



Majella

VVCA DIY MANUAL

Version 1.1

INTRODUCTION

1. The VVCA

The VVCA kit is a small DIY kit. This kit is suitable for DIY'ers who have their basic soldering skills under control. The kit is designed to be as easy as possible.

2. Requirements

The Kit contains the PCB, Panel and all electrical components to finish the module. You will need (as a bare minimum): basic soldering tools and a Digital multimeter to finish this module.

Required tools:

- Soldering iron/station
- Soldering tin
- Wire cutter
- Multimeter
- Nut driver (plier, at own risk)

3. Bill of materials (BOM)

To start, it is good practice to check if the kit is complete. We double check the kitbags, but we are human (tududududuuuhduuh) after all.

22R Resistors (2x)

First we start with the 22R resistors. There are two of them (R49, R50). They are placed on the yellow markings in the figure 1.

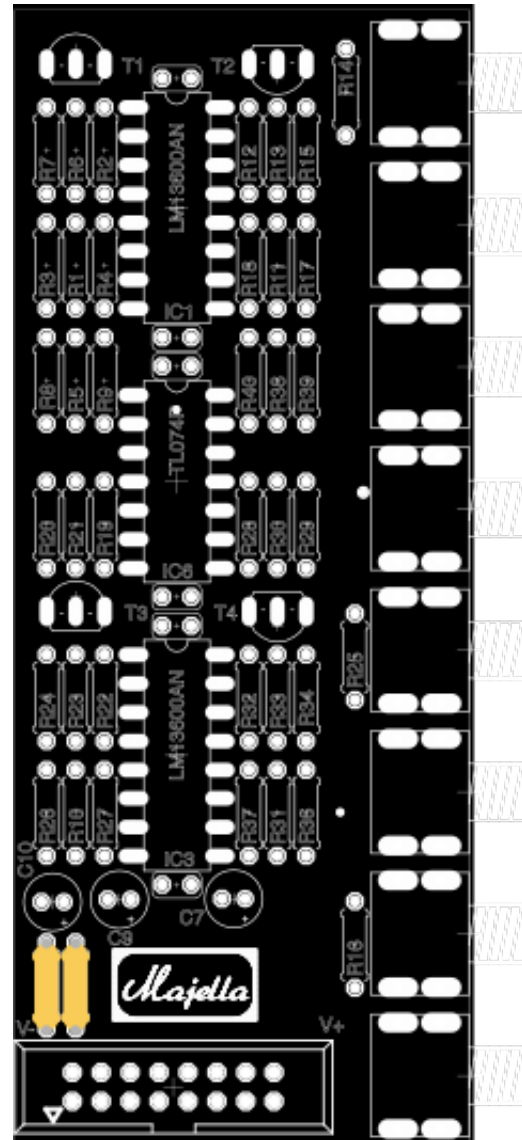


Figure 1: 22R resistor placement (YELLOW)

1K Resistors (7x)

Now that the 22R resistors are soldered we can go on with the 1K resistors.

There are 7 resistors with a 1K value (R2, R12, R14, **R16****, R22, R25, R32).

Their placement is shown in figure 2. They are marked yellow. The blue resistors represent the already soldered resistors:

IMPORTANT NOTICE R16**:

In case you would like to make the VVCA work on +-12V, so that there is no need for a 5V rail, please do not place this resistor.

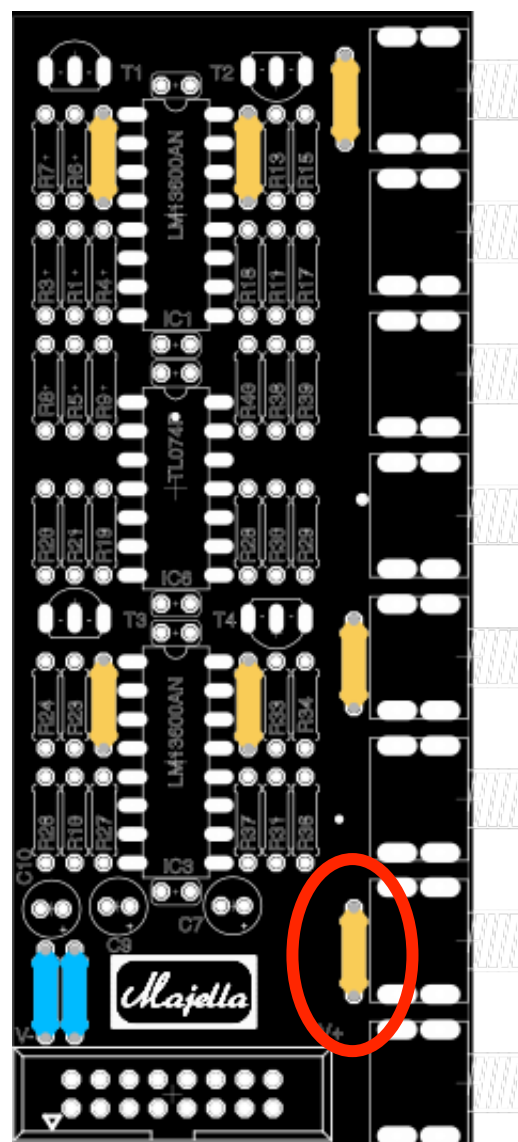


Figure 2: 1K resistor placement. (YELLOW)

10K Resistors (16x)

The next resistors to solder are the 10K resistors. There are 16 of them that need to be soldered (R4, R5, R6, R7, R13, R15, R18, R19, R23, R24, R27, R28, R33, R34, R37, R38).

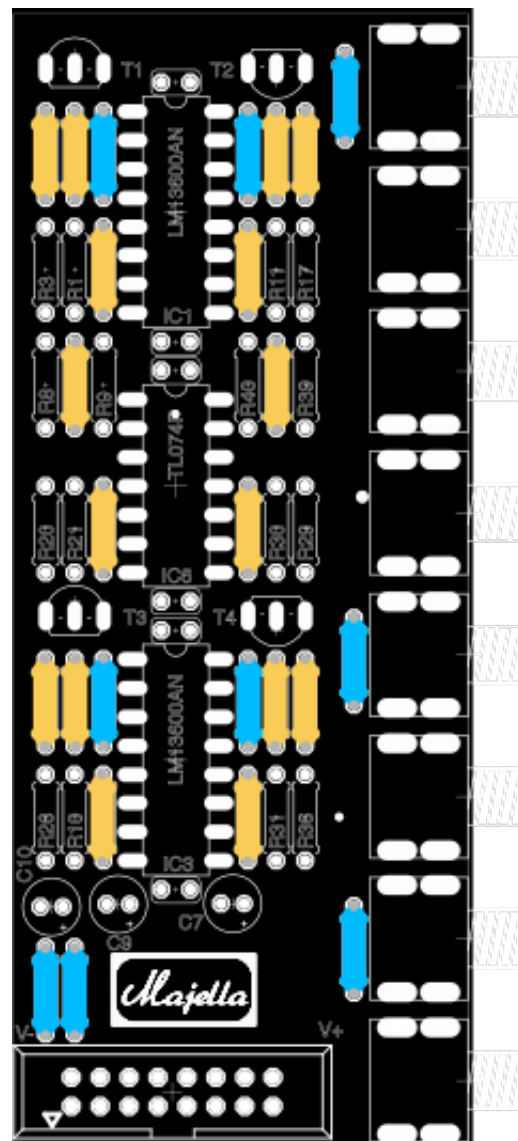


Figure 3: 10K resistor Placement (YELLOW)

100K Resistors (8x)

Now we are going to do the 100K resistors. There are 8 of them. (R3, R8, R17, R20, R26, R29, R36, R39) Figure 4 shows their position (yellow) on the PCB. Lets go champ!

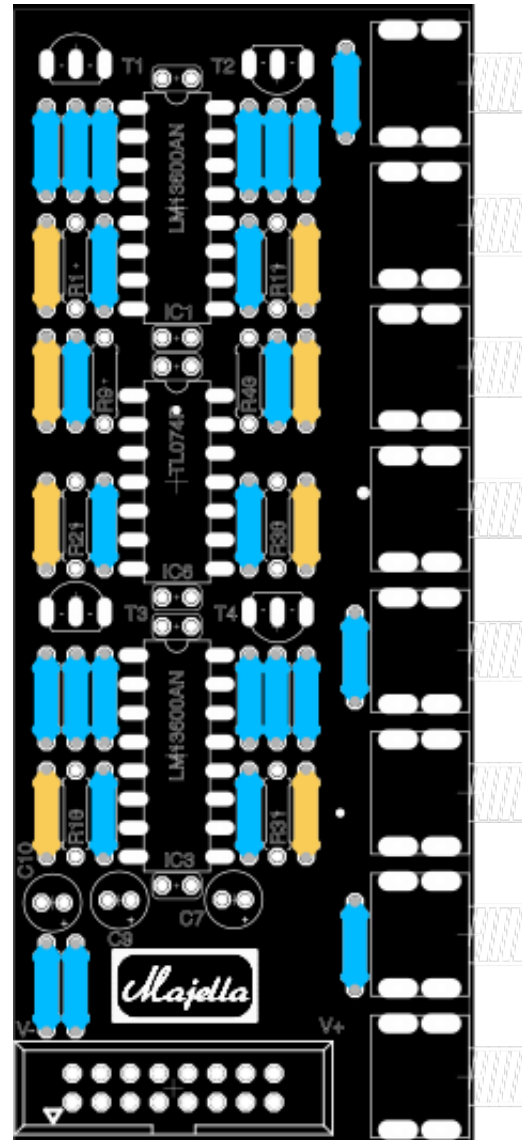


Figure 4: 100K resistor placement (YELLOW)

220K Resistors (4x)

You should now be getting tired of soldering resistors, but we are almost there! Just four of these 220K resistors. (R1, R10, R11, R31). They are yellow marked in figure 5.

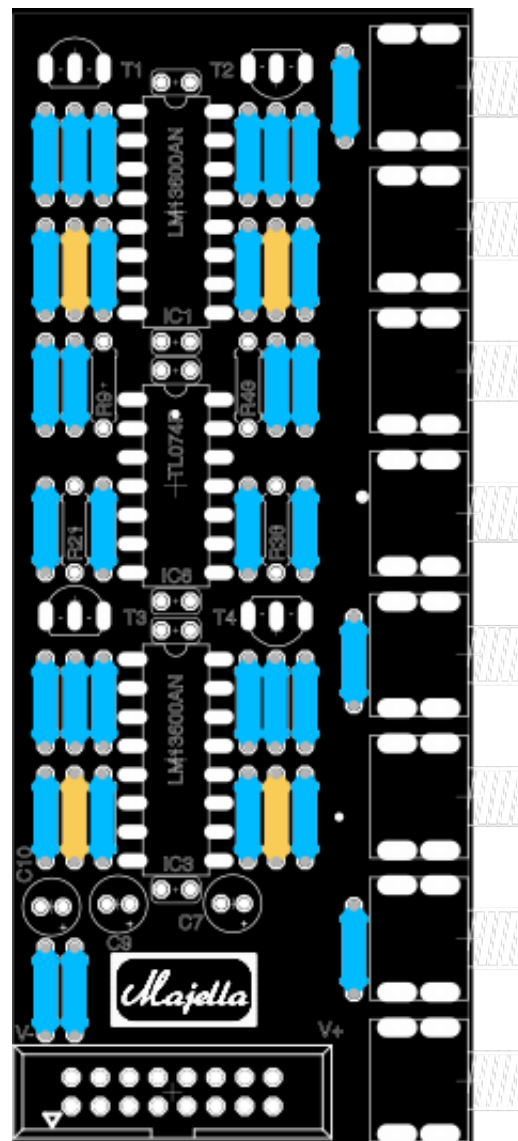


Figure 5: 220K resistor placement (YELLOW).

330K Resistors (4x)

The last 4 resistors! These are gonna be the 330K (R9, R21, R30, R40). Figure 6 shows where they need to be placed.

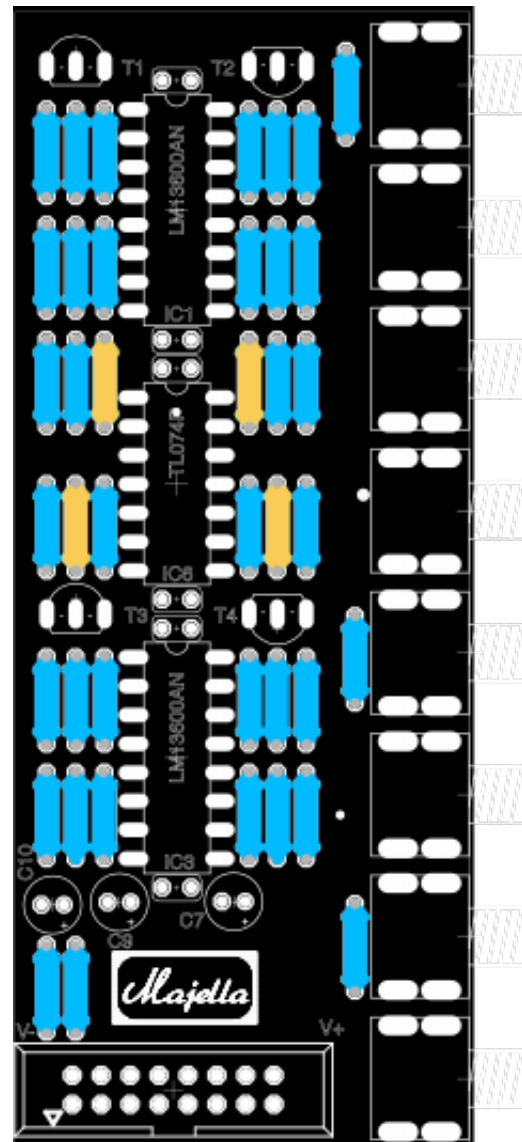


Figure 6: 330K resistor placement (YELLOW)

IC sockets 16 pin (2x)

For the LM13700's we need to solder 2 IC sockets with 16 pins on the PCB. **Check the notch for correct orientation!**

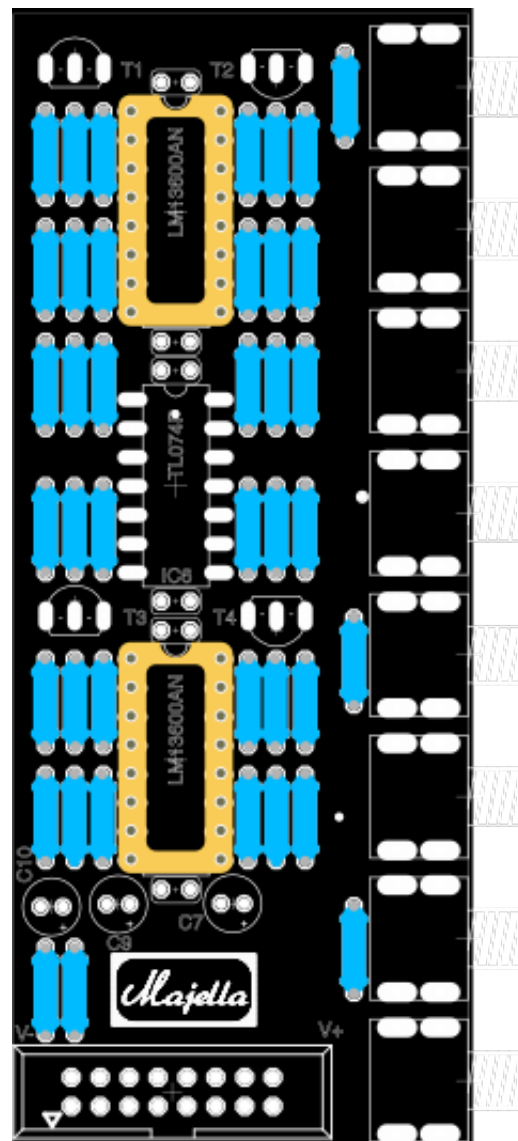


Figure 7: 16 pin IC socket placement (YELLOW)

IC sockets 14 pin (1x)

Now we need to solder the 14 pin IC socket for the TL074 opamp. **Check the notch for correct orientation!**

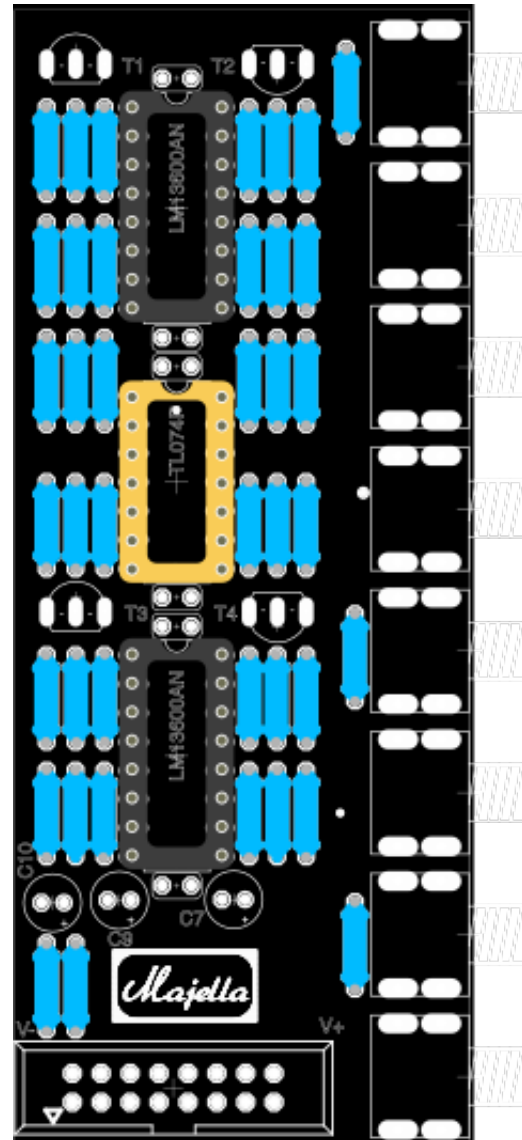


Figure 8: 14 pin IC socket placement (YELLOW)

100nF capacitors (6x)

There are 6 capacitors on this board. Their placement is marked yellow.

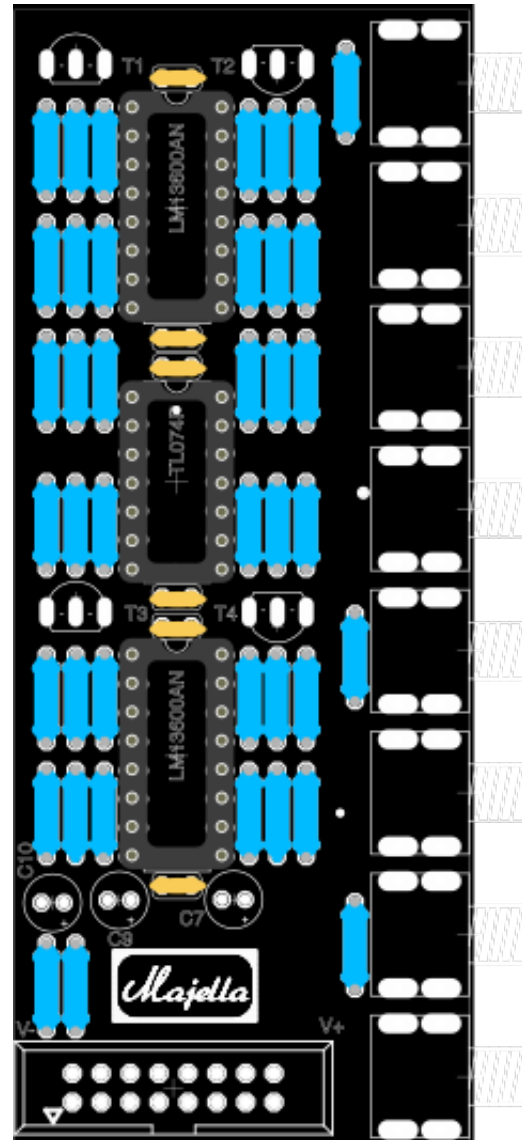


Figure 9: 100nF capacitors placement (YELLOW)

NPN transistors 2N3906 (4x)

There are 4 yellow marked PNP transistors on the PCB. We now need to solder these. Do not solder these the other way around!! Check the belly for the orientation (figure 10).

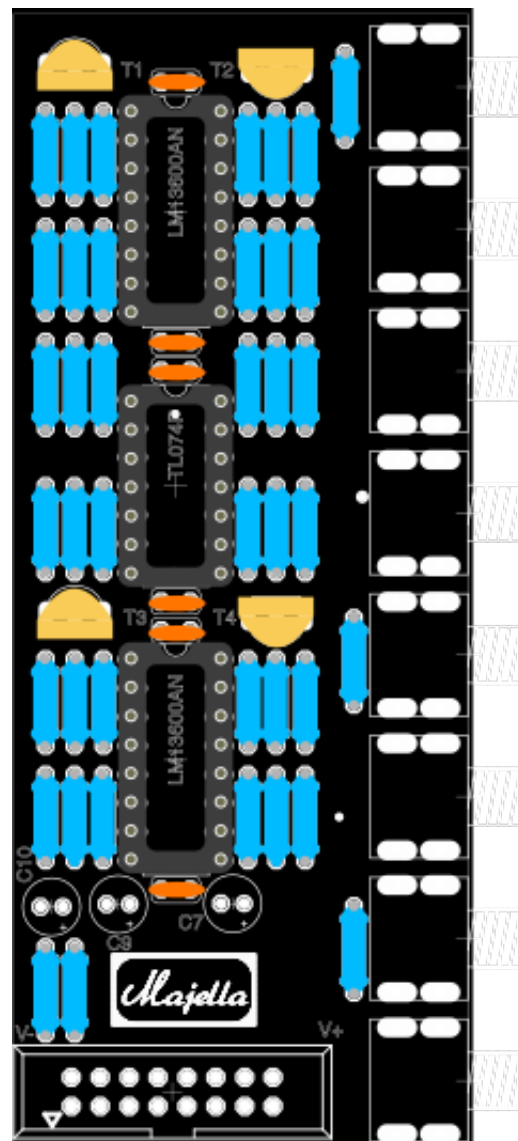


Figure 10: 2N3906 Transistor placement (YELLOW)

Power connector (1x)

To connect this module to your eurorack system we will need to solder a 16 pin IDC connector. Notice the orientation of the connector (figure 11)!

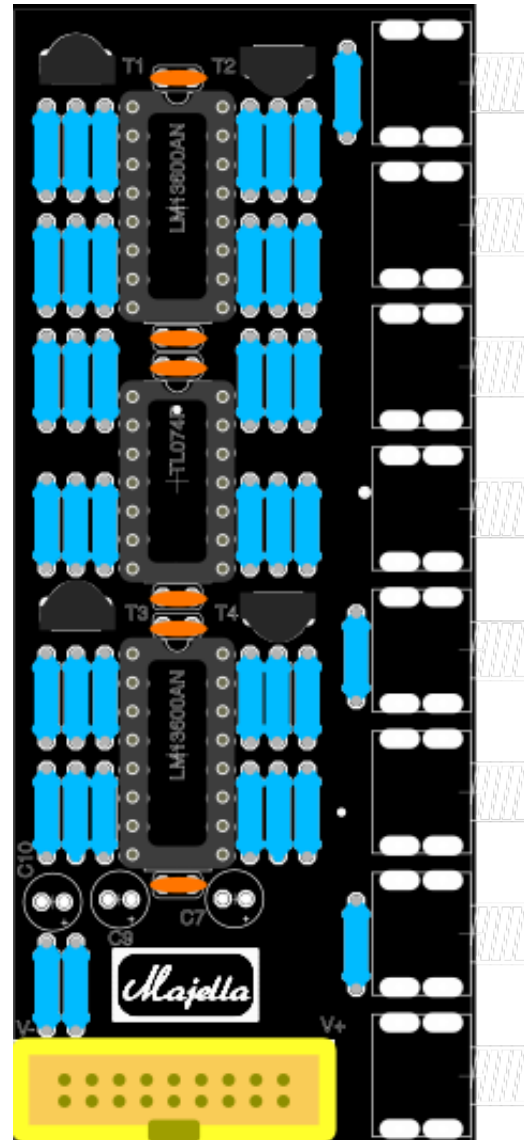
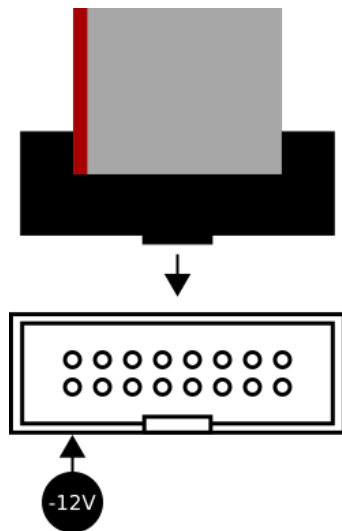


Figure 11: Power connector placement (YELLOW)

3.5 mm minijack connectors (8x)

Solder the 8 minijack connectors on the PCB. We use these so you can include the VVCA in your patch cable spaghetti! The placement of the jacks is marked yellow in figure 12.

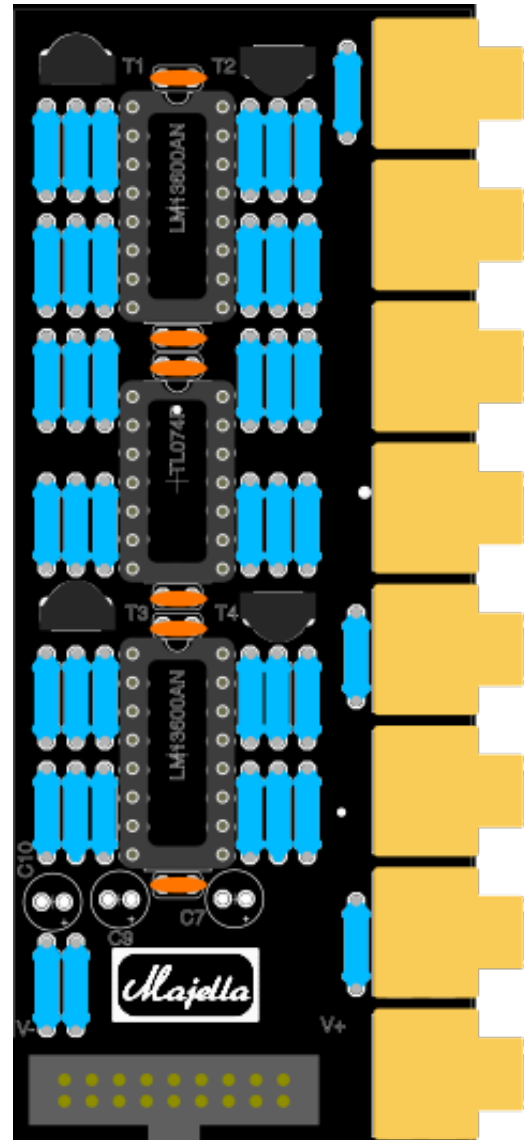


Figure 12: 3.5 mm jack placement (YELLOW)

22uF Capacitors (3x)

Almost done! We need to solder 3 electrolytic capacitors on the PCB. See figure 12 for their placement. Note their orientation, **They will explode if not correctly placed, no joke!!**

The positive (+) side can be recognized by the longer leg. The negative side (-) is marked by a yellow/gold strip with the - sign on it. The negative side is marked purple in figure 12.

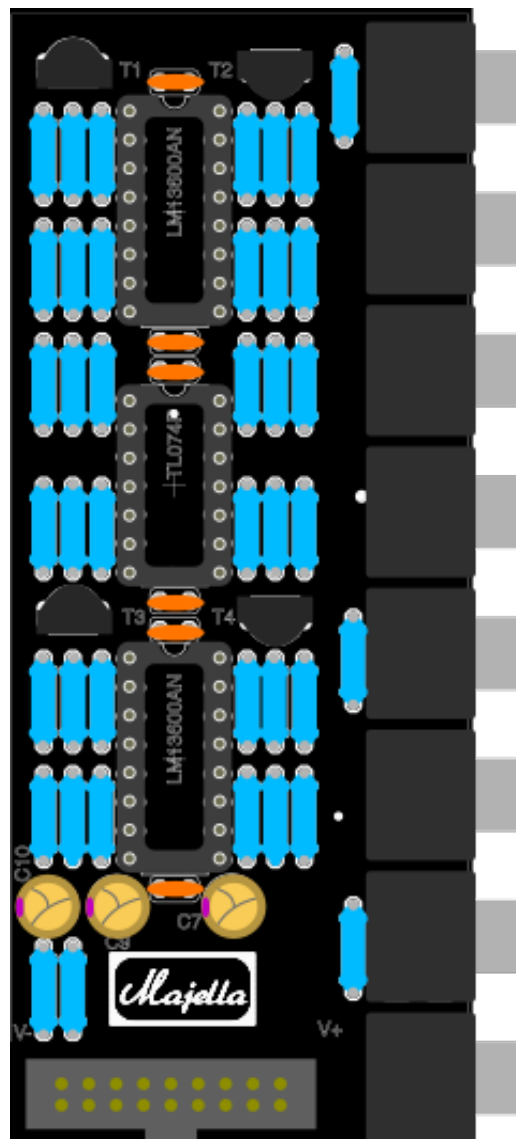


Figure 13: 22uF capacitors placement (YELLOW)

IMPORTANT NOTICE R16**:

In case you would like to run the VVCA on $\pm 12V$ without the need of a 5V supply on your bus board, the following modification can be made:

R16 (1k) should not be placed, see page 4.

Place a 10k resistor as shown in figure 14.

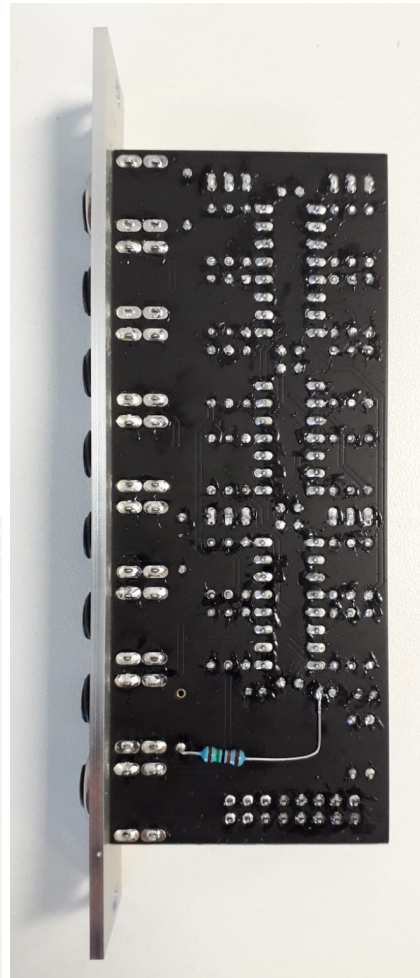
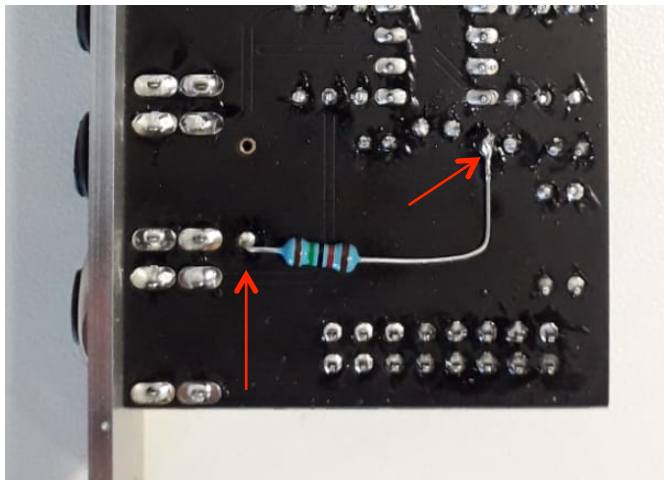


Figure 14: $\pm 12V$ supply modification

IC placement

You can turn off your soldering iron! You will only need to place the IC's in their sockets! Note the orientation of the IC's!.

PCB is done!

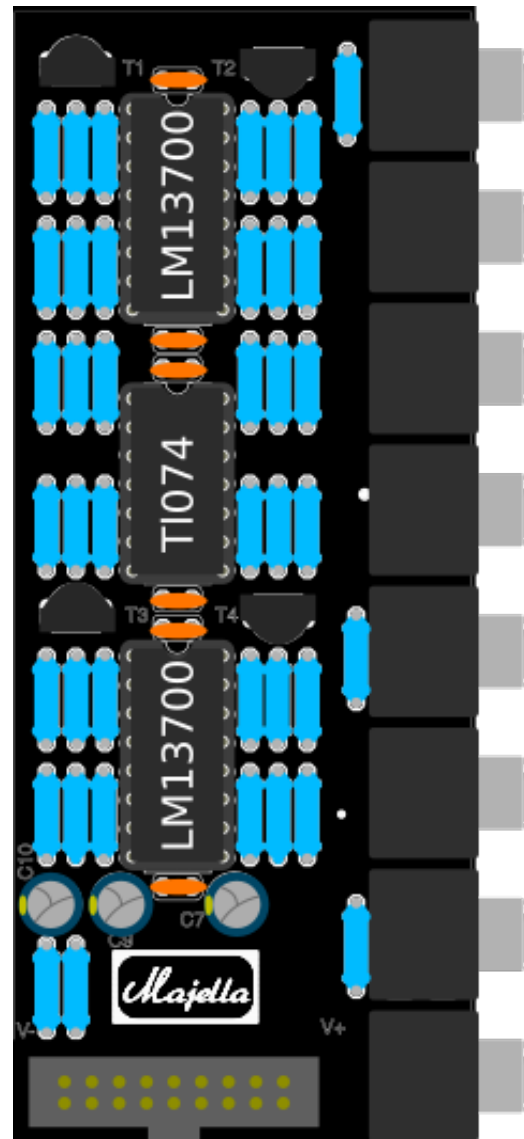
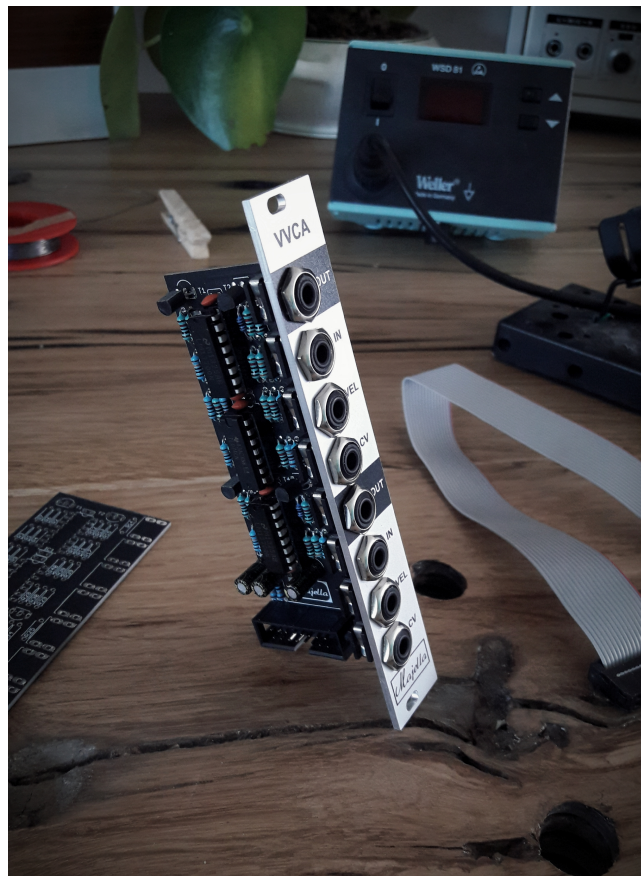


Figure 15: IC placement

Final check + panel

First check if the IC's and the 22uF capacitors are orientated correctly.

Now place the panel on to the jack connectors and put on the Hex nuts, DONE!





Bill of materials:

Qty	Value	Device	Parts
17	10k	Resistor	R4, R5, R6, R7, R13, R15, R18, R19, R23, R24, R27, R28, R33, R34, R37, R38
7	1k	Resistor	R2, R12, R14, R16, R22, R25, R32
8	100k	Resistor	R3, R8, R17, R20, R26, R29, R36, R39
6	100n	Ceramic Capacitor	C1, C2, C3, C4, C5, C6
2	22R	Resistor	R49, R50
4	220k	Resistor	R1, R10, R11, R31
3	22uF	electrolytic capacitors	C7, C9, C10
4	2N3906	PNP transistor	T1, T2, T3, T4
4	330k	Resistor	R9, R21, R30, R40
2	LM13600AN	LM13600AN	IC1, IC3
1	TL074P	TL074P	IC6
1	N/A	IDC Socket	X2
8	N/A	Jack 3.5mm	CV_IN, CV_IN_2, INPUT, INPUT_2, OUTPUT, OUTPUT_2, VELOCITY, VELOCITY_2
1	N/A	IC Socket	N/A
2	N/A	IC Socket	N/A
1	N/A	Ribbon Cable	N/A
1	Amazing	Cookie	Stroopwafel



Thanks for your patience and soldering skills!

Enjoy your VVCA!

VVCA DIY Manual

version 1.1

08-2021

©2021



<https://majella-audio.com>
support@majella-audio.com

Designed and made in Holland