

# DISENTANGLER

## DIY BUILD GUIDE



INFRASONIC  
WAVE AUDIO

# BEFORE YOU BEGIN

Thank you for buying the DISENTANGLER DIY Kit! We hope you have fun building it.

This is a **beginner level** kit with only through hole soldering, ample clearance for everything, and a fairly small number of parts. That being said, it is recommended to have some practice with soldering technique as well as appropriate tools and supplies to ensure a successful build.

Please read the instructions carefully before each starting, and again before each step. Take your time and take breaks if you're feeling tired.

Feel free to contact [support@infrasonicaudio.com](mailto:support@infrasonicaudio.com) for troubleshooting. We're happy to help if we can, and if anything goes wrong we will do our absolute best to resolve it.

## TOOLS AND SUPPLIES

- Soldering Iron
- Philips Screwdriver
- Solder
- Knurled Nut Driver (optional)
- Third-Hand Tool or PCB Holder (optional)
- Multimeter (optional)
- Masking Tape (optional)

Take care of yourself – use appropriate personal protective equipment and/or active ventilation to avoid harmful exposure to flux vapors!

# PARTS LIST

These are the parts included in the complete DIY Kit (minus the power cable, mounting screws). See the [BOM](#) for additional details about parts.

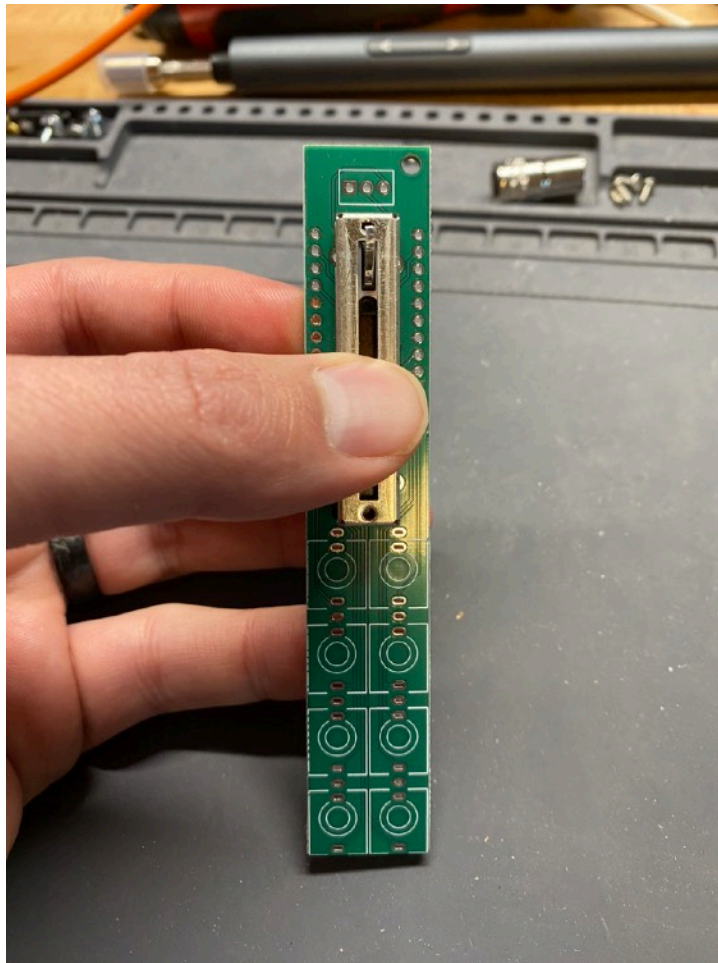
Quantity	Description
1	Front PCB (Bare)
1	Rear PCB (Surface Mount Pre-Assembled)
1	Front Panel
8	Vertical Mono Jack (Thonkiconn)
8	Knurled M6 Nuts for Jacks
1	Submini SPDT On-On Switch
2	Hex 10-48 Nuts for Switch (these might be on the switch already)
1	30mm B100K Slider
1	Slider Cap
1	Right-angle 2x5 power header
2	Pin Header, 1x10, 2.54mm pitch
2	Socket Header, 1x10, 2.54mm pitch
2	M2.5 Machine Screw
1	11mm M2.5 Hex Spacer

# STEP 1

## PARTS FOR THIS STEP

- Front PCB
- 30mm B100K Slider

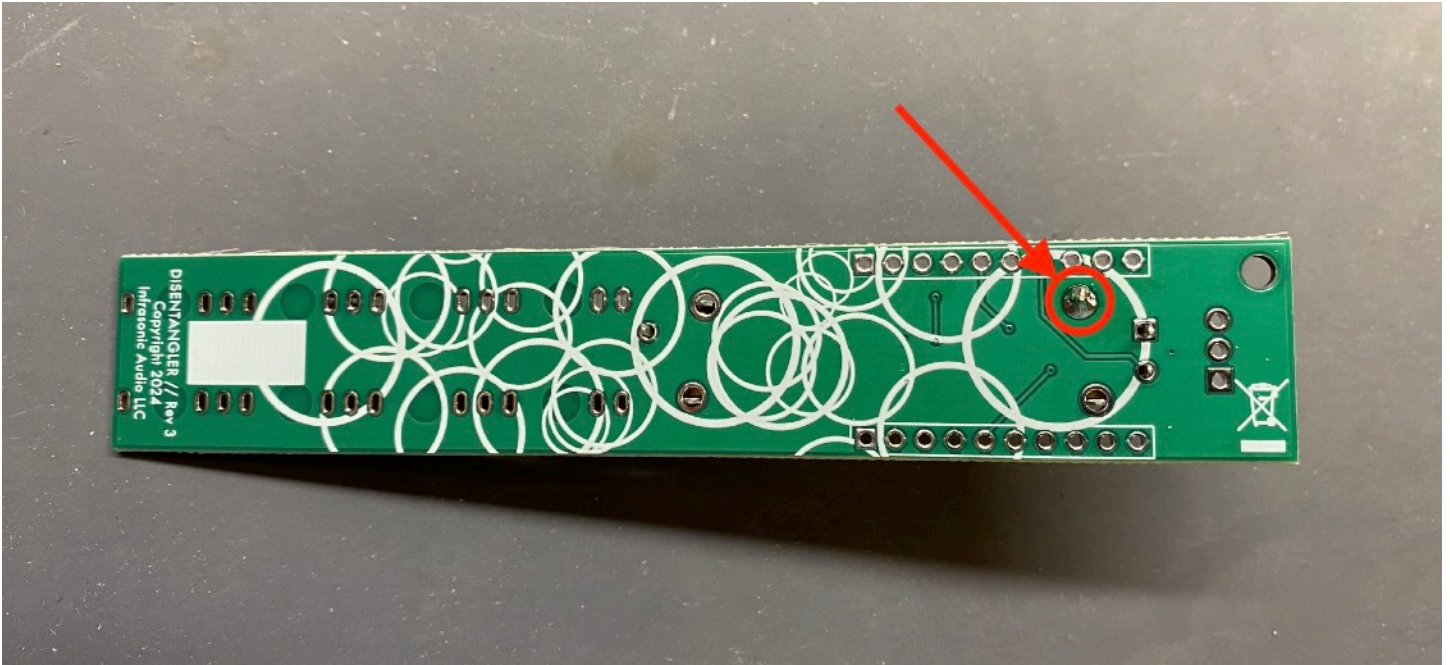
The first step is to solder the 30mm slider to the front PCB. Place the slider into the footprint on the side with the box indicating the slider position, as shown below.



**The most important thing is that the slider is flat and flush against the PCB.**

The easiest way to do this is to temporarily tape the slider down by tightly wrapping some masking tape around the middle of the slider to keep it held firmly against the PCB when you flip it over. For more experienced builders, it is also possible to skip the tape and hold the slider against the PCB with one hand while tack-soldering one joint with the other.

**Only solder one joint initially**, then flip the board over and make sure the slider is completely flat and flush against the PCB. It doesn't really matter which one you solder first, but one of the larger mechanical support joints are usually a little easier to start with, for example the one indicated in the picture below.



Once you've verified the slider is flat and flush, finish soldering the rest of the joints for the slider pins (7 in total).

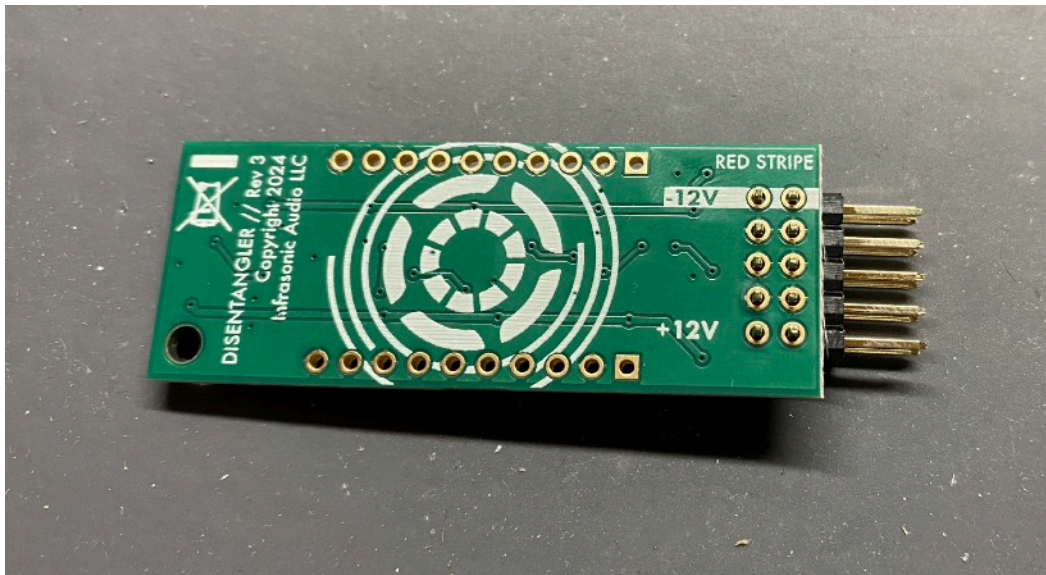


# STEP 2

## PARTS FOR THIS STEP

- Rear PCB
- Right-angle 2x5 power header

Next, take the rear PCB – the smaller one with all the SMD parts on it – and place the right-angle power header on the side with the box, as shown below.



Lay the board flat on your work surface as shown, keeping the header as straight as possible relative to the PCB, and solder **one joint** on the header. We recommend soldering one of the ones on the edges (-12V or 12V columns) as these are a bit easier to flow solder into than the ground pins.

Flip the board over and check if the power header is straight. If it's not straight, pick the board up with your non-dominant hand, and put your finger on the black plastic shield on the header, pushing it gently against the board. Carefully heat the joint you soldered to melt the solder so you can nudge the header until it's straight enough, then remove the iron and let the joint solidify again while the header is held straight.

Once the header is aligned correctly with one joint soldered, place the board back on the work surface with the joints facing upwards and finish soldering the rest of the joints.

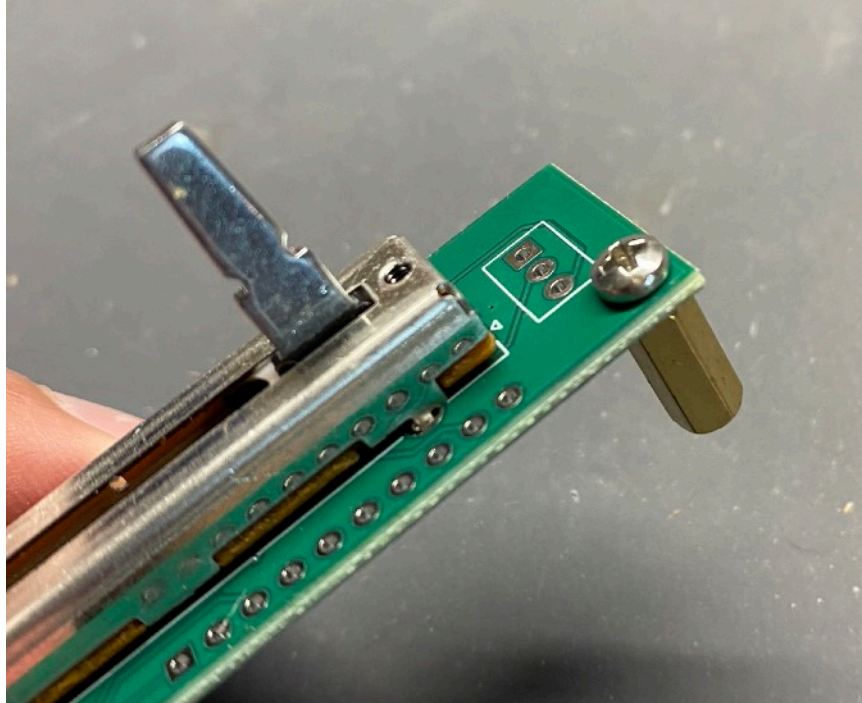
# STEP 3

## PARTS FOR THIS STEP

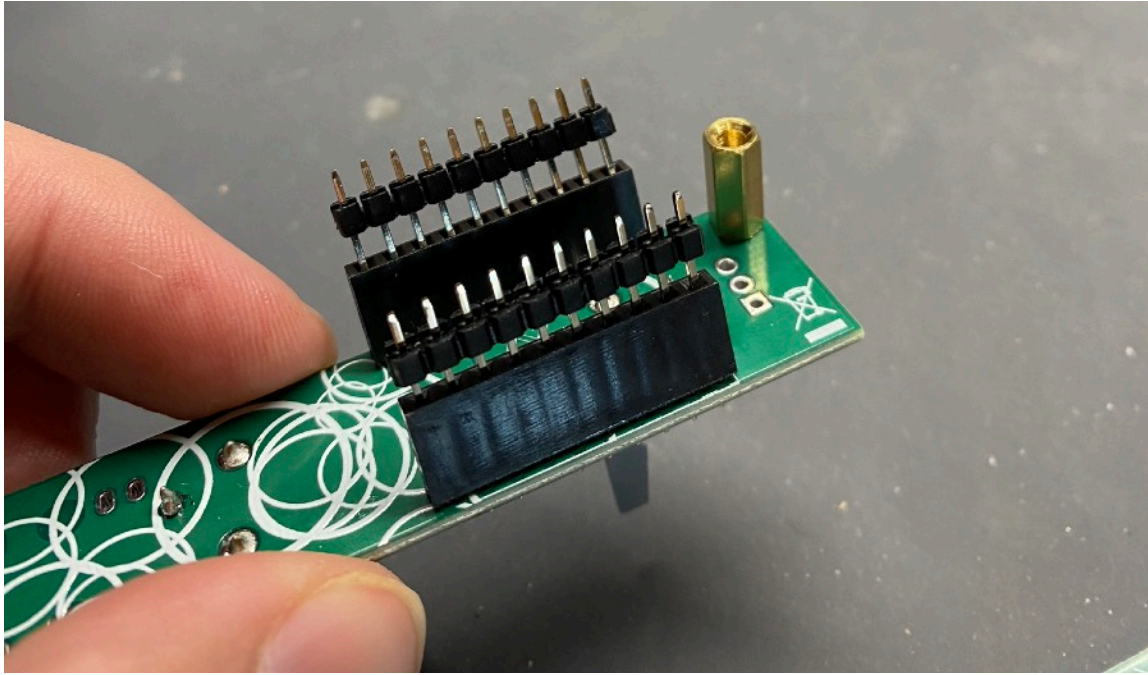
- Front and Rear PCBs
- (2) Pin Header, 1x10
- (2) Pin Socket, 1x10
- (2) M2.5 machine screw
- M2.5 x 11mm hex spacer

In this step, you will be assembling the “PCB Sandwich” using the headers, spacer, and screws, before soldering all the header joints. After this step, the rear PCB assembly will be completed, but you will remove the screw and spacer to separate the boards and finish soldering the front PCB.

First, screw the hex spacer onto the front PCB using one of the M2.5 screws, as shown below. You can do this by hand (finger tighten), there’s no need to use a screwdriver just yet.



Next, push the pin headers and sockets together – make sure the **longer side** of the pin header is going into each pin socket. You can push them all the way together, the image shows them sticking out a bit for illustrative purposes only.



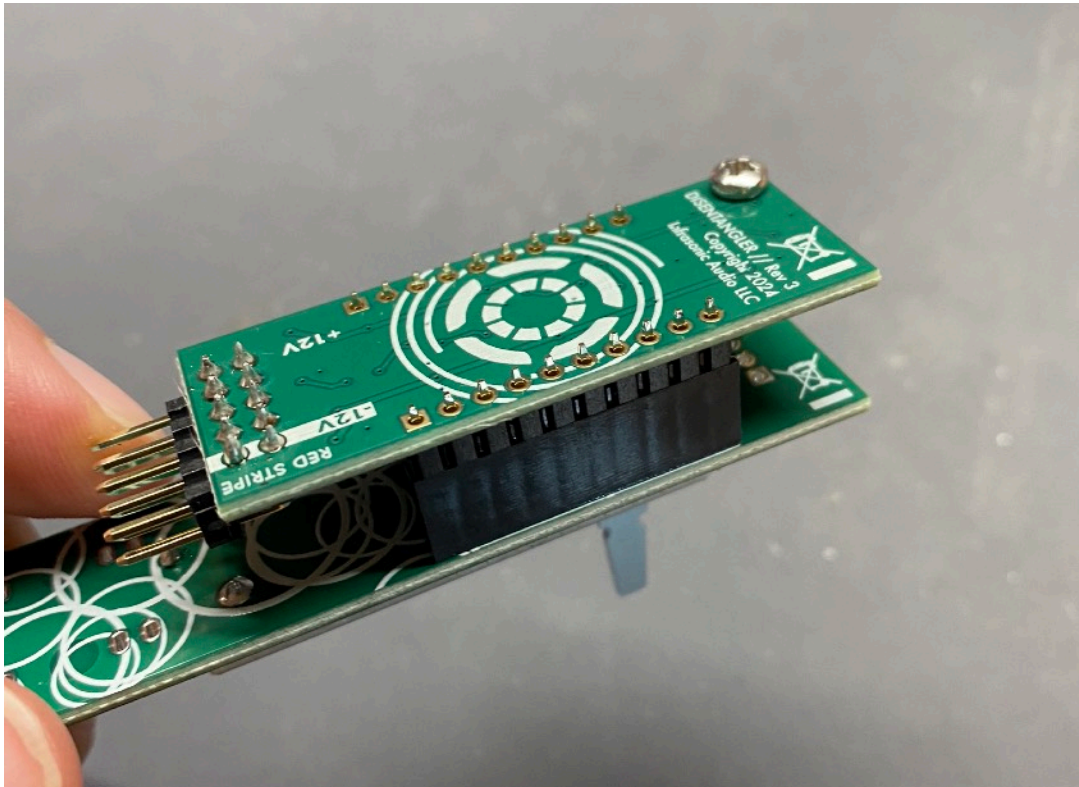
Next, place the pins extending from the pin socket strips into the holes on the back of the front PCB, as shown below. For this step, it is helpful to suspend the front PCB flat above your work surface, using a third-hand tool or similar.

With the headers sticking up as perpendicular as possible from the front PCB, place the rear PCB onto the pins with the SMD components facing towards the inside of the "sandwich" and the screw hole aligned with the spacer.

Then, screw the second screw into the spacer with a screwdriver. Don't over-tighten – just tight enough to keep everything aligned and held in place.



Once that is done, it should look like this:.



Finally, solder all the pins on both sides (4 rows of 10 joints each). Double check to make sure everything is straight as you're going, but the screws and spacer should do a good job holding everything together.

Once all the header joints are soldered and hardened, unscrew the screw from the rear PCB and carefully lift it out of the sockets and set it aside. You can leave the spacer screwed onto the front PCB.

# STEP 4

## PARTS FOR THIS STEP

- Front PCB
- Front Panel
- (8) Vertical Mono Jack (Thonkiconn)
- (8) Knurled M6 Nuts for Jacks
- Submini SPDT On-On Switch
- (2) Hex 10-48 Nuts for Switch (these might be on the switch already)
- Slider Cap

This is the final step! And the longest and most involved one. It's a good time to take a break if you need one, and then re-read the instructions for this step before getting started.

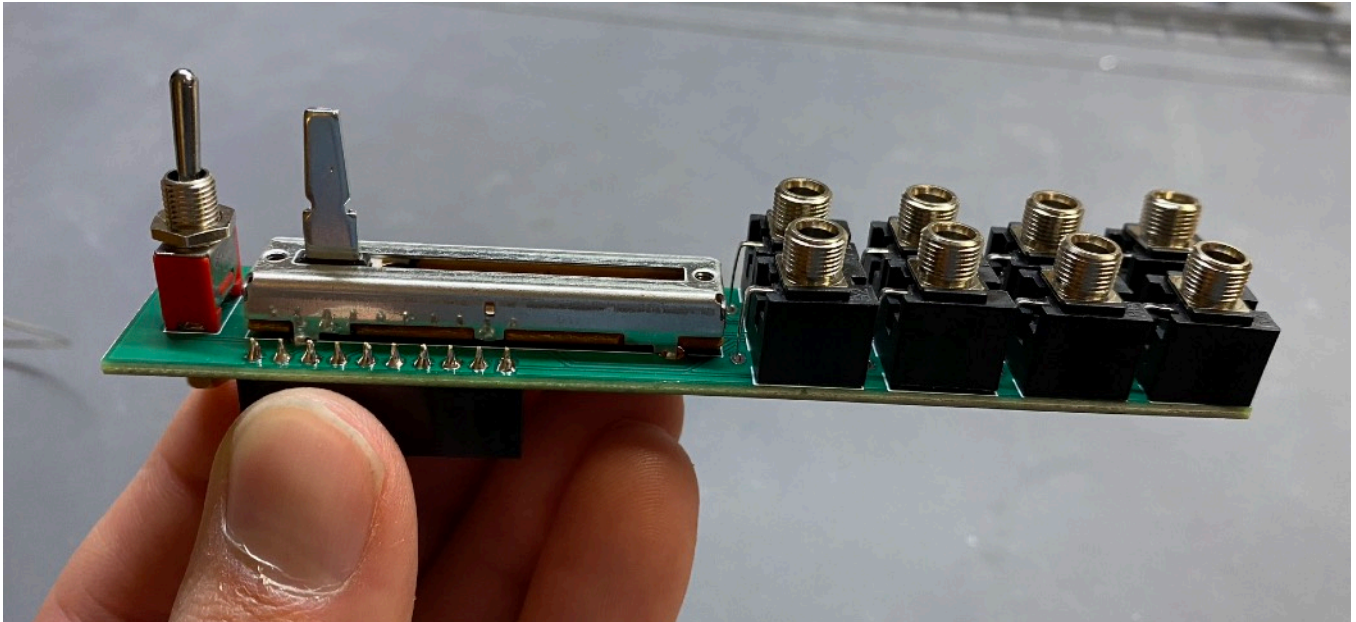
First things first: in order for the front panel to sit correctly on all the jacks and the toggle switch, the toggle switch needs to have just one of the nuts already installed on it, screwed all the way down. If the switch also has a thin locking nut on it (as some do), remove it first – you do not need the locking nut in this build. Screw one of the Hex 10-48 nuts all the way down on the switch.

*For the following steps – it's easy to accidentally knock the parts out of their footprints. Take your time and use third-hand tools or tape if it's helpful to keep things held securely until soldered.*

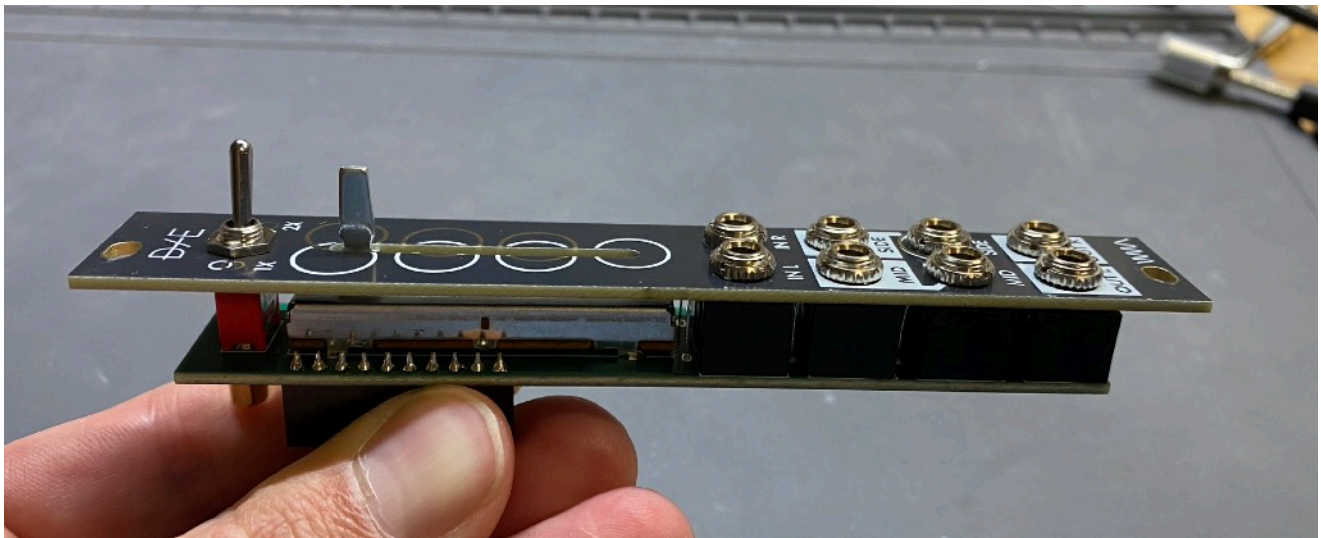
Next, take the front PCB and carefully place all the jacks in the footprints. The free/long leg on each jack should be facing toward the top edge of the PCB where the switch and slider are. Each jack has its own set of holes, and each jack hole should only have one pin in it.

Place the toggle switch in its footprint at the top of the PCB. The orientation does not matter.

**DO NOT SOLDER ANYTHING YET**



Carefully place the front panel onto all the parts, making sure everything stays flush and aligned. Then, screw all the corresponding nuts onto the jacks and toggle switch being careful not to over-tighten or lift the panel up in the process - if any of the parts come out of their footprints, you will most likely have to start over.



Once the panel is attached to the jacks and switch with the nuts, make sure once more that everything is aligned, parallel, and flush to both the panel and PCB, then flip the assembly over carefully and solder all the joints on the jacks and the switch. If anything is not aligned when you begin soldering, it can be tricky to fix, so it's very important to triple-check.

Place the rear PCB back into the pin sockets with the hole aligned with the hex spacer, and screw it down with the M2.5 screw, until it's just barely tight – do not over-tighten!

Push the slider cap down over the slider lever, almost all the way down to the panel but not quite – leave a tiny bit of space to avoid friction.

That's it, you're done!

# TESTING

DISENTANGLER does not require calibration, but it is recommended to test a few things to ensure that the build was successful.

First, with a multimeter set on its continuity check mode (you know, the one that beeps when the probes are shorted together), probe the pins on the power header marked -12V and +12V against each other, and probe each power rail against any of the center pins (ground) of the power header. Make sure there is no continuity. No beeps!

If you find a short circuit, first examine the solder joints for the power header to check for any solder bridges – that is by far the most likely place for a power/ground short.

If you still detect power/ground continuity but can't find the source, contact [support@infrasonicaudio.com](mailto:support@infrasonicaudio.com) for further troubleshooting.

## **To test the function of the module:**

1. Plug it into your system (note the red stripe orientation on the power header!) and turn it on.
2. Patch a stereo signal – or just two different oscillators or sound sources – into the IN L and IN R jacks.
3. Patch the OUT L and OUT R jacks to a stereo mixer or headphone output (headphones recommended) and listen to the signal
4. With the slider all the way up and the toggle switch pointed toward “1X” the stereo signal should be at its normal width, i.e. the input channels should be completely separated into the corresponding output channels.
5. Move the slider down. The input channels should now be summed together into both output channels – both output channels should be the same.
6. Put the switch to 2X and move the slider back up. The output channels should now have a little bit of each of the other channel mixed in and sound a bit “over-stereoized”. Toggle the switch back to 1X to hear the difference.
7. Patch an audio source into the MID input and another, distinct audio source into the SIDE input, and put the switch back to 1X.
8. With the slider all the way up, you should hear a weird out of phase blend of both signals. With the slider all the way down, you should hear only the MID input.