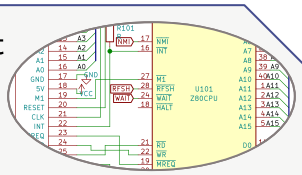
RC2014 Mini Zed Assembly Instructions and User Guide

Introduction

The RC2014 Mini Zed is a Z80 based SBC retro computer kit. It consists of a Z80 CPU, 512k RAM, 512k ROM, serial I/O and a 7.3728MHz clock all on a single PCB. Once assembled it runs RomWBW, which allows you to boot in to various CP/M versions, BASIC, FORTH or a systme monitor.

The RC2014 Mini Zed has an Enhanced Bus connector, which can host any RC2014 compatible expansion module, or a backplane to support multiple modules. RomWBW has built in support for many forms of storage, I/O modules, sound cards and display adapters.

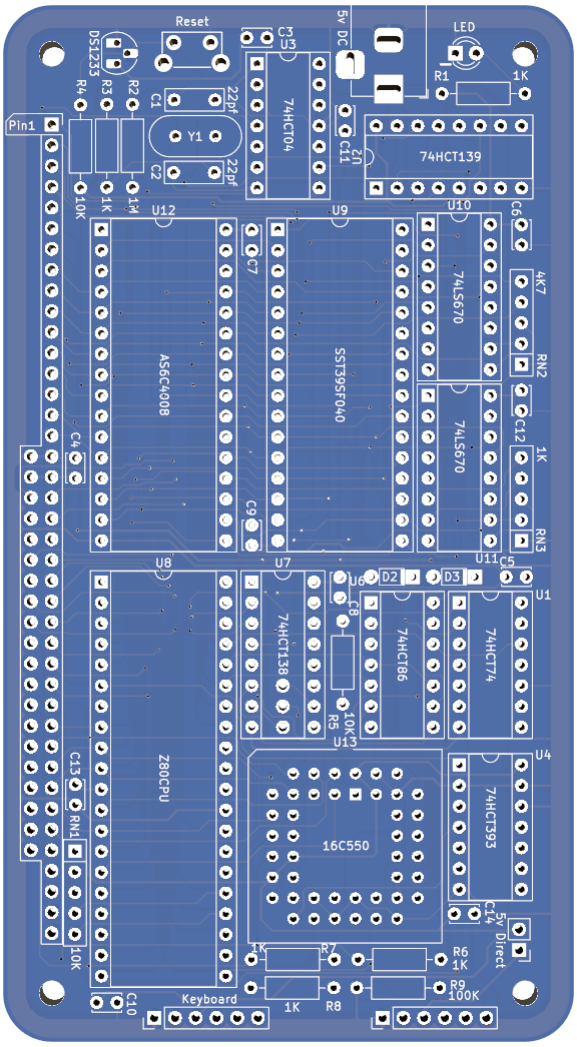
Full schematic available at https://rc2014.co.uk or last page if viewing this doc digitally



Kit's content

The contents of the kit are supplied in several packages grouped into similar components

1 x RC2014 Mini Zed PCB	5 x 1k resistor
1 x 40 pin wide DIL socket	2 x 10k resistor
2 x 32 pin wide DIL socket	1 x 1M resistor
1 x PLCC44 socket	1 x 100k resistor
4 x 14 pin narrow DIL socket	12 x 100nf
4 x 16 pin narrow DIL socket	2 x 1n4148
1 x 40 Way SIL Socket	1 x 74HCT04
1 x 20 Way SIL socket	1 x 74HCT74
1 x 6 Way SIL socket	1 x 74HCT86
1 x 6 pin RA header	1 x 74HCT393
1 x 2 pin RA header	1 x 74HCT138
1 x jumper	1 x 74HCT139
1 x 2.1mm power jack	2 x 74HCT670
1 x 3mm green led	1 x Z80 CPU
1 x RA Tactile Switch	1 x ST39SF040
1 x 7.3728 MHz Xtal	1 x ASC6C4008
2 x 22pf ceramic cap	1 x 16C550
1 x 1k 5 pin resistor pack	1 x DS1233-5+
1 x 10k 5 pin resistor pack	1 x USB Barrel Lead
1 x 4k7 5 pin resistor pack	



Optionally if your kit was ordered with a laser cut enclosure, it will also include

1 x lasercut top plate
1 x laser cut lower bumper
8 x 6mm M3 screws
4 x 10mm M3 threaded spacers

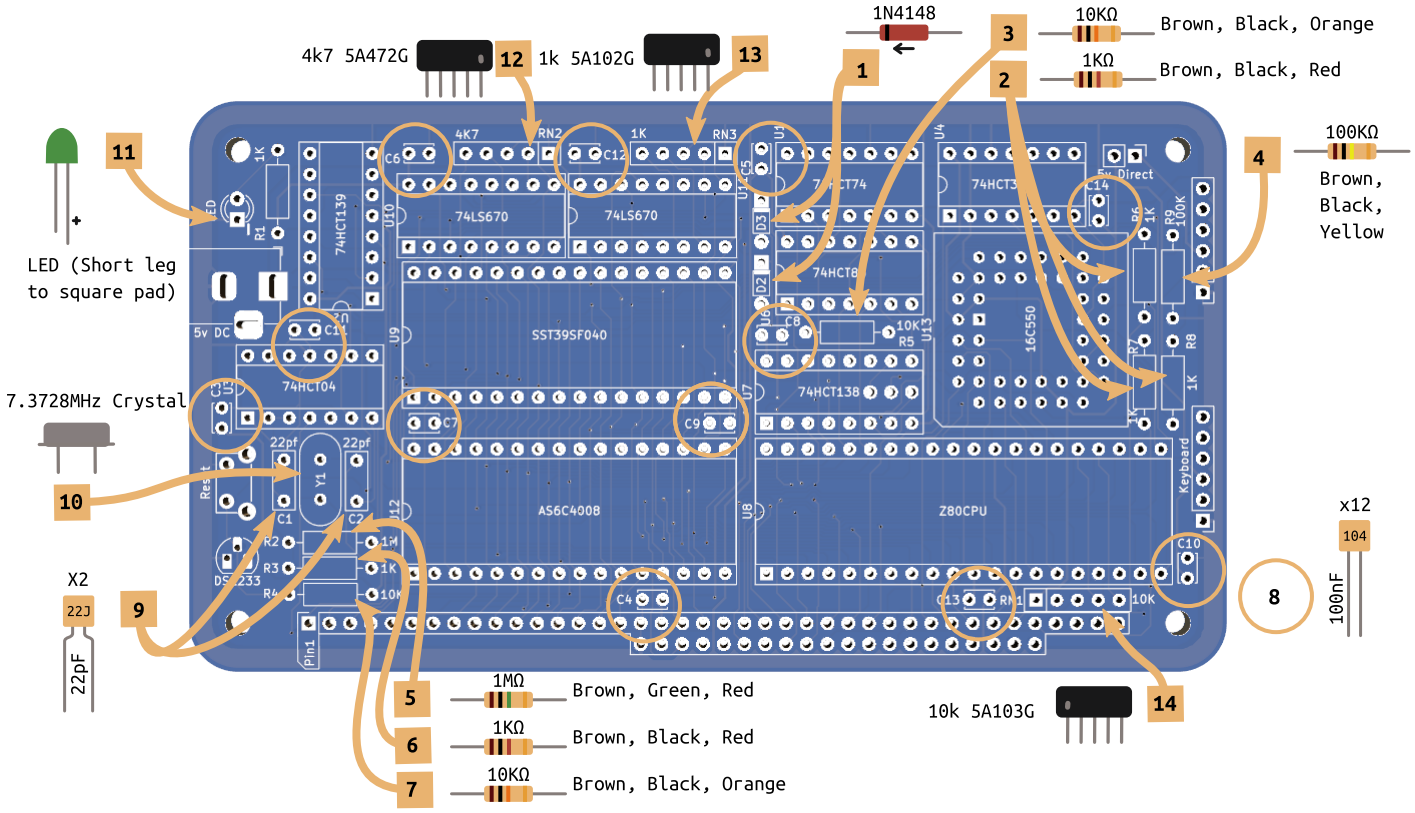
When soldering and building this project use all appropriate safety equipment. We also recommend using ESD protection in order to not damage the components

Radial resistors, crystals, and ceramic capacitors have no 'polarity'. That is, they can be soldered in any direction. Pay attention to polarity for LEDs, diodes, and resistor networks that normally have an indication on the soldering direction

Pay attention to solder the components on the 'component side' of the PCB

Assembly

Assembly of the RC2014 Mini begins with the lowest components. Resistors, capacitors, crystal and LED. Suggested order is marked on the square at the base of the arrow. The resistors will need their legs bent 90 degrees, but the other components should line up perfectly. Place the components on the top side of the board and solder on the other side. Trim the lead excess with some side cutters



The DS1233 is optional. If it is not fitted the RC2014 will run fine, although you may have to hit the reset button after applying power

Ensure that the dot on the resistor network lines up with the square pad on the PCB

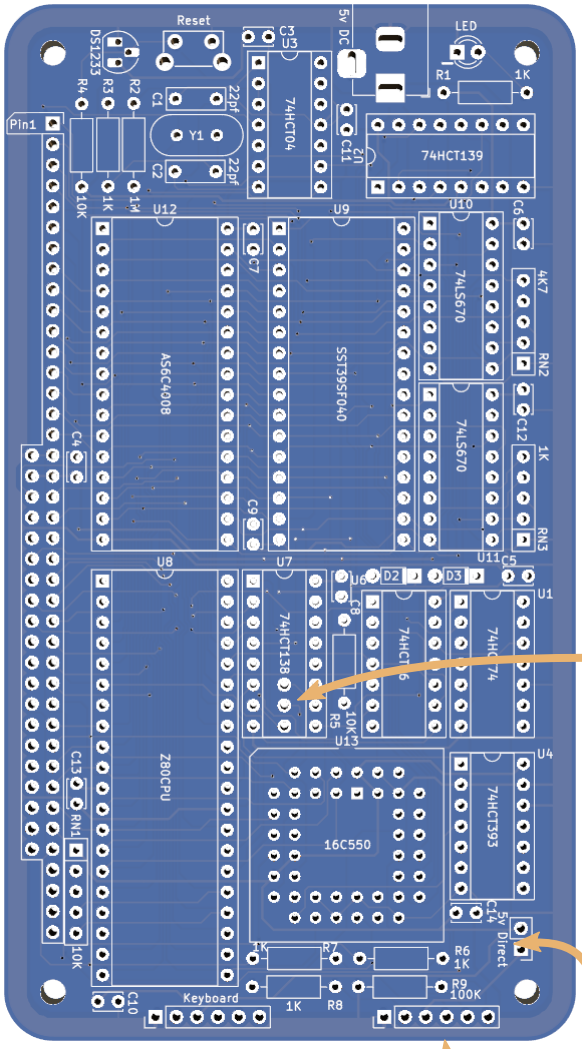
Next attach the IC sockets, noting the notch on the socket should match the notch on the silkscreen. The 5v barrel jack and reset switch can be mounted now too. The USB barrel lead supplied with the kit can be used to power your RC2014 when plugged into a 5v USB socket.

When placing sockets, match the notch on one of the narrow sides to the notch indicated by the outline on the board

You do not need to fit the expansion bus headers at this stage unless you have modules to plug in.

Leaving them off now gives you the option of fitting right-angle headers sockets or pins that might work out better for backplane options.

When fitting the square PLCC socket pay close attention to the chamfered corner and ensure it lines up with the chamfered corner on the silkscreen.



The three holes under the 74HCT138 can safely be ignored for now. These can later be used to swap the serial port from 0x80 to 0x88 if needed.

Fit the 40 pin socket for the RC2014 Standard Bus and the 20 pin socket for the RC2014 Enhanced Bus. The 20 pin socket needs to be sat flush with the 40 pin socket.

Fit the 2 pin right angle header for the FTDI 5v Input with the pins pointing to the outside of the board. Fitting a jumper to this before soldering will help keep it level.

The 6 pin keyboard socket is optional and only required if you will be using the corresponding keyboard

Fit the 6 pin right angle header for the FTDI with the pins pointing to the outside of the board.

Inspect your work carefully, ensuring there are no shorts, missed or bad solder joints and that the component leads are trimmed.

To insert the ICs you will need to bend the legs in slightly. Hold the ends of the chip body firmly in one hand and roll it slightly on a hard surface so that the legs bent up at right angles to the body. Push them in to their corresponding sockets ensuring the correct chip goes into the correct socket and the orientation is correct.

When placing the ICs in the sockets, make sure that the notch on one of the narrow sides matches the notch on the component's silkscreen outline

First power-up!

For power either use the jack with 5V or use the FTDI cable by putting a jumper on the 2-pin FTDI Power header of the RC2014 Mini Zed. When power is applied the green LED on the PCB will turn on.

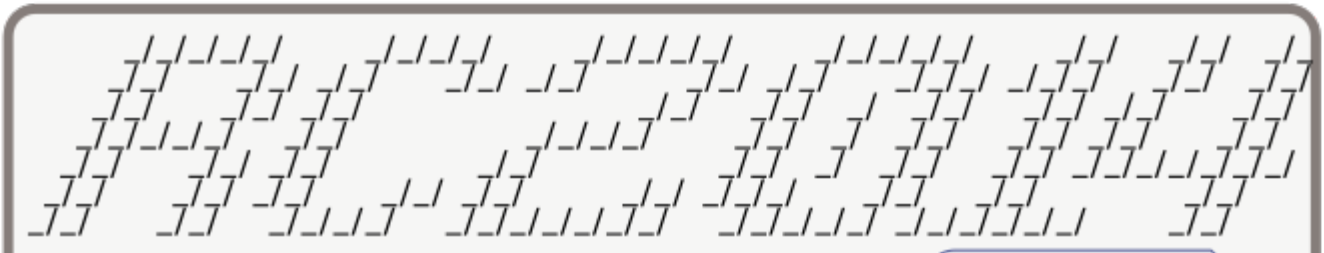
Now connect the FTDI cable, matching the black cable to the Gnd pin on the FTDI header.

Connect the FTDI cable to a computer and launch your favourite terminal emulator (putty, minicom, tera term etc). Set the appropriate port to 115200bps and 8-N-1. Press the reset button and you should get a welcome screen.

Official FTDI colours are
* Black GND
* Brown CTS
* Red VCC
* Orange TXD
* Yellow RXD
* Green CTS

You may need to match the signals if you have different colours

Never power the RC2014 Mini II from both the power jack and the FTDI cable!



```
RomWBW HBIOS v3.6.0, 2026-03-28

RC2014 [RC2014_std] Z80 @ 7.372MHz
0 MEM W/S, 1 I/O W/S, INT MODE 1, Z2 MMU
512KB ROM, 512KB RAM, HEAP=0x2E2C
ROM VERIFY: 00 00 00 00 PASS

LCD: IO=0xDA NOT PRESENT
AY: MODE=RC2014 IO=0xD8
UART0: IO=0x80 16550C MODE=115200,8,N,1 FIFO AFC
DSRTC: MODE=STD IO=0xC0 NOT PRESENT
MD: UNITS=2 ROMDISK=384KB RAMDISK=256KB
IDE: IO=0x10 MODE=RC
IDE0: NO MEDIA
IDE1: NO MEDIA
PPIDE: IO=0x20 PPI NOT PRESENT
SD: MODE=PIO IO=0x69 DEVICES=1
SD0: NO MEDIA
CH0: IO=0x3E NOT PRESENT
CH1: IO=0x3C NOT PRESENT
FP: IO=0x00 NOT PRESENT

Unit        Device      Type              Capacity/Mode
----------  ----------  ----------------  --------------------
Char 0      UART0:      RS-232            115200,8,N,1
Disk 0      MD0:        RAM Disk          256KB,LBA
Disk 1      MD1:        ROM Disk          384KB,LBA
Disk 2      IDE0:       Hard Disk         --
Disk 3      IDE1:       Hard Disk         --
Disk 4      SD0:        SD Card           --
Sound 0     SND0:       AY-3-8910         3+1 CHANNELS


RC2014 [RC2014_std] Boot Loader

Boot [H=Help]:
```

RomWBW Version

Low level hardware and ROM integrity check

THardware detected will be listed out here, along with the ports used and other information.

If adding hardware, check here that it has been recognised

Serial, disk and sound modules recognised

Super quick overview of RomWBW

Typing H at the boot screen will show you a list of acceptable commands.

For example C will boot you in to CP/M 2.2

Z will boot you in to Z-System (CP/M compatible but with more features)

B will boot you in to BASIC

If your Zed Mini was supplied with a compact flash module, or you have any other media with the hd1k_combo.img image on it, you can boot to slice 0, 1, 2, 3 and 4. Wordstar on Slice 5 is pretty handy too.

```
Boot [H=Help]: h


  <u>[.<s>]    - Boot from Disk <Unit>[.<Slice>]
  D            - Device Inventory
  S            - Slice Inventory
  W            - RomWBW Configure
  O            - Hardware Monitor
  M            - Monitor
  C            - CP/M 2.2
  Z            - Z-System
  N            - Network Boot
  B            - BASIC
  T            - Tasty BASIC
  F            - Forth
  P            - Play a Game
  X            - XModem Flash Updater
  U            - User App
  I <u> [<b>] - Console Interface <Unit> [<Baud>]
  V [<v>]      - View/Set HBIOS Diagnostic [Verbosity>]
  R            - Reboot System

Boot [H=Help]:
```



```
hd1k_combo.img
Slice 0  DRI CP/M 2.2 OS
Slice 1  ZCPR-DJ & ZSDOS 1.1 OS
Slice 2  NZCOM ZCPR 3.4 OS
Slice 3  DRI CP/M 3 OS
Slice 4  ZPM3 OS
Slice 5  WordStar v4 & ZDE Apps
Slice 6-63  blank unformatted
Typically Drive C: - H:
```

Storage on RomWBW is divided in to disk units, and in to slices within there. So if you had a compact flash card installed (Disk 2) and had a bootable image on slice 3, you could type 2.3 at the prompt.

Booting to CP/M 2.2

Type C at the Boot Prompt

Start typing CP/M commands at the prompt. Try DIR to get a directory listing

```
Boot [H=Help]: c

Loading CP/M 2.2...

CBIOS v3.6.0 [WBW]

Formatting RAMDISK...

Configuring Drives...

  A:=MD0:0
  B:=MD1:0

  4099 Disk Buffer Bytes Free

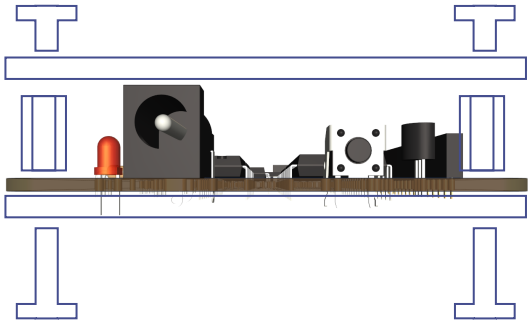
CP/M-80 v2.2, 54.0K TPA

B>
```

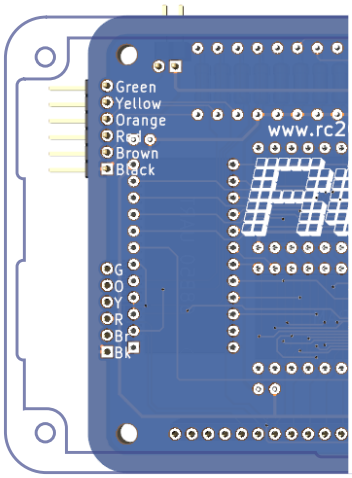
RomWBW was created by Wayne Warthen with contributions from a great many people. It is extremely powerful and has a lot of software, tools, languages and utilities built in. It is also incredibly well documented. So whilst this assembly guide for the RC2014 Zed Mini can barely touch upon how RomWBW can be used, you are much better going to https://wwarthen.github.io/RomWBW/ or scanning the QR code below and finding out for yourself.

Laser Cut Enclosure

If you ordered your kit with the laser cut enclosure, start by peeling off the protective plastic from both sides.
Use four screws to go through the lower piece and the PCB and fixing in place with four the hex-spacers.
Use the other four screws to secure the top piece.

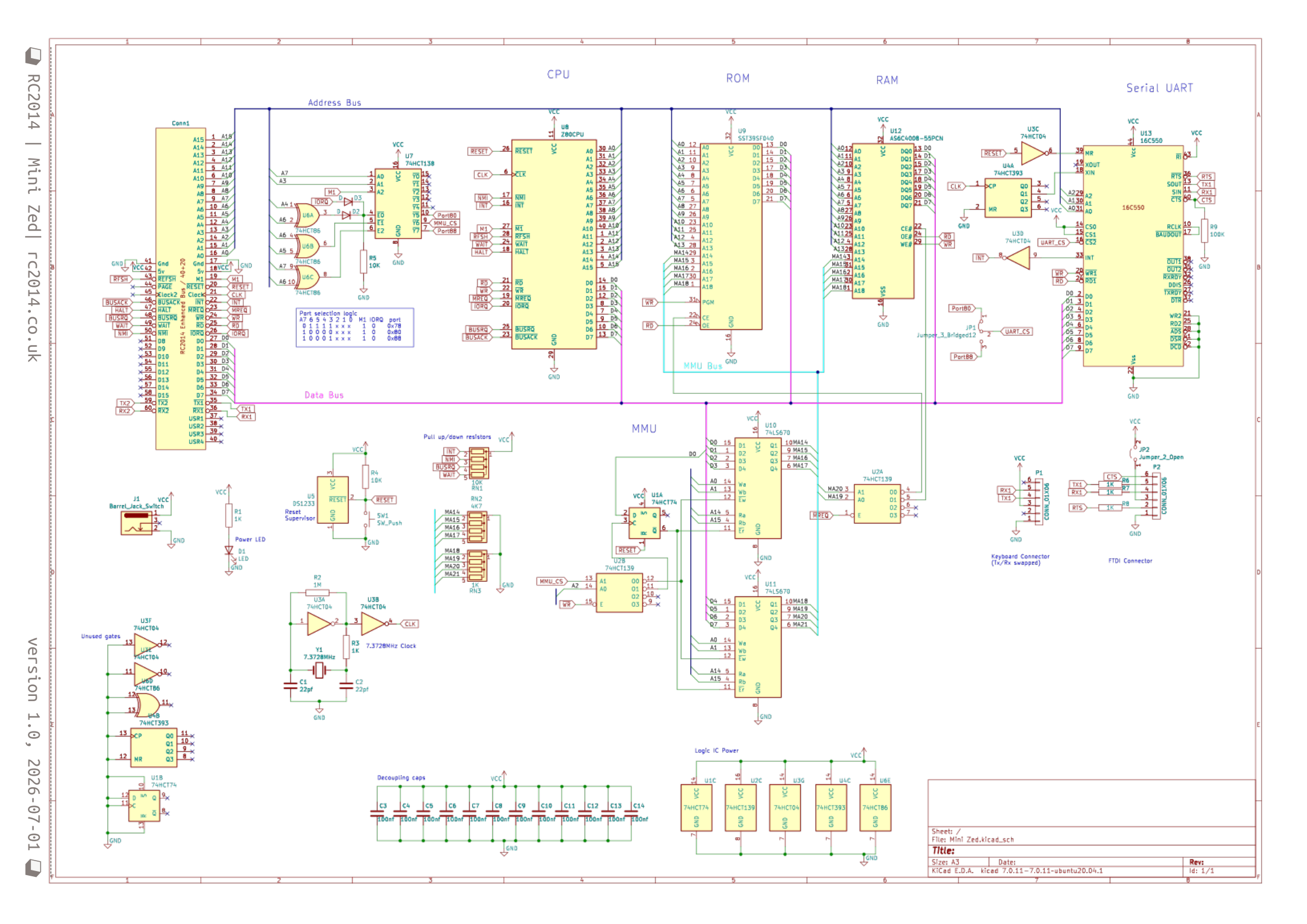


Ensure the profiled indentions on lower piece line up with the pins poking through the PCB



Troubleshooting

Check if power is applied correctly (5V and LED is on). Check that the correct ICs are pluged into their respective sockets and that they are in the correct orientation. Check the orientation of the FTDI cable and port settings. Try pressing the push button again; does anything appear on the screen? Additional help is at rc2014.co.uk/troubleshooting/



RC2014 | Mini Zed | rc2014.co.uk

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