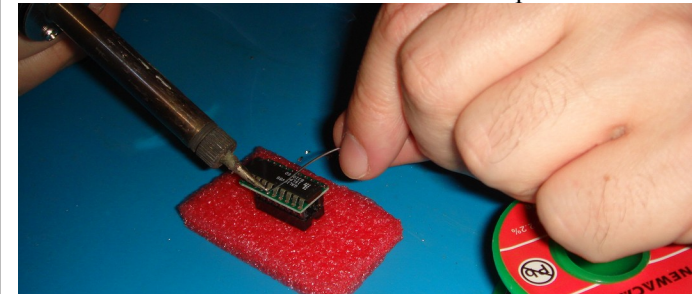Plug the included headers into an IC socket. You can also use a breadbroad:



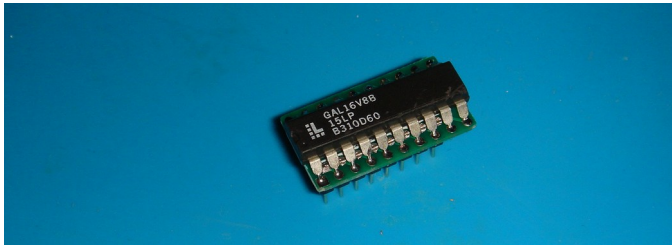Place the PCB on top an solder it on to the headers:

With flush cutters, cut away the header parts that stick out above the PCB:
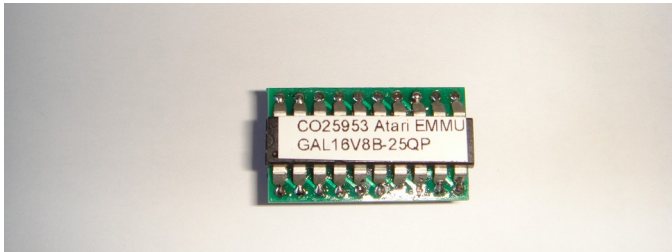




Place the IC onto the PCB and solder it into place:



The CO25953 replacement is now ready!
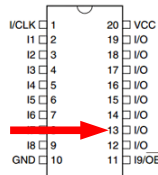
Attach the label to the GAL:



The EMMU is plug and plug and functions like the original EMMU. It can be plugged into the mainboard. There is no need to install U35 and therefore the repalcement is compatible with mainboards that don't have position U35.

You can plug the EMMU into your Atari mainboard and switch it on, it will greet you with the blue READY prompt.

## Atari XL mode

Bad behaving software that is unaware of the additional memory in the Atari XE series may uninentionally modify the bank switch lines on the PIA, therefore activate the additional memory and crash. The EMMU replacement features a compatibility pin, pin 13 of the GAL. If pin 13 is connected to ground, the EMMU replacement disables the bank switching functions, effectively turning your Atari XE into an Atari 800XL. In order too use this functionality, you can solder a switch to pin 13, and connect the other side of the switch to ground. (Pin 13 is compatible with push-pull outputs.)

| I/CLK | 1 | 20 | VCC |
| I1 | 2 | 19 | I/O |
| I2 | 3 | 18 | I/O |
| I3 | 4 | 17 | I/O |
| I4 | 5 | 16 | I/O |
| I5 | 6 | 15 | I/O |
| I6 | 7 | 14 | I/O |
| I7 | 8 | 13 | I/O |
| I8 | 9 | 12 | I/O |
| GND | 10 | 11 | I9/OE |

## Contact

In case of problems, you can contact me on daniel.mantione@freepascal.org. Besides, English, you can also write me in Dutch, German, Italian or Afrikaans.