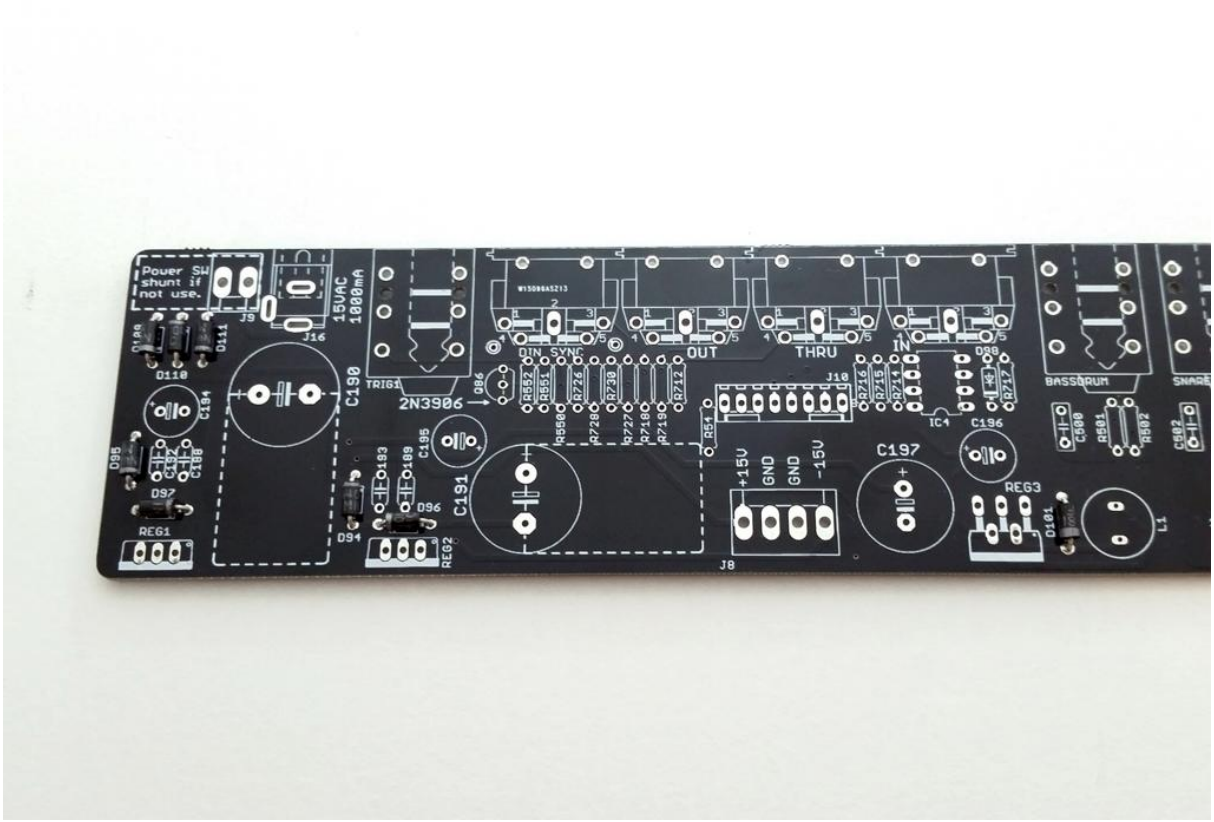
YOCTO² Building guide

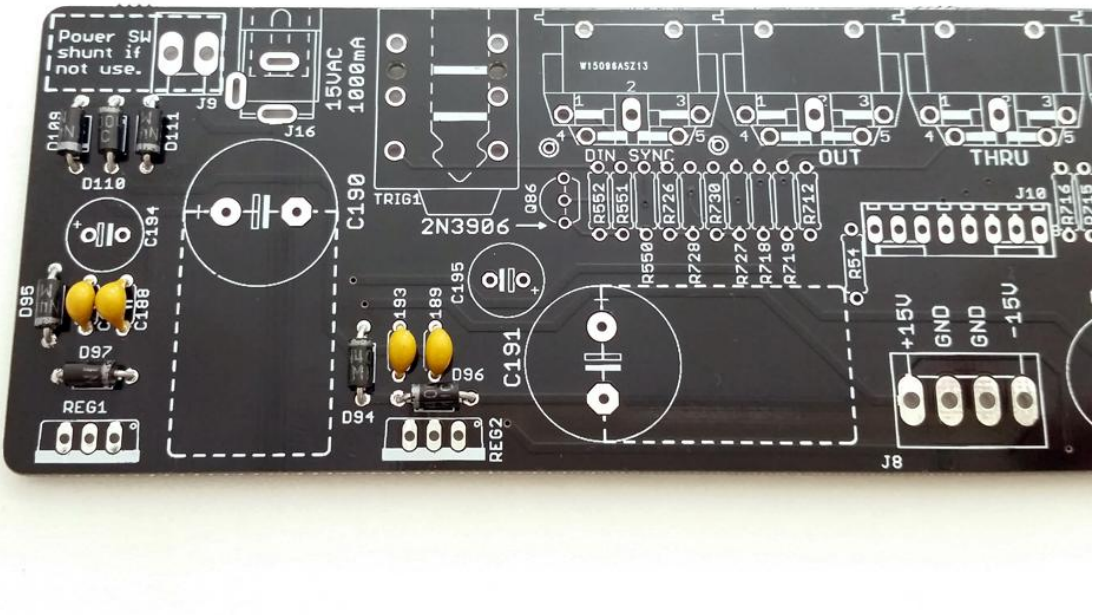
Welcome to this new DIY adventure. How brave you are ! ;). The assembly of the Yocto² is very simple if you are methodical and organized. Do not rush. If you have any doubt about the location of a component, use the supplied Eagle file. wishing you to have fun during the assembly, crazy DIYer!

1. PSU build

Let's start with the power supply section. First, let's populate the board with diodes and resistor. Diodes are polarized, the white ring must match the symbol silkscreened on the PCB. Do not mix D101 (1N5819) with others diodes ! R54 should be 0 ohm. This resistor share Digital ground and Analog ground.

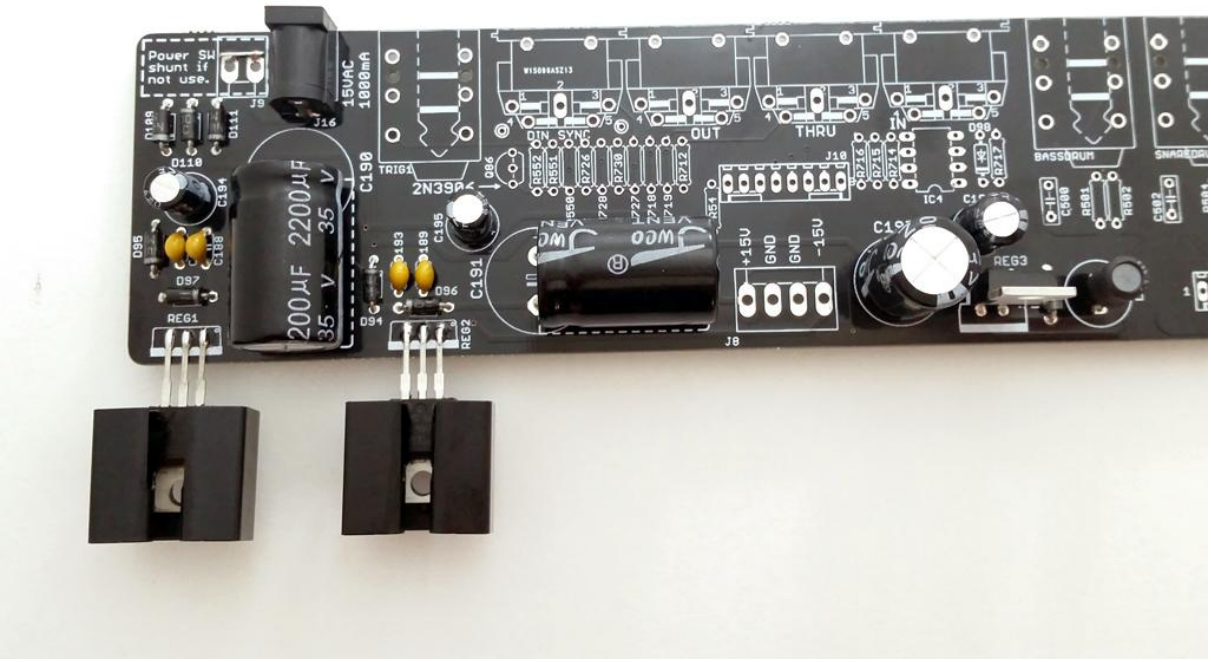


Add the four 100nF ceramic capacitors.

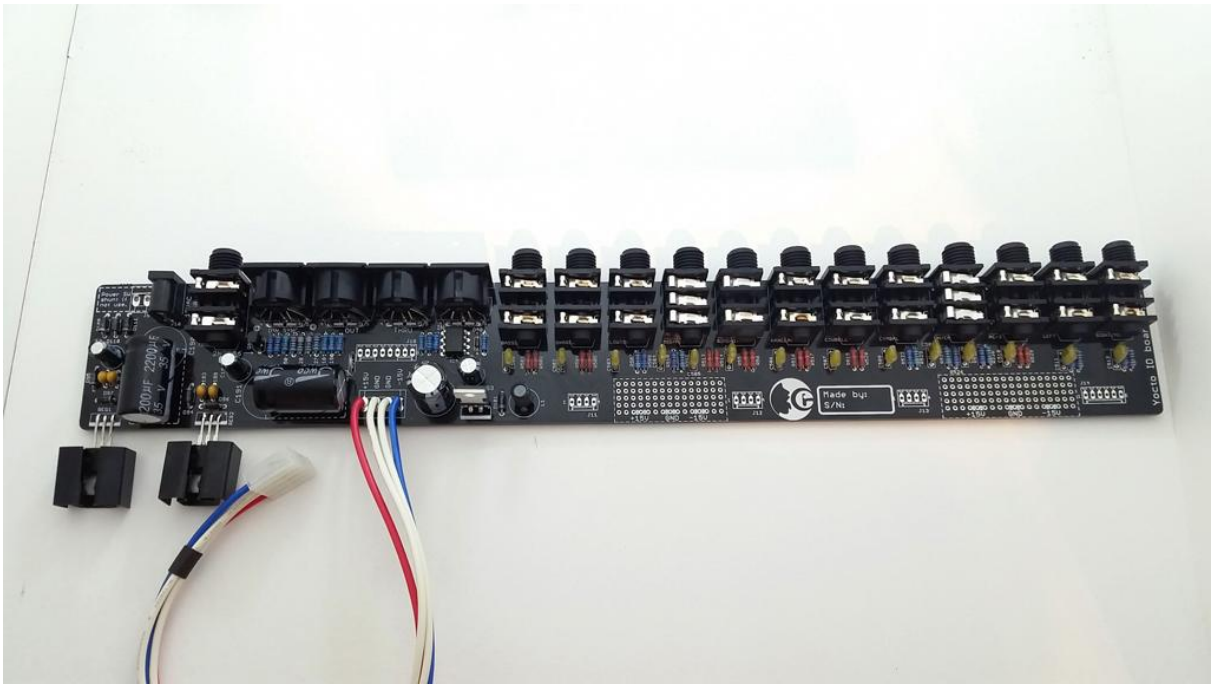


Now add the electrolytic capacitors and the inductor L1. Electrolytics capacitors are polarized, the long leg of the capacitors is the positive. Pay attention to orientation in which you solder electrolytic capacitors. First, bend 2200uF capacitors legs.

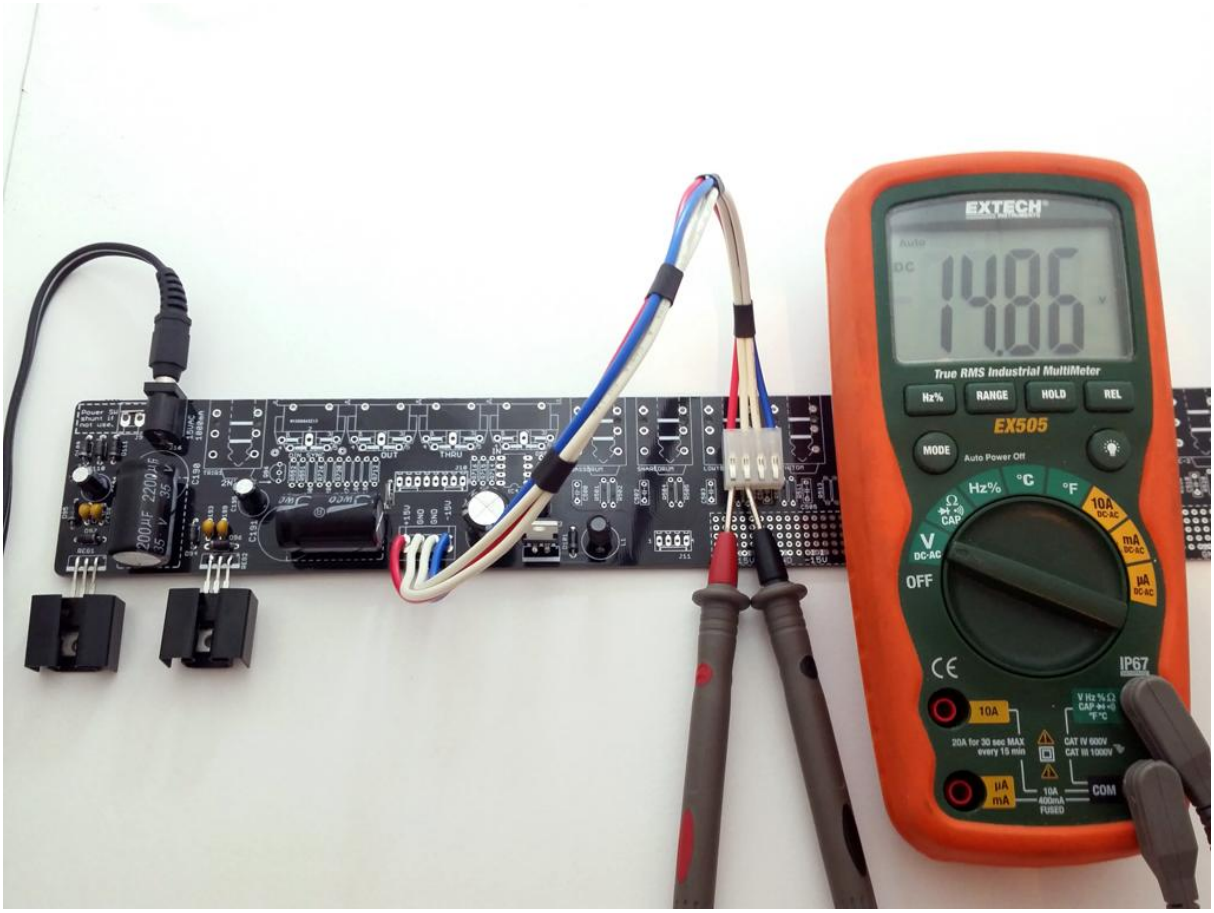
Bend regulators legs and Add the regulators on the IO board. Pay attention to the orientation ! and do not mix 7815 with 7915 they are different. Add 2.1mm barrel connector and short J9 power switch connector with a component leg too.

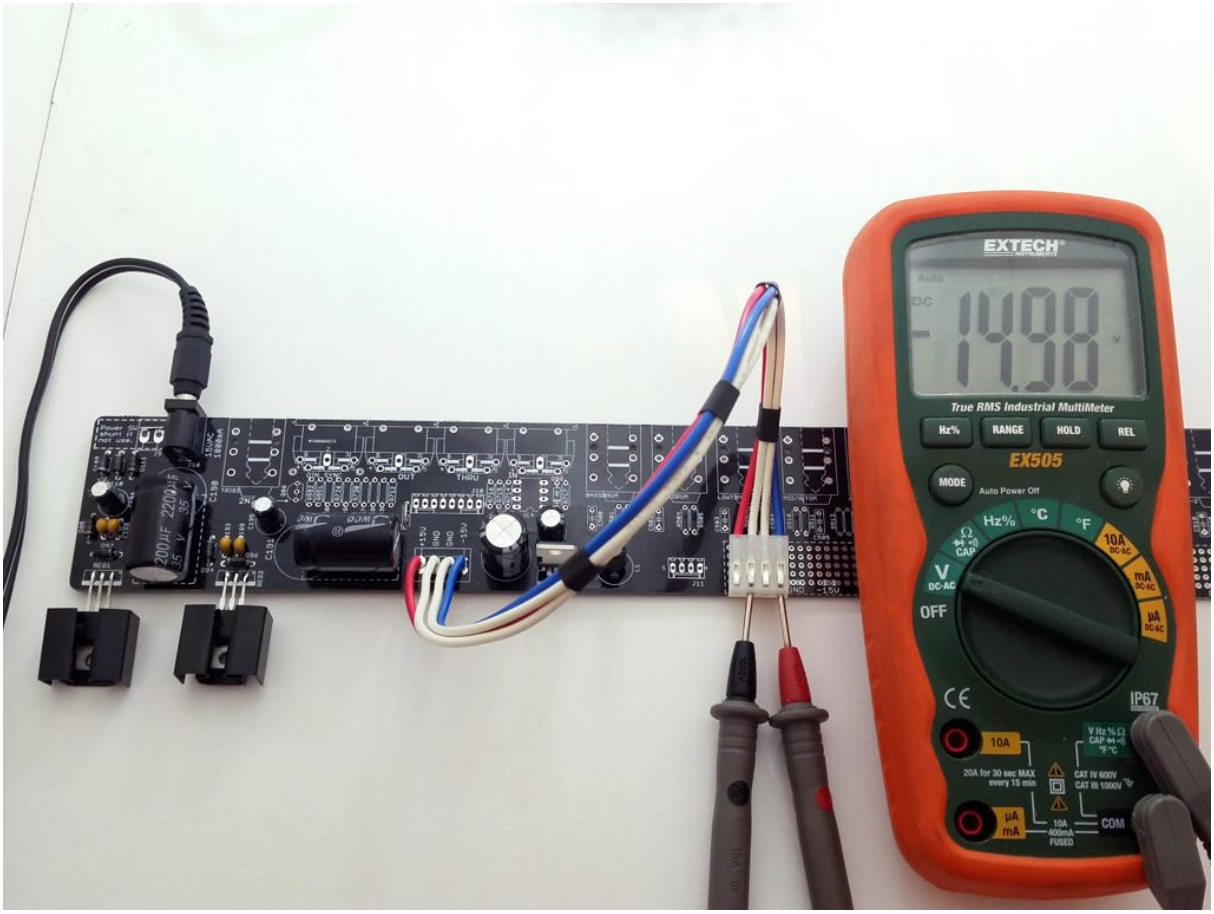


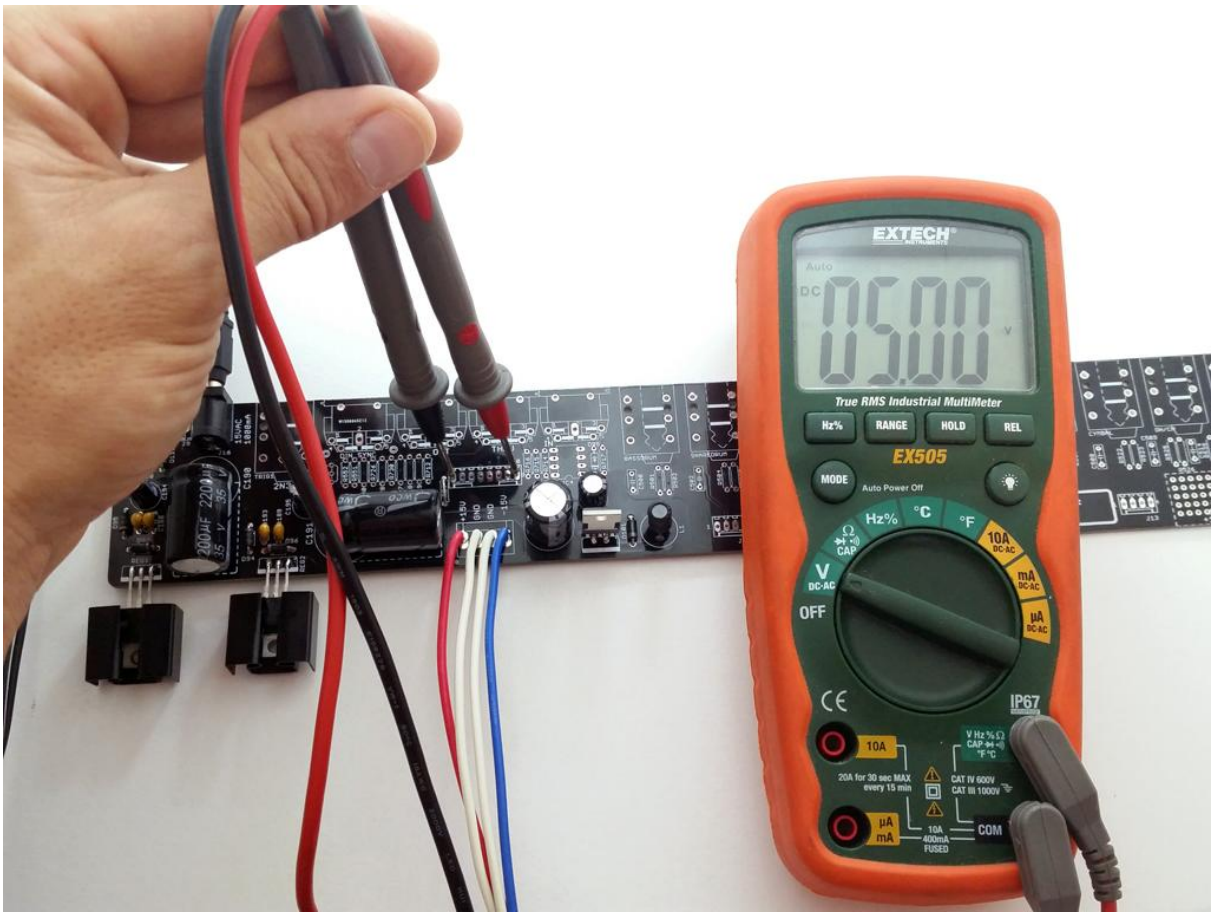
Prepare a four pins cable. First you need to crimp four wires. If you never do that before have a look on Youtube or Google there are lots of tutorial on "How to crimp a wire".
You got two different types of crimp in the Mouser Bom, use the biggest one for the power supply. Solder the four wires respecting the order of connecting, then you are ready to test your power supply.



Plug your 15VAC 1000mA wall wart transformer to the IO board. Connect your multimeter in DC mode between ground and each output: you should measure +15v, -15v (more or less 0.5v) and +5V (between J10 pin1 GND and pin8 +5V).



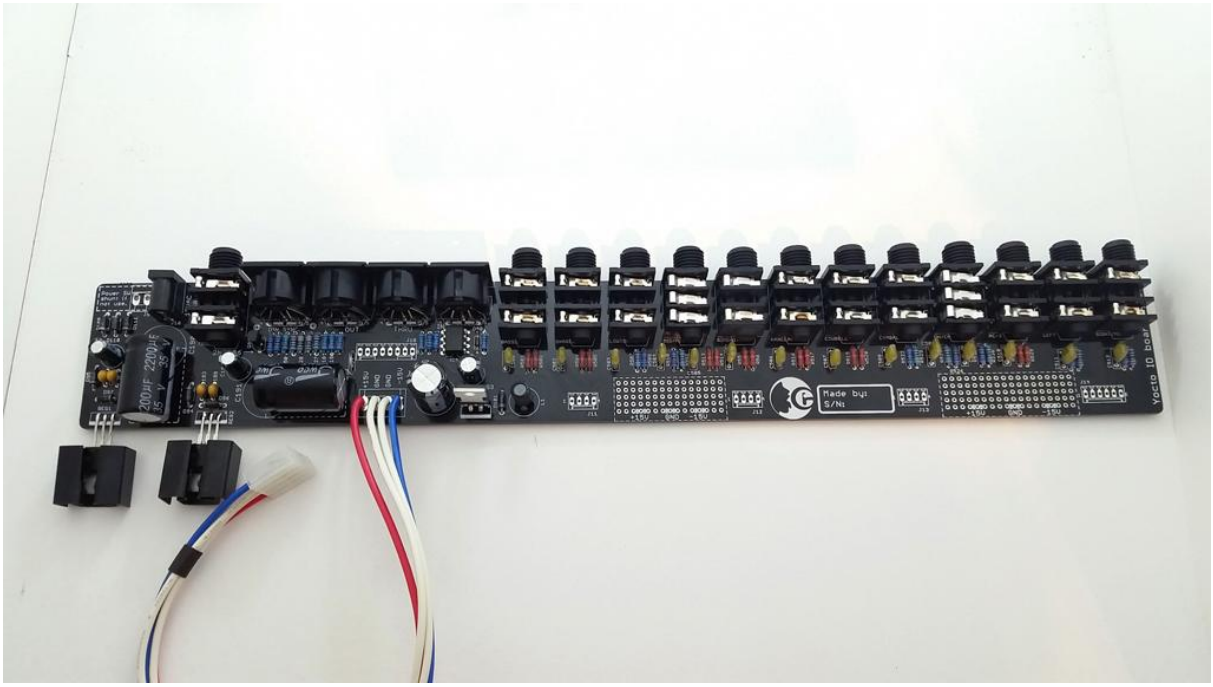

EXTECH
-14.98
True RMS Industrial MultiMeter
Hz%
RANGE
HOLD
REL
EX505
MODE
Auto Power Off
OFF
10A
IP67
COM


EXTECH
Auto
DC
05.00
V
True RMS Industrial MultiMeter
Hz%
RANGE
HOLD
REL
EX505
MODE
Auto Power Off
Hz%
°C
°F
Ω
CAP
10A
DC-AC
V
DC-AC
mA
DC-AC
OFF
µA
DC-AC
CE
IP67
10A
20A for 30 sec MAX
every 15 min
V Hz % Ω
CAP
°F °C
CAT IV 600V
CAT III 1000V
µA
mA
10A
400mA
FUSED
COM

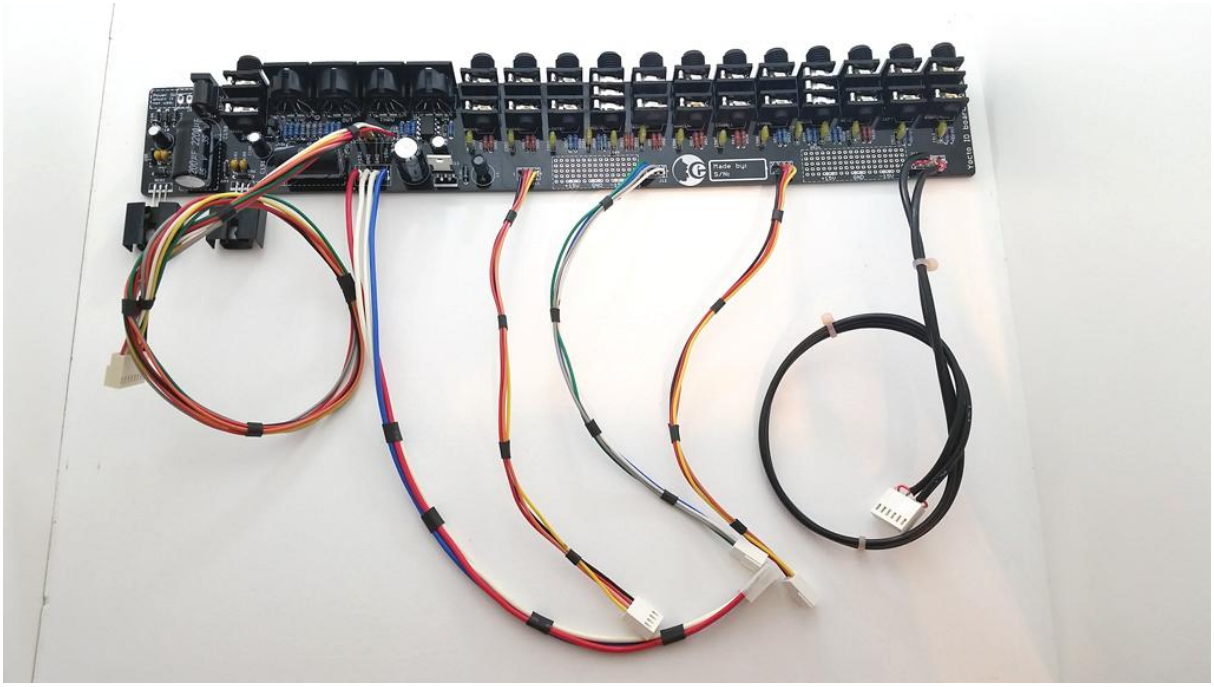
2. IO Board

Let's continue with the IO board. As we added a instruments test mode in the firmware you need to build IO Board first.

Like habits, you must solder components in this order: Resistor, diodes, capacitors, transistors, ICs and connectors.
Your board should look like this. Some components may be different ;) :

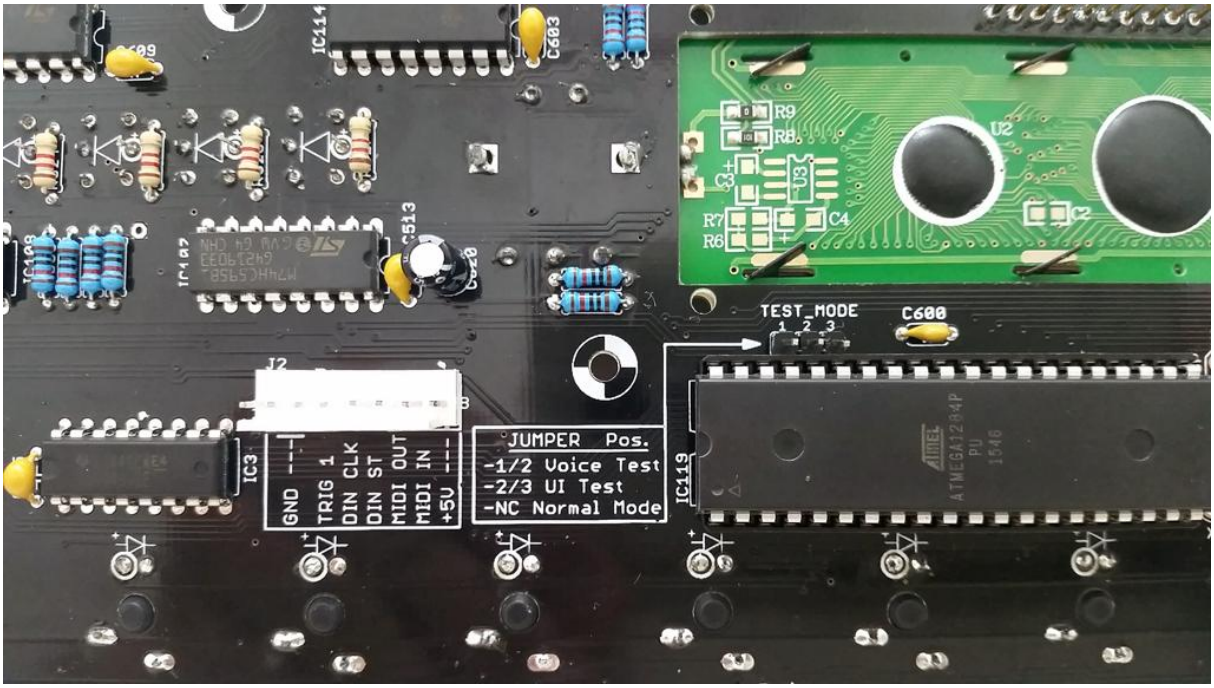


Make three 4 pins wire 25cm length, one 8 pins wire 45cm length and one 6 pins shielded wire 45cm too (Master cable pin2 and pin4 are shielded ground) . Solder wires respecting the way. Cable housing connectors Pin1 must match Pin1 silkscreened on IO board. IO Board is complete.

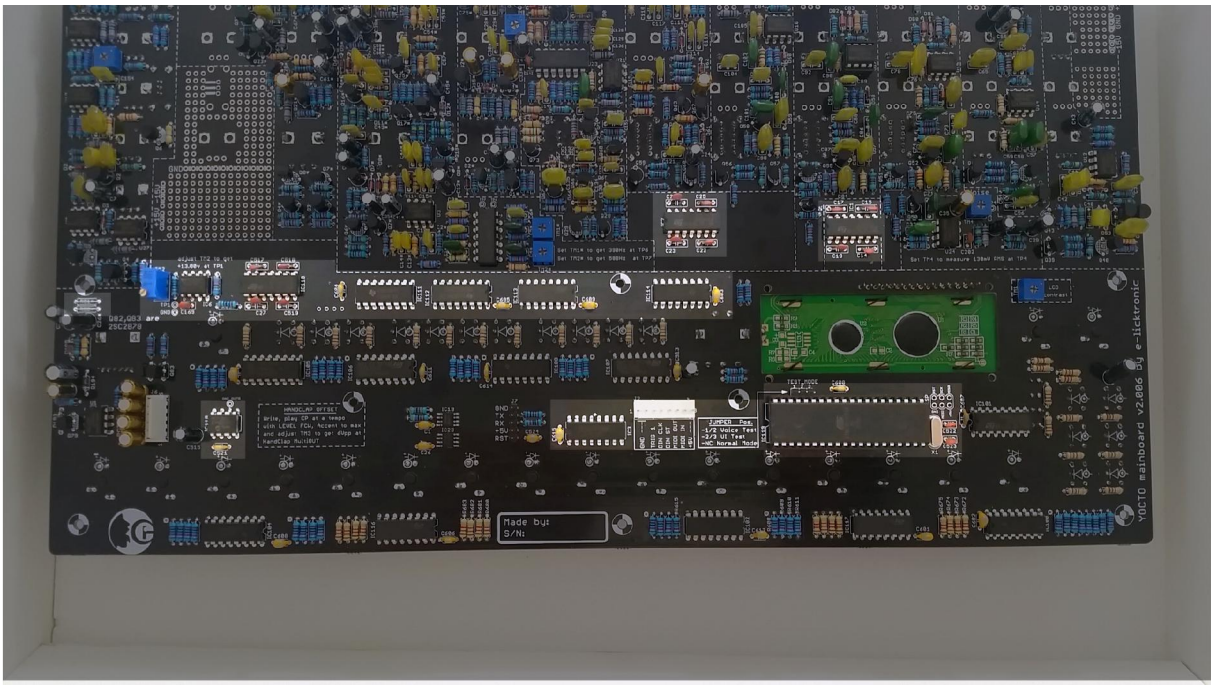


3. Sequencer (only parts needed to test instrument)

Yocto² firmware allow you to test each voices during building process. A jumper on pins 1-2 of Test _mode header set the CPU in Voice test mode. In this mode a trig pulse is sent every second to all voices.



Solder only the part needed to trig voices, start with resistor, then capacitor, µC IC socket, connector and ICs.



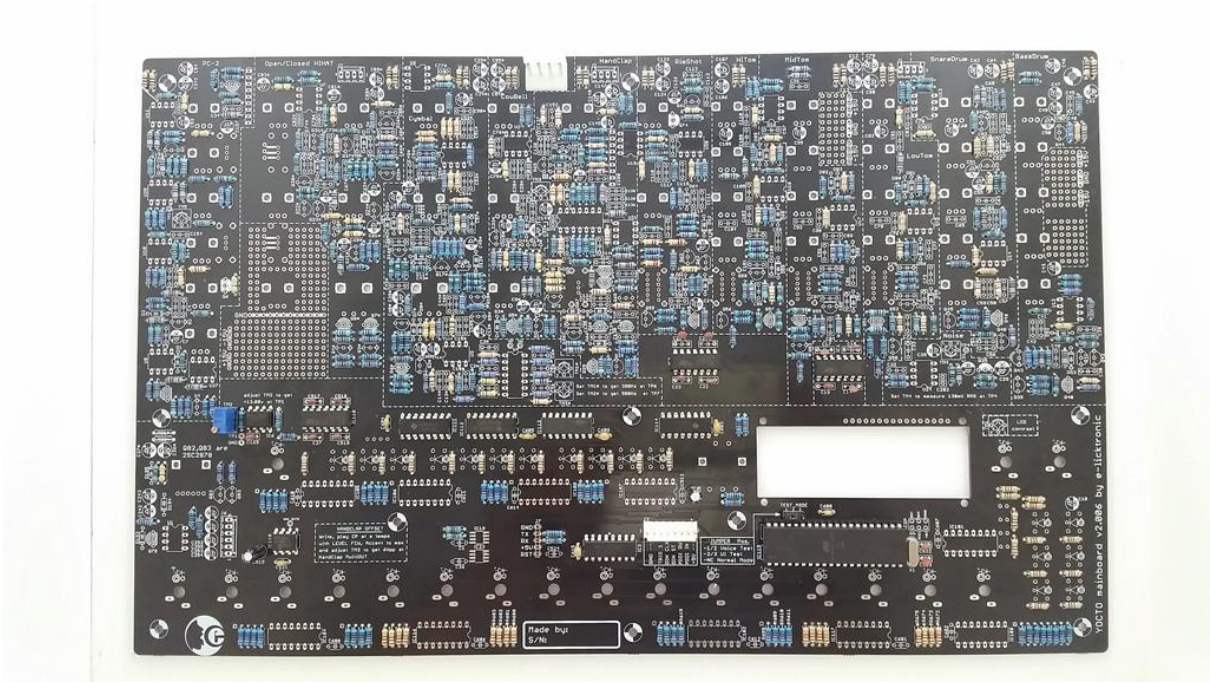
4. Main board bottom parts

Now you can start voices building process. There are two ways to build voices.
The first one is to build each voice separately (Noise then BassDrum then Snare etc...) that allow you to test each section before start building an other one. Use individual voices Parts lists
Or, if you are an expert in DIY project ;), you can build the entire board in one time, i mean when you choose a component value you put in place the value everywhere on the board using the Main parts List. This way is faster but if you got a issue, short cut or what ever, it's harder to fix it.
Beginner use the first method, please ;) (refer to the Nava building guide to know how to do): http://www.e-licktronic.com/en/content/46-nava-roland-tr-909-clone

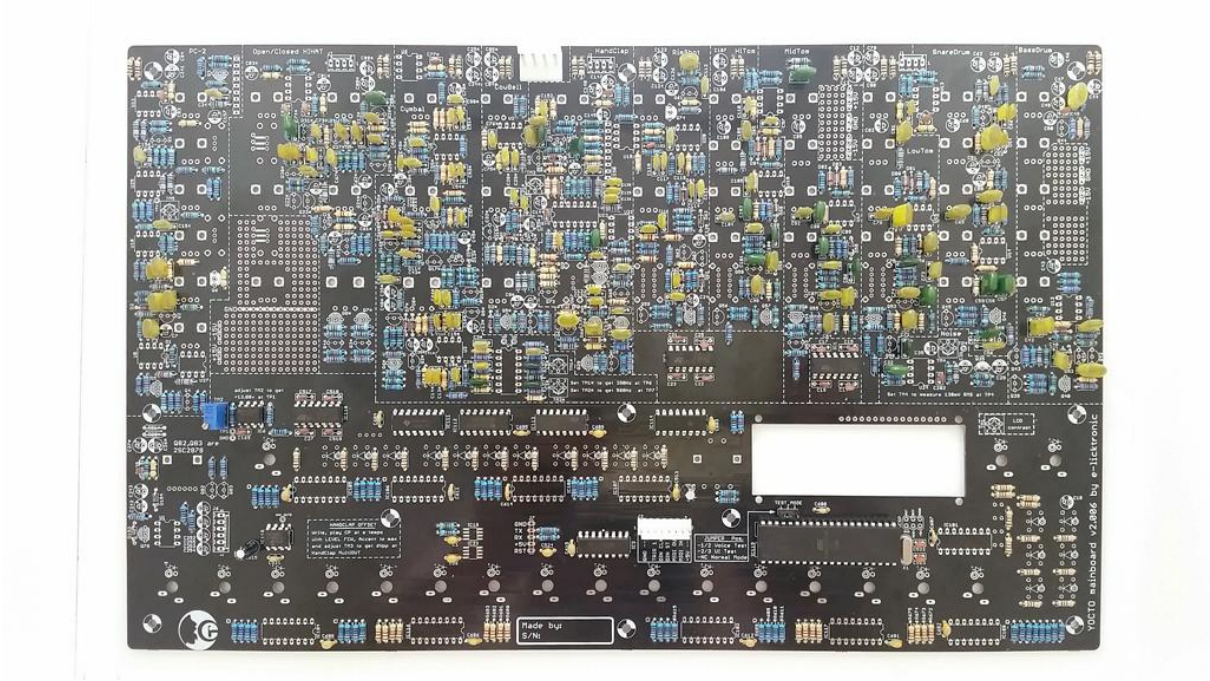
As we already describe individual voices building process in others projects (Yocto v1.0 or Nava), here we describe the faster way to build your Yocto v2.0. BEGINNER PLEASE DON'T USE THIS WAY !!!

Yocto² voices components names match original TR-808 components names that you can use the Roland Tr-808 service manual to fix or mod your Yocto². As the TR-808 had two voices boards, some components had the same name. To difference the components from the second TR-808 voice board (the one with Cowbell, Cymbal and HitHat) we add a "*" at the end of the name. DO NOT MIX COMPONENT WITH THE SYMBOL "*" WITH OTHERS ;)

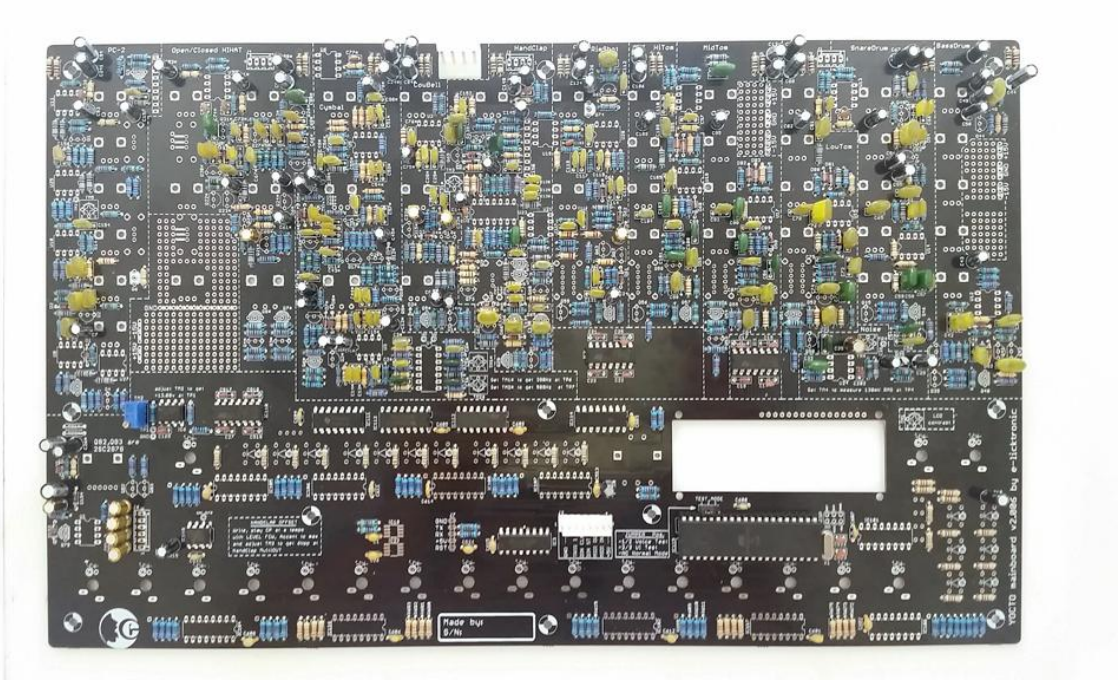
First, we will populate the bottom side of the board – starting by the shortest and smallest parts. Add the resistors.



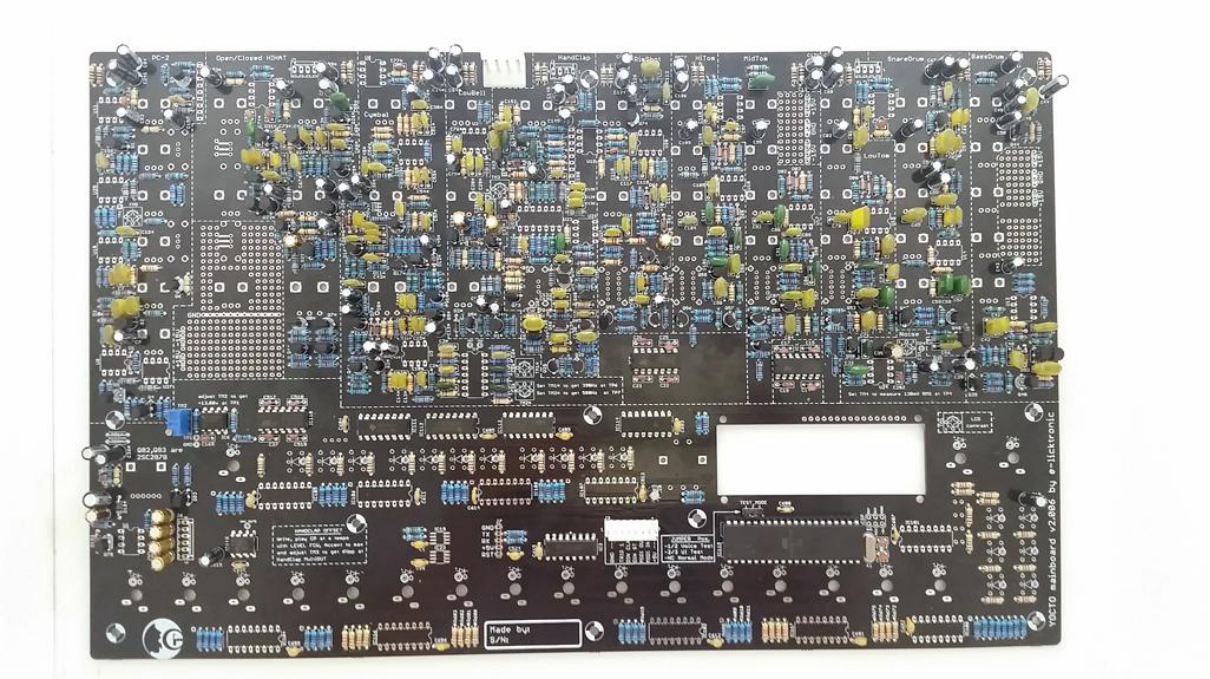
Add diodes, take The diodes are polarized, the ring of the diodes must be on the same side as the ring on the diagram printed on the board and add non polarized capacitors too.



Then solder electrolytic capacitors, take care of the voltage value and orientation.

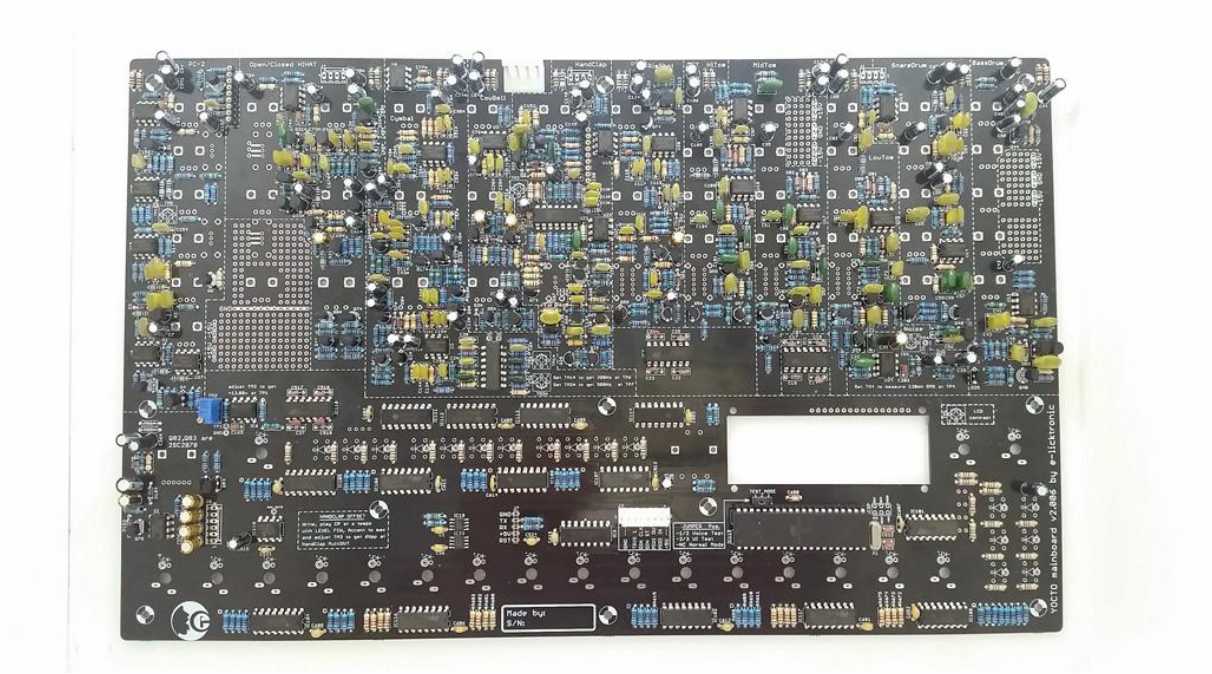


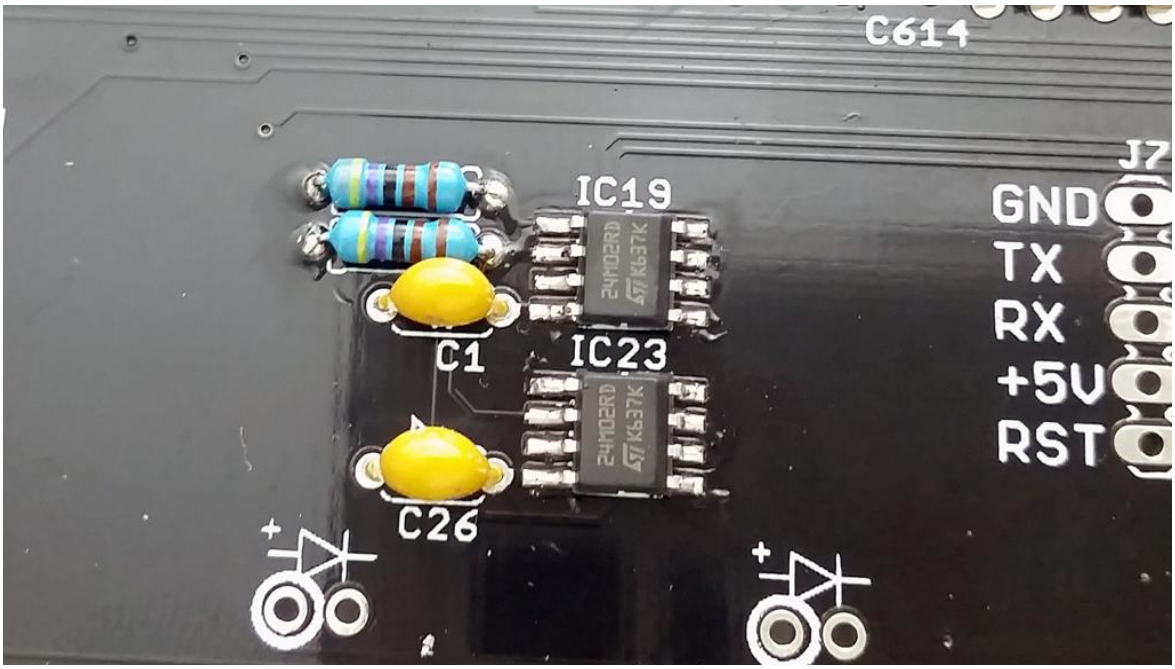
Add Transistors. Each transistor type have a different symbol printed on the board so you should not mix it ;)



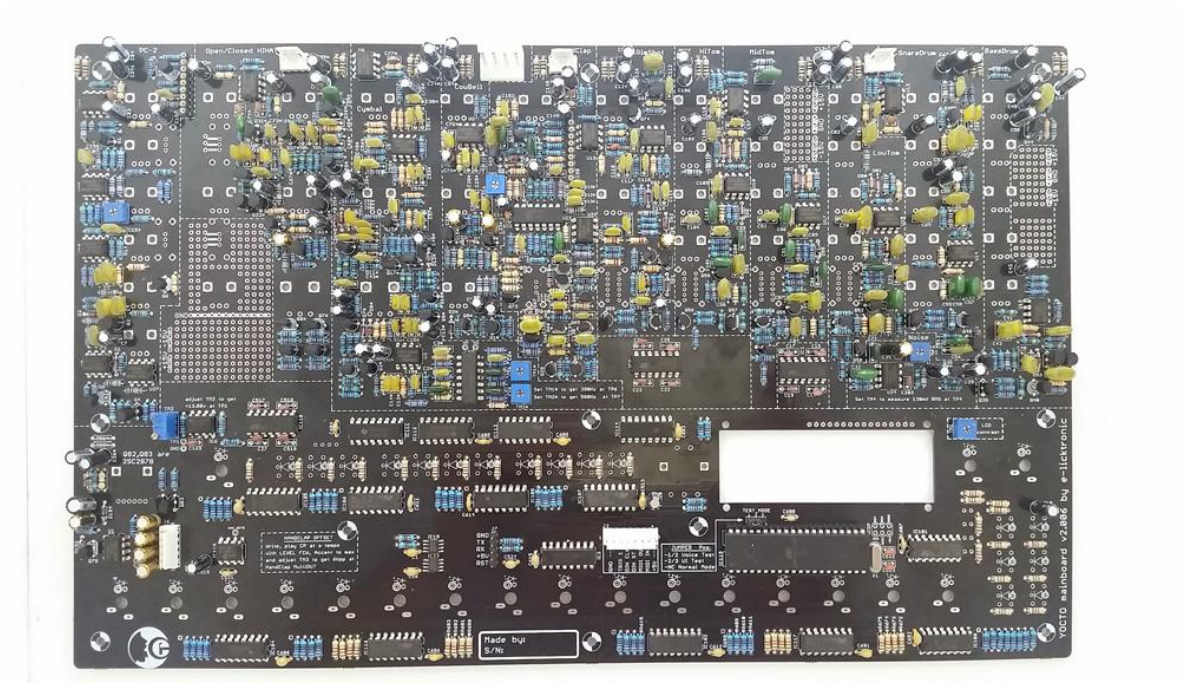
Add all ICs. EEprom ICs are SO-8 CMS components. If you have never soldered CMS component refer to this tutorial:
https://www.youtube.com/watch?v=fq8A95AQFYU

Take care of ICs placement and orientation, they are not all in the same way, especially in the sequencer.




C614
IC19
24M02RD
K637K
C1
IC23
24M02RD
K637K
C26
J2
GND
TX
RX
+5V
RST

Now add trimmers and connectors and bottom part of the main board is finished ;)



5. Main board top parts

Add Voices switches first. Then add sequencer switches, leds and LCD. As Yocto² sequencer is very similar to Nava sequencer you can have a look on this page: http://www.e-licktronic.com/en/content/58-nava-tr-909-clone-sequencer, to get more detail on how to put switches, LCD, LEDs... and finally potentiometers.

6. Calibration

- **EEproms initialization**

At the first start the EEproms will be automatically initialized

- **DAC calibration**

Set the sequencer in Voice test mode (1.2 jumper position)
Adjust TM2 to get +13V at TP1

- **Noise**

Set TM4 to measure 130VRMS at TP4

- **Handclap Offset**

With the sequencer in Voice test mode, adjust TM3 to get 6Vpp Handclap at Handclap multiout

- **Cowbell oscillator frequency**

Set TM1* to get 390Hz at TP6
Set TM2* to get 588Hz at TP7

- **PC-2 depth mods**

Set VR18, VR3 and VR2 full CCW
Set VR20 center position
With the sequencer in Voice test mode
Scope to TP2
Adjust TM5 for the minimum thumps