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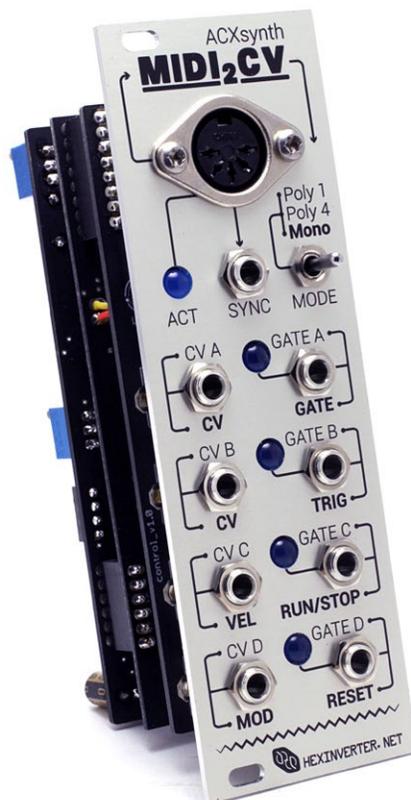
presents:

ACXsynth **MIDI₂CV**

DIY MIDI to CV/Gate Interface

ASSEMBLY MANUAL v1.0

Firmware v4.0



Introduction

This is the Assembly Manual for the MIDI2CV project. This manual will serve as a guide as to how to put together a step-by-step guide on how to assemble your kit module for the eurorack format, and a general guide as to how to assemble a PCB set into any format you desire.

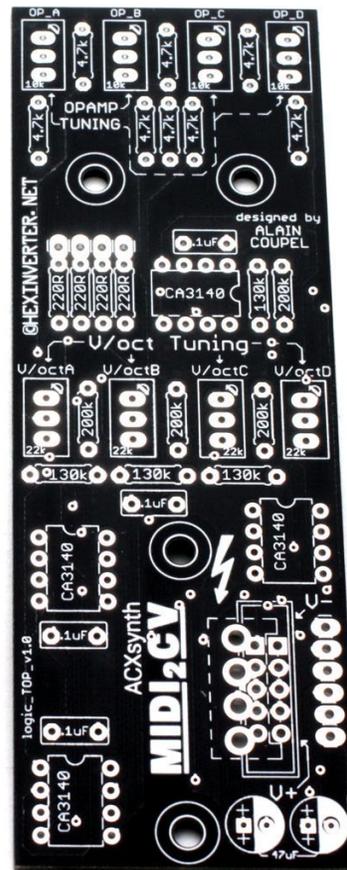
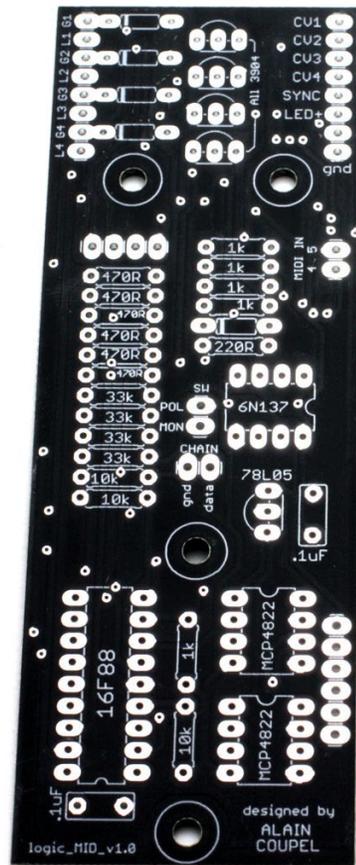
If you are looking for features, usage guides, design philosophy/description or how to tune the outputs of your MIDI2CV module, please see the User/Setup Manual available for download at the hexinverter.net project site **(CLICK)**.

If you are a kit purchaser, please compare your kit's contents with the Bill of Materials on the project page before building to check and see if any parts are missing. While I strive for perfection in my kit packaging, I am only human and sometimes mistakes are made! Please email me at [hex\[at\]hexinverter.net](mailto:hex@hexinverter.net) if something has accidentally been missed and I will sort it out!

Well, let's get started building!

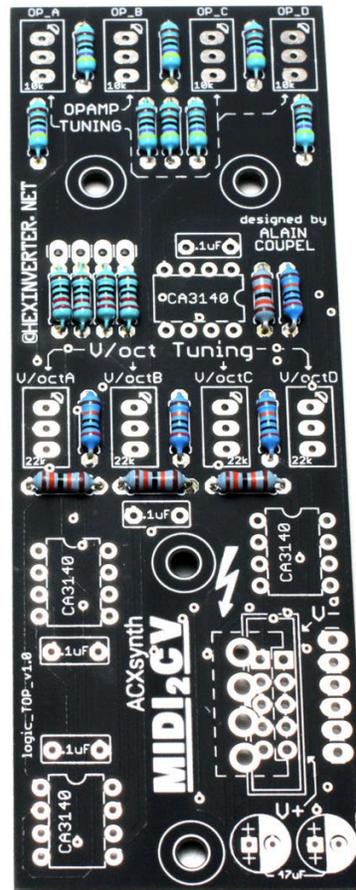
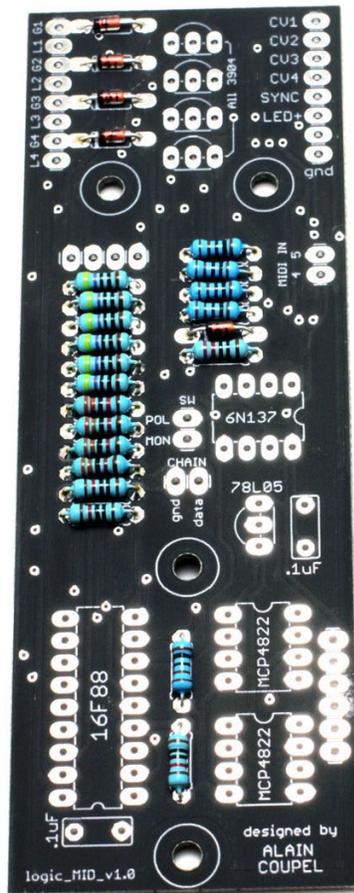
Top/Middle Logic Board Assembly (all formats)

The two logic boards make up the active circuitry for MIDI2CV. The eurorack control board is completely passive and. Be careful while assembling to make sure that you put inter-board jumpers on the correct sides of the boards, as it will only go together one way! **Study the photos carefully before soldering anything to make sure you're doing it right.**



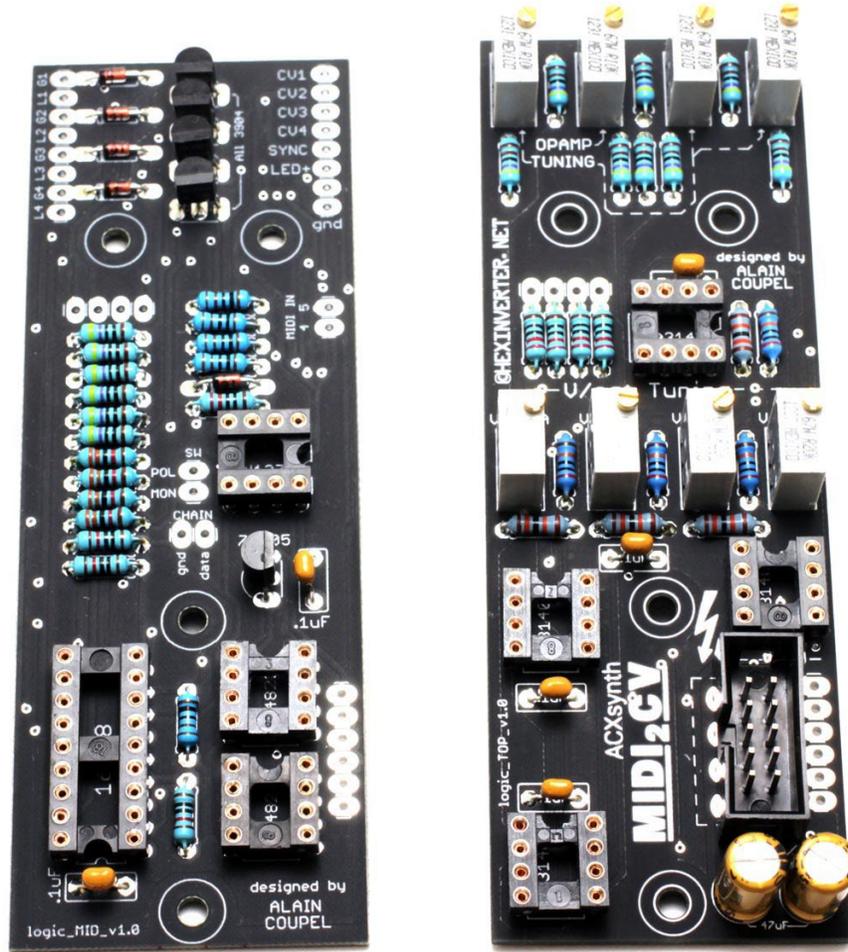
Step 1: Resistors and Diodes

Install the five diodes first, making sure that they are oriented in the correct direction. Then, install the resistors. Resistors do not care which way you install them.



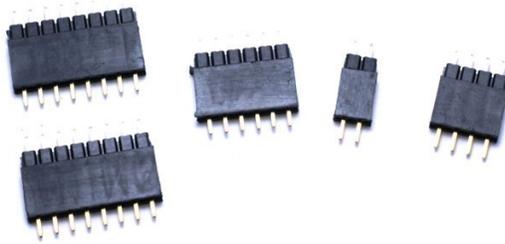
Step 5: Trim potentiometers, electrolytic capacitors and power header

Install the trim pots (direction does not matter except for aesthetics). Then install the two 47uF electrolytics, making sure they are oriented the correct way. Now install your chosen power header (Doefer-style eurorack shrouded header or MTA-156). If you aren't using either of these power headers, leave the spot blank and solder wires in for power later.



Step 6: Connect the two boards together

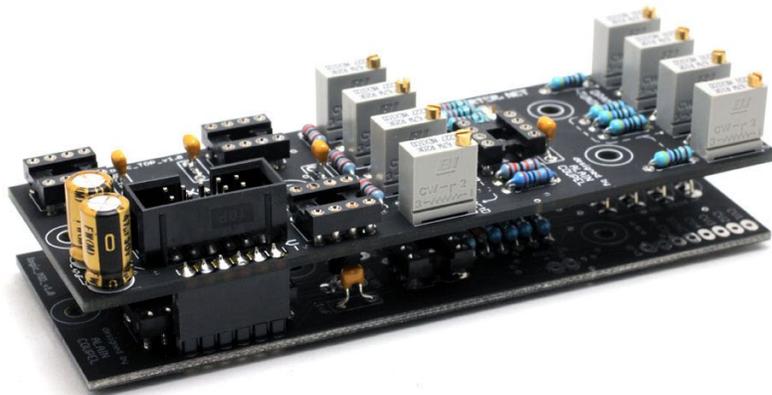
Prepare the 2.54mm/0.1" inter-board connect headers which you will use to connect the two logic boards together. Note that if you aren't building eurorack, you won't need all of these pictured.



Sandwich the two boards together with the unsoldered headers between. Begin soldering one pin at a time.

I recommend tacking one pin of each header and repeatedly testing the headers/PCBs for straightness during assembly. Adjust as necessary while re-heating with your iron so that the two boards connect perfectly together in the end. **I highly recommend having the two boards sandwiched together like this with the unsoldered headers between them connected while you solder. This means your PCBs will for sure be able to connect together in the end.** If you solder them with the connectors disconnected and one is off by a bit, the PCBs won't connect together well in the end.

You need the PCB stack to be nice and straight so the screws can hold the stack of boards together.



Make sure that you do not mess this part up. If you install a header on the wrong side of either PCB, you will have to desolder it! It will be a big mess and not very fun at all to deal with!

Here are some more photos detailing how the headers should be installed.



Done! That completes the two logic boards. You can now proceed to install the ICs if you are not building eurorack. If you are building eurorack, I recommend you leave the ICs out until later since you will be soldering to the PCBs more in the next step. (Skip ahead if you are not building eurorack)

Eurorack Control Board Assembly

In this final assembly section you will finish up your eurorack module by building the eurorack control board and affixing the panel to it.

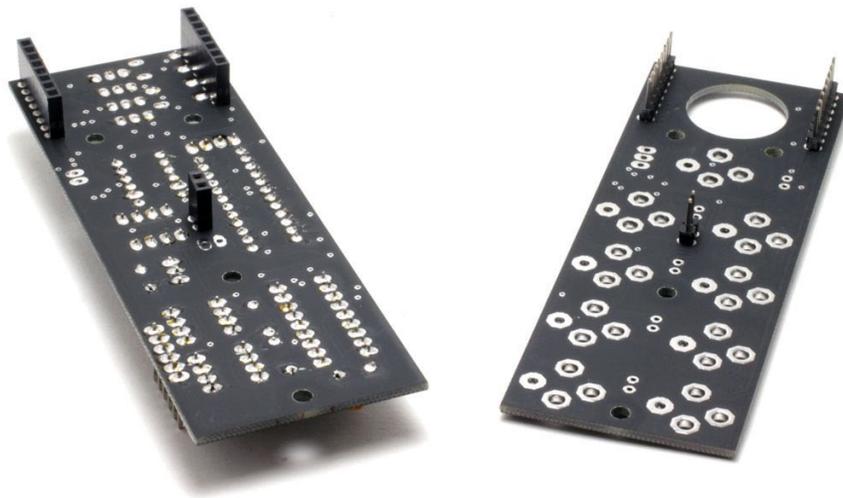
If you are building a format other than eurorack, you can skip this section and go ahead to the panel wiring guide for universal formats.

Step 1: Connect the middle logic board to the control board

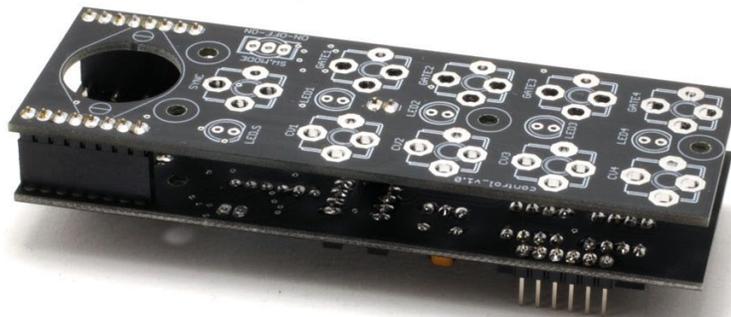
Gather the remaining header assemblies and prepare to connect the control and middle logic board together.



Study the images carefully until you are certain you are about to solder things the right way!



Once again, make a sandwich and tack one leg at a time, checking to make sure the PCBs are aligned correctly and the screws can easily pass through the holes straight.



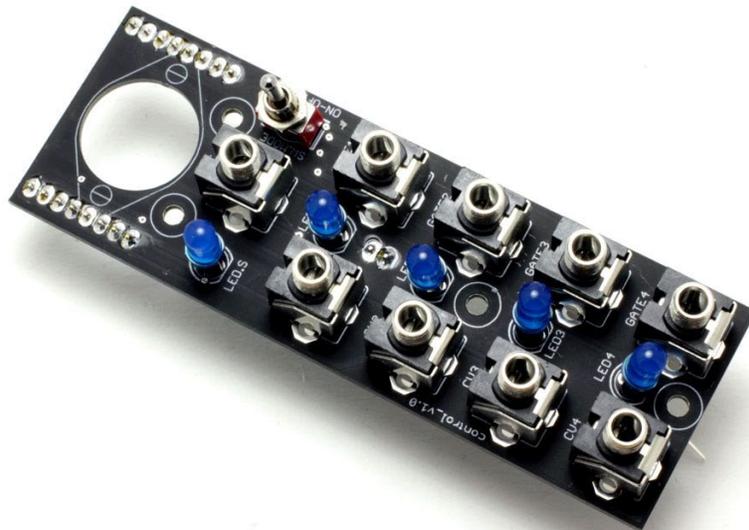
Step 2: Prepare the panel components and install them in the control board

Install the 5 LEDs in their panel spacers to prepare them for installation into the control board.



Begin installing control board components but **do not solder anything yet**. Make sure the LEDs are oriented correctly. (line the flat edge of the LED up with the flat edge on the PCB legend)

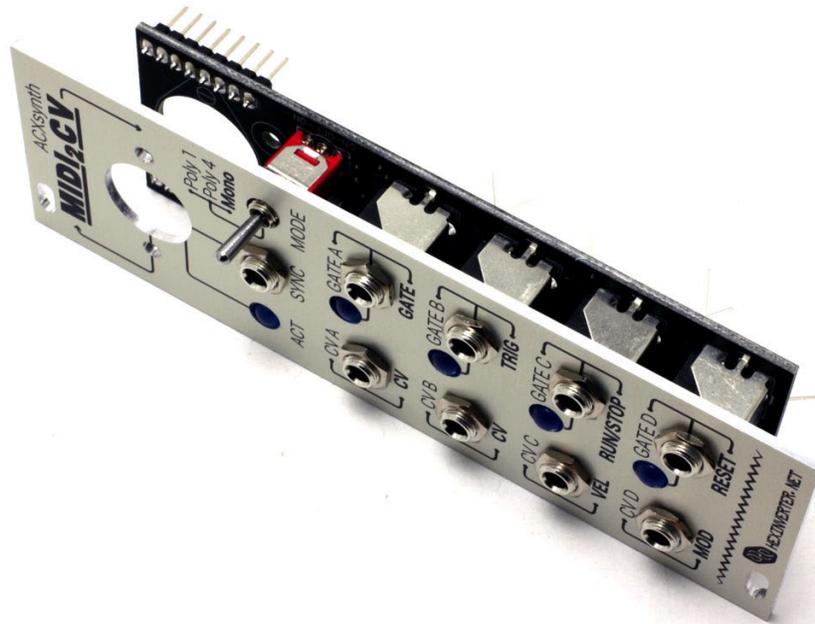
Kink the LED legs so that they don't fall out when you flip the board over later.



Step 3: Install the panel + hand tighten nuts

Remove the protective coating on the panel by peeling it off. Install the panel onto the control surface components.

Install and finger tighten the jack nuts on each of the jacks. We'll be removing the panel again soon so don't bother cranking them down yet.

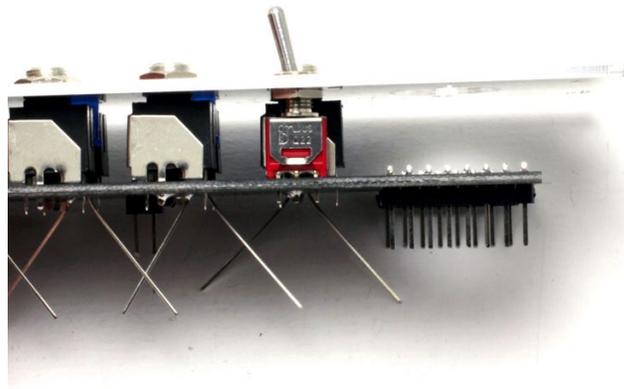


Step 4: Begin to solder control surface components

Making sure the panel is straight and flush against the jacks, solder one leg of a few of the jacks and one leg of each LED and switch. **Don't solder them all yet!**



Now adjust the switch nut so that it is the same height to the panel as the jacks.



Now, adjust each component (jacks, LEDs and switch) one at a time while re-heating the single pad you soldered earlier. **Make sure each component is straight and flush with the panel and readjust as necessary.**

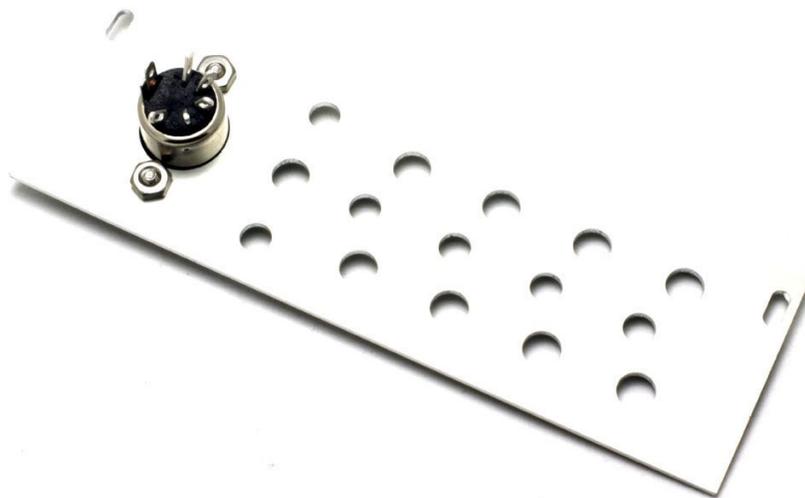
Once every part is adjusted, **THEN** you may solder everything!

Step 5: Install the MIDI jack into the panel

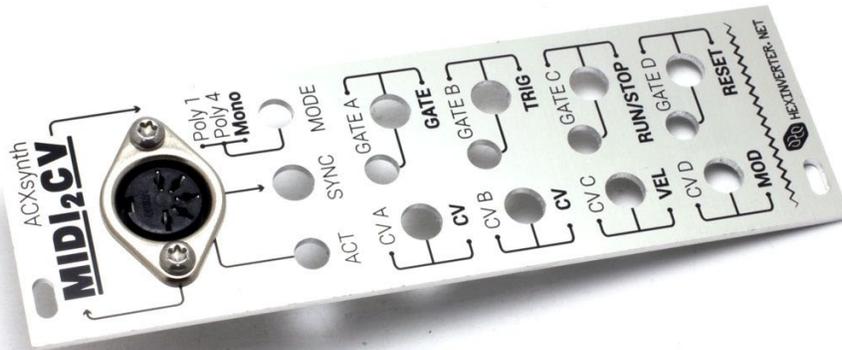
Remove the panel from the control board by unscrewing all of the jack nuts.



Using the two shorter machine screws with nuts and a Torx 10 (aka: T-10) screwdriver, affix the MIDI input jack to the panel.

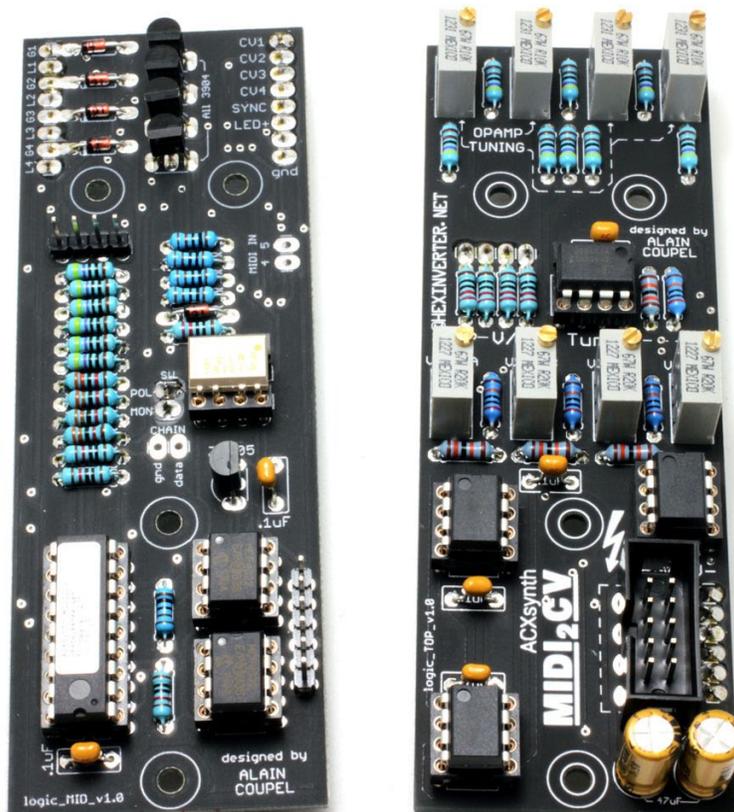


Ohhh, it's starting to look nice!



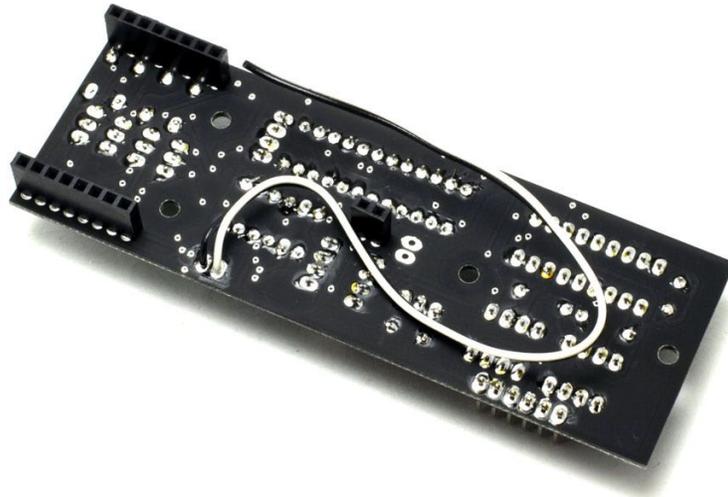
Step 6: Install the ICs

Carefully bend the legs of each IC slightly inward on your worktable and then install them to their respective locations. Be careful to install them the right way!



Step 7: Solder the MIDI connector to the middle logic PCB.

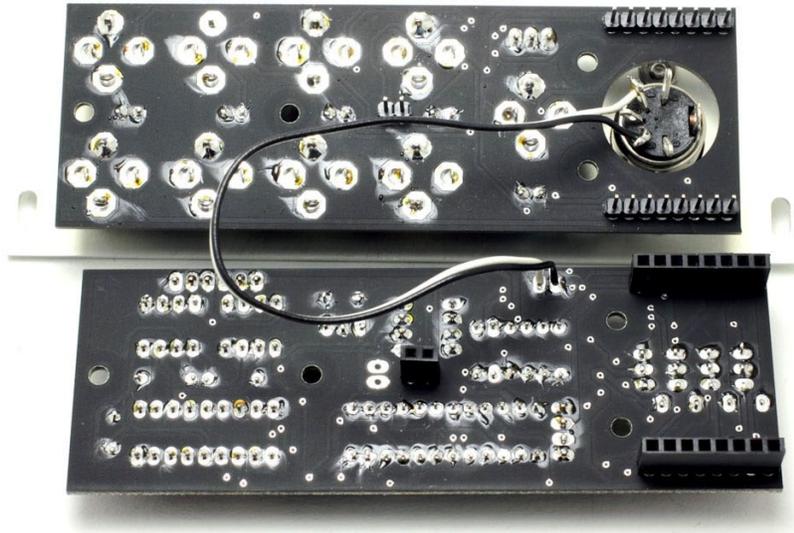
Begin by soldering the two conductor cable to the back of the middle logic PCB. Take note of which colour you have attached to which number of the MIDI connector as indicated by the legend on the PCB.



The numbers on the PCB correspond to the actual numbers printed on the back of the MIDI input socket. Easy!

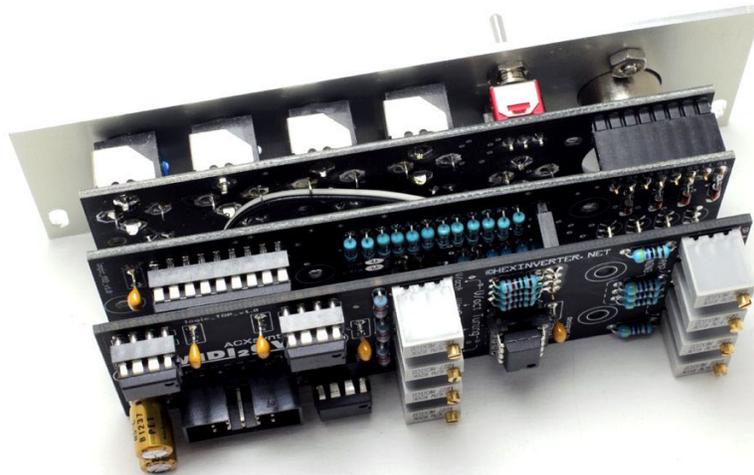


Attach the panel back onto the control PCB and then solder the wires to their respective numbers on the MIDI connector, passing the cable through the hole on the control board.



Step 8: Test fit the PCB stack

If all went well it should all stack neatly together like this!



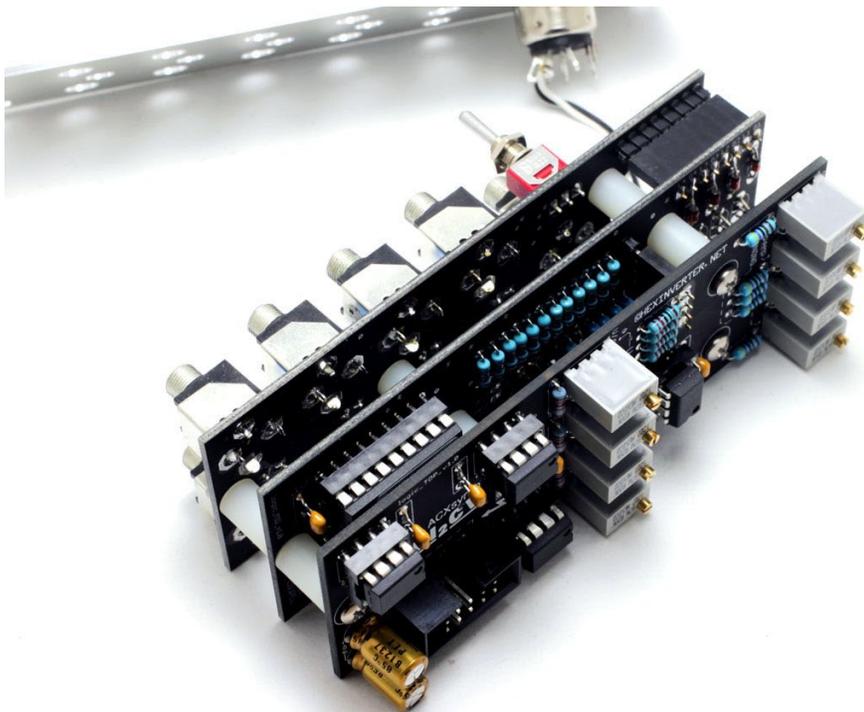
Step 9: Use the screws to hold the board stack together

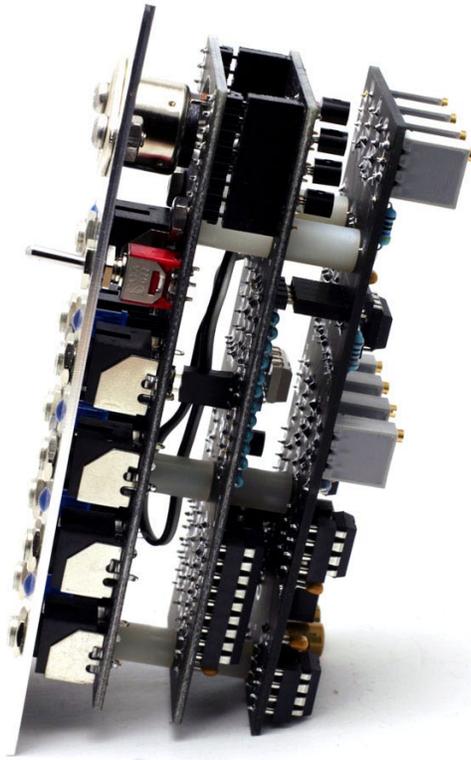
NOTE: You may want to test the module first to make sure it works alright before screwing everything together!

Grab the 8 spacers and 4 machine screws with nuts and then fasten the board stack together. You will likely have to remove the panel to do this.



This is how it will all look when it's done! I like to put the nut side on the control board and the philips screw/panhead side on the top logic board. It looks nicer this way.





Finished! YAY!

Now you can move on to calibrating your module for use. Please download and read through the User/Setup Guide from the hexinverter.net project site (CLICK**) for instructions on how to do that!**

Panel Wiring for Non-eurorack Builders

If you are not building eurorack format, hopefully you stopped following the step-by-step guide before the eurorack control surface PCB assembly and did not solder the control surface headers into where you now need to solder wires for your panel parts!

Please refer to the following diagram for how to wire a MIDI2CV in any format. You will be soldering wires to the middle logic PCB:

POTENTIOMETERS VIEWED FROM FRONT

