



Assembly Guide

The first thing to note is that this is an *assembly guide*. It is not an *instruction guide*. When it comes to building an RC2014 there are a lot of options, and a lot of reasons why you may prefer one thing over another. This guide tries to hold your hand through the assembly process, explain some of the options, and suggest what route to take if you don't necessarily know where to go. What you decide to do, however, is down to you.

Whilst a knowledge of electronics, computer architecture, assembly language and BASIC programming is helpful, it is not a requirement.

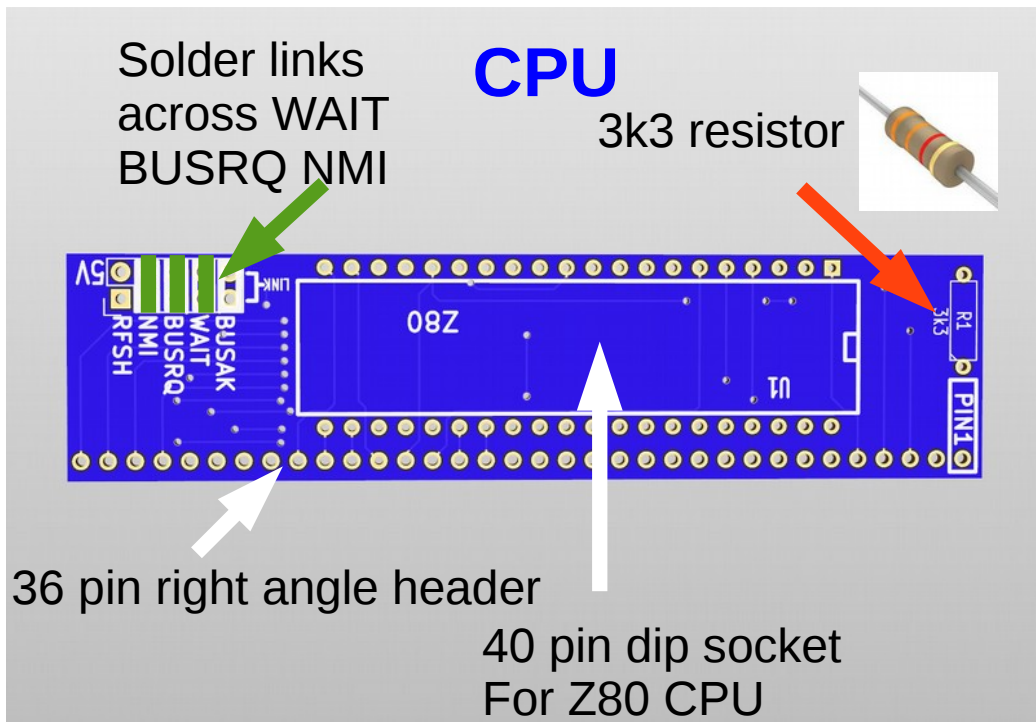
A bit of soldering experience is assumed though, and kind of essential for building a RC2014. None of it is difficult, there are no surface mount components or anything on a very fine pitch, but there are a lot of joints (Over 600 for a minimal build!). If you haven't soldered before, or it's been a while since you picked up a soldering iron, there are a lot of good tutorials on YouTube, or check out the Soldering Is Easy guide by Mighty Ohm.

The best advice I can give is to take your time and enjoy the experience. Although it is possible to plow through and finish it in an hour or so, it's also possible to make mistakes that way too. [Although don't underestimate troubleshooting as a great way to really get to know your RC2014!]

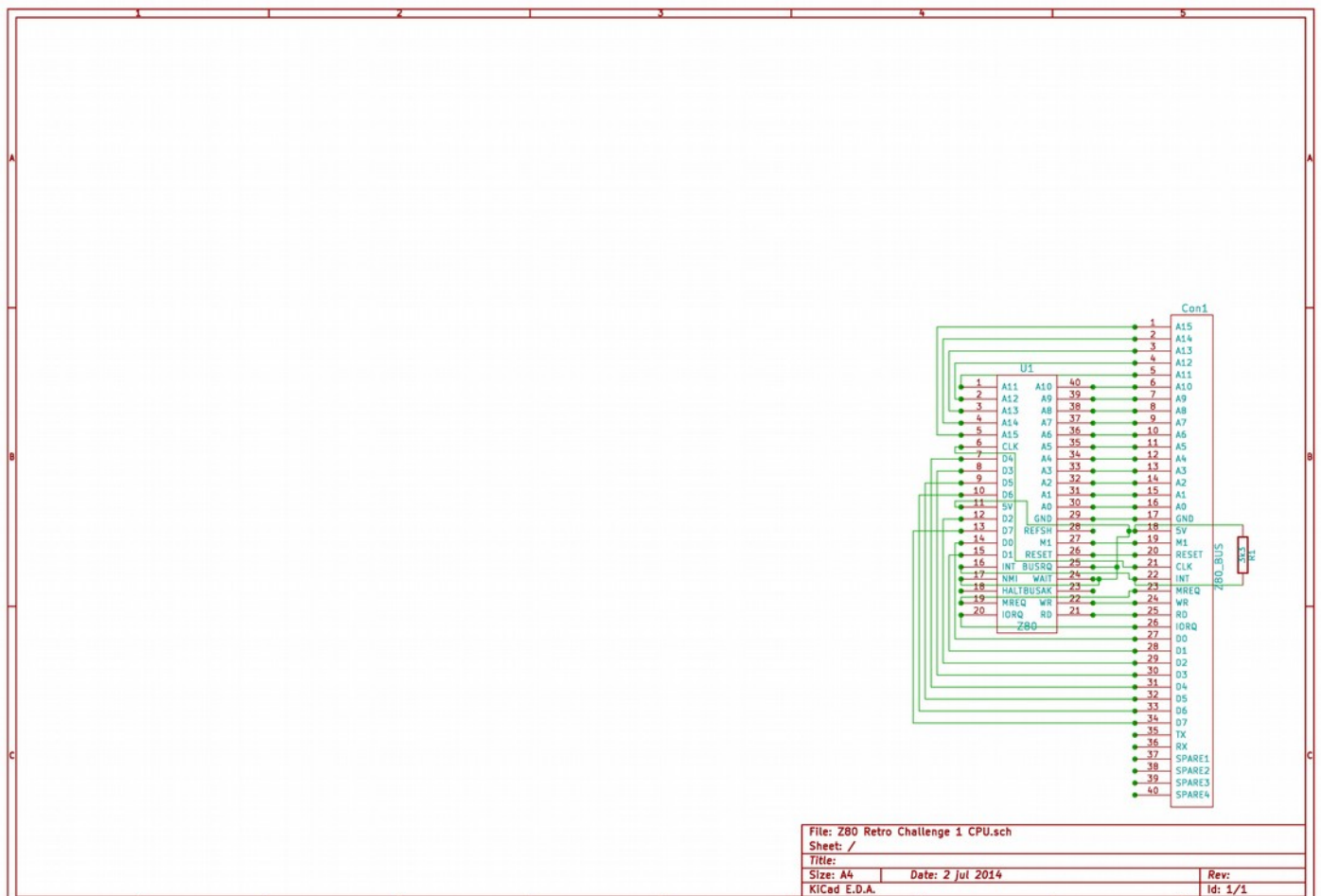
Up to date information and full size schematics can be found at

www.rc2014.co.uk

PCZ014



Wire links should be soldered across the pads by WAIT, BUSRQ, NMI as indicated. Leave BUSAK and RFSH unconnected. Alternatively, use header pins and jumpers if you need to break these signals out. (Tip: if you don't know if you will need these signals broken out, you probably don't). **Pro Tip:** Use the leads from resistors for the links



3 x 3 pin header
3 x Jumpers from A to 0

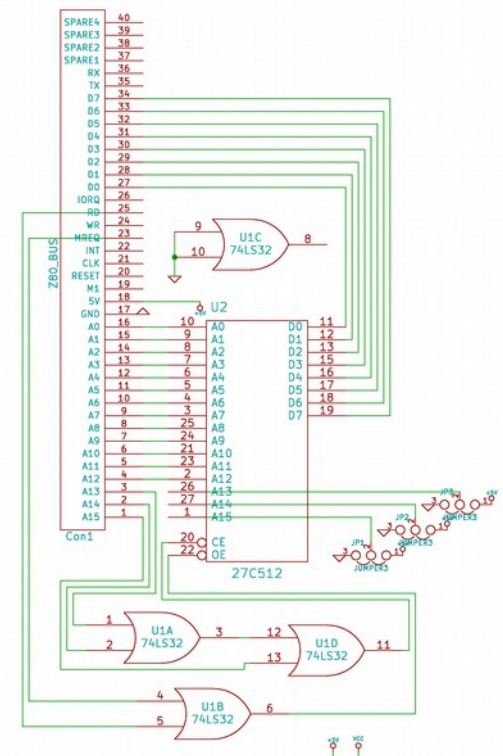
ROM 14 pin dip socket
For 74LS32

36 pin right angle header

28 pin dip socket
For 27C512 ROM

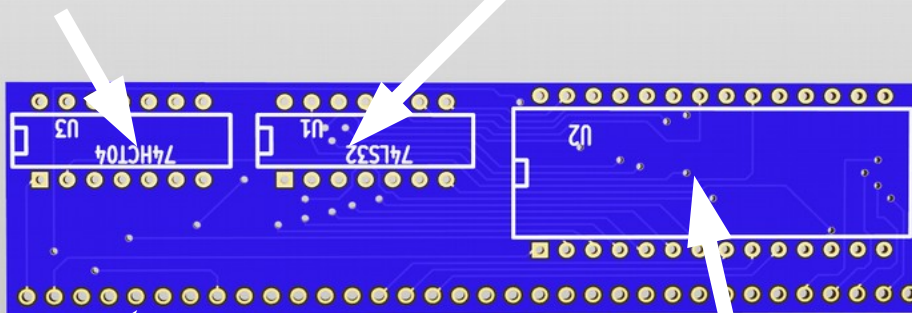
Jumpers across these select which 8k bank of the ROM is used. For BASIC, use jumpers between A and 0 on each one.

Pro tip: To keep them spaced evenly, use jumpers vertically between headers when soldering



R2014

14 pin dip socket **RAM** 14 pin dip socket
For 74LS04 For 74LS32

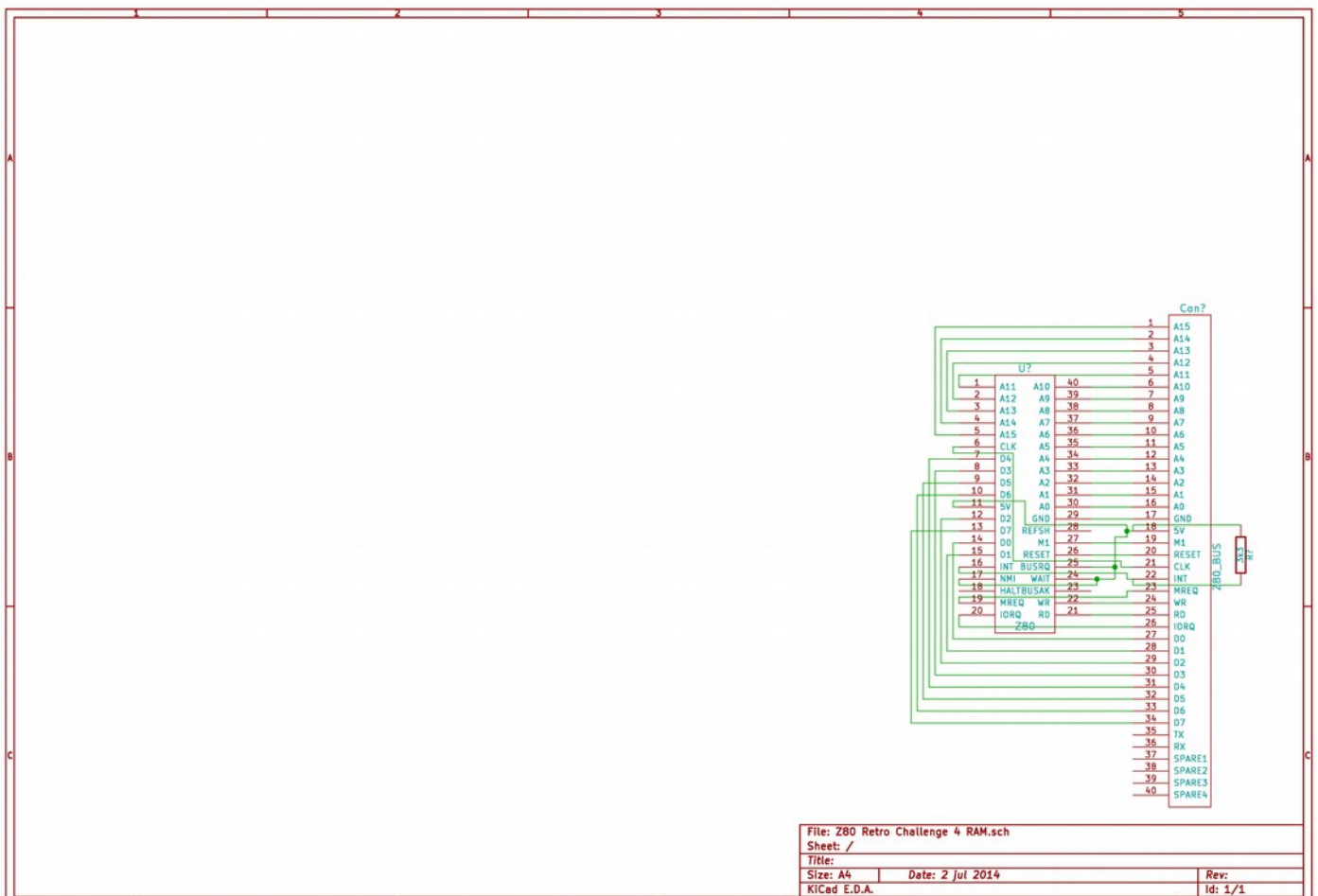


36 pin right angle header

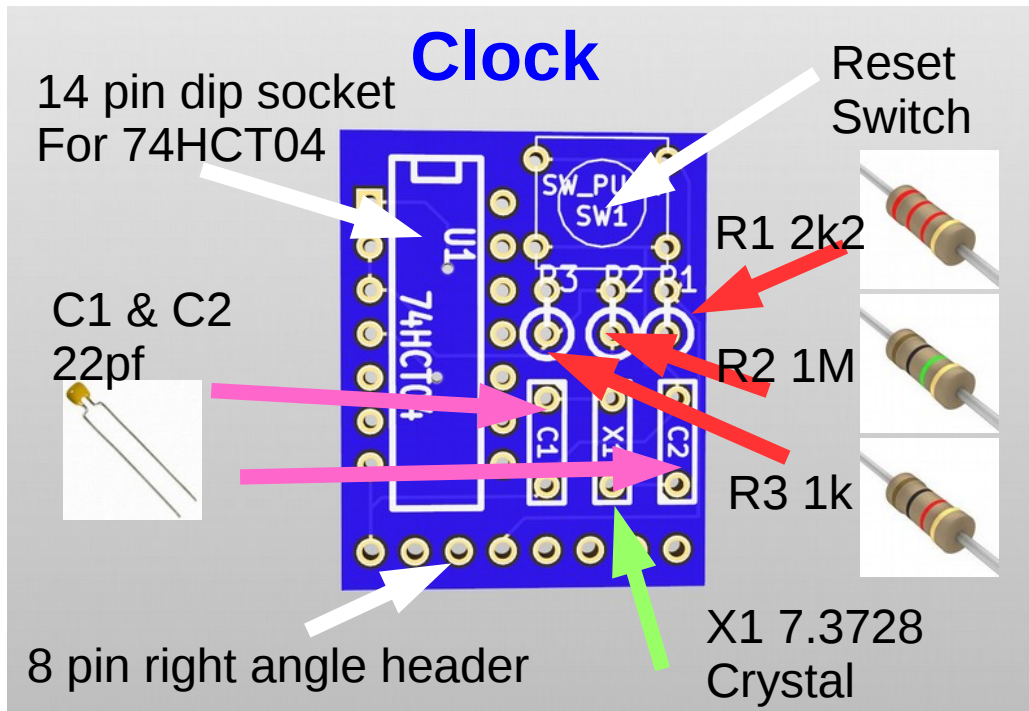
28 pin dip socket
For 62256 RAM

This is the easiest of the boards to solder.

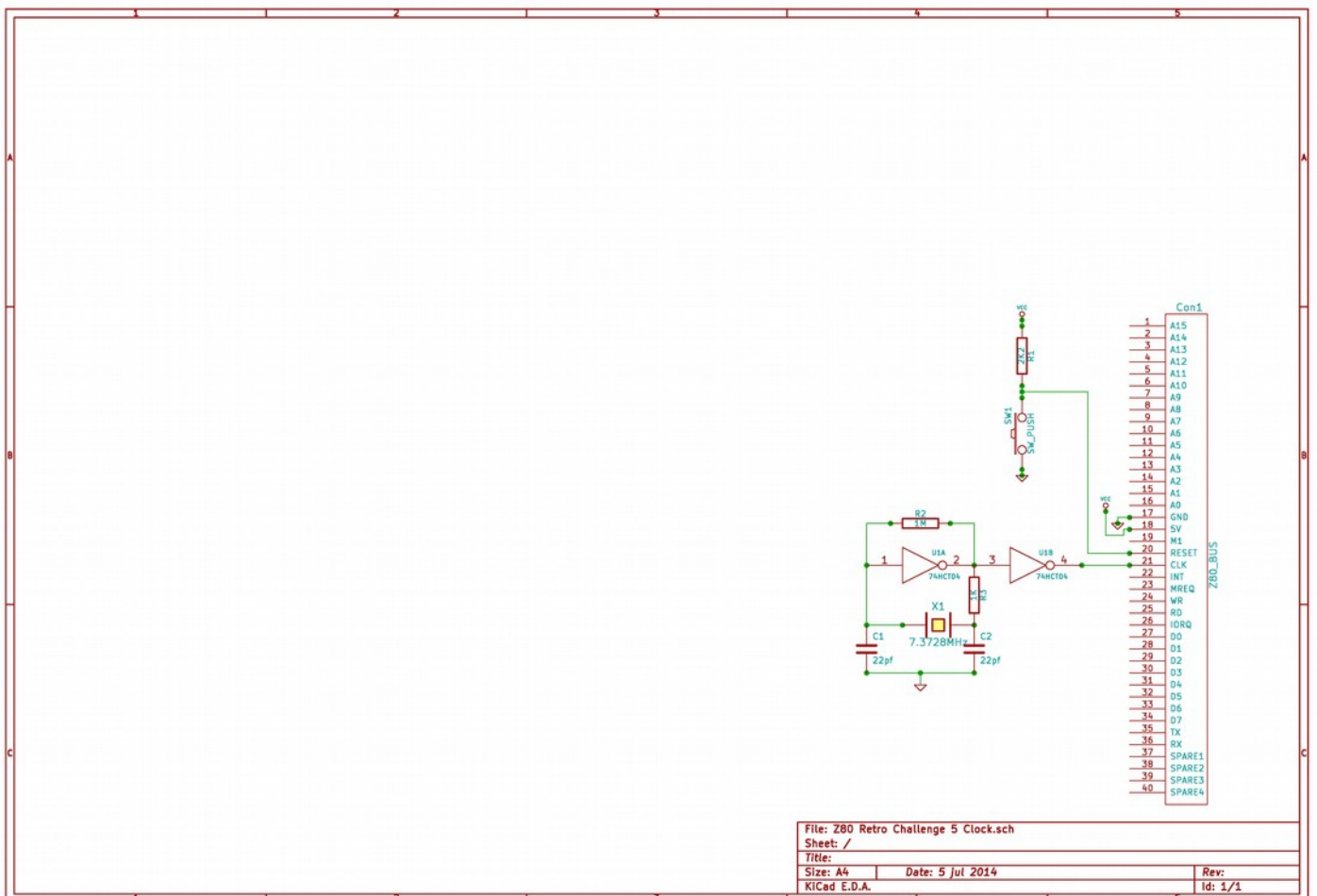
Pro tip: Tack 2 opposite corners of the chip sockets with a little bit of solder first of all. Then check they are lying flush with the PCB before doing the rest of the pins.



R2014



- * Reset switch and R1 may be mounted on backplane or clock PCB according to user preference.
- * Resistors are mounted end-on
- * 8 pin header (may be supplied as 2 x 4 pin headers) should be fitted before the crystal
- * Use markings on reverse side to locate on backplane
- * **Pro tip:** A spare 16 pin header on backplane will make location easier



RC2014

Serial I/O

24 pin dip socket
For 63B50 or 68B50

FTDI Power

R1, R2, R3
2k2

Optional RS232
Components

14 pin dip socket
For 74HCT04

36 pin right angle header

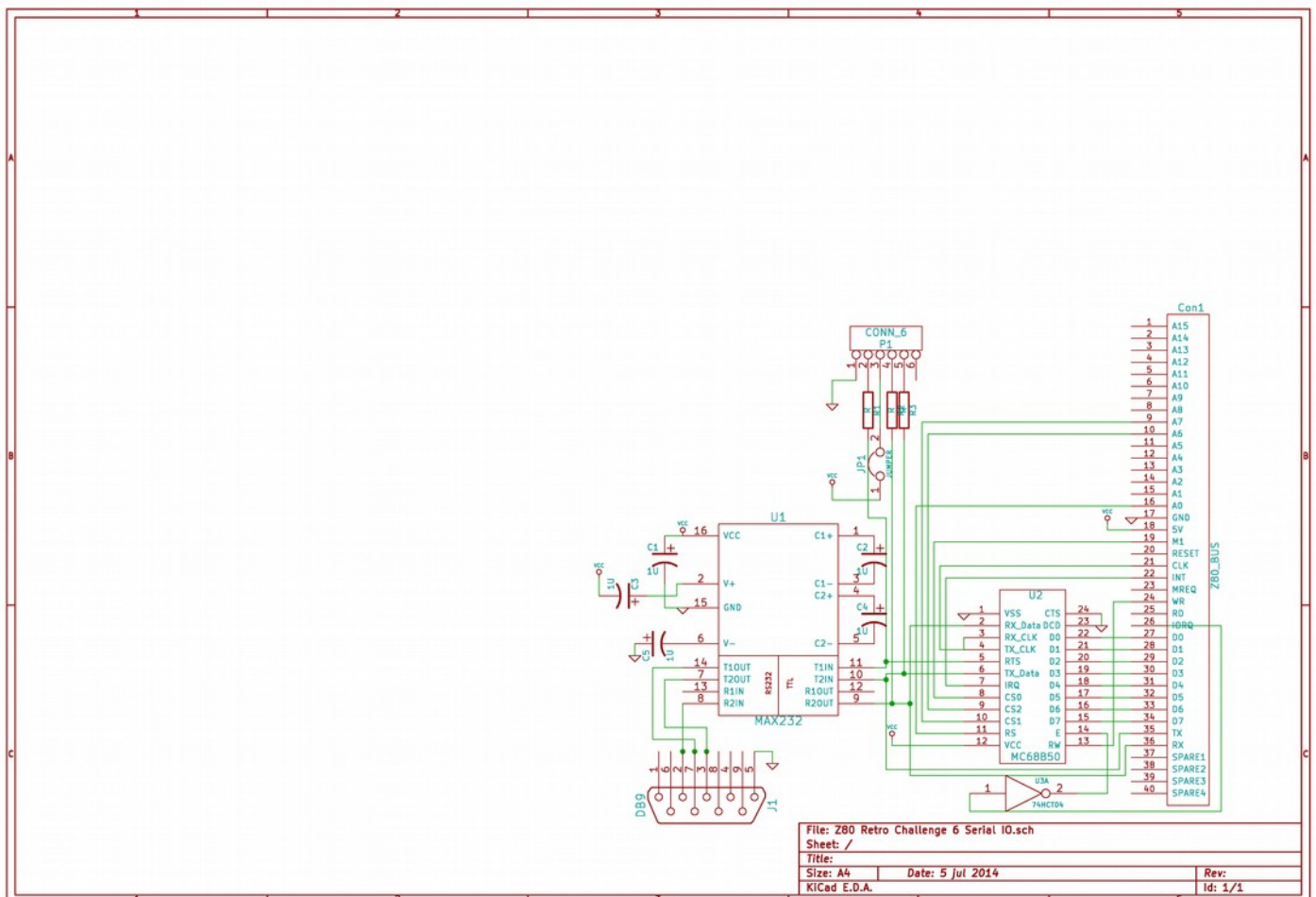
6 pin straight
header for FTDI

FTDI Cable

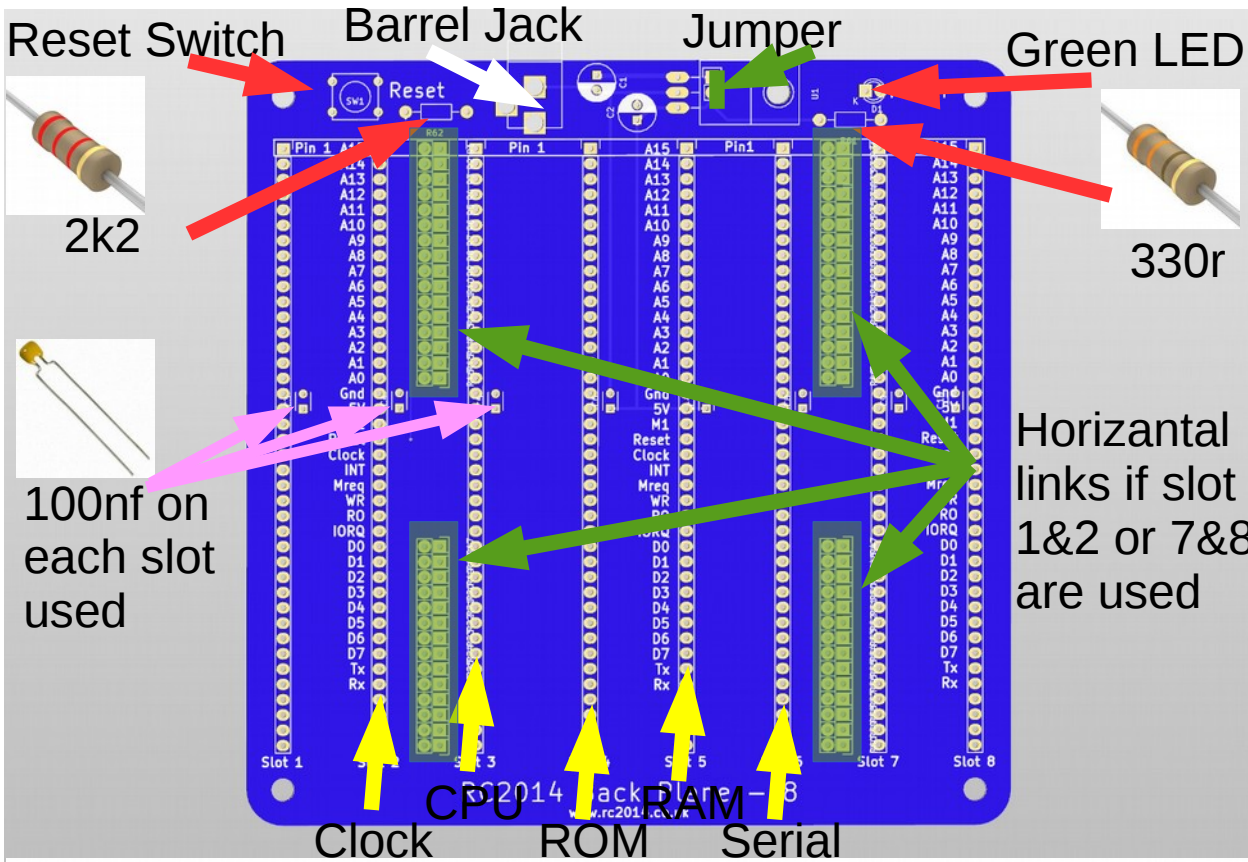
Use 2 pin right angle header and jumper for FTDI power. When jumper connected, RC2014 is powered from FTDI lead.

All resistors 2k2, mounted end-on, but note orientation from marking – particularly R1

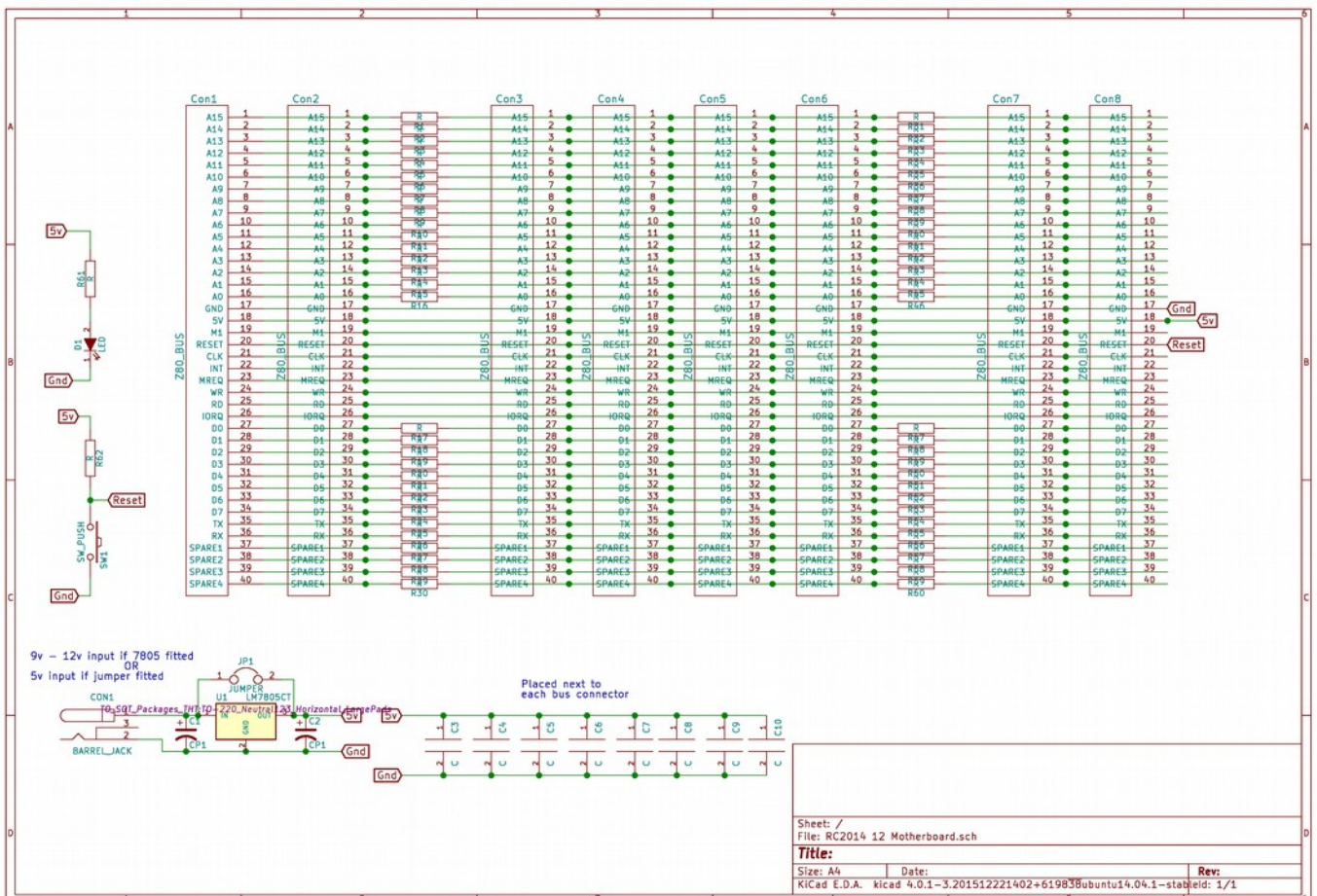
MAX232, 4 capacitors and DB9 connector only required for RS232 connectivity



RC2014



- * Suggested configuration is shown using slots 2-6
- * Wire links, jumpers or resistors needed if slot 1&2 or 7&8 used
- * 5v input via barrel jack if jumper fitted.
- * Optional 7805 regulator & 10uf caps for 9-15v input (cover jumper tabs with tape)
- * Decoupling caps next to each slot
- Pro Tip:** LED Cathode marked K is short lead



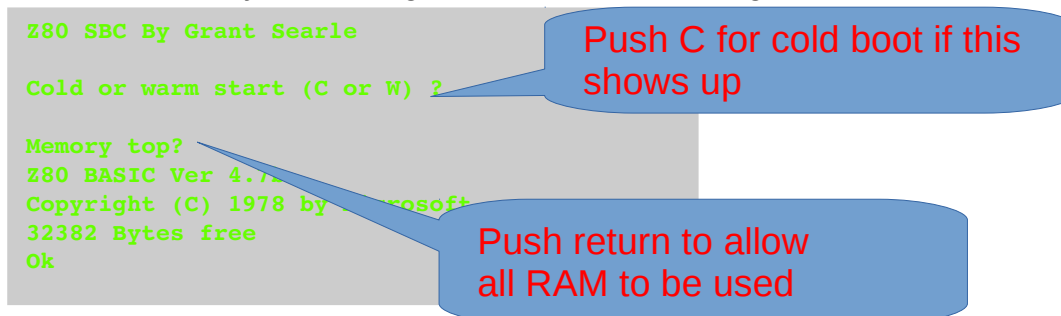


First Time Use

When everything is soldered together, give the modules a quick visual inspection and plug them in to the backplane – taking note of the Pin 1 designator and the bus isolation pads.

Initially, I recommend powering the RC2014 from a 5v FTDI cable plugged in to the Serial I/O module. Start by plugging the FTDI cable in to a USB socket on your PC/Laptop, and opening your preferred serial terminal (I recommend PuTTY or Teraterm) and setting the baud rate to 115,200bps. The other settings should default to 8-N-1. Plug the other end in to the Serial I/O module, noting the black cable goes nearest to the large IC and the green cable goes towards the 9 pin D end.

Hit the reset button and you will be greeted with the following



Congratulations! Your RC2014 works! Now it's time to type in your first program;

```
10 for a=1 to 10
20 print "RC2014 is cool"
30 next a
run
```

Troubleshooting

If you have connected up your RC2014 and it hasn't sprung in to life then it's time to start troubleshooting.

Firstly, re-read the rest of this guide and see if there's something you have missed. As mentioned at the beginning, this is only a guide, so you don't have to follow it exactly – but if you have deviated from the guide or implemented your own ideas, just double check that you know why. If you take the suggestions here, it *should* work. The following steps, although seemingly obvious, have brought most troubled RC2014s to life;

- * Are all the ICs of the correct part type, and the correct orientation within the socket?
- * Give all the joints a visual inspection – Any solder bridges between pins? Or dodgy looking joints?
- * Does the power LED come on when plugged in? If so, is 5v across the power pins of each of the ICs?
- * Are the modules all installed with Pin 1 lining up with Pin 1 marker on the backplane?
- * Are you using Slot 1, 2, 7 or 8? If so, have you put jumpers across where indicated?
- * Are you powering it from FTDI cable? If so, is the 5v jumper on the Serial I/O module in place? (Are you using a 5v FTDI adapter?)
- * Are the jumper pins on the ROM module all set to 0?
- * Have you put jumpers on BUSRQ, WAIT and NMI on CPU module?
- * Have you selected the correct serial port on your terminal software? Is it set to 115,200, 8, N, 1?
- * Push the reset button again. Did that work?