BISHOP'S MISCELLANY

DUAL STEPPED CV/GATE RECORDER

BUILDING GUIDE

Shakmat
MODULAR

Table of Contents

01. Components List + Tools

Resistors

6,8 kΩ
X14 – Pack 1/5
x12 on V2 kit

100 kΩ
X6 – Pack 2/5

1 kΩ
X4 – Pack 1/5

1 MΩ
X2 – Pack 1/5

22 Ω
X1 – Pack 1/5

33 kΩ (V2 kit only)
X2 – Pack 2/5

Capacitors

22 pF
X2 – Pack 2/5
C1, C2

100 nF
X1 – Pack 1/5
C3

Diodes

1N4148
X9 – Pack 2/5
D1 → D9

1N4742 Zenner
X1 – Pack 1/5
D10

Quartz

16 MHz
X1 – Pack 2/5
Q1

LEDs

Green LED
X2 – Pack 2/5
L1, L2

IC's

8 Pin IC Socket
X1 – Plastic Tubbing or bag
IC3

LM358 OpAmp
X1 – Plastic Tubbing
on IC3

14 Pin IC Socket
X1 – Plastic Tubbing or bag
IC4

MCP4922
X1 – Plastic Tubbing
on IC4

28 Pin IC Socket
X1 – Plastic Tubbing or bag
IC1

ATMEGA328
X1 – Plastic Tubbing
on IC1

78L05
X1 – Pack 2/5
IC2

Miscellanous

Power Supply Header
X1 – Pack 2/5
PSH

Jack Connectors
X16 – Pack 3/5
J1 → J16

Jack Knurled Nuts
X16 – Pack 4/5
on jack connectors

Switches
X4 – Pack 3/5
S1 → S4

Switches Nuts
X4 – Pack 4/5
On switches

Potentiometers
X2 – Pack 3/5
P1, P2

Potentiometers Nuts
X2 – Pack 4/5
on potentiometer

M3 Screws
X4 – Pack 4/5
on panel

Chroma Caps Knobs
X2
on potentiometers

PCB
X1 – Pack 5/5

Aluminum Panel
X1 – Pack 5/5

Power Ribbon Cable
X1

Tools

Soldering Iron

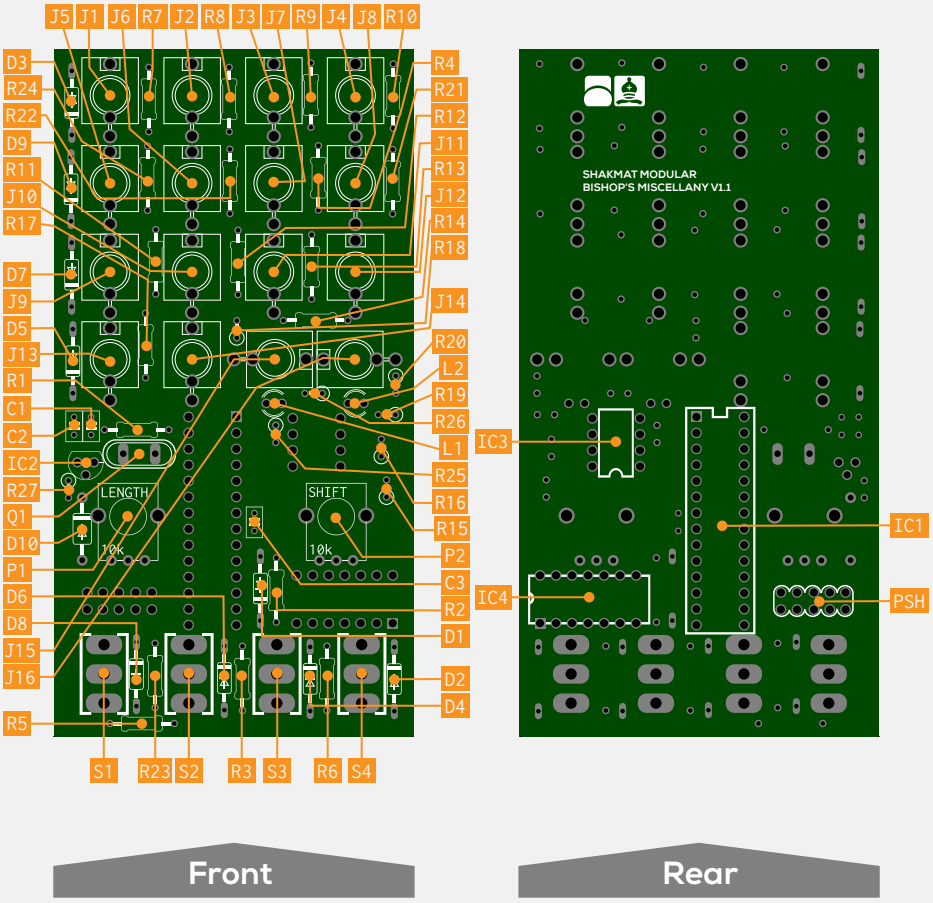
Solder

Cutting Pliers

Masking Tape

Multimeter

02. Panel Sides



The front of the PCB is the one with the switches, jack connectors and potentiometers on it. The top of the board is the connectors side, the bottom is the switches side. Almost all the components goes to the front of the PCB. Here is a list of the components that goes to the rear side :

- 1 x 8 pin socket + IC
- 1 x 14 pin socket + IC
- 1 x 28 pin socket + IC
- Power supply header

03. Important Note

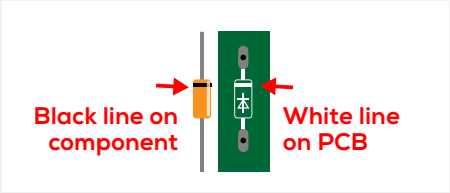
If you feel you're going to build this kit without looking at the steps, just remember this : **don't solder the switches without placing them into the front panel first.** If you don't want the final PCB & front panel assembly becoming a real pain, do this, seriously. We also strongly recommand to have a look to the step 04_10 that require unexpected cuts on the potentiometers.

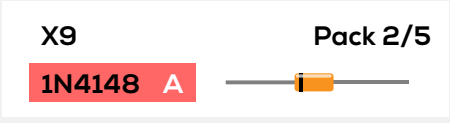
04. Step by Step Assembly

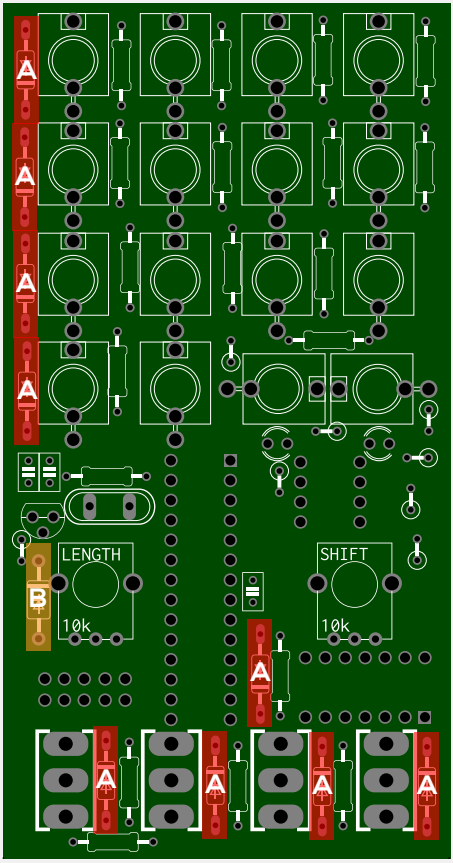
04_1. Diodes

There's two kind of diodes : 9 tiny ones (1N4148) and a bigger one (Zenner 1N4742) that goes to the left of LENGTH potentiometer.

Diodes orientation has to match the PCB silkscreen. The white line on the silkscreen has to match the black bar on the component, as show here :

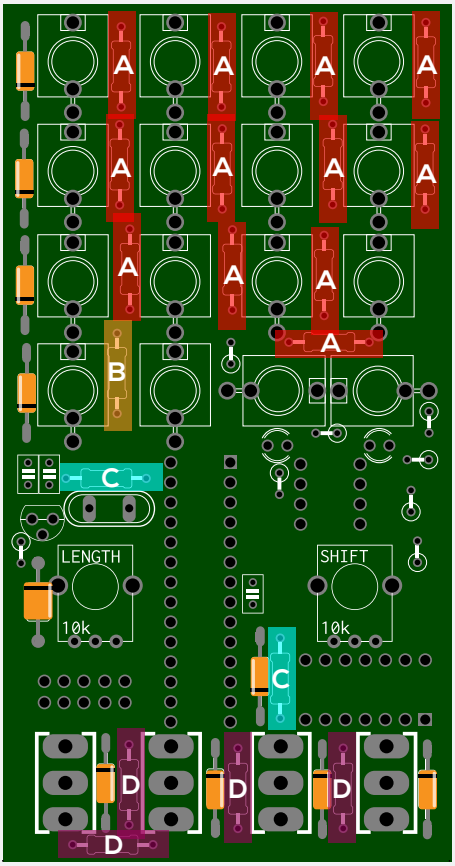






04_2. Flat Resistors

Here's a picture of the PCB with placement of the flat resistors by value. There's no polarity to observe with resistors, so you can solder them no matter the way. Once soldered, you've to cut the excess of the resistor legs with a pair of cutting pliers. This has to be done for most of the build's components.



X12	Pack 1/5
6.8kΩ A	

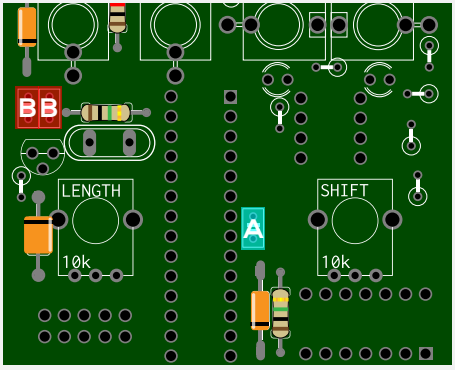
X1	Pack 1/5
1kΩ B	

X2	Pack 1/5
1MΩ C	

X4	Pack 2/5
100kΩ D	

04_3. Capacitors

Quite simple, Two 22pf, in red on the picture, and one 100nF in blue.



X1	Pack 1/5
100nF A	

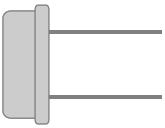
X2	Pack 2/5
22pF B	

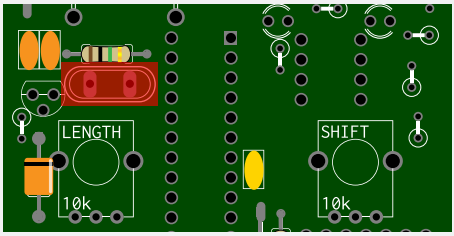
04_4. Quartz

The quartz has to lay flat and fits the shape on the PCB silkscreen.

X1 Pack 2/5

16 MHz



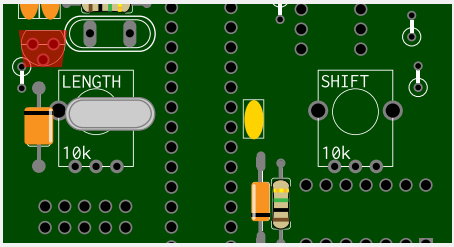


04_5. 78L05

Bend the middle leg of the 78L05, then place the component on the PCB, like shown on the silkscreen.

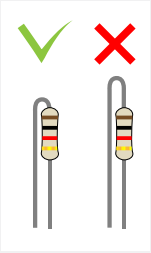
X1 **Pack 2/5**

78L05



04_6. Standing Resistors

Only one leg of the resistor have to be bent before soldering. Don't bend the leg too high or it will cause short-circuit with the panel :



X3 Pack 1/5

1kΩ A

X2 Pack 2/5

100kΩ C

X2 Pack 1/5

6.8kΩ B

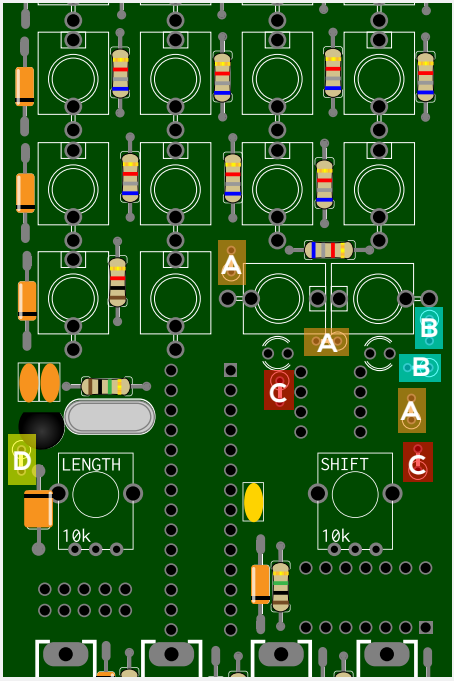
OR

X2 Pack 2/5

33kΩ B

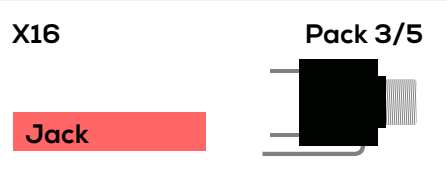
X1 Pack 1/5

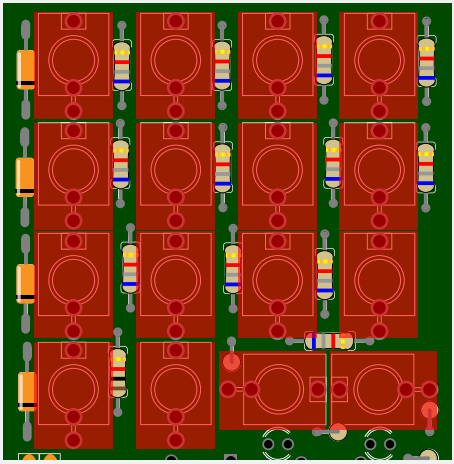
22Ω D



04_7. Jack Connectors

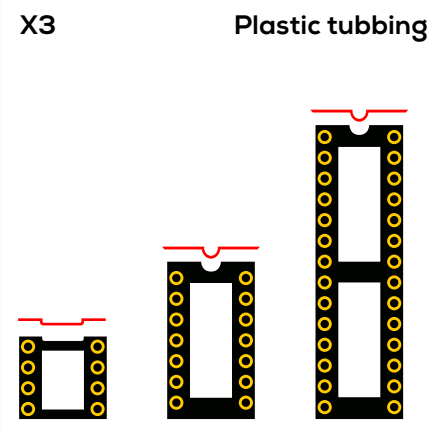
There are 16 jack connectors, that have to sit tight and flush with the PCB. Be sure to push them all the way through before soldering. A good way to do so is by pushing the PCB from behind on your table while all the jack connectors are in place but unsoldered.

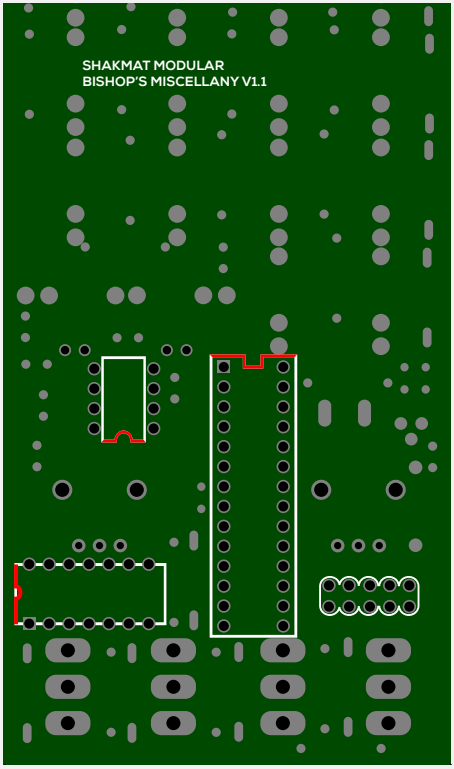




04_8. IC Sockets

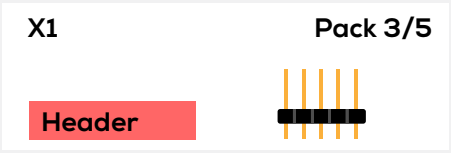
Now, let's flip the PCB and solder the three IC's sockets. Be attentive to their orientation. The notch on the silkscreen (marked in red on the picture) as to match the notch on the socket. Be careful not to miss any of the tiny socket legs or to bridge two of them with solder.

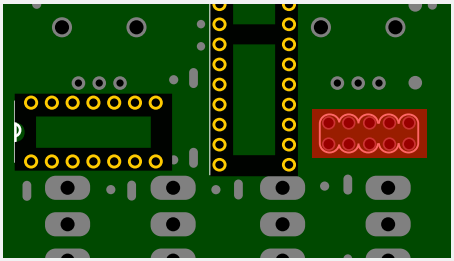




04_9. Power Supply Header

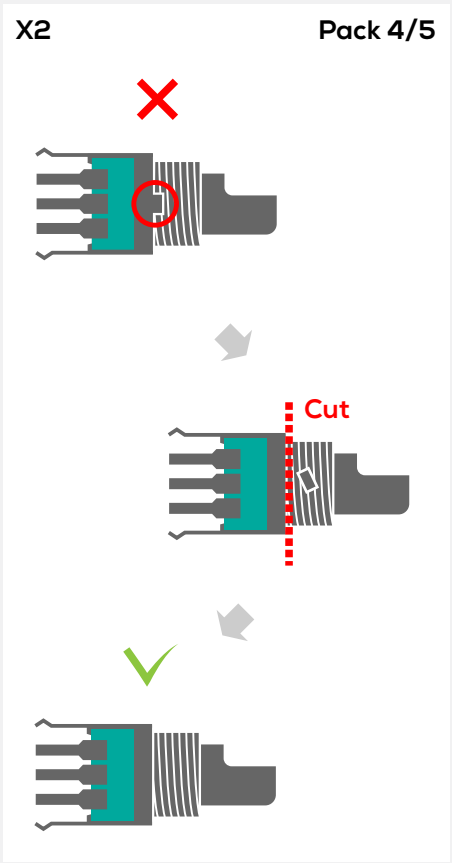
Solder only one leg of the header, verify that it's flush with the PCB & then solder the 9 other legs.

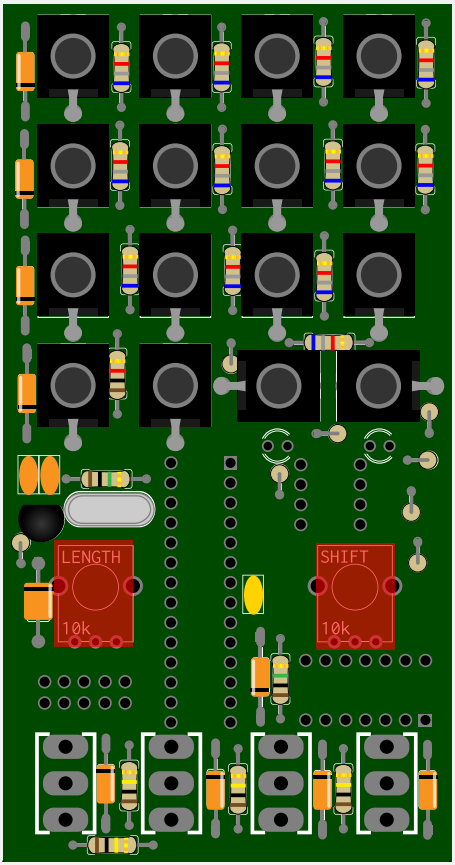




04_10. Potentiometers

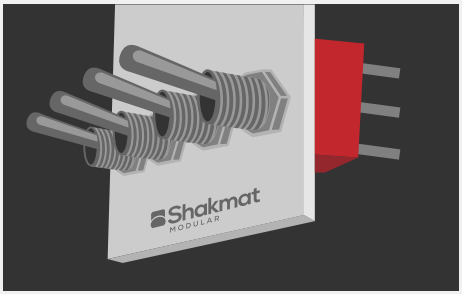
Let's go back to the front side. First you'll have to remove a little bit of metal on the potentiometer as shown in the picture. Then you can solder them.

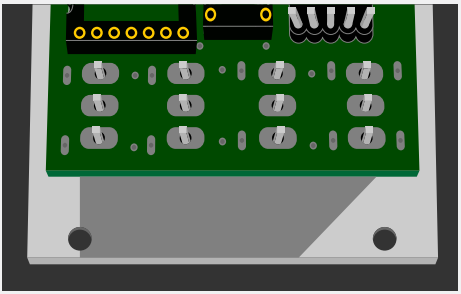




04_11. Switches

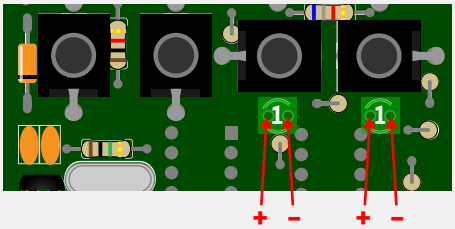
First, finger tighten the switches on the panel with their nuts. Then assemble the panel with the PCB while the switches are mounted. Finally solder the legs.



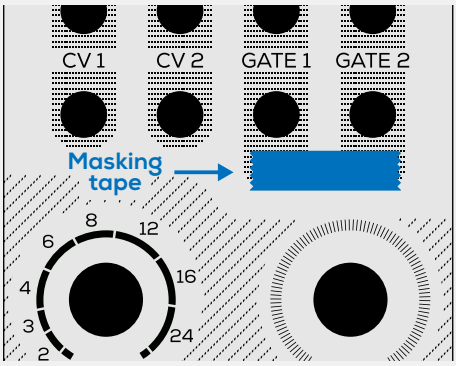


04_12. LEDs

Remove the front panel, put the LEDs into place in the PCB. Be very careful to get them the right way around. The longer leg goes into the hole marked with a plus in the picture.



Before soldering the legs, put the front panel on. Finger tighten the nuts on the jack, switches and pots. Put the LEDs into place pointing through the holes in the front panel, and align them flush. A good way to do this is to stick a small piece of masking tape covering the LEDs holes helping them to stay in place.

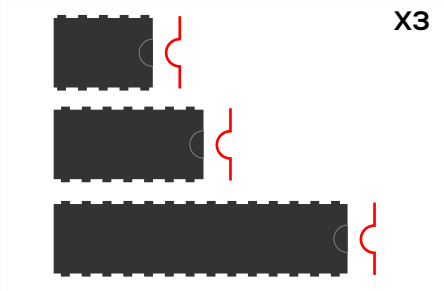


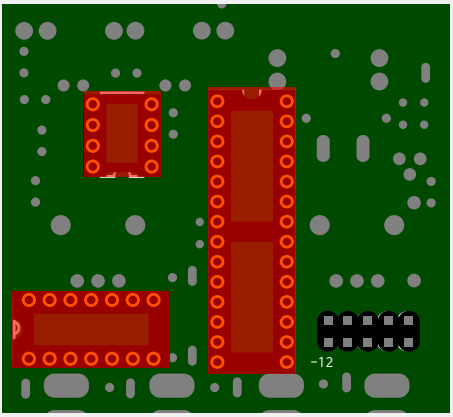
X2 **Pack 2/5**

LED **1**

04_13. ICs

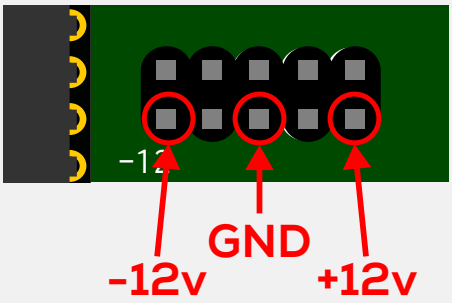
Plug the IC's in thieir sockets, make sure their orientations matches the socket orientation.



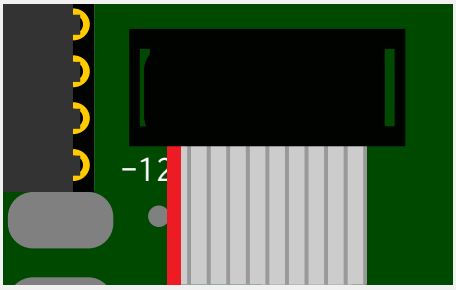


04_14. Testing

Now let's have a visual test : is everything correctly soldered ? Are the diodes orientation right ? Are the IC's orientation OK ? Is there any shape on the PCB silkscreen that is not covered by a component ? Take some minutes to carrefully check everything.



Now take a multimeter and check if there's no shortcut between the ground, 12V and -12V pins on the power header. If nothing's wrong, you're good to go ! Plug the power cable and make sure the red stripe of the cable matches the -12V on the PCB silkscreen. Don't forget to add the nuts on the connectors, switches and potentiometers, finally add the knobs. Now let's plug the module in your system and test it. The module LEDs doesn't blink if the module isn't running. So don't panic if the modules seems quiet when nothing is connected to it. A fast and easy way to check if the module is working is to feed the clock input with a trig gate signal, turn the REC and RNDM switch ON (that's to say down) & both LEDs should be randomly blinking.



If ever you get some troubles or questions,
send us an email at
support@shakmatmodular.com.

To download the Bishop's Miscellany
Operation Manual, go to our website
(address below) and navigate to the
support section.

There are two different firmware available
for the Bishop's Miscellany.
V1.0 to v1.2 all operate the same way but
the 2.0 firmware introduces some
new functionnalities & replaces some other.
For info about the 2.0 firmware usage,
please refer to the appropriate video
on our YouTube channel.

www.shakmatmodular.com