Tynemouth Software

TYNEMOUTH 48K RAM FOR JUPITER ACE

OVERVIEW

This module can be plugged into the expansion slot on the back of a Jupiter ACE to add the maximum 48K expansion RAM. This is mapped from $4000-$FFFF, so combined with the existing 1K of RAM gives the full 49K of system RAM.

A power LED and reset switch are provided, both useful things that were missing from the original Jupiter Ace.

PARTS LIST

CAPACITORS – AXIAL CERAMIC RATED 16V OR HIGHER

2 x 100nF *(usually marked 100n or 104)*

RESISTORS – ALL ¼W 5% OR BETTER (4 BAND RESISTOR COLOUR CODES SHOWN)

1 x 1KΩ 

SEMICONDUCTORS

1 x 74LS32 quad 2 input OR gate
1 x AS6C1008 or equivalent 128K static RAM
1 x RED 5mm LED (open version)
1 x RED 4mm round flat top LED (case version)

CONNECTORS

1 x 0.1” Edge connector 2x25 way with pins 23 removed for key

SWITCHES

1 x tactile switch 6 x 3.5 x 4.3mm (e.g. Panasonic EVQPE404Q)

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CONSTRUCTION

Start with the resistor and capacitors, then the ICs. If building the cased version, do not fit sockets as there is not sufficient height in the case. Sockets are optional for the open version (not included in the kit).

Next roll the edge connector carefully on a flat surface to bend the pins towards the middle so the PCB can slide between the rows and be soldered in place.

Solder the reset switch into place.

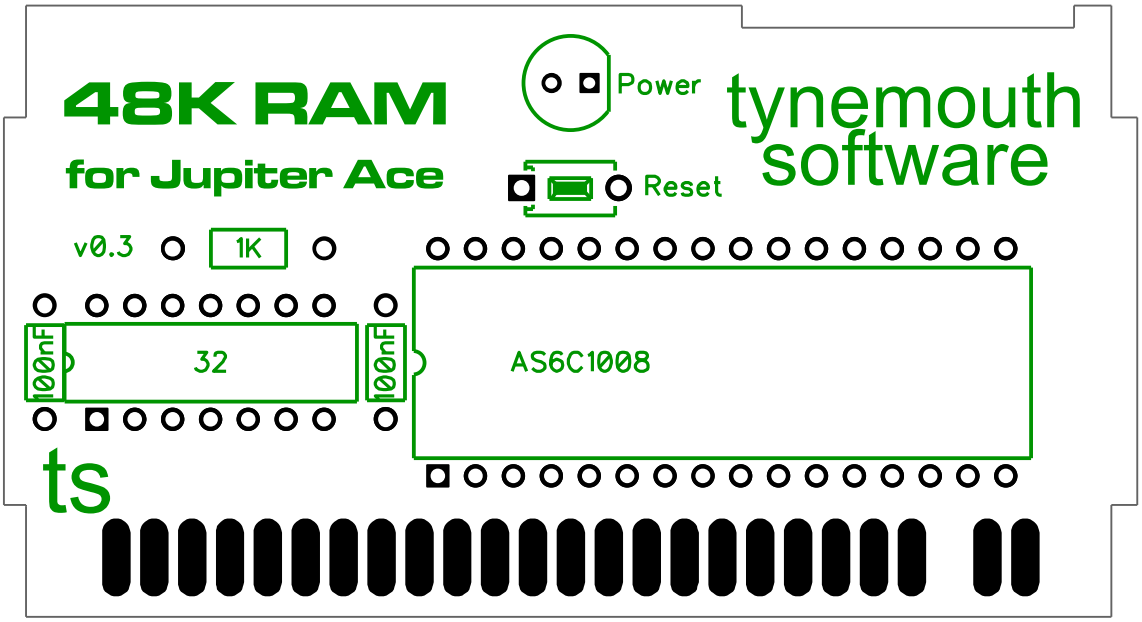
If building the cased version, the LED should be raised up slightly so that its top is level with the top of the case. To do that, push the rear PCB into place at 90 degrees to the main PCB. Place the case face down on a flat surface and let the LED drop into the top hole on the front before soldering the legs in place.

Next, lift up the PCB and drop the button into the lower hole in the case and put the PCB back in place and then the bottom of the case.

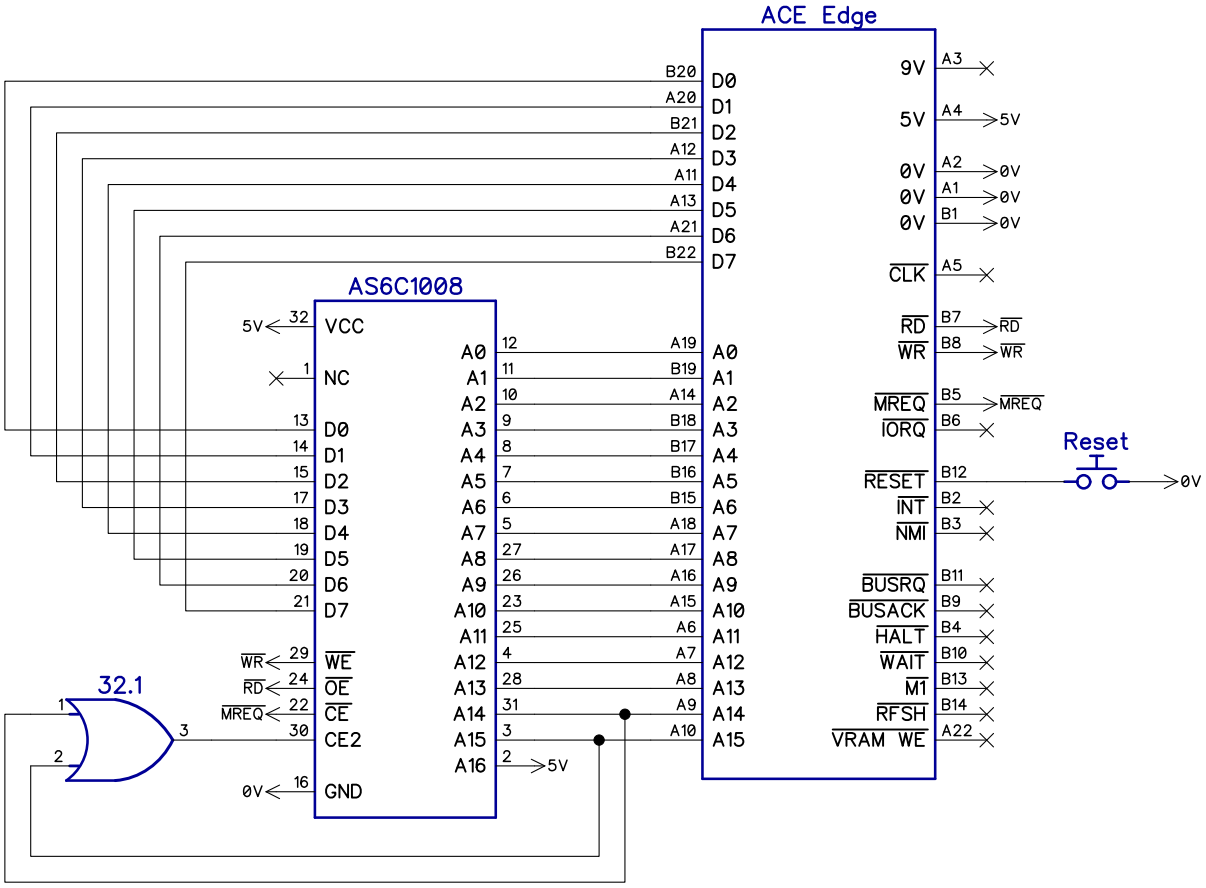
When turned around, the button should now click when pressed.

You might need to use a tiny amount of glue or some tape to hold the case halves together, once you have tested it.

COMPONENT PLACEMENT



SCHEMATIC



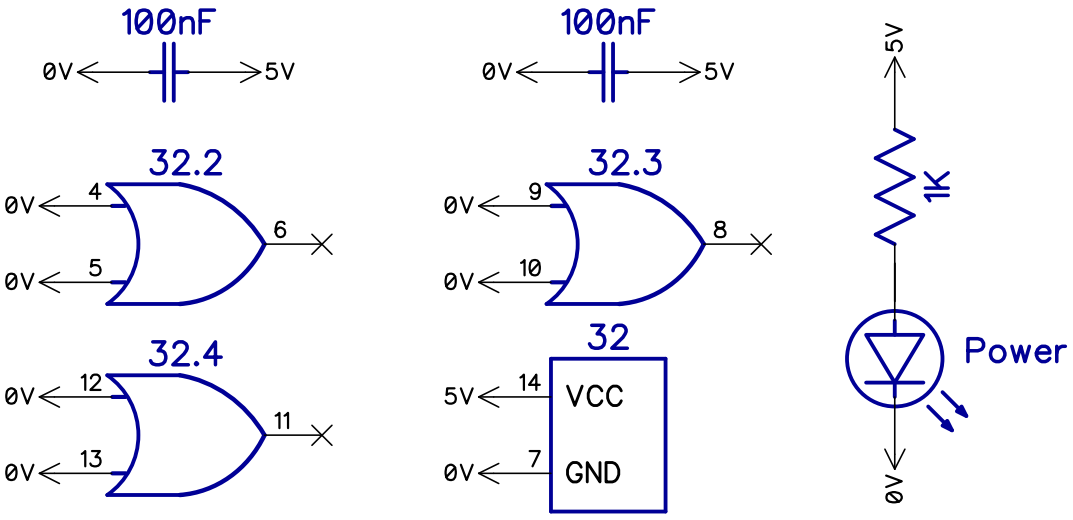
The main chip is a 128K static RAM chip. This is the most easily available size to use, although the Jupiter Ace can only use 48K of it (at least without adding paging, which is not supported in this design).

This is wired direct to the Z80 lines on the edge connector. Decoding is simplified by the two chip select lines. One ensure the chip is only active for memory requests, the other that one or both of address lines A14 and A15 are high. This uses a single OR gate, the other 3 gates in the chip are unused.

The chip is mapped into memory at $4000-$FFFF, filling all available space after the end of the internal 1K RAM at $3FFF.

A reset switch is provided to reset the Ace.

POWER



The board uses the 5V from the Jupiter Ace, with a decoupling capacitor by each chip.

The unused gate inputs are tied to 0V.

A power LED indicates this 5V supply is active.

TESTING

To test the amount of installed RAM, use the following command:

```
15384 @ 1 - U.
```

An unexpanded Jupiter Ace should print 16383. That is the last free byte of memory is 16383 or $3FFF.

With the 48K RAM installed, it should print 65535. That is $FFFF, which indicates the full RAM expansion is active.

USING YOUR NEW RAM

Here are some useful links to get software to make use of all the newly available RAM.

- https://github.com/markgbeckett/jupiter_ace/tree/master
- https://gldm.itch.io/
- https://petrih.itch.io/