● 1U/14HP Eurorack Module ● Built & designed in Belgium ● www.shakmat.com

Shakmat Time Apprentice 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.

We strongly advise you NOT to spill all the bags open and mix their components. Some of them are virtually indistinguishable (like LEDs that all appear clear when inactive). We recommend to only take the neccesary component out of its bag, or to empty the bags in separate & marked containers. For each step there is a reference, next to the component's graphical representation, indicating where to find the component. (i.e. P1 for Pack 1, or LP for Loose Part).

Also, 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

2x 33kΩ resistors
2x 1kΩ resistors
1x 100nF capacitor
1x 1N4148 diode
1x 78L05 IC
1x 3 pin male header
3x 2 pin male headers
1x Power header

Pack 2

2x 6.8kΩ resistors
1x 22Ω resistor
4x Jack connectors
4x Jack connectors nuts
2x Potentiometers
2x Green LEDs
4x Jumpers
4x M3 screws
1x Power header connector

Pack 3

1x PCB
1x Aluminium Intellijel format panel
1x Composite Pulp Logic format panel

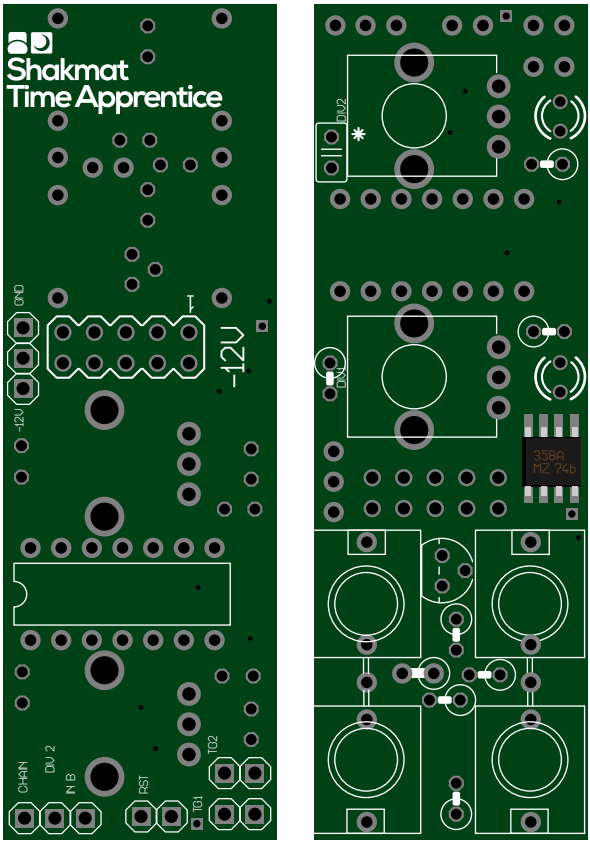
Loose parts

1x 14 pin IC socket
1x ATtiny IC
1x Power cable
1x User manual

Necessary tools

Soldering iron
Solder
Cutting pliers
Masking tape

3. PCB details



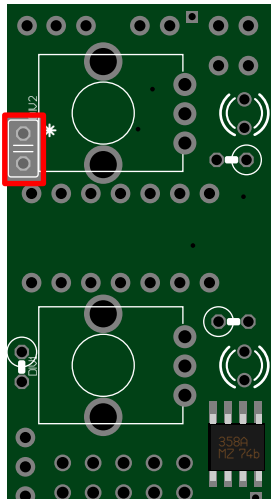
Back & front

4. PCB assembly

4.1 Front

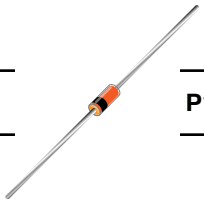
4.1.1 Capacitor

P1

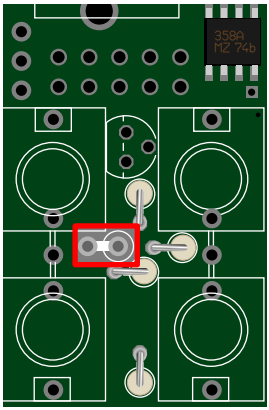


Solder the single capacitor on the front of the PCB and trim the legs flush. Capacitors have no polarity (except for electrolytic ones) so the orientation of the component does not matter.

4.1.2 1N4148 diode

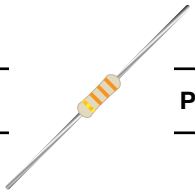


P1

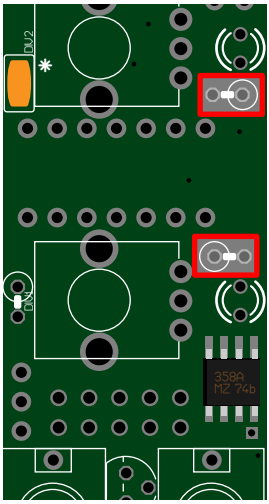


Just like the resistors, the diode is mounted perpendicularly to the PCB but for this, you need to pay attention to the polarity. The black line on the component's body marks the side that has to be inserted into the circled hole of the PCB. Solder and trim the legs.

4.1.3 33kΩ resistors (x2)

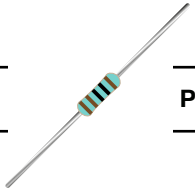


P1

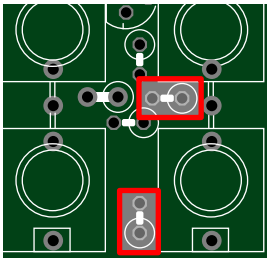


All the resistors are mounted perpendicularly to the PCB so you only need to bend one leg of each 33kΩ resistor. Be careful not to bend too far off the resistor's body, because it could lead to short-circuits with the aluminium front panel. Solder, then trim the legs flush with cutting pliers. Resistors have no polarity so the orientation does not matter.

4.1.4 1kΩ resistors (x2)

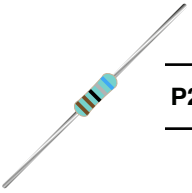


P1

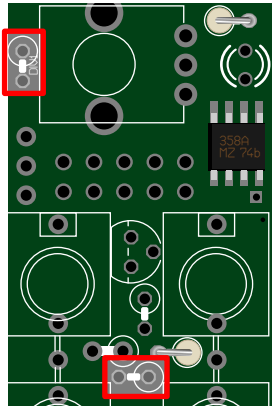


Bend one leg of each 1kΩ resistor and solder them perpendicularly to the PCB, then trim the legs flush with cutting pliers.

4.1.5 6.8kΩ resistors (x2)



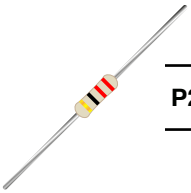
P2



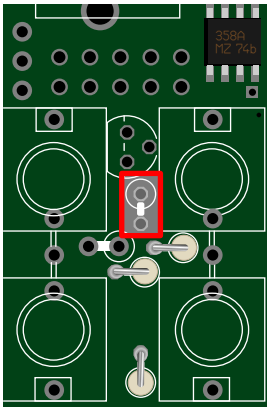
Bend one leg of each 6.8kΩ resistor and solder them perpendicularly to the PCB, then trim the legs flush.

4.1.6 22Ω resistor

P2

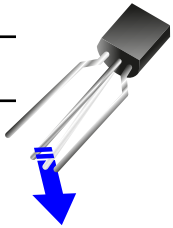


Bend one leg of the 22Ω resistor
and solder it perpendicularly to the PCB,
then trim the legs flush.

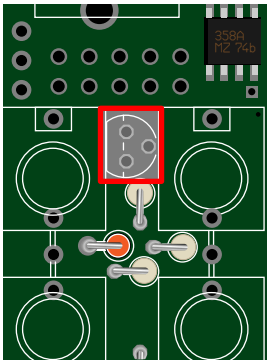


4.1.7 78L05

P1



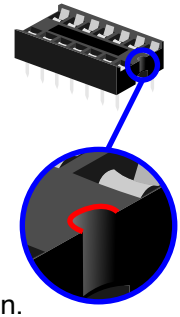
Before soldering the 78L05,
bend the central leg a little to
help it sit flush. Also, pay attention to
its orientation, the flat & round contour of
the component has to match the contour of the PCB's
silkscreen. Solder and trim the legs.



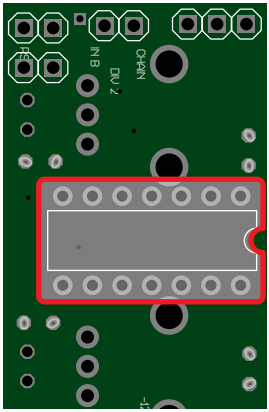
4.2 Back

4.2.1 14 pin IC socket

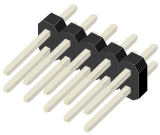
LP



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 on the PCB silkscreen.

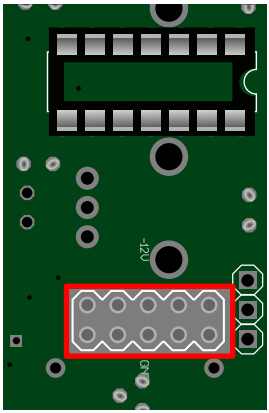


4.2.2 Power header (2x5 pin)

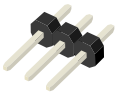


P1

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

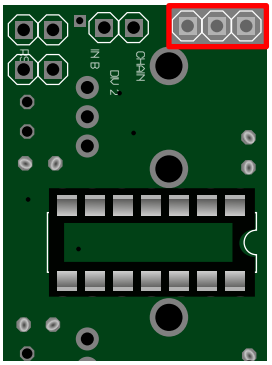


4.2.3 Male header (1x3 pin)



P1

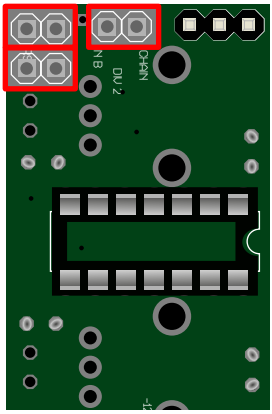
Place the male header and be sure to lay it flat and upright. We recommend you to solder only one pin and check the alignment, correct it if necessary, and then solder the two remaining pins.



4.2.3 Male headers (1x2 pin) (x3)

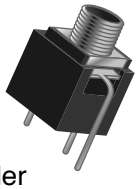
P1

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, correct it if necessary, and then solder the two remaining pins.

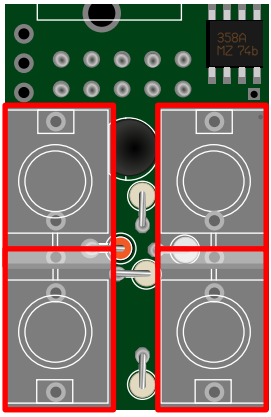


4.3 Front

4.3.1 Jack connectors (x4)

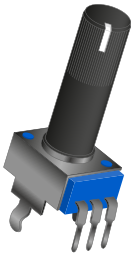


P2

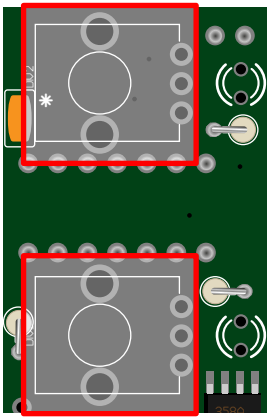


Flip the PCB again, we're going to solder the four jack connectors. The outer legs of the connectors overlap and are soldered together in a single hole. Push the connectors all the way through the PCB holes and be sure to lay them flat and perpendicular before soldering all the legs.

4.3.2 Potentiometers (x2)



P2

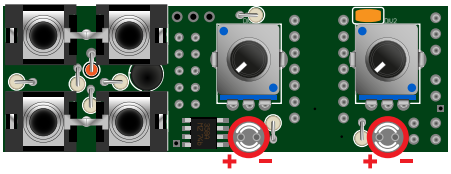


Push the two potentiometers snugly through the PCB holes. Solder one of the three contact legs first and be sure that the component sits perpendicular with the PCB, then solder the remaining legs.

5. LED mounting

5.1 Green LEDs (x2) — P2

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



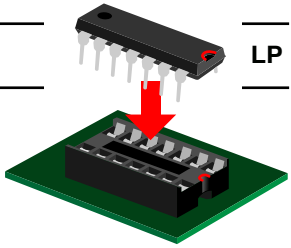
These LEDs are special flat top models intended to be mounted flush with the aluminum front panel. The best way to do this neatly is to use masking tape to cover the panel LEDs holes.

Place the two LEDs through the PCB, assemble PCB & panel with some nuts (one on CLK & one on Out 2) 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.

6. IC

Plug the ATtiny IC into the previously soldered 2x14 IC socket. Make sure the indentation on the IC (shown by the red line) matches the indentation on the IC socket. To insert the IC without damaging the fragile legs, you may have to slightly bend one row inward. You can bend it against a table to keep the legs evenly bent.

ATtiny — LP



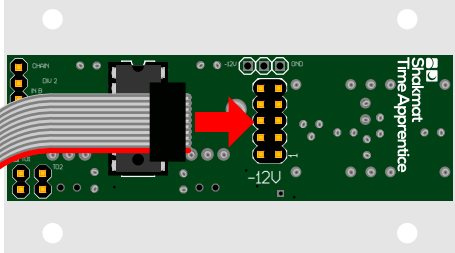
7. Jack nuts

Place the four jack connectors nuts and tighten them.

Jack connector nut (x4)		P1

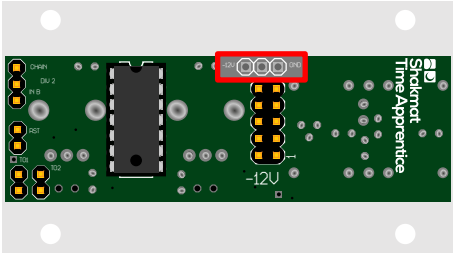
8. Powering

Plug the power cable in and make sure the red side of the ribbon matches the -12V on the PCB.



9. Pulp Logic

In order to provide a cross standard approach, the module comes with both Intellijel and Pulp Logic 1U front panels. The format is easily changed by swapping them out. To do so, unscrew the 4 jack nuts, swap the front panels & screw the nuts back on.



The Time Apprentice can also be powered via a 1U Tile power bus. For this, you need to solder a cable ending with a Futaba J male connector to the three soldering holes right above the standard eurorack power header. The cable has to be soldered on the right way. The white wire goes to -12V, the red wire in the middle hole and the black wire goes to GND. Strip about 3 mm off the cable and tin the wires. Pass the wires through the PCB holes from the back and solder them to the front. Finally, mount the Pulp Logic panel and screw the jack nuts back on. When the Pulp Logic power socket is used, cover the eurorack power header with the provided blank connector in order to prevent shorts.

10. Configuration

Your Time Apprentice is provided with 4 jumpers that are meant to be used on male headers. Placing those alter the behavior of the module. For more information regarding those alterations, please refer to the user manual.

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Shakmat

Product design & engineering : François Gaspard
Product & brand design : Steve Hackx