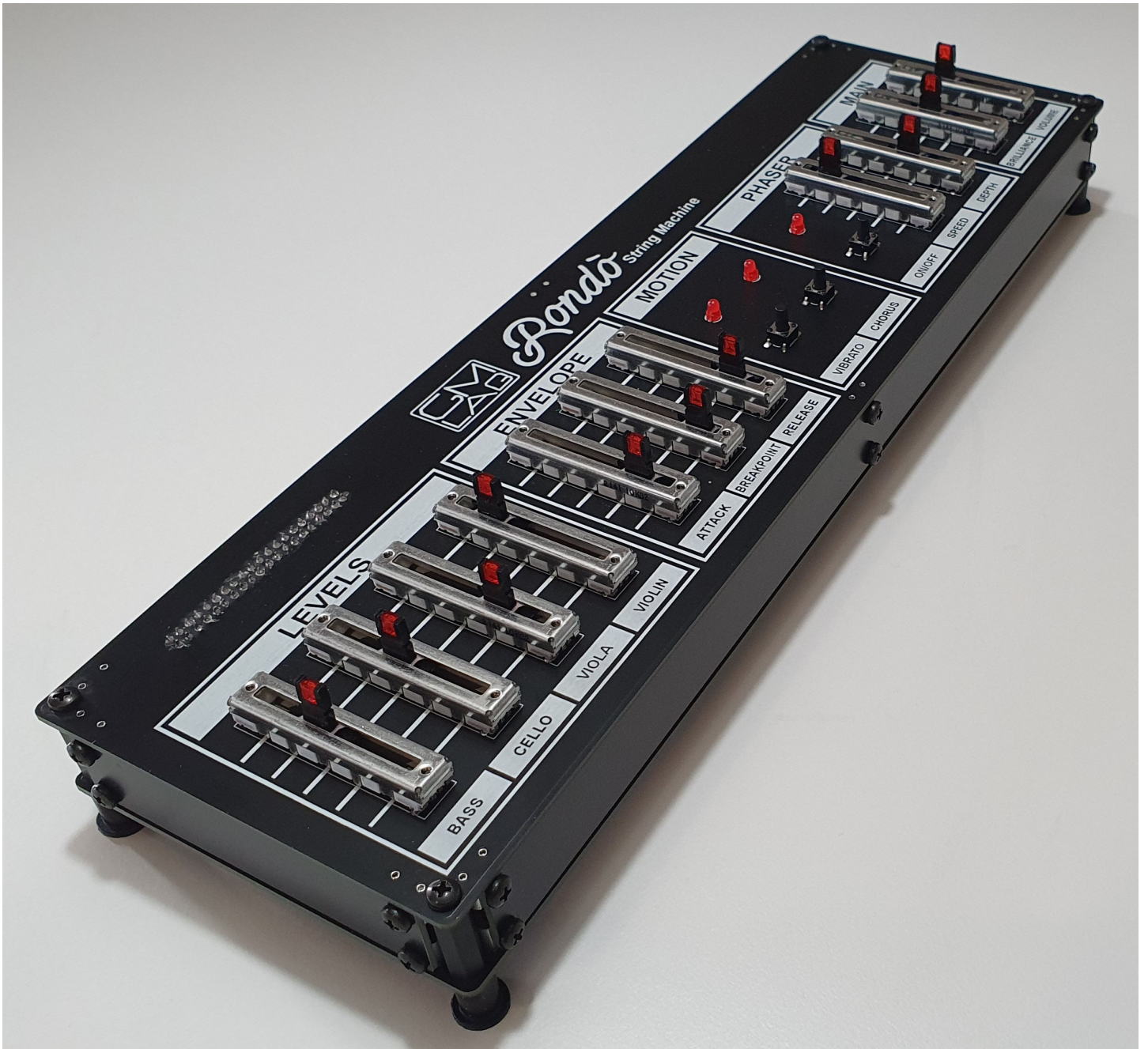


RONDO' DIGITAL STRING MACHINE



Thank you for purchasing GMLab Rondò! Whether you bought the kit version or the pre-assembled version, please refer to this document for basic information and instructions. If you purchased the kit version, please refer to the full version of the guide that you will find online, here:

XX

GMLab Rondo is a string machine inspired but the great "violin keyboards" of the Seventies. It has 4 sounds (Bass, Cello, Viola, Violin) that you can mix together to achieve your favourite string sound, an envelope section and 3 effects: "vibrato" and "chorus" are fixed and you can only activate or deactivate them, the "phaser" effect can be adjusted. A "brilliance" and "Volume" sliders complete the interface.

No power supply unit is supplied with a KIT purchase. GMLab Rondò requires a 12v DC 500mA minimum power supply in order to operate correctly. These are very common and you probably already have one compatible laying around somewhere. Just be sure that the DC male plug is 5.5/2.1 with the positive in the central pin and the negative in the external frame of the plug. You can also use a power supply with less voltage (for example 9v) but please don't use the ones for guitar pedals, they are normally with center negative. Using a different power source than the one suggested (12v DC) won't harm your instrument, unless you connect a power supply with a voltage higher than 12v; but will affect the audio quality because the operational amplifier circuitry used in this project is designed around 12v DC voltage for optimal performance. GMLab Rondo is sending out mono audio from the 6.3 jack plug. The MIDI connector of GMLab Rondo is a MIDI IN port, there you are supposed to plug a device capable of sending MIDI messages, typically MIDI NOTE ON/OFF messages. Plug there your MIDI keyboard, your computer or your sequencer. **Rondò recognizes MIDI data on channel 1** and does not support velocity.

Rondò is able to recognize MIDI CC# messages as follow:

| | |
|-----------------|--------------------|
| 7: Volume | 18: Release |
| 12: Bass | 19: Brilliance |
| 13: Cello | 21: Phaser Rate |
| 14: Viola | 22: Phaser Depth |
| 15: Violin | 30: Vibrato On/Off |
| 16: Attack | 31: Chorus On/Off |
| 17: Break Point | 32: Phaser On/Off |

GMLAB Rondo is sold on-line on the web sites www.gmlab.it and on www.MyRigShop.com by V.M.Connection, an enterprise based in Italy.

You can get the project files and source code for this project (if available) and other GMLab projects on our Github account: <https://github.com/zioGuido>

If you need spare parts or blank PCBs, just let us know.

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MOUNTING INSTRUCTIONS

Welcome to the mounting instruction sheet for the GMLAB Rondò string machine. To assemble this kit correctly and set it up to work properly, a good skill and experience with electronics and computers is required, plus some tools and a little bit of patience and attention. You must be able to recognize electronic components, resistors, capacitors, integrated circuits, you must be able to solder them properly on the PCB. Please note that we are not responsible for instruments not working due to improper mounting, improper soldering/desoldering of components or parts broken during the mounting process

REQUIRED TOOLS

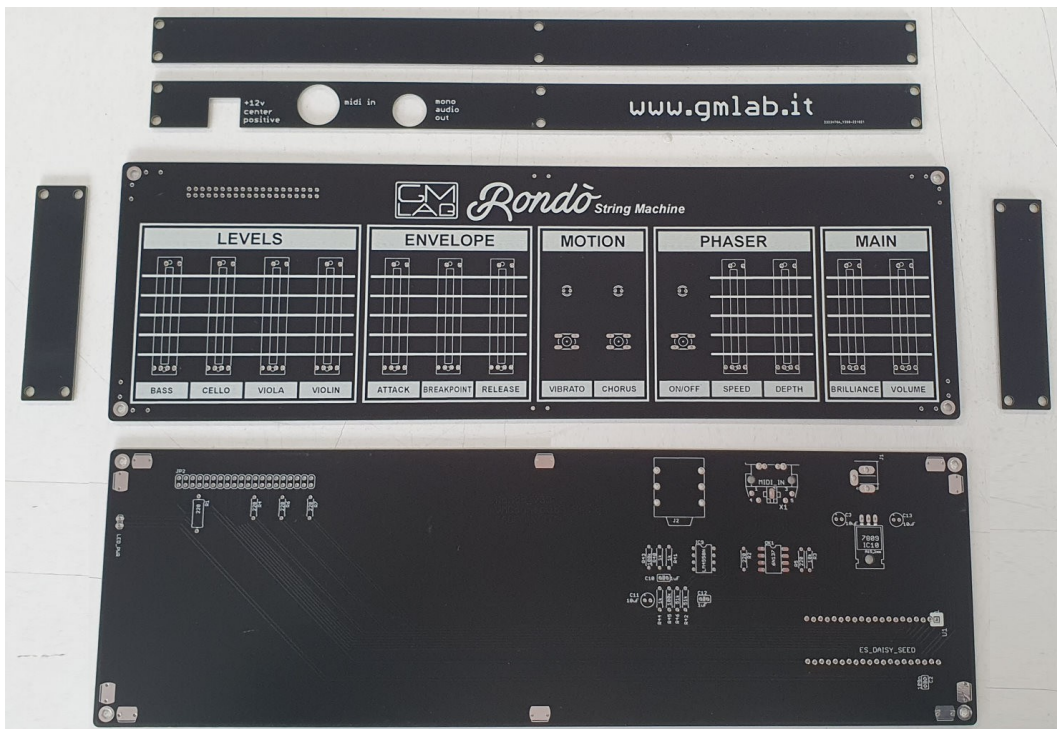
1. Soldering iron, preferably a temperature-controlled 60W iron with a 1,5 ~ 2,5 mm wide tip;
2. Solder tin wire, preferably good quality 0,8 ~ 1 mm diameter;
3. Good quality cutters, pliers, screwdrivers;
4. Patience.

PREPARATION

Prepare a clean and tidy surface, with just the required tools handy and make sure you have discharged your body from electrostatic charge by touching some metal object that makes contact with the floor. Optionally, wear an ESD wristband.

WHAT'S IN THE KIT

- 1x Active Panel bottom PCB
- 1x Top Panel PCB
- 1x Front panel PCB
- 1x Rear panel PCB
- 2x Side panels PCB

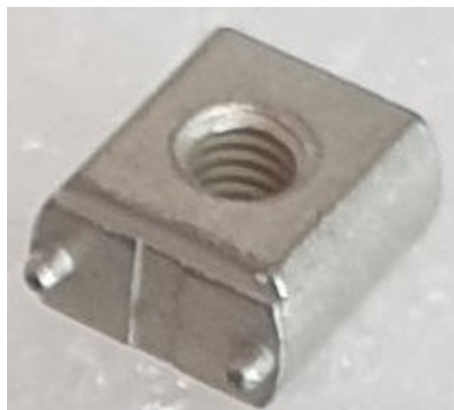


- 20x REDCUBE
- 4x M3x20 M/F HEX spacers
- 4x Rubber feet
- 15x M3x5 screws
- 11x Slide potentiometers
- 3x Push switches
- 3x 3mm Red LED
- 1x 40 pin long female headers
- 2x 20 pin log male headers
- 2x 20 pin short female headers
- 1x 2 pin header
- 1x Jumper
- 1x 100nF ceramic capacitor
- 3x 10uF electrolytic capacitors
- 2x 1uF capacitors
- 1x IC 7809
- 1x IC 6N137
- 1x IC LM4558 or TL072 or TL082
- 1x Jack TRS 6.3
- 1x MIDI Connector
- 1x DC Connector
- 1x 10kohm resistor
- 6x 220ohm resistors
- 3x 1kohm resistors
- 2x 51kohm resistors
- 2x 100kohm resistors
- 1x IC Daisy Seed

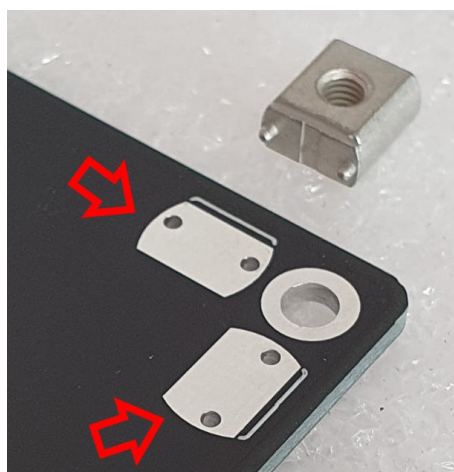


NOTE ABOUT REDCUBES

Redcubes are little components that allow to fix the side panels of the synthesizer without compromising the aesthetical end result of the product. They need to be soldered to the bottom and top PCBs. The procedure is not very easy and we suggest to do this operation before anything else.



You are required to solder 10 pieces on the bottom PCB and 10 pieces on the top PCB: 2 pieces on every angle plus 2 pieces in the middle. Please take a look at the PCBs in order to find out where they are located.



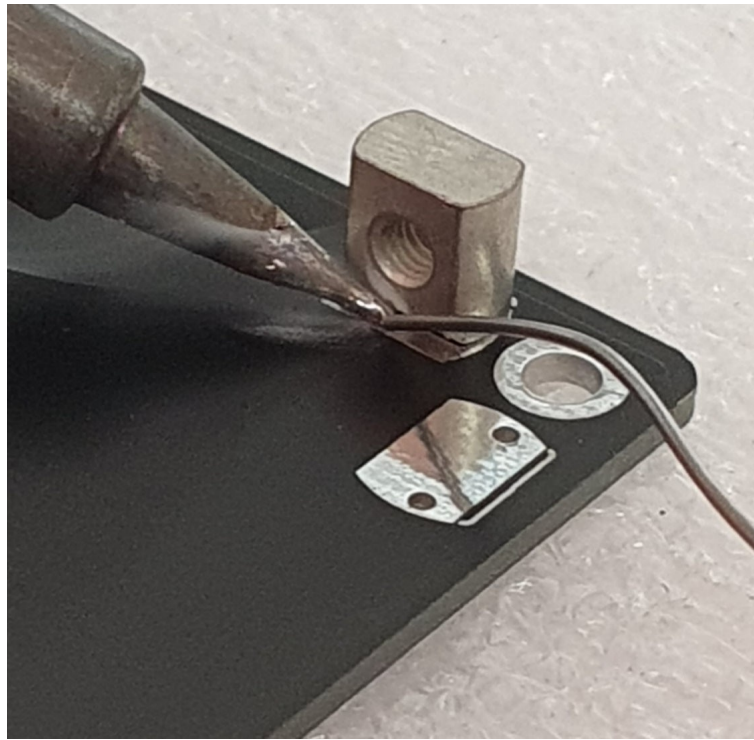
Once mounted you will be able to fix the side panels of your synthesizer with the screws to improve the overall structure and appearance.

The soldering procedure requires time: please follow our instructions carefully!

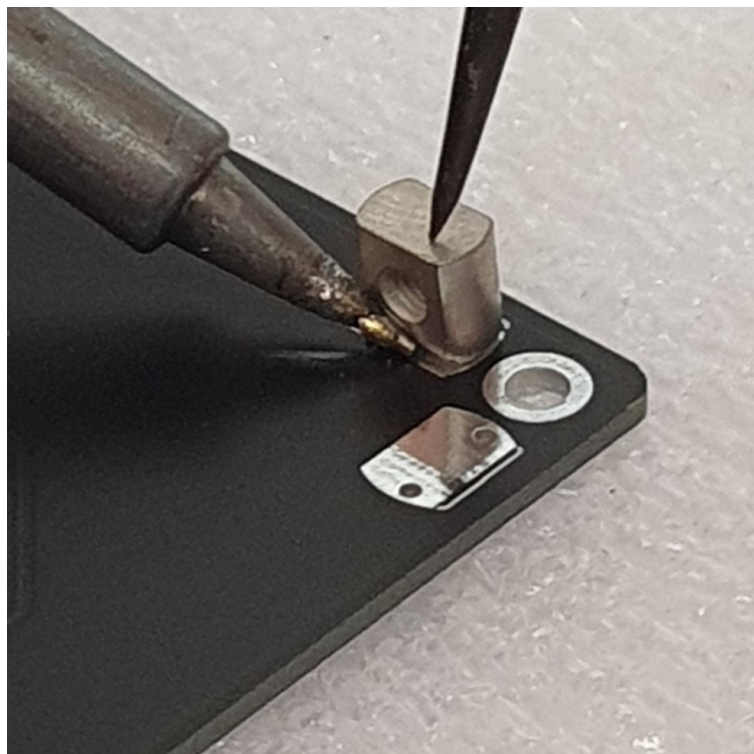
- Locate a REDCUBE pad and place one on it: be sure that the two small pins are inside the 2 small holes in the pad.



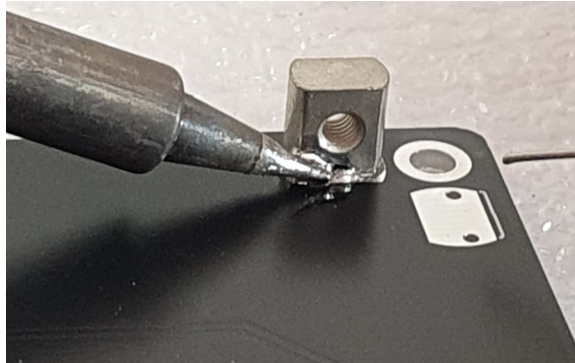
- You will notice that the pad is a little bit bigger in the inside area: that is the place where you have to start soldering it. Put the tip of your soldering iron there and start applying the soldering tin wire to it: hold them firmly, don't apply the solder tin on the pad before positioning the REDCUBE, otherwise it will be difficult then to re-position it again. Please don't forget that the area and the redcube will become very hot!



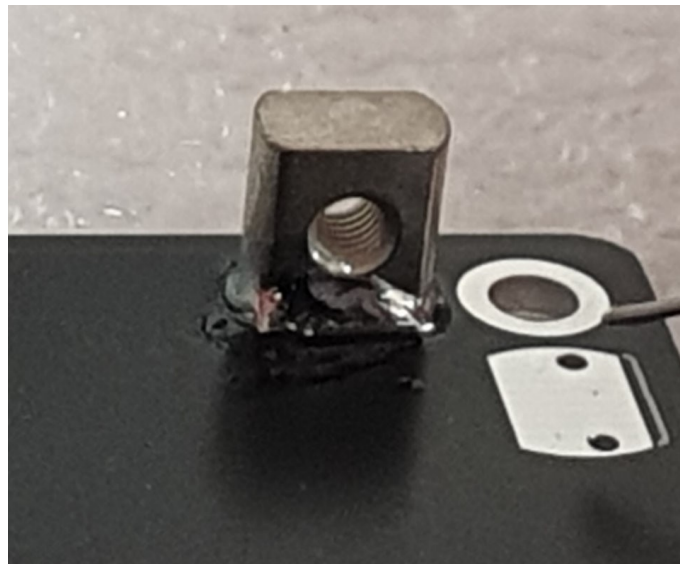
- You can help yourself in this operation using a tool to firmly hold the REDCUBE until the solder starts melting and attaches to the PCB. Don't move the soldering iron tip!



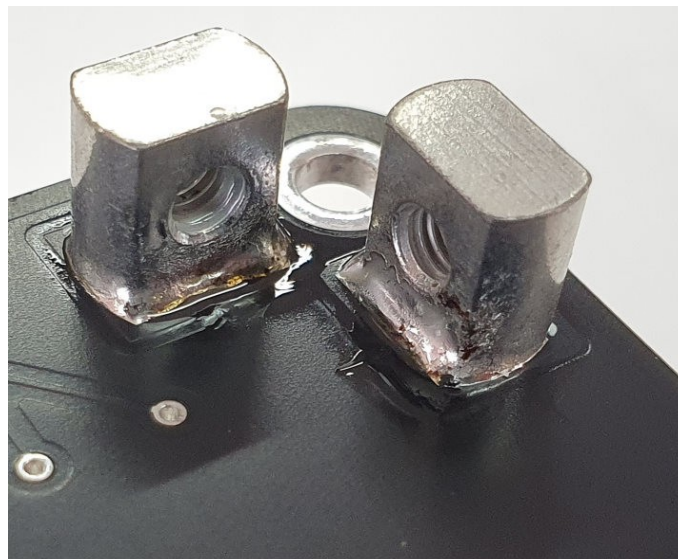
- The soldering tip needs to heat both the PCB and the REDCUBE before the tin starts melting. This requires time, it can be from 10 to 30 seconds depending on the temperature.
- When the solder tin starts melting you will see the tin going everywhere in the pad and also underneath the REDCUBE, firmly attaching it to the PCB. You need a lot of solder tin there! Wait until everything is well covered with the tin and then remove the soldering iron tip gently without dropping the REDCUBE.



- When the solder tin is solid again, the end-result should look like this:



- You can now proceed with all 20 pieces.



ACTIVE BOTTOM BOARD

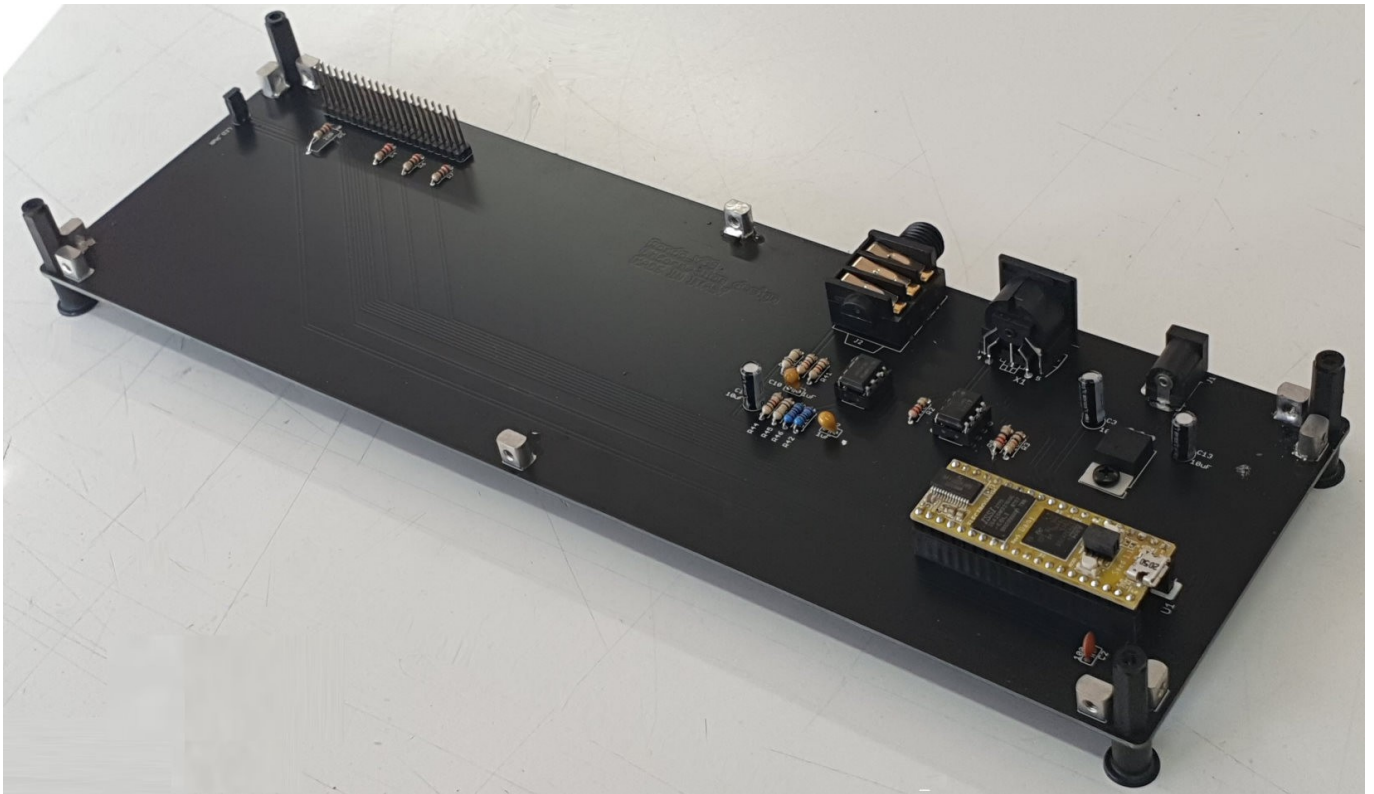
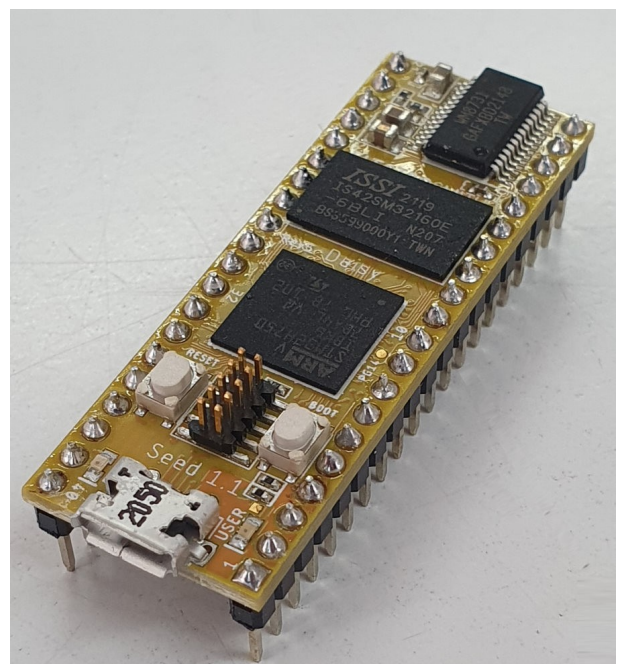
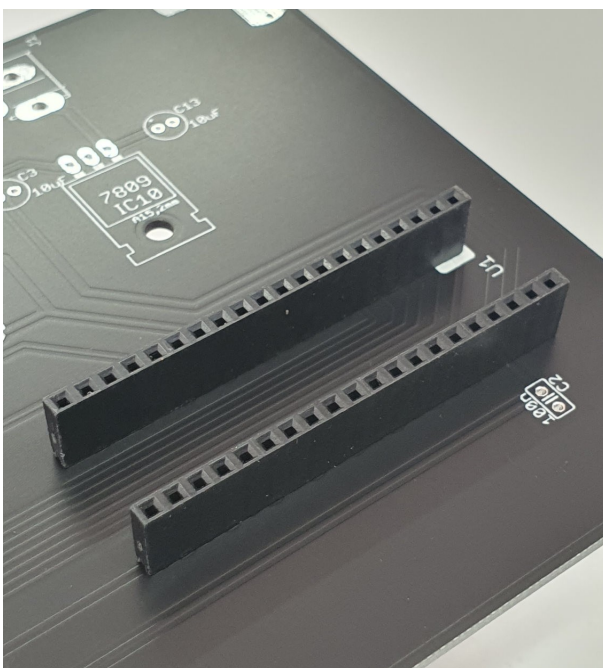


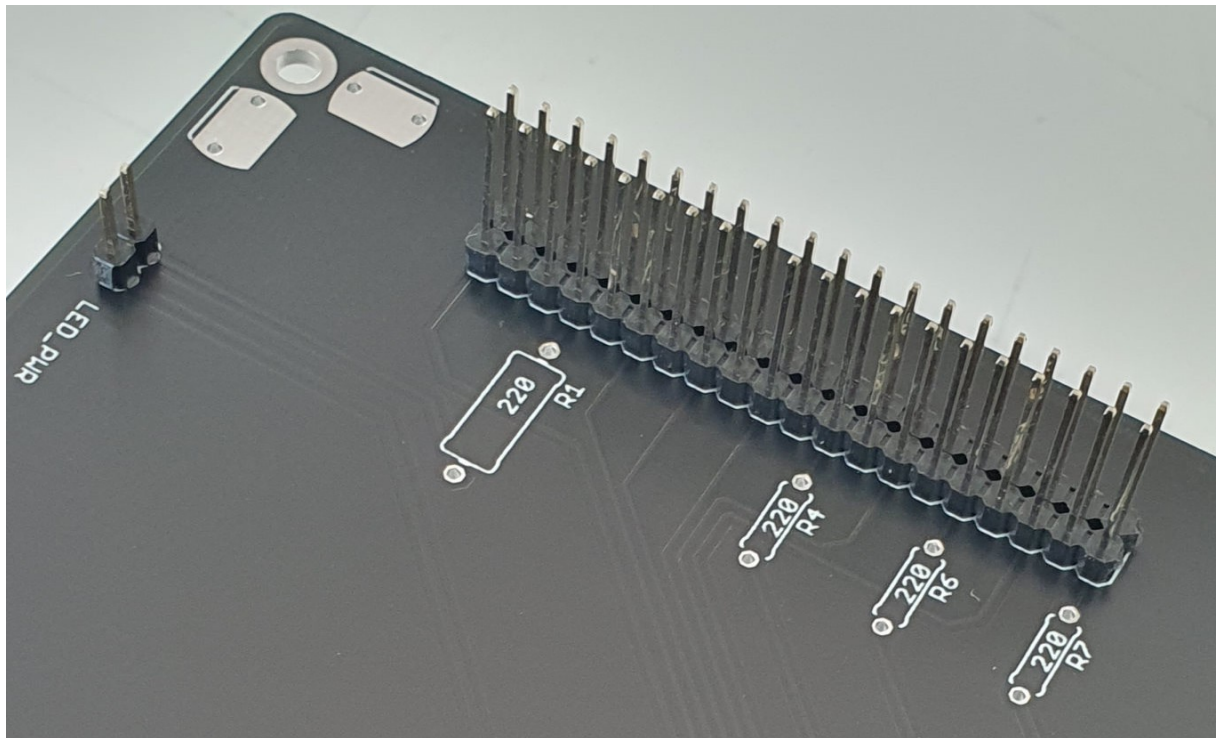
fig. 1

STEP 1: Let's start from the electronics. All passive components first, starting from the lowest till the tallest. Take the resistors, bend the terminals 90 degrees (if not already bent) and add them to the main PCB in the correct positions (check the schematics, silkscreen on the PCB and the component numbering and value). Do the same with the capacitors and keep in mind that electrolytic capacitors do have a polarity.

STEP 2: Let's place and solder all the connectors (male and female SIL and DIL headers). Let's start from the 2x20 pins female headers for the brain of the string machine: the Daisy seed. Insert them and solder on the other side.

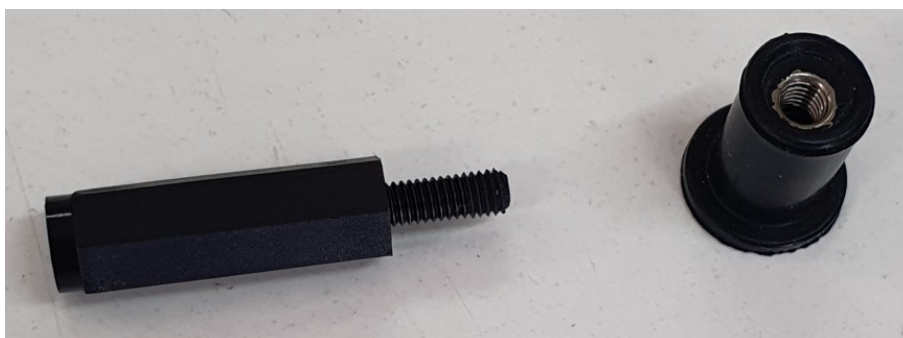


Then you can proceed with the 2x20 **long** male headers (these are used to connect the bottom board to the top board) and the 2 pin header. That 2 pin header is used to give or remove power to the LEDs of the sliders in the top board. Adding a jumper the LEDs will lit, without the jumper the LEDs will stay off.

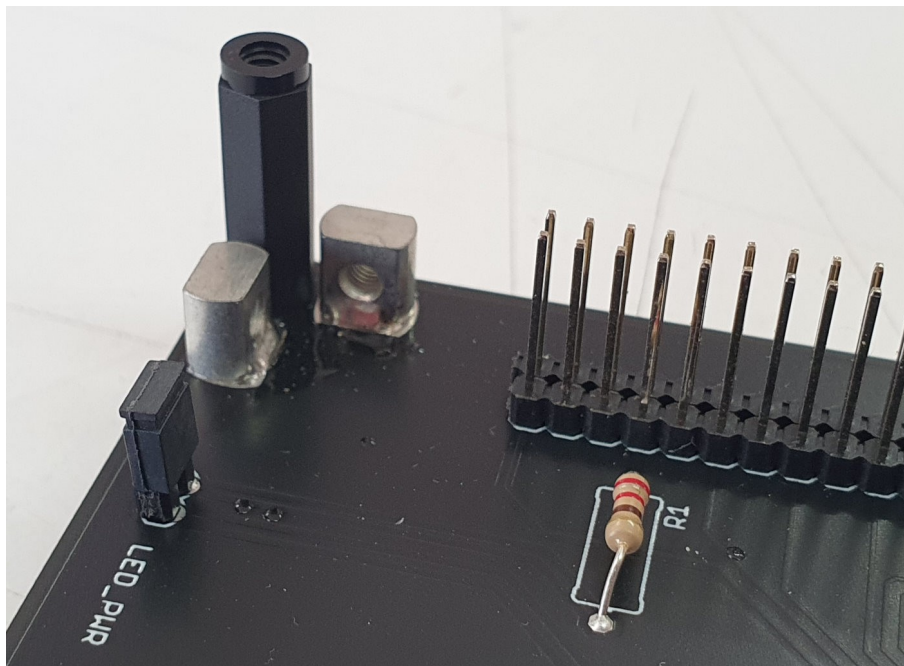


STEP 3: Add the Integrated Circuits. Pay attention not to keep the solder pin for too long, and that all pins have been soldered correctly. Do not solder two or more pins together, each pin is soldered separately from the surroundings. Also pay attention to the direction and polarity. Drawings on the PCB have a notch on a side indicating where pin 1 goes. The same notch is generally present in the IC itself, or you'll also find a small dot. Please take a close look at the codes in the integrated circuits (they all look the same but they have different codes, 6N137 is not the OPAMP!!!). This is a delicate step, do not make mistakes! Also a voltage regulator is present: it is a special integrated circuit that, in this case, also needs to be screwed onto the PCB using a 3x5 screw and a M3 nut. Before soldering it, you have to bend the pins. Add the MIDI connector, the DC plug and the TRS 6.3 jack and solder them. At the end, just insert the Daisy Seed into the female headers you just soldered: pay attention on the polarity: the USB connector must face outside the board. Please note that the Daisy seed is delivered already programmed.

STEP 5: this is the last step for the bottom board and consist in mounting the 4 plastic Hex spacer and the 4 rubber feet, one for each corner of the PCB.



This should be the end-result:



Now your bottom board is complete and it should look as the fig. 1 on page 8. Let's now proceed with the top board.

TOP PANEL BOARD

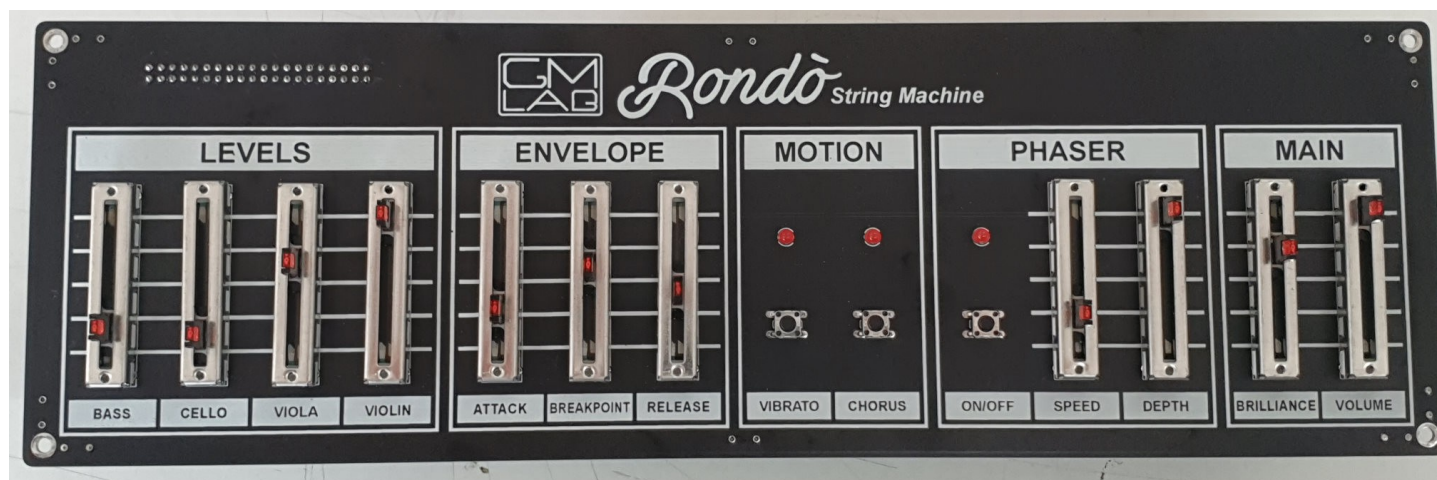
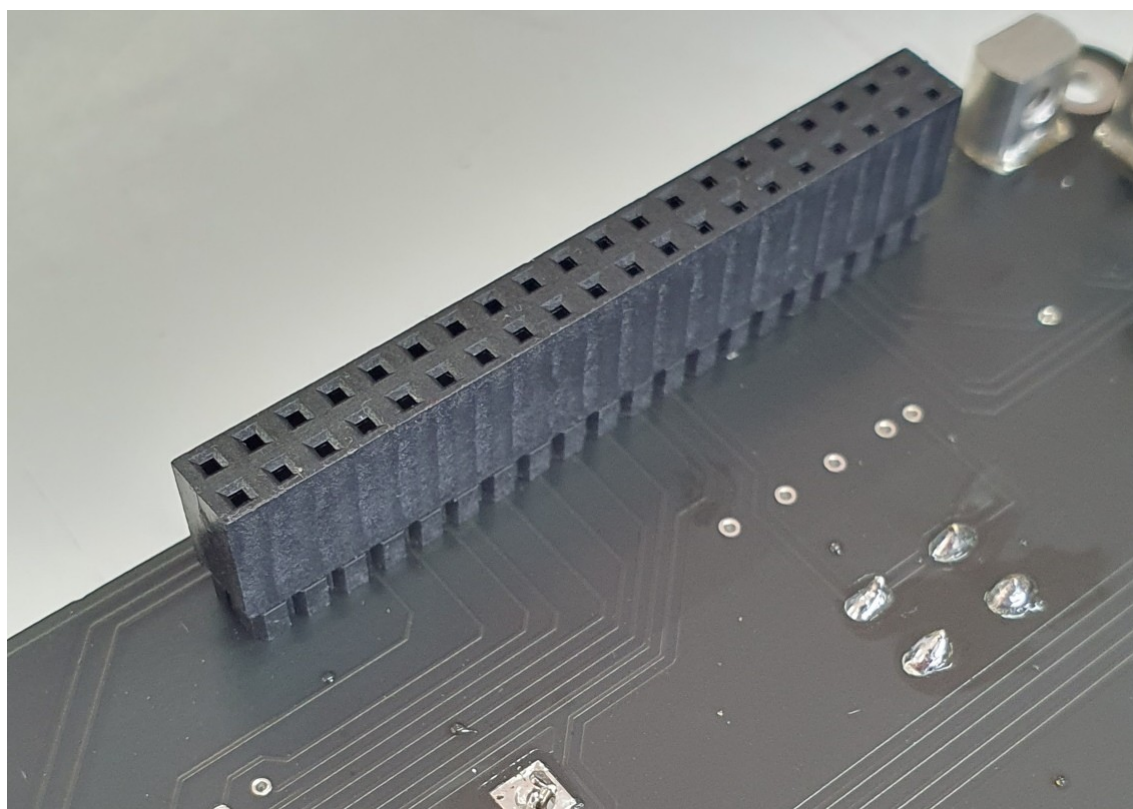


Fig. 2

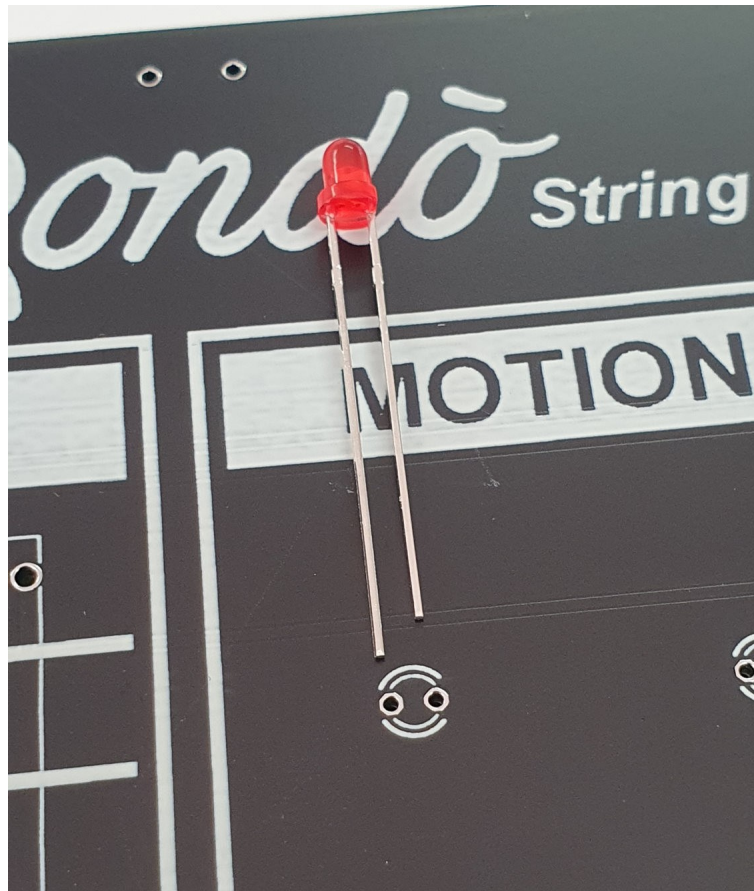
STEP 6: the top panel board, once mounted, will be the the control surface of your GMLab Rondo, where you will find the sliders, leds and pushbuttons. Let's suppose that you already soldered the 10 Redcubes on this board (see page 5) so let's proceed. First of all insert and solder the 1x40 long female header:



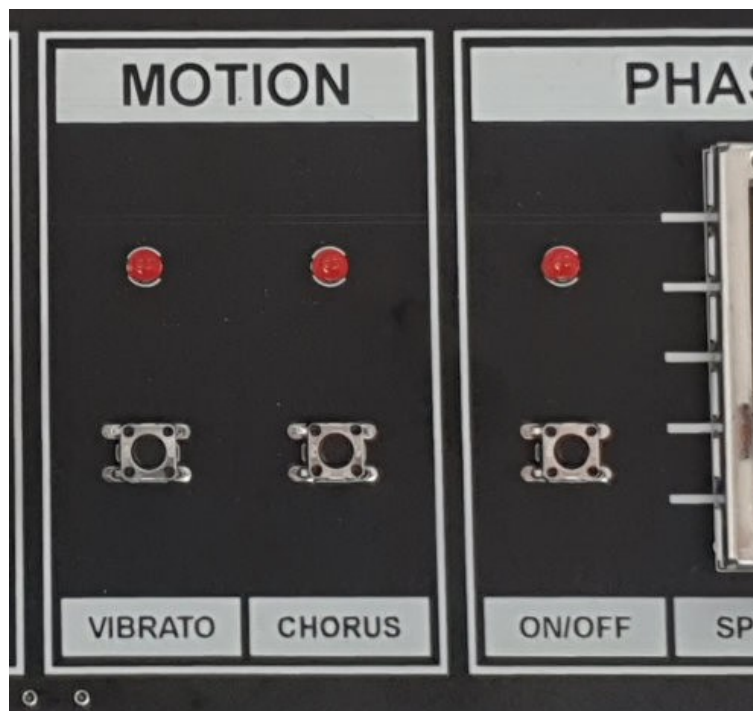
Step 7: Now is time to mount all the sliders, the LEDs and the pushbuttons.

Once again, pay much attention to have them sit perfectly on the surface of the PCB, so they will pass through the panel holes correctly. Our advice is to keep them with a finger and solder just one pin, repeat this operation for all buttons and potentiometers, at the end solder the rest of the pins.

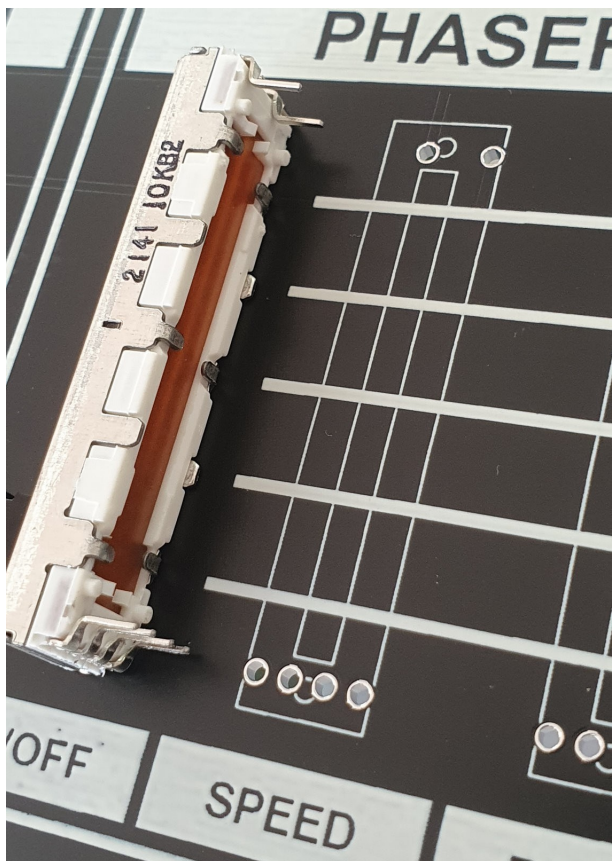
Start with the 3 leds: the first important thing to keep in mind is the polarity of them. For THT LEDs, the positive pin (anode) is always longer than the negative one (cathode). So please mount all 3 of them with the anode on the left like this photo:



Then go on with the pushbuttons, insert them in the PCB and solder. The end-result should be like this:



Then insert the sliders one by one in the board and start soldering them. Don't worry: it's not possible to mount them reversed (180°) because the pins are different.



when you are done, the board should look as the photos fig. 2 on page 11.

STEP 8: In this step, you are required to connect together the bottom board and the top board you just finalized. The electric connection between the two boards is made by the 1x40 pin female and male headers: they need to be connected together. Once the two boards are connected, you will notice that also the 4 plastic Hex spacers will be in the correct position, just underneath the 4 holes in the top board. just underneath the corresponding holes of the top board. So, just screw four M3 screws there.



STEP 9: The very last step is mounting the four side panels for your Rondo. Please note that they are all different. You have one for the rear side, where you will also find labelings for the connections.



Then you have two small ones completely black for the left and right side and a big one for the front. They are fixed in your Rondo just with M3 screws that will go in the Redcubes.

The mounting procedure is over! Good Job!

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