Trigger IO assembly guide

The Trigger IO extension is an upgrade for the LXR drumsynthesizer that provides additional analog trigger in- and outputs. It has

- 7 trigger outputs for the individual sequener tracks
- 1 clock input for different clock rates (1, 4, 8, 16 and 32ppq) to sync the LXR to analog sequencers
- 1 reset input
- 2 clock outputs with variable prescaler to sync external sequencers to the LXR
- 1 reset output

The outputs are V-triggers, but can also be modified to S-triggers for vintage gear with some additional parts (not included in the kit)

This assembly guide only covers the more common V-Trigger assembly.

The BOM is available here

Schematic can be found here

Using the Trigger IO

This section gives a short overview over the functionality of the expansion board.

Trigger Outs

The 7 trigger out jacks generate a short +5V pulse signal whenever a note is played on the corresponding sequencer track.

Reset Out

This output is high whenever the sequencer is stopped. you can use it to reset connected external sequencers when the LXR is stopped.

Reset In

A high level on this input will stop and reset the LXR sequencer.

A low level will restart the sequencer.

Clock Outs

These outputs will generate a continuous clock signal while the internal sequencer is running.

There are 4 parameters at the end of the global settings menu to controll the trigger IO settings.
Press shift + load/save to enter the settings menu.
Scroll to the right with the encoder until you see the 4 parameters "cki, co1, co2 and mod"
co1 = clock out 1, co2 = clock out 2 ppq settings.
On this page you can set different prescalers for the clock outs.The tempo can be set to 1, 4, 8, 16, or 32 pulses per quarter note.

Clock In

If the BPM is set to zero (external sync) you can use this input to sync the sequencer to an external clock.
The input also has a prescaler on the trigger settings page and can be set to 1, 4, 8, 16, and 32 ppq.
The parameter is named "cki = clock in ppq"

Gate Length

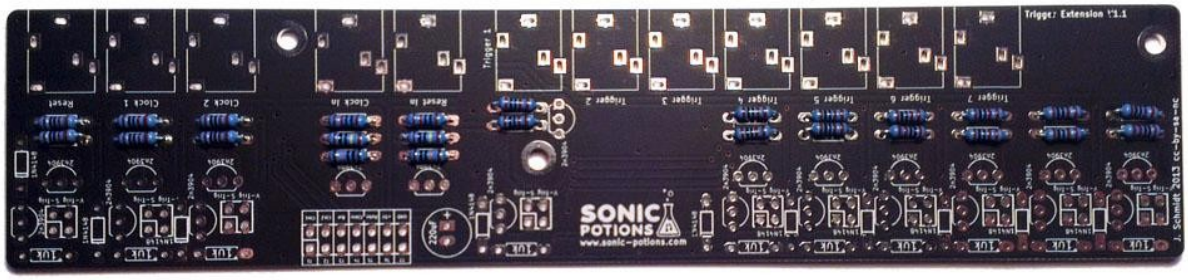
The 'mod' parameter controls the gate mode. Per default the trigger IO outputs just short 5V pulses.
If the gate mode is turned on, the trigger pulse will be high as long as the amplitude envelope is bigger than 0 - i.e as long as a sound is playing.

PCB Assembly

Step 1 - Resistors

The first step is to solder the resistors. The 10k resistors on the bottom of the PCB are only needed for S-Triggers and can be left unpopulated.

Image	Description	Amount	Notes
	1k resistor	20	
	100k resistor	2	
	1M resistor	2	
	10k resistor	2	



Step 2 - V-Trigger solder bridge

You should have plenty of cut off resistor legs left from the previous step. Use them as wire bridges to populate the 10 V-/S-Trigger selection spots on the PCB. Insert them in the right V-Trig position.

Image	Description	Amount	Part nr.	Notes
	Wire Bridge	10	-	This is just a normal piece of wire. use one of the cut off resistor legs from the previous steps.

Step 3 - Jacks

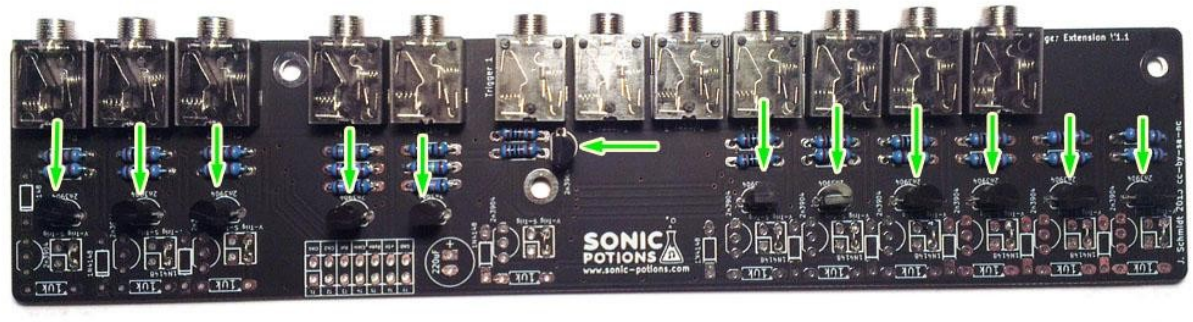
Solder the jacks to the PCB. The washers and nuts are not needed.

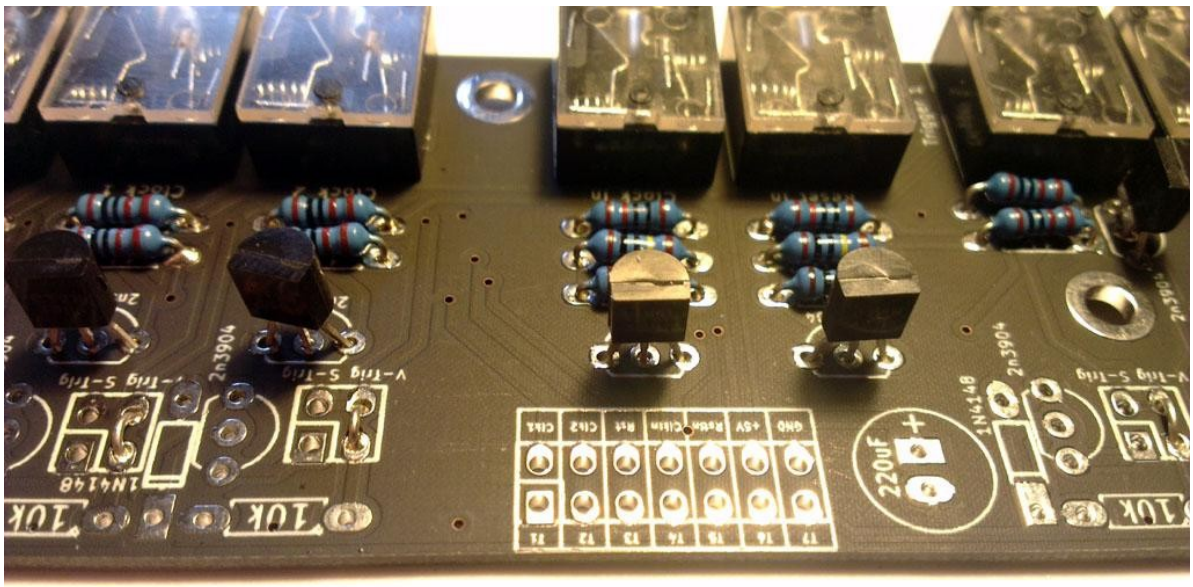
Image	Description	Amount	Notes
	3.5mm Audio Jack	12	

Step 4 - Transistors

Solder the 12 transistors to the marked spots. The other transistor places on the PCB can be left blank, as they are also only needed for the S-Trigger mod.

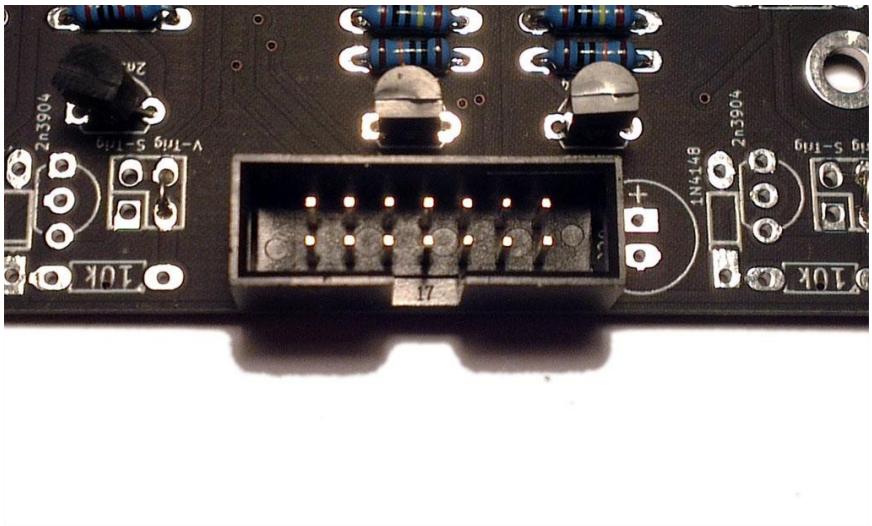
Image	Description	Amount	Notes
	2n3904 Transistor	12	Watch out for the right orientation! Align the flat side of the transistors with the flat marking of the silkscreen.



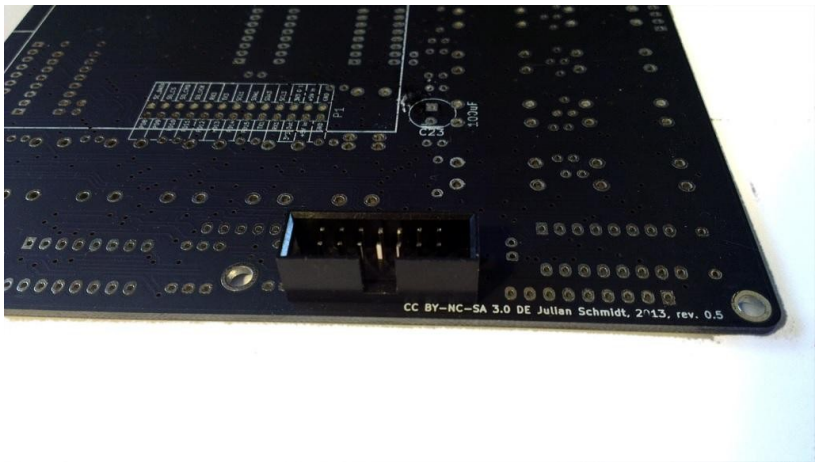


Step 5 - Ribbon cable connector

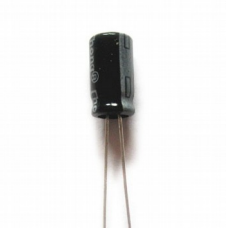
Image	Description	Amount	Notes
	14 pin keyed header	2	The slot has to face to the PCB edge to ensure the right polarity.



Solder the 2nd connector to the bottom of the LXR frontpanel board. There is a header marked "Trigger Extension" (from rev. 0.5 and up). Once again the slot in the header has to point to the edge of the board



Step 6 - Capacitor

Image	Description	Amount	Notes
	Electrolytic capacitor 220uF	1	**Polarized part!** The shorter leg is negative, the longer leg is for the positive voltage.

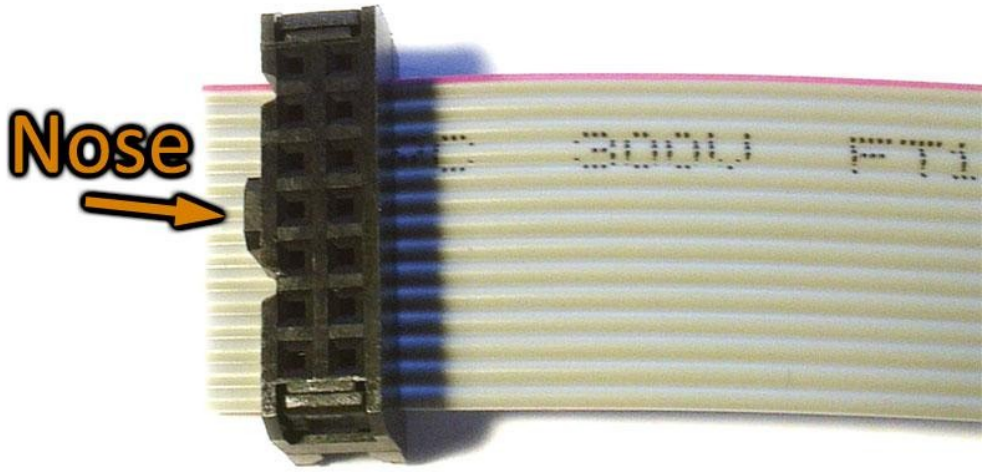
Connecting the trigger IO to the LXR

use the ribbon cable to connect the trigger IO PCB to the LXR frontpanel trigger extension port.

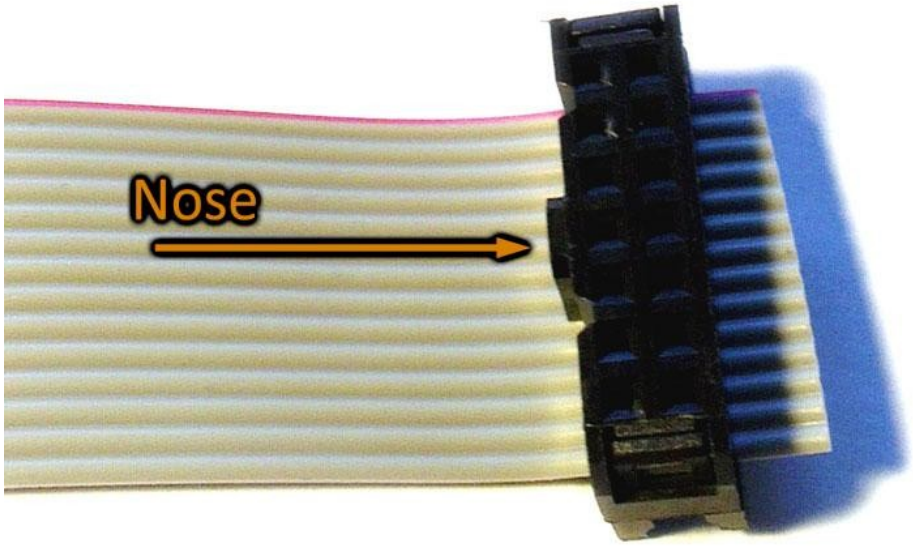
If you have a Batch 1 board (rev0.4 without round corners) the Trigger Extension Header on the PCB is missing. Please read the next step to learn how to wire up the board.

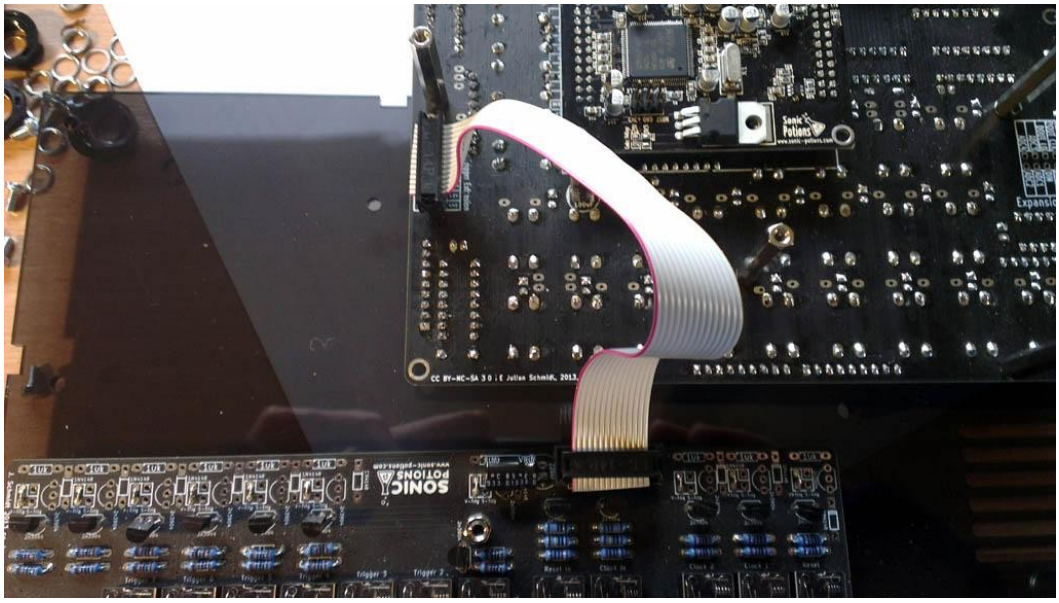
Image	Description	Amount	Notes
	ribbon cable with 14 pin connector	1	

The cable has 2 connectors.
The one with the 'nose' from the keyed header pointing away from the cable is for the frontpanel PCB:



the side with the 'nose' pointing to the cable is for the trigger PCB:



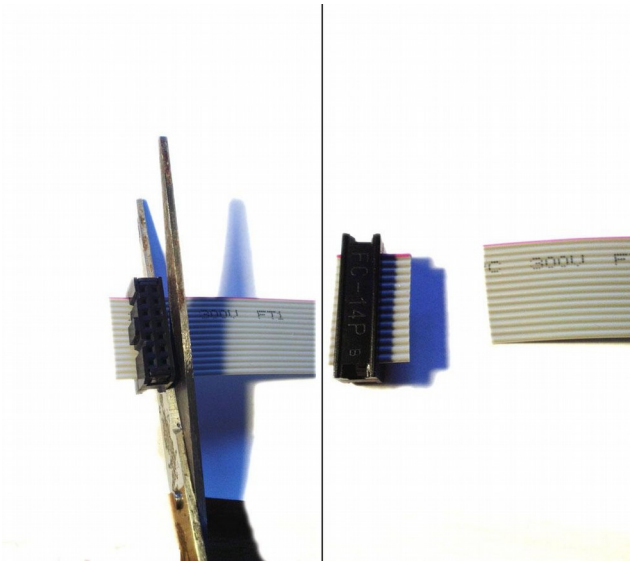


Board connection for Batch 1 users (frontpanel board rev0.4)

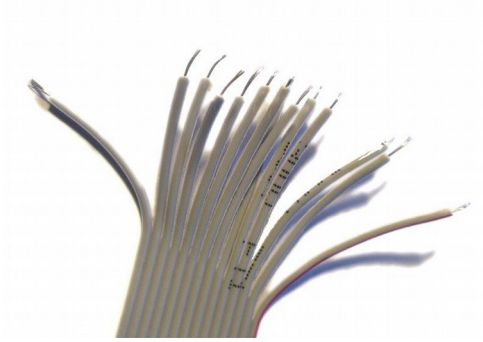
This step is only needed for user that have an early batch 1 board without the trigger IO expansion header. If you have the header on your board, please skip this step and CONTINUE HERE

Since there is no trigger IO expansion header on the frontpanel board, you have to solder the cable directly to the mainboard connector.

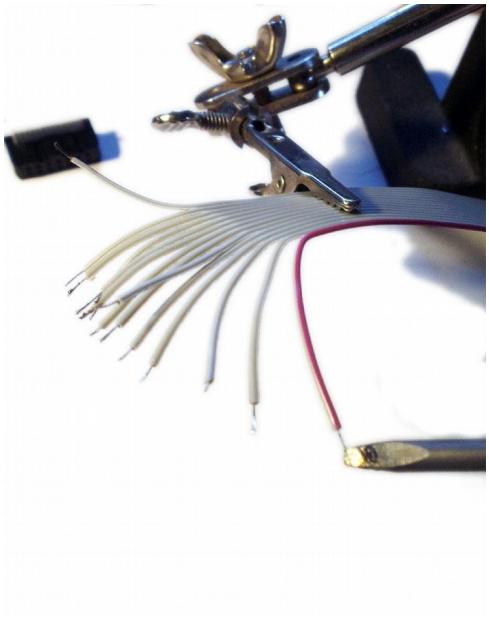
- First cut away the connector of the ribbon cable for the frontpanel PCB. This is the connector with the 'nose' pointing away from the cable.



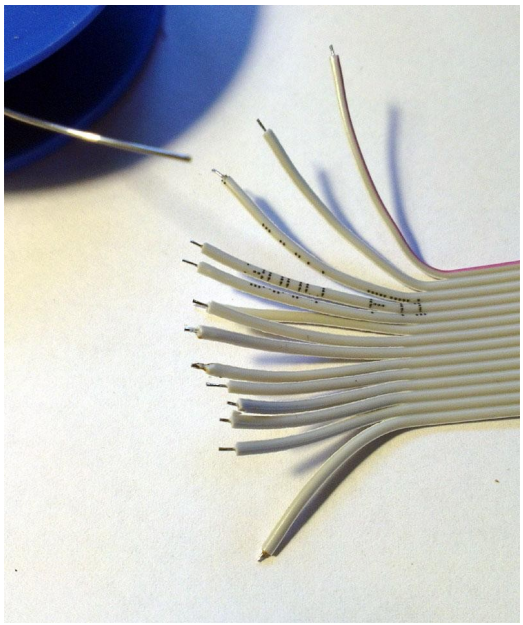
- Pull the cables apart a little bit and strip away the insulation from the tip of the cable.



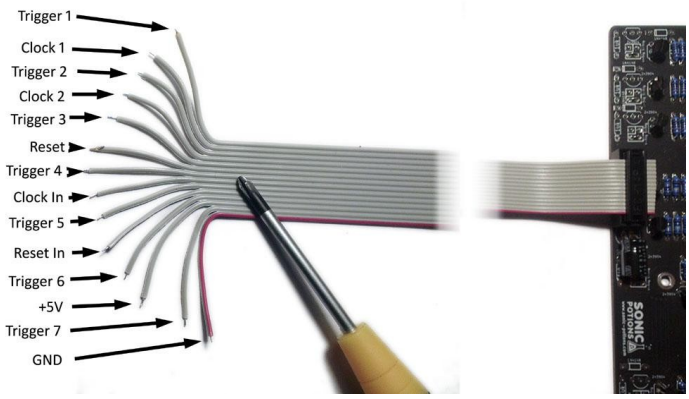
- Use some solder to tin coat the tips of the cables



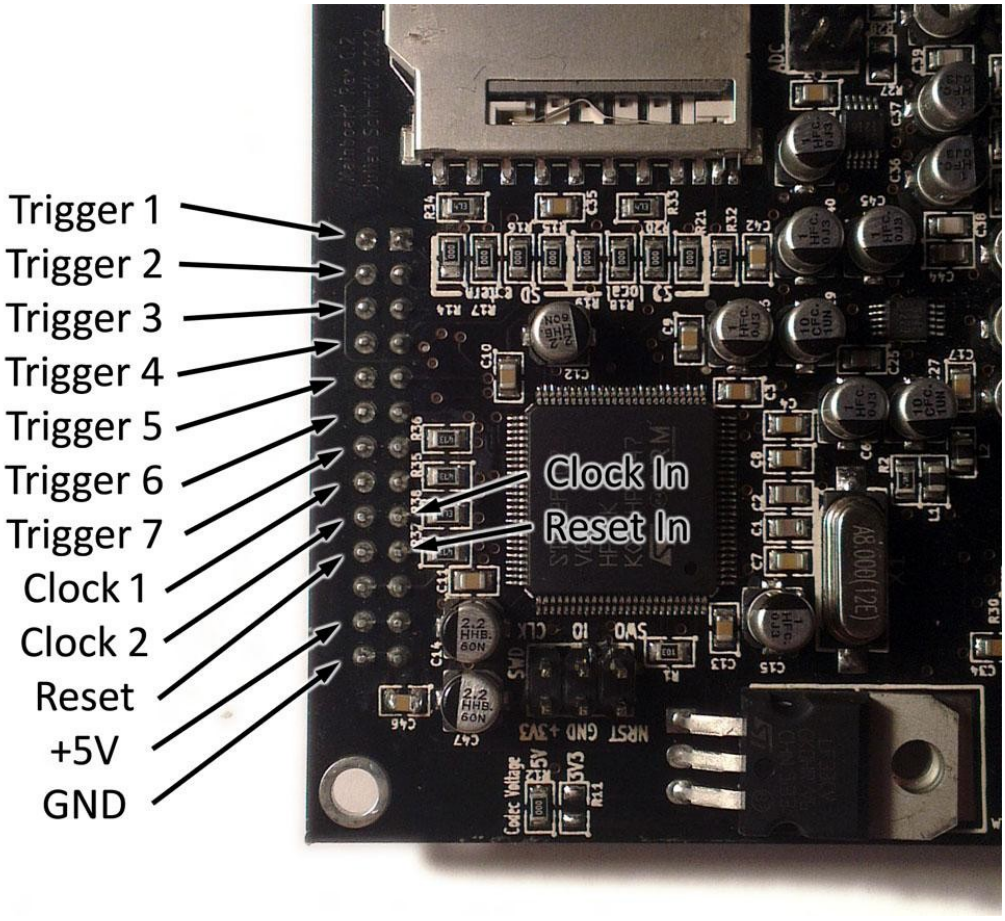
- Now cut the cable tips short, 1mm is enough. A short, tinned tip on the cable guarantees that it can not accidentally short out with an adjacent pin.



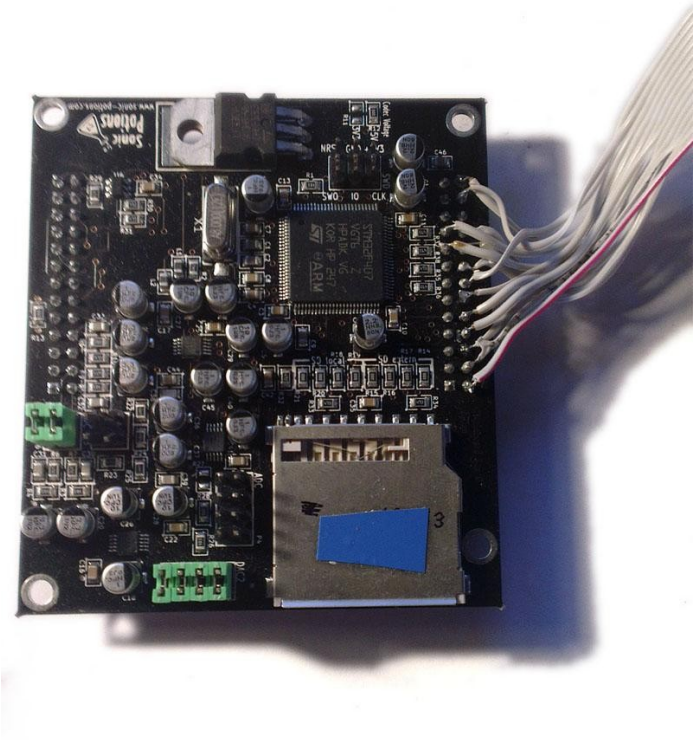
- These are the signals on the cable. Viewed from the top with the connector facing down. **Do not use the red stripe as reference!** it may be on the other side on your cable.



- Now solder the cables to the mainboard connector like this:



- It should look something like this:



Test the board

Before you assemble the Enclosure, it is advised to test the trigger board. It's quite annoying to spot a mistake after assembling the case!

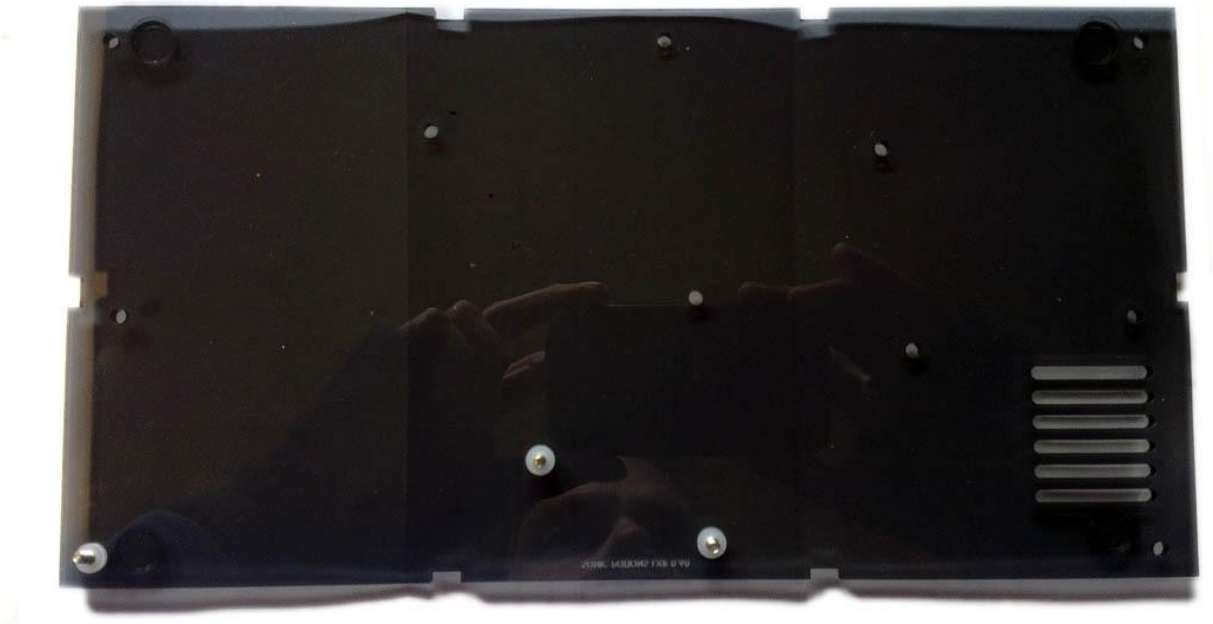
Enclosure assembly

First remove the ribbon cable from the trigger PCB. This makes the assembly easier.

Step 1 - Screws and Washers

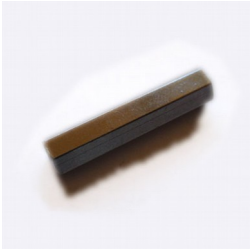
Put the 3 screws through the holes indicated on the image and add 3 plastic washers to each screw from the top.

Image	Description	Amount	Notes
	10mm M3 screw	3	
	plastic washers	9	



Step 2 - Attach PCB

Put the PCB on top of the washers and screw the new 27mm standoffs on top of it.

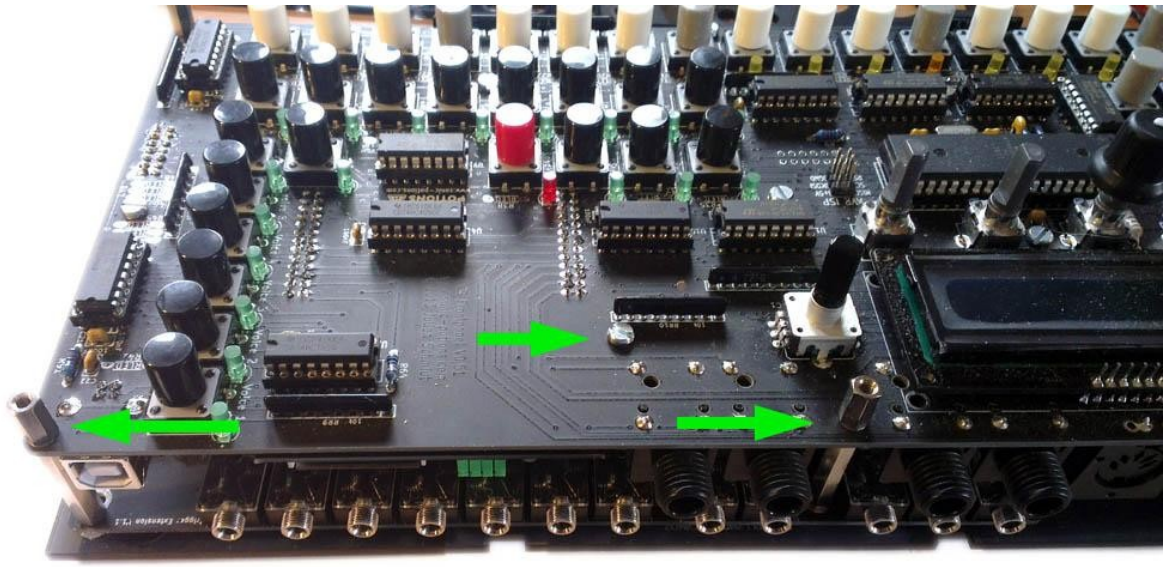
Image	Description	Amount	Notes
	27mm standoff	3	

Step 3 - Connect ribbon cable

If you havn't done it yet, connect the trigger IO to the LXR using the ribbon cable.

Step 4 - Attach LXR to Standoffs

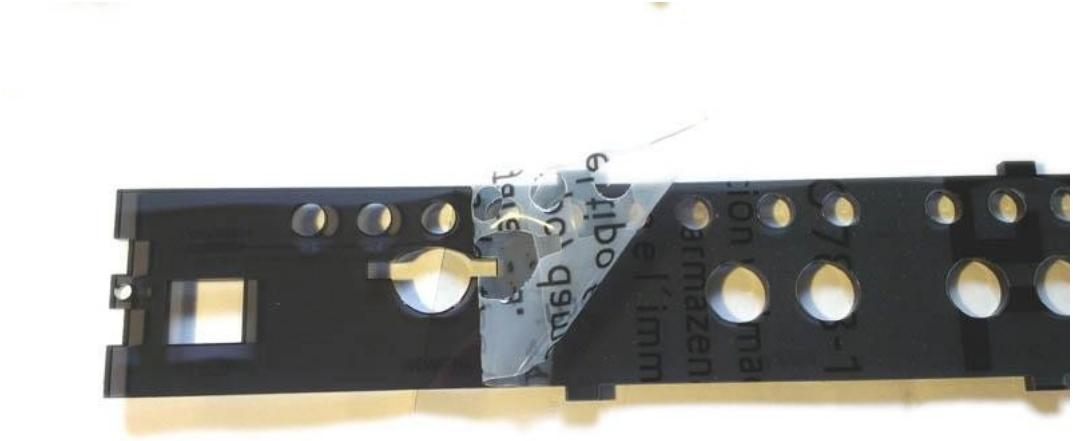
Remove the old 30mm standoffs from the LXR (see arrows) and screw it onto the trigger IOs 27mm standoffs.



Step 5 - Prepare backpanel

The lasercut bits may still be inside the backpanel. You can simply push them out.

Step 6 - Remove protective foil



Step 7 - Assemble enclosure with the new backpanel

Now you can assemble the rest of the enclosure with the new backpanel. Just follow the instructions for the regular enclosure assembly guide

MEMORY
AUDIO 1
R
L
OUT
MIDI
CLOCK IN
RESET IN
CLOCK 2
CLOCK 1
RESET