Conspiracy to Commit Electronics – Tungsten Preamp

The Tungsten preamp is an all-tube bass preamp and transformerless tube D.I. for use onstage and in the studio.

DISCLAIMER AND WARNING

This circuit contains high voltages exceeding 200V and is EXTREMELY DANGEROUS. Conspiracy to Commit Electronics is not responsible for any damage or injury caused by improper use or assembly. I encourage you to use the utmost care when building, testing, and using this pedal. If high voltages make you uncomfortable, DO NOT BUILD THIS. Just don't. This is not a beginner project and should not be treated as such. It was designed to be as easy as possible to assemble and make it work, but **you have to be careful**.

Normally I would recommend testing a circuit before putting it into the box, but in this case I recommend fully boxing the unit before testing for the sake of safety. If for any reason you need to probe voltages inside the box, do so with extreme caution, and only keep one hand near the box at a time, do not allow both hands to touch the box/circuit at the same time.

Recommended Build Instructions

Since this build is not only more complicated but also very different than typical DIY pedal builds, I've provided detailed build instructions at the end of this document. You're welcome to try your own method, but the boards were designed to be assembled using the methods explained in this document.

Bill of Materials

The links below are recommendations and suitable replacements can be used as needed.

Comment	Description	Designator	Qty	Link	Alternate
51R	1/4W Resistor	R1 (XLR PCB)	1	Tayda Link	
10n 100V	Film capacitor	C1 (XLR PCB)	1	Tayda Link	
AC3MAV2	XLR jack, PCB mount	J4 (XLR PCB)	1	Mouser Link	
SPDT	LONG BAT switch	GND LIFT (XLR PCB)	1	Tayda Link	
Screw	M3x12mm self-tapping	M3, M4 (XLR PCB)	2	Amazon	

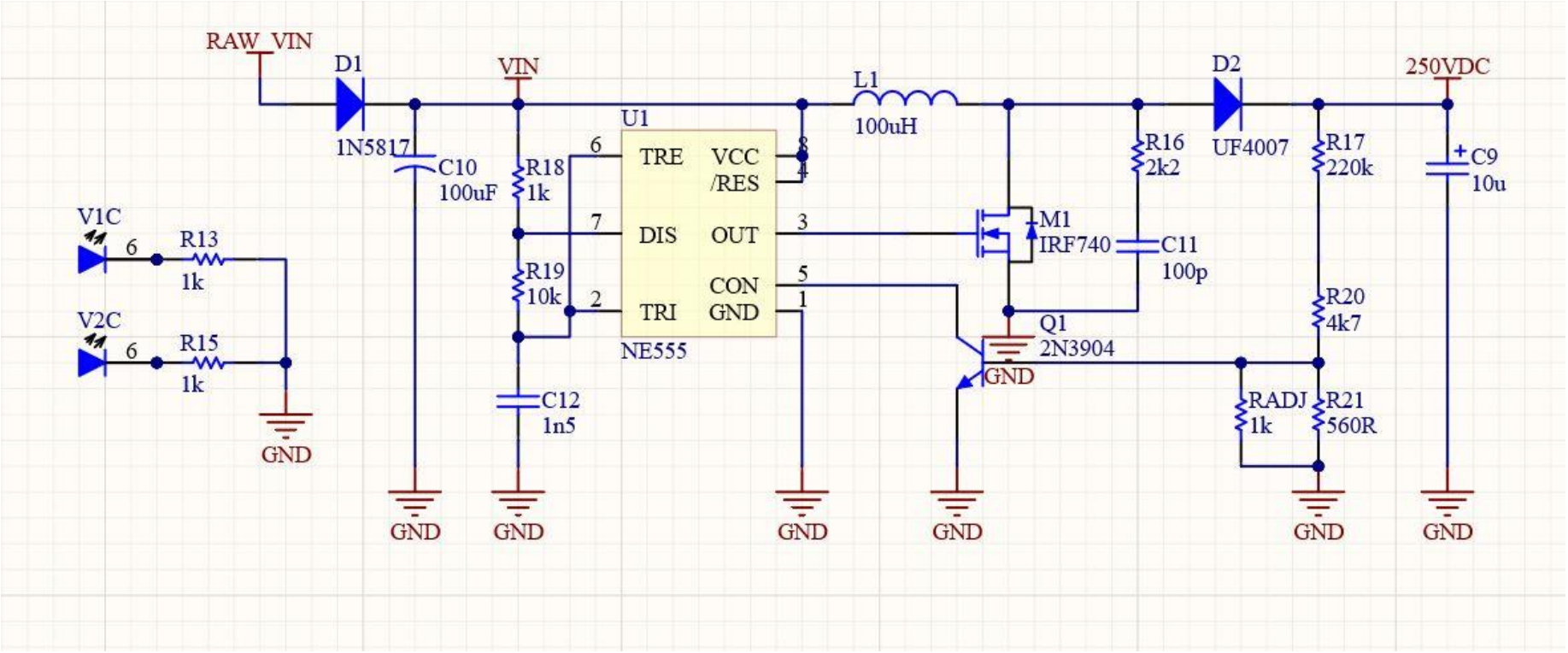
Comment	Description	Designator	Qty	Link	Alternate
560R	1/4W Resistor	R21	1	Tayda Link	
1k	1/4W Resistor	R8, R13, R15, R18, RADJ*	5	Tayda Link	
2k2	1/4W Resistor	R16	1	Tayda Link	
3k9	1/4W Resistor	R2, R3, R11	3	Tayda Link	
4k7	1/4W Resistor	R20	1	Tayda Link	
10k	1/4W Resistor	R19	1	Tayda Link	
47k	1/4W Resistor	R4, R7, R10	3	Tayda Link	
100k	1/4W Resistor	R1, R5, R6, R14	4	Tayda Link	
220k	1/4W Resistor	R17	4	Tayda Link	
1M	1/4W Resistor	R9, R12, R22	3	Tayda Link	
100p 50V	Ceramic capacitor	C11	1	Tayda Link	
500p 500V	HV Silver mica capacitor	C1	1	AP Link	
1n5 100V	Film capacitor	C12	1	Tayda Link	
33n 630V	HV Film Capacitor	C2, C3	2	AP Link	
100n 630V	HV Film capacitor	C6	1	Tayda Link	
330n 630V	HV Film Capacitor	C7, C8	2	AP Link	
4u7 25V	Electrolytic Capacitor	C4, C5	2	Tayda Link	
10u 400V	HV Electrolytic capacitor	C1**	1	Tayda Link	
100uF 25V	Electrolytic capacitor	C2	1	Tayda Link	
A250k	9mm Potentiometer	BASS, TREBLE, VOLUME	3	Tayda Link	SBP Link
500k	Trimpot	XLR OUT	1	SBP Link	
SW SPDT	Switch	ROLLOFF	1	Tayda Link	
1N5817	Schottky diode	D1	1	Tayda Link	
UF4007	Ultra-fast rectifier	D2	1	Tayda Link	
100uH	100uH 2A Inductor	L1	1	Tayda Link	
IRF740	N-Channel MOSFET	M1	1	Tayda Link	
2N3904	NPN Transistor	Q1	1	Tayda Link	
NE555	Timer	U1	1	Tayda Link	
12AX7	Dual Triode	V1, V2	2	AP Link	
9-pin socket	Tube socket	V1, V2	2	AP Link	
2x5 header	2x5 right angle	V1, V2	2	Tayda Link	
Standoff	M3x10mm standoff		3	Tayda Link	

Comment	Description	Designator	Qty	Link	Alternate
Nut	M3 nut		3	Tayda Link	
Screw	M3x8mm machine screw		3	Tayda Link	
1/4"	1/4" audio jack	J1, J2	2	AP Link	LMS Link
2.1mm	2.1mm DC jack	J3	1	AP Link	LMS Link
Knobs	(your choice)	External	6	Tayda Link	
LED	(your choice)	Tube daughter PCB	2	Tayda Link	

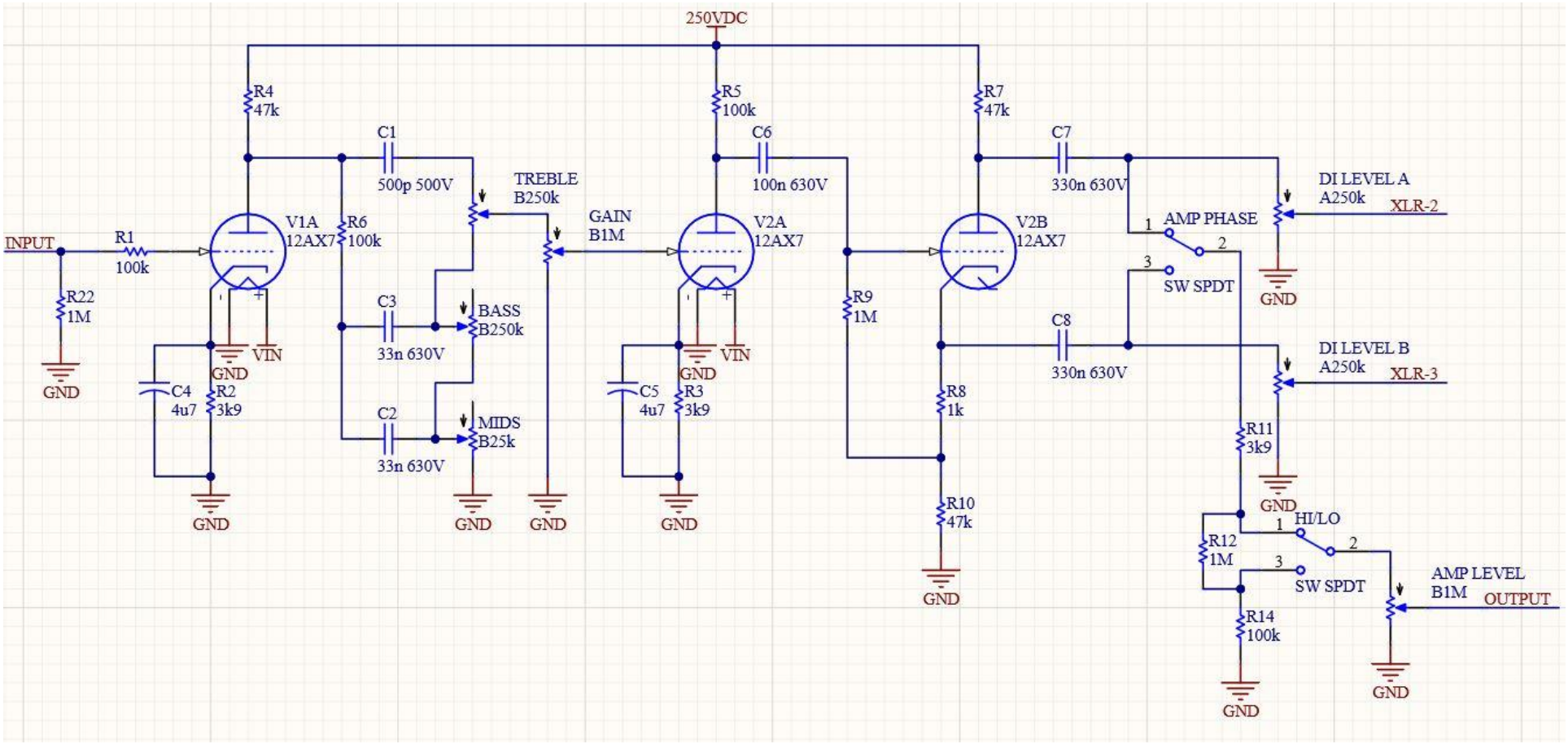
* RADJ is an optional resistor to adjust the high voltage level. 1k is a recommended starting point, and a value lower than 1k is not recommended.

** The voltage rating of C1 should be adjusted based on the high voltage level set by RADJ. If RADJ is not used, a 250V capacitor is suitable for C1. If RADJ is used, 400V minimum is recommended.

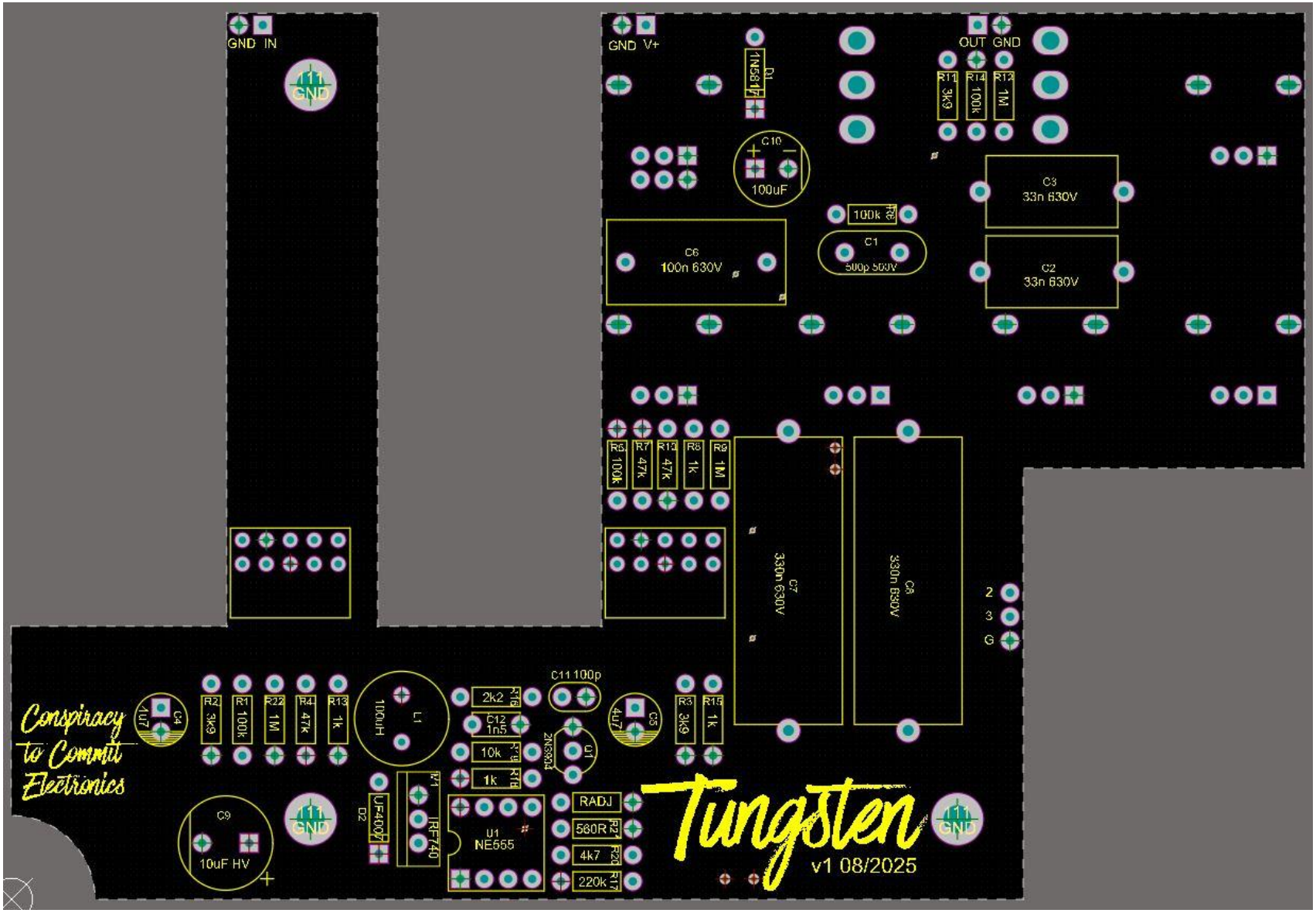
Schematic: Power Supply



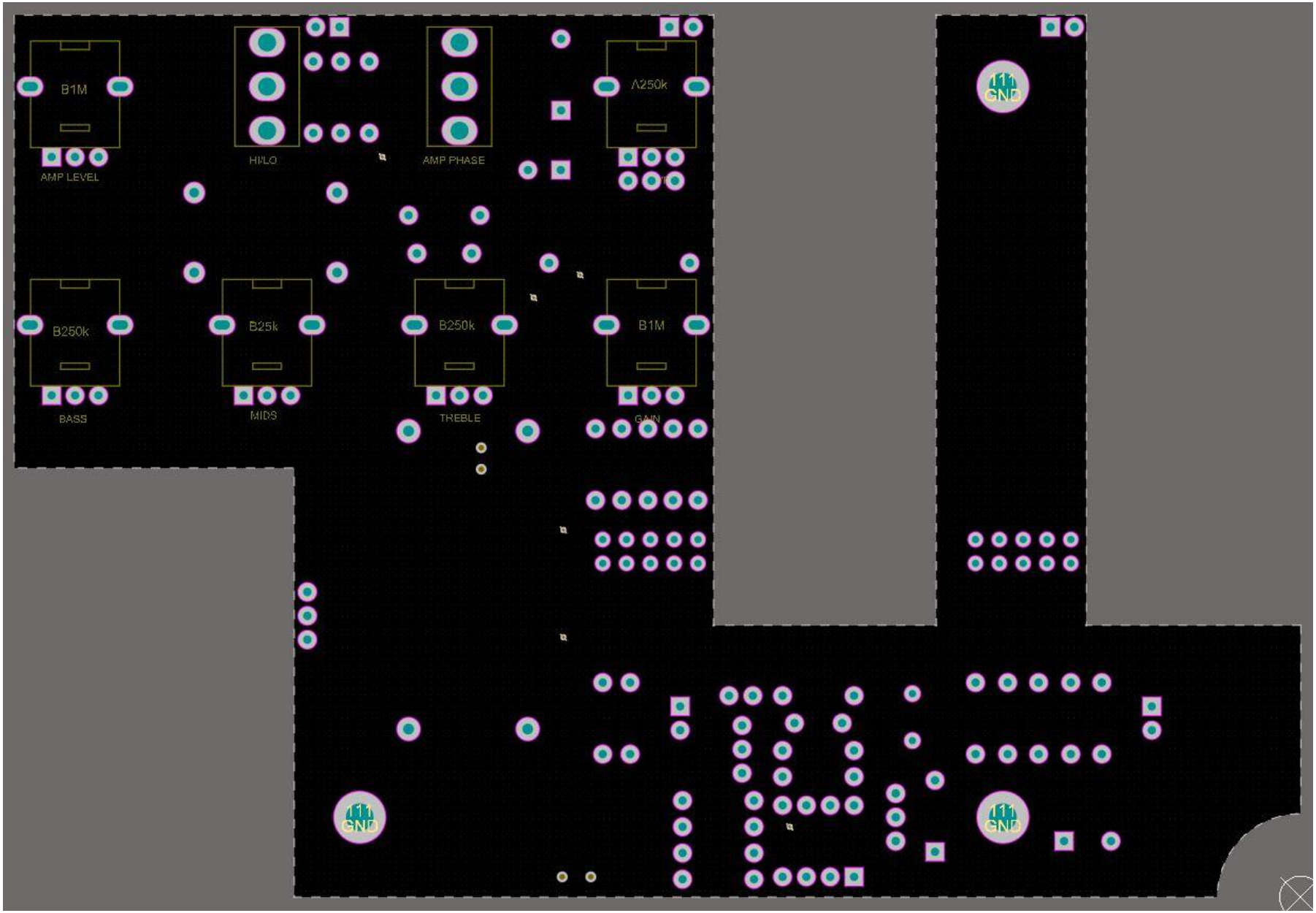
Schematic: Audio



Board Layout - Top



Board Layout - Bottom



Drill Template – 1590XX

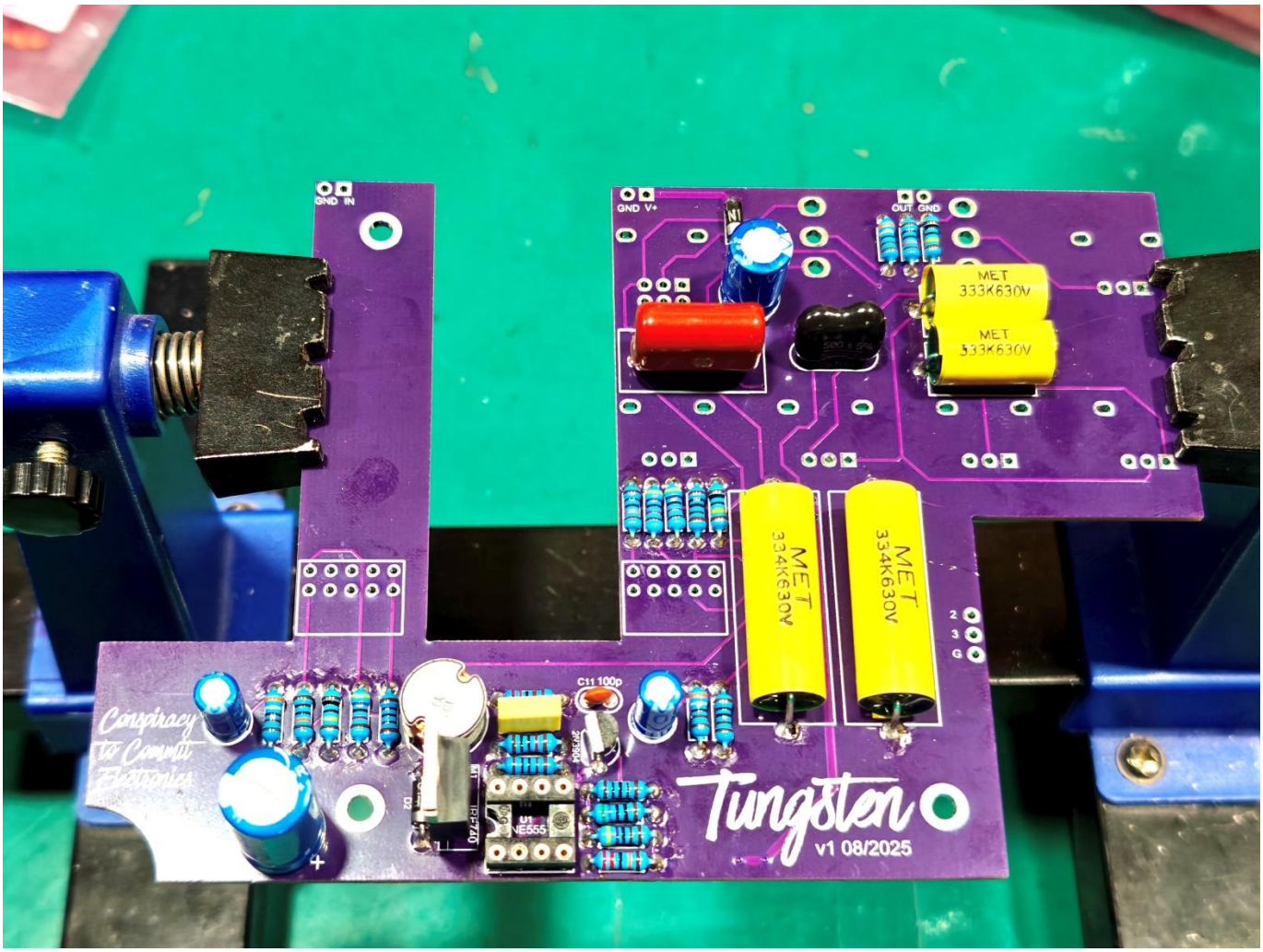
Print to 100% scale; provided as a reference with no guarantees. The small holes to the right side of the enclosure face are optional for tube ventilation. Feel free to use as many (or few) of them as you want.

Drill Template coming soon

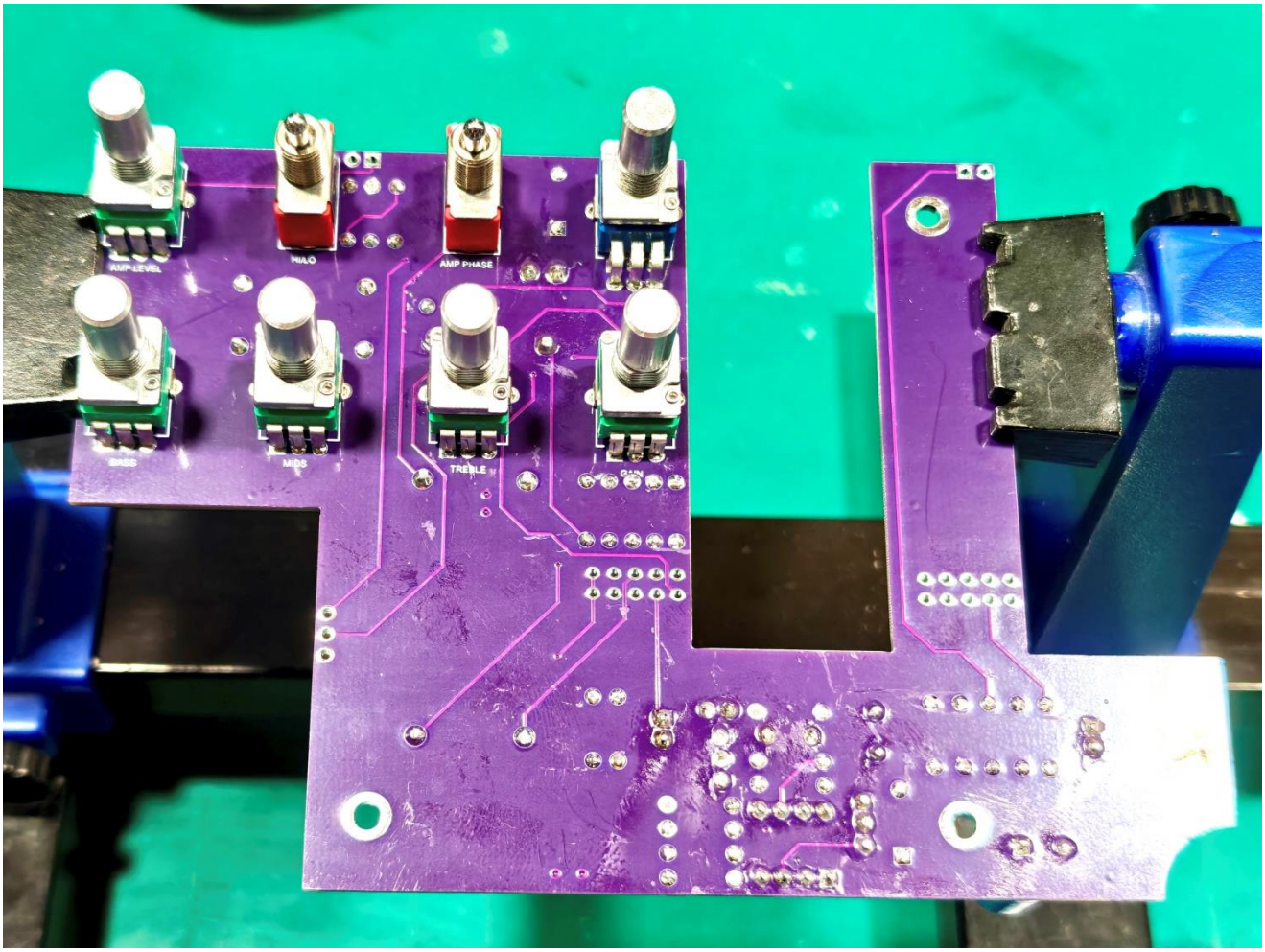
Detailed Build Instructions

Due to the complexity of the build, please reference the following instructions. Due to similarities between Mirage Tremolo and Black Eye build process, Black Eye images have been used here.

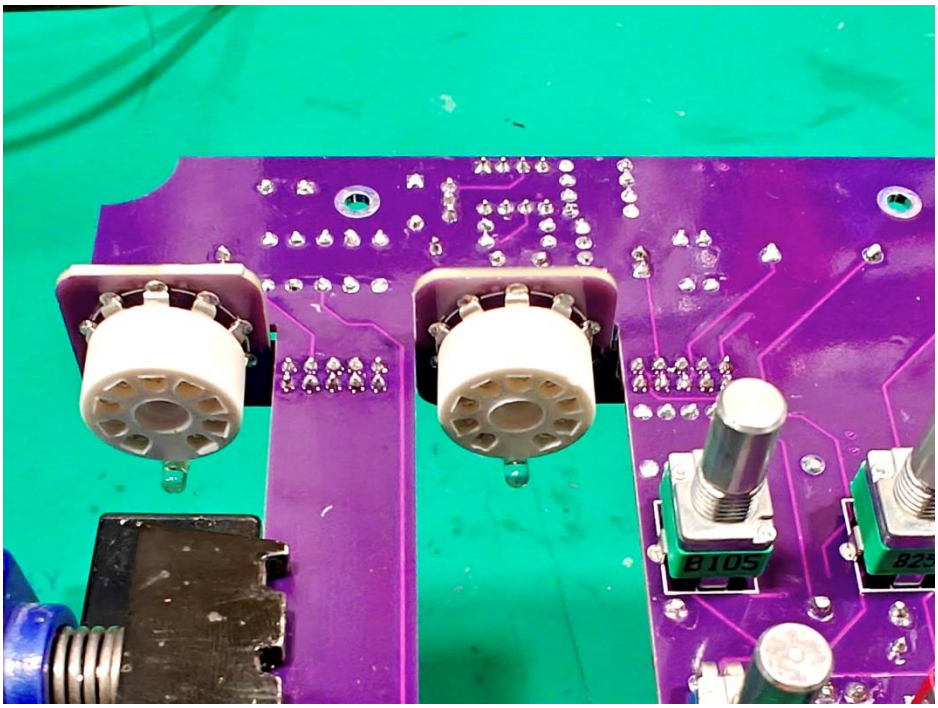
1. Assemble the main PCB. Solder the components to the top of the main PCB and clip the excess leads from the bottom.



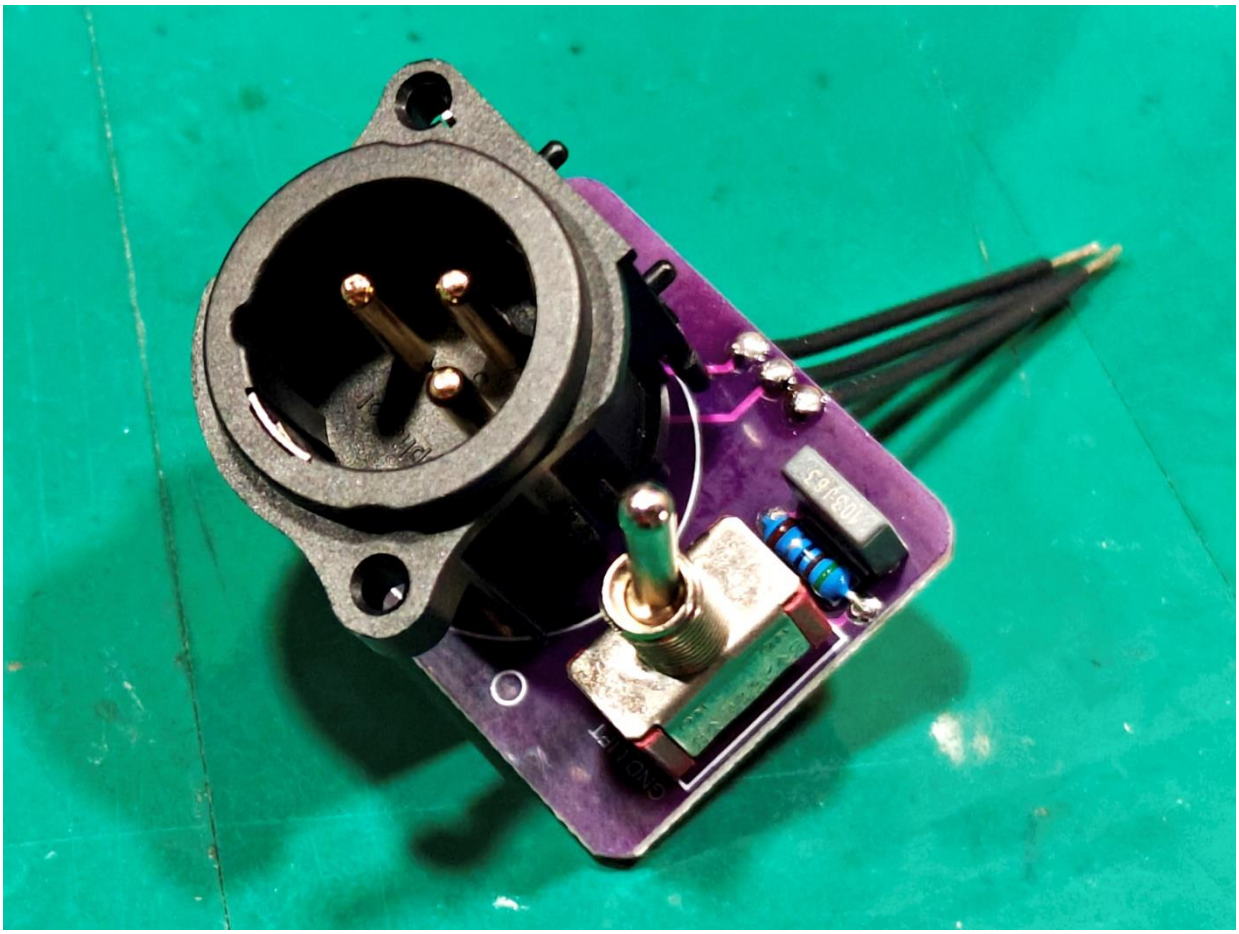
2. Attach the pots. Connect the pots to the bottom side of the main PCB and solder them in place. The two pins on the side of the body are for stability and are also used as a ground connection to the chassis and it is recommended that you solder them in addition to the 3 main signal pins.



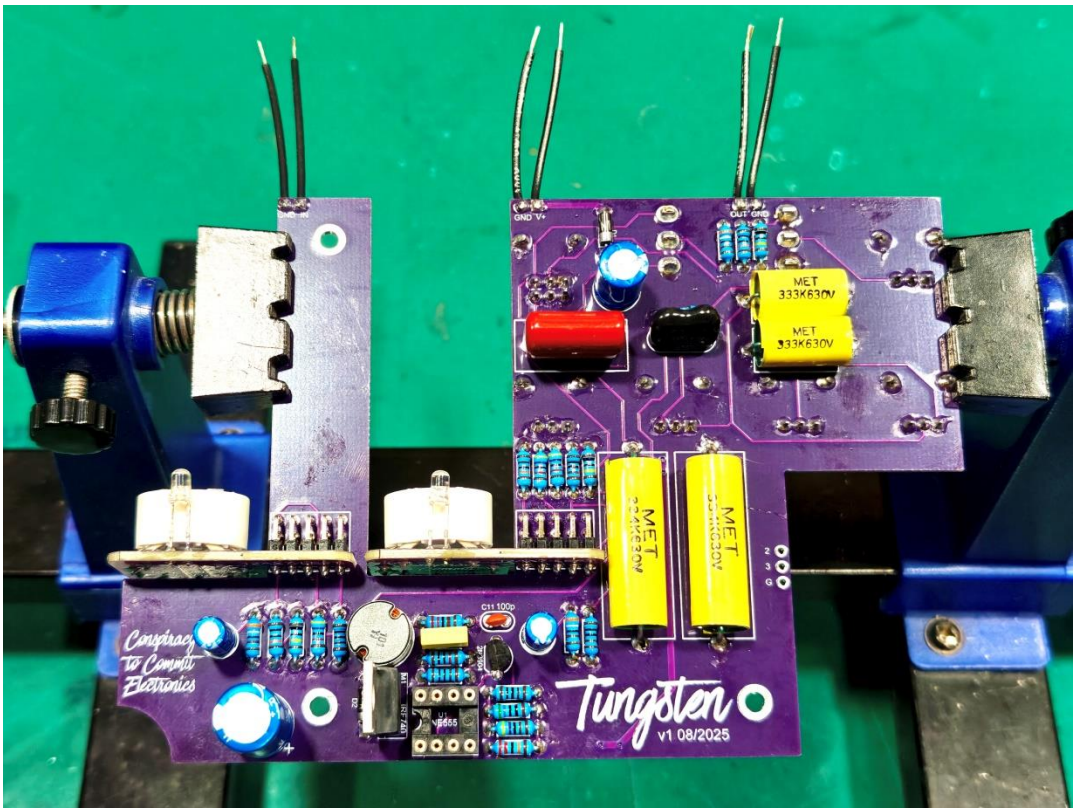
3. Attach the Tube Daughter Boards. After assembling the tube daughter board per these instructions, slide the pins into the pads on the board until the daughter board sits flush with the main PCB, and then solder the pins in place from the bottom of the main PCB. Solder the wires to the pins on top of the PCB.



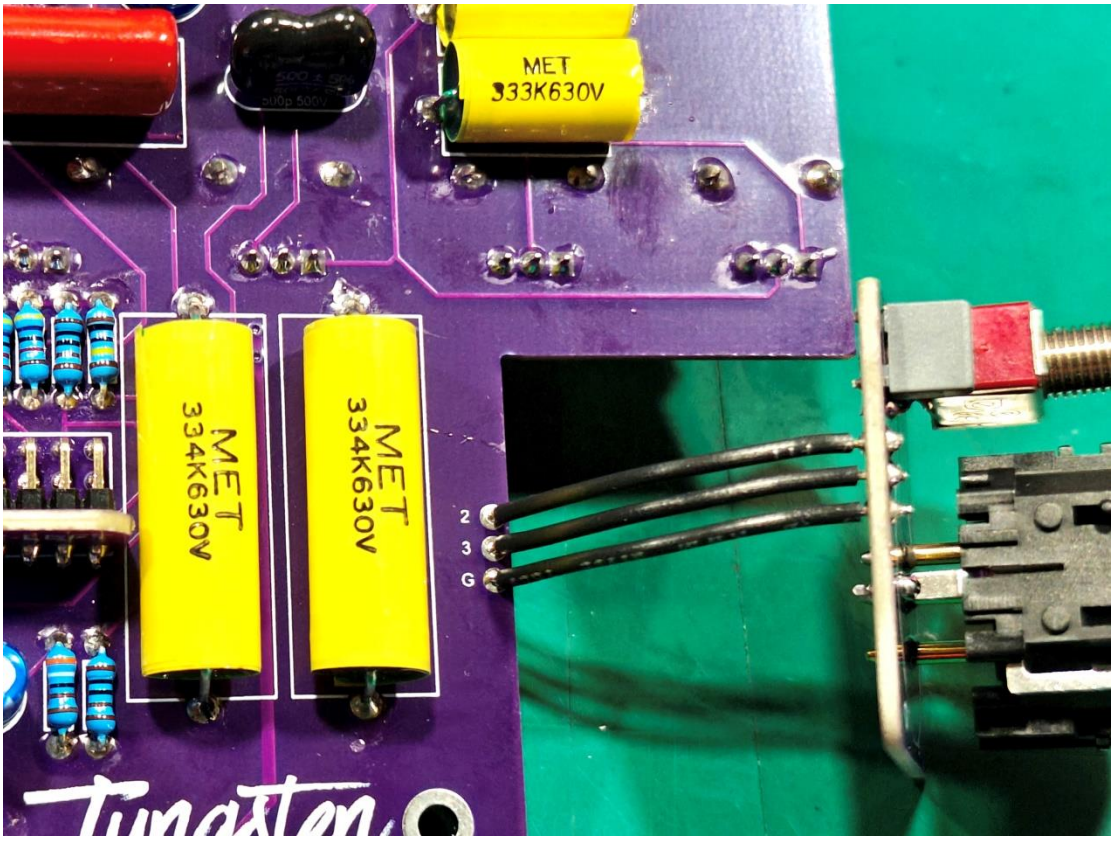
4. Assemble the XLR daughter PCB and attach wires to each of the pads.



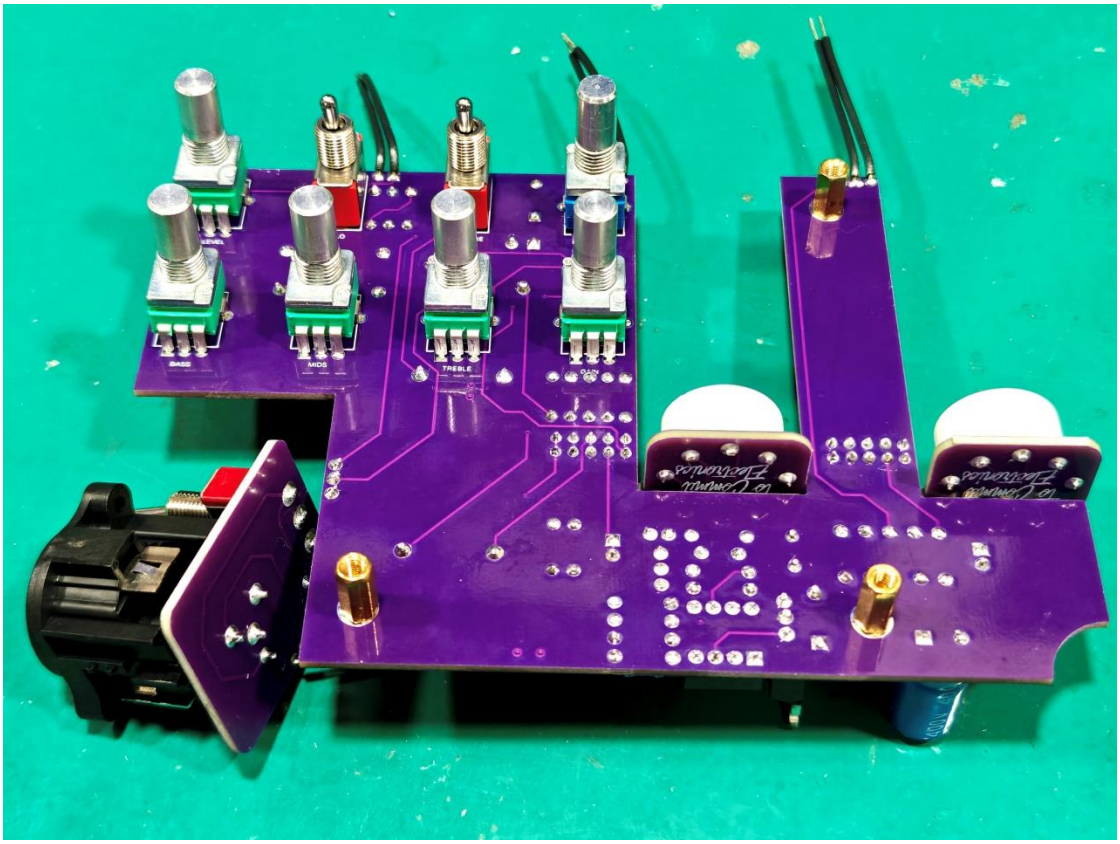
5. Attach wires to the input/output jack pads at the top of the main board.

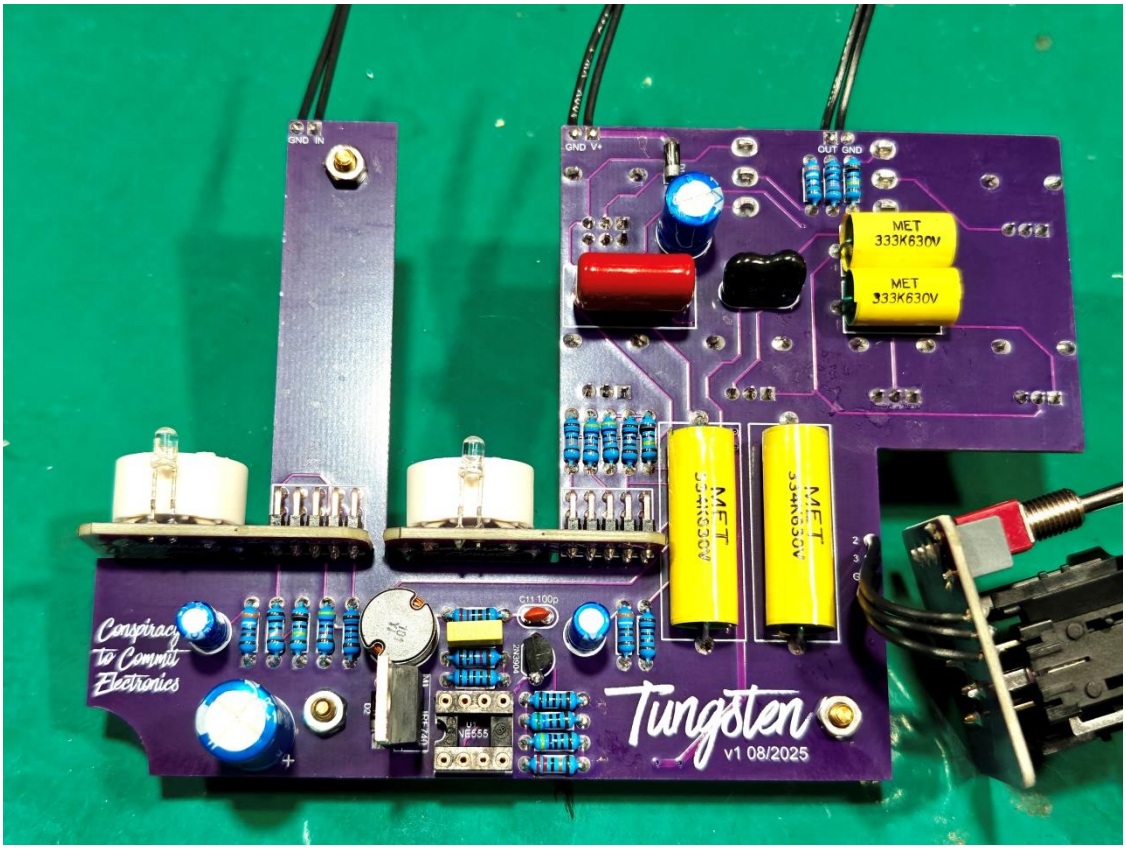


6. Attach the XLR daughter board to the main board, connecting each wire from the XLR daughter board to the corresponding pad on the main board.

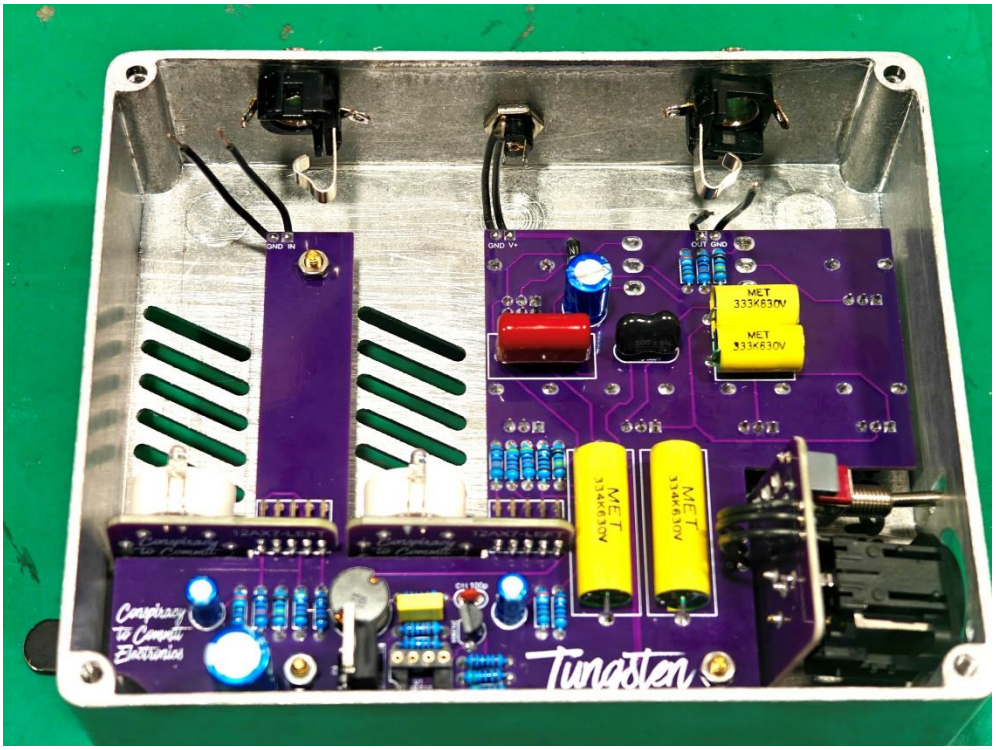


7. Connect the M3 standoffs to the underside (pot/switch side) of the main board, securing them on the top side (component side) with M3 nuts.

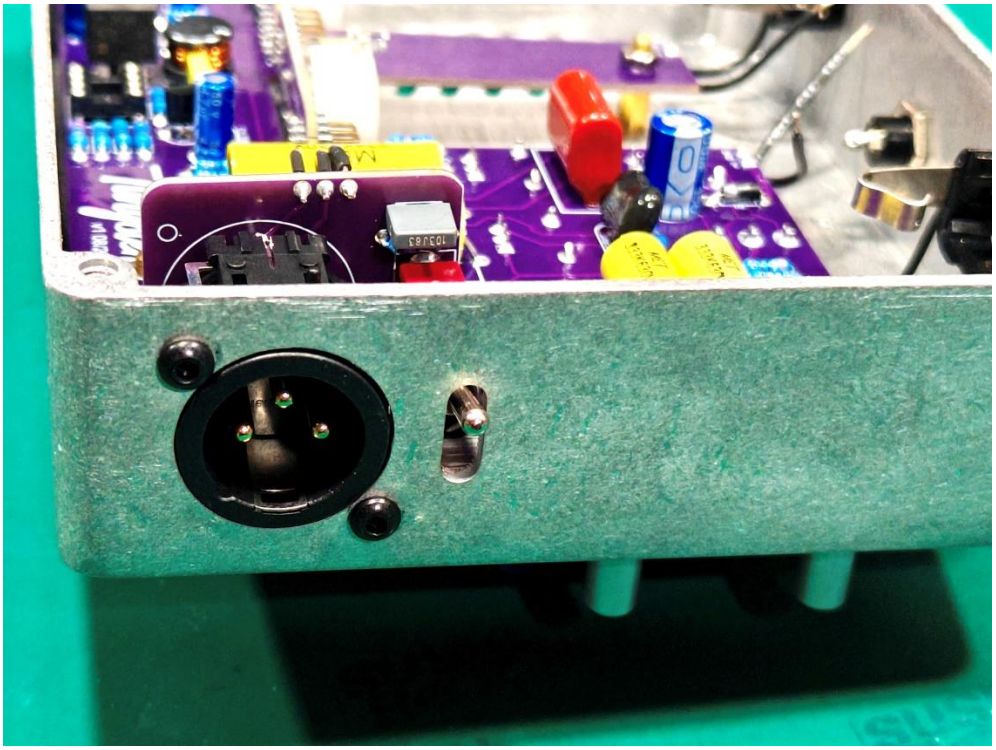




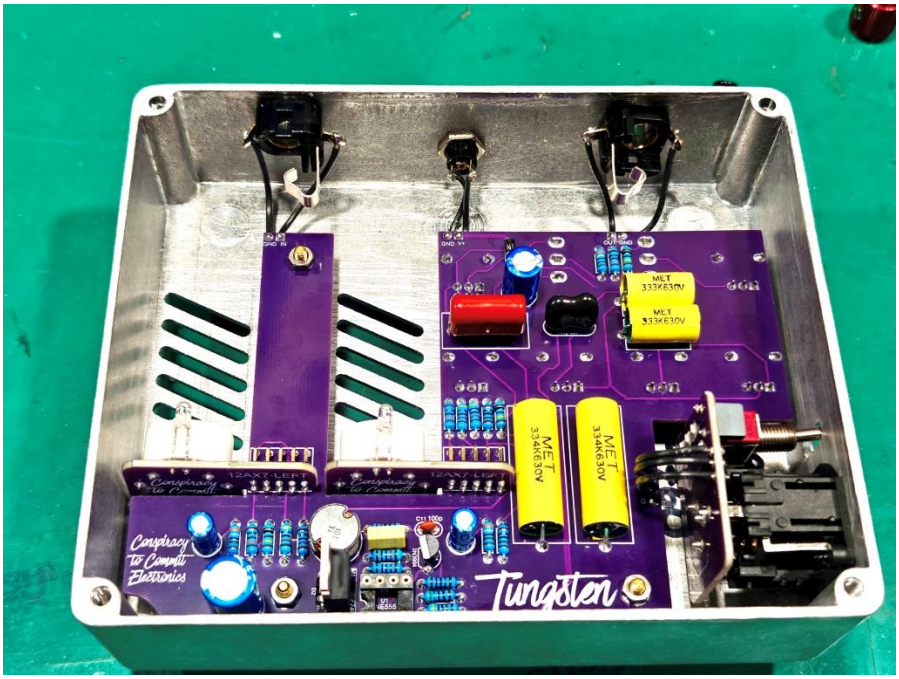
8. Insert the power and input/output jacks to the enclosure and secure them with corresponding hardware. Insert the main PCB into the enclosure. Secure the board to the enclosure by connecting the corresponding hardware to the pots and switches, and insert the M3 machine screws into the standoffs of the main PCB.



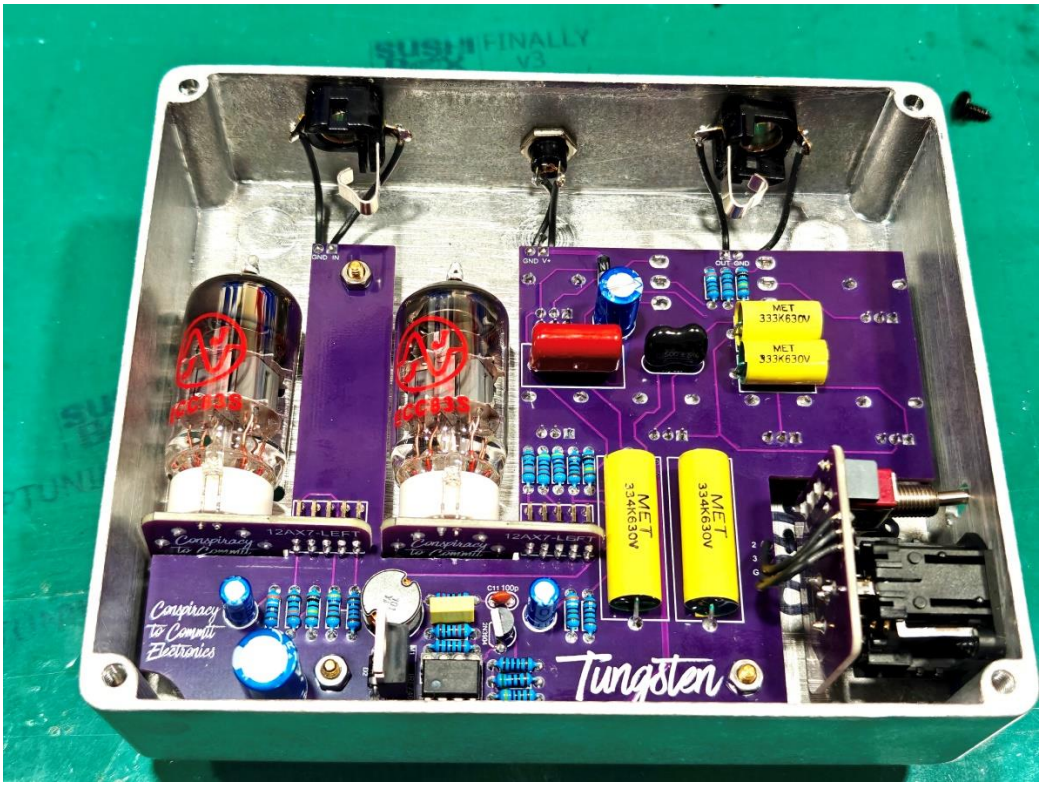
9. Secure the XLR daughter board to the enclosure by inserting the M3 self-tapping screws to the XLR jack mounting holes.



10. Connect the wires from the main board to the corresponding terminals of the power and input/output jacks.



11. Insert the tubes and NE555. I'm specifically mentioning the NE555 because if you plug in the pedal without the NE555 then your MOSFET will get very hot and potentially damage itself, so make sure it gets inserted before being plugged in. The way I like to do this is to put the tube in angled away from the pedal and line up pins 1 and 9 with the socket, then tip the tube backwards toward the enclosure to seat the remaining pins, then push down until the tube sits flush in the socket.



12. Add knobs on the outside and you're good to go! Plug it in and try it out! If you have any issues or questions regarding assembly or troubleshooting if it doesn't work, please reach out on the [PedalPCB forum] for assistance.