

# Sampling Modulator Assembly manual ( para PCB V1.5)

**Main PCB:** (The smaller one)

**Open "Main Board Bag A"**

**Resistors:**

QTY.	Value	Code	Name on PCB
12	10k	<i>Brown, black, black, red, brown</i>	R5, R9, R10, R11, R14, R18, R25, R26, R28, R32, R34, R38,
7	100k	<i>Brown, black, black, orange, brown</i>	R7, R15, R23, R31, R33, R35, R36
3	20k	<i>Red, black, black, red, brown</i>	R13, R17, R29
2	4k7	<i>Yellow, violet, black, brown, brown</i>	R24, R30
2	47k	<i>Yellow, violet, black, red, brown</i>	R27, R37
2	1K	<i>Brown, black, black, brown, brown</i>	R2, R21
2	2k2	<i>Red, red, black, brown, brown</i>	R19, R20
1	6K2	<i>Blue, red, black, brown, brown</i>	R8
1	12k	<i>Brown, Red, black, red, brown</i>	R4
1	470k	<i>Yellow, violet, black, orange, brown</i>	R16
1	330K	<i>Orange, orange, black, orange, brown</i>	R22
1	2k7	<i>Red, violet, black, brown, brown</i>	R3
1	820 0hm	<i>Gray, red, black, black, brown</i>	R39
1	2k	<i>Red, black, black, brown, brown</i>	R40
1	390 0hm	<i>Orange, white, black, black, brown</i>	R12

**Solder diodes** respecting the polarity. Line on the diode must match the line on the PCB's silkscreen. D2 comes presoldered to fix a small PCB bug.

QTY.	Value	Code	Name on PCB
2	1N5817	<i>1N5817</i>	(black color) D22, D23
1	1N4148	<i>1N4148</i>	D1 , D2 (presoldered)

**Solder the two ferrite beads** (FERRITE+, FERRITE-) passing trough a resistor leg. Solder them same way as resistors.

**Open the "Main board Bag B"**

Place the sockets on IC1, IC2, IC3, IC4, IC5, Taking care of the polarity (The mark on the front of the socket, must match the one on PCB's silkscreen) then solder them.

**Solder capacitors:**

QTY.	Value	Code	Name on PCB
7	100n	104	C1, C4, C7, C9, C11, C15, C16
3	2n2	222 (silver color)	C6, C8, C12
2	10µF	10µF	C13, C14 (Mind polarity! Long=+ Short=-)
1	10n	103	C2
1	1n	102	C5
1	47p	470	C10

1	100p	101	C3
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**Solder transistors.** Be sure they are on right position (same as the silkscreen on the PCB)

QTY.	Value	Code	Name on PCB
6	2n3904	3904	Q1, Q2, Q3, Q4, Q5, T1

**Solder the trimmer** (A small plastic-square-thingie with tree legs) at ("V/Oct").

**Place the ICs on the sockets** taking care of the polarity. The mark on the front of the IC must match the one on the socket.

QTY.	Value	Name on PCB
3	TL072 or TL082	IC1, IC2, IC3
1	LM393	IC4
1	LF398	IC5

**Solder the "Power" connector** from the bottom of the PCB taking care of polarity.

**Place the two Male Pin Headers** (CON1, CON\_2) at the the silkscreen side, then solder them making sure it is 90° from PCB.

**CONTROL PCB:** (the bigger one)

**Open "Control Board bag A"**

**Solder the resistors:**

QTY.	Value	Code	Name on PCB
8	18k	<i>Brown, gray, black, red, brown</i>	R103, R104, R105, R106, R107, R108, R109, R111
3	100K	<i>Brown, black, black, orange, brown</i>	R100, R114, R115
2	3k9	<i>Orange, white, black, brown, brown</i>	R102, R110
1	1M	<i>Brown, black, black, yellow, brown</i>	R112
1	180k	<i>Brown, gray, black, orange, brown</i>	R113
1	1K	<i>Brown, black, black, brown, brown</i>	R101

**Solder diodes minding polarity** (Black line has to match the white one in the board's silkscreen):

QTY.	Value	Code	Name on PCB
1	1N4148	1n4148	D100

**Solder the capacitors:**

QTY.	Value	Code	Name on PCB
1	100n	104	C100

### Open "Control Board Bag B"

Place and solder the two female pin headers ensuring it is 90 degree from the PCB (To\_conn\_1, To\_conn\_2).

Screw the metallic spacer from the bottom of the control PCB (by the male side) using the nut.

Place the two position toggle switch on (SW1) **but don't solder** it until the front panel is on place and with all nuts screwed to it.

This way it's easier to solder them on the right position and height. Keep in mind that the front panel holes are quite narrow and is almost impossible to place it with all the components already soldered..

Ensure it's the two position switch! You will recognize it because is the one when switching it have just two different positions and never stops on the middle.

Place the 8 tree position toggle switches on SW2, SW3, SW4, SW5, SW6, SW7, SW8, SW9. But also **but don't solder** them until the front panel is on place and with all nuts screwed to it.

### Open the bag with the jack sockets.

Place jack sockets ensuring they are by the silkscreen side but (again)...

**don't solder** them until the front panel is on place and with all nuts screwed to it.

**Caution:** the switch nuts and the jack nuts looks the same but they are not, and wil not fit in each other's thread so dont mix them!

Put the 8 LEDs (control board Bag A) on place (D2, D3, D4, D5, D6, D7, D8, D9) taking care of the polarity but.....again... **don't solder them** until you put the panel on place because that way it's easier to place them at the correct height.

**Important:** Long leg is the positive one and must match the "+" symbol on the PCB

**Cut the little ledge** on all three pots with cutting pliers as pictured:



Place the Pots (RATE, RATE\_FINE ) but as with the LEDs etc, don't solder them yet until they are totally screwed to the panel, (sorry but this is the only method to have all the panel components on the right height).

**Put the panel on place** gently moving all components until it fits perfectly.

**Screw the nuts** totally to the jacks, switches and potentiometers and...  
Finally!! **solder them.**

**Place the LEDs** at the exact height (thru their panel holes) and solder them.

**Plug Main PCB to the Control PCB** with the pin headers and screw them with one of the 3mm screws.

**Place the two knobs** on the potentiometers and the plastic covers on the switches.

Congratulations!! your Sampling modulator is almost finished, but before you can use it...

**Adjustment procedure:**

Most of the features of the sampling modulator work straight away, but in order to have a correct V/oct tracking you should adjust the "V/oct trimmer" carefully.

For that you will need:

- A decent multimeter.
- A small plane screw driver or even better a trimming tool.
- A Tuner.
- A calibrated voltage source. You can do one with a multi-turn potentiometer connecting it as voltage divider as follows:  
Connect Leg 1 to positive, leg 3 to negative and use leg two as your voltage source out. **IMPORTANT:** Always measure your voltages when they are connected to the CV IN.

The tune process is an iteration of successive approximations as follows:

Connect a tuner to the clock out or to Pin 1 of IC3

- 1 -Move the tune and fine tune pots until you have an E2.
- 2 -Add 3.000 Volts to the CV IN with the voltage source. Measure this voltage when it is already plugged to ensure it is 3,000 (3 volts)
- 3 -Adjust TUNE until E5 +0 cents
- 4 -Unplug the voltage source from the CV In and adjust V/Oct trimmer until reach E2 + 0 cents
- 5 -Back to step number 2..4 until there is no need of adjustment after adding the 3.000 volts.

You can also use a decent MIDI to CV interface or any device that can send pitch cv accurately as voltage source. Just move within three octaves to make sure it's tracking properly (instead of using voltages)

**Done!** Enjoy your sampling modulator!

You can fix it to your rack with M3 screws provided.

# BLOCK DIAGRAM

