

ARDUINO DRUM MACHINE

By Mitja Cerkvnik

This is not a full documentation or full instructions on how to build the drum machine based on Arduino. Probably it has some errors and if you find any send me an email at mitjacerkvnik@gmail.com. Donations are very welcome (go to mitjacerkvnik.com and under Projects click donate) and will make this document grow and become more detailed. Nevertheless I wrote this because I received a donation. These are merely indications that are necessary to know how to connect the switches, the pots and LEDs to Arduino in order to make it work with the Arduino project for the Arduino Drum Machine. You are more than invited to check on the internet the proper use of LEDs, how to connect the potentiometers and the switches. Don't forget this is DIY, so if you damage anything, it's part of the process, and obviously I will not be responsible for it.

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To build this drum machine you will need:

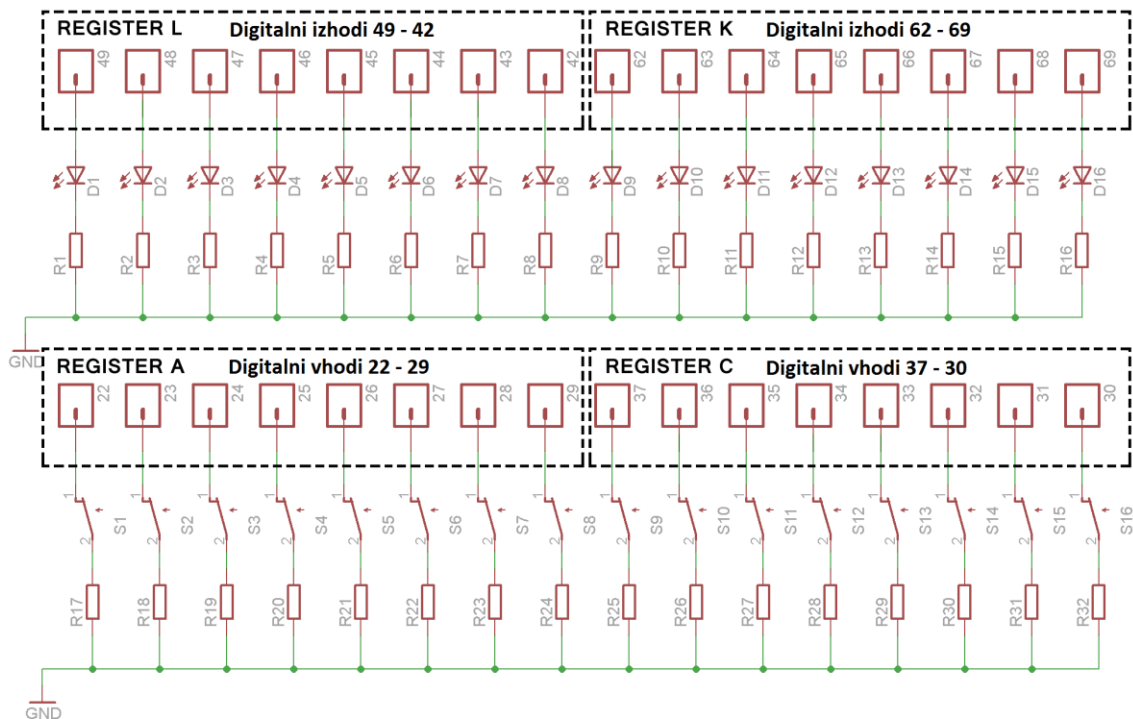
- 4x linear rotary potentiometers 4k7 or 10k
- 16x momentary switches normally open (NO)
- 19x LED 5V
- 35x 1k1 resistors
- 1x slide logarithmic potentiometer 10k (for the output volume)
- 1x slide or rotary linear potentiometer 4k7 or 10k (for tempo)
- 3x switches single pole single throw (SPST) for selecting the sound that is currently being edited
- 1x Arduino MEGA 2560
- 1x ¼ jack socket (for the audio output)
- 1x 220uF capacitor (if you want to make a passive low pass filter)
- Wires and soldering stuff and skills (very basic)

You can try to assemble this on a breadboard first.



THE SEQUENCER (9, 10)

You can see from the schematics the numbers of the digital pins on the Arduino MEGA that are to be connected to LEDs. Make sure that the LEDs on the panel are in the right sequence, otherwise you will have the LEDs lighting up in the wrong order. All the resistors are 1k1 and I used momentary switches that are normally open (means that conduct only when pressed).



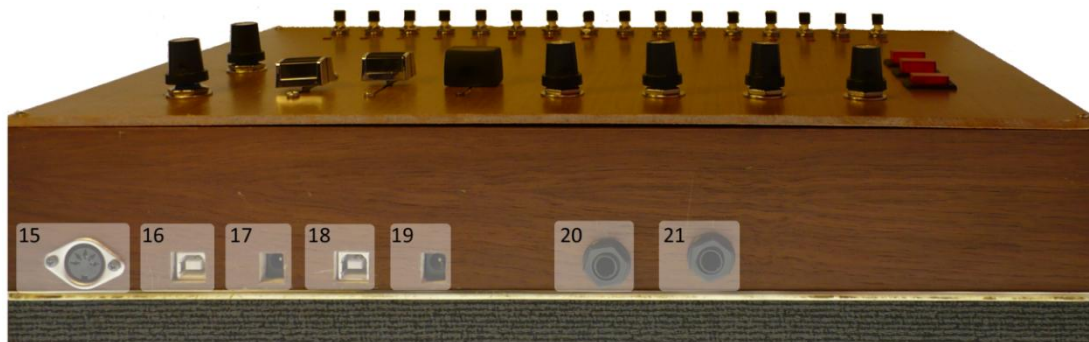
THE EDITING PANEL (1,2,3,4,5,6,7,8,11)

Once you have set up the sequencer you can connect the potentiometers that will shape the sounds. Left terminal of the potentiometer goes to GND, the right one goes to 5V and the middle terminal (shaft) goes to the analog input. The pots are connected to analog inputs from A0 to A3.

Then connect the 3 SPST switches that are used to select the sound (kick, snare, hi-hat) that will be edited. This means that the same 4 pots you connected before will be used to shape all of the 3 sounds available, but only one at a time, depending on the switch that is turned on. These switches will also display the current rhythm on the sequencer's 16 LEDs. One pin of the switch goes to 5V the other goes to a 1k1 resistor. The other pin of the resistor is to be connected to the positive (anode) pin of the LED, the negative (cathode) pin of the LED goes to the relative digital pin of Arduino MEGA: digital pins 10, 11 and 12. This LED will show which sound is currently selected.

Now you can connect the slide pots. The pot that will be used to define the tempo of the rhythm is again connected to 5V and GND, the shaft pin goes to analog input A4. Check the specification of the potentiometer in the datasheet to verify which pin is the shaft and where to connect the GND and 5V (obviously not on the same pin). The 10k logarithmic slide pot that is used to set the volume has a slightly different connection. The shaft goes to the jack socket, the other two pins have to be connected one to GND and the other to digital pin 3 on the Arduino MEGA.

REAR PANEL (19,20)



You need to power the Arduino, so drill a hole in the case to access the Arduino power socket (19) if you have a case. You will need a jack socket (20) to connect the speakers or amplifier to. As mentioned before, this jack socket has to be connected to digital pin 3 on Arduino MEGA. On a TRS jack the Tip is the signal, while the Sleeve is the GND. If you have a stereo socket, connect the Tip and Ring together. You can also make a passive low pass filter wiring a capacitor (I used a 220uF) to GND (cathode) and Tip and Ring (anode). Check on the internet for a passive low pass filter, there is also a resistor between the GND and the cathode of the capacitor and you can calculate online which resistor to use (search for RC low pass filter calculator).