Ljunggren Audio
Roll Your Own
Trig Xpander

Version: Trig Xpander 1.2

For version 1.1 follow this link.

Bills Of Material

PCB1

TYPE	PART	VALUE	PCS	NOTE
LED	L1,L2,L3,L4,L5,L6,L7,L8	Orange	8	3mm Individual outs
LED	L9	Green	1	3mm Sum out
Diode	D10	1N4148	1	
Resistor	R9,R10	2.2K	2	LED resistors
Resistor	R7	1M	1	
Resistor	R8	1K	1	
Jack	J1,J2,J3,J4,J5,J6,J7,J8,J9	3.5mm	9	PJ301BM-12/Thonkicon/Inline

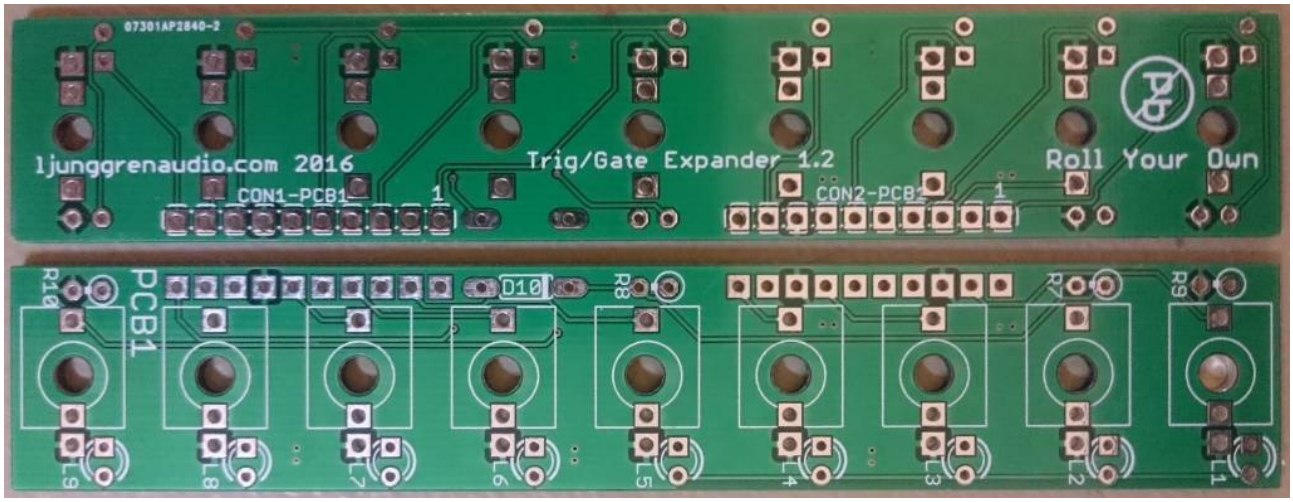
PCB2

TYPE	PART	VALUE	PCS	NOTE
Capacitor	C2,C3,C4,C9	100nF	4	X7R 2.5mm
Capacitor	C8	33nF	1	C0G 2.5mm, Timing cap.
Electrolytic	C1	10uF	1	2mm pin pitch, 5mm dia, 5mm height
Diode	D1	1N5818	1	Or 1N5817,1N5819 Power polarity protection.
Diode	D2,D3,D4,D5,D6,D7,D8,D9	1N4148	8	
Resistor	R2,R3,R4,R5,R6	33K	5	
Resistor	R1	10R	1	
Resistor	R11,R12,R13,R14,R15,R16,R17,R18	1M	8	
Resistor	R19,R20,R21,R22,R23,R24,R25,R26	1K	8	
IC Socket	IC1	8 pin	1	
Timer	IC1	NE555	1	Or TLC555
IC Socket	IC2	16 pin	1	
CD4xxx	IC2	CD4051	1	Break-before-Make version like TI CD4051BE.
Trimmer	TRIM1	500k	1	Trig length adjustment.
Transistor	Q1,Q2,Q3,Q4,Q5,Q6,Q7,Q8,Q9,Q10	BC547	10	NPN transistor.
Pin strip	JP1	3 pin	1	Single row, jumper.
Expand header	IN, THRU	10 pin	2	2 rows x 5 pins
Power header	POWER	10 pin	1	boxed

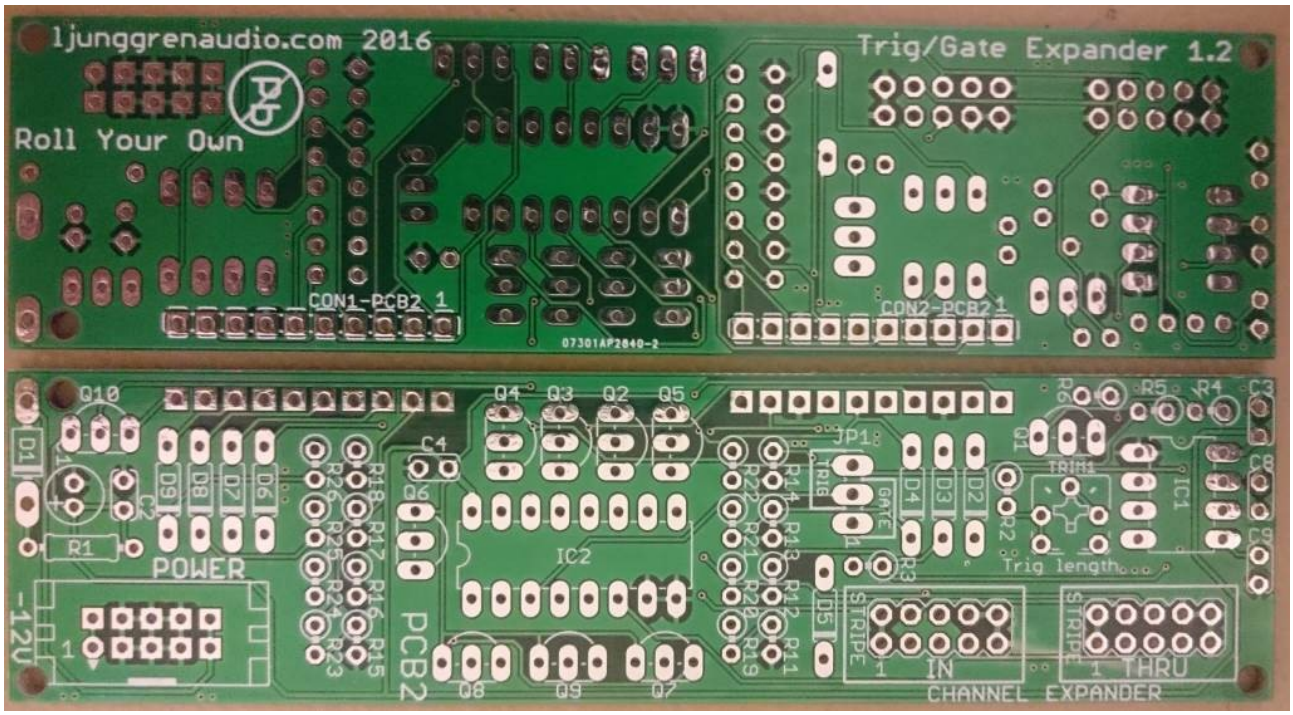
OTHER

TYPE	PART	VALUE	PCS	NOTE
Faceplate			1	PCB material (FR4), black, 2mm
PCB	PCB1,PCB2		1	One PCB split into two with V-Cut.
Power cable		IDC	1	16pin – 10pin
Expansion cable		IDC	1	10pin – 10pin
Mounting screws			2	M3x6 black pozi
Jumper			1	For JP1
Pin strip	CON1,CON2	10 pin	2	Angled 90 degrees, single row. Connects PCB1 and PCB2 together.

Assembly instructions



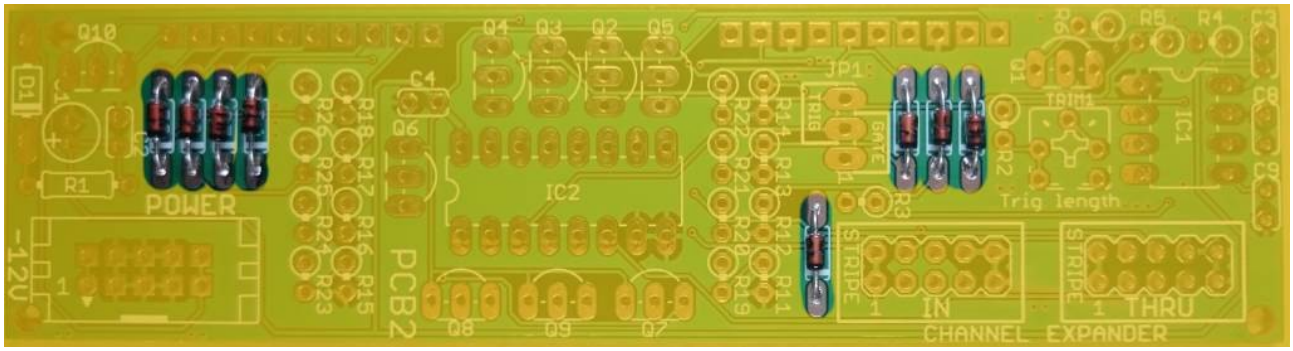
*Empty **PCB1** bottom & top.*



*Empty **PCB2** bottom & top.*

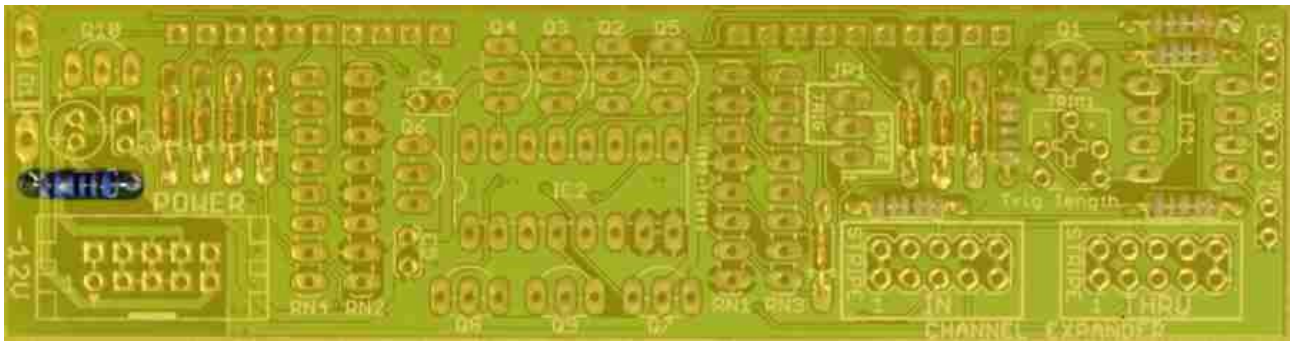
We start with PCB2.

Step 1
Solder small signal diodes. Diodes are sensitive to mounting direction, the stripe on the diodes must be on the same side as indicated in the silk screen.



D2, D3, D4, D5, D6, D7, D8, D9 *1N4148 8pcs*

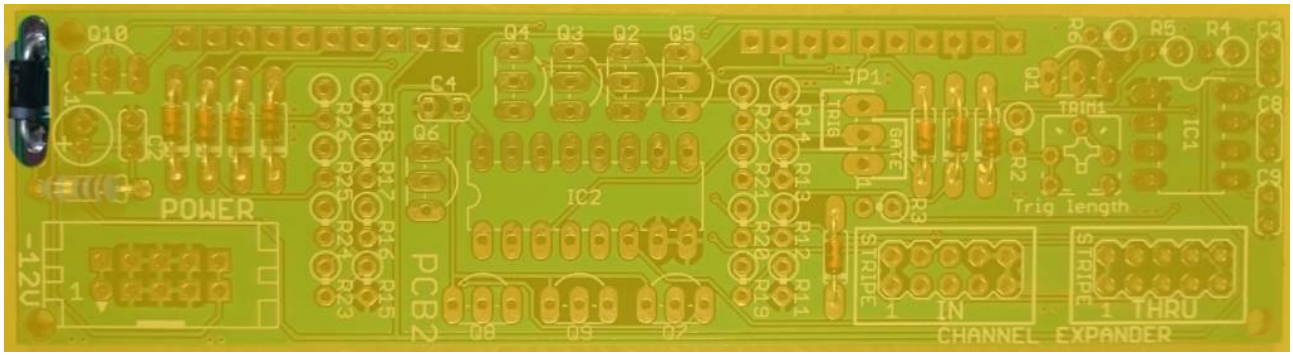
Step 2
Solder resistors. Resistors are not sensitive to mounting direction.



R1 *10R*

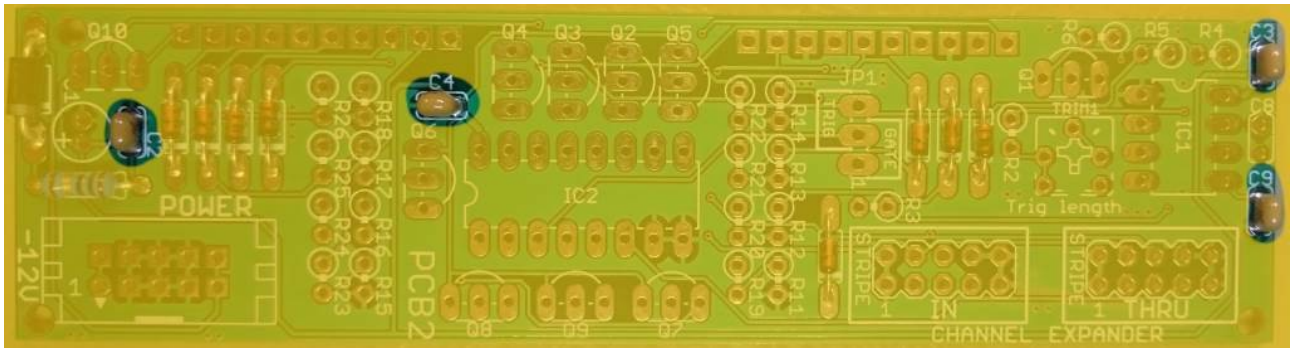
We will solder the resistors that strand upright later as they are taller.

Step 3
Solder reverse polarity protection diode. Diodes are sensitive to mounting direction, the stripe on the diode must be on the same side as indicated in the silk screen.



D1 *1N5818*

Step 4
Solder ceramic capacitors. Ceramic capacitors are not sensitive to mounting direction.

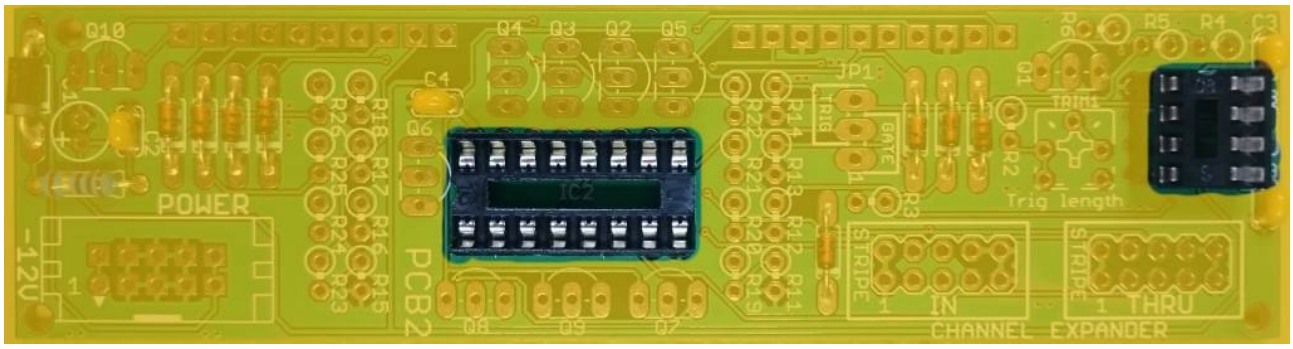


C2, C3, C4, C9 *100nF 4pcs*

In the first batch of kits for version 1.2, **C5** is included but shouldn't be.

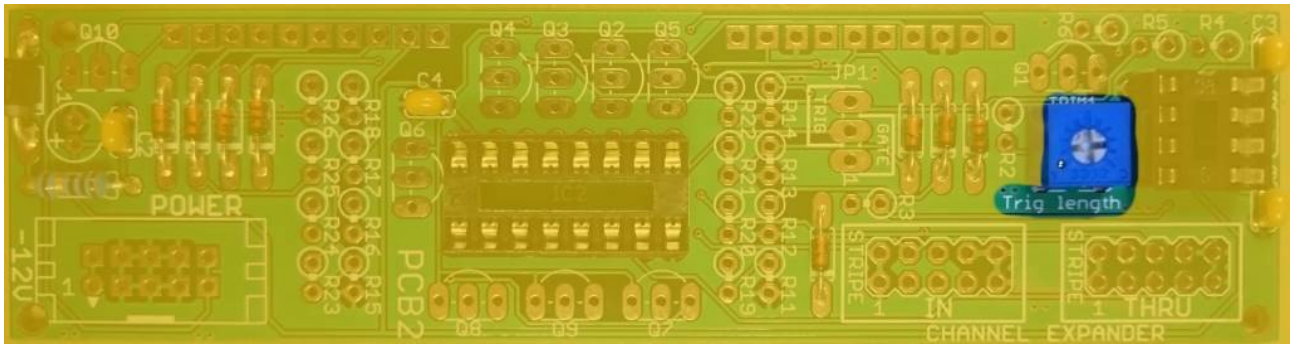
We wait a little with the last ceramic cap **C8** as it's taller.

Step 5
Solder IC sockets. Match the IC sockets indent (marking pin 1 side) with the silk screens.



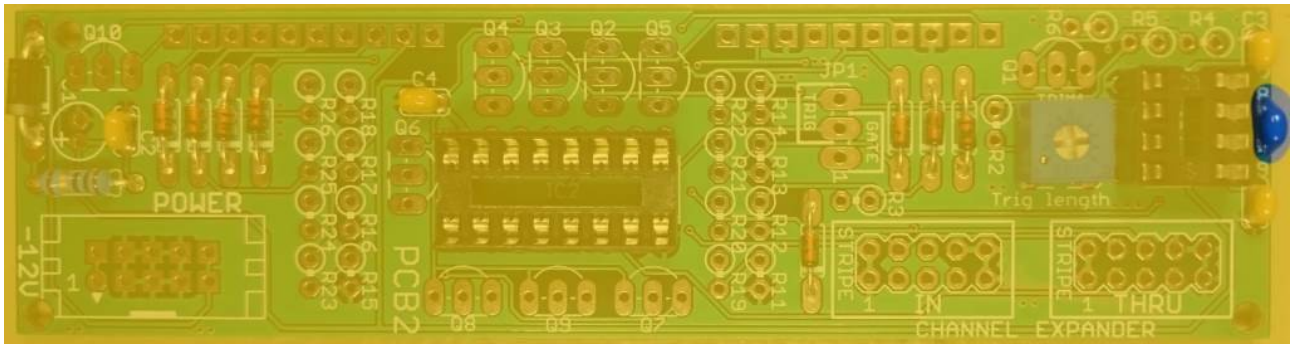
IC1 *8 pin DIP socket.*
IC2 *16 pin DIP socket. IC's will be mounted later.*

Step 6
Solder trimmer. Only 3 of the 5 holes are used, the extra 2 holes are for fitting trimmers with different appearence.



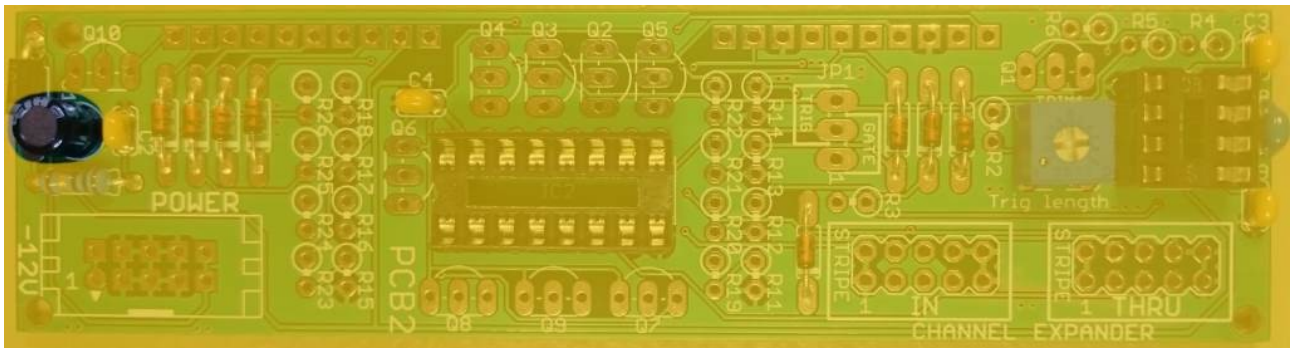
TRIM1 *500K*

Step 7
Solder the last ceramic capacitor. Ceramic capacitors are not sensitive to mounting direction.



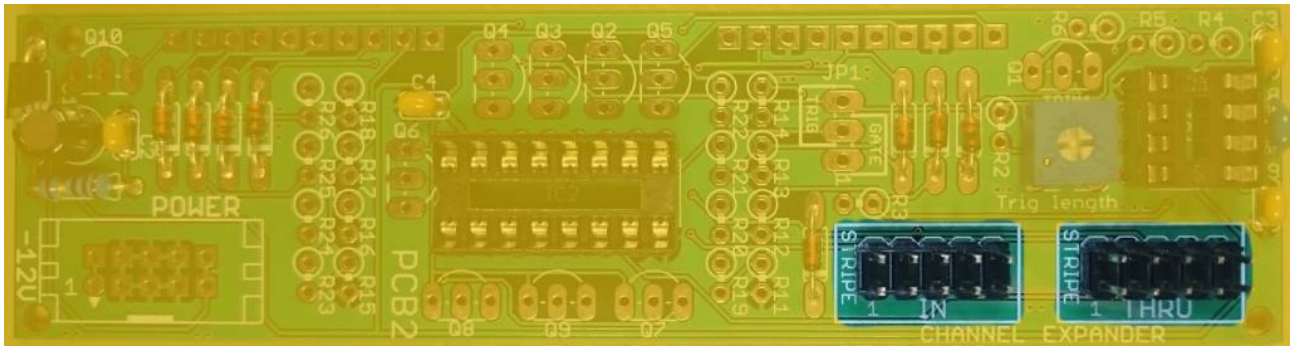
C8 *33nF*

Step 8
Solder Electrolytic. Long leg is + (anode).



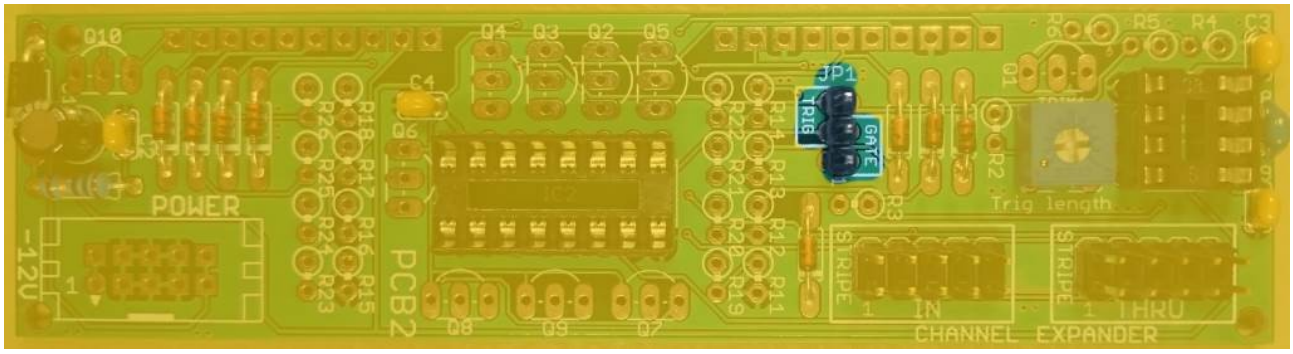
C1 *10µF*

Step 9
Solder expander headers. It's a good idea to take the 10-pin side of the power cable and plug it in the header you are soldering. It makes it easier to avoid heating the pins up too much and make them unaligned by moving around.



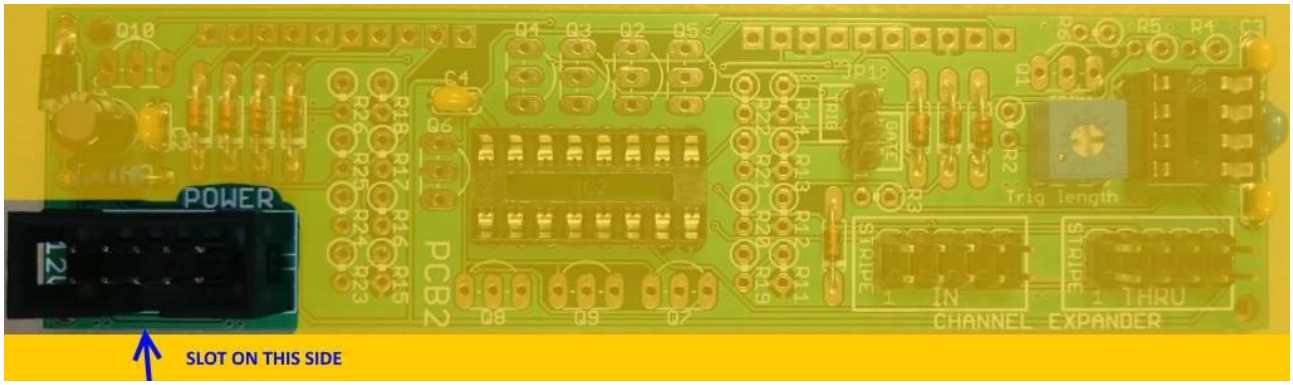
IN, THRU *10 pin open header*

Step 10
Solder the 3 pin strip and place the jumper in either **TRIG** or **GATE** mode.



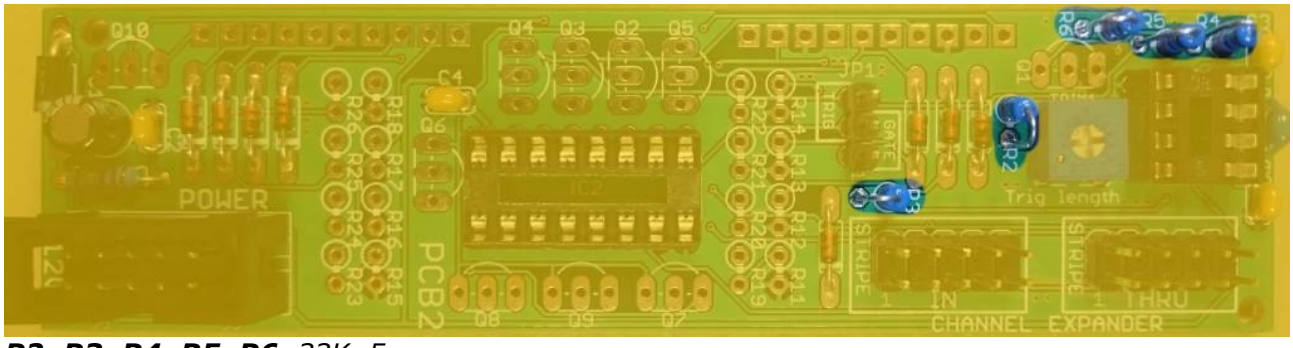
JP1 *3 pin strip*

Step 11
Solder the keyed boxed power header. Pay extra attention to the direction. The triangle (pin 1) must be at the -12V side. It's a good idea to use the power cable in the same way as in the previous step. In the picture below the slot opening (key) is pointed to.

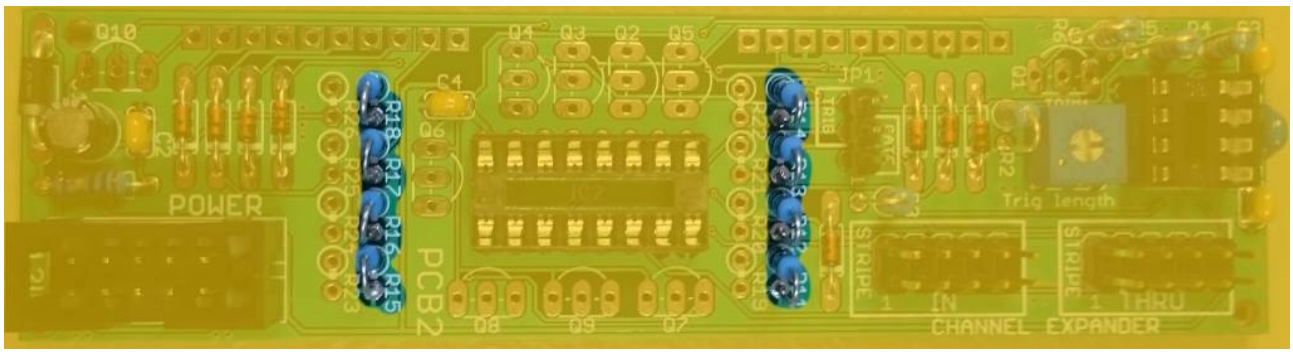


POWER

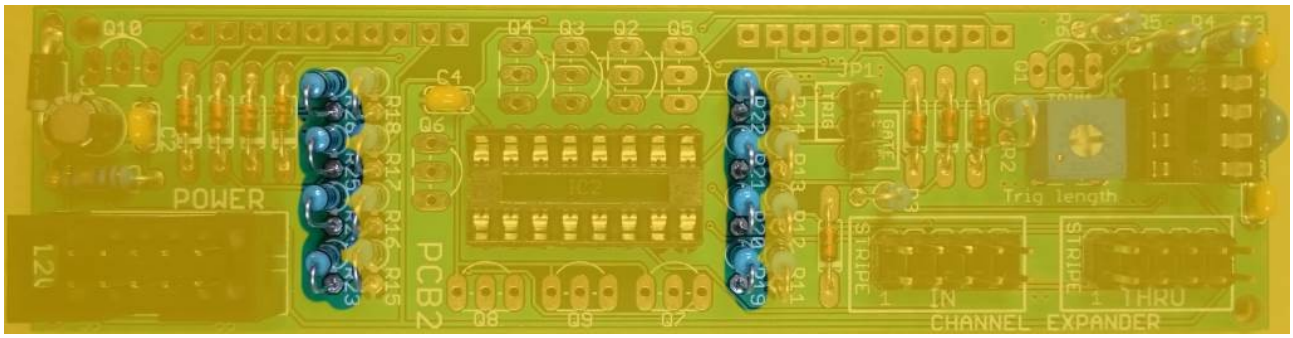
Step 12
Solder upright standing resistors. Resistors are not sensitive to mounting direction but we recommend that you place the resistor body on the side with the silk screen circle around the hole. This direction is optimized to reduce the effect of the bare lead acting as an antenna. This is not as critical on this module as it would be on an audio module.



R2, R3, R4, R5, R6 *33K 5pcs*



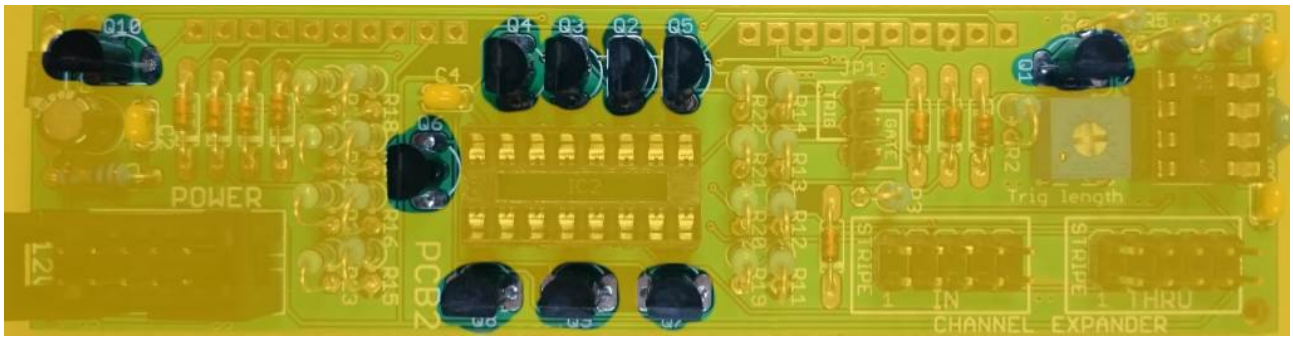
R11, R12, R13, R14, R15, R16, R17, R18 *1M 8pcs*



R19, R20, R21, R22, R23, R24, R25, R26 *1K 8pcs*

Step 13

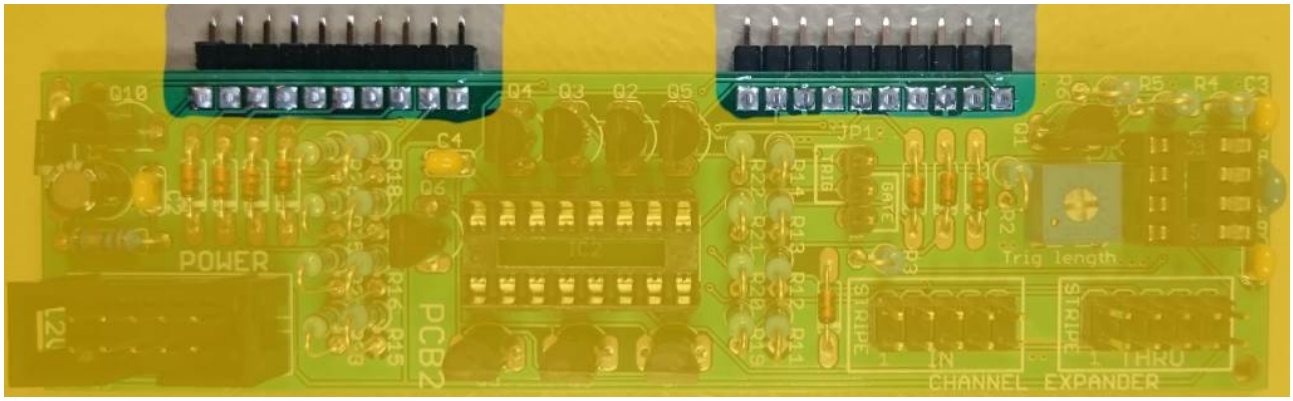
Solder transistors. Match the curved side with the silk screen.



Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10 *BC547 10pcs*

Step 14

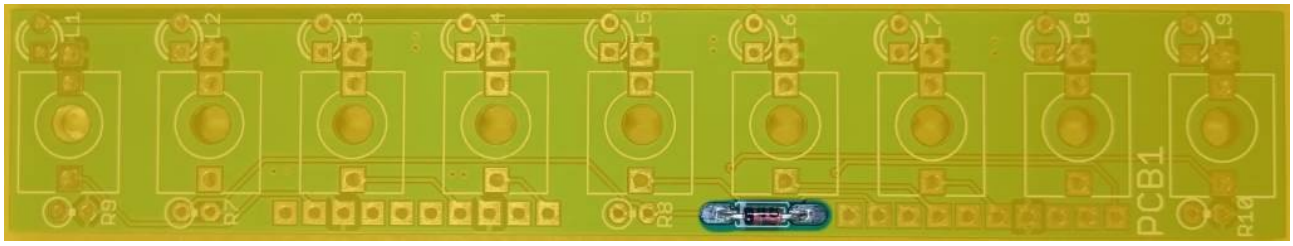
Solder the 90 degree angled connectors to PCB2. Place them on the bottom side with the long pins thru PCB2. See the picture below.



Leave PCB2 on the side. Now it's time for PCB1.

Step 15

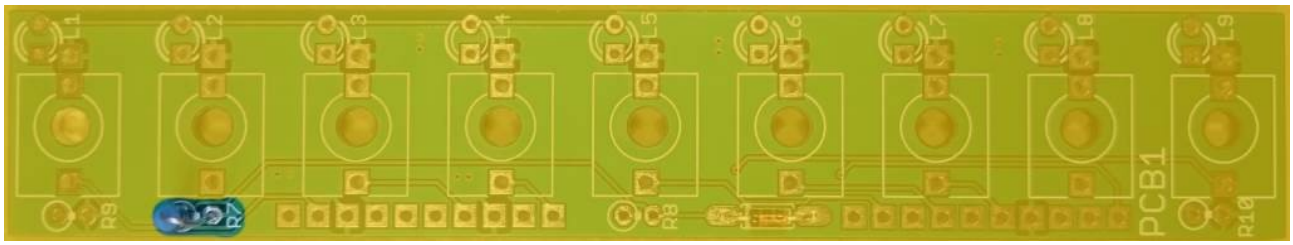
Solder small signal diode. Diodes are sensitive to mounting direction, the stripe on the diodes must be on the same side as indicated in the silk screen.



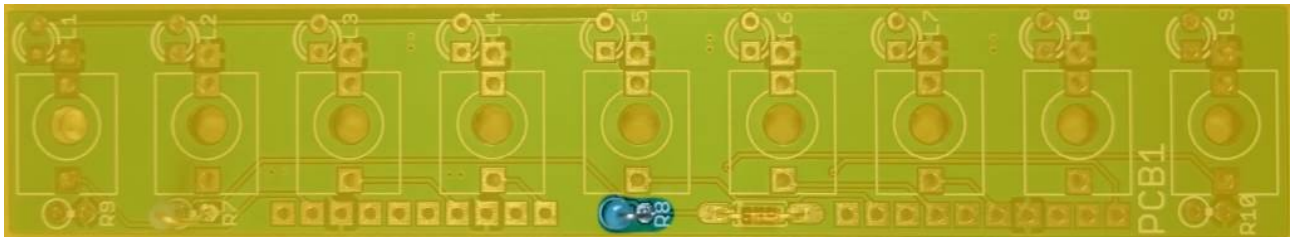
D10 *1N4148*

Step 16

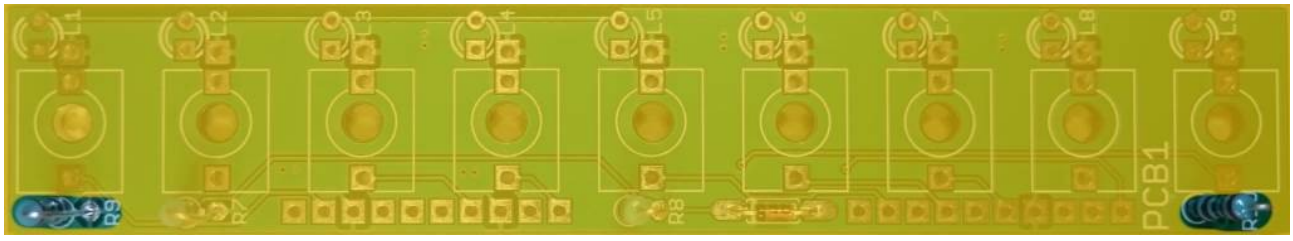
Solder upright standing resistors. Resistors are not sensitive to mounting direction but we recomment that you place the resistor body on the side with the silk screen circle around the hole. This direction is optimized to reduce the effect of the bare lead acting as an antenna. This is not as critical on this module as it would be on an audio module.



R7 *1M*

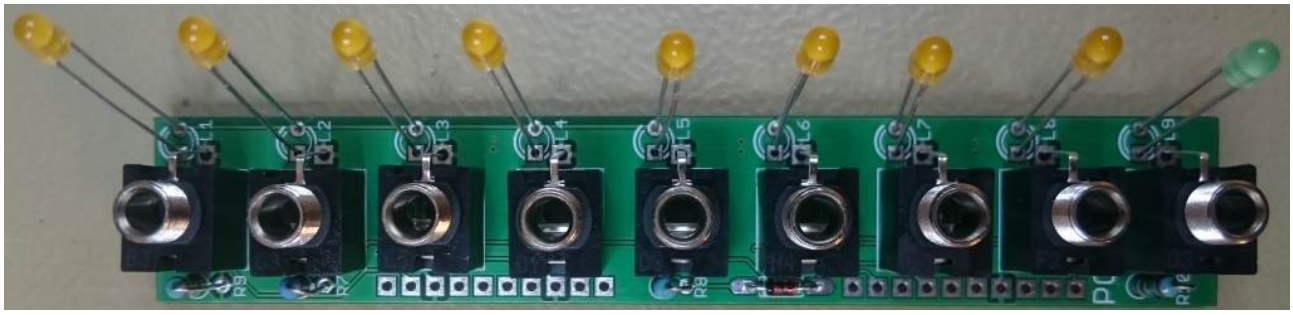


R8 *1K*



R9, R10 *2.2K 2pcs*

Step 17
Place the jacks and LEDs in their places without soldering them. The long pin of the LEDs are anode (+) and goes in the hole with a square pad.



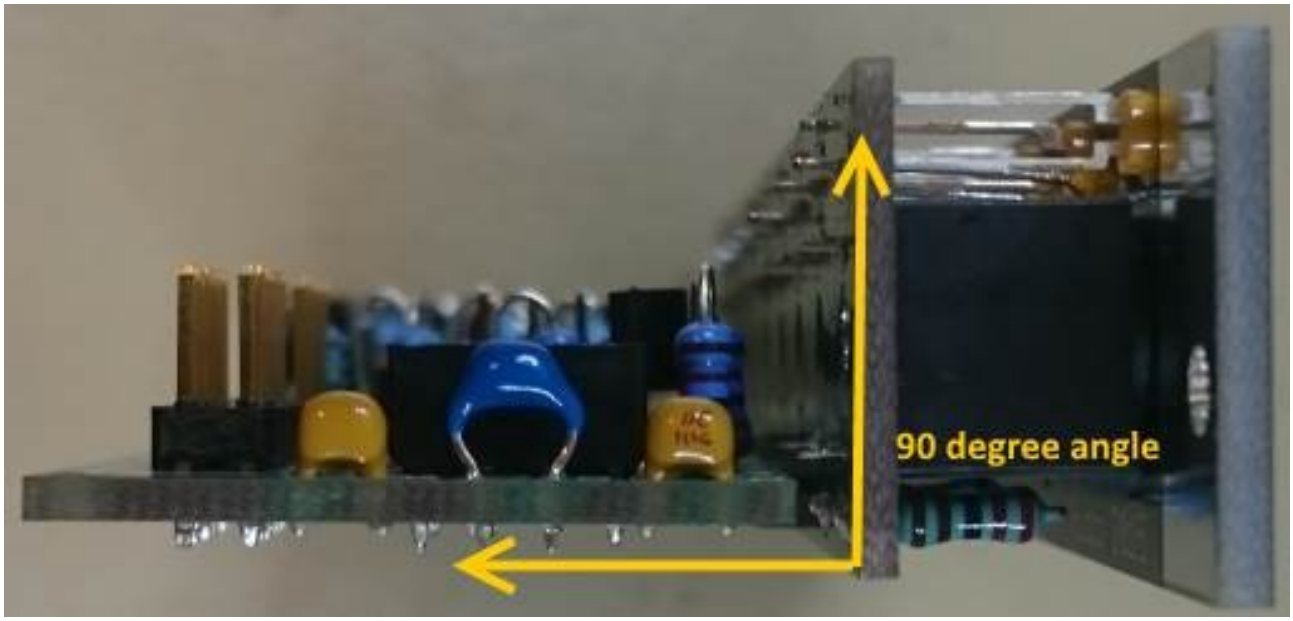
Mount the panel over the jacks with the help of a washer and a nut on each jack.

Don't worry if the jacks twist a tiny bit in their socket while tightening the nut, this is normal, as long as it's not soldered yet it won't be stressed. Make sure the top and bottom jack don't go outside of the PCB edge so it the module will fit better in the rack.

Use a socket wrench to keep the risk of scratching the panel to a minimum.

Make sure the LEDs goes properly thru the holes in the panel and solder the LEDs and jacks in place.

Step 18
Now we will solder the two angled pin strips to PCB1 that was previously soldered on to PCB2. Solder one pin like in the picture below and then check that you get a 90 degree angle between the PCBs. Correct it if needed.



Once you get an aproximate 90 degree angle you can solder the rest of the pins on the pin strips.

Step 19
Mount IC1: NE555 (8 pin) and IC2: CD4051 (16 pin). Make sure they are place in the correct position with the indent or corner dot indicating the side with pin 1. Just like the IC sockets.

Step 20
Attach the power cable (**10pin to 16pin** IDC flat cable). Make sure the stripe indicating pin 1 is on the same side as -12V.
Attach the expansion cable (**10pin to 10pin** IDC flat cable). Make sure the stripe indicating pin 1 is on the same side as the text **"STRIPE"**.

See the picture in step 19 for guidance.

The expansion cable is supposed to connect to the channel expansion port on the VC Sequencer or to the thru port on another Trig Xpander or other channel expansion module that's already connected to the VC Sequencer.

Now the module should be finished!

EXPAND-CHANNEL