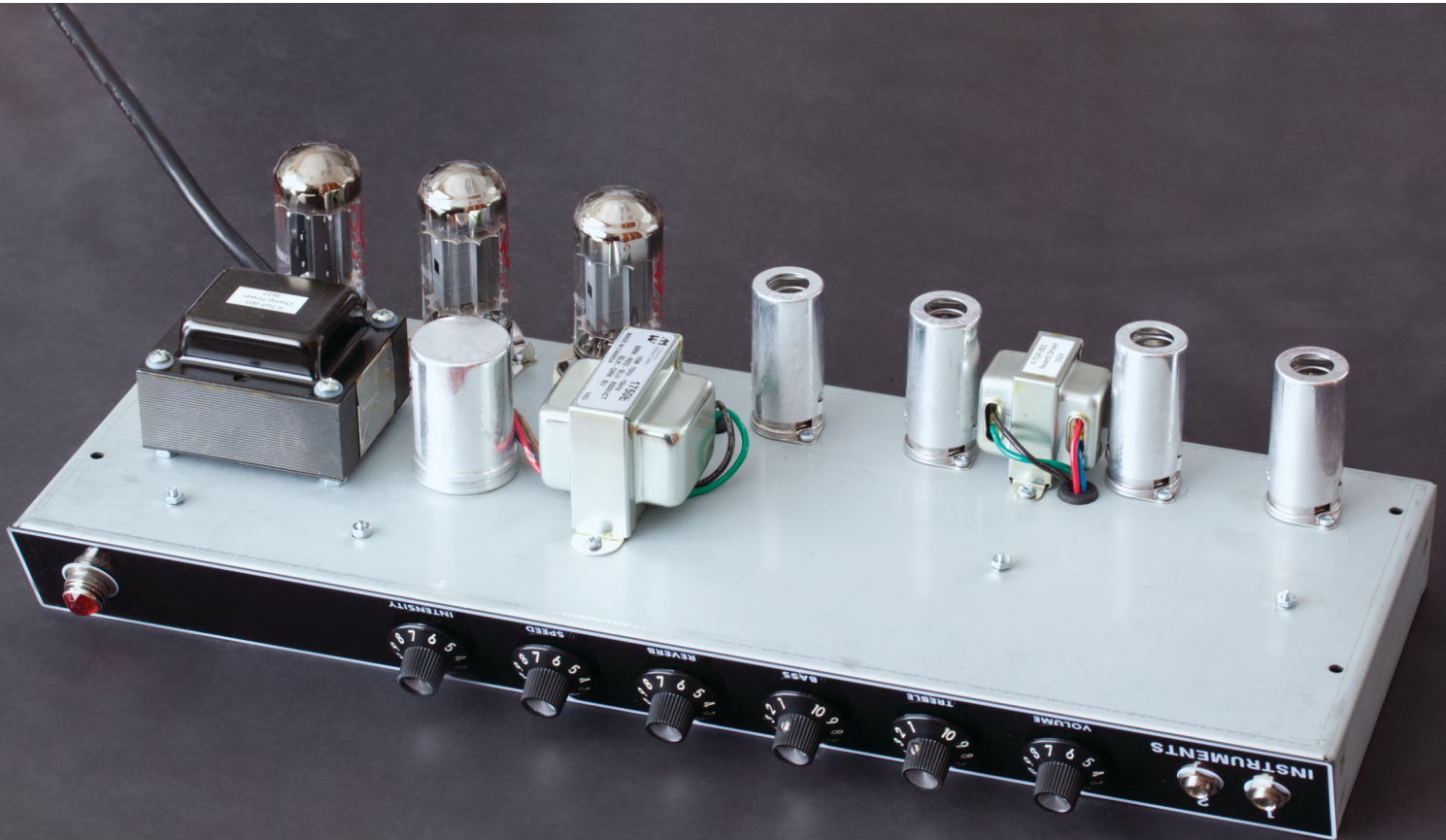
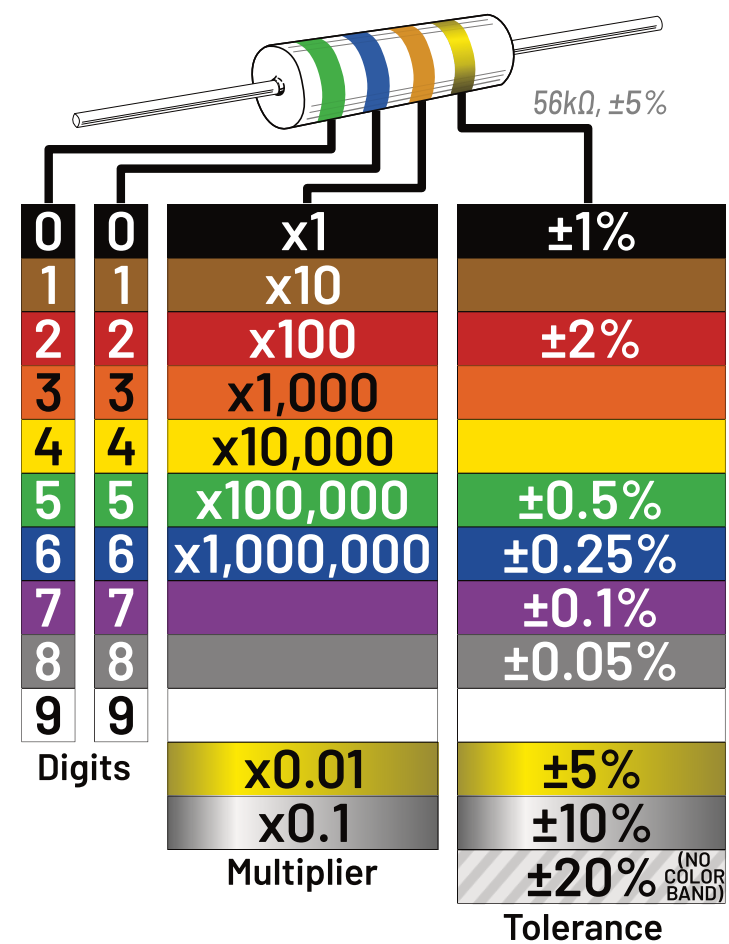




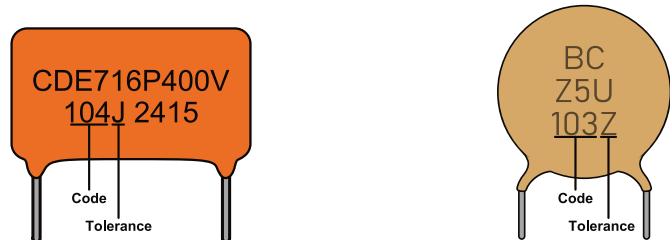
This kit provides all the chassis components to recreate a classic amplifier circuit, renowned for its warm, sparkling clean tones and lush reverb. The project offers a rewarding and educational experience for both seasoned builders and beginners to explore the world of tube amplifiers. The step-by-step guide simplifies the assembly process, ensuring you have everything needed to successfully complete the AA1164 amplifier.

The AA1164 chassis kit is designed to match the original specifications, using high-quality parts to replicate the vintage sound and appearance faithfully. With clear instructions, detailed diagrams, and practical tips, the building experience is straightforward and rewarding.

4-BAND RESISTOR COLOR CODE CHART



CAPACITOR CODE CHART



Picofarad pF	Nanofarad nF	Microfarad uF	Code	Picofarad pF	Nanofarad nF	Microfarad uF	Code	Tolerance
10	0.01	0.00001	100	2200	2.2	0.0022	222	E: 0.5%
12	0.012	0.000012	120	3300	3.3	0.0033	332	F: ±1%
15	0.015	0.000015	150	4700	4.7	0.0047	472	G: ±2%
22	0.022	0.000022	220	5600	5.6	0.0056	562	J: ±5%
33	0.033	0.000033	330	6800	6.8	0.0068	682	K: ±10%
47	0.047	0.000047	470	10000	10	0.01	103	M: ±20%
56	0.056	0.000056	560	15000	15	0.015	153	P: +100%, -0%
68	0.068	0.000068	680	22000	22	0.022	223	Z: +80%, -20%
82	0.082	0.000082	820	33000	33	0.033	333	
100	0.1	0.0001	101	47000	47	0.047	473	
120	0.12	0.00012	121	56000	56	0.056	563	
150	0.15	0.00015	151	68000	68	0.068	683	
220	0.22	0.00022	221	100000	100	0.1	104	
330	0.33	0.00033	331	150000	150	0.15	154	
470	0.47	0.00047	471	220000	220	0.22	224	
560	0.56	0.00056	561	330000	330	0.33	334	
680	0.68	0.00068	681	470000	470	0.47	474	
820	0.82	0.00082	821	560000	560	0.56	564	
1000	1	0.001	102	680000	680	0.68	684	
1500	1.5	0.0015	152	1000000	1000	1	105	

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Required Tools

- Adjustable Wrench
- Cutters
- Needlenose Pliers
- Phillips Head Screwdrivers
- Ruler
- Solder (No Clean Type)
- Soldering Iron (70W+)
- Multimeter with Standard Probes & Alligator Clip Leads
- Wire Stripper
- Xacto Knife or Similar Cutting Tool
- 8Ω Speaker with Speaker Cable
- Electric Guitar with Instrument Cable
- Heat Gun

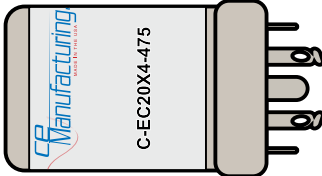
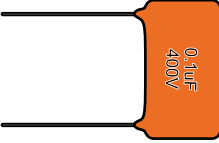
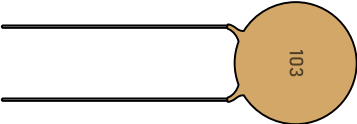
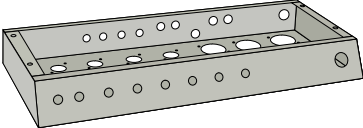
Optional Recommended Tools

- Self-adjusting Wire Stripper
- Strain Relief Pliers
- Socket Drivers
- Desoldering Braid
- Desoldering Pump
- Helping Hands
- Non-Slip Bench Mat
- Speaker Cable Extension

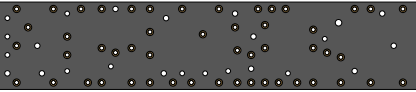
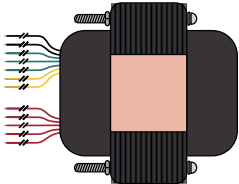
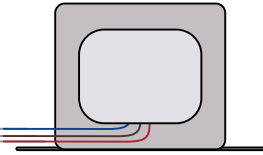
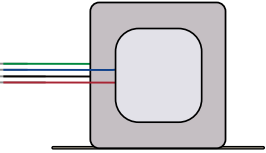
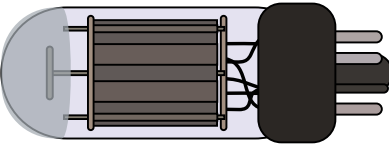
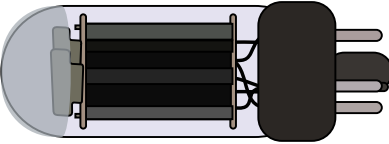
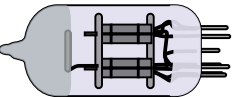
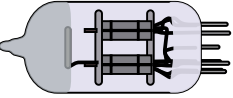
Parts List

	R-PR02-47	Qty 1	47Ω 2W Metal Film Resistor
	R-PR02-1K	Qty 1	1kΩ 2W Metal Film Resistor
	R-PR02-1D5K	Qty 4	1.5kΩ 2W Metal Film Resistor
	R-PR02-2D2K	Qty 1	2.2kΩ 2W Metal Film Resistor
	R-PR02-2D7K	Qty 1	2.7kΩ 2W Metal Film Resistor
	R-PR02-3D3K	Qty 1	3.3kΩ 2W Metal Film Resistor
	R-PR02-6D8K	Qty 1	6.8kΩ 2W Metal Film Resistor
	R-PR02-27K	Qty 1	27kΩ 2W Metal Film Resistor
	R-PR02-56K	Qty 2	56kΩ 2W Metal Film Resistor
	R-PR02-68K	Qty 2	68kΩ 2W Metal Film Resistor
	R-PR02-100K	Qty 7	100kΩ 2W Metal Film Resistor
	R-PR02-220K	Qty 4	220kΩ 2W Metal Film Resistor
	R-PR02-470K	Qty 1	470kΩ 2W Metal Film Resistor
	R-PR02-1M	Qty 6	1MΩ 2W Metal Film Resistor
	R-J3D3M	Qty 1	3.3MΩ 1/2W Carbon Comp Resistor
	R-PR03-1K	Qty 1	1kΩ 3W Metal Film Resistor
	R-PR03-18K	Qty 2	18kΩ 3W Metal Film Resistor

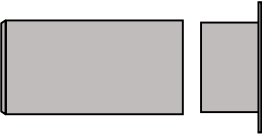
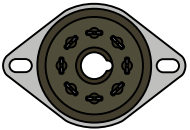
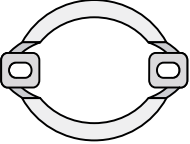
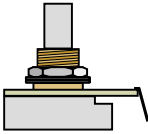
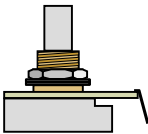
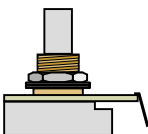
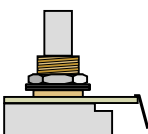
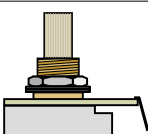
Parts List

	P-Q1N4007	Qty 1	Rectifier Diode
	C-ET50-100-MOD	Qty 1	50uF 100V Electrolytic Capacitor
	C-ET25-50-MOD	Qty 6	25uF 50V Electrolytic Capacitor
	C-EC20X4-475	Qty 1	20/20/20/20μF 475V Electrolytic Cap
	C-PD1-400	Qty 4	0.1 400V Film Capacitor (104J) <i>(marked 104J)</i>
	C-PD047-400	Qty 1	0.047uF 400V Film Capacitor (473J) <i>(marked 473J)</i>
	C-SD003-600	Qty 1	0.003uF 600V Film Capacitor (302K) <i>(marked 302K)</i>
	C-DS20N-500	Qty 4	0.02uF 500V Ceramic Capacitor (203Z) <i>(marked 203Z)</i>
	C-DS10N-500	Qty 2	0.01uF 500V Ceramic Capacitor (103K) <i>(marked 103K)</i>
	C-DS470P-500	Qty 1	470pF 500V Ceramic Capacitor (471) <i>(marked 471)</i>
	C-DS220P-500	Qty 1	220pF 500V Ceramic Capacitor (221) <i>(marked 221)</i>
	C-CD10-500	Qty 1	10pF 500V Ceramic Capacitor (10) <i>(marked 10)</i>
	P-HCH723	Qty 1	AA1164 Chassis

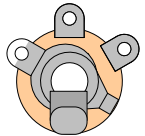
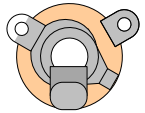
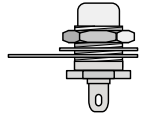
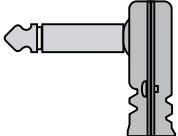
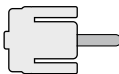
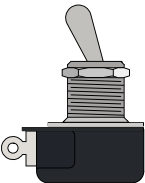
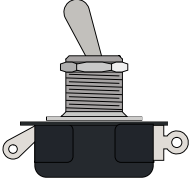
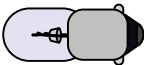
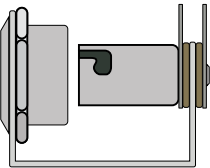
Parts List

	P-H723-F	Qty 1	AA1164 Front Panel
	P-H723-R	Qty 1	AA1164 Rear Panel
	P-HEYE-4	Qty 1	AA1164 Main Board with Bottom
	P-HEYE-6	Qty 1	AA1164 Bias Board with Bottom
	P-TGP-001	Qty 1	AA1164 Power Transformer
	P-T1750E	Qty 1	AA1164 Output Transformer
	P-TGR-001	Qty 1	Reverb Driver Transformer
	P-RMOD-4AB3C1B	Qty 1	Reverb Tank
	P-RBAG-17-A	Qty 1	Reverb Tank Bag
	T-6V6-S-JJ	Qty 2	6V6S (6V6GT) Power Tube
	T-5AR4-JJ	Qty 1	GZ34S (GZ34/5AR4) Rectifier Tube
	T-12AX7-S-JJ	Qty 3	ECC83S (12AX7) Preamp Tube
	T-12AT7-S-JJ	Qty 1	ECC81S (12AT7) Preamp Tube

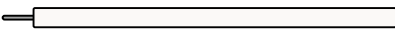
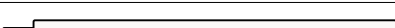
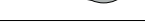
Parts List

	F-Z3AG-S1	Qty 1	1A 3AG Slow Blow Fuse
	S-H201	Qty 1	Fuse Holder
	P-ST9-700	Qty 4	Noval Socket
	P-SS9-400	Qty 4	Noval Socket Shield & Base
	P-ST8-209MIP	Qty 3	Octal Socket
	S-H142	Qty 3	Octal Socket Tube Retainer
	P-H1350	Qty 1	Power Cord Strain Relief
	S-W133	Qty 1	3 Conductor Power Cord
	R-VC1MA-M	Qty 1	A1MΩ Potentiometer (marked R-VC1MA-M or 450S3493)
	R-VC250KA-M	Qty 2	A250kΩ Potentiometer (marked R-VC250KA-M or 450S3495)
	R-VC250KL-M	Qty 1	B250kΩ Potentiometer (marked R-VC250KL-M)
	R-VC100KL-M	Qty 1	B100kΩ Potentiometer (marked R-VC100KL-M)
	R-VC3M-RA	Qty 1	C3MΩ Potentiometer (marked R-VC3M-RA or 450S2546)

Parts List

	P-K314-1-A	Qty 6	1-10 Knob
	W-SC-12A	Qty 3	Switched 1/4" Jack
	W-SC-11	Qty 1	Unswitched 1/4" Jack
	W-SC-3501FR	Qty 4	RCA Jack
	W-SC-228	Qty 1	Right Angle 1/4" Plug
	W-SC-3501MX	Qty 4	RCA Plug
	P-H495	Qty 1	SPST Toggle Switch
	P-H494	Qty 1	SPDT Toggle Switch
	P-L115	Qty 1	Red Jewel
	P-47	Qty 1	47 Bulb
	P-L124-P	Qty 1	Pilot Light Socket
	P-GROM-14-S	Qty 3	1/4" Inner Diameter Rubber Grommet

Parts List

	S-W901	8 ft	22AWG Braided Wire
	S-W902Y	17 ft	22AWG Yellow Wire
	S-W902W	2 ft	22AWG White Wire
	S-W902BLU	3 ft	22AWG Blue Wire
	S-W902BRN	3 ft	22AWG Brown Wire
	S-W902R	4 ft	22AWG Red Wire
	S-W903G	11 ft	18AWG Green Wire
	S-W903W	2 ft	18AWG White Wire
	S-W903B	2 ft	18AWG Black Wire
	S-W3817	3 ft	20AWG Bus Wire
	S-MHS-332	1 ft	3/32" Heat Shrink
	S-HS440-14	Qty 14	4-40 x 1/4" Pan Head Screw
	S-HS440-12	Qty 5	4-40 x 1/2" Pan Head Screw
	S-HS632-38	Qty 4	6-32 x 3/8" Pan Head Screw
	S-HHN440	Qty 24	4-40 Nut
	S-HHN632	Qty 4	6-32 Nut
	S-HHN832	Qty 4	8-32 Nut
	S-HW4	Qty 5	#4 Flat Washer
	S-HLW4	Qty 19	#4 Lock Washer
	S-HLW6	Qty 4	#6 Lock Washer
	S-HLW8	Qty 1	#8 Lock Washer
	S-H112	Qty 2	#6 Solder Lug
	S-H113	Qty 3	#8 Solder Lug
	S-H132	Qty 3	3/8" Solder Lug

Notes on Wired Connections

This section covers stripping and dressing the various wires used throughout this kit.

Instructions Terminology

Throughout these instructions, you will be guided to make various wire connections. Typically, these steps will instruct you to 'connect a wire from one point to another.' Occasionally, a specific length will be specified. It's important to follow these measurements precisely.

In other steps, you will be instructed to 'trim and connect' a wire that is already installed to components, like the transformers or wires previously connected to the eyelet board or elsewhere. For these steps, first line up the wire to gauge the required length. Ensure the wire is not pulled taut, allowing for some slack.

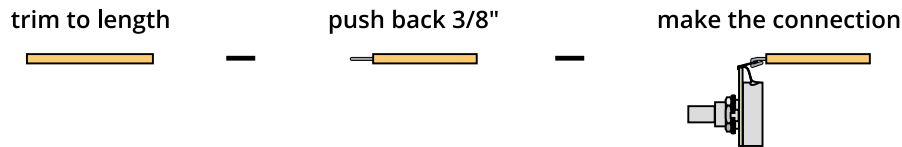
You will sometimes want to route wires away from or around other components. This keeps the build tidy and prevents wires from blocking access to solder lugs and other connections. In the drawings, the individual wires are laid out to avoid overlapping for clarity, but their basic routings are good examples to follow. It is perfectly fine if the wires in your build overlap one another as long as metal contacts don't touch.

Once you are satisfied with the length and routing, cut the wire. Prepare the wire appropriately for its type and then make the connection as instructed.

Preparing Cloth-Covered Wires

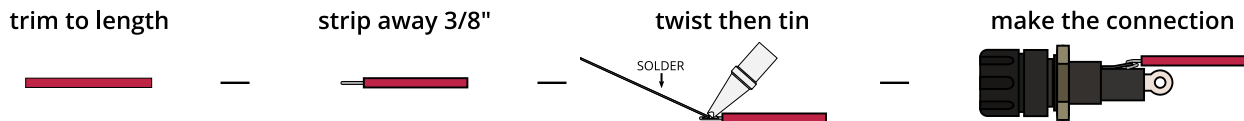
The majority of the wire used throughout this kit is cloth-covered wire. The type included is stranded wire, which allows flexibility, but it includes a top coat of solder to help it hold shape. Additionally, no tinning is required which makes building with this type of wire a breeze.

Cloth-covered wire like this is commonly referred to as "push back" wire. This is because you can simply trim the wire to length and then push back the cloth insulation rather than stripping it with wire strippers. First, make a clean cut with a sharp pair of cutters. Then carefully push the cloth cover back to expose ~3/8" of the bare wire. Try to avoid fraying the cloth when pushing it back. As mentioned, no additional tinning is required so you can now make the connection.



Preparing PVC-Insulated Wires

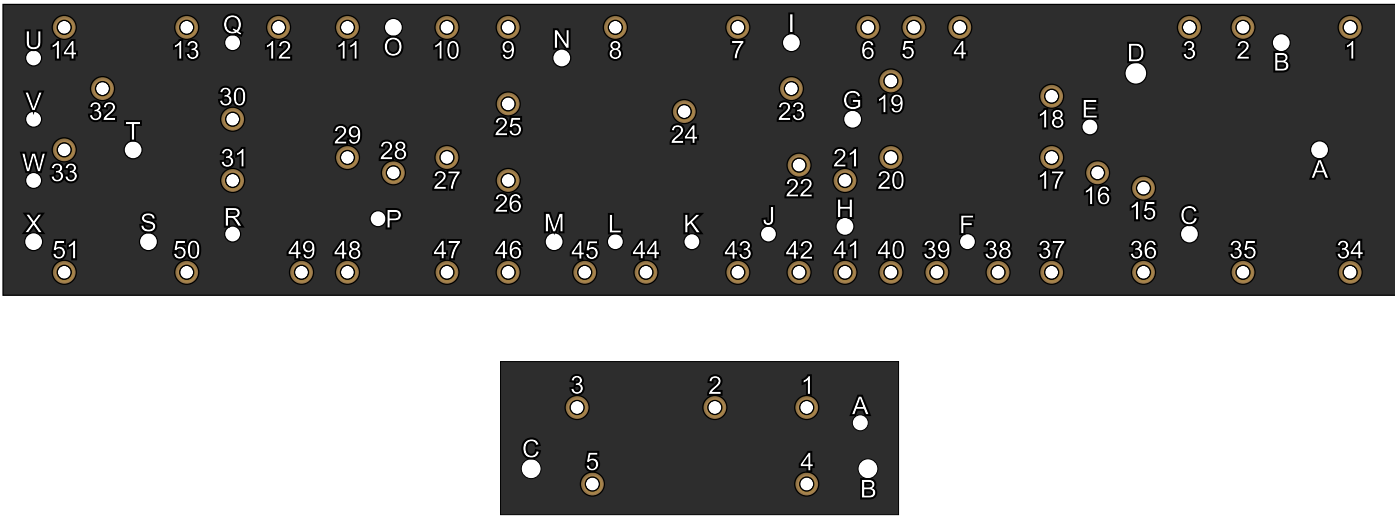
Some wires, like the power cord and transformer wires, are PVC-insulated. To prepare these wires you will need to strip and tin them before making the connection. Once trimmed to length, use wire strippers to remove ~3/8" of the insulation. Twist the bare end of the wire and then tin it with a soldering iron. You can now make the connection.



Notes on Fiberboard Construction

This section covers basic fiberboard construction.

Board Layout

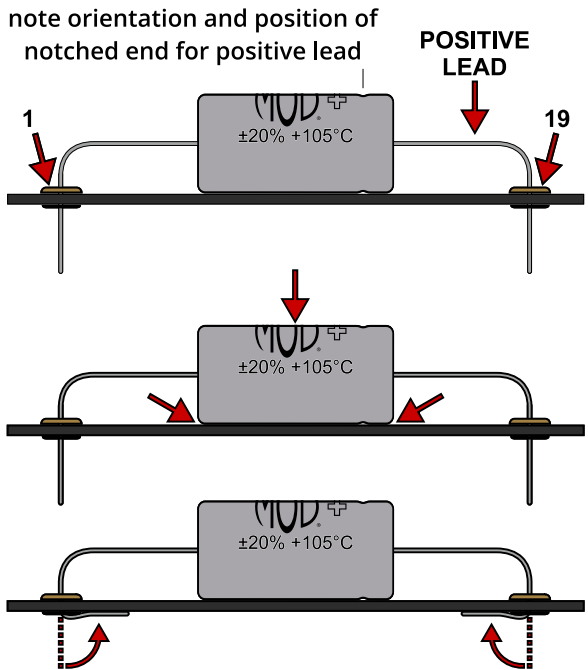


Orient the fiberboards as shown above. The eyelets will be referenced by the numbers shown on this drawing throughout the instructions. Similarly, the empty holes will be referenced by the letters shown here. These numbered and lettered holes will be used when mounting the various parts. For example, you might be instructed to connect an electrolytic capacitor from eyelet 1 to 19 on the main fiberboard with the positive lead at 19. For the empty holes, you will be instructed to pass a wire through them. These wires may connect to an eyelet through the back of the board. Alternatively, the wire may pass back through another hole to be routed to an eyelet on the top of the board or elsewhere in the amp.

Mounting and Soldering Parts

When instructed to mount a part to the board, first make sure you have the correct board. Then, line the part up with the two holes and then bend the leads so each lead can pass through the eyelets. Make sure that the label is facing upwards so you can clearly read the capacitance or other pertinent info for the type of part being mounted. Make sure that the body of the part sits flush to the board.

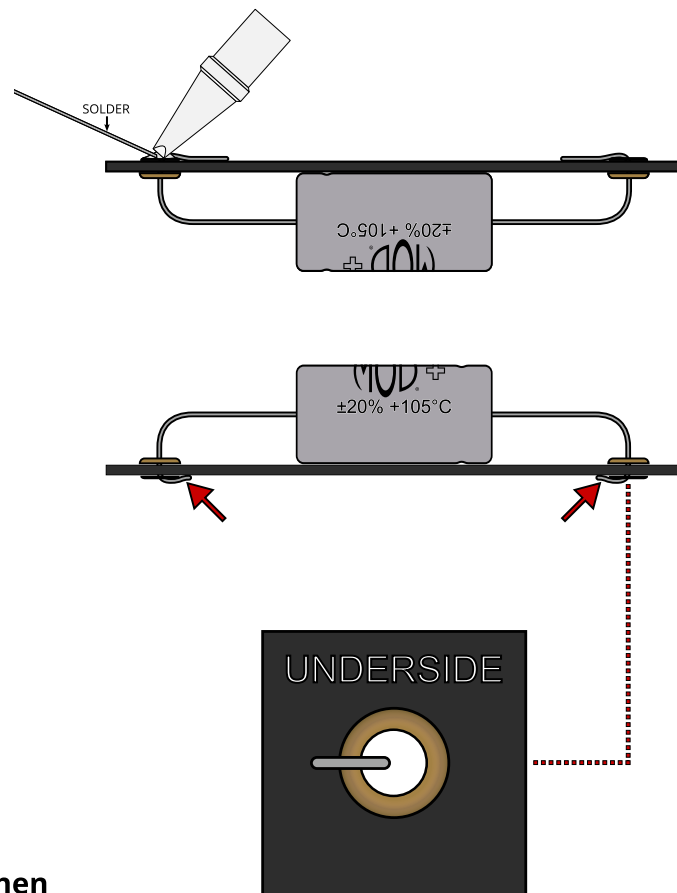
Once the part is oriented correctly and flush to the board, bend the leads on the underside of the board to secure the component to the board. Do this by pushing each lead inwards and completely flat to the board. The part should now be held tightly to the board.



Notes on Fiberboard Construction

Mounting and Soldering Parts (cont.)

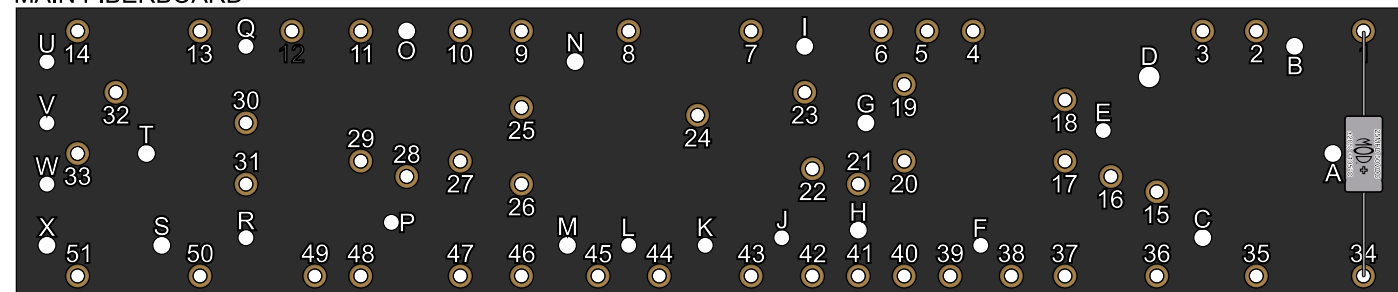
At this point you may be instructed to solder one or both of the eyelets. If so, make sure your soldering iron is fully warmed up before soldering. Position the tip of the iron so that it is touching both the metal eyelet and the lead or leads of the mounted components. Slowly feed solder onto the eyelet. The solder should flow evenly across the eyelet and completely fill the hole. You may need to move the end of the solder strand around the eyelet to ensure that the eyelet is fully filled with solder and that it is also bonding to the lead of the component. Once fully flowed, remove both the solder strand and iron from the eyelet and components.



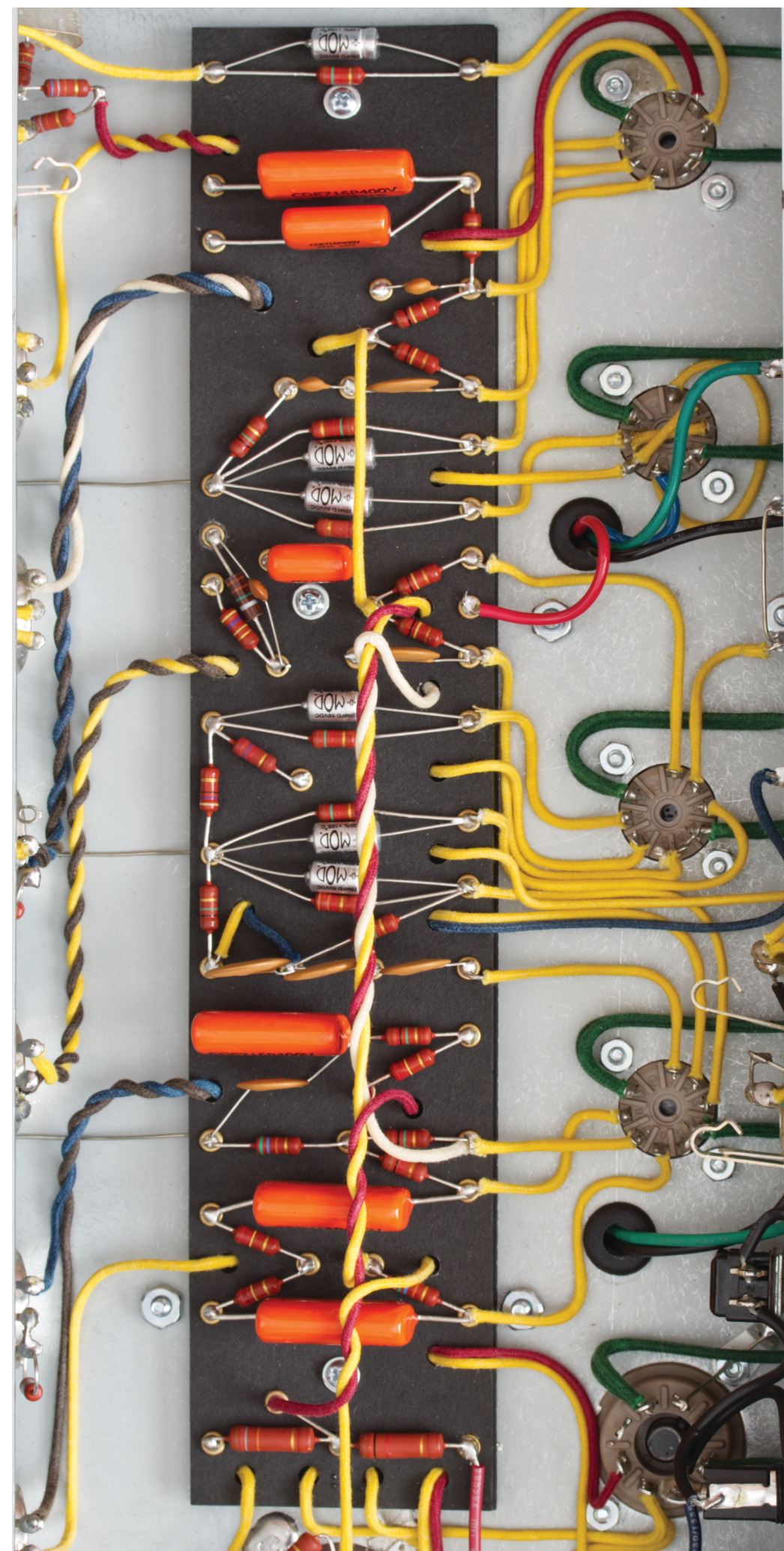
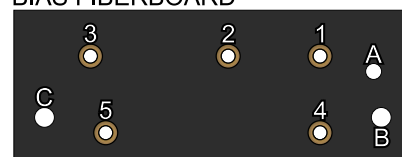
With the component soldered to the board, use a pair of cutters to trim the excess leads on the underside of the board.

Be sure to carefully follow the various connections listed in the instructions. **Only solder an eyelet when instructed.** Some eyelets will connect multiple parts or offboard wire connections that appear later in the instructions.

MAIN FIBERBOARD



BIAS FIBERBOARD



AA1164 Main Eyelet Board Construction

Please fully review the safety information on page 74 before beginning.

Locate the AA1164 Main Eyelet Board. The following steps will cover the placement and soldering of all parts that are mounted on this board. Use the Parts List as a reference.

AA1164 Main Eyelet Board: Part 1

A1-1: Locate a 25uF 50V capacitor. Connect the negative lead to eyelet 1 and the positive to 34.

A1-2: Locate a 1.5kΩ resistor. Its color bands are brown, green, red, gold. Connect this resistor from eyelet 1 to 34.

A1-3: Connect a 4" piece of yellow wire to eyelet 1. Solder eyelet 1 now.

A1-4: Connect a 4" piece of yellow wire to eyelet 34. Solder eyelet 34 now.

A1-5: Thread a 12" piece of red wire from B to C with the loop passing through the back of the board. Ensure the ends exiting holes B and C are roughly equal in length.

A1-6: Thread a 12" piece of yellow wire from B to C with the loop passing through the back of the board. Ensure the ends exiting holes B and C are roughly equal in length.

A1-7: Locate a 0.1uF (104J) 400V capacitor. Connect it from eyelet 2 to 35.

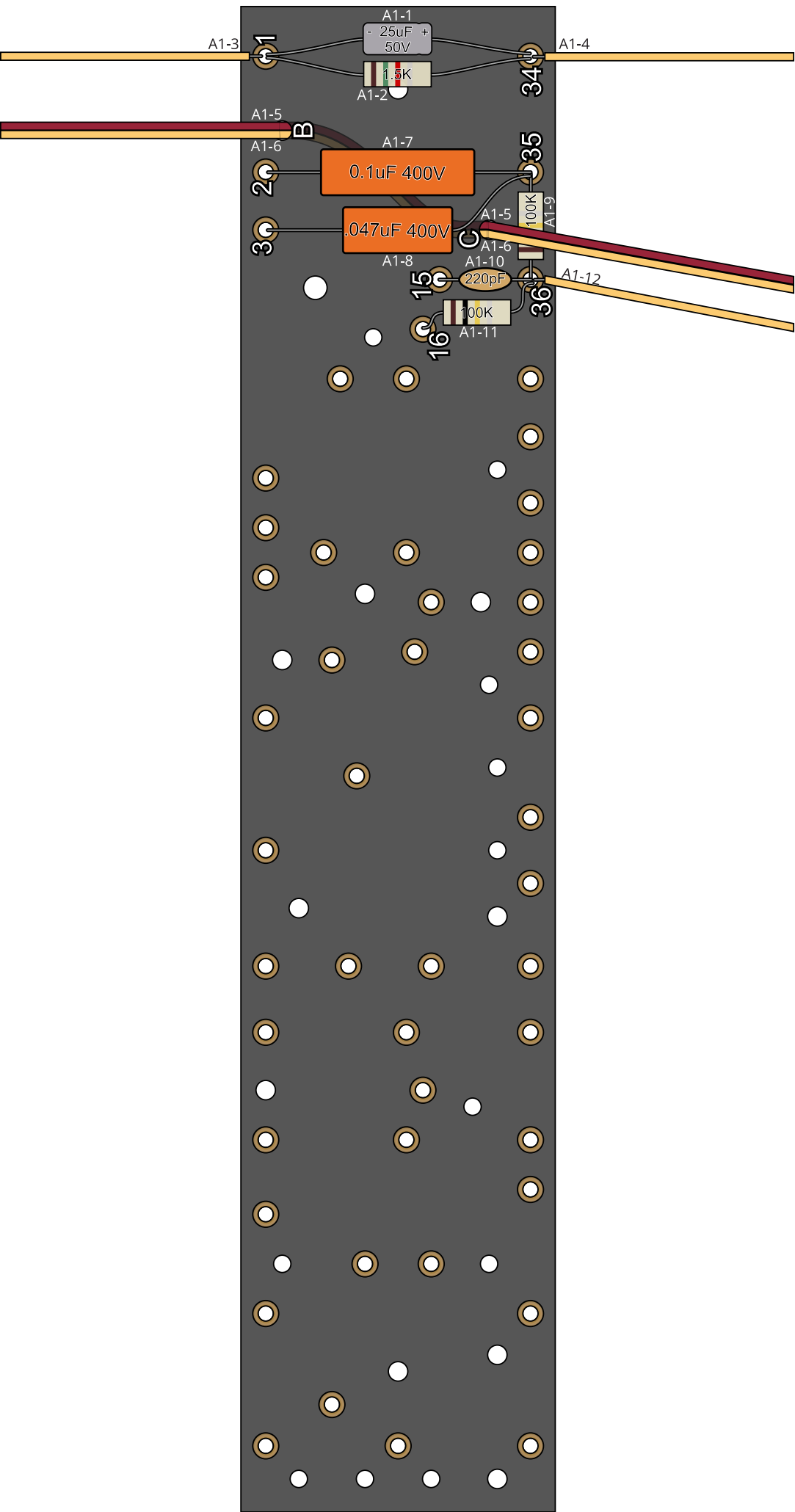
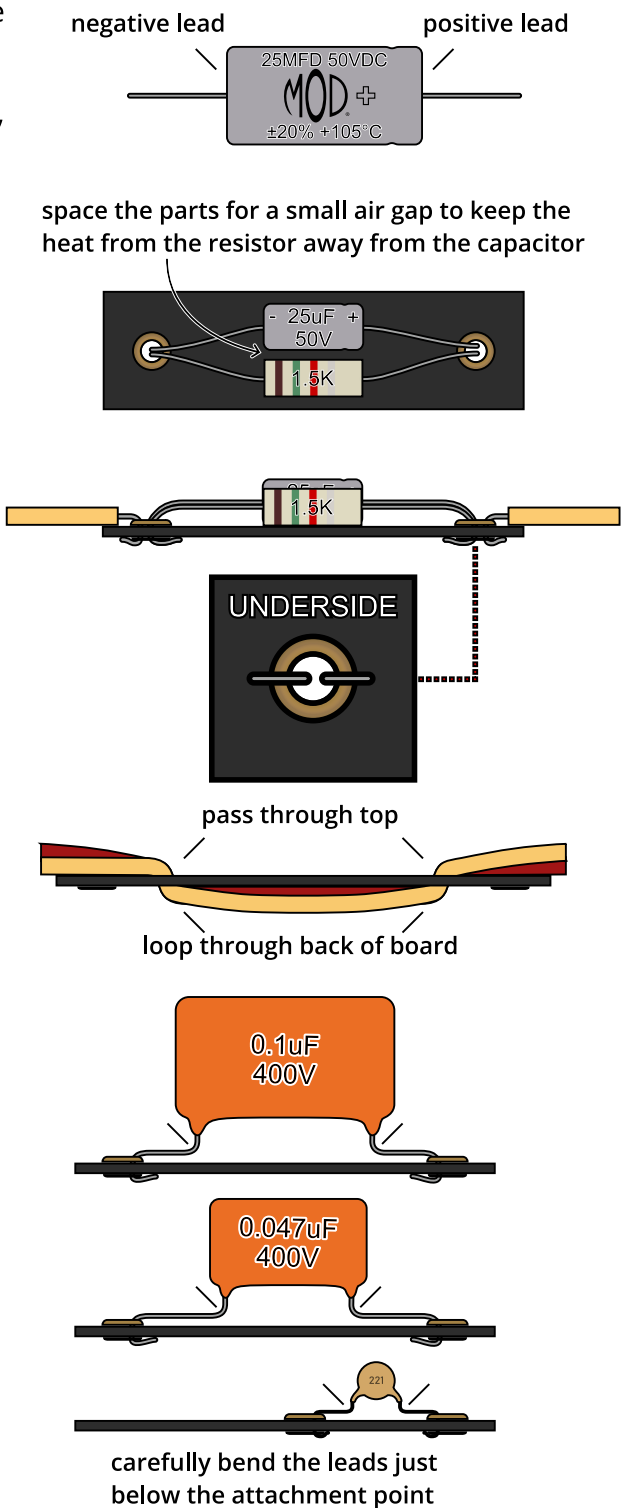
A1-8: Locate the 0.047uF (473J) 400V capacitor. Connect it from eyelet 3 to 35.

A1-9: Locate a 100kΩ resistor. Its color bands are brown, black, yellow, gold. Connect this resistor from eyelet 35 to 36. Make sure that the wires from hole C are not under the resistor when mounting it. Solder eyelet 35 now.

A1-10: Locate the 220pF (221) 500V ceramic capacitor. Connect it from eyelet 15 to 36.

A1-11: Locate a 100kΩ resistor. Its color bands are brown, black, yellow, gold. Connect this resistor from eyelet 16 to 36.

A1-12: Connect a 4" piece of yellow wire to eyelet 36. Solder eyelet 36 now.



AA1164 Main Eyelet Board Construction

AA1164 Main Eyelet Board: Part 2

A2-1: Thread a 9" piece of 22AWG (thinner) white wire through hole D and connect it to eyelet 15 through the back of the board. Solder eyelet 15 now.

A2-2: Thread an 11" piece of brown wire through hole D and connect it to eyelet 2 through the back of the board. Solder eyelet 2 now.

A2-3: Thread an 11" piece of blue wire through hole D and connect it to eyelet 3 through the back of the board. Solder eyelet 3 now.

A2-4: Locate a 100kΩ resistor. Its color bands are brown, black, yellow, gold. Connect this resistor from eyelet 16 to 37.

A2-5: Thread a 4" piece of yellow wire through hole E and connect it to eyelet 16 through the back of the board. Solder eyelet 16 now.

A2-6: Locate a 0.02uF (203Z) 500V ceramic capacitor. Connect it from eyelet 17 to 37.

A2-7: Connect a 4" piece of yellow wire to eyelet 37. Solder eyelet 37 now.

A2-8: Locate the 470pF (471) 500V ceramic capacitor. Connect it from eyelet 17 to 18.

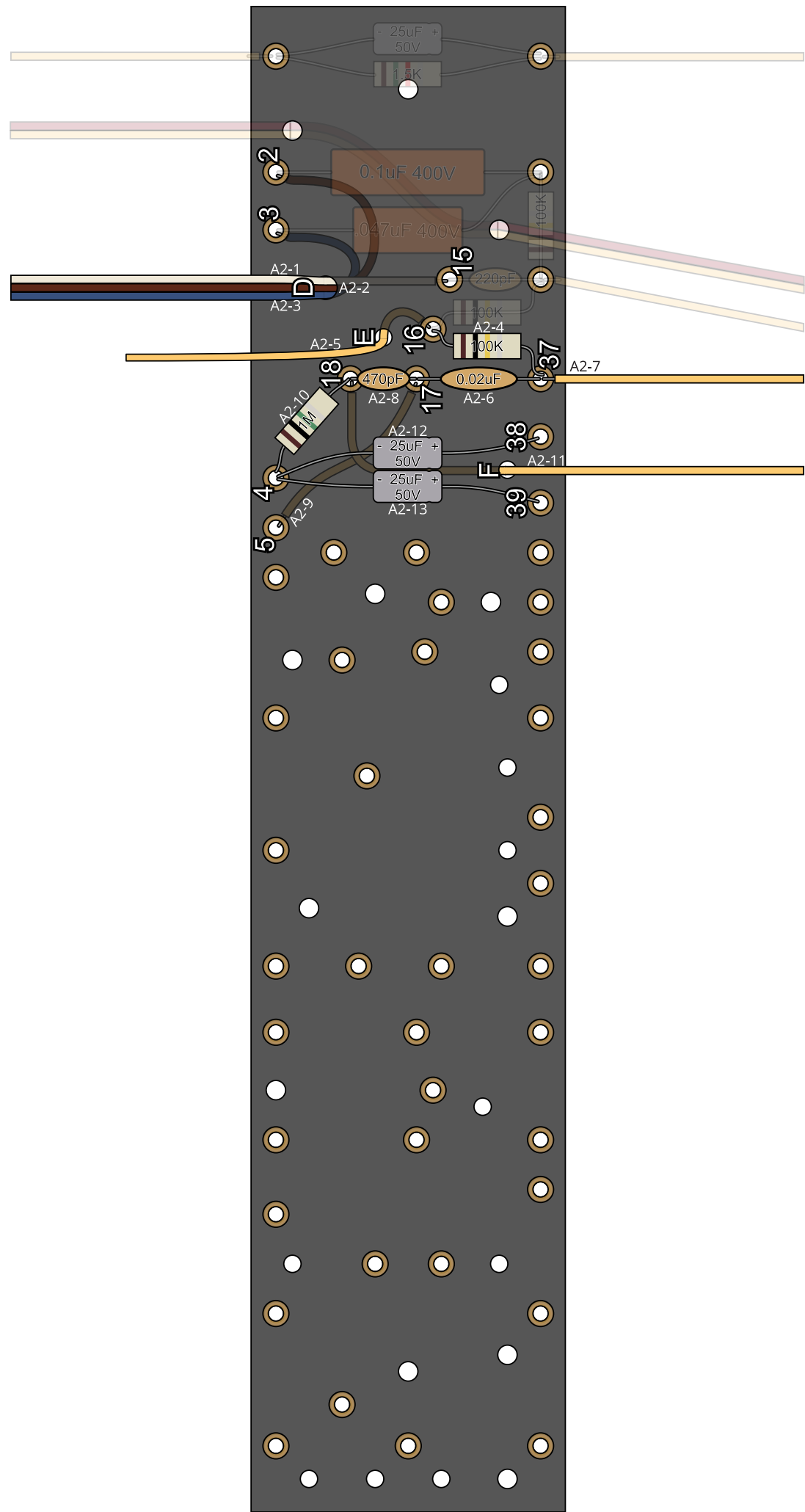
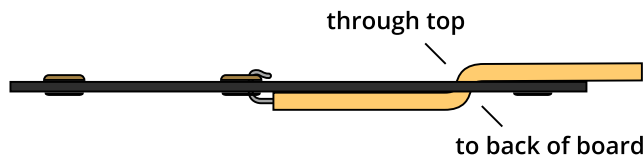
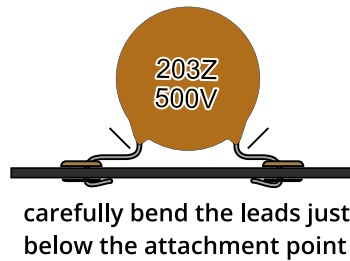
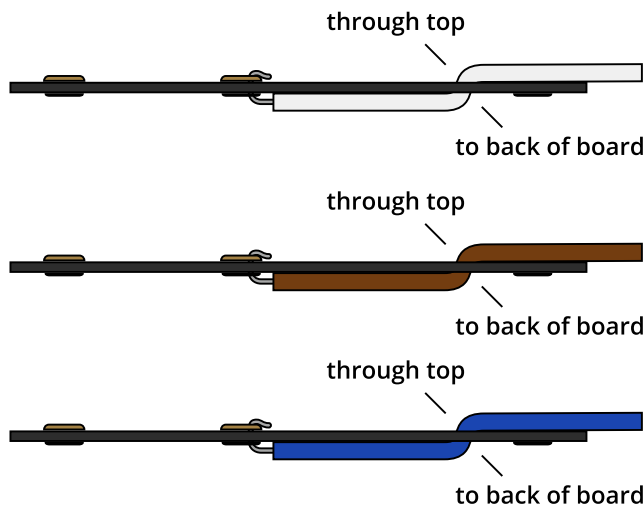
A2-9: Connect a 2.25" piece of yellow wire from the back of eyelet 17 to the back of eyelet 5. Solder eyelet 17 now.

A2-10: Locate a 1MΩ resistor. Its color bands are brown, black, green, gold. Connect this resistor from eyelet 4 to 18.

A2-11: Thread a 4" piece of yellow wire through hole F and connect it to eyelet 18 through the back of the board. Solder eyelet 18 now.

A2-12: Locate a 25uF 50V capacitor. Connect the negative lead to eyelet 4 and the positive to 38.

A2-13: Locate a 25uF 50V capacitor. Connect the negative lead to eyelet 4 and the positive to 39.



AA1164 Main Eyelet Board Construction

AA1164 Main Eyelet Board: Part 3

A3-1: Locate a 1.5kΩ resistor. Its color bands are brown, green, red, gold. Connect this resistor from eyelet 4 to 38.

A3-2: Locate the 2.2kΩ resistor. Its color bands are red, red, red, gold. Connect this resistor from eyelet 4 to 39.

A3-3: Connect a 4" piece of bus wire to the back of eyelet 4. Solder eyelet 4 now.

A3-4: Connect a 4" piece of yellow wire to eyelet 38. Solder eyelet 38 now.

A3-5: Connect a 3" piece of yellow wire to eyelet 39. Solder eyelet 39 now.

A3-6: Locate the 10pF (10) 500V ceramic capacitor. Connect it from eyelet 5 to 23.

A3-7: Locate the 3.3MΩ resistor. Its color bands are orange, orange, green, silver. Connect this resistor from eyelet 5 to 23. Solder eyelet 5 now.

A3-8: Locate the 0.003uF (302K) 400V capacitor. Connect it from eyelet 19 to 20.

A3-9: Connect a 1.5" piece of bus wire from the back of eyelet 20 to the back of 40. Solder eyelet 20 now.

A3-10: Locate a 100kΩ resistor. Its color bands are brown, black, yellow, gold. Connect this resistor from eyelet 21 to 40.

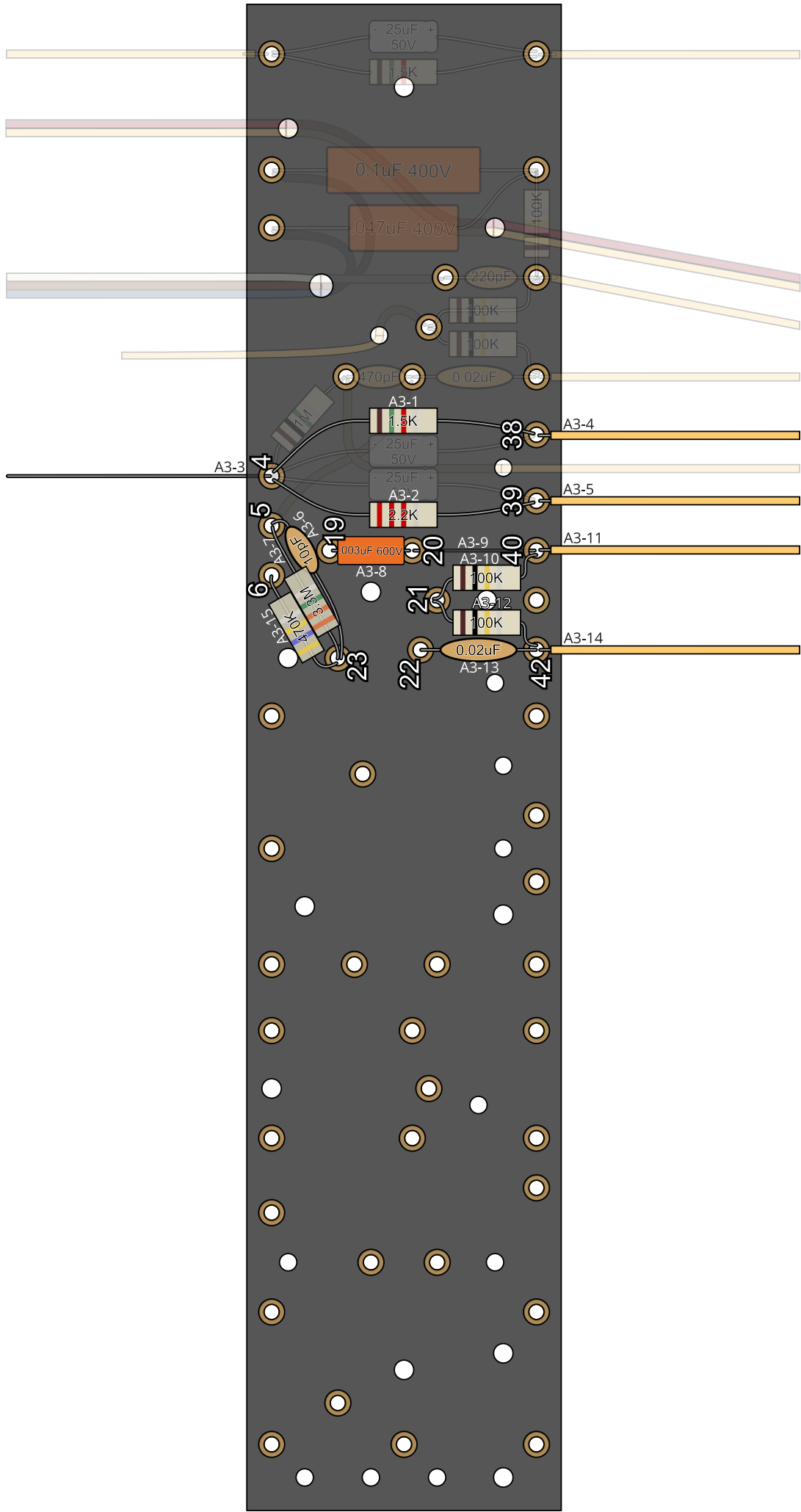
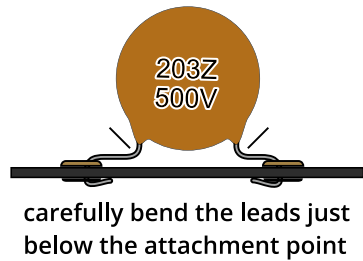
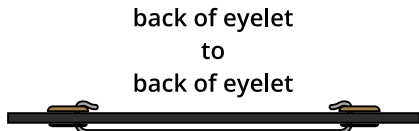
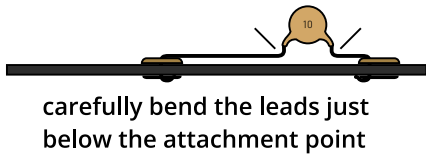
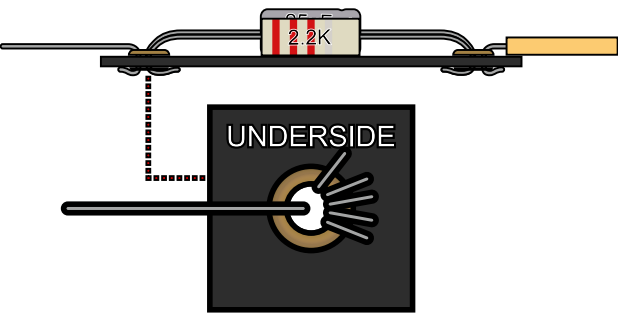
A3-11: Connect a 4" piece of yellow wire to eyelet 40. Solder eyelet 40 now.

A3-12: Locate a 100kΩ resistor. Its color bands are brown, black, yellow, gold. Connect this resistor from eyelet 21 to 42.

A3-13: Locate a 0.02uF (203Z) 500V ceramic capacitor. Connect it from eyelet 22 to 42.

A3-14: Connect a 5" piece of yellow wire to eyelet 42. Solder eyelet 42 now.

A3-15: Locate the 470kΩ resistor. Its color bands are yellow, violet, yellow, gold. Connect this resistor from eyelet 6 to 23.



AA1164 Main Eyelet Board Construction

AA1164 Main Eyelet Board: Part 4

A4-1: Thread an 11" piece of brown wire through hole I and connect it to eyelet 6 through the back of the board. Solder eyelet 6 now.

A4-2: Thread an 11" piece of yellow wire through hole I and connect it to eyelet 19 through the back of the board. Solder eyelet 19 now.

A4-3: Locate a 25uF 50V capacitor. Connect the negative lead to eyelet 7 and the positive to 43.

A4-4: Locate a 1.5kΩ resistor. Its color bands are brown, green, red, gold. Connect this resistor from eyelet 7 to 43.

A4-5: Connect a 3" piece of yellow wire to eyelet 43. Solder eyelet 43 now.

A4-6: Thread a 5" piece of yellow wire through hole K and connect it to eyelet 23 through the back of the board. Solder eyelet 23 now.

A4-7: Locate the 2.7kΩ resistor. Its color bands are red, violet, red, gold. Connect this resistor from eyelet 7 to 24.

A4-8: Locate the 47Ω resistor. Its color bands are yellow, violet, black, gold. Connect this resistor from eyelet 7 to 8. Solder eyelet 7 now.

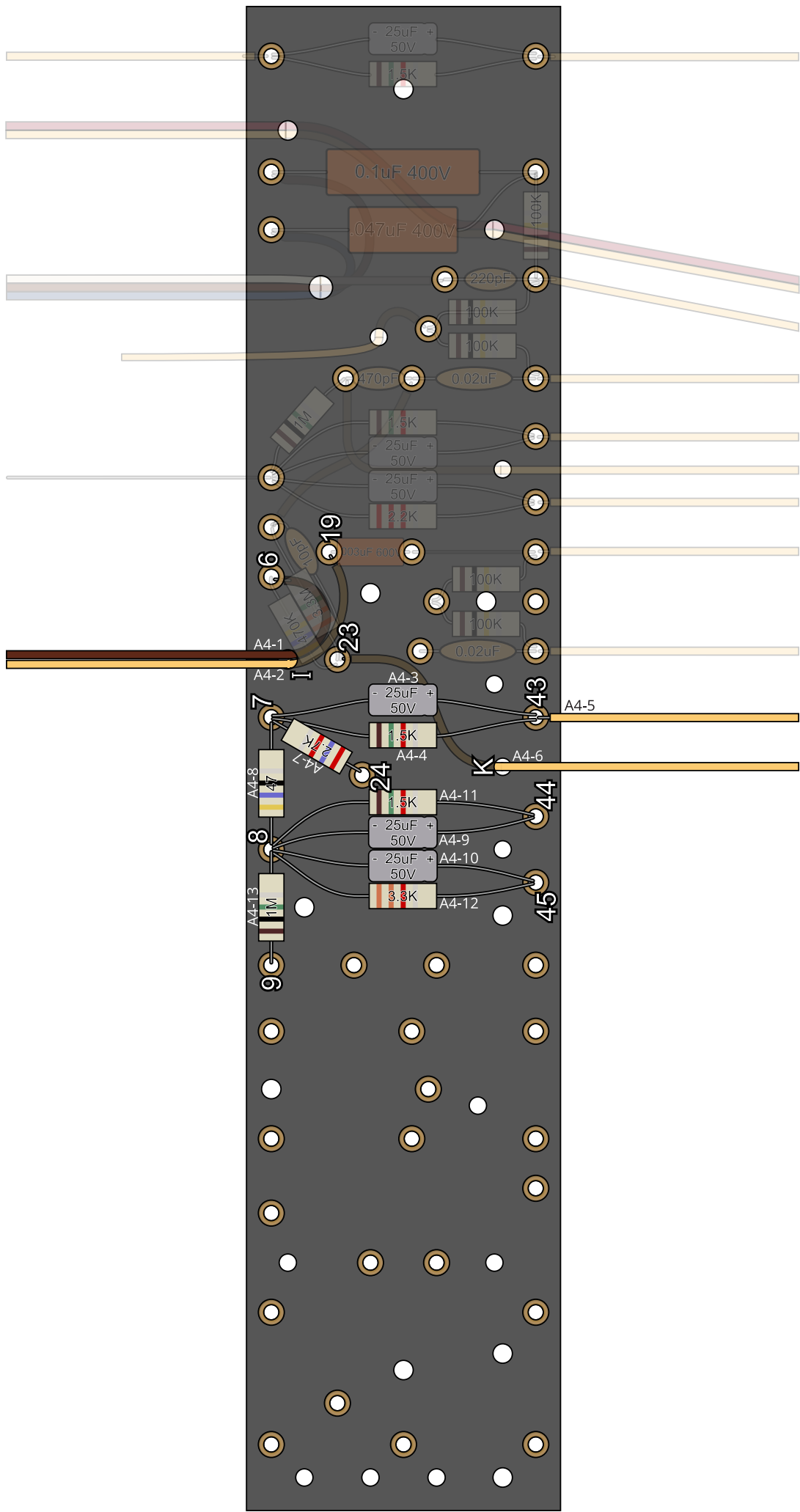
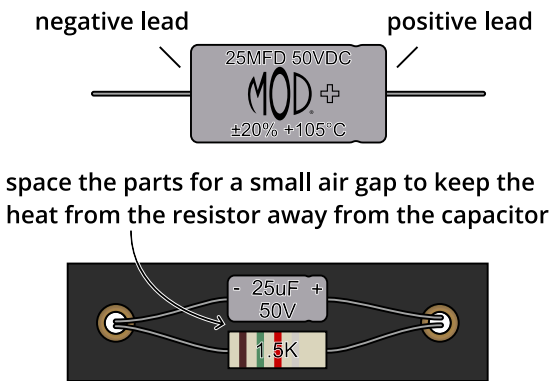
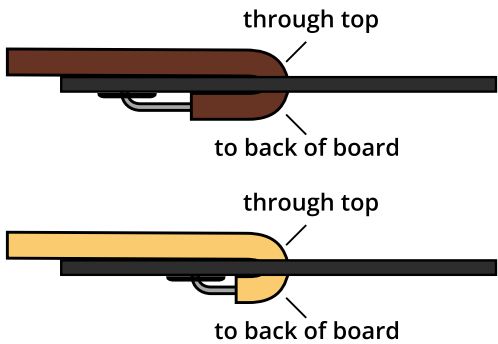
A4-9: Locate a 25uF 50V capacitor. Connect the negative lead to eyelet 8 and the positive to 44.

A4-10: Locate a 25uF 50V capacitor. Connect the negative lead to eyelet 8 and the positive to 45.

A4-11: Locate a 1.5kΩ resistor. Its color bands are brown, green, red, gold. Connect this resistor from eyelet 8 to 44.

A4-12: Locate the 3.3kΩ resistor. Its color bands are orange, orange, red, gold. Connect this resistor from eyelet 8 to 45.

A4-13: Locate a 1MΩ resistor. Its color bands are brown, black, green, gold. Connect this resistor from eyelet 8 to 9.



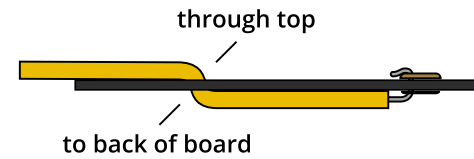
AA1164 Main Eyelet Board Construction

AA1164 Main Eyelet Board: Part 5

A5-1: Connect a 4" piece of bus wire to the back of eyelet 8. Solder eyelet 8 now.

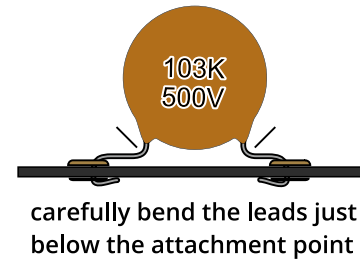
A5-2: Connect a 5" piece of yellow wire to eyelet 44. Solder eyelet 44 now.

A5-3: Thread an 8" piece of yellow wire through hole L and connect it to eyelet 24 through the back of the board. Solder eyelet 24 now.



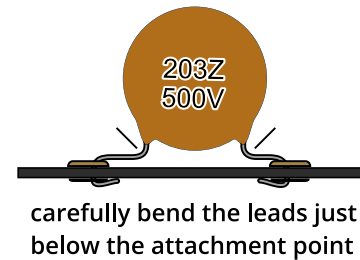
A5-4: Locate a 1M Ω resistor. Its color bands are brown, black, green, gold. Connect this resistor from eyelet 25 to 45.

A5-5: Connect a 5" piece of yellow wire to eyelet 45. Solder eyelet 45 now.



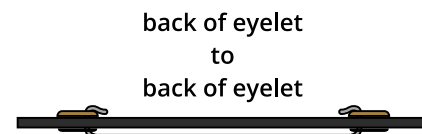
A5-6: Locate a 0.01uF (103K) 500V ceramic capacitor. Connect it from eyelet 9 to 25.

A5-7: Locate another 0.01uF (103K) 500V ceramic capacitor. Connect it from eyelet 25 to 26.

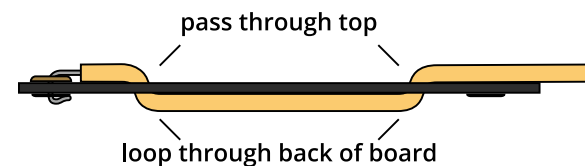


A5-8: Locate a 0.02uF (203Z) 500V ceramic capacitor. Connect it from eyelet 26 to 46.

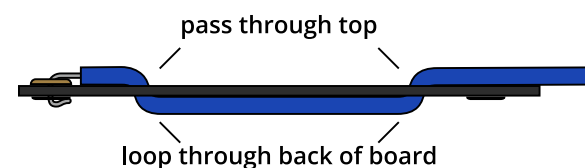
A5-9: Connect a 1" piece of bus wire from the back of eyelet 46 to the back of 47.



A5-10: Connect a 7" piece of yellow wire to eyelet 9. Thread the other end to the back of the board through hole N and then back out to the front through hole M. Solder eyelet 9 now.

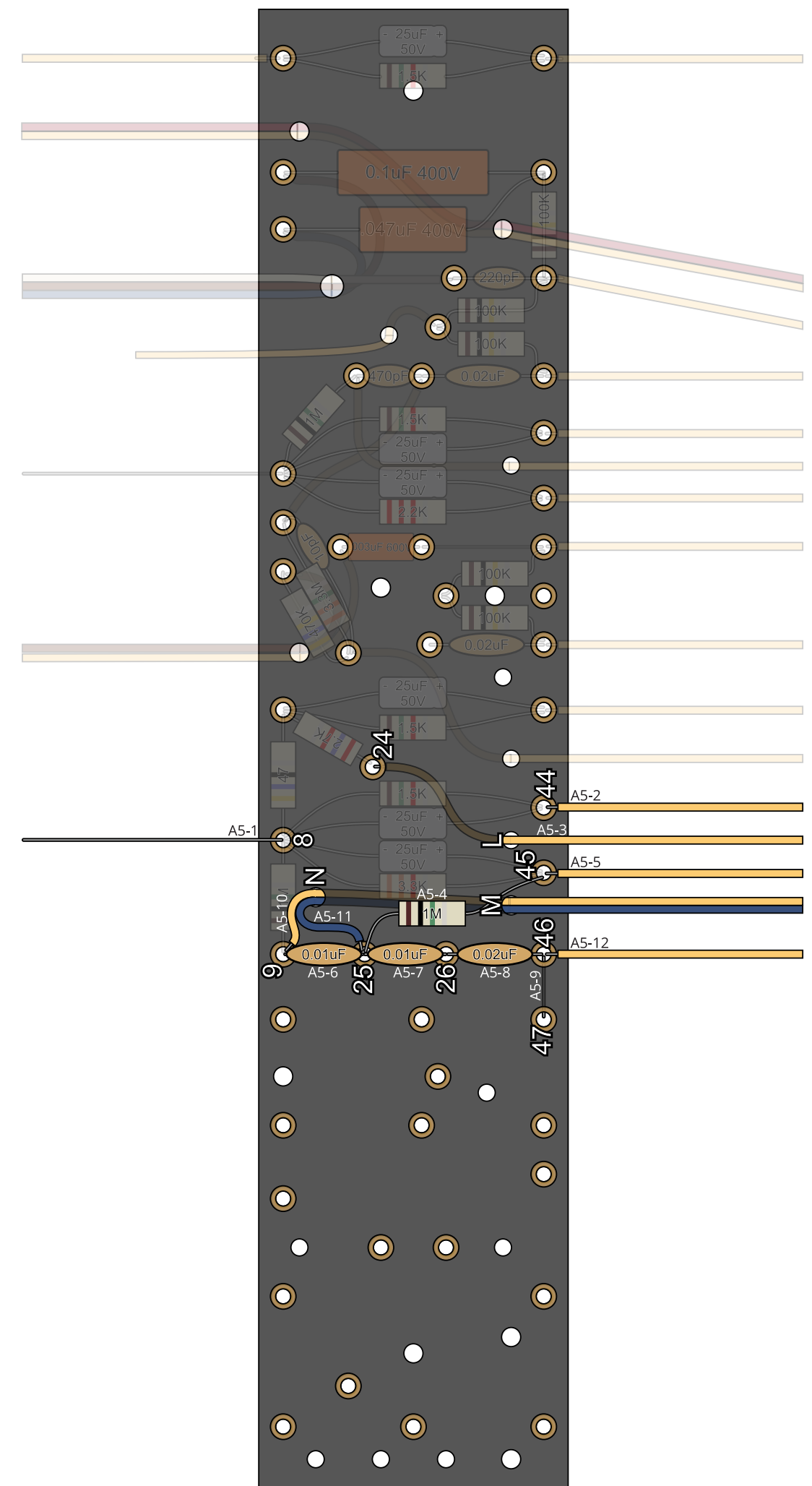


A5-11: Connect a 9" piece of blue wire to eyelet 25. Thread the other end to the back of the board through hole N and then back out to the front through hole M. Solder eyelet 25 now.



A5-12: Connect a 3" piece of yellow wire to eyelet 46. Solder eyelet 46 now.

Main Eyelet Board Construction



AA1164 Main Eyelet Board Construction

AA1164 Main Eyelet Board: Part 6

A6-1: Locate a 0.1uF (104J) 400V capacitor. Connect it from eyelet 10 to 27.

A6-2: Thread a 9" piece of brown wire through hole O and connect it to eyelet 10 through the back of the board. Solder eyelet 10 now.

A6-3: Thread a 9" piece of blue wire through hole O and connect it to eyelet 26 through the back of the board. Solder eyelet 26 now.

A6-4: Locate a 0.02uF (203Z) 500V ceramic capacitor. Connect it from eyelet 11 to 27.

A6-5: Locate a 1MΩ resistor. Its color bands are brown, black, green, gold. Connect this resistor from eyelet 27 to 47. Solder eyelet 27 now.

A6-6: Locate a 220kΩ resistor. Its color bands are red, red, yellow, gold. Connect this resistor from eyelet 28 to 47. Solder eyelet 47 now.

A6-7: Locate a 56kΩ resistor. Its color bands are green, blue, orange, gold. Connect this resistor from eyelet 11 to 29.

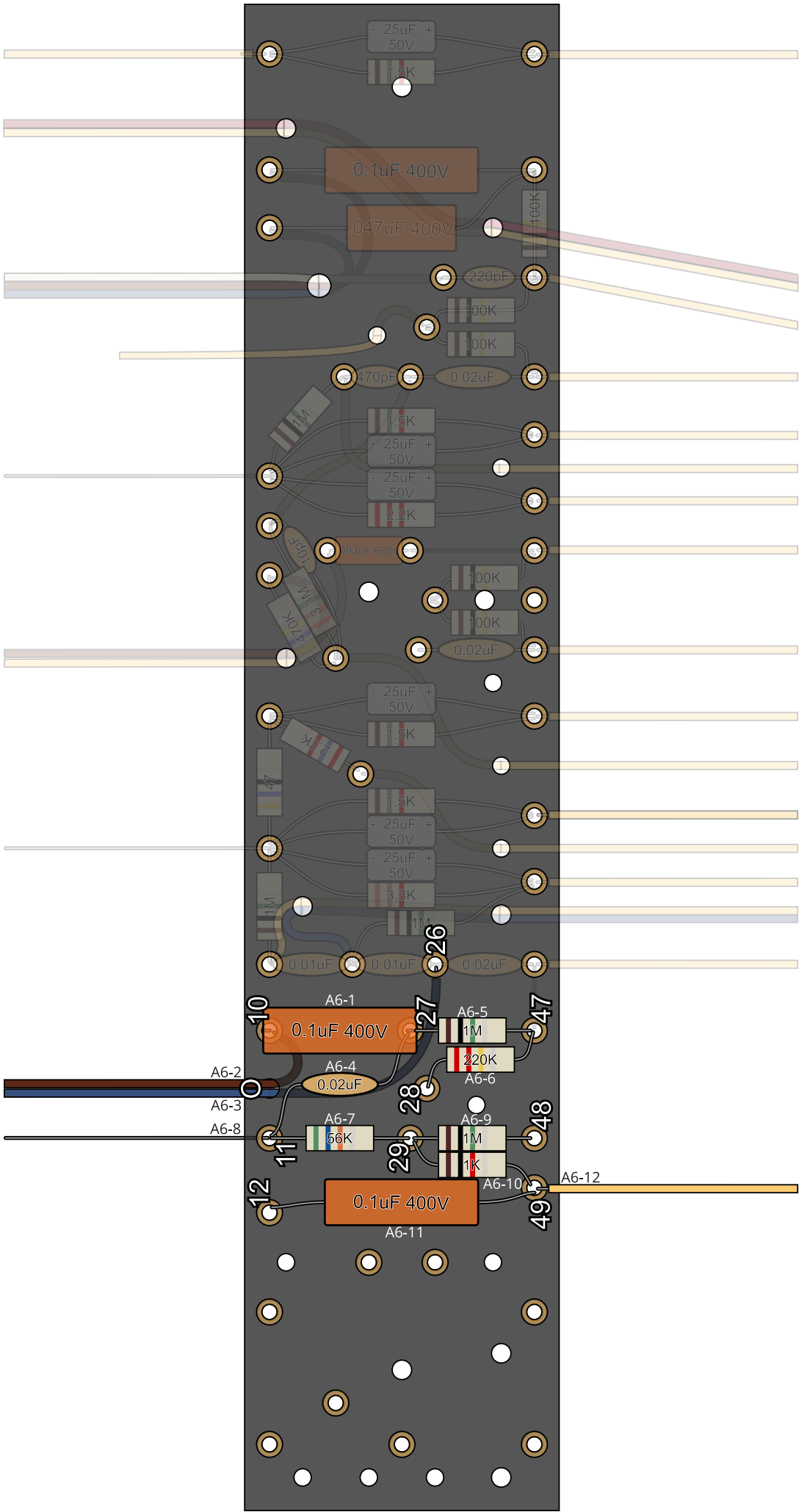
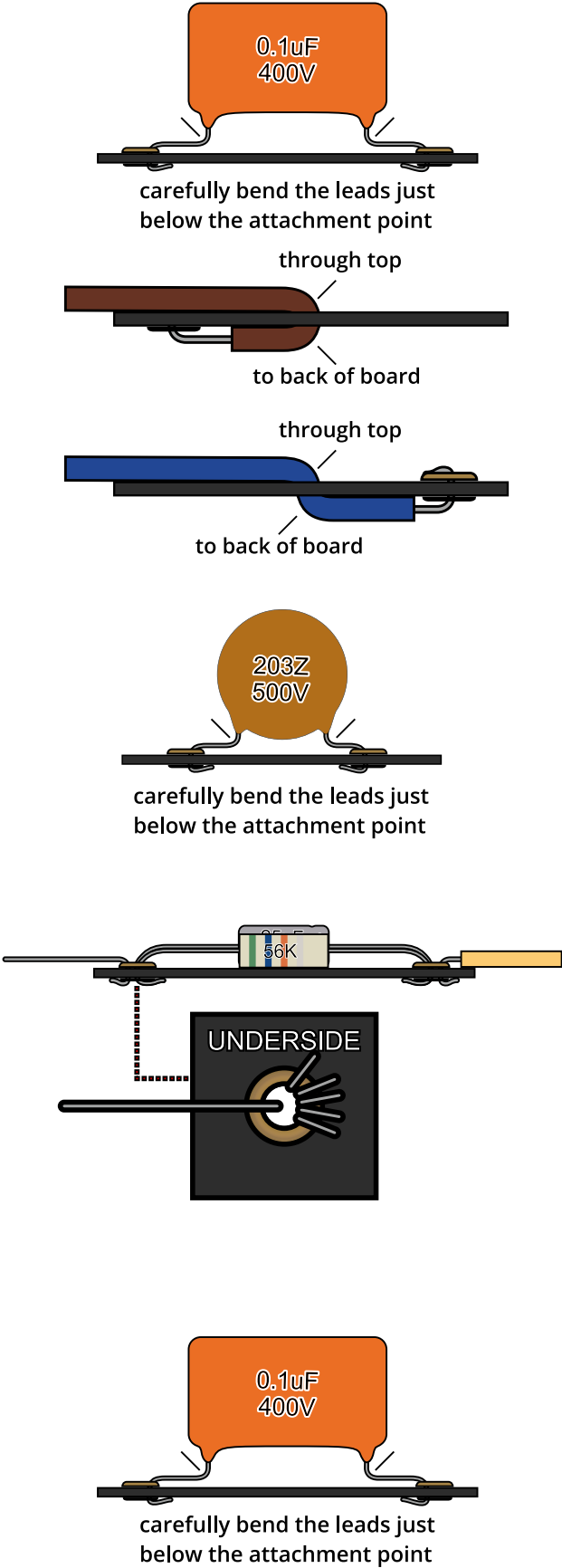
A6-8: Connect a 4" piece of bus wire to the back of eyelet 11. Solder eyelet 11 now.

A6-9: Locate a 1MΩ resistor. Its color bands are brown, black, green, gold. Connect this resistor from eyelet 29 to 48.

A6-10: Locate a 2W (the smaller of the two resistor sizes) 1kΩ resistor. Its color bands are brown, black, red, gold. Connect this resistor from eyelet 29 to 49. Solder eyelet 29 now.

A6-11: Locate a 0.1uF (104J) 400V capacitor. Connect it from eyelet 12 to 49.

A6-12: Connect a 3" piece of yellow wire to eyelet 49. Solder eyelet 49 now.



AA1164 Main Eyelet Board Construction

AA1164 Main Eyelet Board: Part 7

A7-1: Locate a 220kΩ resistor. Its color bands are red, red, yellow, gold. Connect this resistor from eyelet 12 to 30.

A7-2: Thread a 6" piece of red wire through hole S and connect it to eyelet 12 through the back of the board. Solder eyelet 12 now.

A7-3: Locate a 220kΩ resistor. Its color bands are red, red, yellow, gold. Connect this resistor from eyelet 13 to 30.

A7-4: Thread a 7" piece of yellow wire through hole Q and connect it to eyelet 30 through the back of the board. Solder eyelet 30 now.

A7-5: Locate a 56kΩ resistor. Its color bands are green, blue, orange, gold. Connect this resistor from eyelet 31 to 50.

A7-6: Locate a 0.1uF (104J) 400V capacitor. Connect it from eyelet 13 to 50.

A7-7: Thread an 8" piece of yellow wire through hole S and connect it to eyelet 13 through the back of the board. Solder eyelet 13 now.

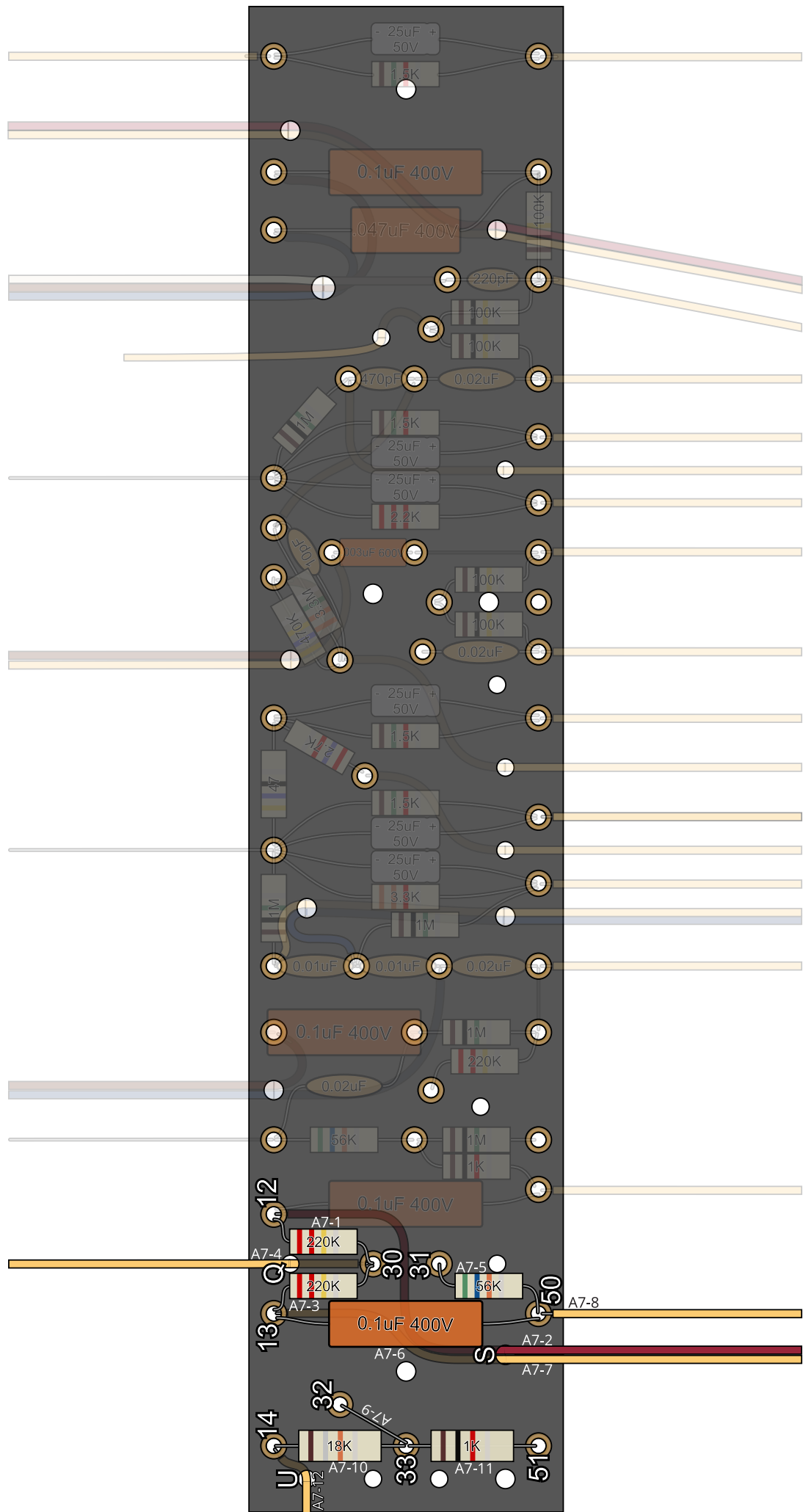
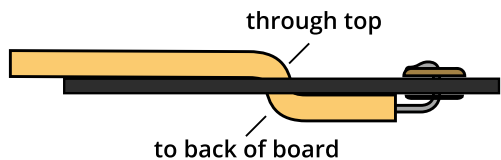
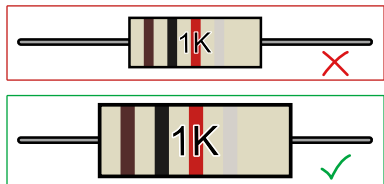
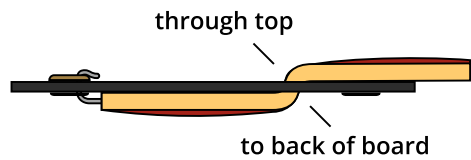
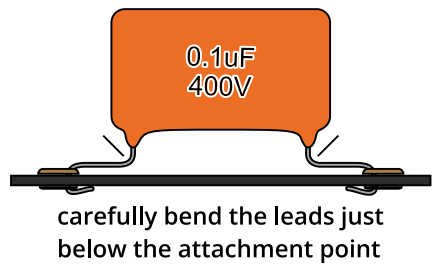
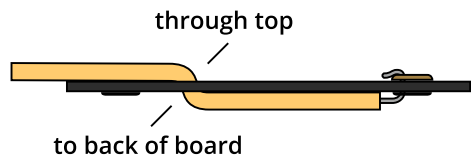
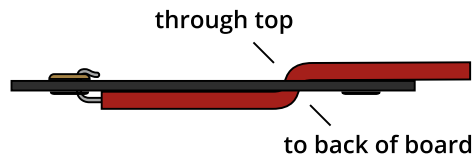
A7-8: Connect a 4" piece of yellow wire to eyelet 50. Solder eyelet 50 now.

A7-9: Connect a 1" piece of bus wire from eyelet 32 to 33.

A7-10: Locate a 3W 18kΩ resistor. Its color bands are brown, gray, orange, gold. Connect this resistor from eyelet 14 to 33.

A7-11: Locate the 3W (the larger of the two resistor sizes) 1kΩ resistor. Its color bands are brown, black, red, gold. Connect this resistor from eyelet 33 to 51.

A7-12: Thread a 3" piece of yellow wire through hole U and connect it to eyelet 14 through the back of the board. Solder eyelet 14 now.



AA1164 Main Eyelet Board Construction

AA1164 Main Eyelet Board: Part 8

A8-1: Thread a 3" piece of yellow wire through hole V and connect it to eyelet 33 through the back of the board.

A8-2: Thread a 5" piece of yellow wire through hole W and connect it to eyelet 33 through the back of the board. Solder eyelet 33 now.

A8-3: Thread a 4" piece of yellow wire through hole X and connect it to eyelet 51 through the back of the board.

A8-4: Thread a 7" piece of red wire through hole X and connect it to eyelet 51 through the back of the board. Trim the excess 1kΩ resistor lead at this eyelet but do not solder it at this point. A transformer wire will connect to this eyelet later in the instructions when the fiberboard is mounted.

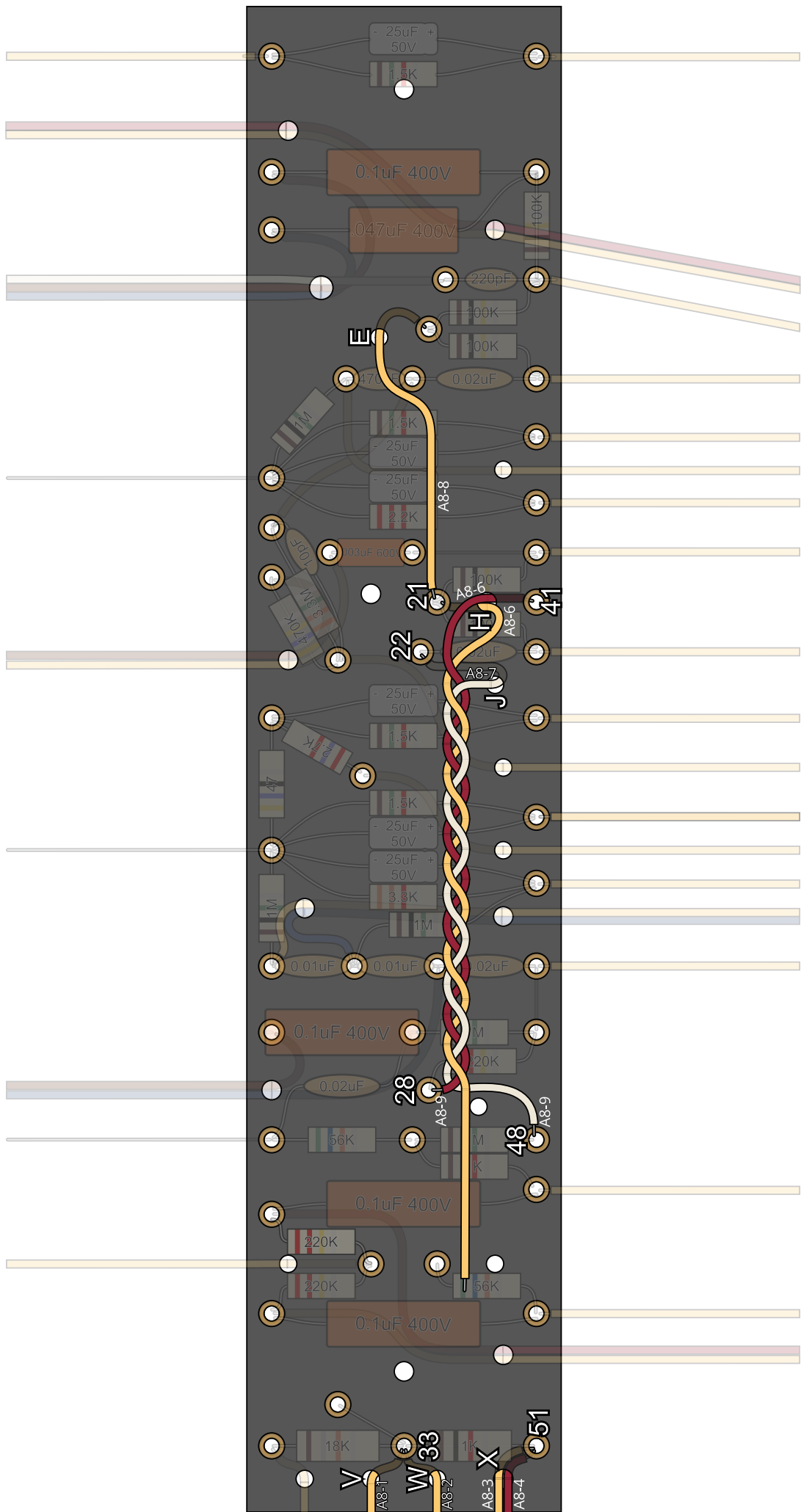
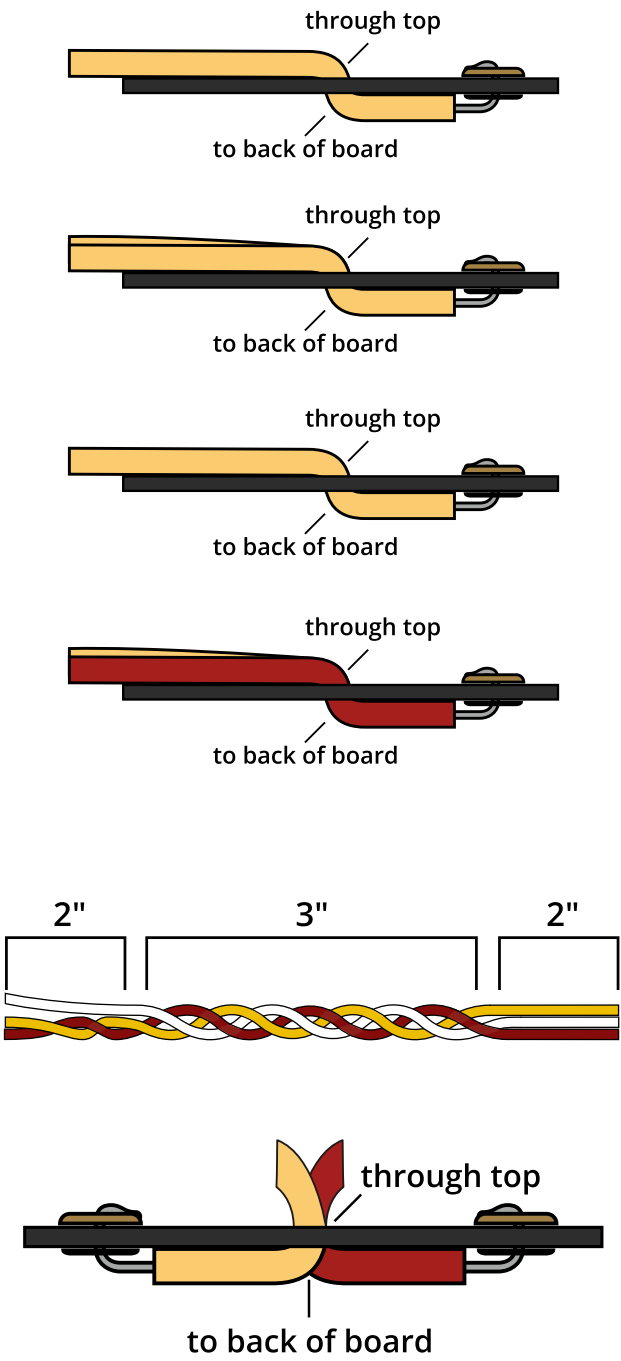
A8-5: Starting at 2" in of an 8" piece of yellow wire, an 8" piece of red wire, and an 8" piece of 22AWG white wire, twist a 3" segment, leaving roughly 2" untwisted on the other ends.

A8-6: Twist the 2" ends of the red and yellow wires together. Thread the twisted 2" ends of the red and yellow wires through hole H. Connect the yellow wire to eyelet 21 through the back of the board. Connect the red wire to eyelet 41 through the back of the board.

A8-7: Thread the 2" end of the white wire through hole J. Connect the white wire to eyelet 22 through the back of the board. Solder eyelet 22 now.

A8-8: Locate the yellow wire at hole E. Connect it to eyelet 21. Solder eyelet 21 now.

A8-9: Route the 3" twisted section towards the direction of the end of the board with the U, V, W, and X holes. Make sure this twisted section is lifted up and over the taller parts mounted on the fiberboard. Trim the 2" end of the red wire to connect to eyelet 28. Trim the 2" end of the white wire to connect to eyelet 48. Make sure that the twisted section remains elevated at both ends.



AA1164 Main Eyelet Board Construction

AA1164 Main Eyelet Board: Part 9

A9-1: Connect a 3" piece of yellow wire to eyelet 48. Solder eyelet 48 now.

A9-2: Thread a 5.5" piece of red wire through hole P and connect it to eyelet 28 through the back of the board. Solder eyelet 28 now.

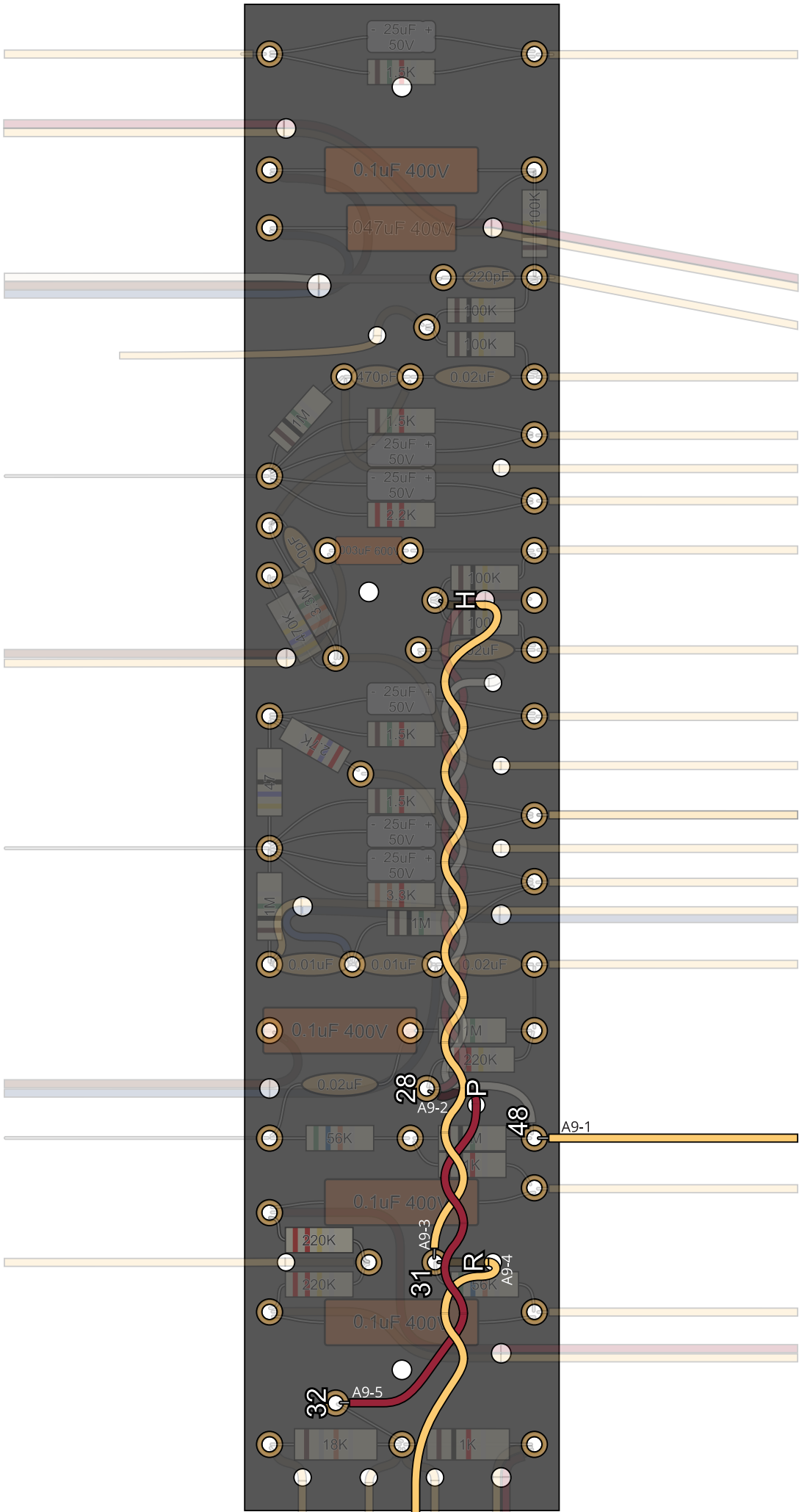
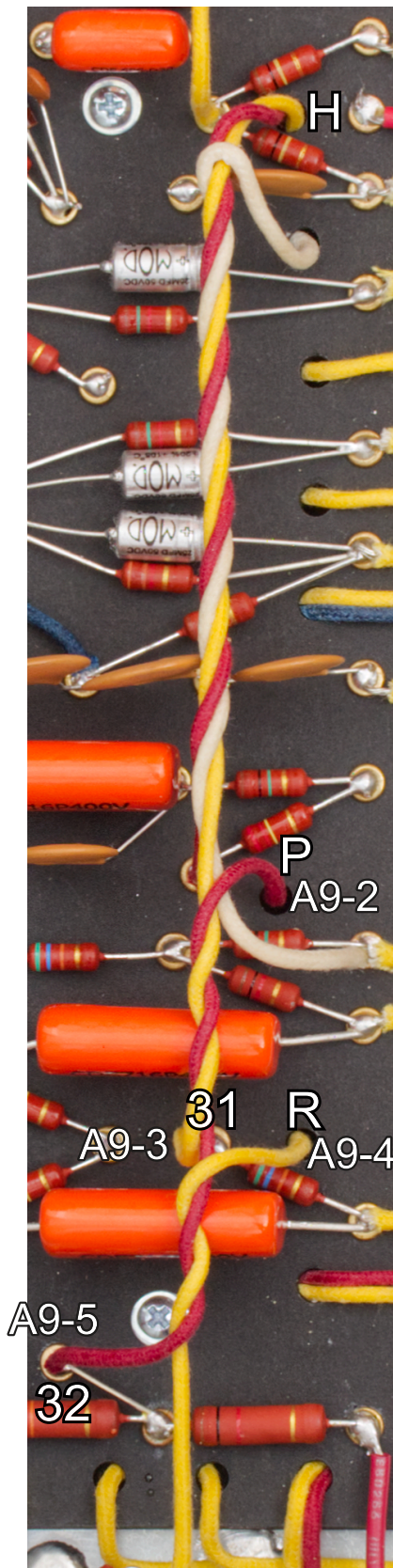
A9-3: Lift the red wire at hole P up to meet the unconnected 2" end of the yellow wire from hole H. Twist these two wires into a 1" segment. Connect the remaining yellow wire to eyelet 31

A9-4: Thread a 6" piece of yellow wire through hole R and connect it to eyelet 31 through the back of the board. Solder eyelet 31 now.

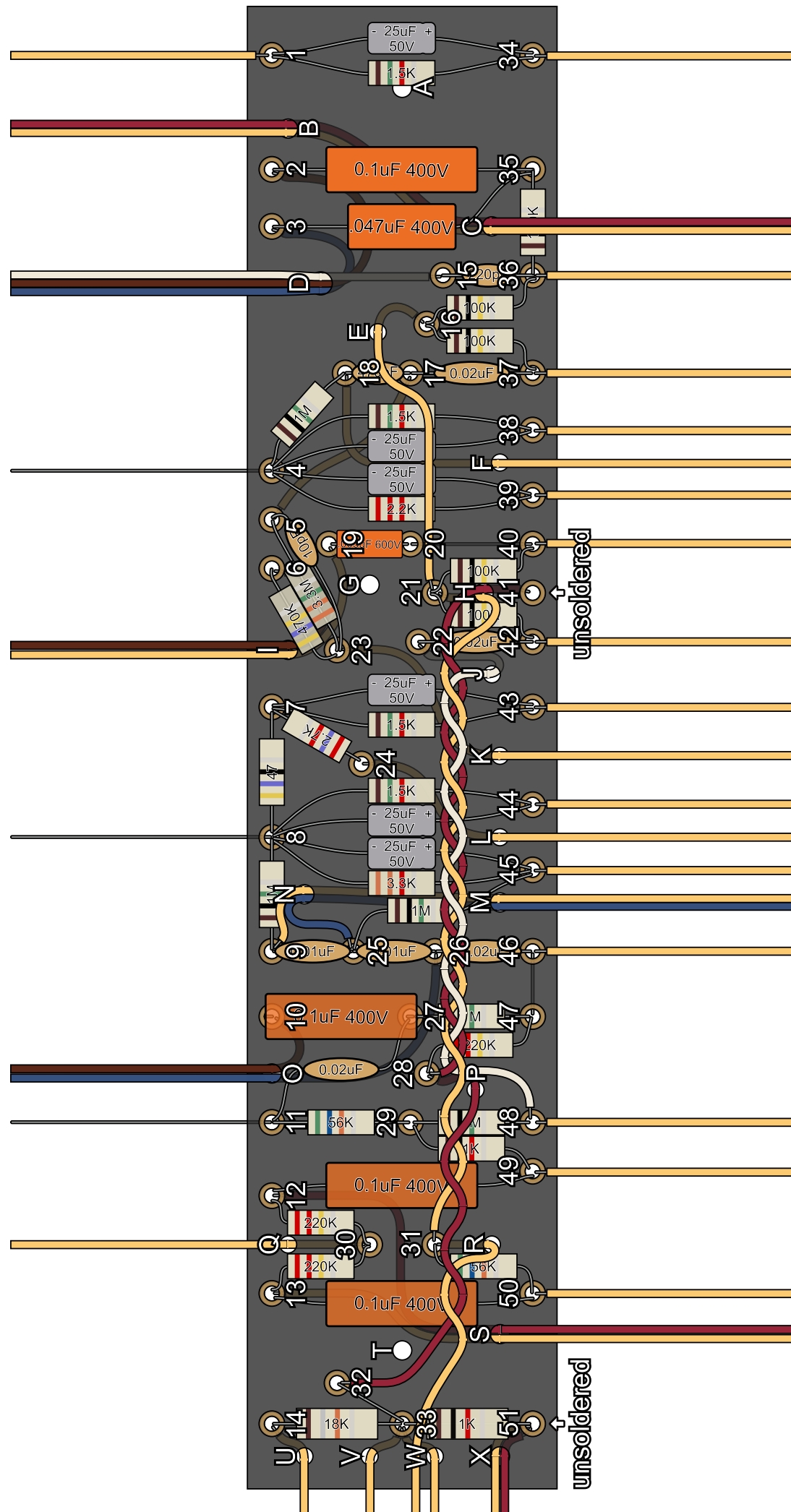
A9-5: Lift the yellow wire at hole R up to meet the unconnected end of the red wire from hole P. Twist these two wires into a 1" segment. Connect the remaining red wire to eyelet 32. Solder eyelet 32 now.

Completed Fiberboard: Inspection

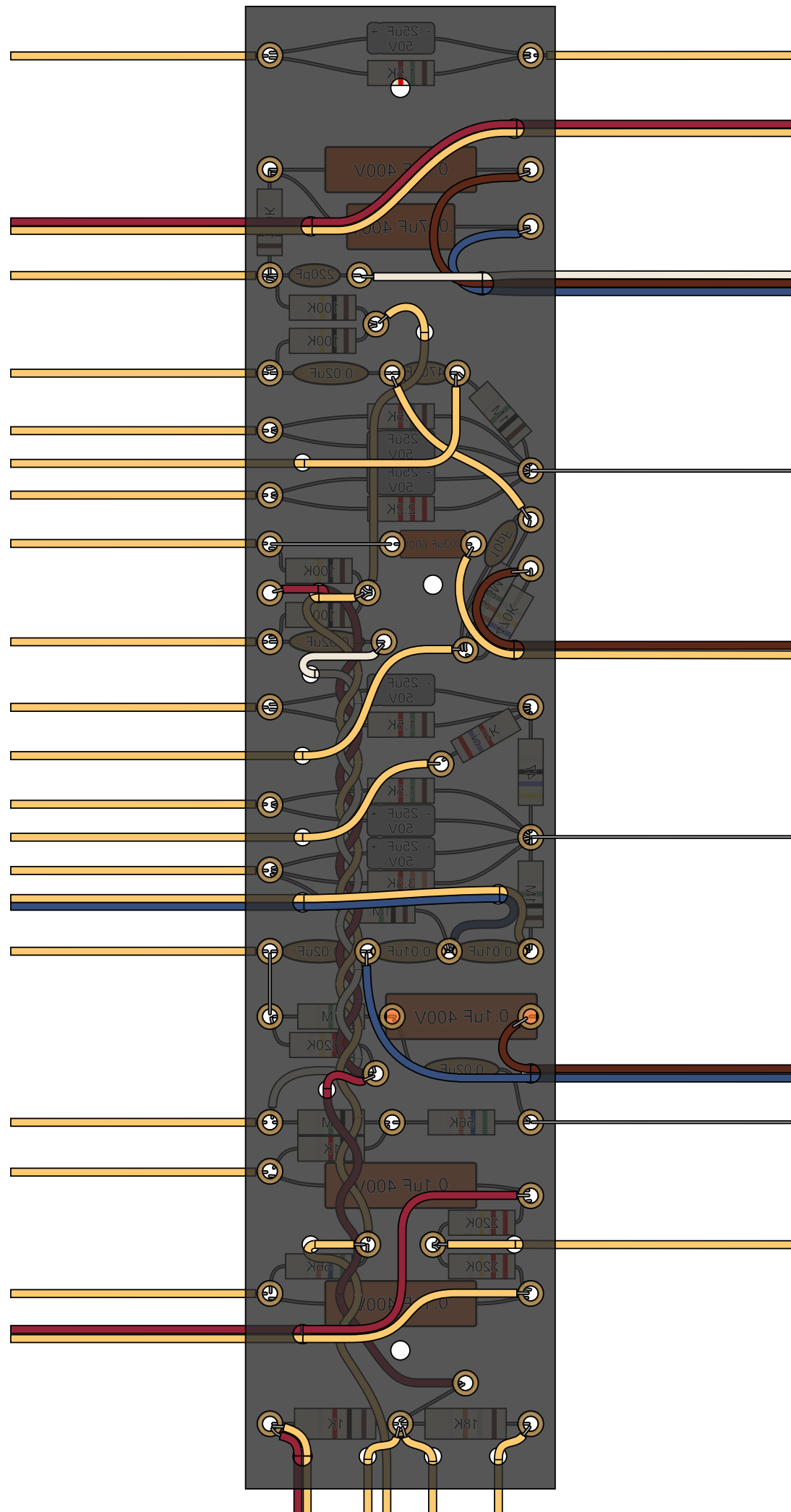
The main fiberboard of the AA1164 is now completed. Please take some time to thoroughly check the connections, parts placement, and solder joints. Ensure all components are in their correct positions according to the wiring diagram, with electrolytic capacitors oriented correctly for polarity. Verify that all solder joints are smooth and shiny, and free of cold joints, which can appear dull or cracked. Note that all eyelets except for 41 and 51 should be soldered at this point.



Completed AA1164 Eyelet Board (Front)



Completed AA1164 Eyelet Board (Back)



AA1164 Bias Eyelet Board Construction

Locate the AA1164 Bias Eyelet Board. The following steps will cover the placement and soldering of all parts that are mounted on this board. Use the Parts List as a reference

AA1164 Bias Eyelet Board: Part 1

B1-1: Locate the 1N4007 diode. Connect the anode to eyelet 1 and the cathode, the side with the silver band, to eyelet 2.

B1-2: Locate a 100kΩ resistor. Its color bands are brown, black, yellow, gold. Connect this resistor from eyelet 2 to 3. Solder eyelet 2 now.

B1-3: Connect a 1" piece of bus wire from the back of eyelet 1 to the back of eyelet 4.

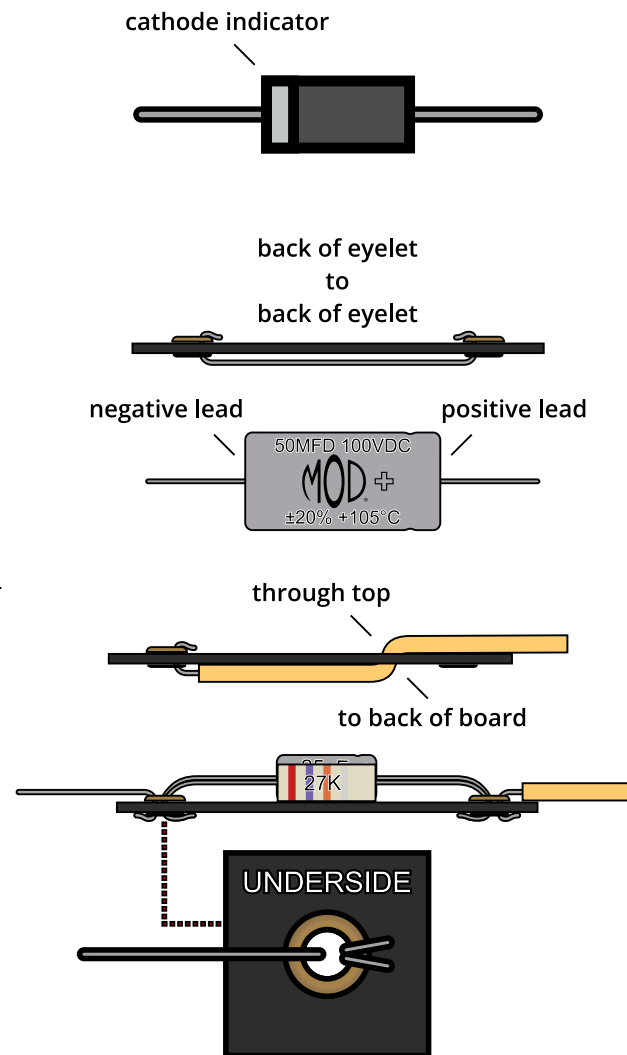
B1-4: Locate the 50uF 100V capacitor. Connect the negative lead to eyelet 4 and the positive to 5.

B1-5: Locate the 27k Ω resistor. Its color bands are red, violet, orange, gold. Connect this resistor from eyelet 4 to 5. Solder eyelet 4 now.

B1-6: Thread a 5" piece of yellow wire through hole A and connect it to eyelet 1 through the back of the board. Solder eyelet 1 now.

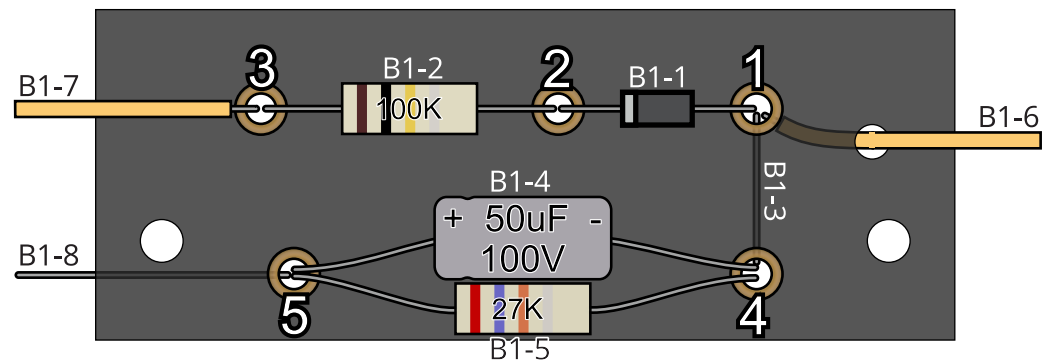
B1-7: Connect an 8" piece of yellow wire to eyelet 3. Solder eyelet 3 now.

B1-8: Connect a 3" piece of bus wire to the back of eyelet 5. Solder eyelet 5 now.



Completed Fiberboard: Inspection

The bias fiberboard of the AA1164 is now completed. Please take some time to thoroughly check the connections, parts placement, and solder joints. Ensure all components are in their correct positions according to the wiring diagram, with electrolytic capacitors oriented correctly for polarity. Verify that all solder joints are smooth and shiny, and free of cold joints, which can appear dull or cracked. Note that all eyelets should be soldered at this point.



AA1164 Eyelet Board Construction Builder Notes

Use this page to record any notes on the eyelet board construction.

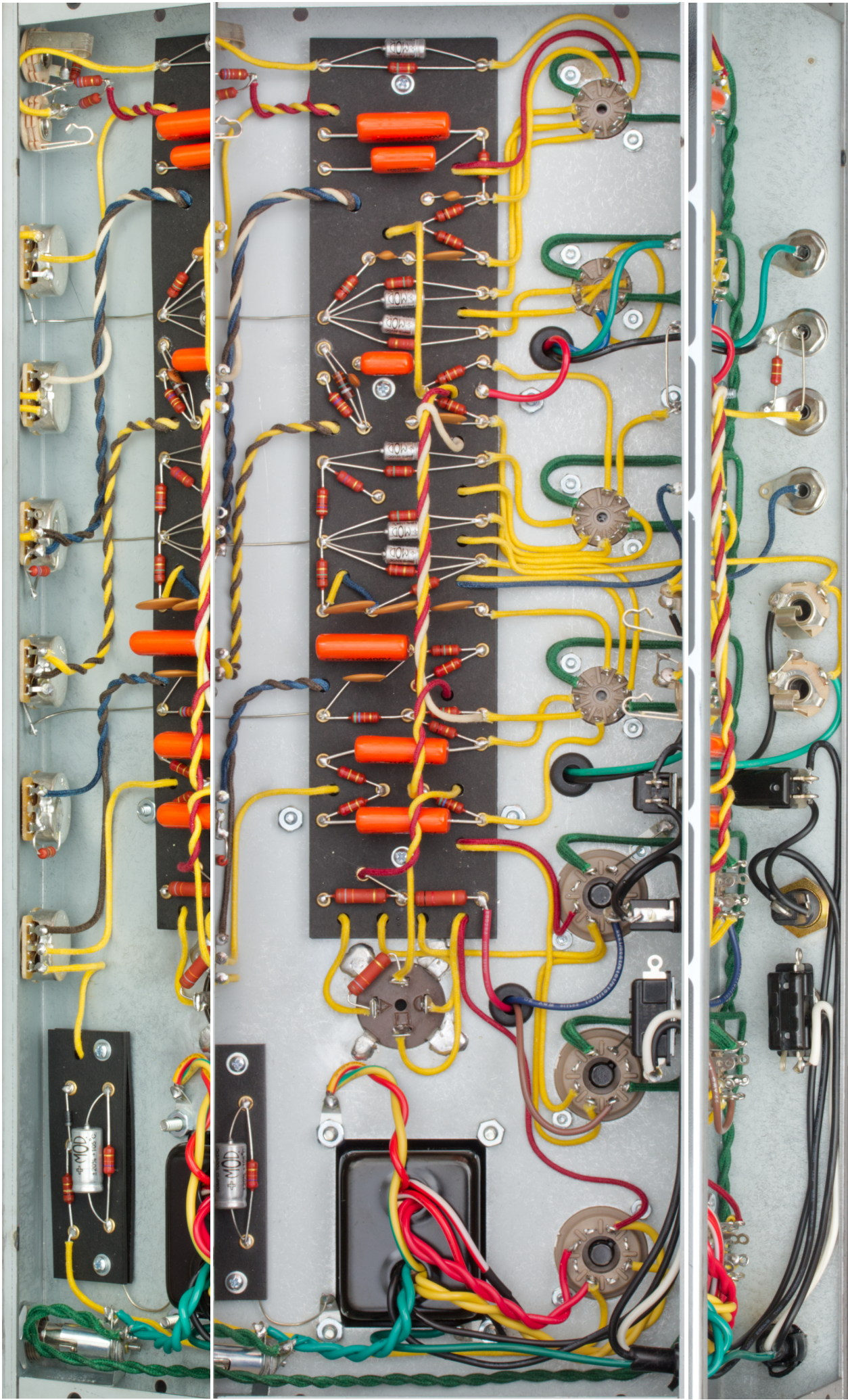
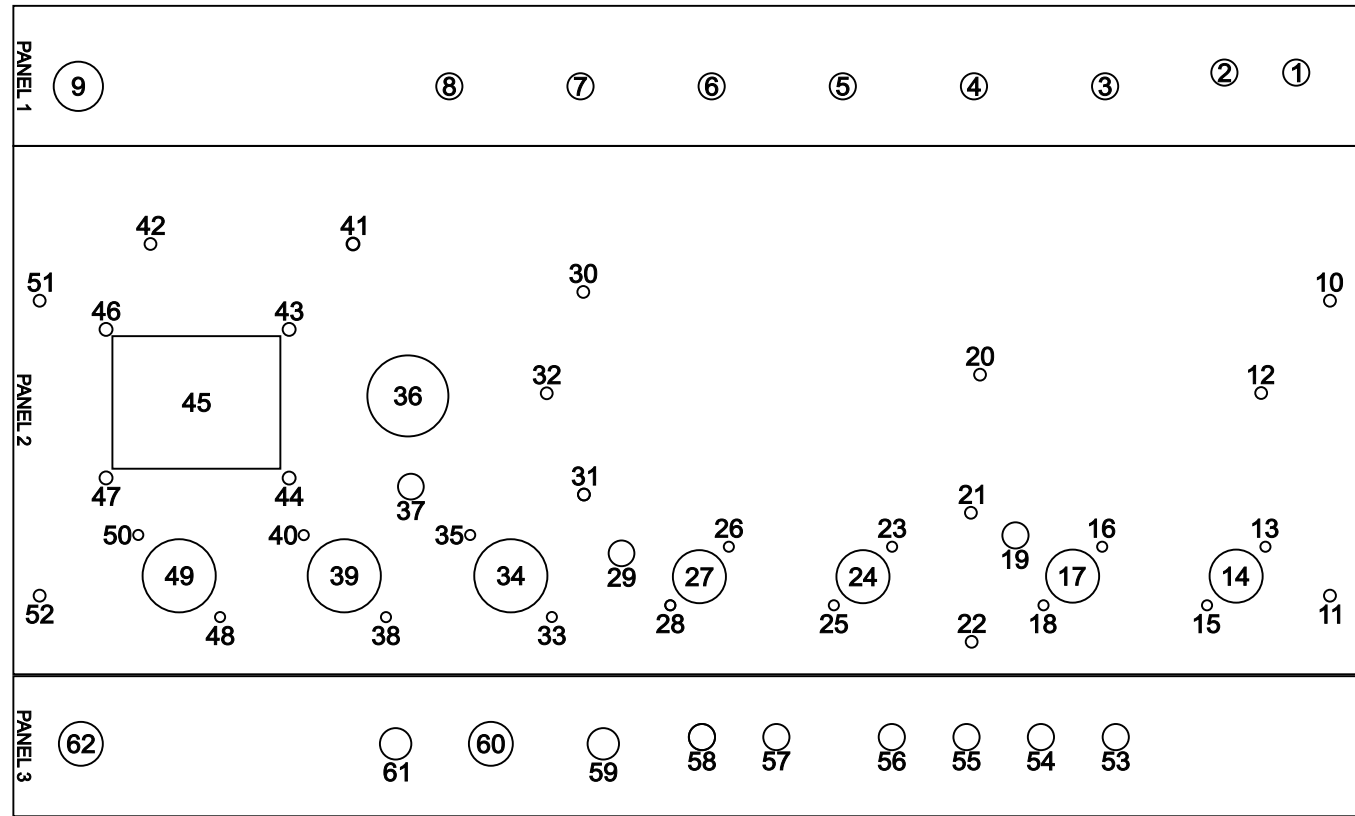
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Notes on Chassis Construction

This section covers the chassis construction and diagrams used throughout these instructions.

Chassis Layout

The chassis drawings show a flattened view of the chassis, looking into the open side, with the control side at the top and the rear panel at the bottom. The top panel with the inputs and controls is referred to as Panel 1. The middle panel with the transformers and fiberboard is Panel 2. The bottom panel with the power and speaker outputs is Panel 3. The holes referenced throughout the instructions will correspond to the numbers shown on this drawing.

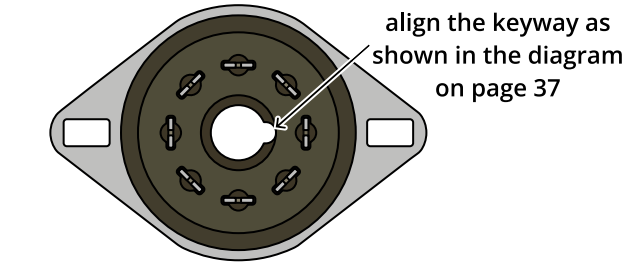


Chassis-Mounted Components: Panels 1 & 2

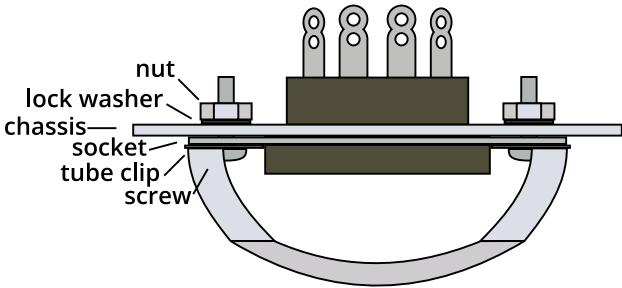
Locate the chassis. The following steps will cover the placement and mounting of components such as potentiometers, transformers, and sockets onto the chassis. Use the Parts List as a reference.

Part 1: Tube Sockets

C1-1: Locate the three octal sockets and tube clips. These will mount to holes 34, 39, and 49 on panel 2 of the chassis. Hole 49 is the rectifier tube socket and holes 34 and 39 are the output tube sockets. Be sure to orient the sockets as shown in the drawing.

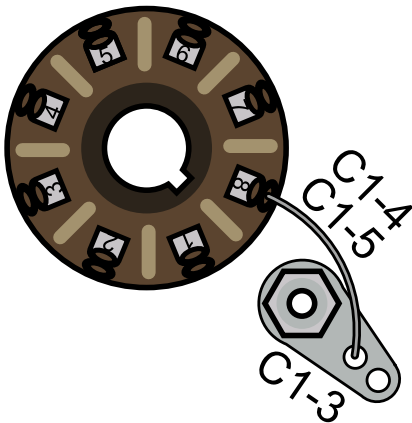


C1-2: Locate six 1/4" 4-40 screws, six 4-40 nuts, four #4 lock washers and two #6 solder lugs. Pass the screws through the tube clip and then the mounting bracket of the octal sockets.



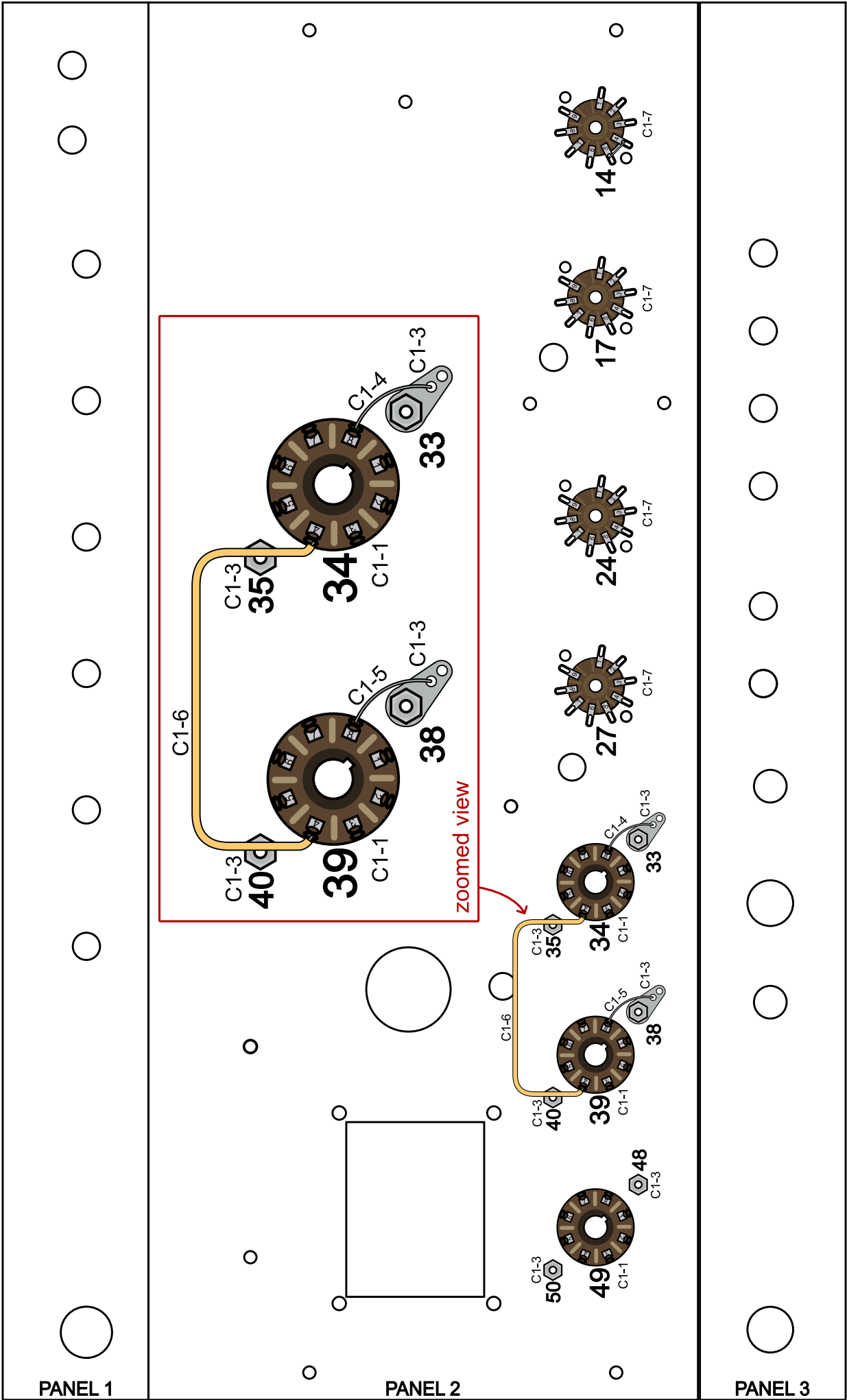
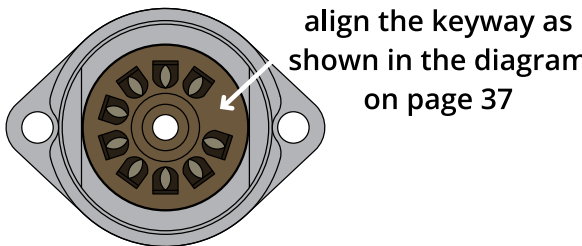
C1-3: Mount these through the outside of the chassis then use the lock washers and nuts to secure the sockets to the chassis at holes 35, 40, 48, and 50. At holes 33 and 38, slide the #6 solder lugs onto the screws and then secure each with a 4-40 nut.

C1-4: Cut a 1.5" piece of bus wire. Use this to connect the lug 8 of the noval socket at hole 34 to the solder lug at hole 33. Solder both lug 8 of the socket and the solder lug at 33 now.



C1-5: Cut a 1.5" piece of bus wire. Use this to connect the lug 8 of the noval socket at hole 39 to the solder lug at hole 38. Solder both lug 8 of the socket and the solder lug at 38 now.

C1-6: Cut a 5" piece of yellow wire. Use this to connect lug 4 of the socket at hole 34 to lug 4 of the socket at hole 39. Solder lug 4 of the socket at hole 39 now.

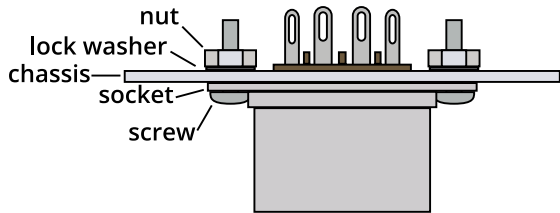


Chassis-Mounted Components: Panels 1 & 2

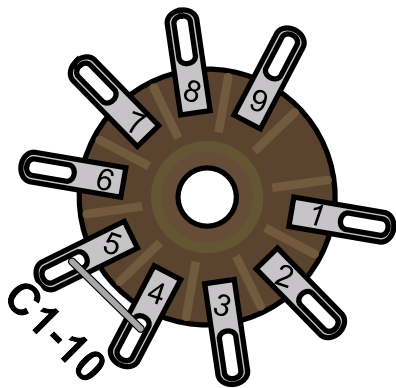
Part 1: Tube Sockets (Continued)

C1-8: Locate eight 1/4" 4-40 screws, 4-40 nuts, and #4 lock washers. Pass the screws through the mounting bracket of the noval socket at holes 13 and 15, 16 and 18, 23 and 25, and 26 and 28.

C1-9: The sockets mount through the outside of the chassis. Use the lock washers and nuts to secure the sockets to the chassis.



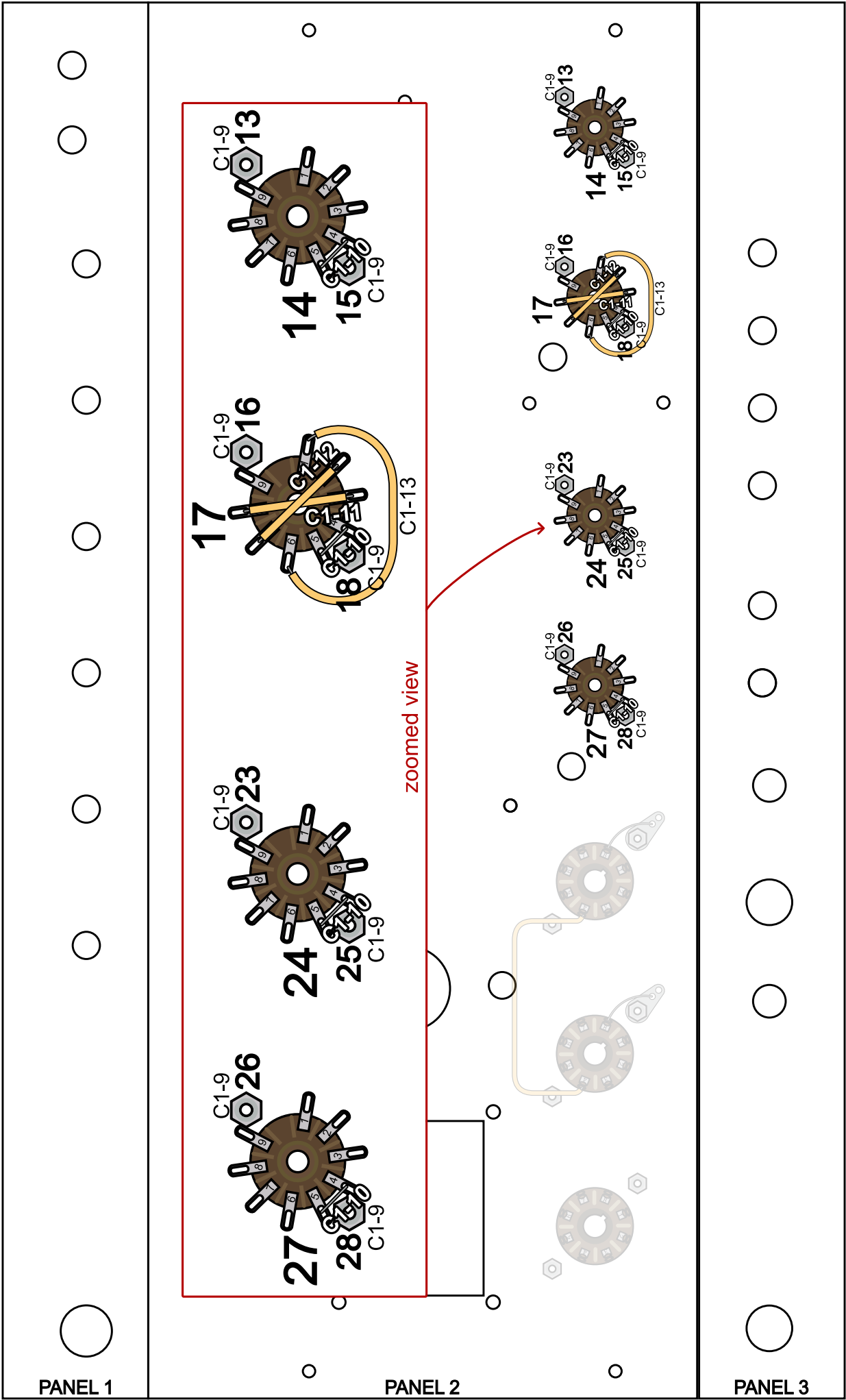
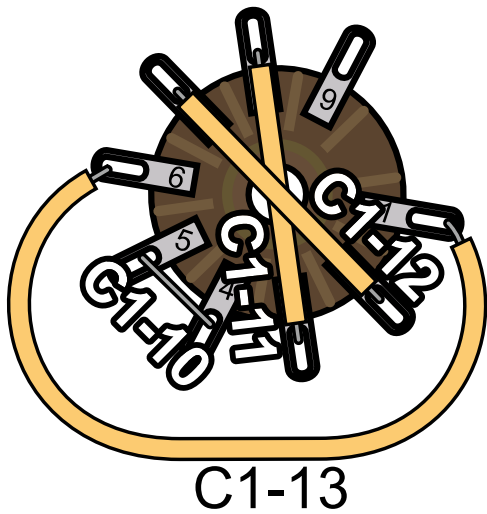
C1-10: Cut four 1/2" pieces of bus wire. Use these to connect the lug 4 to 5 on each noval socket. Solder lug 5 on all noval sockets now.



C1-11: Cut a 1" piece of yellow wire. Use this to connect the lug 3 to 8 on the noval socket at hole 17. Solder lug 3 now.

C1-12: Cut a 1" piece of yellow wire. Use this to connect the lug 2 to 7 on the noval socket at hole 17. Solder lug 2 now.

C1-13: Cut a 3" piece of yellow wire. Use this to connect lug 1 to 6 on the noval socket at hole 17. Solder lug 1 now.



Chassis-Mounted Components: Panels 1 & 2

Part 2: Filament Wiring

C2-1: Starting at the middle of two 8" pieces of green wire, twist a 1.5" segment. Leave the two ends untwisted. Position the twisted section against the edge of panels 2 and 3 of the chassis between the noval socket at hole 14 and the noval socket at hole 17. Trim the four untwisted ends to connect pins 9 and 4 of the noval socket at hole 14 to 9 and 4 of the noval socket at hole 17. Polarity does not matter with these wires. Solder pins 9 and 4 of the noval socket at hole 14 now.

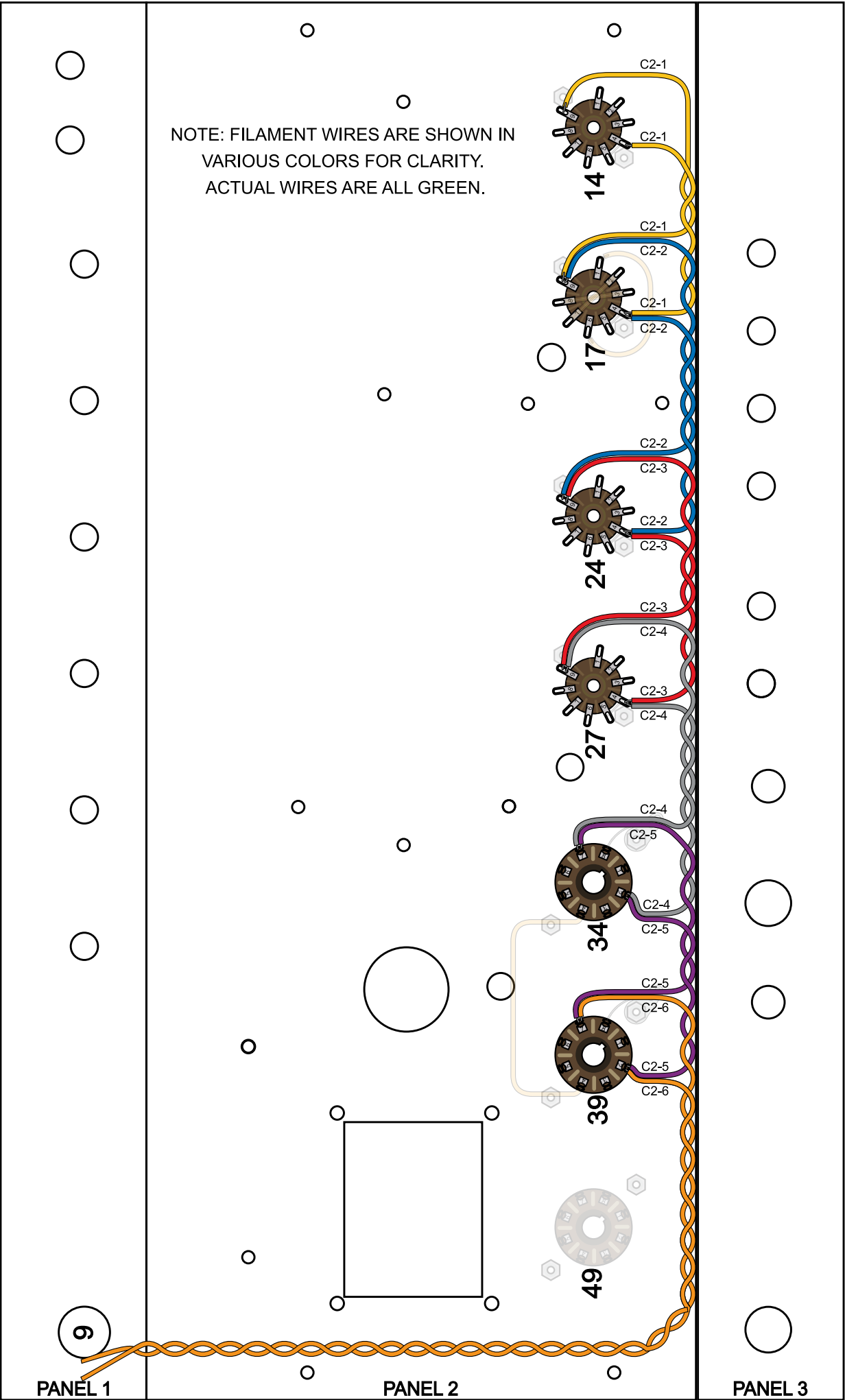
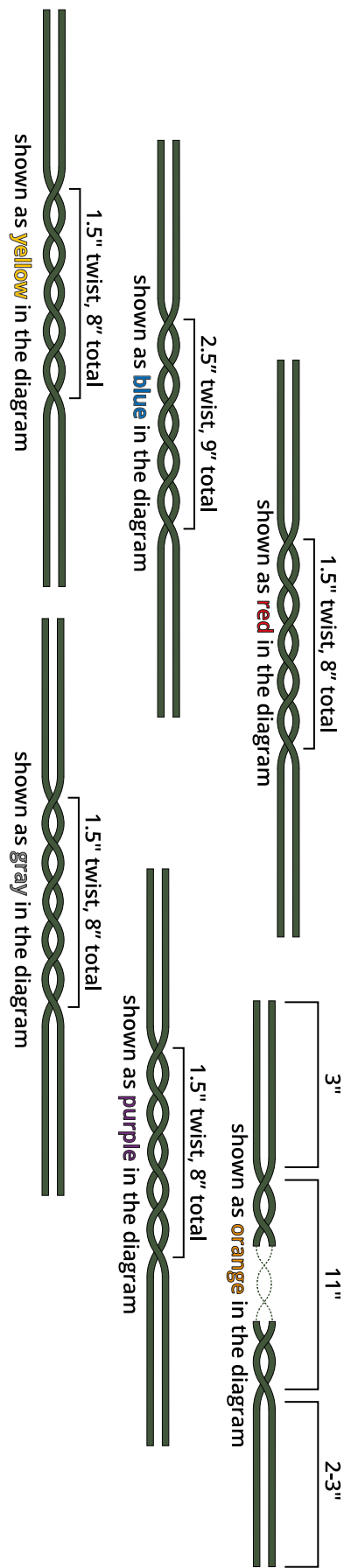
C2-2: Starting at the middle of two 9" pieces of green wire, twist a 2.5" segment. Leave the two ends untwisted. Position the twisted section against the edge of panels 2 and 3 of the chassis between the noval socket at hole 17 and the noval socket at hole 24. Trim the four untwisted ends to connect pins 9 and 4 of the noval socket at hole 17 to 9 and 4 of the noval socket at hole 24. Polarity does not matter with these wires. Solder pins 9 and 4 of the noval socket at hole 17 now.

C2-3: Starting at the middle of two 8" pieces of green wire, twist a 1.5" segment. Leave the two ends untwisted. Position the twisted section against the edge of panels 2 and 3 of the chassis between the noval socket at hole 24 and the noval socket at hole 27. Trim the four untwisted ends to connect pins 9 and 4 of the noval socket at hole 24 to 9 and 4 of the noval socket at hole 27. Polarity does not matter with these wires. Solder pins 9 and 4 of the noval socket at hole 24 now.

C2-4: Starting at the middle of two 8" pieces of green wire, twist a 1.5" segment. Leave the two ends untwisted. Position the twisted section against the edge of panels 2 and 3 of the chassis between the noval socket at hole 19 and the octal socket at hole 23. Trim the four untwisted ends to connect pins 9 and 4 of the noval socket at hole 27 to 7 and 2 of the octal socket at hole 34. Polarity does not matter with these wires. Solder pins 9 and 4 of the noval socket at hole 27 now.

C2-5: Starting at the middle of two 8" pieces of green wire, twist a 1.5" segment. Leave the two ends untwisted. Position the twisted section against the edge of panels 2 and 3 of the chassis between the octal socket at hole 34 and the octal socket at hole 39. Trim the four untwisted ends to connect pins 7 and 2 of the octal socket at hole 34 to 7 and 2 of the octal socket at hole 39. Polarity does not matter with these wires. Solder pins 7 and 2 of the octal socket at hole 34 now.

C2-6: Starting at 3" in of two 17" pieces of green wire, twist an 11" segment, leaving roughly 2-3" untwisted on the other end. With the 3" untwisted section facing the octal socket at hole 39, route the twisted section against the edge of panels 2 and 3 of the chassis towards hole 49 on panel 2 of the chassis. Once past hole 49, route the twisted wires toward hole 9. Try to avoid blocking any of the other holes on its way across panel 2. Trim the 3" ends to connect to pins 7 and 2 of the octal socket at hole 39. Keep in mind that the other ends will connect to the pilot light holder at holes 11 later in the instructions. Solder pins 7 and 2 of the octal socket at hole 39 now.



Chassis-Mounted Components: Panels 1 & 2

Part 3: Mounting the Multi-Section Capacitor

C3-1: Locate the 20/20/20/20μF 450V electrolytic capacitor. Position this capacitor into hole 36 on panel 2 of the chassis. This mounts through the outside of the chassis with the tabs on the inside and the metal can on the outside.

C3-2: Note the three symbols associated with the solder tabs of the capacitor. Rotate the capacitor so the triangle tab is closest to panel 1 and the moon (semicircle) tab is closest to panel 3. The square tab should be facing hole 45. The blank tab should be facing hole 32.

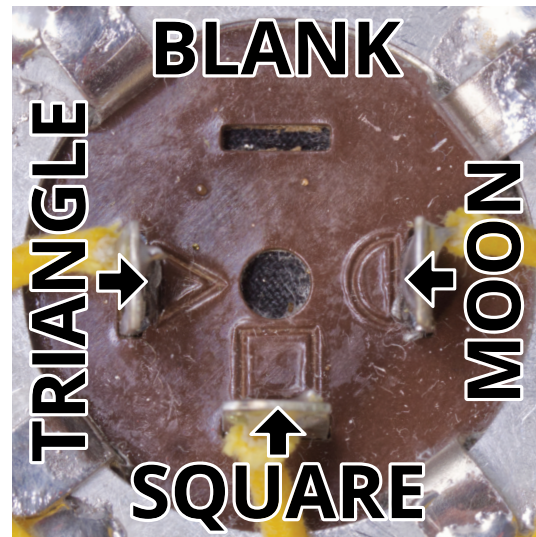
C3-3: With the body of the capacitor flush to the outside of panel 2, bend the four ground tabs outward until they are flush with the inside of the chassis to secure the capacitor to the chassis. Pliers are useful for starting each bend and a flathead screwdriver works well to push each tab flush to the chassis. Once the tabs are flush, the capacitor should be fully secured to the chassis and will not rotate or wobble.

C3-4: Turn on the soldering iron and allow it to fully heat up. A high-power iron like the Weller SPG80L is ideal for soldering the capacitor to the chassis, but a 70W iron set to a high temperature with a large tip can work equally well with some patience.

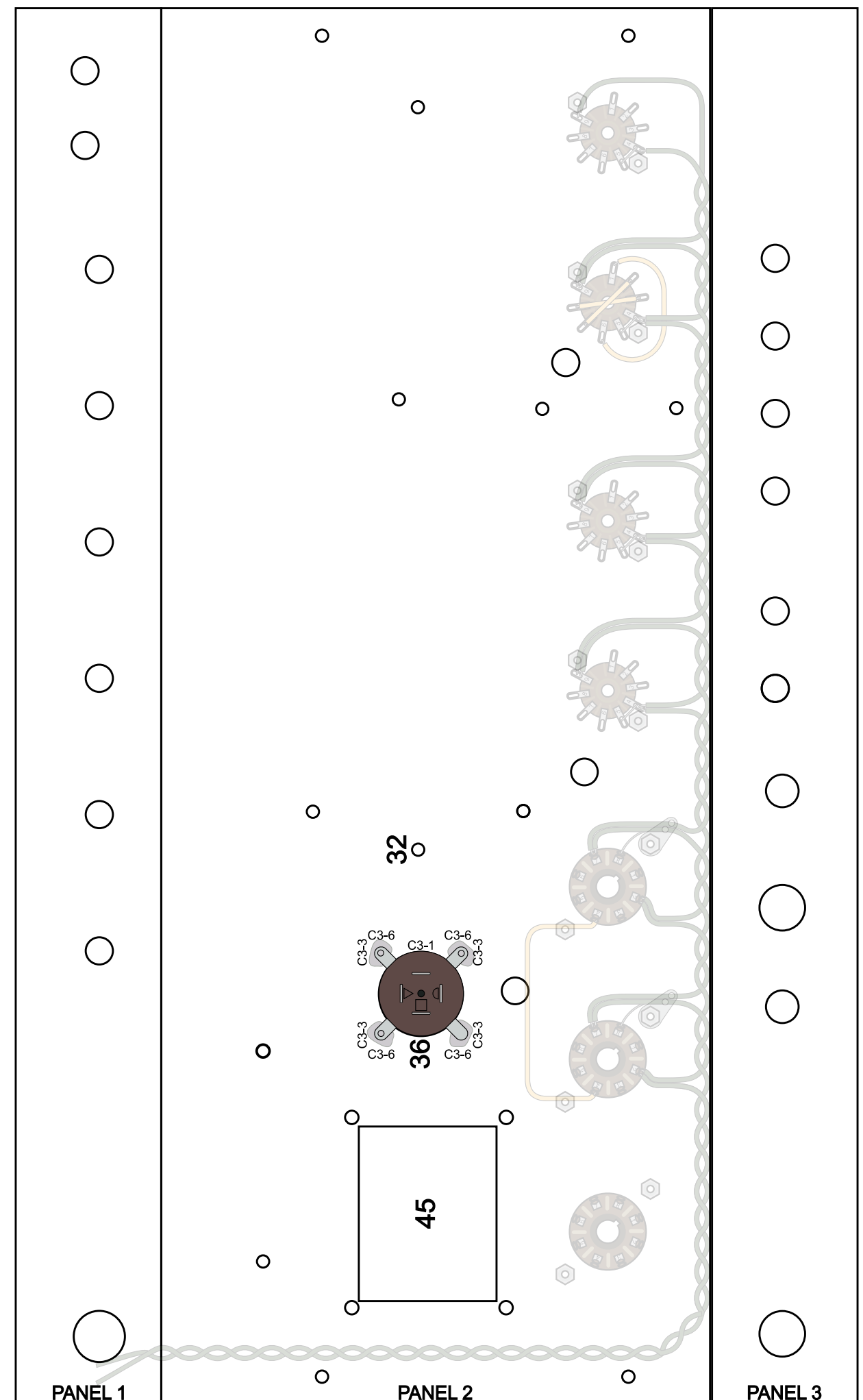
C3-5: Begin soldering each ground tab to the chassis. Allow the iron to fully heat both the tab and the chassis at each connection before applying any solder. This can take a lot longer than a typical solder joint.

C3-6: When the tab and chassis are sufficiently heated, slowly apply the solder. The solder should flow across the tab and surrounding chassis area. If the solder beads, there is not enough heat. If beading, do not attempt to add more solder and allow for more heat to transfer into the chassis before resuming. Solder all four ground tabs to the chassis.

C3-7: When all four ground tabs are soldered to the chassis, allow the chassis to completely cool before handling. This can take several minutes.



Tip: Scuff sanding the chassis beneath the ground tabs can help the solder bond.



Chassis-Mounted Components: Panels 1 & 2

Part 4: Mounting the Front Faceplate & Controls

C4-1: Locate the front faceplate. Line it up with the corresponding holes of panel 1 on the outside of the chassis. The following steps detail how to secure the faceplate to the chassis using the front panel hardware. These components will pass through both the chassis and the faceplate at the corresponding holes. Loosely secure each piece of hardware at first, ensuring all items are mounted on panel 1 before fully tightening. Be careful not to scratch the panel when tightening the front panel hardware.

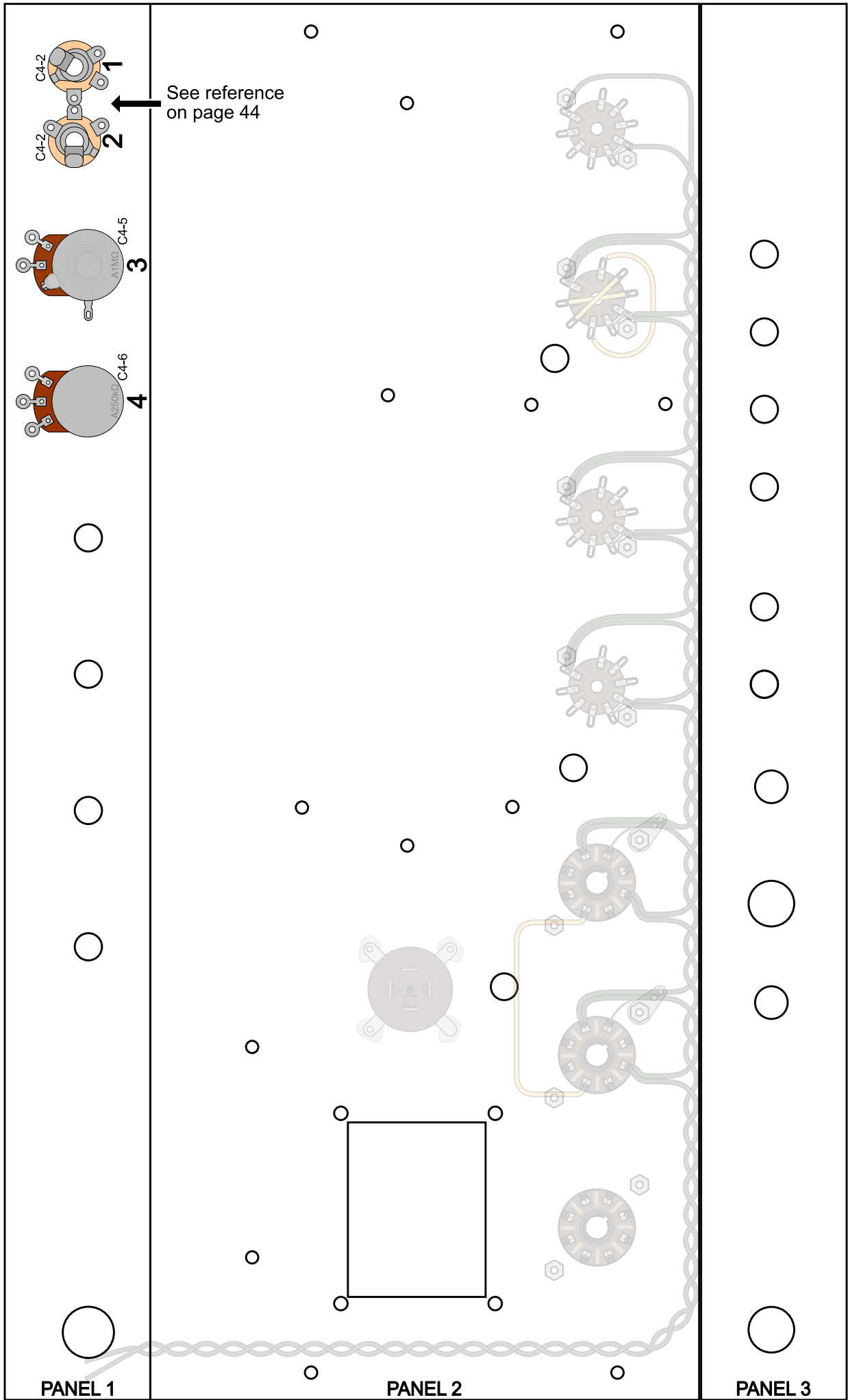
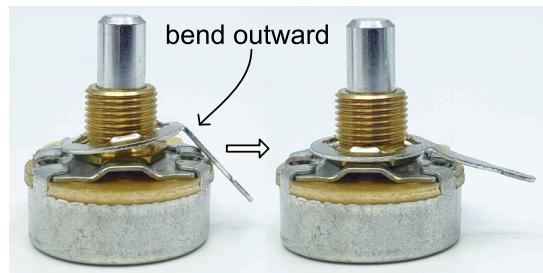
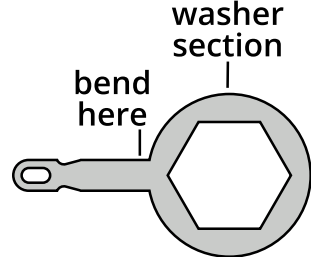
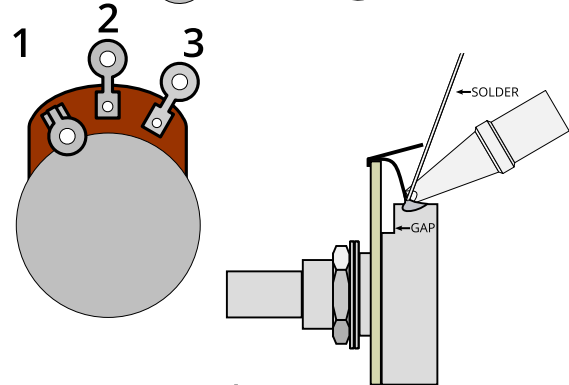
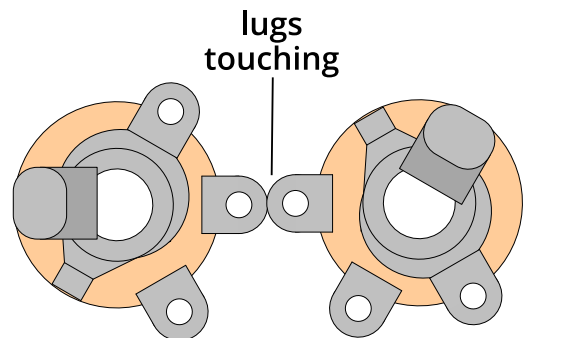
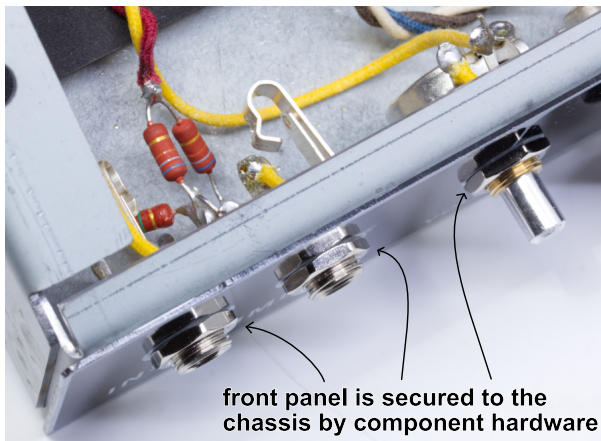
C4-2: Locate two of the switched 1/4" jacks. Mount these to holes 1 and 2 on panel 1. The nut is attached on the outside of the chassis. The included flat washers are not required and can be discarded. Orient the jacks as shown in the drawing to the right. The tip lug of the jack at hole 1 should be touching the switch lug of the jack at hole 2. These lugs may need to be adjusted with pliers for the jacks to sit flush to the panel.

C4-3: Locate the A1MΩ and B100kΩ potentiometers. On each of these, bend lug 1 down until it makes contact with the metal potentiometer body. Solder lug 1 to the frame on these pots now. Be careful not to melt any solder into the gap. This connection grounds the lug to the chassis when the pots are mounted.

C4-4: Locate three 3/8" solder lugs. Use needlenose pliers to slightly bend the arm so that the washer section of the solder lug can sit flush on the potentiometers.

C4-5: Remove all of the mounting hardware from the A1MΩ potentiometer. Slide one of the 3/8" solder lugs onto this pot's bushing. Mount this pot to hole 3 with its lugs facing up. The 3/8" solder lug should be pointing left. The easiest way to accomplish this is to stand the chassis on the end closest to hole 9 when mounting the pot. Attach the nut on the outside of the chassis.

C4-6: Locate one of the A250kΩ potentiometers. Mount this pot to hole 4. First slide the lock washer onto the pot's bushing. Mount the pot with the lugs facing up. Attach the nut on the outside of the chassis.



Chassis-Mounted Components: Panels 1 & 2

Part 4: Mounting the Front Faceplate & Controls (Continued)

C4-7: Remove all of the mounting hardware from the other A250kΩ potentiometer. Slide one of the 3/8" solder lugs onto this pot's bushing. Mount this pot to hole 5 with its lugs facing up. The 3/8" solder lug should be pointing left. Attach the nut on the outside of the chassis.

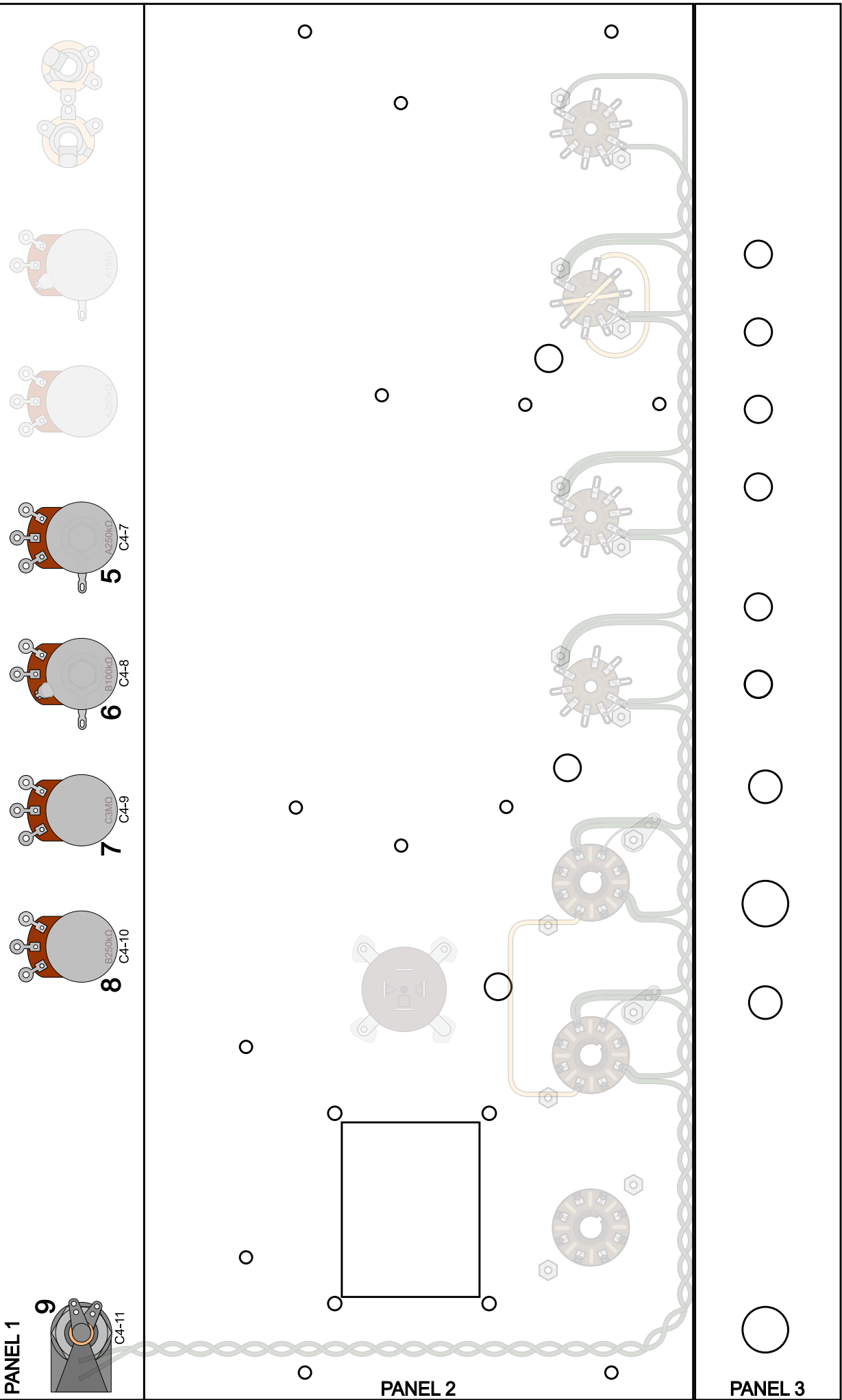
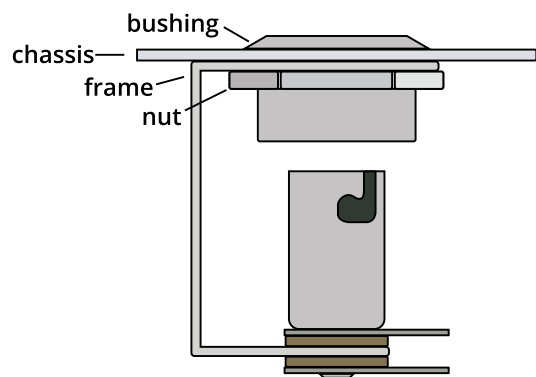
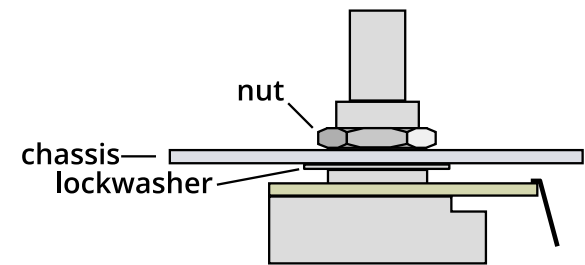
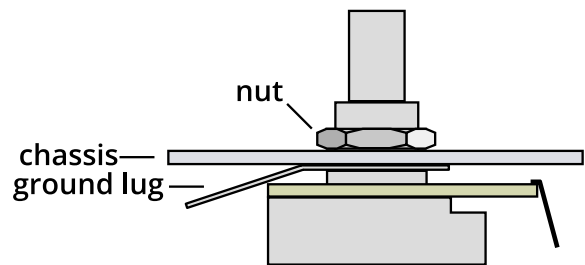
C4-8: Remove all of the mounting hardware from the B100kΩ potentiometer. Slide one of the 3/8" solder lugs onto this pot's bushing. Mount this pot to hole 6 with its lugs facing up. The 3/8" solder lug should be pointing left. Attach the nut on the outside of the chassis.

C4-9: Locate the C3MΩ potentiometer. Mount this pot to hole 7. First slide the lock washer onto the pot's bushing. Mount the pot with the lugs facing up. Attach the nut on the outside of the chassis.

C4-10: Locate the B250kΩ potentiometer. Mount this pot to hole 8. First slide the lock washer onto the pot's bushing. Mount the pot with the lugs facing up. Attach the nut on the outside of the chassis.

C4-11: Locate the pilot light socket. This will mount in hole 9. The bushing mounts to the outside of the chassis. The frame is then secured with the nut on the inside of the chassis. Make sure that the frame is oriented to the left and that the solder lugs are not touching the chassis. The lugs may need to be rotated away from the chassis.

C4-12: Now that all of the front panel components have been mounted, tighten down all mounting hardware. Be careful not to damage the front panel.



Chassis-Mounted Components: Panels 1 & 2

Part 5: Front Controls Preliminary Wiring

C5-1: Cut a 3/4" piece of bus wire. Use this to connect the switch lug to the sleeve lug on the jack at hole 1. Solder the switch lug of the jack at hole 1 now.

C5-2: Locate a 1M resistor. Its color bands are brown, black, green, gold. Connect this resistor from the tip lug to the sleeve lug on the jack at hole 1. Make sure that the resistor's body is not blocking the path of the plug. Test by inserting a cable into this jack. Once the position is confirmed, solder the sleeve lug of this jack.

C5-3: Locate a 68kΩ resistor. It's color bands are blue, gray, orange, gold. Connect this resistor to the tip lug of the jack at hole 2. There should be roughly 1/4" of lead between the body of the resistor and the solder lug. Solder the tip lug now.

C5-4: Locate another 68kΩ resistor. Connect this resistor to the tip lug of the jack at hole 1. There should be roughly 1/4" of lead between the body of the resistor and the solder lug. Make sure that the switch lug of the jack at hole two is still making contact with the tip lug of the jack at hole 1. Solder these connections together now. The joint should coat both jacks' lugs and the wrapped leads of the two resistors connected to the tip lug at hole 1.

C5-5: Once the parts have cooled, gently twist together the unconnected ends of the two 68kΩ resistors.

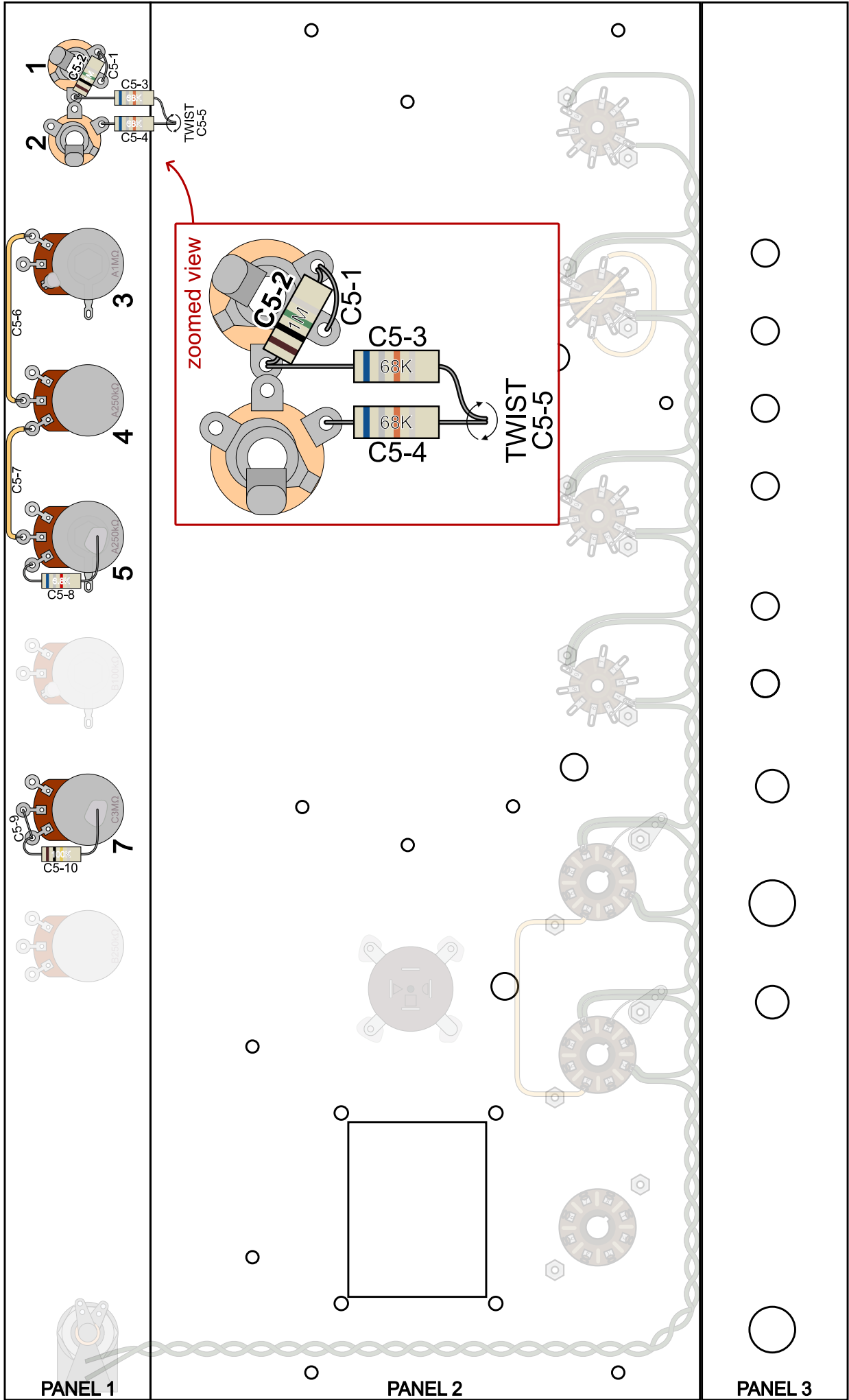
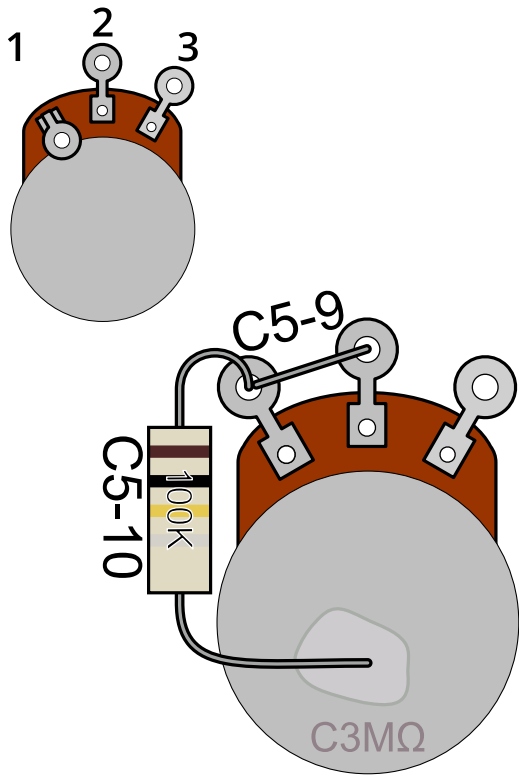
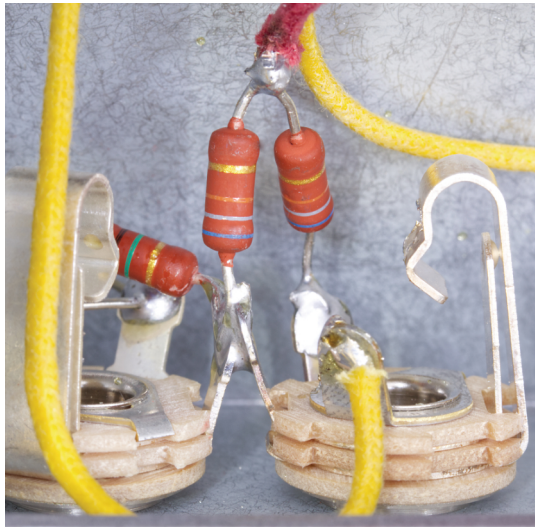
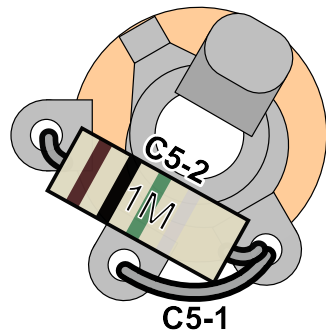
C5-6: Cut a 3" piece of yellow wire. Use this to connect lug 3 of the pot at hole 3 to lug 2 of the pot at hole 4. Solder both connections now.

C5-7: Cut a 2.5" piece of yellow wire. Use this to connect lug 1 of the pot at hole 4 to lug 2 of the pot at hole 5. Solder lug 1 of the pot at hole 4 now.

C5-8: Locate a 6.8kΩ resistor. Its color bands are blue, gray, red, gold. Connect it from lug 1 of the pot at hole 5 to the back of the pot. First wrap the resistor to lug 1 of the pot. Do not solder lug 1 at this point. Then solder the other lead to the back of the pot. Be sure to sufficiently heat both the lead and the back of the pot before attempting to apply solder. It can sometimes be helpful to lightly sand or scuff the back of the pot so the solder can bond to it more easily.

C5-9: Cut a 1/2" piece of bus wire. Use this to connect lug 1 to lug 2 of the pot at hole 7. Solder lug 2 of the pot at hole 7 now.

C5-10: Locate a 100kΩ resistor. Its color bands are brown, black, yellow, gold. Connect it from lug 1 of the pot at hole 7 to the back of the pot. First solder lug 1 of the pot. Then solder the other lead to the back of the pot. Be sure to sufficiently heat both the lead and the back of the pot before attempting to apply solder. It can sometimes be helpful to lightly sand or scuff the back of the pot so the solder can bond to it more easily.



Chassis-Mounted Components: Panels 1 & 2

Part 6: Power Transformer Mounting & Partial Wiring

C6-1: Locate the power transformer. It has two red & white striped wires. Cut these to ~2" each. Be sure to only cut the red & white striped red wires and not the solid red wires or the red & yellow striped wire.

C6-2: Locate the 3/32" heat shrink and cut two 1" pieces. Slide each piece 1/2" onto the ends of the cut red & white striped wires and shrink with a heat gun.

C6-3: Mount the power transformer in hole 45 of panel 2 with the red wire cluster oriented towards the multisection capacitor. Leave the four preinstalled transformer nuts in place.

C6-4: Locate three #8 solder lugs. Slide these onto the mounting screws of the power transformer at holes 43, 46, and 47.

C6-5: Locate a #8 lock washer. Slide it onto the mounting screw of the power transformer at hole 44.

C6-6: Locate four 8-32 nuts. Thread these onto each mounting screw of the transformer. Use a nut driver to completely tighten each down.

C6-7: Locate the two yellow wires on the power transformer. Tightly twist the entire length of these wires. Once twisted, trim these to connect to pins 2 and 8 of the octal socket at hole 49. Solder pin 2 now.

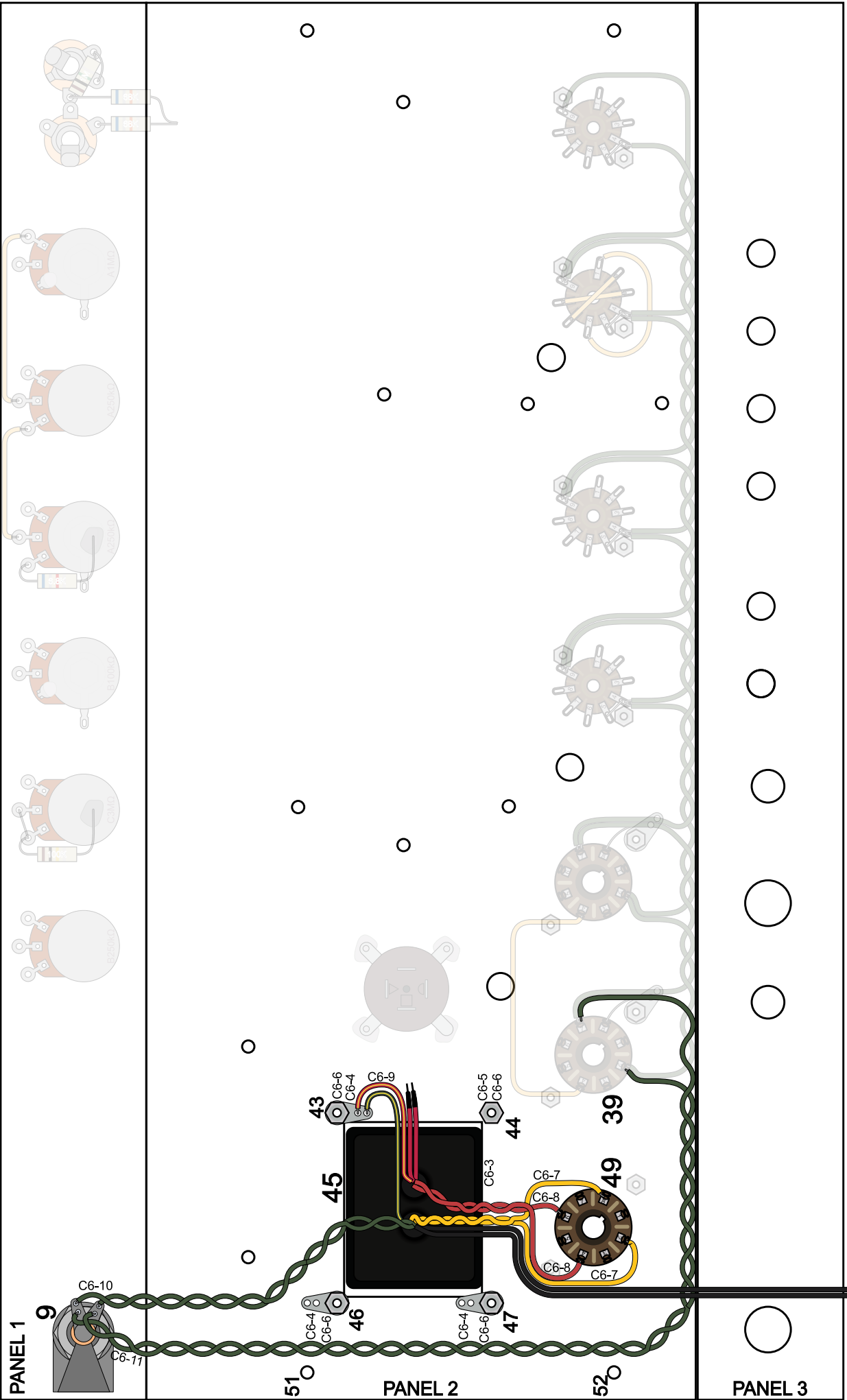
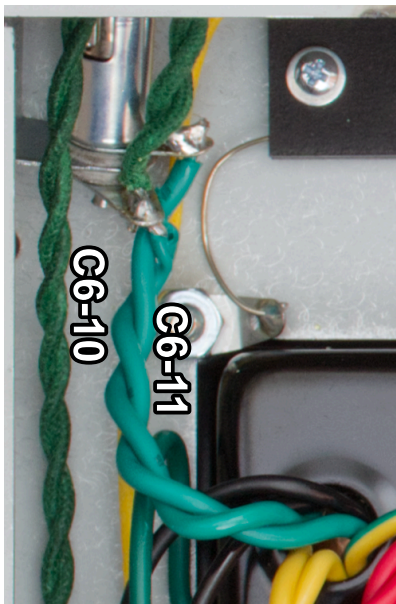
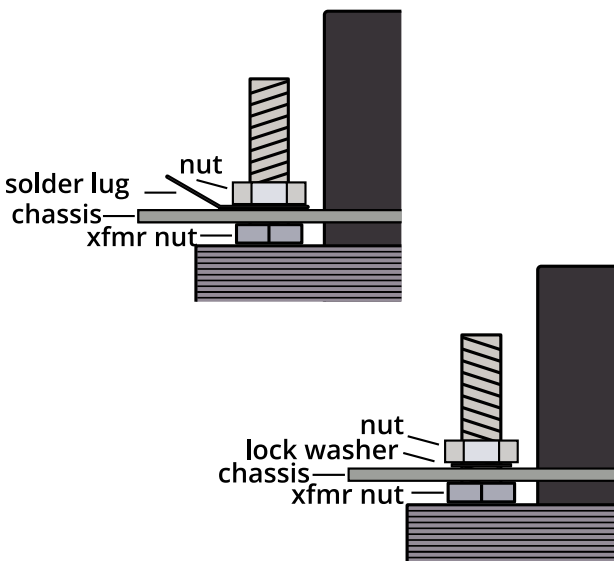
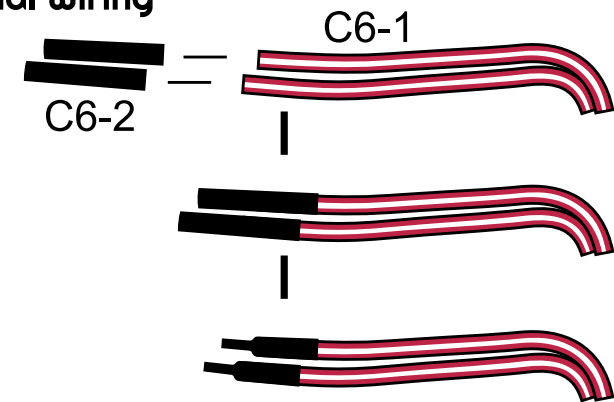
C6-8: Locate the two red wires on the power transformer. Tightly twist the entire length of these wires. Once twisted, trim these to connect to pins 4 and 6 of the octal socket at hole 49. Solder pin 6 now.

C6-9: Locate the yellow-striped red wire and yellow-striped green wire on the power transformer. Tightly twist the entire length of these wires. Once twisted, trim these to connect to the ground lug at hole 43. Solder this lug now.

C6-10: Locate the two green wires on the power transformer. Tightly twist the entire length of these wires. Once twisted, trim these to connect one wire to lug 1 and the other to lug 2 of the pilot light holder.

C6-11: Locate the two twisted green wires coming from the octal socket at hole 39. Trim these to connect one to lug 1 and the other to lug 2 of the pilot light holder. Polarity does not matter. Solder both holes on both lugs now.

C6-12: Make sure that none of these wires are blocking holes 51 and 52 on panel 2 of the chassis. Reposition the wires if necessary.



Chassis-Mounted Components: Panels 1 & 2

Part 7: Reverb Transformer Mounting & Partial Wiring

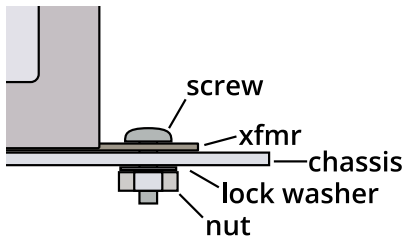
C7-1: Locate a 1/4" rubber grommet. Attach it to hole 19 on panel 2 of the chassis.

C7-2: On the outside of the chassis, mount the reverb driver transformer with the blue and red wires oriented towards the socket at hole 17 and the green and black wires oriented towards the socket at hole 24. Pull all of the wires of the reverb driver transformer through the 1/4" grommet at hole 19.

C7-3: Locate two 3/8" 6-32 screws. These two screws will mount through the transformer and then through holes 21 and 22 on the outside of panel 2.

C7-4: Locate two #6 lock washers and two 6-32 nuts. First slide the lock washers over the threading of the two 6-32 screws on the inside of the chassis. Secure both screws using the 6-32 nuts. Make sure the green filament wires are not pinched by the hardware at hole 22 when tightening.

C7-5: Locate the blue wire of the reverb driver transformer. Trim and connect this wire to pin 6 of the noval socket at hole 17. Solder this connection now.

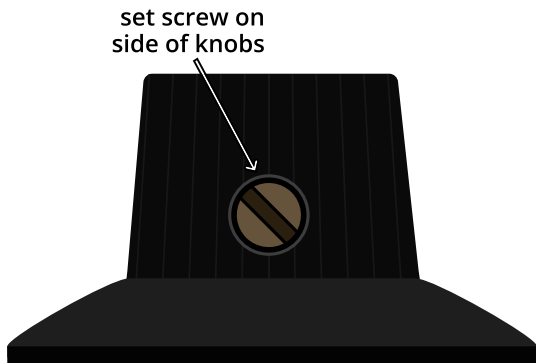
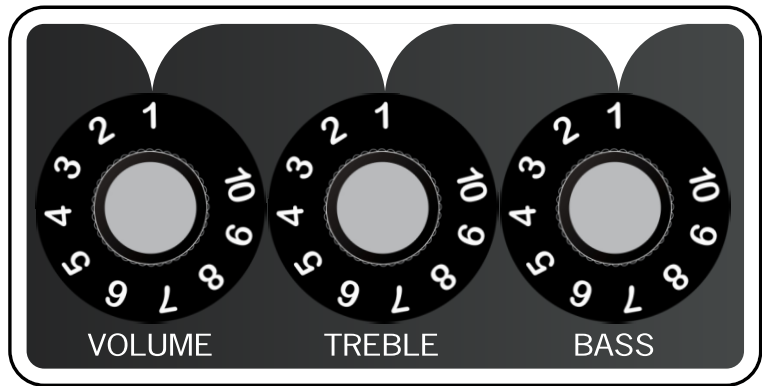


Completed Low-Profile Chassis Hardware: Inspection

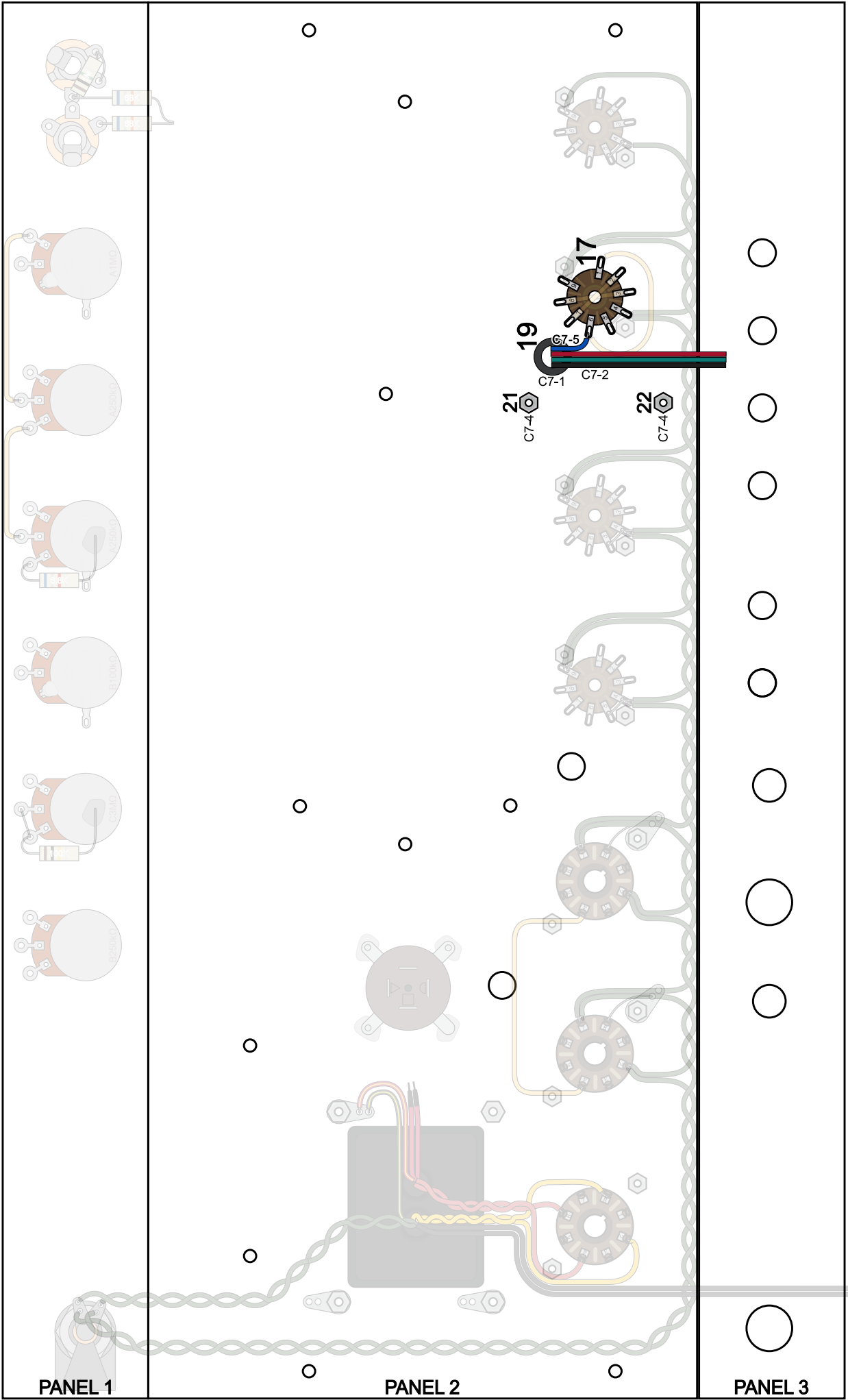
The hardware mounting and wiring of this section is now completed. Please take some time to thoroughly check the connections, parts placement, and solder joints. Ensure all components are in their correct positions according to the wiring diagram. Verify that all solder joints are smooth and shiny, and free of cold joints, which can appear dull or cracked.

Front Panel Control Knobs

Attach the knobs to the potentiometers. Turn the pot shafts fully counter-clockwise, then align the knobs so the 1 on the skirt lines up with the white vertical line on the front panel. Tighten the set screw. Rotate the knobs to ensure that they are fully attached and are not slipping.



Use page 70 to record any chassis constructions notes for panels 1-3.

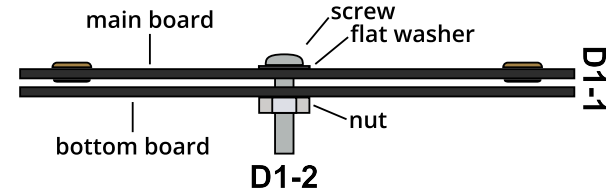


Fiberboard Mounting & Partial Wiring

Locate the completed fiberboards. The following steps will guide you through mounting the fiberboard into the chassis and wiring its connections.

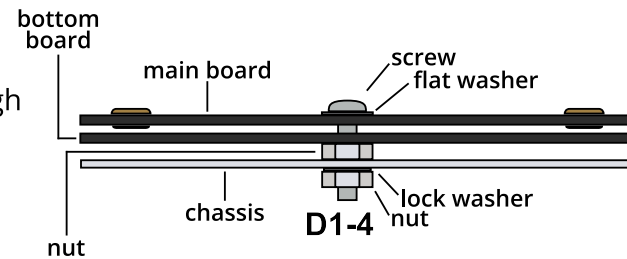
Part 1: Mounting the Main Fiberboard

D1-1: Line up the bottom main fiberboard with the top main fiberboard. Make sure the three empty holes match the same position on both boards. Be careful not to disturb any of the unsoldered connections on the main board.



D1-2: Locate three 1/2" 4-40 screws, three #4 flat washers, and three 4-40 nuts. Slide the flat washers onto the screws and then insert the screws through the top of the main fiberboard at holes A, G, and T. On the bottom side of the bottom board, thread the nuts onto the screws. These only need to be finger tight.

D1-3: Carefully lower the fiberboard assembly into the chassis so that the ends of the 1/2" screws pass through holes 12, 20, and 32 of the chassis.

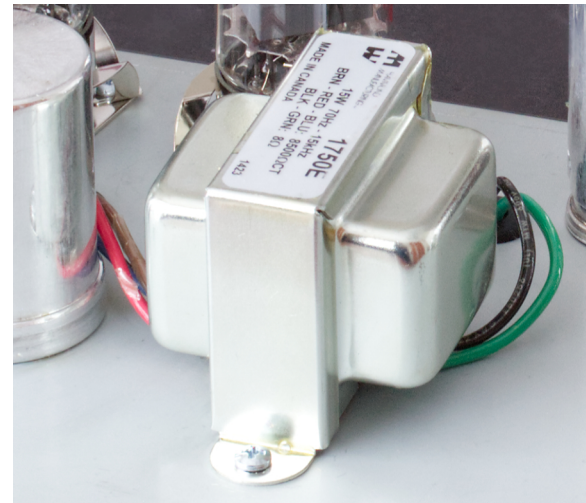


D1-4: Locate three 4-40 nuts and #4 lock washers. On the outside of the chassis, slide the lock washers onto the 1/2" screws and then secure them using the nuts.

Part 2: Output Transformer Mounting & Partial Wiring

D2-1: Locate two 1/4" rubber grommets. Attach them to holes 29 and 37 on panel 2 of the chassis.

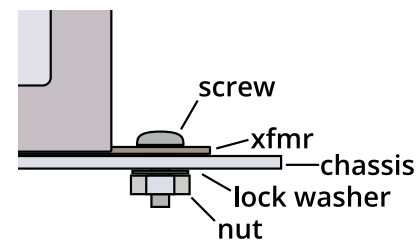
D2-2: On the outside of the chassis, mount the output transformer with the blue, brown, and red wire cluster oriented towards the multisection capacitor. Pull these three wires of the output transformer wires through the 1/4" grommet at hole 37. Pull the green and black wires through the 1/4" grommet at hole 29.



D2-3: Locate two 3/8" 6-32 screws. These two screws will mount through the transformer and then through holes 30 and 31 on the outside of panel 2. You may need to adjust the position of the main fiberboard's nut at hole 32

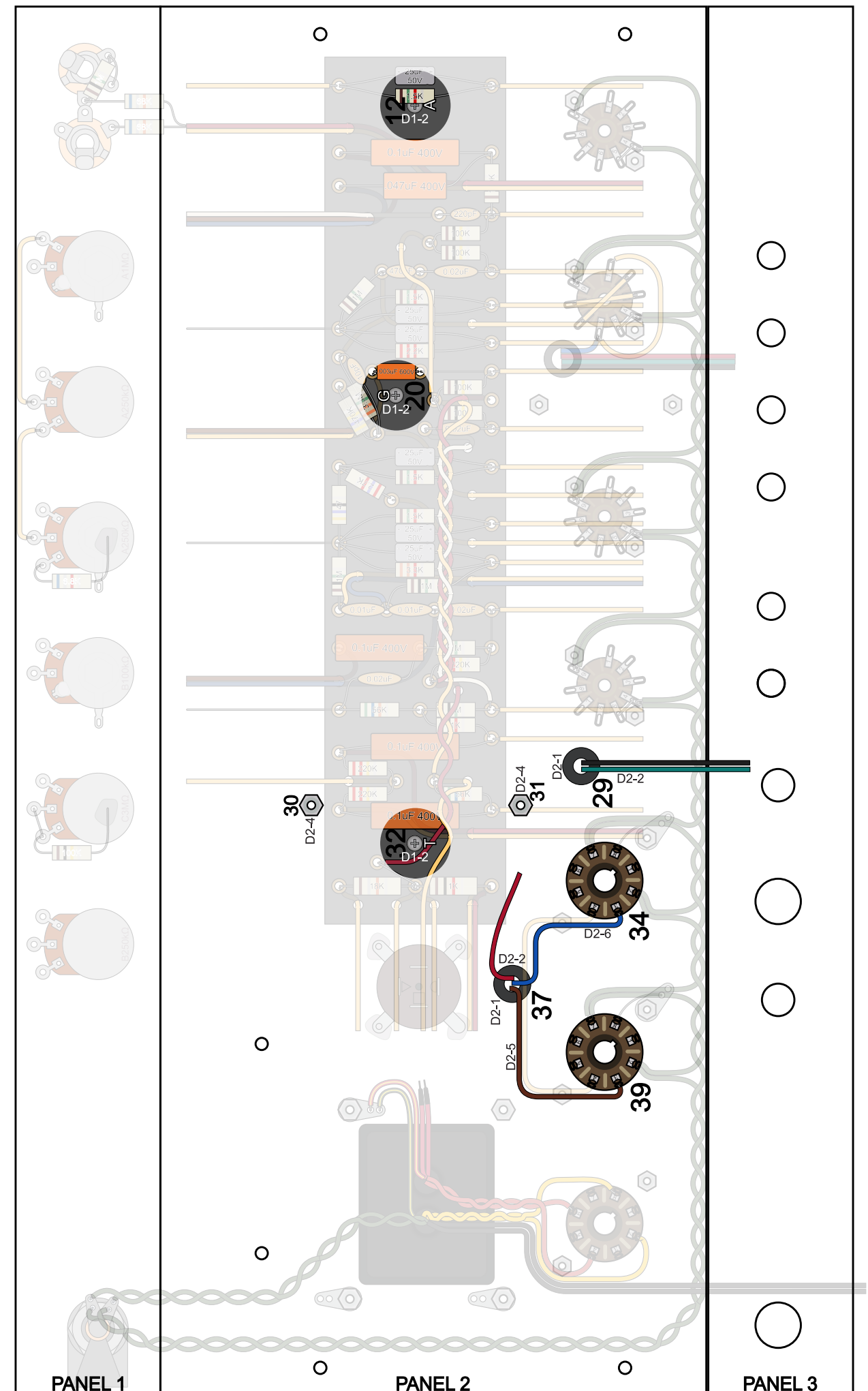
D2-4: Locate two #6 lock washers and two 6-32 nuts. First slide the lock washers over the threading of the two 6-32 screws on the inside of the chassis. Secure both screws using the 6-32 nuts.

D2-5: Locate the brown wire on the output transformer. Trim this to connect to pin 3 of the octal socket at hole 39. Solder this connection now.



D2-6: Locate the blue wire on the output transformer. Trim this to connect to pin 3 of the octal socket at hole 34. Solder this connection now.

Fiberboard Mounting & Partial Wiring



Fiberboard Mounting & Partial Wiring

Part 3: Main Fiberboard Wired Connections

D3-1: Connect the bus wire at eyelet 4 to the 3/8" solder lug at hole 3 of the chassis. Solder the 3/8" solder lug at hole 3 now.

D3-2: Connect the bus wire at eyelet 8 to the 3/8" solder lug at hole 5 of the chassis. Solder the 3/8" solder lug at hole 5 now.

D3-3: Connect the bus wire at eyelet 11 to the 3/8" solder lug at hole 6 of the chassis. Solder the 3/8" solder lug at hole 6 now.

D3-4: Locate the red wire of the output transformer coming from hole 37 of the chassis. Trim and connect it to eyelet 51. Make sure that the yellow and red wires coming from hole X are still connected to eyelet 51 in addition to the 3W 1kΩ resistor. Solder eyelet 51 now.

D3-5: Locate the red wire of the reverb driver transformer coming from hole 19 of the chassis. Trim and connect it to eyelet 41. Make sure that the red wire coming from hole H is still connected to eyelet 41. Solder eyelet 41 now.

D3-6: Locate the yellow wire at eyelet 1. Trim and connect it to the sleeve lug of the input jack at hole 2. Solder the sleeve lug now.

D3-7: Locate the yellow and red wires at hole B. Twist these until a ~1" long twist forms starting at the fiberboard.

D3-8: Trim and connect the red wire from hole B to the twisted leads of the two 68kΩ resistors that are connected to the jacks at holes 1 and 2. Make sure that the red wire is securely wrapped around the leads before soldering. Once the connection is soldered, trim the excess resistor leads.

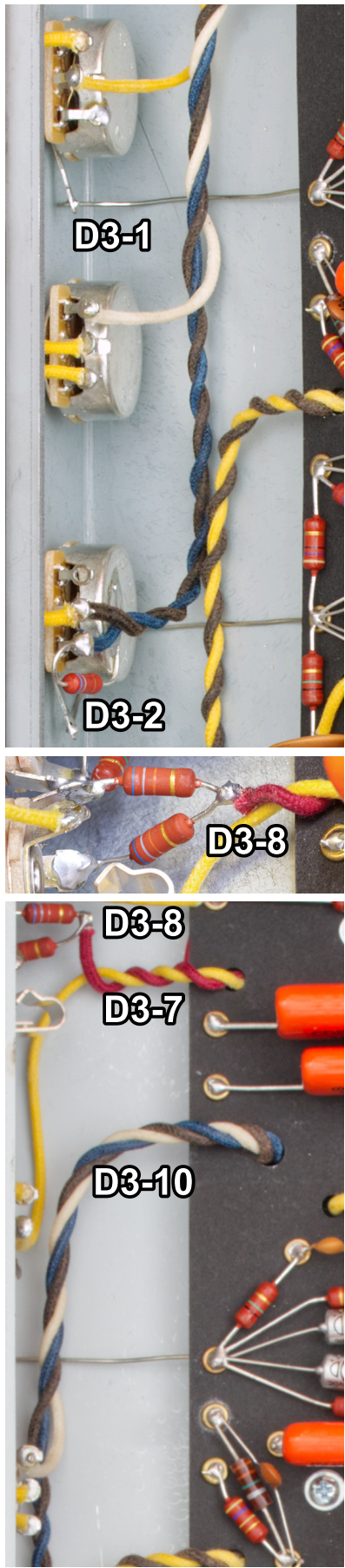
D3-9: Trim and connect the yellow wire from hole B to lug 2 of the potentiometer at hole 3. Solder lug 2 of the potentiometer at hole 3 now.

D3-10: Locate the white, brown, and blue wires at hole D. Twist these until a ~3" long twist forms starting at the fiberboard.

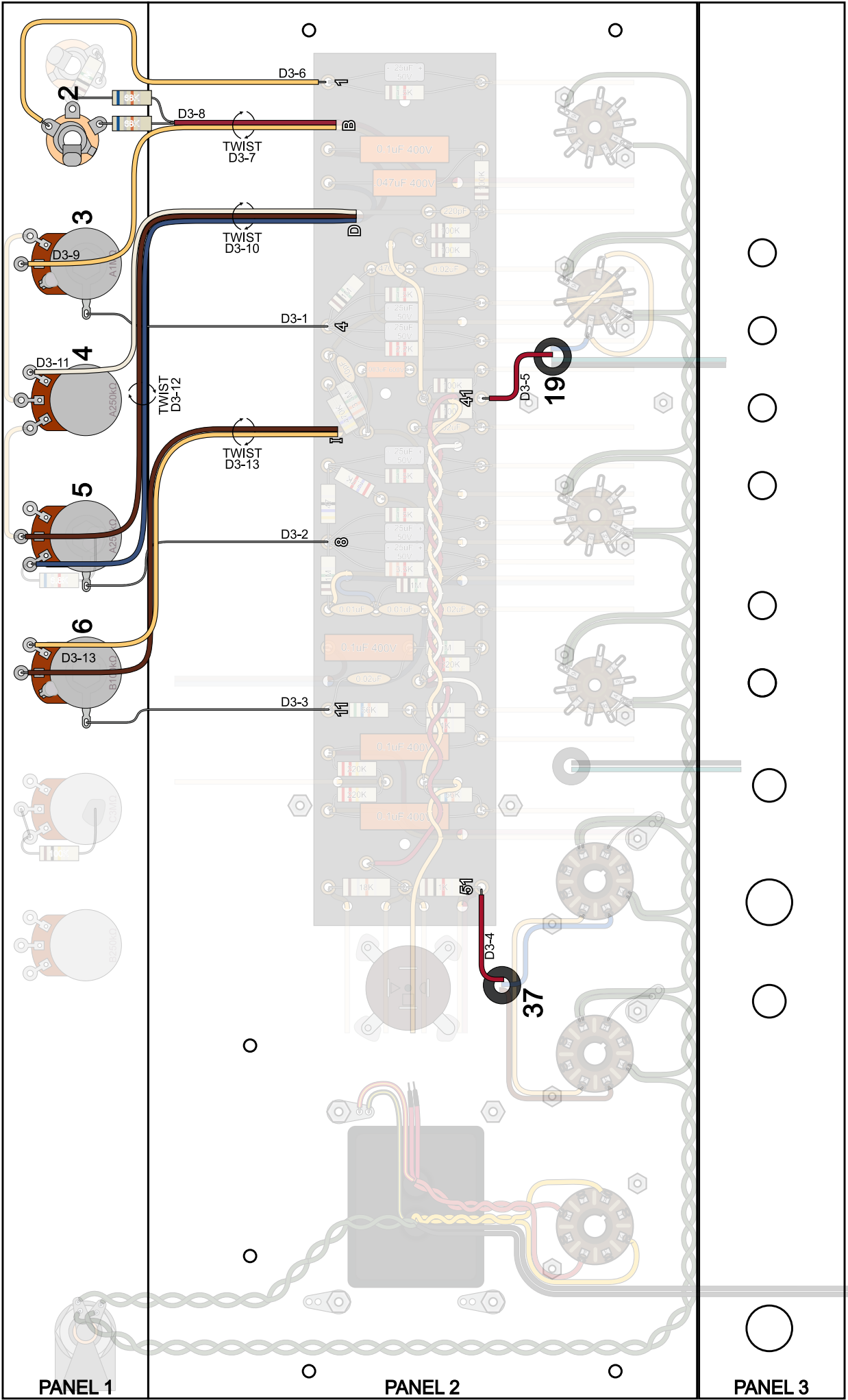
D3-11: Trim and connect the white wire from hole D to lug 3 of the potentiometer at hole 4. Solder lug 3 of the potentiometer at hole 4 now.

D3-12: Twist the remaining lengths of the brown and blue wires from hole D. Trim these to connect the brown wire to lug 2 of the potentiometer at hole 5 and the blue wire to lug 1 of the potentiometer at hole 5. Solder both connections now.

D3-13: Locate the brown and yellow wires at hole I. Twist the full length of these wires. Trim these to connect the brown wire to lug 2 of the potentiometer at hole 6 and the yellow wire to lug 3 of the potentiometer at hole 6. Solder both connections now.



AA1164 Chassis Kit



Fiberboard Mounting & Partial Wiring

Part 3: Main Fiberboard Wired Connections

D3-14: Locate the brown and blue wires at hole O. Twist these until a ~2" long twist forms starting at the fiberboard.

D3-15: Trim and connect the blue wire from hole O to lug 3 of the potentiometer at hole 7. Solder lug 3 of the potentiometer at hole 7 now.

D3-16: Trim and connect the brown wire from hole O to lug 3 of the potentiometer at hole 8. Solder lug 3 of the potentiometer at hole 8 now.

D3-17: Trim and connect the yellow wire from hole Q to lug 2 of the potentiometer at hole 8. Solder lug 2 of the potentiometer at hole 8 now.

D3-18: Locate a 3W 18kΩ resistor. Its color bands are brown, gray, orange, gold. Connect this resistor from the triangle lug of the multisection capacitor to the blank lug.

D3-19: Locate the yellow wire at hole U of the fiberboard. Trim and connect it to the triangle lug of the multisection capacitor. Solder the triangle lug now.

D3-20: Locate the yellow wire at hole V of the fiberboard. Trim and connect it to the moon (semicircle) lug of the multisection capacitor. Solder the moon lug now.

D3-21: Locate the yellow wire of the twisted pair from hole R of the fiberboard. Trim and connect it to the blank lug of the multisection capacitor. Solder the blank lug now.

D3-22: Locate the yellow wire at hole W of the fiberboard. Trim and connect it to lug 4 of the octal socket at hole 34. Solder lug 4 of the octal socket at hole 34 now.

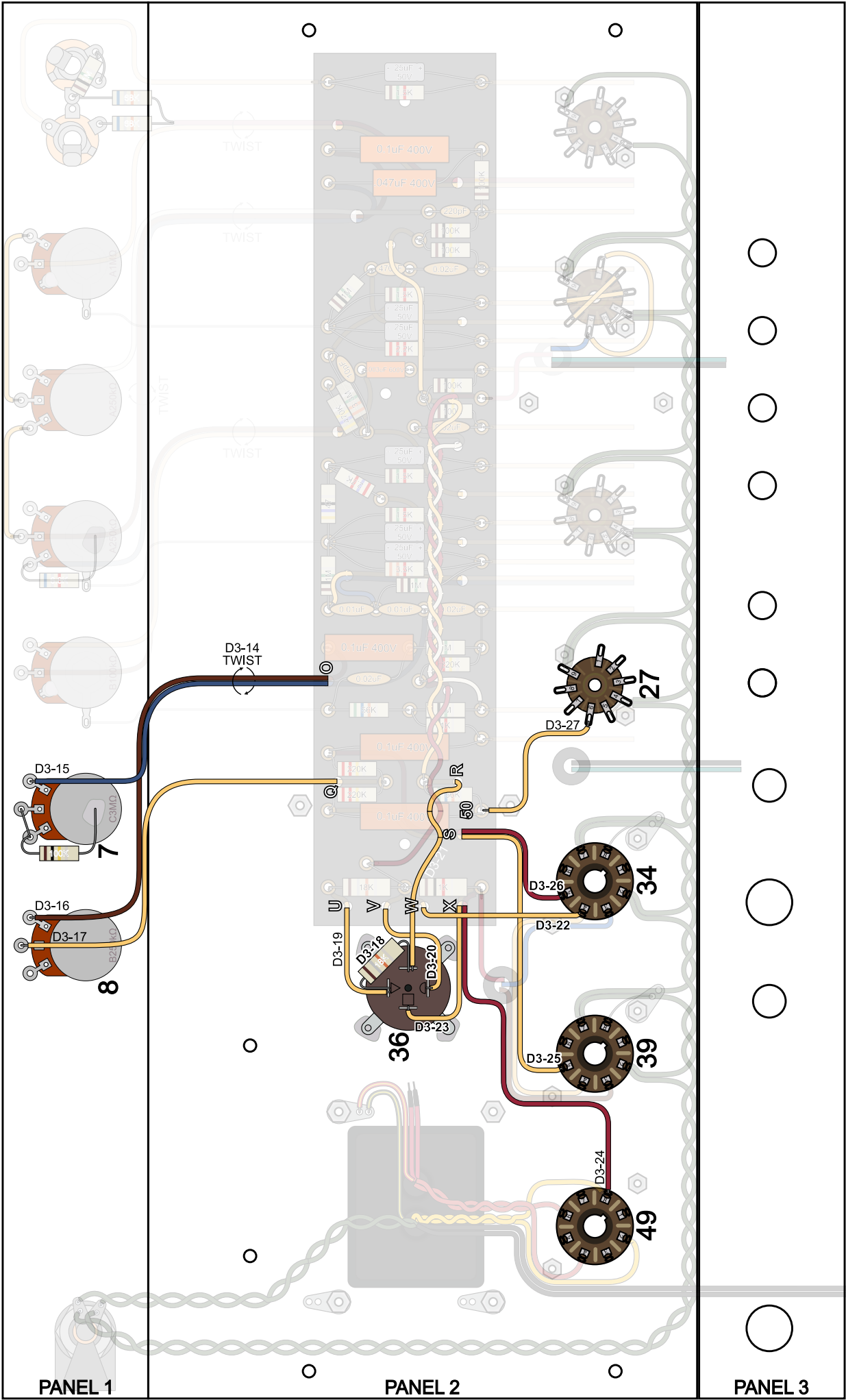
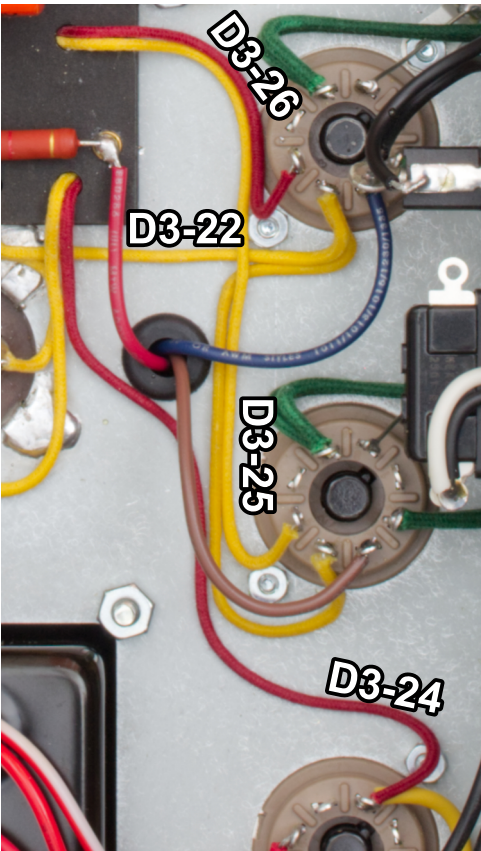
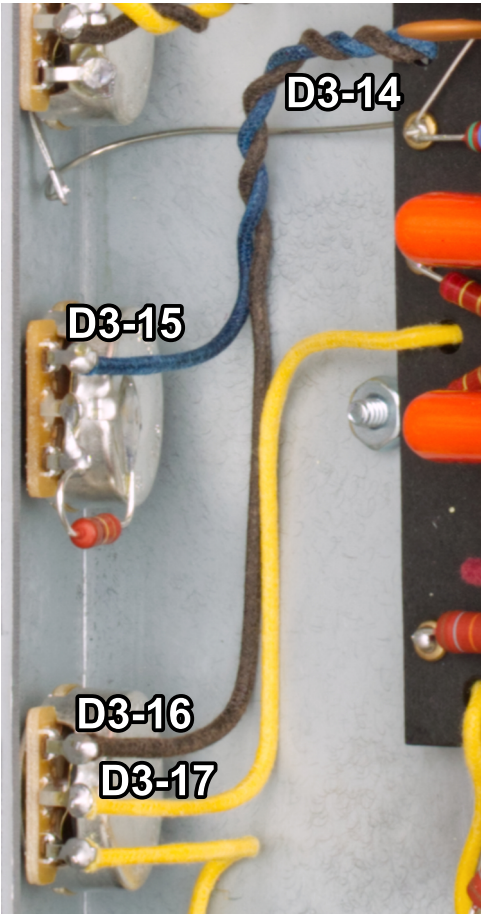
D3-23: Locate the yellow wire at hole X of the fiberboard. Trim and connect it to the square lug of the multisection capacitor. Solder the square lug now.

D3-24: Locate the red wire at hole X of the fiberboard. Trim and connect it to lug 8 of the octal socket at hole 49. Solder lug 8 of the octal socket at hole 49 now.

D3-25: Locate the yellow wire at hole S of the fiberboard. Trim and connect it to lug 5 of the octal socket at hole 39. Solder lug 5 of the octal socket at hole 39 now.

D3-26: Locate the red wire at hole S of the fiberboard. Trim and connect it to lug 5 of the octal socket at hole 34. Solder lug 5 of the octal socket at hole 34 now.

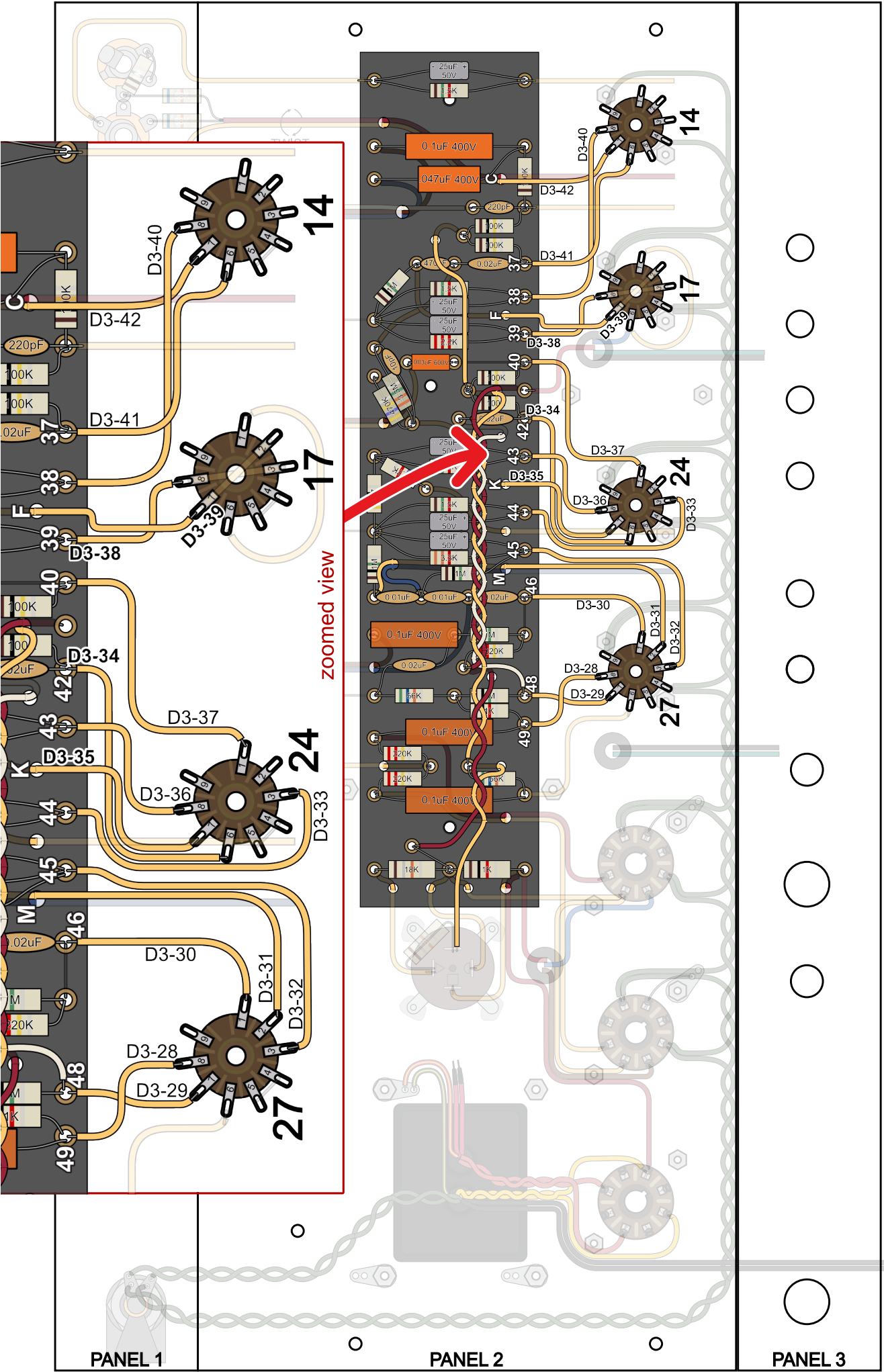
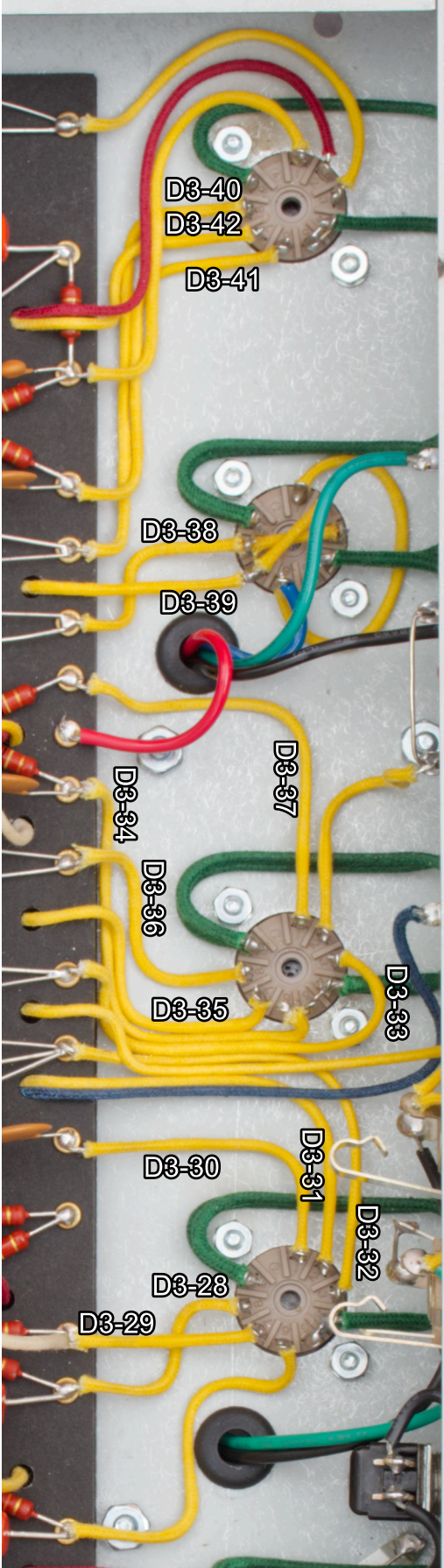
D3-27: Locate the yellow wire at eyelet 50. Trim and connect it to lug 6 of the noval socket at hole 27. Solder lug 6 of the noval socket at hole 27 now.



Fiberboard Mounting & Partial Wiring

Part 3: Main Fiberboard Wired Connections

- D3-28:** Locate the yellow wire at eyelet 49. Trim and connect it to lug 8 of the noval socket at hole 27. Solder lug 8 of the noval socket at hole 27 now.
- D3-29:** Locate the yellow wire at eyelet 48. Trim and connect it to lug 7 of the noval socket at hole 27. Solder lug 7 of the noval socket at hole 27 now.
- D3-30:** Locate the yellow wire at eyelet 46. Trim and connect it to lug 1 of the noval socket at hole 27. Solder lug 1 of the noval socket at hole 27 now.
- D3-31:** Locate the yellow wire at hole M of the fiberboard. Trim and connect it to lug 2 of the noval socket at hole 27. Solder lug 2 of the noval socket at hole 27 now.
- D3-32:** Locate the yellow wire at eyelet 45. Trim and connect it to lug 3 of the noval socket at hole 27. Solder lug 3 of the noval socket at hole 27 now.
- D3-33:** Locate the yellow wire at eyelet 44. Trim and connect it to lug 3 of the noval socket at hole 24. Solder lug 3 of the noval socket at hole 24 now.
- D3-34:** Locate the yellow wire at eyelet 42. Trim and connect it to lug 6 of the noval socket at hole 24. Solder lug 6 of the noval socket at hole 24 now.
- D3-35:** Locate the yellow wire at hole K of the fiberboard. Trim and connect it to lug 7 of the noval socket at hole 24. Solder lug 7 of the noval socket at hole 24 now.
- D3-36:** Locate the yellow wire at eyelet 43. Trim and connect it to lug 8 of the noval socket at hole 24. Solder lug 8 of the noval socket at hole 24 now.
- D3-37:** Locate the yellow wire at eyelet 40. Trim and connect it to lug 1 of the noval socket at hole 24. Solder lug 1 of the noval socket at hole 24 now.
- D3-38:** Locate the yellow wire at eyelet 39. Trim and connect it to lug 8 of the noval socket at hole 17. Solder lug 8 of the noval socket at hole 17 now.
- D3-39:** Locate the yellow wire at hole F of the fiberboard. Trim and connect it to lug 7 of the noval socket at hole 17. Solder lug 7 of the noval socket at hole 17 now.
- D3-40:** Locate the yellow wire at eyelet 38. Trim and connect it to lug 8 of the noval socket at hole 14. Solder lug 8 of the noval socket at hole 14 now.
- D3-41:** Locate the yellow wire at eyelet 37. Trim and connect it to lug 6 of the noval socket at hole 14. Solder lug 6 of the noval socket at hole 14 now.
- D3-42:** Locate the yellow wire at hole C of the fiberboard. Trim and connect it to lug 7 of the noval socket at hole 14. Solder lug 7 of the noval socket at hole 14 now.



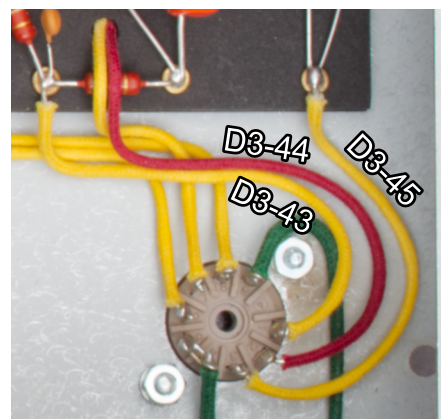
Fiberboard Mounting & Partial Wiring

Part 3: Main Fiberboard Wired Connections (Continued)

D3-43: Locate the yellow wire at eyelet 36. Trim and connect it to lug 1 of the noval socket at hole 14. Solder lug 1 of the noval socket at hole 14 now.

D3-44: Locate the red wire at hole C of the fiberboard. Trim and connect it to lug 2 of the noval socket at hole 14. Solder lug 2 of the noval socket at hole 14 now.

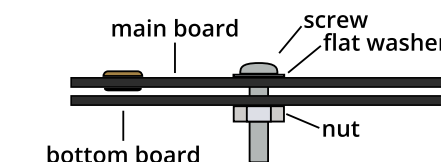
D3-45: Locate the yellow wire at eyelet 34. Trim and connect it to lug 3 of the noval socket at hole 14. Solder lug 3 of the noval socket at hole 14 now.



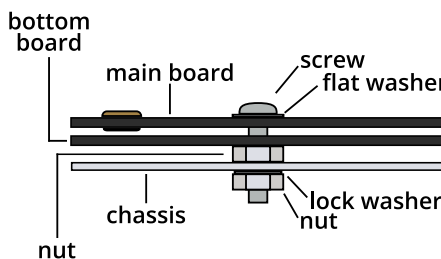
Part 4: Mounting the Bias Fiberboard

D4-1: Line up the bottom bias fiberboard with the top bias fiberboard. Make sure the two empty holes match the same position on both boards.

D4-2: Locate two 1/2" 4-40 screws, two #4 flat washers, and two 4-40 nuts. Slide the flat washers onto the screws and then insert the screws through the top of the bias fiberboard at holes B and C. On the bottom side of the bottom board, thread the nuts onto the screws. These only need to be finger tight.



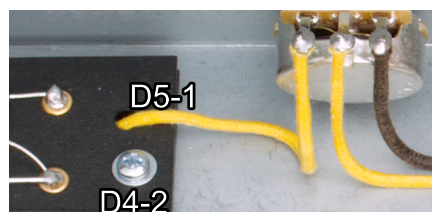
D4-3: Carefully lower the fiberboard assembly into the chassis so that the ends of the 1/2" screws pass through holes 41 and 42 of the chassis. The screw at B should be passing through hole 41 and the screw at C through hole 42.



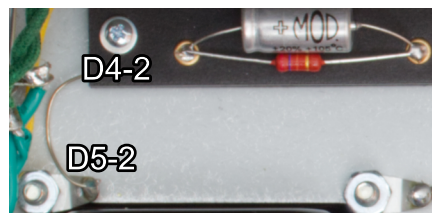
D4-4: Locate two 4-40 nuts and #4 lock washers. On the outside of the chassis, slide the lock washers onto the 1/2" screws and then secure them using the nuts.

Part 5: Bias Fiberboard Wired Connections

D5-1: Locate the yellow wire at hole A of the fiberboard. Trim and connect it to lug 1 of the potentiometer at hole 8. Solder lug 1 of the potentiometer at hole 8 now.



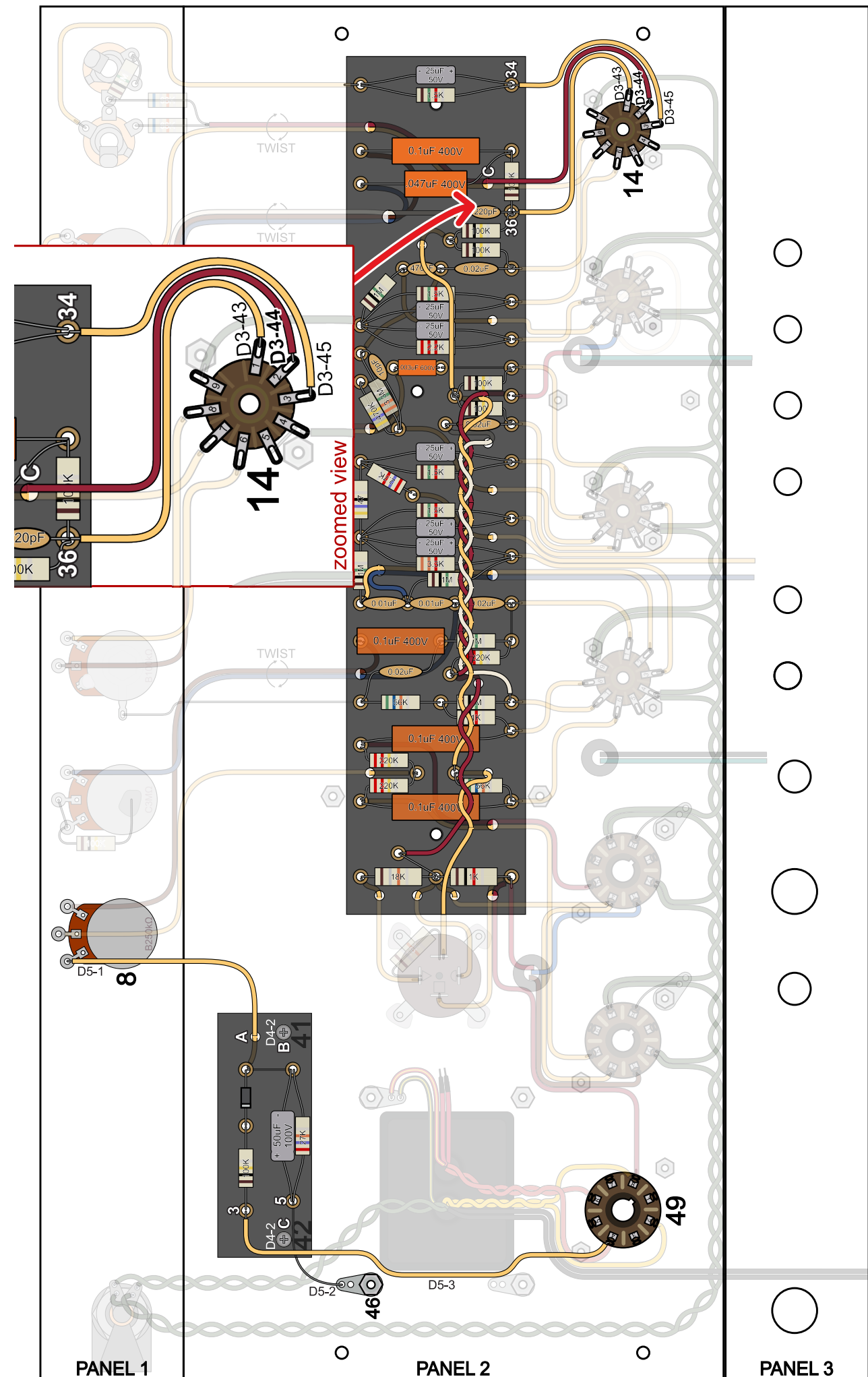
D5-2: Locate the bus wire coming from eyelet 5 of the fiberboard. Trim and connect it to the #8 solder lug at hole 46 on panel 2 of the chassis. Solder the #8 solder lug at hole 46 on panel 2 of the chassis now.



D5-3: Locate the yellow wire at eyelet 3 of the fiberboard. Trim and connect it to lug 4 of the octal socket at hole 49. Solder lug 4 of the octal socket at hole 49 now.

Completed Fiberboard Mounting & Partial Wiring: Inspection

Ensure all components are in their correct positions according to the wiring diagram. Verify that all solder joints are smooth and shiny, and free of cold joints, which can appear dull or cracked.



Fiberboard Mounting & Partial Wiring

Chassis-Mounted Components: Panel 3

Locate the completed fiberboards. The following steps will guide you through mounting the fiberboard into the chassis and wiring its connections.

Part 1: Mounting the Rear Faceplate & Controls

E1-1: Locate the rear faceplate. Line it up with the corresponding holes of panel 3 on the outside of the chassis. The following steps detail how to secure the faceplate to the chassis using the rear panel hardware. These components will pass through both the chassis and the faceplate at the corresponding holes. Loosely secure each piece of hardware at first, ensuring all items are mounted on panel 3 before fully tightening. Be careful not to scratch the panel when tightening the front panel hardware.

E1-2: Locate the four RCA jacks. Remove all hardware from each jack. First slide the teardrop shaped ground lug onto each jack's bushing. Next add the flat washers on each jack and then insert them from the inside of the chassis to holes 53, 54, 55, and 56. The nuts are attached on the outside of the chassis.

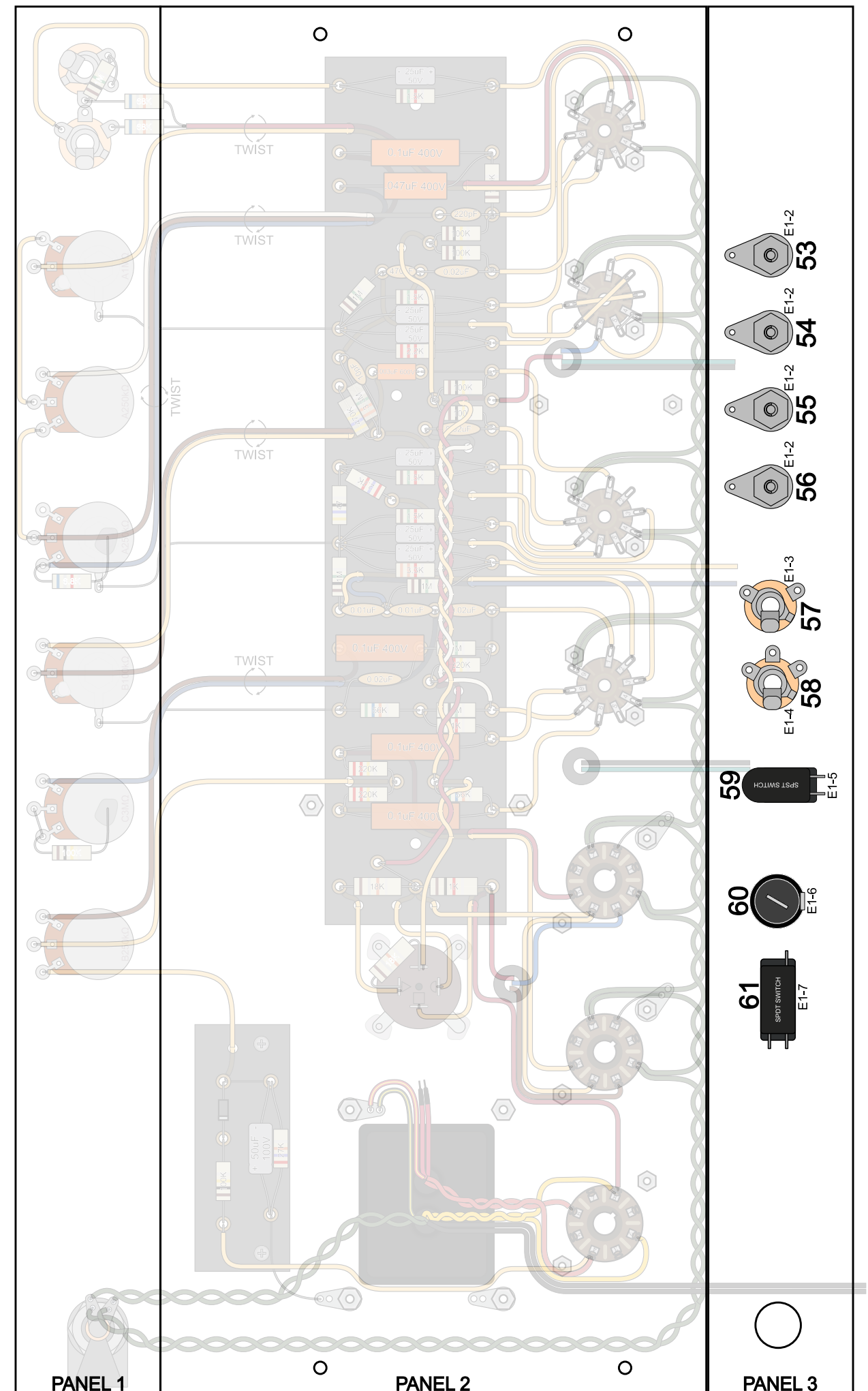
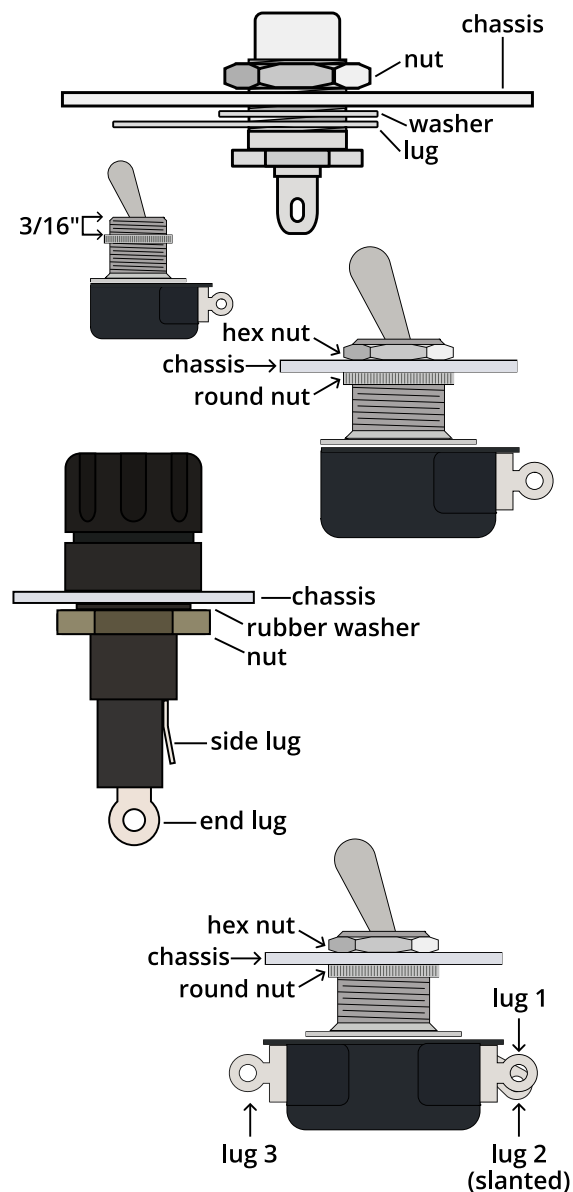
E1-3: Locate the non-switched 1/4" jack. Mount this to hole 57 on panel 3. The nut is attached on the outside of the chassis. The included flat washer is not required and can be discarded. Orient the jack as shown in the drawing on page 65.

E1-4: Locate a switched 1/4" jack. Mount this to hole 58 on panel 3. The nut is attached on the outside of the chassis. The included flat washer is not required and can be discarded. Orient the jack as shown in the drawing on page 65.

E1-5: Locate the SPST toggle switch. This will mount to hole 59. First remove both nuts. Thread the circular nut unto the bushing until 3/16" of the threading is exposed. Then secure the SPST toggle switch to the chassis with the hex nut. Make sure that the lugs are oriented upward.

E1-6: Locate the fuse holder. This will mount to hole 60. The holder is inserted through the outside of the chassis. Slide the rubber washer over the bushing inside the chassis and then secure the fuse holder with the nut. Make sure that the side lug is oriented upward.

E1-7: Locate the SPDT toggle switch. This will mount to hole 61. First remove both nuts. Thread the circular nut onto the bushing until 3/16" of the threading is exposed. Then secure the DPST toggle switch to the chassis with the hex nut. Make sure that the side with one lug is facing hole 60 and the side with two lugs is facing hole 62.



Chassis-Mounted Components: Panel 3

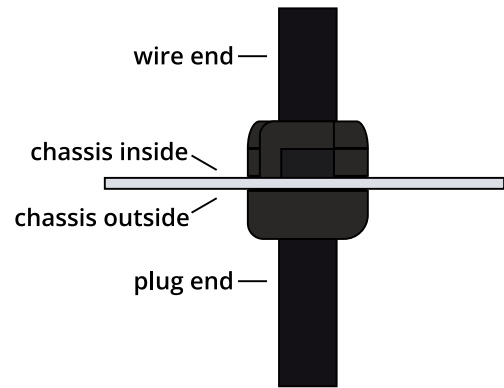
Part 1: Mounting the Rear Faceplate & Controls (Continued)

E1-8: Locate the three prong power cord. Trim back 8 inches of the black outer insulation from the bare end. Self adjusting wire strippers are the best tool for this but careful use of cutters can work.

E1-9: From the outside of the chassis, thread this cord through hole 62 on panel 3 of the chassis until roughly 1/2" of the black outer insulation is inside the chassis.

E1-10: Locate the strain relief. Attach it to the power cord at the outside of the chassis. Strain relief pliers are the ideal tool to compress the cord in the strain relief but careful use of standard pliers can accomplish this. Feed the strain relief into hole 62 until it snaps into place.

E1-11: Now that all of the rear panel components have been mounted, tighten down all mounting hardware.



Part 2: Rear Panel Wiring

E2-1: Locate the green wire of the reverb driver transformer at hole 19 of panel 2. Trim and connect this wire to the tip lug of the RCA jack at hole 53. Solder the tip lug of the RCA jack at hole 53 now.

E2-2: Locate the black wire of the reverb driver transformer at hole 19 of panel 2. Trim and connect this wire to the ground lug of the RCA jack at hole 54. You may find it easier to lift RCA jacks' ground lugs away from the chassis using pliers before attempting to wire them. Solder the ground lug of the RCA jack at hole 54 now.

E2-3: Locate a 220kΩ resistor. Its color bands are red, red, yellow, gold. Connect this resistor from the tip lug of the RCA jack at hole 54 to the ground lug of the RCA jack at hole 55. Solder the ground lug of the RCA jack at hole 55 now.

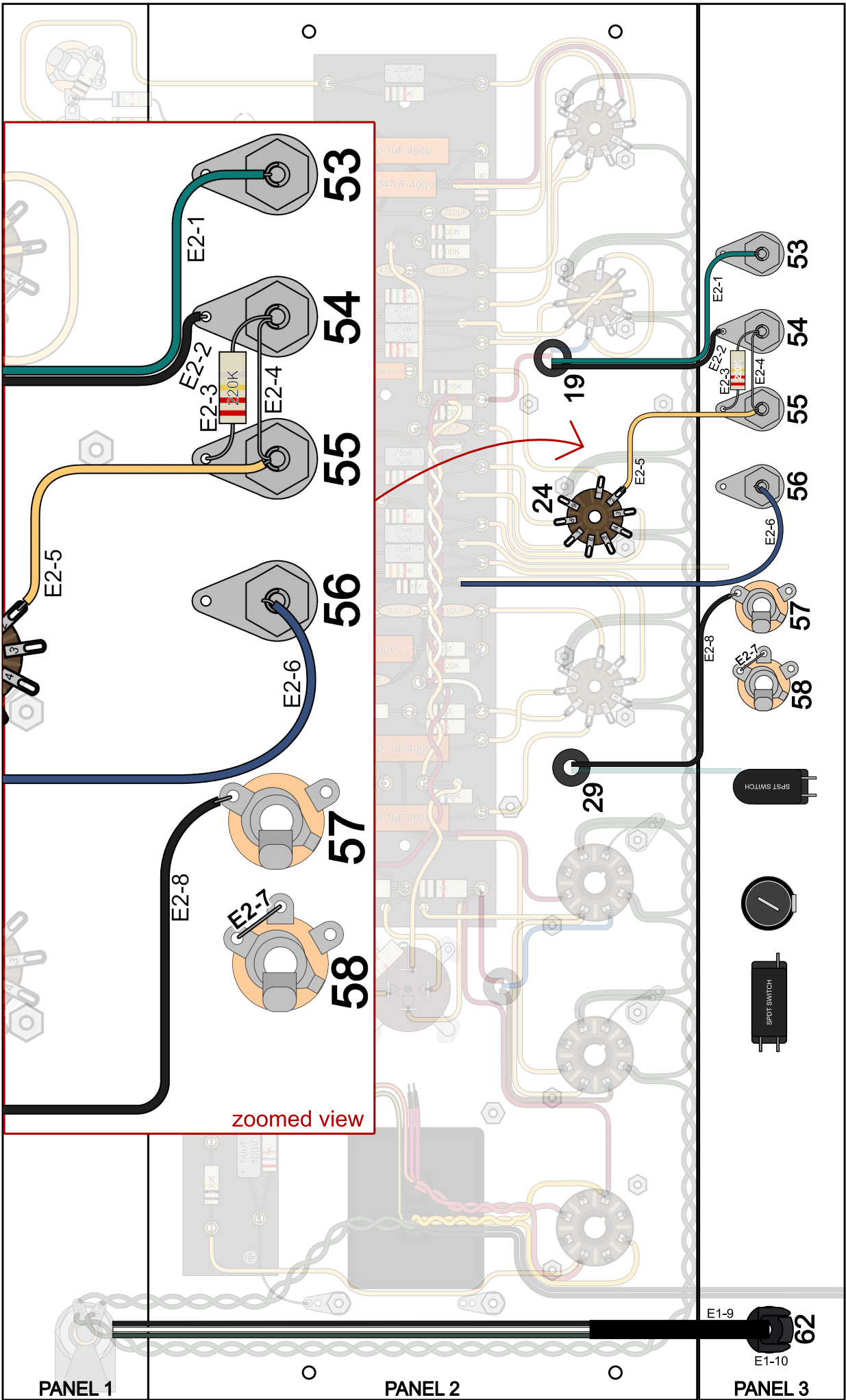
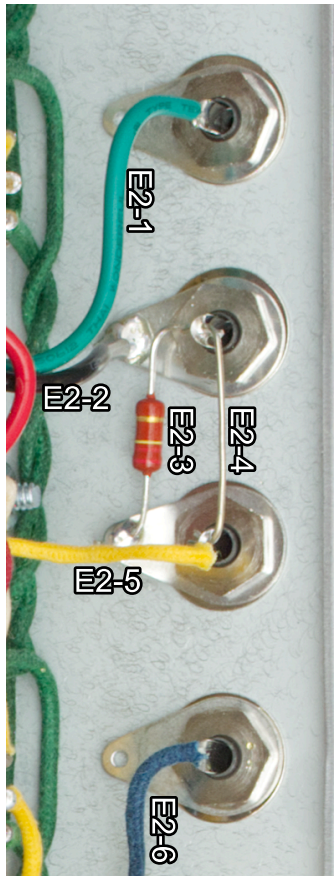
E2-4: Cut a 1.5" piece of bus wire. Use this to connect the tip lug of the RCA jack at hole 54 to the tip lug of the RCA jack at hole 55. Solder the tip lug of the jack at hole 54 now.

E2-5: Cut a 3" piece of yellow wire. Use this to connect the tip lug of the RCA jack at hole 55 to lug 2 of the noval socket at hole 24. Solder both lugs now.

E2-6: Locate the blue wire at hole M of the main fiberboard. Trim and connect it to the tip lug of the RCA jack at hole 56. Solder the tip lug of the RCA jack at hole 56 now.

E2-7: Cut a 3/4" piece of bus wire. Use this to connect the switch lug to the sleeve lug on the jack at hole 58. Solder both the switch lug and sleeve lug of the output jack now.

E2-8: Locate the black wire of the output transformer at hole 29 of panel 2. Trim and connect this wire to the sleeve lug of the jack at hole 57. Solder the sleeve lug of the jack at hole 57 now.



Chassis-Mounted Components: Panel 3

Part 2: Rear Panel Wiring (Continued)

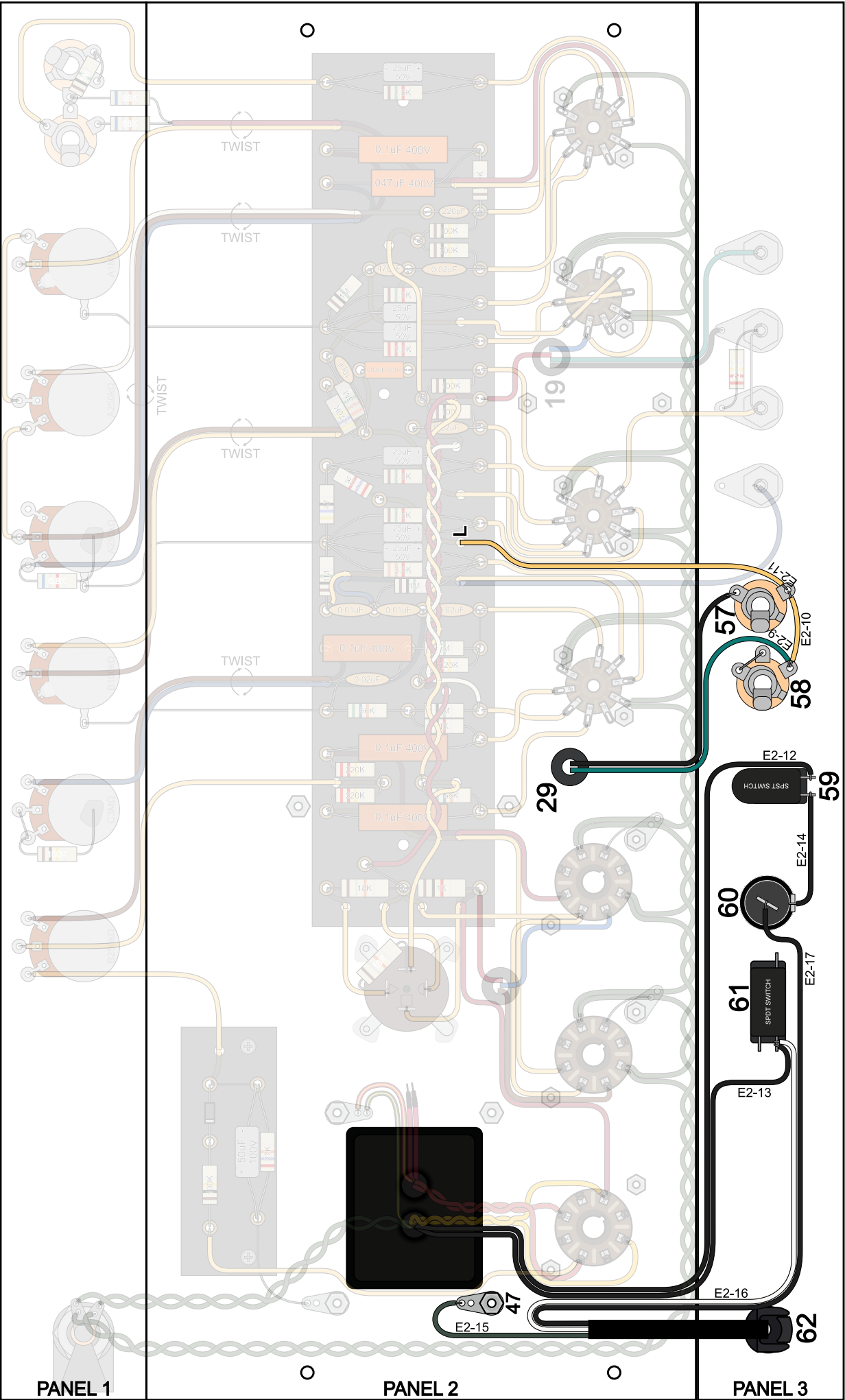
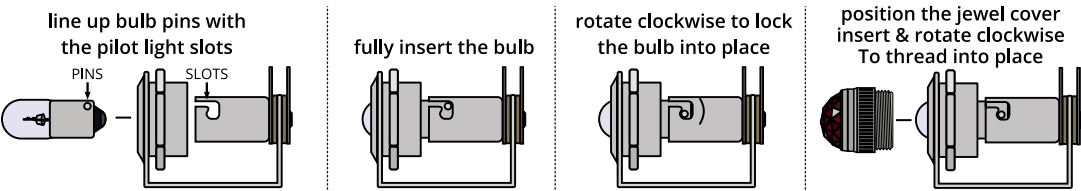
- E2-9:** Locate the green wire of the output transformer at hole 29 of panel 2. Trim and connect this wire to the tip lug of the jack at hole 58.
- E2-10:** Cut a 2" piece of yellow wire. Use this to connect the tip lug of the jack at hole 57 to the tip lug of the jack at hole 58. Solder the tip lug of the jack at hole 58 now.
- E2-11:** Locate the yellow wire at hole L of the main fiberboard. Trim and connect it to the tip lug of the jack at hole 57. Solder the tip lug of the jack at hole 57 now.
- E2-12:** Locate one of the black wires on the power transformer. Trim this wire to connect to lug 1 of the SPST switch at hole 59. Solder lug 1 now.
- E2-13:** Locate the other black wire on the power transformer. Cut 3" of wire from the end of it. Set this 3" length aside. Trim and connect the still attached end to lug 1 of the SPDT switch at hole 61.
- E2-14:** Locate the 3" of black wire. Gently lift the side lug of the fuse holder at hole 60 a few millimeters away from its body. Use the 3" of black wire to connect lug 2 of the SPST switch at hole 59 to the side lug of the fuse holder at hole 60. Solder both lugs now.
- E2-15:** Locate the green wire of the power cord. Trim and connect it to the #8 solder lug at hole 47. Solder the #8 solder lug at hole 47 now. Alternatively, the solder lug can be removed from the chassis for easier access when soldering.
- E2-16:** Locate the white wire of the power cord. Trim and connect it to lug 1 of the SPDT switch at hole 61. Solder lug 1 of the SPDT switch now.
- E2-17:** Locate the black wire of the power cord. Trim and connect it to the end lug of the fuse holder at hole 60. Solder the end lug now.

Completed Fiberboard Mounting & Partial Wiring: Inspection

The chassis of the AA1164 is now completed. Please take some time to thoroughly check all of the connections, parts placement, and solder joints. Ensure all components are in their correct positions according to the wiring diagram, with electrolytic capacitors oriented correctly for polarity. Verify that all solder joints are smooth and shiny, and free of cold joints, which can appear dull or cracked. Make sure no debris or clippings are left floating around in the chassis, as these could cause shorts or other issues.

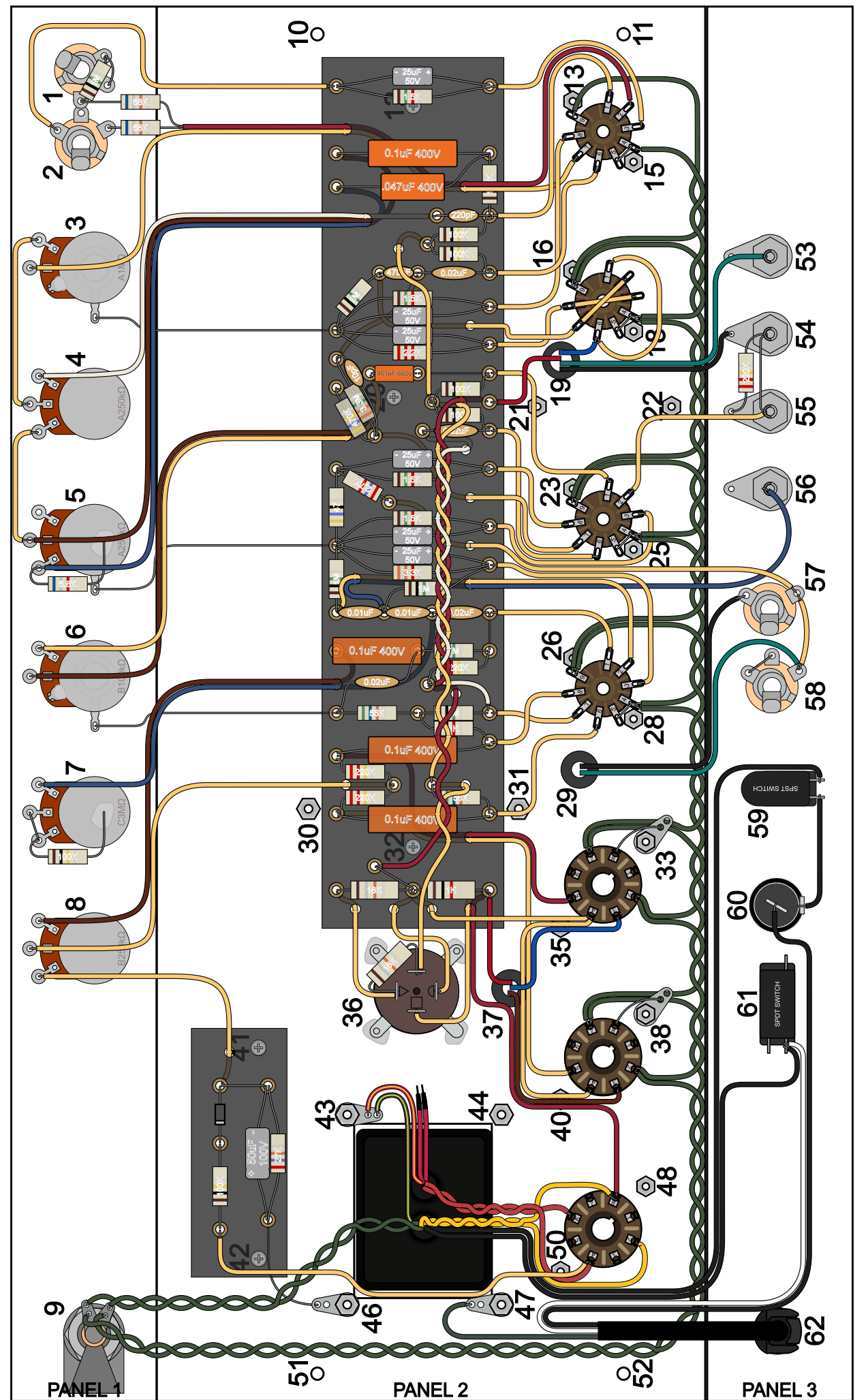
Install the Pilot Light Bulb and Jewel

Insert the bulb into the pilot light socket ensuring it is securely in place. Position the jewel cover over the bulb and screw it on gently until it is firmly attached.



AA1164 Chassis Build Notes

Use this page to record any notes on the chassis construction.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

AA1164 Chassis Final Layout

Reverb Tank RCA Cables

This section provides instructions for wiring the RCA cables for use with the reverb tank.

Part 1: Preparing the RCA Cables

F1-1: Locate the 8ft piece of braided 22AWG wire. Cut this to a 3ft and 5ft length.

F1-2: Push back the metal braid to expose 3/4" of black cloth wire on each. You may need to slightly unravel the ends of the braid to get it to separate from the black cloth beneath it.

F1-3: On each end, carefully push the cloth cover back to expose ~1/4" of the bare wire. Try to avoid fraying the cloth when pushing it back.

F1-4: Secure an end of one of the wires using helping hands or a similar tool.

F1-5: Slide an RCA plug over the black cloth cover until the full length of exposed wire exits the tip of the plug. Solder the tip of the plug now. Once cooled, trim any excess wire from the tip.

F1-6: Using the helping hands or similar tool, position the jack so that the tip is pointing down. Push down the braid until it makes contact with the sleeve of the RCA plug. Solder the shield to the sleeve of the jack.

F1-7: Repeat this process for the remaining ends of each wire. Once completed, check that all solder joints are smooth and shiny, and free of cold joints, which can appear dull or cracked.

Part 2: Testing the cables

F2-1: Using the continuity test on a multimeter, check that the tip of each RCA jack does not make a connection with its sleeve on each end of both cables.

F2-2: Using the same setting on the multimeter, check that the sleeves of the RCA jack on each end of the 3ft cable cable make a connection. Check that the sleeves of the RCA jack on each end of the 5ft cable cable make a connection.

F2-3: Using the same setting on the multimeter, check that the tips of the RCA jack on each end of the 3ft cable cable make a connection. Check that the tips of the RCA jack on each end of the 5ft cable cable make a connection.

F2-4: With these tests completed, you have successfully verified proper functionality of the RCA cables for use with the reverb tank.



Speaker Wiring (optional)

This optional section provides instructions for wiring the stock speaker when using the stock cabinet with the amplifier. If a different speaker or cabinet will be used, this section can be skipped.

Part 1: Preparing the Speaker Wire

G1-1: Locate the black and white 18AWG wires. Push back the cloth sleeving to expose 3/8" of bare wire on each.

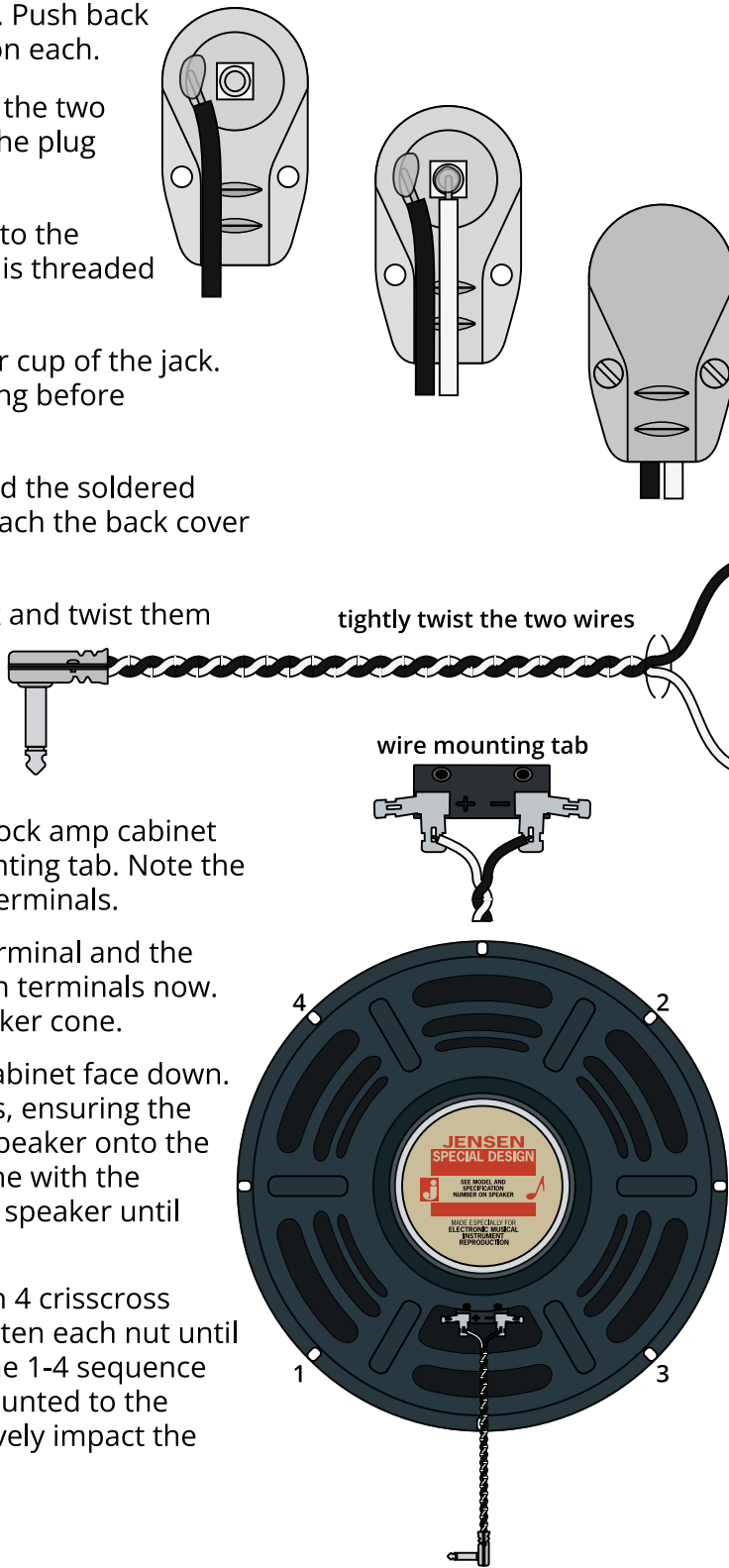
G1-2: Locate the right angle 1/4" plug. Remove the two screws to open the case. Secure the half with the plug using helping hands or a similar tool.

G1-3: Take the black wire and solder it directly to the inside of the jack's frame. Ensure that the wire is threaded through the opening before soldering.

G1-4: Solder the white wire to the center solder cup of the jack. Ensure the wire is threaded through the opening before soldering.

G1-5: Slide the sleeving back up the wire toward the soldered connections. Then, use the two screws to reattach the back cover of the jack

G1-6: Grip the two wires at the base of the jack and twist them leaving only 1/2" of each wire untwisted.



Part 2: Wiring the Speaker

G2-1: Locate the 10" 8Ω speaker used in the stock amp cabinet for the AA1164. Identify the speaker wire mounting tab. Note the orientation of the positive (+) and negative (-) terminals.

G2-2: Connect the white wire to the positive terminal and the black wire to the negative terminal. Solder both terminals now. Be careful not to drip any solder onto the speaker cone.

G2-3: Remove the back panels and place the cabinet face down. Align the speaker's holes with the baffle screws, ensuring the wire tab is at the bottom. Carefully lower the speaker onto the screws. Be very careful not to puncture the cone with the screws. Once all screws are through, lower the speaker until it's flush with the baffle

G2-4: Attach the 6-32 Kep nuts in the 1 through 4 crisscross pattern shown on the graphic to the right. Tighten each nut until it just touches the speaker. Then go through the 1-4 sequence with half turns until the speaker is securely mounted to the baffle. Avoid over-tightening as this can negatively impact the speaker's performance.

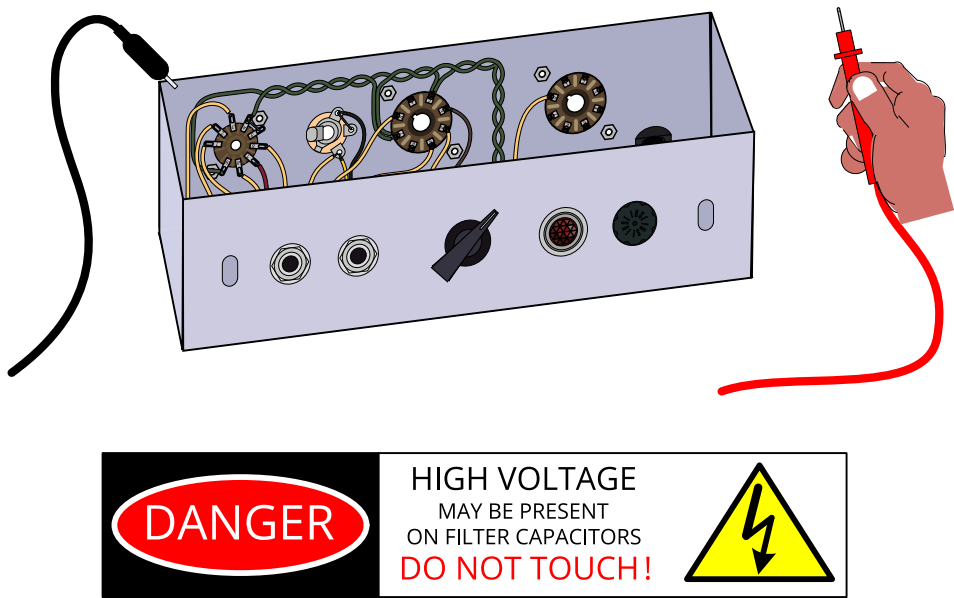
Safety

Tube amps operate at high voltages that have the potential to injure and kill. Please remember the following when working on this project.

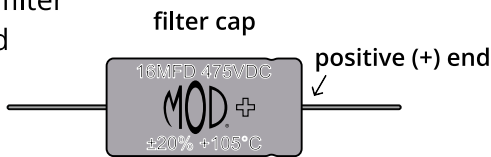
- Only work on tube amps when you are wide awake and sober
- Do not plug the amp in until you have gone through all of the instructions, checking and rechecking each step.
- Be aware that tubes become very hot when the amp is on and can take several minutes to cool down after power is turned off.
- Work in a ventilated area when soldering.
- Always follow the one hand rule when working with an amp that is connected to power or may have voltage present. (Any amp that has been plugged in at one time may have high voltage present)

One Hand Rule

The one hand rule is a safety precaution for working on an amp that is plugged in or could potentially have high voltages present. Use an alligator clip on the negative lead of your DMM and secure it to the chassis. With a standard 2mm probe on the positive lead, test the various points using one hand. This practice prevents a fatal shock by avoiding current passing through your heart. (Many people even put their other hand in their pocket or behind their back).



Always probe a tube amp for dangerous voltages present on the filter capacitors before working on it, even if it has been turned off and unplugged for months.



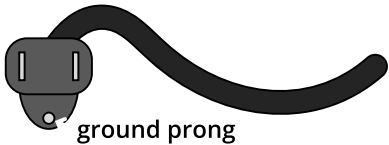
Preliminary Testing

At this stage, it's crucial to double-check and triple-check all connections, solder joints, and parts placement. It's highly recommended to review each step of the instructions to ensure all steps have been accurately completed. Incorrect wiring or misplaced components can permanently damage the amplifier. Once you are confident that the build is fully completed, you can begin preliminary testing.

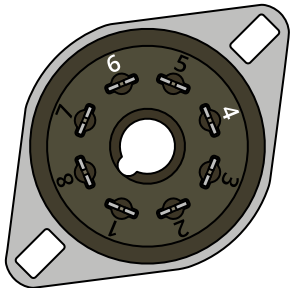
Power Transformer Verification

H1-1: If any of the test results differ from the provided information, immediately stop and unplug the amplifier. Review all connections to locate and fix the fault before proceeding further.

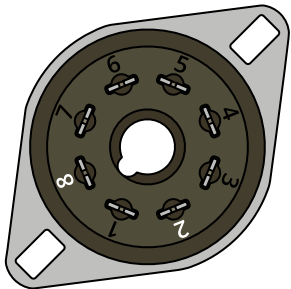
H1-2: Using the continuity test on a multimeter, check that the ground prong of the power cord has continuity with the chassis. Once verified, place the chassis in a clean work area with the open side facing down. A bench mat will help prevent slipping. The amp should be fully stable.



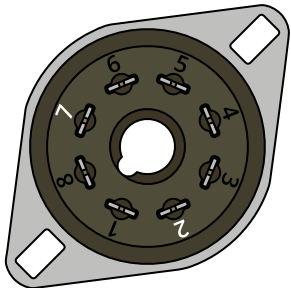
H1-3: Insert the 1A fuse into its holder. Set the multimeter to measure volts AC and attach standard 2mm pin test leads. Insert the probes into pins 4 and 6 of the rectifier's octal socket at hole 49. Make sure that the metal probes are not touching the tube clamp or one another. Flip the power switch into the off position.



H1-4: Plug the power cord into an outlet. The meter should read 0VAC but might show ~1-100mV. This is OK. flip the power switch into the on position. The pilot light should be lit and the meter should now read ~710VAC. Flip the power switch into the off position. Unplug the amp from the outlet.



H1-5: Remove the probes from pins 4 and 6 of the rectifier's octal socket and insert them into pins 2 and 8 of the same socket. Plug the power cord into the outlet. The meter should read 0VAC. Flip the power switch into the on position. The meter should now read ~5.4VAC. Flip the power switch into the off position. Unplug the amp from the outlet.



H1-6: Remove the probes from pins 4 and 6 of the rectifier's octal socket and insert them into pins 2 and 7 of the output tube's octal socket at hole 34. Plug the power cord into the outlet. The meter should read 0VAC. Flip the power switch into the on position. The meter should now read ~6.8VAC. Flip the power switch into the off position. Unplug the amp from the outlet.

H1-7: With these tests completed, you have successfully verified proper functionality of the power transformer in your amplifier. Measuring 710VAC confirms that the AC voltage, which will be rectified into the B+, is reaching the rectifier tube. The measurement of 5.4VAC ensures that the filament voltage is properly supplied to the rectifier tube. Similarly, the 6.8VAC measurement confirms that the 6.3V filament voltage is correctly distributed. Additionally, the functionality of the 6.3V filament is further validated by the pilot light, which is powered by the same 6.3V supply as the audio tubes.

DC Voltage Testing

Remember to follow the one-hand rule when working on an amp that is plugged in or may have high voltages present. Use an alligator clip on the negative lead of your DMM and secure it to the chassis. With a standard 2mm probe on the positive lead, test the various points using one hand. This practice prevents a fatal shock by avoiding current passing through your heart.

Rectifier Check

I1-1: If any of the test results differ from the provided information, immediately stop and unplug the amplifier. Review all connections to locate and fix the fault before proceeding further.

I1-2: Keep the chassis on the clean work area with the open side facing down. Switch your negative test lead to an alligator clip style lead. Secure the negative lead of the multimeter directly to the chassis. Hole 10, 11, 51 or 52 on panel 2 of the chassis works well for this.

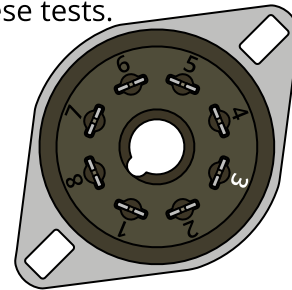
I1-3: Insert the GZ34 tube into the rectifier socket at hole 49. Make sure that the key on the tube aligns with the corresponding slot on the socket. Gently bend the clamp away from the tube and carefully insert it into place.

I1-4: Insert the positive probe of the multimeter into pin 3 of the power tube's octal socket at hole 34, ensuring the metal probe does not touch the tube clamp. Set the multimeter to measure DC volts. Plug the power cord into the outlet and then flip the power switch to the on position. Observe the DC voltage as it rises. It should stabilize around 490VDC. This is the plate voltage for the 6V6 output tube. It will read high without the tube installed but will drop down to approximately 420VDC with the tubes installed.

I1-5: Flip the power switch into the off position. Unplug the amp from the outlet. Leave the multimeter connected and observe the voltage. Notice how slowly it decreases; this is the charge held by the capacitors. Even though the amp is unplugged and off, dangerous voltages are still present. Be mindful of this and be sure to use the one-hand rule throughout these tests.

I1-6: Leave everything in place and allow the voltage to drop before continuing. This may take up to an hour. It should eventually settle around 5VDC.

I1-7: Carefully remove the positive probe from pin 3 of the output tube's socket. Be careful not to touch the metal retainer with the probe.



DC Voltage Test Measurements

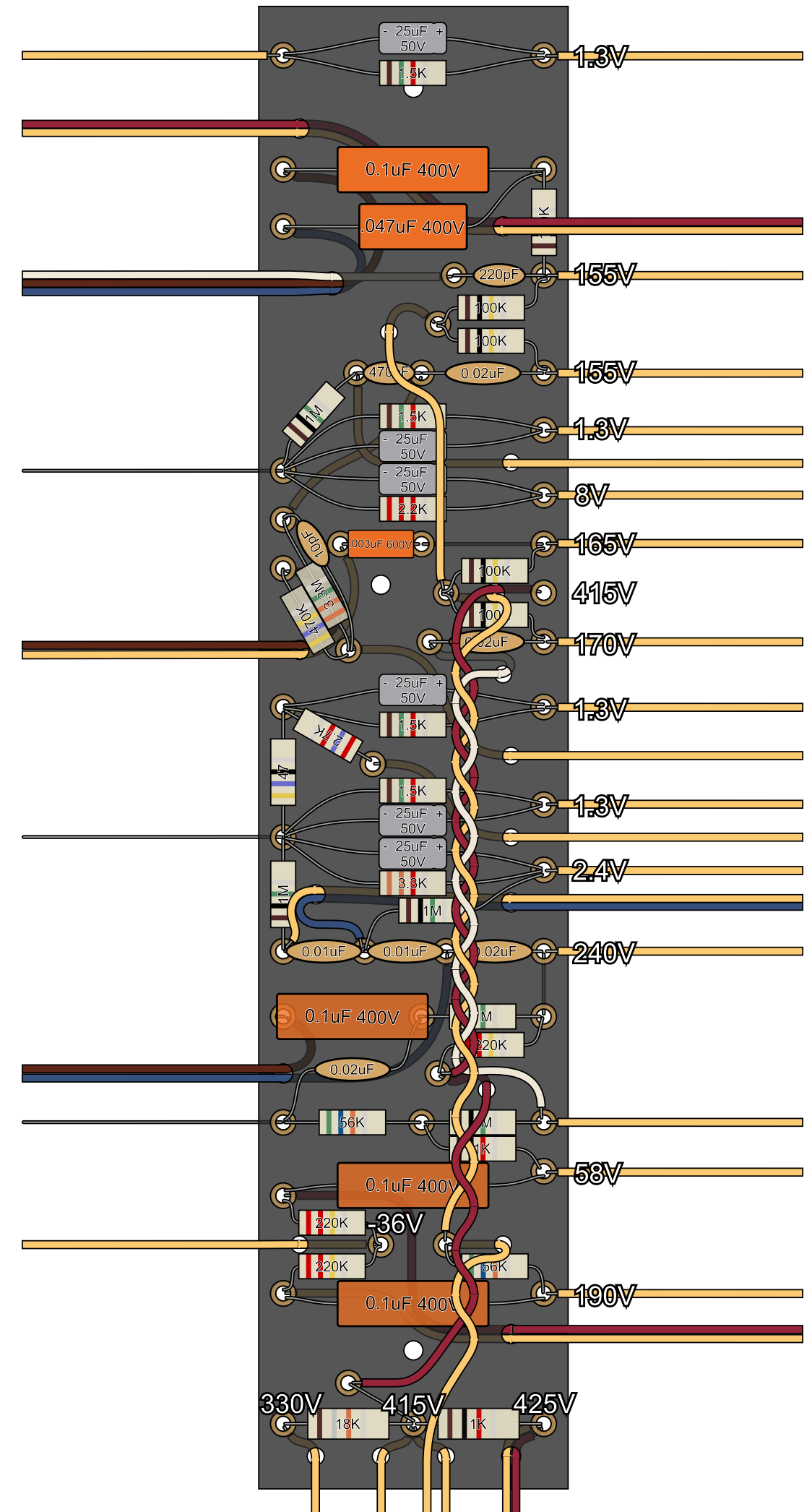
I2-1: Insert the 6V6 tubes into the octal socket at holes 34 and 39. Insert the three 12AX7 tubes into the noval sockets at 14, 24, and 27. Insert the 12AT7 into the noval socket at hole 17. Attach the noval socket shield covers to each tube

I2-2: Position the amplifier with the open side facing up. Use wooden blocks, small cardboard boxes, or similar supports to keep the chassis level and prevent the tubes from touching the bench. It is crucial to ensure the amplifier chassis is completely stable before proceeding to the next steps.

I2-3: Make sure the negative lead of the multimeter is still securely connected to the metal chassis. Turn all of the knobs to their lowest setting. Connect an 8Ω speaker to the output jack at hole 58. Set the multimeter to volts DC. Plug the power cord into the outlet and flip the power switch to the on position. The speaker might have a very faint 60hz hum but should otherwise be silent.

I2-4: Carefully measure the voltage at eyelet 51 using the positive lead of the multimeter. The meter should read approximately 425VDC.

Voltage test procedures continued on page 78.



DC Voltage Testing

DC Voltage Test Measurements (Continued)

I2-5: Carefully measure the voltage at eyelet 33 using the positive lead of the multimeter. The meter should read approximately 415VDC.

I2-6: Carefully measure the voltage at eyelet 14 using the positive lead of the multimeter. The meter should read approximately 330VDC.

I2-7: Carefully measure the voltage at eyelet 50 using the positive lead of the multimeter. The meter should read approximately 190VDC.

I2-8: Carefully measure the voltage at eyelet 30 using the positive lead of the multimeter. The meter should read approximately -36VDC.

I2-9: Carefully measure the voltage at eyelet 49 using the positive lead of the multimeter. The meter should read approximately 58VDC.

I2-10: Carefully measure the voltage at eyelet 46 using the positive lead of the multimeter. The meter should read approximately 240VDC. This measurement might pulse up and down. This is normal.

I2-11: Carefully measure the voltage at eyelet 45 using the positive lead of the multimeter. The meter should read approximately 2.4VDC. This measurement might pulse up and down. This is normal.

I2-12: Carefully measure the voltage at eyelet 44 using the positive lead of the multimeter. The meter should read approximately 1.3VDC.

I2-13: Carefully measure the voltage at eyelet 43 using the positive lead of the multimeter. The meter should read approximately 1.3VDC.

I2-14: Carefully measure the voltage at eyelet 42 using the positive lead of the multimeter. Be prepared for the speaker to make a popping sound when the probe makes contact with this eyelet. The meter should read approximately 170VDC.

I2-15: Carefully measure the voltage at eyelet 41 using the positive lead of the multimeter. Be prepared for the speaker to make a light popping sound when the probe makes contact with this eyelet. The meter should read approximately 415VDC.

I2-16: Carefully measure the voltage at eyelet 40 using the positive lead of the multimeter. Be prepared for the speaker to make a light popping sound when the probe makes contact with this eyelet. The meter should read approximately 165VDC.

I2-17: Carefully measure the voltage at eyelet 39 using the positive lead of the multimeter. The meter should read approximately 8VDC.

I2-18: Carefully measure the voltage at eyelet 38 using the positive lead of the multimeter. The meter should read approximately 1.3VDC.

I2-19: Carefully measure the voltage at eyelet 37 using the positive lead of the multimeter. Be prepared for the speaker to make a popping sound when the probe makes contact with this eyelet. The meter should read approximately 155VDC.

I2-20: Carefully measure the voltage at eyelet 36 using the positive lead of the multimeter. The meter should read approximately 155VDC.

I2-21: Carefully measure the voltage at eyelet 34 using the positive lead of the multimeter. The meter should read approximately 1.3VDC.

I2-22: Flip the power switch to the off position. Unplug the power cord.

Functionality Testing

Sound Test

J1-1: Remove the multimeter and flip the amplifier so the open side faces down. Ensure the amp is securely positioned and the speaker remains connected. Set the Treble and Bass knobs between 5 and 6 and make sure that Volume, Reverb, Speed, and Intensity controls are turned fully counter-clockwise.

J1-2: Locate the reverb tank and remove the foam from the springs. Position it open side down behind the amp chassis. Make sure the speaker is not close to it as this can cause feedback.

J1-3: Connect the 5ft RCA cable to the Reverb Input jack on the rear panel. Connect the 3ft RCA cable to the Reverb Output jack on the rear panel.

J1-4: Connect the other end of the 5ft RCA cable to the reverb tank's In jack. Connect the other end of the 3ft RCA cable to the reverb tank's Out jack.

J1-5: Connect a guitar to an instrument cable and plug it into the Instrument 1 jack. Make sure that you have enough cable to play the guitar without pulling on the amp.

J1-6: Plug the power cord into the outlet and then flip the power switch to the on position. Slowly increase the Volume knob closest to the jacks until the guitar can be heard clearly.

J1-7: Play around with the different levels. The amp should have fairly clean headroom at a high volume before the tube distortion kicks in. Adjust the Treble and Bass controls to hear the variety of sounds they offer. The Treble adjusts the higher frequencies and the Bass adjusts the lower frequencies of the signal.

J1-8: Slowly turn up the Intensity knob while playing a sustained note on the guitar. The volume should start pulsing at a slow and steady rate. With the Intensity at ten, adjust the Speed knob to hear the different tremolo rates it offers. Low settings will be slower and high settings are faster. Play around with both the Speed and Intensity to hear the variety of sounds provided by this effect.

J1-9: Turn the Intensity knob fully counter clockwise to remove the tremolo effect. Slowly increase the Reverb knob to bring in this effect. Play around all of the settings now to hear how they interact with the reverb. Note that the tremolo effect also reduces the reverb volume since it takes place after the reverb.

J1-10: Turn the Volume control fully counter-clockwise and flip the power switch into the off position. Unplug the cable from the Instrument 1 jack and plug it into the Instrument 2 jack. Flip the power switch to the on position. Play with the levels again. This should sound roughly the same as Normal 1 input but quieter. When satisfied that this input is working correctly, Flip the power switch to the off position.

J1-11: You have now fully tested the functionality of the amplifier. Unplug the amp from the outlet.

J1-12: You can now install the amplifier into its cabinet. It's a good idea to remove the tubes and reverb tank before mounting the chassis to avoid potential damage. Allow the tubes to cool to room temperature before attempting to remove them.



Thanks for selecting a Mod® Electronics amp kit. We hope you had as much fun building this amplifier as we had designing it for you. Mod® Electronics is a small business and your support means the world to us. Learn more about what else we do at modelectronics.com. Keep rocking.

