● 8HP Eurorack Module ● Built & designed in Belgium ● www.shakmat.com

Shakmat Time Wizard Building Guide

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1. Preamble

Thank you for purchasing a Shakmat DIY kit !

We spare no effort in our kit packing process to prevent any mistakes or missing parts. In this document as well, we do our best to describe the assembly process in the most practical and comprehensive way. If by any chance there is a missing/damaged part in your kit or if you have any suggestion, feel free to contact us via shakmat.com.

The assembly process will be dramatically simplified if you follow the order defined by this building guide. We tested various orders of steps before finding the most convenient, and the one presented here is the best!

2. Component list & necessary tools

Pack 1

1x 78L05 regulator
1x 16 Mhz quartz
6x Green LEDs
1x 2x5 pin power header
8x Jack connectors
8x Jack connector nuts
4x Mini toggle switches
6x Mini potentiometers
1x 2 pin male header
1x Jumper
2x M3 screws

Pack 2

1x PCB
1x Aluminium panel

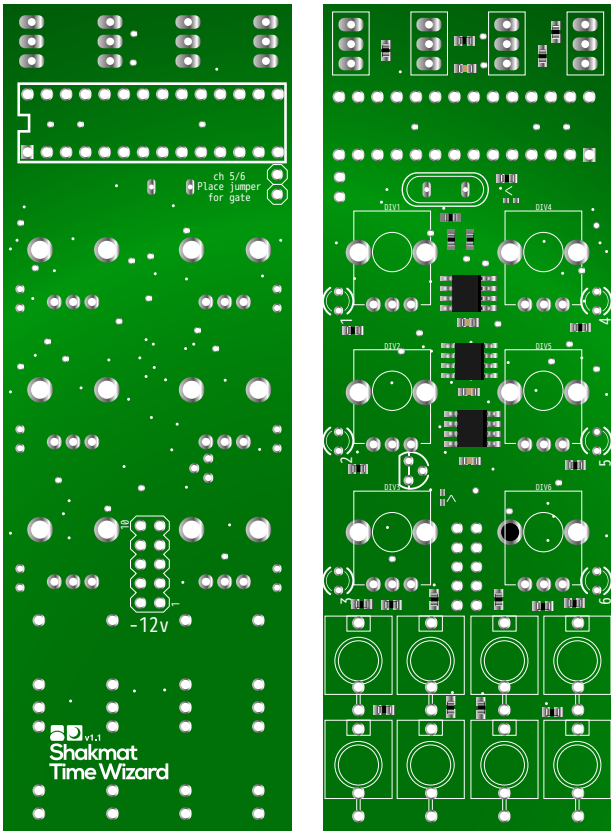
Loose parts

1x 28 pin IC socket
1x ATmega 328p
1x Power cable
1x User manual

Necessay tools

Soldering iron
Solder
Cutting pliers
Masking tape

3. PCB details

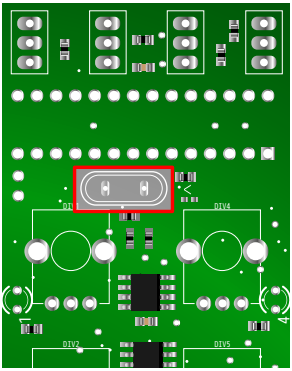


Back & front

4. PCB assembly

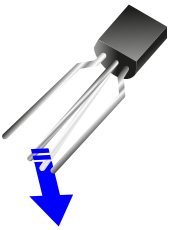
4.1 Front

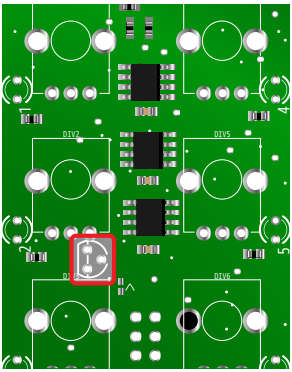
4.1.1 Quartz



Solder the quartz on the front of
the PCB and trim the legs flush.
There is no polarity to observe for this part.

4.1.2 78L05

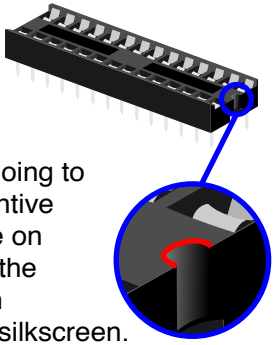


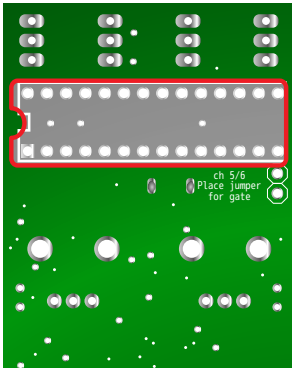


Before soldering the 78L05,
bend the central leg a little
to help it sit flush on the PCB.
Also, pay attention to the orientation :
the flat & round contour of the component
has to match the contour of the PCB silkscreen.

4.2 Back

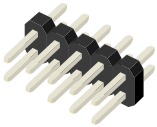
4.2.1 28 pin IC socket

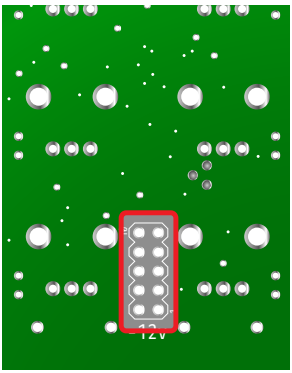




Flip the PCB around, we're going to
solder the IC socket. Be attentive
to its orientation. The red line on
the magnified picture shows the
indentation that has to match
the indentation of the PCB's silkscreen.

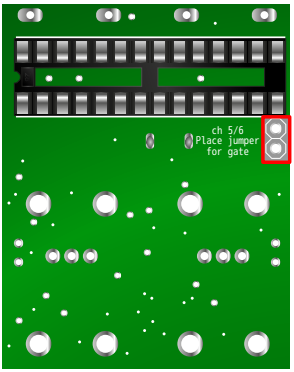
4.2.2 Power header (2x5 pin)





Be sure to lay the power header flat and perpendicularly. We recommend you to solder only one pin and check the alignment, correct it if necessary, and solder the remaining pins.

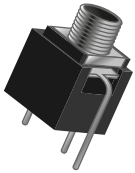
4.2.3 Male header (1x2 pin)

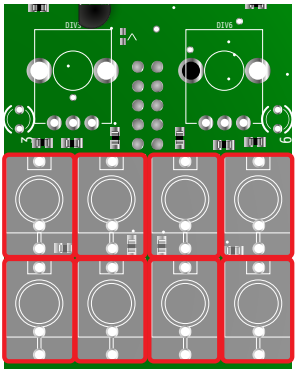


Place the male header and be sure to lay it flat and upright. We recommend you to solder only one pin and check the alignment, then solder the remaining pin. By default, all the dividers provide trigger signals, but with the jumper cap on, dividers 5 and 6 produce half period gates.

4.3 Front

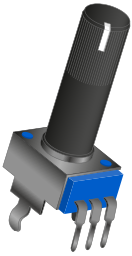
4.3.1 Jack connectors (x8)





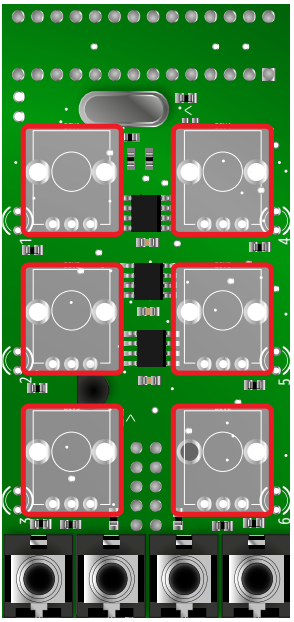
Time to solder the eight jack connectors.
Be sure to lay them all completely flat on the PCB before soldering. If those jacks aren't perpendicular to the PCB, the front panel will be very hard to mount.

4.3.2 Mini potentiometers (x6)



Place and solder the mini potentiometers. All six can be done at once, but be sure they are fully pushed inside the PCB holes and lay perpendicularly to it.

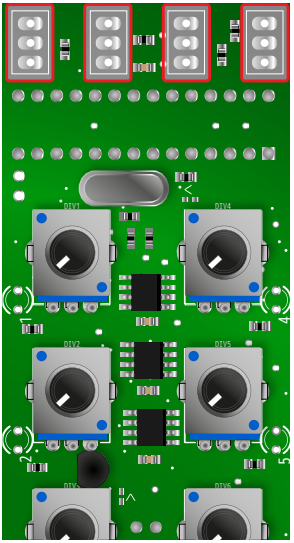
One useful trick to ensure a perfect alignment of the pots with the panel is to solder only one mechanical pin at first. Once the panel and the LEDs are mounted, you can adjust the pots and then solder all the other pins.



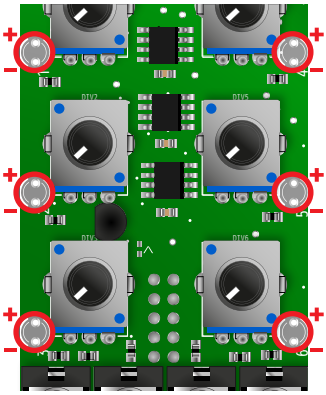
4.3.3 Mini toggle switches (x4)

The switches are generaly provided with two nuts and two washers, but only the nuts are needed. Let the first one in place (thoroughly screwed in), discard the two washers and save the second nut for the final assembly.

Once you've removed the unnecessary pieces, you can place the 4 switches on the PCB. Then mount the front panel and keep it in place with a knurled nut on jack B6. Screw the four switch nuts to secure them to the front panel, you can then solder the switches.



4.3.4 Green LEDs (x6)

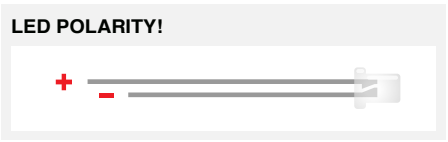


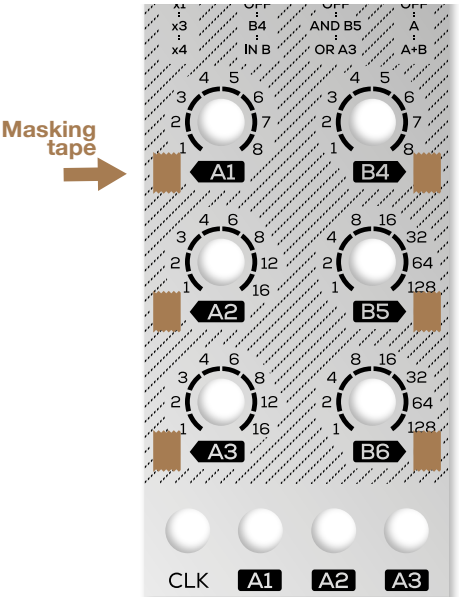
Placing the LEDs requires a specific orientation due to their polarity. The long legs are the positive side and they all go into the top hole.

These LEDs are special flat top models intended to be mounted flush with the aluminium front panel. The best way to do this neatly is to use masking tape to cover the panel's LED holes.

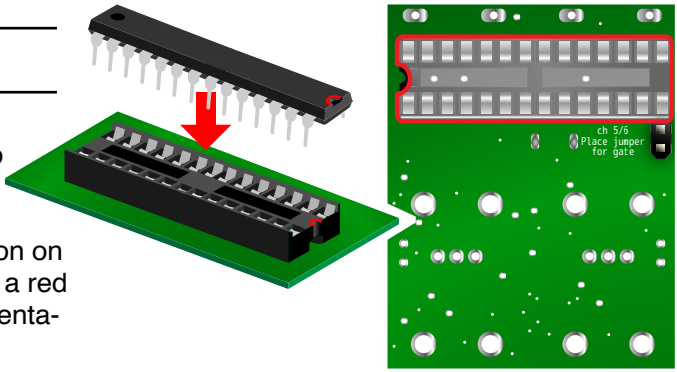
Place the six LEDs through the PCB, assemble PCB & panel with some nuts (one on B6 & one on the first toggle switch) then push the LEDs through their holes until they sit flush with the panel by sticking to the tape.

Once everything is in place, you can solder them and trim the legs.





4.3.5 ATmega 328p



Plug the ATmega IC into the previously soldered 2x14 IC socket.
Make sure the indentation on the IC (shown here with a red line) is matching the indentation on the IC socket.

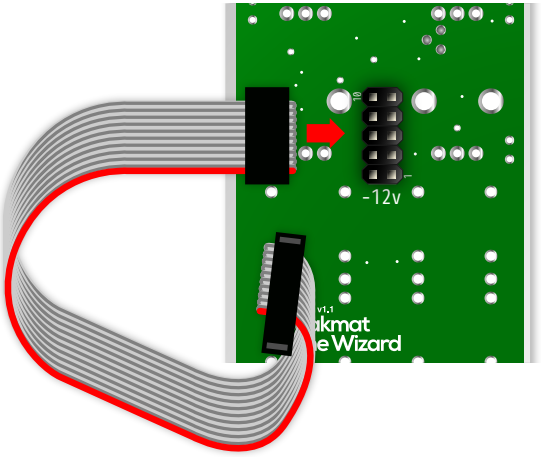
4.3.6 Jack nuts (x8)

It's time to finally fix the front panel. Place the eight jack connectors nuts and tighten them.

4.3.7 Toggle switch nuts (x4)

Place the four toggle switch nuts and tighten them.

5. Power



Plug the power cable in and make sure the red side of the ribbon cable matches the -12V on the PCB. Now let's plug the module in your system and test it. Plug in a clock signal on the CLK input, set all the potentiometers to their smallest value and all the switches up. If everything went well, all the LEDs should blink according to the incoming clock signal.

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