



THE MOJOTONE BLACKFACE PRINCETON REVERB STYLE 1 X10 COMBO AMP

The Blackface Princeton Reverb® has been a staple in guitar tone since its inception in 1964. Similar to the idea behind the Vibro Champ, the Princeton Reverb was essentially all the good parts of its predecessor, the Tweed Princeton, but with a long-spring reverb and tube-driven tremolo circuit added. These amps were ideal not only for use in the studio, but for traveling and gigging with as well. Over the years the Princeton Reverb has worked its way into the gear repertoire of many renowned guitarists such as Larry Carlton, Glen Campbell, and Tommy Tedesco.

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INTRODUCTION

This amplifier kit wiring and assembly are based on the same construction methods that the original designers used 50+ years ago. This vintage method of assembly is a “hands-on” experience. When putting them together and you should take your time when assembling the kit. It’s always exciting as you get closer to finishing the build, but this is where errors will normally occur. It can become overwhelming when looking at the whole picture of building the kit, therefore try looking at the amp in small sections. Ex: The input jacks, preamp section on the board, power supply section on the board, wiring the potentiometers, wiring the preamp tube sockets, wiring the power tube sockets, transformer wiring and so on.

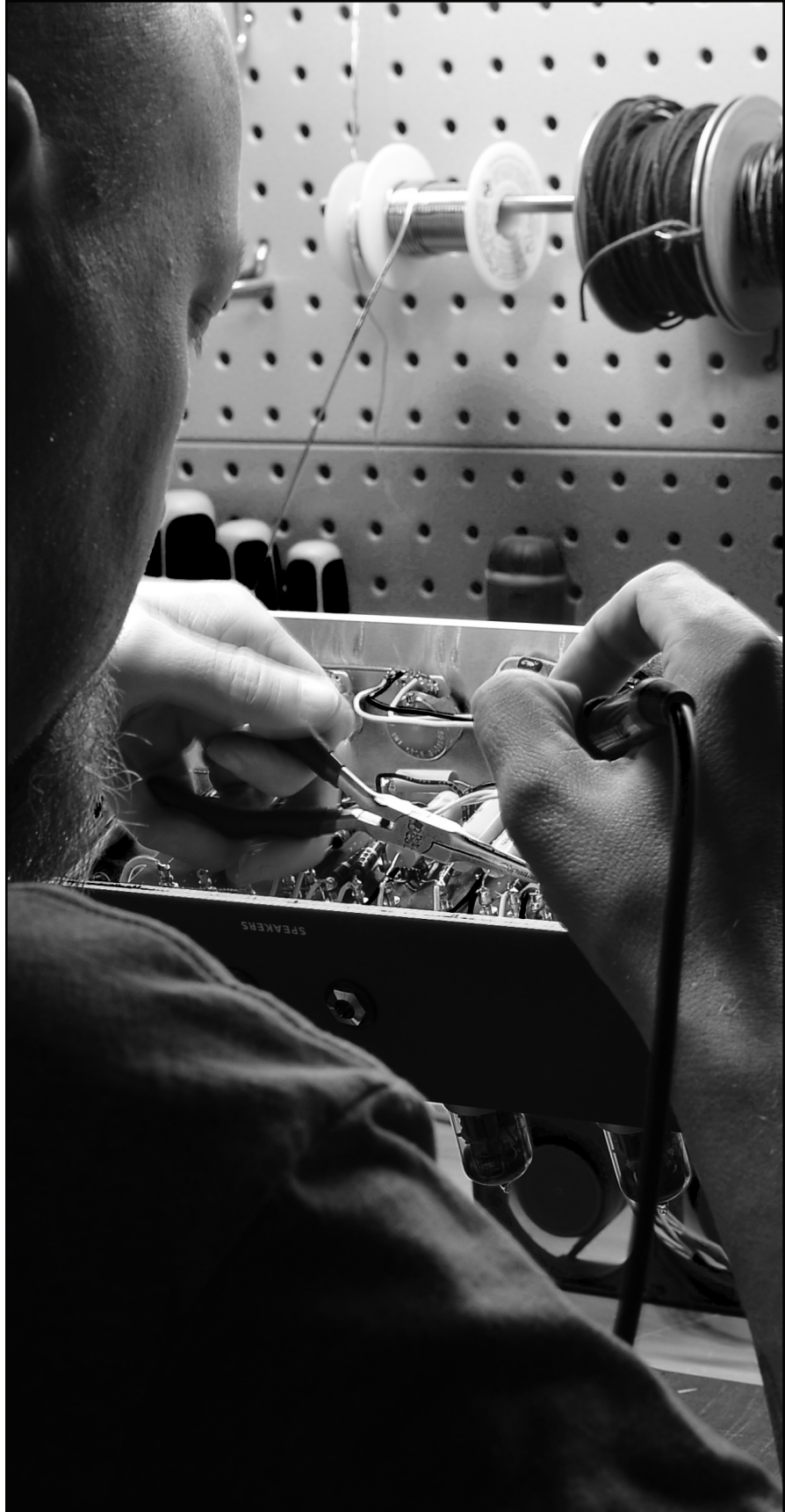
Remember to take your time and enjoy the build. If you get stuck on something, step away from the build for a few hours or a day, then come back to it.

SECTION 1:

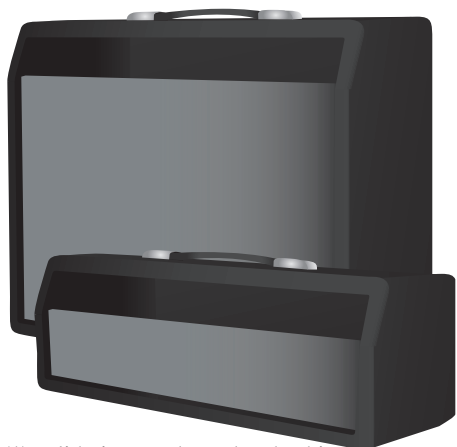
SAFETY

SAFETY FIRST! Electronics can be dangerous and must be treated with respect. Any circuit that works with 120VAC power from an electrical outlet is especially dangerous and could potentially kill you. Here are some guidelines to keep you safe as you work.

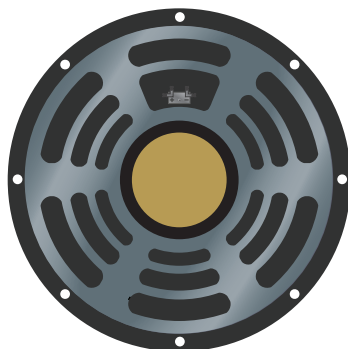
- **Never work on a circuit** while power is applied.
- **Do not connect power** to a circuit until the circuit is finished and you have carefully checked your work (twice).
- **If you smell anything burning**, immediately disconnect the power and examine your circuit to find out what went wrong.
- **Keep your work area** dry and organized.
- **Be careful around large capacitors.** They can continue to hold voltage long after they are disconnected from power. Discharge electrolytic capacitors if power has been applied to the unit.
- **Be especially careful when you solder.** A hot soldering iron can easily burn you.
- **Always work** in a well-ventilated space.
- **Have safety equipment** such as a fire extinguisher, a first-aid kit and a phone nearby.
- **Be Patient!** Rushing through any type of technical work just leads to frustration and compounds issues that can easily be avoided.



SECTION 2: INVENTORY *optional based on order



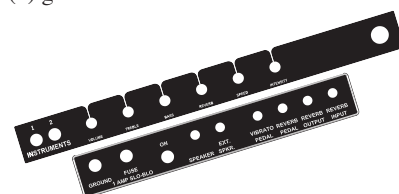
(1) solid pine combo or head cabinet*



(1) Jensen C10Q 10" 35watt 8Ω speaker



(1) galvanized steel chassis



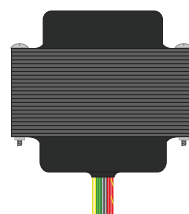
(1) Blackface Princeton Reverb style faceplate & backplate



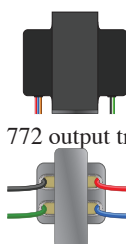
(1) Mojotone 2 spring reverb tank & reverb tank bag



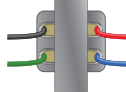
(1)VIB/REV 2 button footswitch



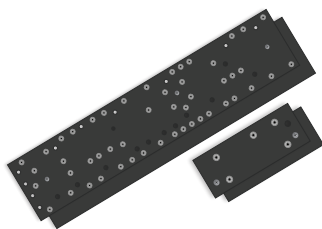
(1) Mojo 760 Power Transformer w/ hardware



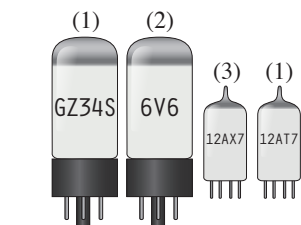
(1) Mojo 772 output transformer



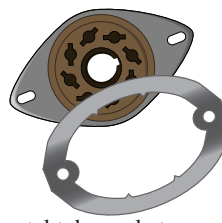
(1) Mojo 776 reverb driver



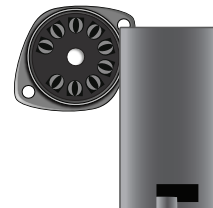
(1) eyelet boards & backer boards



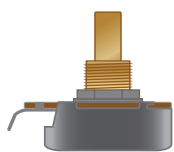
vacuum tubes



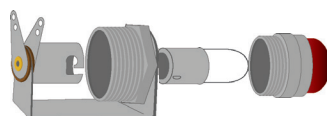
(3) octal tube sockets & tension clamps



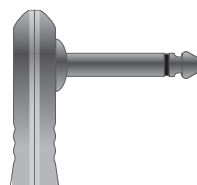
(4) 9-pin tube sockets & tube shields



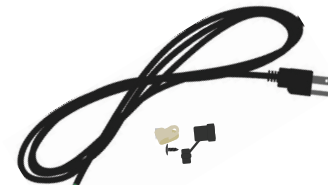
potentiometers w/ hardware
(2) 250KA, (1) 250KL,
(1) 1MA, (1) 3MRA, (1) 100KL



(1) indicator light assembly w/ hardware



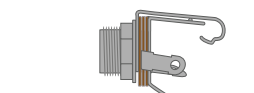
(1) right angle 1/4" plug



(1) 10' install power cord w/ hardware



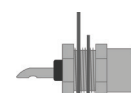
(6) witch hat knobs



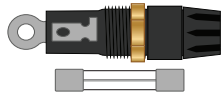
(3) J12A 1/4" shorting jack w/ hardware



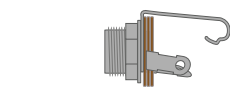
(1) ground switch w/ hardware



(4) RCA jacks w/ hardware



(1) fuse holder, (1) slow blow 1 amp fuse w/ hardware



(1) J11 1/4" mono jack w/ hardware



(1) power switch w/ hardware



(3) rubber grommets (4) ground tabs

RESISTORS

Carbon Composite

	(1) 1/2 watt 47Ω
	(2) 1/2 watt 100Ω
	(1) 1/2 watt 1K
	(4) 1/2 watt 1.5K
	(2) 1/2 watt 2.2K
	(1) 1/2 watt 2.7K
	(1) 1/2 watt 3.3K
	(1) 1/2 watt 6.8K
	(1) 1/2 watt 22K
	(2) 1/2 watt 56K
	(2) 1/2 watt 68K
	(7) 1/2 watt 100K
	(4) 1/2 watt 220K
	(1) 1/2 watt 470K
	(6) 1/2 watt 1M
	(1) 1/2 watt 3.3M

Metal Oxide

	(1) 2 watt 1K
	(2) 2 watt 15K

DIODE

	(1) 1A diode 1N4007 @ 1000v
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CAPACITORS

	(6) Sprague Atom 25μf @500v
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	(1) Mojotone Electrolytic KingCap 100μf @100v
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	(1) can capacitor w/ mounting hardware 40μf+20μf+20μf+20μf @ 500v
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Orange Drop

	(4) 0.1 μf @ 600v
--	-------------------

	(1) 0.047 μf @ 600v
--	---------------------

	(3) 0.022 μf @ 600v
--	---------------------

	(1) 0.0033 μf @ 600v
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Silver Mica

	(2) 250pf @ 500v
	(1) 500pf @ 500v

Ceramic Disc

	(1) 10pf @ 500v
	(1) 0.02 μf @ 500v
	(2) 0.01 μf @ 500v

HARDWARE

	(16) 4-40 1/4" screw & keps nuts
	(4) 6-32 1/2" screw & keps nuts
	(9) 8-32 3/8" screw & keps nuts
	(1 set) 4 5/8" chassis straps

WIRES

cloth covered wire

22 gauge:	18 gauge:
(2') Blue	(6') Green
(2') Brown	(2') Black
(2') Red	(2') White
(6') Yellow	
(3') Black	
(3') White	
(2') copper bus wire	

SECTION 3:

TOOLS

Certain tools are required to successfully build your amp. The following are recommended to complete your project.

NEED A TOOL? Do you see something on this list that you need? Turn to **page 20** for a full list of tools, parts and kits to add to your workbench

- ☐ 1/2" nut driver
- ☐ Set of needle nose pliers (one with teeth and one without)
- ☐ Wire cutters
- ☐ Wire strippers
- ☐ Soldering iron and solder
- ☐ Adjustable wrench
- ☐ Philips head screw driver
- ☐ Multimeter

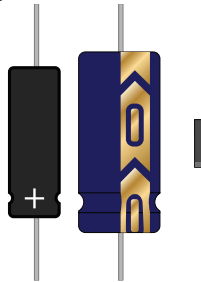
SECTION 4:

COMPONENT IDENTITY & ORIENTATION

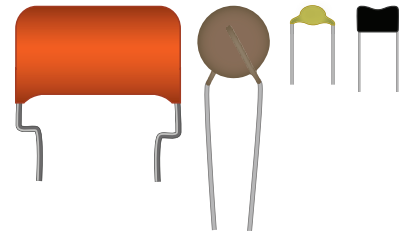
Ensure all polarized caps are in the correct orientation when installing onto the board. This is typically denoted by an arrow pointing towards the negative side, or a small indentation on the positive side.

SAFETY FIRST! A cap in the wrong orientation can explode! So follow your wiring diagram and pay close attention when orienting your polarized caps

POLARIZED



NON-POLARIZED

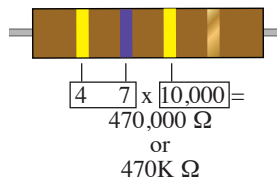


SECTION 5:

HOW TO READ COMPONENTS

READING RESISTOR VALUES

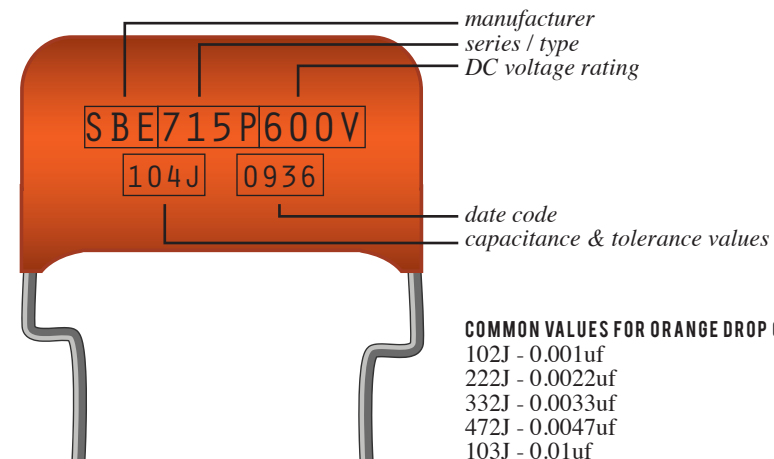
The resistors that are included in your Mojotone kit, all use the 4-band resistor color code for determining their values. The easiest way to read the resistors, start by having the gold strip facing towards the right. The first two colors on the left are going to be your values, for example Yellow & Violet would be 47. The third strip is going to be your multiplier. So for this example, the third strip is a yellow stripe which is 10,000. The value of the resistor is calculated as such 47 X 10,000 which equals 470,000 ohms or 470K ohms.



COLOR	BAND 1	BAND 2	MULTIPLIER	TOLERANCE
Black	0	0	1Ω	
Brown	1	1	10Ω	± 1%
Red	2	2	100Ω	± 2%
Orange	3	3	1KΩ	
Yellow	4	4	10KΩ	
Green	5	5	100KΩ	± 0.5%
Blue	6	6	1MΩ	± 0.25%
Violet	7	7	10MΩ	± 0.10%
Grey	8	8	100MΩ	± 0.05%
White	9	9	1Ω	
Gold			0.1Ω	± 5%
Silver			0.01Ω	± 10%

READING ORANGE DROP CAPACITOR VALUES

Your Mojotone kit includes 715P Series Orange Drop capacitors. These capacitors use a numerical value and multiplier, very similar to resistors, for calculating their values. The top line printed on the capacitor is going to be the series number followed by the 3 digit voltage rating. For example, SBE 715P600V translates to SBE (manufacturer), 715P (capacitor series / type), 600V (DC voltage rating). The next line will have a 3-digit code followed by a letter. Just like the resistors, the first two digits are your values in pico farads (pf) and the third digit is the multiplier. The letter code after the 3-digits is tolerance value for the capacitor. For example, 104J is equal to 10 X 10,000 or 100,000pf which converts to 0.1uf, the 'J' indicates that cap is has a 5% tolerance in value. The 4-digit code after the value digits is going to be the date code when the capacitor was manufactured. For example, 0936 converts to the 36th week of 2009.

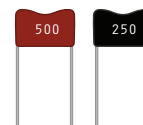


COMMON VALUES FOR ORANGE DROP CAPACITORS:

102J - 0.001uf
 222J - 0.0022uf
 332J - 0.0033uf
 472J - 0.0047uf
 103J - 0.01uf
 223J - 0.022uf
 473J - 0.047uf
 104J - 0.1uf

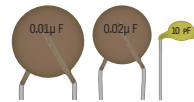
READING SILVER MICA CAPACITOR VALUES

On Silver Mica capacitors, the actual values are printed on the capacitor. Silver Micas are typically smaller values in pico farads. For example, if a cap has 510 printed on it, the value is 510pf, another would be 47 or 47pf.



READING CERAMIC DISC CAPACITOR VALUES

Ceramic Disc capacitors will typically have the actual value and voltage rating printed on them.



READING DIODES

The diode(s) included with the kit are directional and it is very important that they are installed correctly according to the circuit. Pay close attention to the orientation of the silver band that is around the outside of the diode. Depending on the direction they are going will determine how they conduct or rectify the AC voltages. For example, in the case of the Princeton Reverb, the band on the diode is facing towards the incoming AC voltage, meaning it is going to block the positive cycle of the AC voltage but rectify the negative cycle giving the negative DC voltages needed for a fixed bias amplifier.



SECTION 6:

SOLDERING BASICS

Before you start slinging solder in your kit or if you have never soldered before, take a moment to read over this section about soldering.

When assembling your amp kit, whether it's putting components on the eyelet board, wiring up the tube sockets or connecting wires to the potentiometers, the first thing you want is a good solid mechanical connection. So for example if you are connecting a wire to a pin on a tube socket or on the back of a potentiometer, you do NOT want to set the wire on the pin or let it float loosely and throw a bunch of solder on there. Solder is not a great conductor, specially some of the newer lead-free solder, think of it as more of a semi-conductive glue. So what you want is a solid physical connection between the components that you are connecting together. For example, when soldering to a tube socket, you would want to create a hook with the wire or component lead, hook it through the pin, then use a pair of needle nose pliers to pinch the hook together around the pin. Now the wire has a solid connection to the pin, so even if solder were to fail, in theory you have the components connected together. After you have created the mechanical "bond", then you can add a little solder to help solidify the joint.

WORKING WITH EYELET BOARDS

When installing components onto the eyelet boards, you want the component to lay or sit down onto the board, feeding the leads into the eyelets and then bending them underneath the board. Once all the components are installed on the board and the connecting wires are attached as well, then start soldering the joints. After they have been soldered, be sure to clip the excess leads that are underneath the boards so that they do

not short against other components.

PRO TIP: There is an exception to laying a component down on the eyelet board and that would be higher wattage resistors are in the power supply OR if the amplifier is running the power tubes in a cathode biased configuration. These components are dropping voltages across them during operation, which results in excess heat, and needs to float a little above the board to dissipate the heat.

SOLDERING A CONNECTION

When soldering a connection on an eyelet, tube socket or potentiometer, make sure that you are heating the component lead as well as the pin or eyelet. Then slowly flow the solder into the connection. The solder should liquify and spread over the connection. It should only take about 2-3 seconds for the connecting component leads to become hot enough to flow solder. If it takes longer, double check the temperature of your soldering iron and make sure the tip of the iron is clean. A quick way to tell if your iron is hot enough and clean is to take a little solder and touch it to the tip. The solder should melt almost instantly and stay on the tip, NOT bead up and fall off.

PRO TIP: It doesn't take a lot of solder to make a good connection. Again think of the solder as semi-conductive glue that holds your connections together.

SECTION 7:

CHASSIS ASSEMBLY

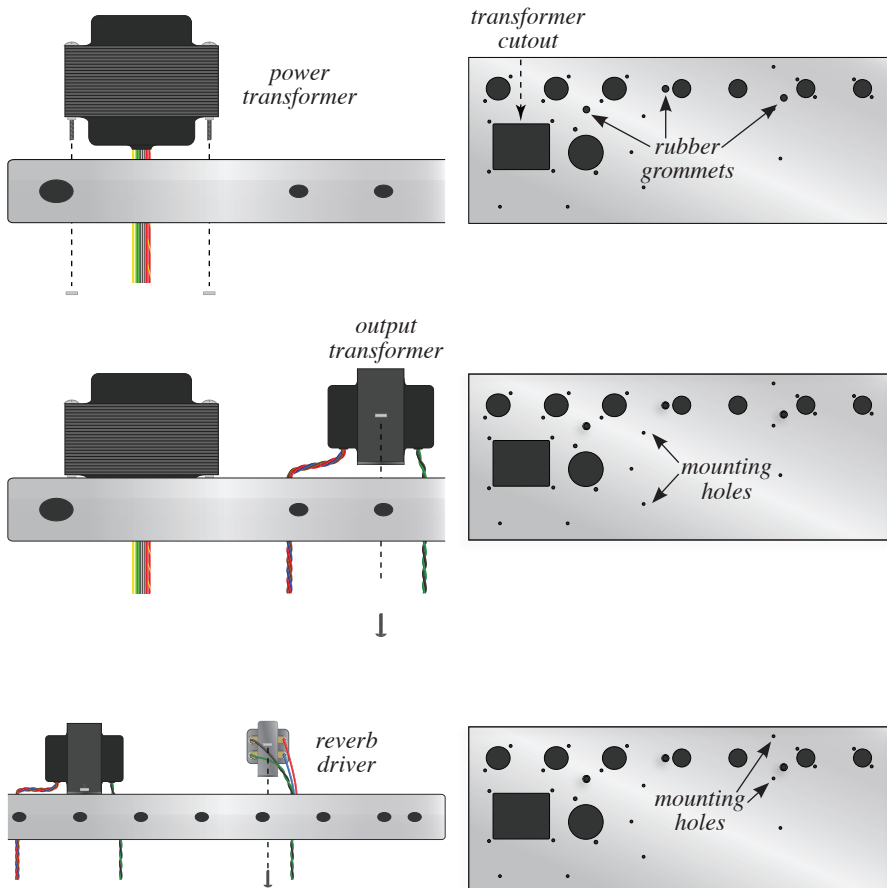
TRANSFORMERS

○ **Mount the power transformer** using into the chassis using (4) 8-32 keps nuts using your adjustable wrench. The transformer will be recessed through the rectangular cutout in the “belly” of the chassis. You do not need to remove the screws or nuts that are already on the transformer.

○ **Install rubber grommets** in holes for output transformer and reverb driver transformer leads.

○ **Mount the output transformer** using the (2) 8-32 x 1/4” screws and corresponding keps nuts onto the outside of the chassis next to the power transformer (output transformer is not recessed). Install the transformer so that the **Red**, **Blue** and **Brown** wires go through the grommet closest to the power transformer. The **Black** and **Green** go through the grommet to the right of the output transformer. The screws will go through the inside of the chassis, and the nuts will be installed on the outside. Use a screwdriver and adjustable wrench to tighten.

○ **Mount the reverb driver transformer** using the (2) 8-32 x 1/4” screws and corresponding keps nuts onto the outside of the chassis between the two middle 9-pin tube sockets. All four wires (**Red**, **Blue**, **Green** and **Brown**) go through the grommet furthest from the power transformer. The screws will go through the inside of the chassis, and the nuts will be installed on the outside. Use a screwdriver and adjustable wrench to tighten.



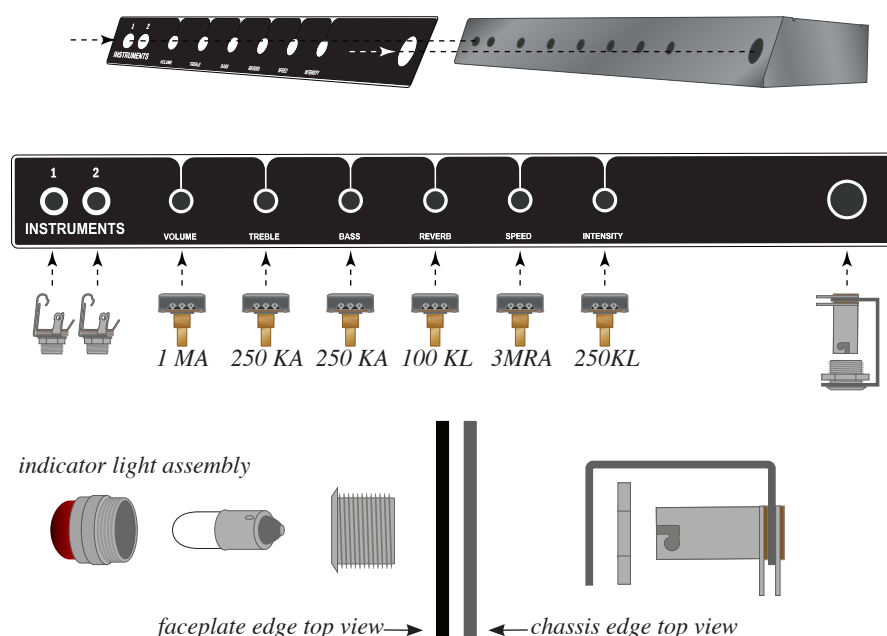
FRONT PANEL

○ **The faceplate will be secured** by the washers and nuts from the components being mounted through it. Ensure the faceplate is straight before tightening down the components and installing the knobs.

○ **Mount indicator lamp** using its preassembled hardware. Un-thread the hardware from the component and insert it through the chassis and corresponding faceplate cut out. Reapply hardware and tighten with adjustable wrench and pliers.

○ **Mount potentiometers** using their pre-assembled hardware and 1/2” nut driver. Make sure potentiometers are mounted with their lugs facing up towards the open end of the chassis.

PRO TIP: When mounting the pots, make sure the toothed locking washer goes between the potentiometer and the chassis. The flat washer will go on the outside of the chassis and the nut will tighten down



○ Once you have the pots securely installed, turn the shaft of the pot all the way counter-clockwise. Install the knob on each pot, making sure the “1” of the knob is pointing to the white indicator on the faceplate. Use a small flat head screwdriver to tighten the set screw in the back of the knob securely on the pot shaft. If the knob isn’t moving smoothly, loosen the set screw, back the knob off of the pot 1/16” and re-tighten

○ Mount the J12A input jacks using their pre-assembled hardware and an adjustable wrench. Pay close attention to the orientation of the jacks on the wiring diagram.

PRO TIP: Pre-install and solder any resistors on the jacks before mounting it to the chassis wherever possible.

REAR PANEL

○ The rear faceplate will be secured by the washers and nuts from the components being mount through it. Ensure the faceplate is straight before tightening down the components.

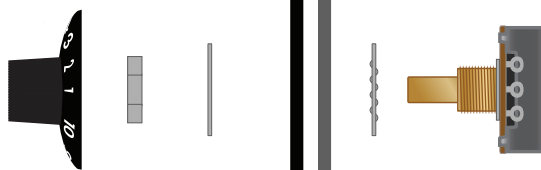
○ Mount Ground and Mains switches using their pre-assembled hardware.

○ Mount the Fuse holder using its pre-assembled hardware. Install the fuse at this time.

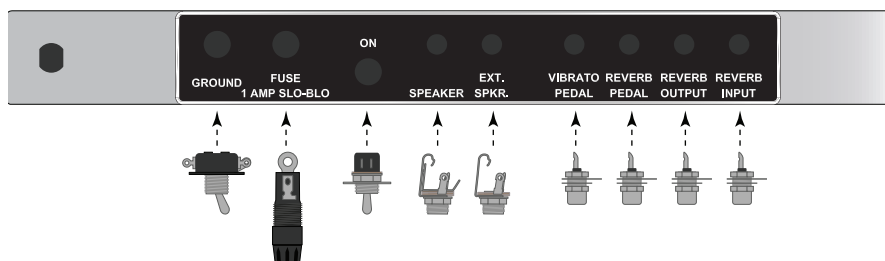
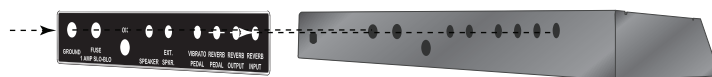
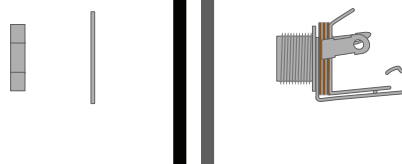
○ Mount the J12A and J11 jacks. J12A in the “SPEAKER” position and J11 in the “EXT. SPKR” position.

○ Mount the (4) RCA input jacks in the remaining holes on the back of the chassis.

potentiometer and knob assembly



input/output jack assembly



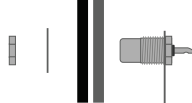
fuse holder assembly



ground switch assembly



RCA jack assembly



power switch assembly



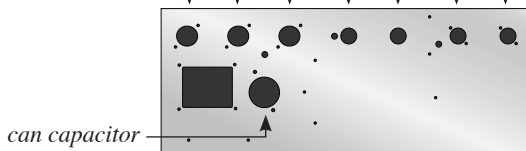
SOCKETS & CAN CAPACITOR

○ Mount octal tube sockets and tension clamp using the (6) 4-40 x 3/8” screws and keep nuts. When mounting, be sure to choose an orientation and keep this orientation uniform throughout all octal sockets. Install octal sockets with solder lugs facing inside the chassis. Be sure to mount the ground tabs for both of the power tube sockets.

○ Mount 9-pin tube sockets using (8) 4-40 x 1/4” screws and keeps nuts and tighten down with adjustable wrench and screwdriver.

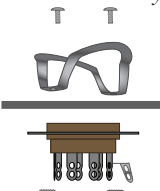
○ Mount can capacitor screws and keeps nuts and tighten down with adjustable wrench and screwdriver. Be sure to mount the ground tab.

octal tube sockets 9-pin tube sockets

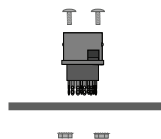


can capacitor

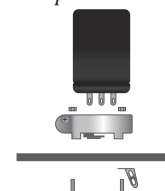
octal tube socket assembly



9-pin tube socket assembly



can capacitor assembly



SECTION 8:

TRANSFORMER WIRING

POWER TRANSFORMER

○ **Twist all matching pairs of wires** coming out of the power transformer.

○ **Measure length needed for each wire**, allow yourself extra lead and cut to length. This will eliminate excess wire and free up space in your chassis — apply this principle to all leads.

○ **Prepare the two Red wires** from the power transformer (HV secondary). Solder one wire to pin 4 and the other to pin 6 of the rectifier tube socket, the octal socket that is closest to the power transformer.

NOTE: These wires carry AC voltage, so either wire can go to either pin 4 or 6.

○ **Prepare the Red and Yellow striped wire**, connect it to one of the ground tabs by the can capacitor

○ **Prepare the two Yellow wires** from the power transformer (5v rectifier filament) and connect them to pins 8 and 2 (top opening of pins) of the rectifier tube socket. Solder pin 2 but don't solder pin 8 yet.

○ **Prepare the 2 Green wires** from the power transformer (6.3v tube filament). These will go to your pilot light with the (2) 100ohm resistors to ground.

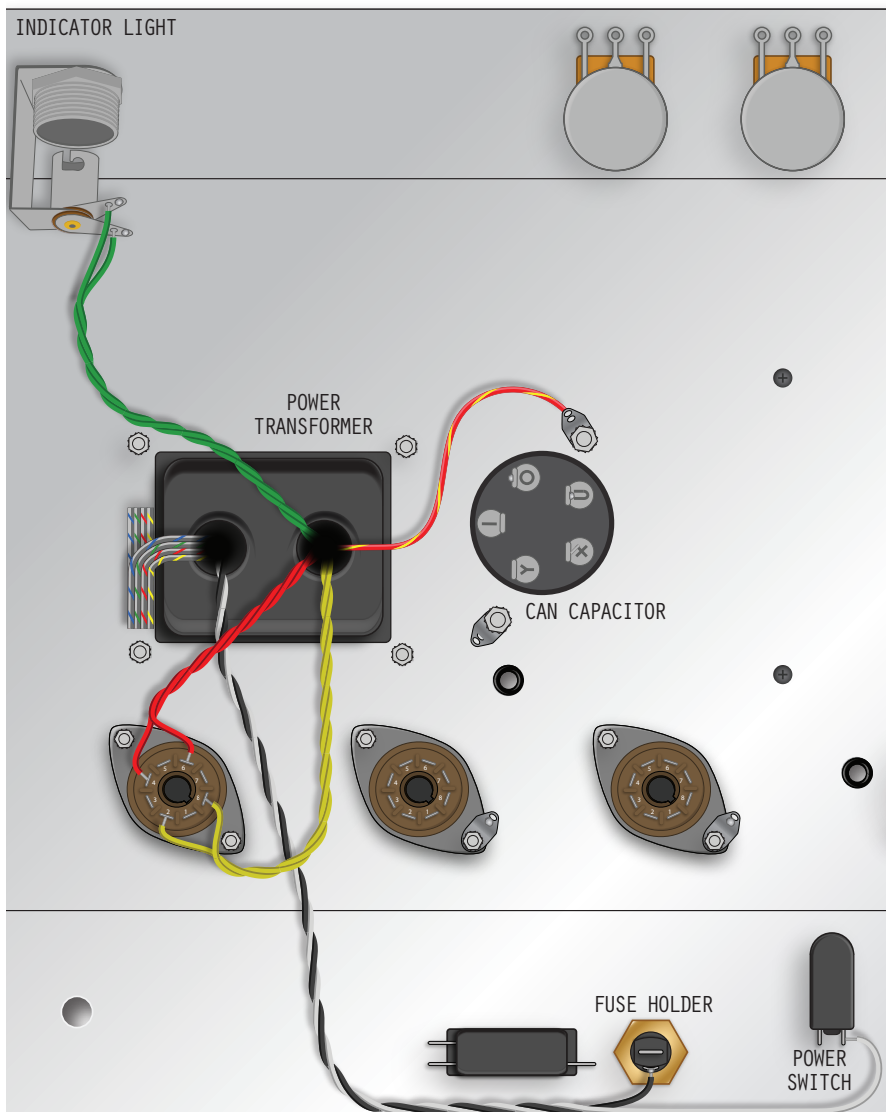
○ **Determine which Primary AC voltage** (AC voltage coming from the wall socket) you will need. The power transformer included with the kit has taps for both USA and export voltages. **White** - 120V (USA), **Black / Blue** - 100V, **Black / Yellow** - 220V, **Black / Green** - 230V, **Black / Red** - 240V.

○ **Measure and strip the AC Voltage wire** for your application, connect it the ring terminal of the fuse holder.

○ **Measure and strip the Black wire** coming from the power transformer and connect it to the left side terminal on the power switch.

○ **For the remaining primary voltage wires**, clip the ends, apply a piece of heat shrink to each end, then neatly secure them in between the side of the chassis and the power transformer.

○ **Double check your wiring**



OUTPUT TRANSFORMER

○ **Twist all sets of wires together.** Primary is **Red**, **Blue** and **Brown**. Secondary is **Black** and **Green**.

○ **Connect the Brown wire** from the output transformer to pin 3 of the power socket closest to the rectifier.

○ **Connect the Blue wire** from the output transformer to pin 3 of the power socket closest to the mains switch.

○ **The Red wire** from the output transformer will be connected to the eyelet board after the board has been installed.

○ **Connect a small jumper wire** from the middle lug (shorting lug) of the J12A jack to its ground lug.

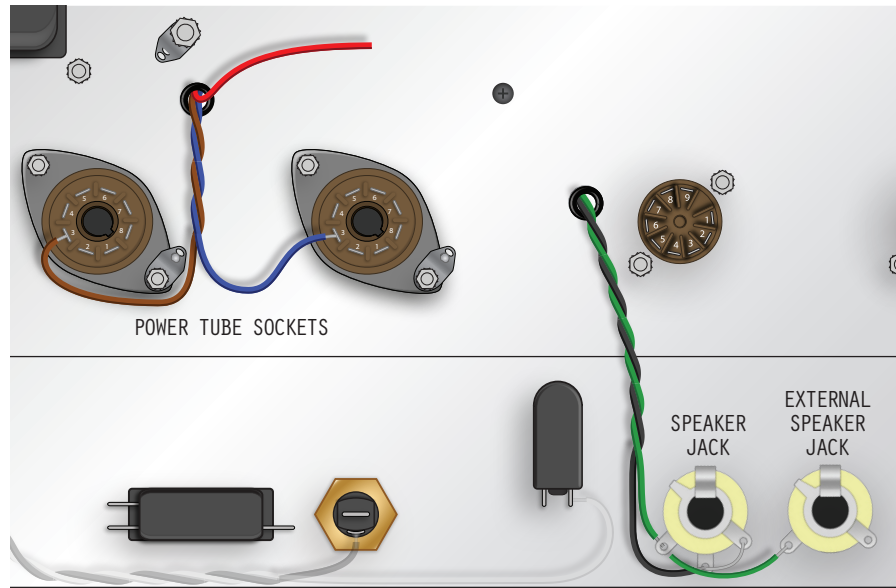
○ **Connect the Black wire** from the output transformer to the ground lug of the J12A jack

○ **Solder the middle lug and ground lug** of the J12A jack.

○ **Connect the Green wire** from the output transformer to the tip lug of the speaker jack (J12A jack) closest to the power sockets.

○ **Connect a small jumper wire** from the tip lug of the J12A speaker jack to the tip lug of the J11 EXT jack.

○ **Double check your wiring**



REVERB DRIVER

○ **Twist the Green and Black wires** together.

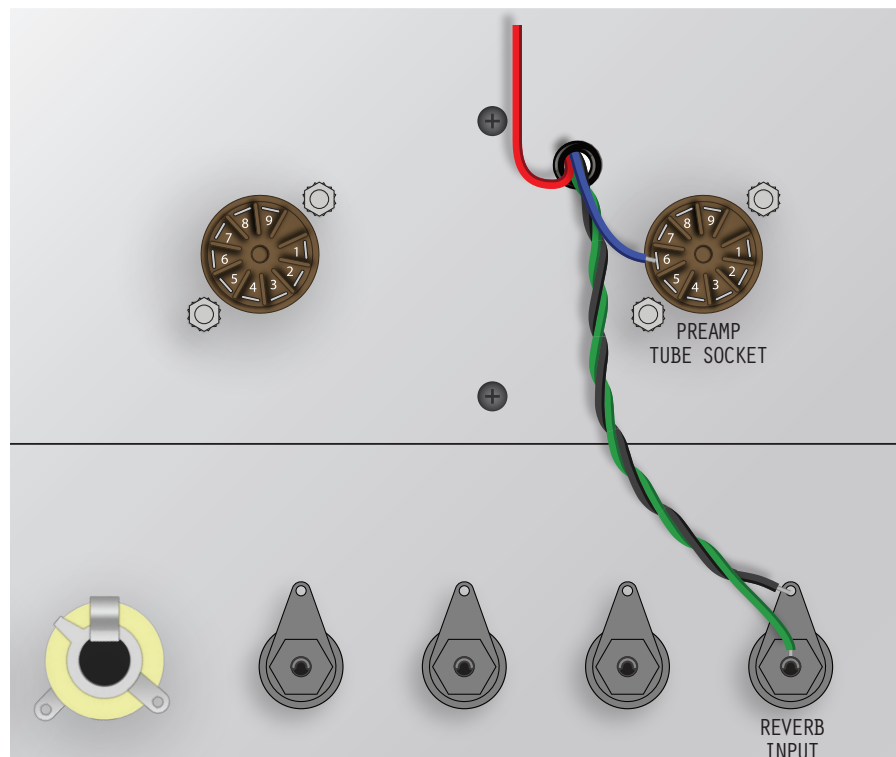
○ **Connect the Green wire** to the center pin of the RCA labeled "REVERB INPUT"

○ **Connect the Black Wire** to the ground lug of the same RCA jack.

○ **Connect the Blue wire** to pin-6 of the preamp tube to the right of where the blue wire comes through.

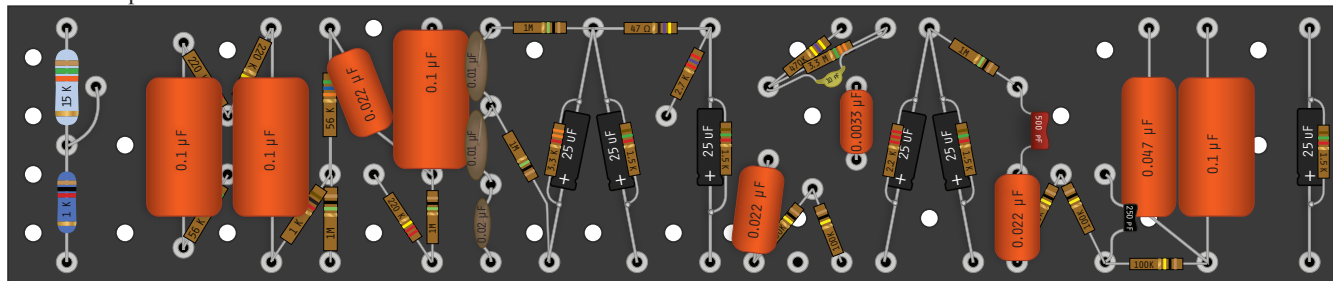
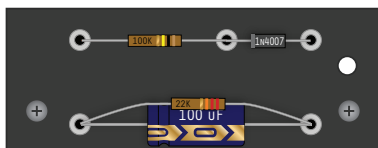
○ **The Red wire** will be connected to the eyelet board after the board has been installed.

○ **Double check your wiring** and begin soldering all connections in this section.



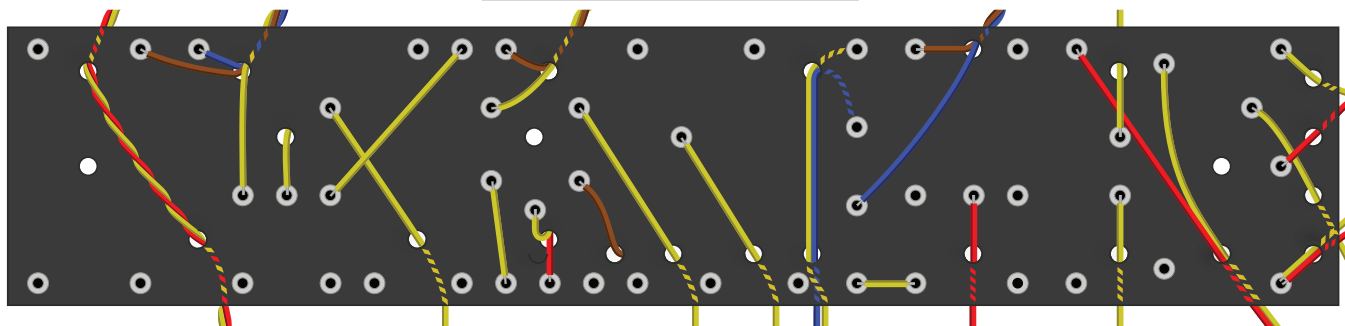
CIRCUIT BOARD ASSEMBLY & INSTALLATION

○ **Starting at one end** of the front side of the board, identify the necessary components for each eyelet connection and place leads through the eyelet holes. Once inserted, bend the leads under the bottom of the board to hold them in place.



A diagram of a solenoid, which is a long coil of wire. A grey wire passes through the center of the solenoid from left to right. The solenoid is represented by a grey cylinder with a brown cylindrical core inside. The wire is connected to the ends of the solenoid, forming a loop around it.

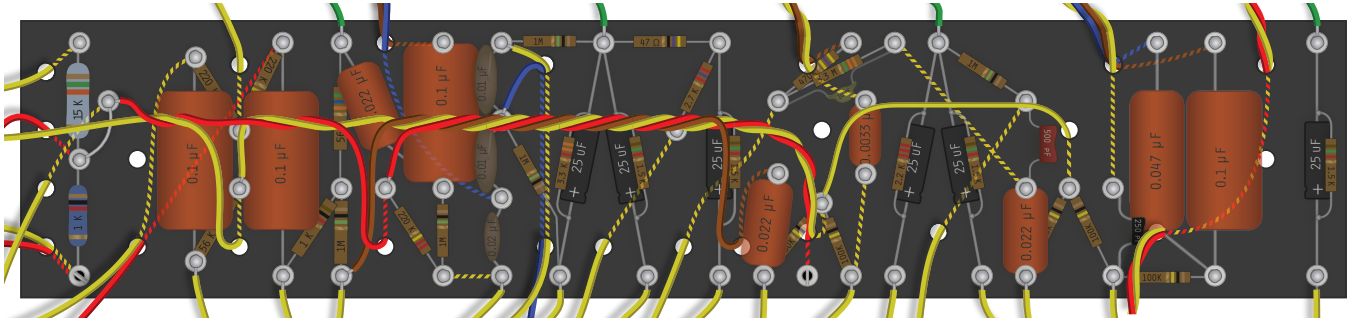
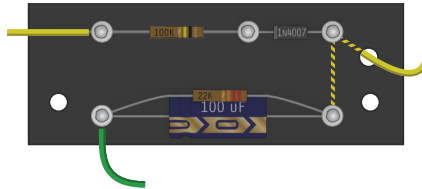
A diagram of a 2D environment with a dark gray background. A yellow robot is positioned on the left edge, facing right. It has a dashed yellow line indicating its path towards a goal, which is a white circle with a black outline. The path starts with a dashed line and then becomes a solid yellow line. There are several obstacles represented by white circles with black outlines. The path goes from the robot, moves right, then down, then right again, and finally up to the goal.



A diagram showing a cable with a yellow section and a grey section, connected by a grey coupling device. The coupling device has two U-shaped components that fit over the ends of the cable sections.

○ **Once jumper wires are in place**, follow wiring diagram to create leads where necessary. These will be the wires that go out from the component board to other components in the circuit. Insert these leads down through the front of the board and bend around back to secure.

PRO TIP: Use the included Wiring Diagram to approximate lead lengths. The diagram is scaled to be actual size of the chassis and components.



○ **Once all components, jumpers, and leads are in place**, start at one end of the board and begin soldering every eyelet hole.

○ **Make Sure** you don't have any bad or "cold" solder joints by lightly pulling each wire after solder has set.

CIRCUIT BOARD INSTALLATION

○ **Locate** the two small fiber board mounting holes drilled into the top left corner of the chassis.

○ **Align the mounting holes** on the backer board and diode board (with the backer board on the bottom).

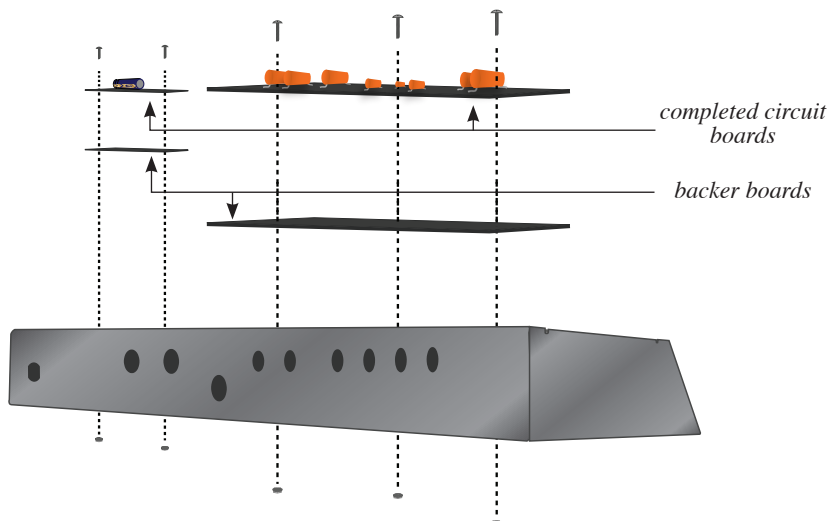
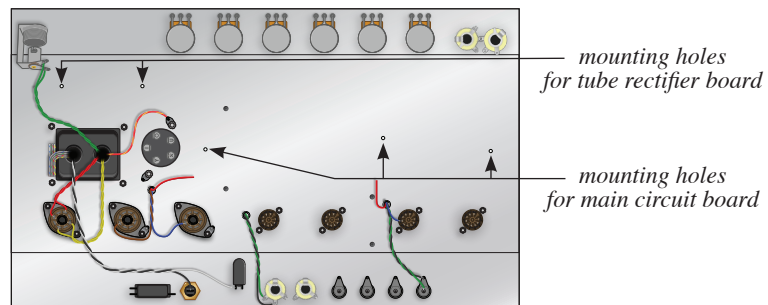
○ **Insert a 6-32 screw** into both mounting holes on the boards.

○ **Install the two boards** with the screws into the chassis.

○ **Install 6-32 keps nuts** on the outside of the chassis and tighten.

○ **Repeat the same procedure** with the main fiber board.

○ **Once in place**, fasten down the screws and nuts using a screwdriver and adjustable wrench.



SECTION 10:

WIRING THE SOCKETS, JACKS & POTS

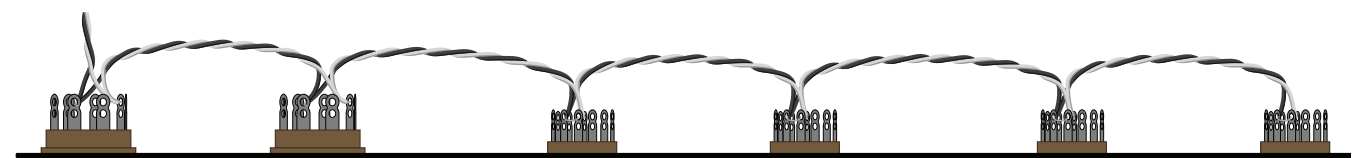
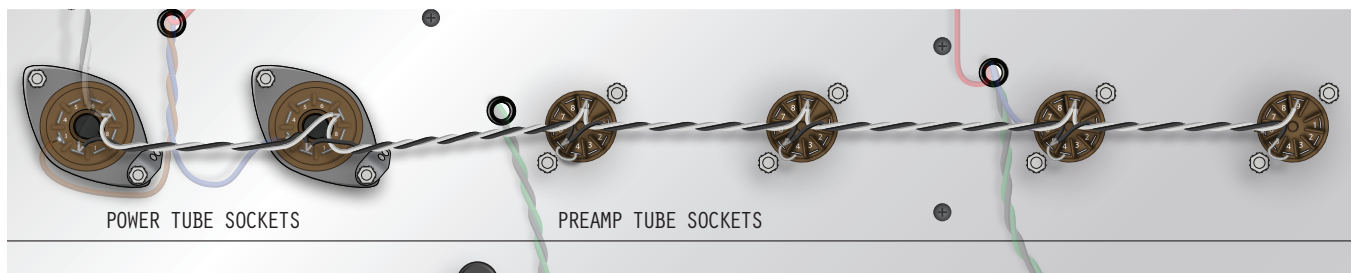
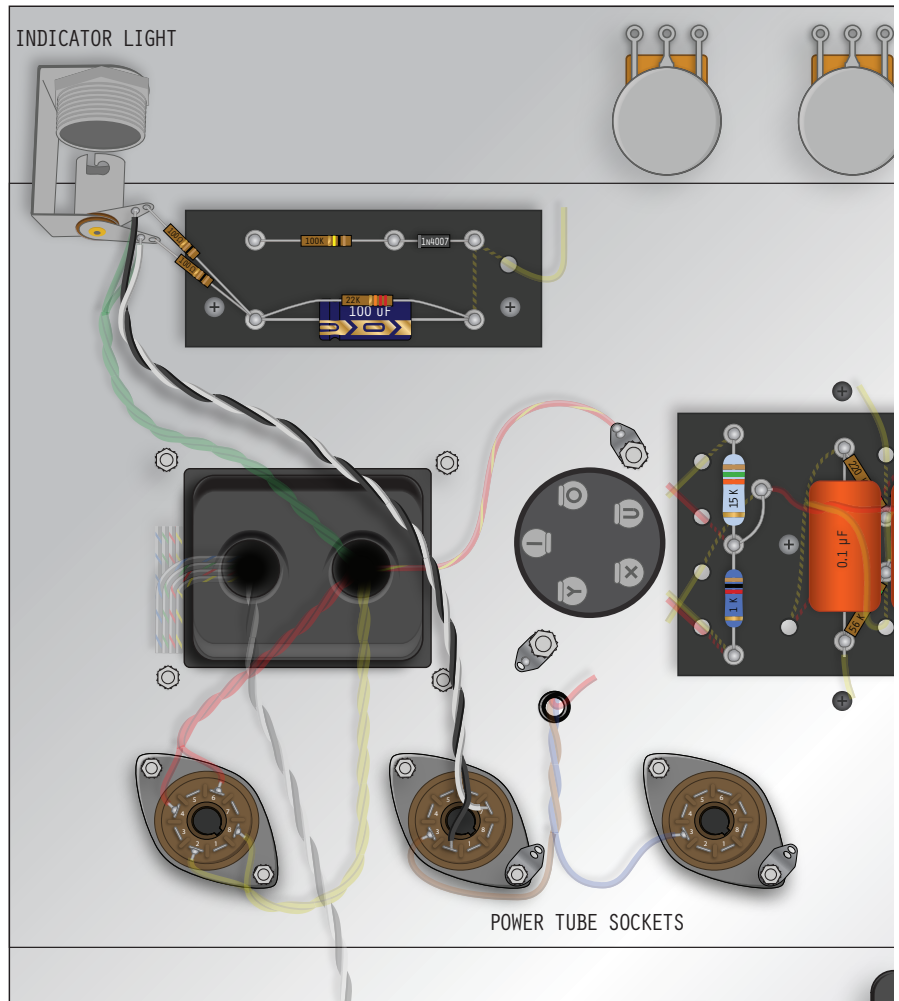
WIRING TUBE SOCKETS

○ **Twist tightly together** a length of about 5' of **White** and **Black** 22 gauge wire to start wiring the tube filaments. Starting with the pilot light, connect the **White** wire to one terminal and the **Black** wire to the other terminal. From there, connect the **White** wire to pin 7 of the power tube closest to the rectifier tube. Connect the **Black** wire to pin 2 on the same power tube socket.

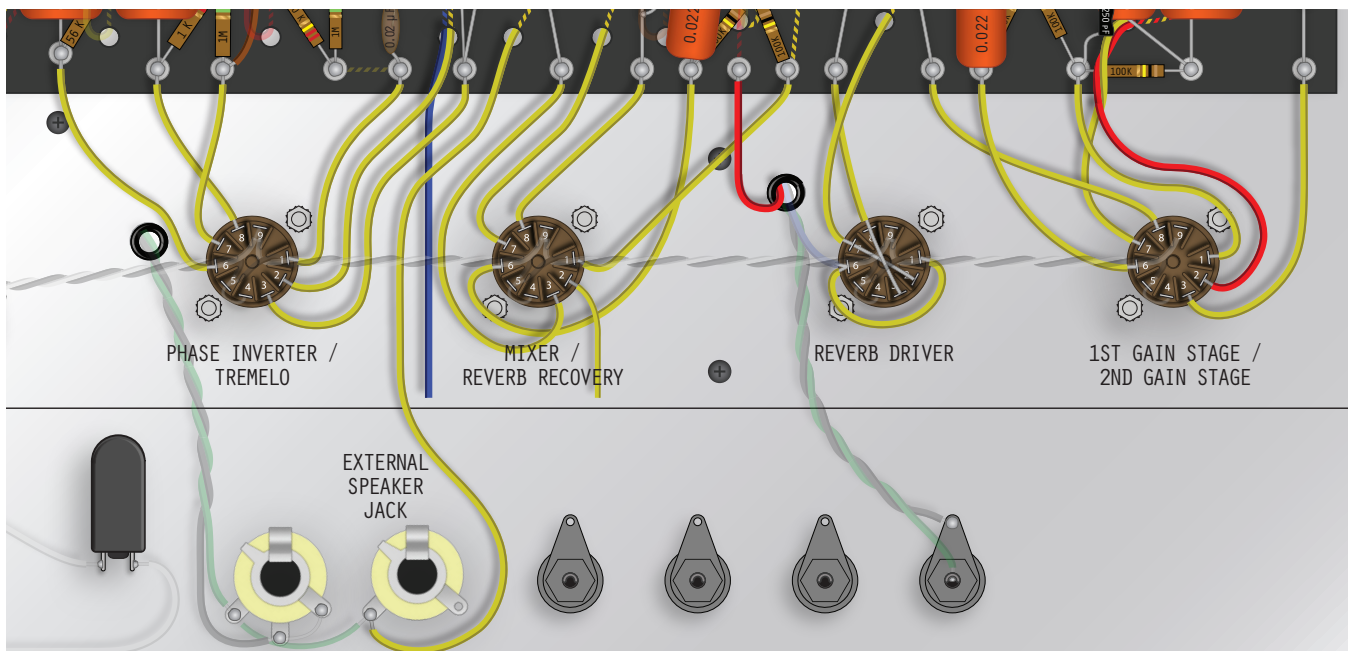
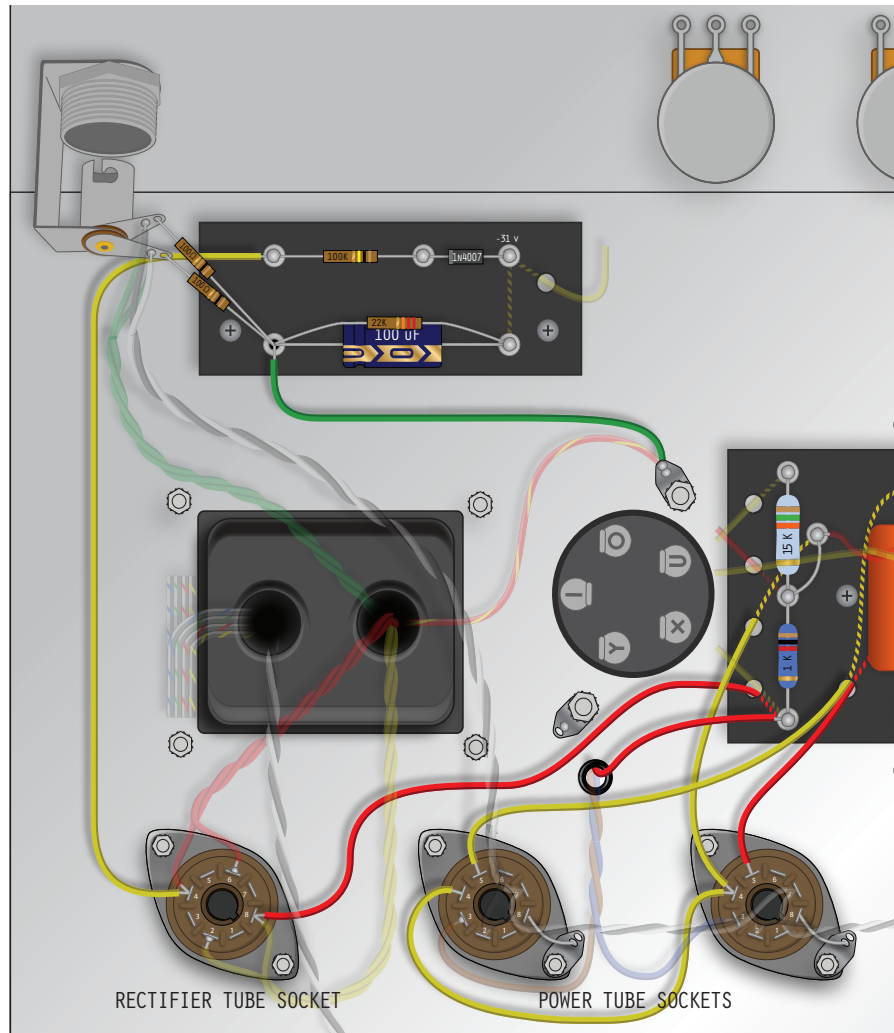
○ **Install a 100 ohm resistor** to each tab on the pilot light to the bottom left eyelet on the diode board.

PRO TIP: Make sure the power tube filaments are “in phase”. This means that the filament wires (**White** and **Black** twisted wire running between the power tubes sockets) must connect to the corresponding pins between the sockets. Pin 2 to pin 2, Pin 7 to pin 7. Preamp tubes do not have to be in phase. For a more vintage correct look use the **Green** 18 gauge wire.

PRO TIP: Since there is a wire connected to the 5 pin, you can achieve the jumper wire to pin 4 by stripping the wire back a little further, running it through pin 5 and loop it in to pin 4. Solder the wire to both pins. Use this method on any jumper on the tube sockets.



PRO TIP: When running wires in the preamp section of the amplifier, pay attention to the lead dress. Make sure that the leads going from the eyelet board are short and neat. Keeping the signal wires from the tremolo circuit clear from the reverb recovery and mixer stage.

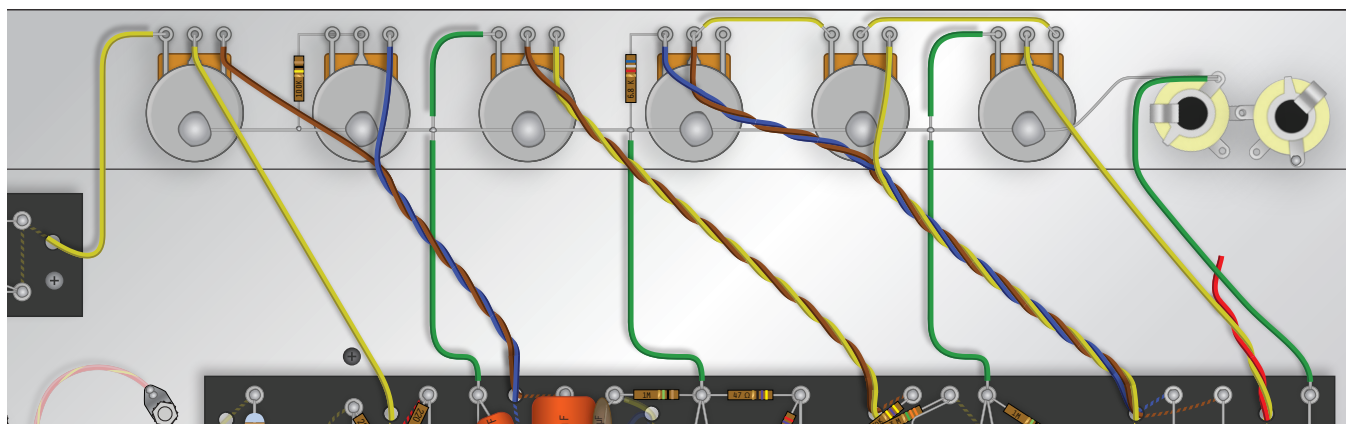


WIRING POTENTIOMETERS & INPUT JACKS:

○ **Prepare the bus wire** that will mount across the back of all the pots. Start from the “INTENSITY” control on the left side and solder the wire on the back of each pot. This will provide a place to run to ground since the pots are all grounded to the chassis.

○ **Follow the wiring diagram** and begin wiring the pots on the front of the chassis. Start from the left “INTENSITY” control and work your way across the chassis towards the input jacks.

○ **Prepare the four Green wires** and connect from the board to the ground buss wire that is installed on the back of the pots.

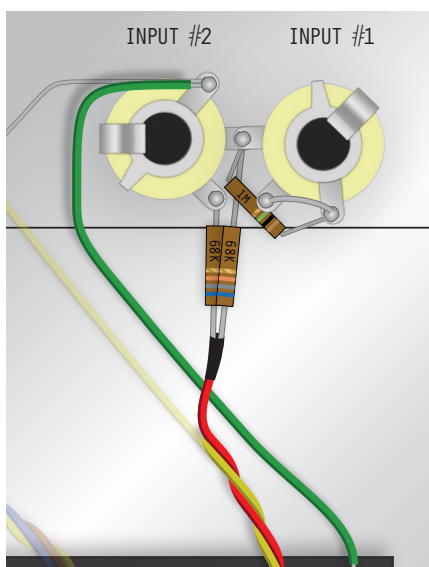


○ **Install a 1M resistor** on the INPUT #1 from the ground lug to the tip lug. Install a jumper wire or use the lead of the resistor to connect from the ground lug to the middle lug of the same jack. Connect the tip lug of INPUT #1 to the middle lug of INPUT #2 with a jumper wire or use the lead from the 1M resistor.

○ **Install one 68K resistor** on the tip lug of INPUT #2. Install one 68K resistor on the middle lug of INPUT #2. Be sure to install the resistor so that the body is close to the lugs.

○ **Twist the unused leads** of the two 68K resistors together.

○ **Make a hook** on the end of the **Red** wire and hook it where the 68k resistors are twisted together. Solder them together. Clip the extra leads left over from the 68K resistors. Make sure that this connection is not touching the chassis. You use a piece of heat shrink at this joint to keep it from grounding out on the chassis.



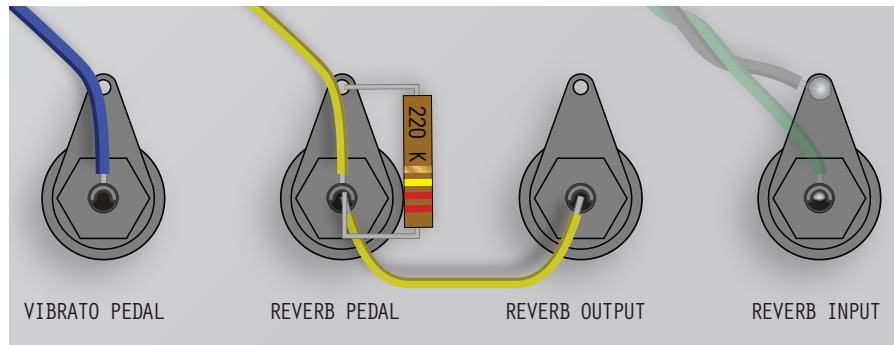
WIRING REVERB AND TREMOLO JACKS

○ Connect a 220K resistor to the center pin of the Reverb pedal jack on the back of the chassis, and solder the other end of the resistor to the ground lug of the same jack.

○ Connect and solder a small jumper wire from the center pin of the Reverb Output jack to the center pin of the Reverb Pedal jack.

○ Connect and solder a piece of wire from the center pin of the Reverb Pedal jack to pin 2 of the V3 (Reverb Recover / Mix preamp tube).

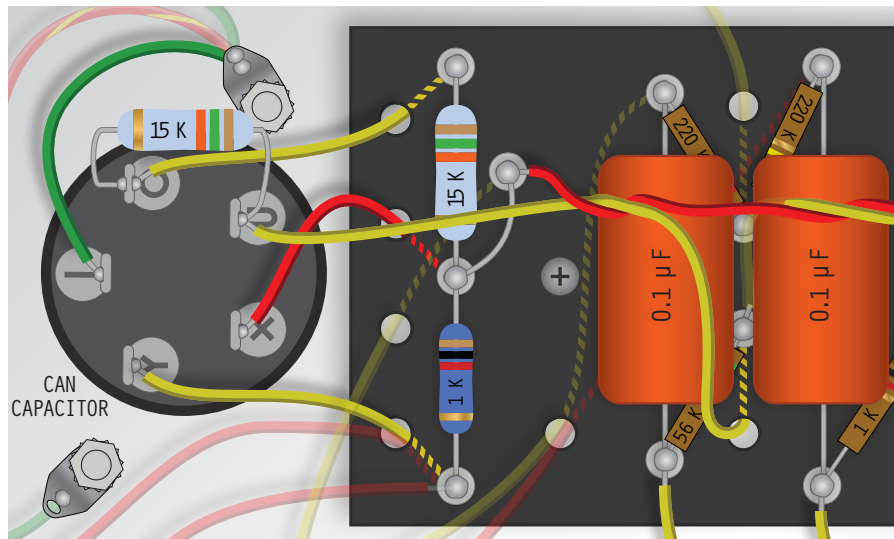
○ Connect and solder the blue wire from the eyelet board to center pin of the Vibrato Pedal jack.



WIRING CAN CAPACITOR

○ On the can capacitor, each terminal has a letter stamped in it indicating which value each terminal is for. "Y" is 40uf, "X", "U" & "O" are 20uf capacitors. The terminal with "I" is the ground terminal. Connect a small jumper wire from this terminal to one of the ground lugs. Follow the wiring diagram to the right connecting each terminal to the appropriate eyelet location.

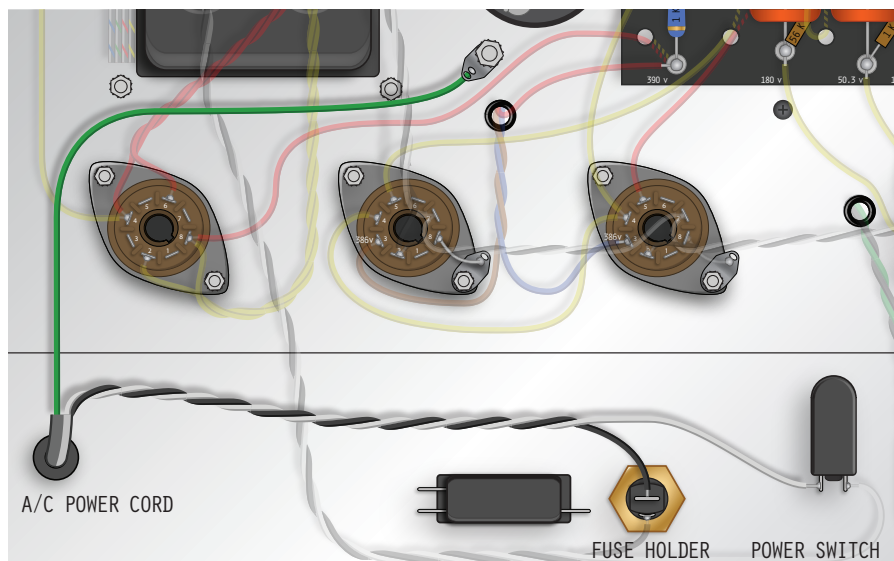
○ Connect the Red wire from the output transformer to the bottom left eyelet on the eyelet board where the yellow wire from the can capacitor and 1K 2W resistor are connected.



INSTALL POWER CORD

○ Strip off about 6" of the outer insulation on the end of the power cord without the plug. Insert the cord through the back of the chassis so that there is enough length for the white wire to reach the power switch.

○ Attach the black strain relief on the power cord outside of the chassis about 1" away from the chassis. Make sure the tapered end is facing towards the chassis. Take a pair of pliers and squeeze strain relief on the power cord, keeping it compressed, insert the strain relief into the chassis until it locks into place.



SECTION 11:

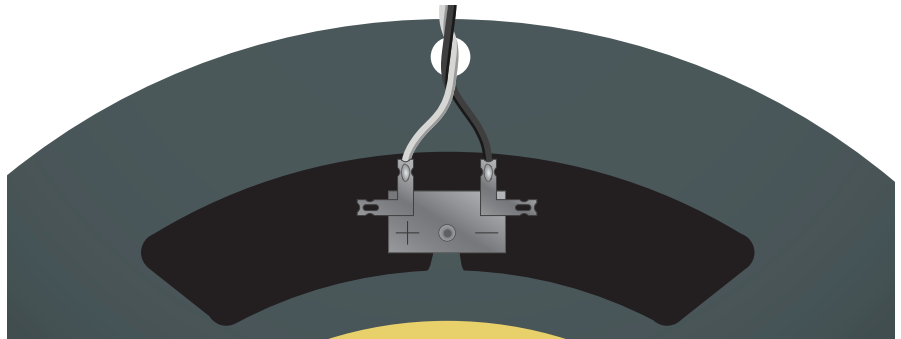
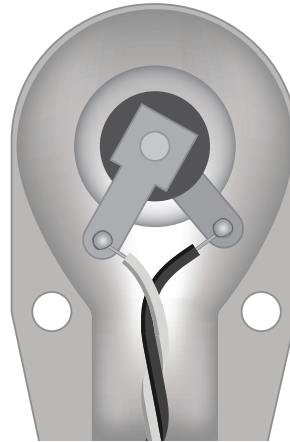
SPEAKER WIRING & INSTALLATION

SPEAKER WIRING:

- Twist the two 15" lengths of **Black** and **White** 18 gauge stranded wire together.
- Push the insulation back about 1/2" from both wires on one end and tin them.
- Unscrew the back of the 1/4" right angle plug.
- Solder the tinned wires to the plug, **White** to center and **Black** to shield. Then reinstall the back.
- Push back the insulation on the other end of the wires by 1/4" and tin them.
- On the other end of the wiring harness, push back the insulation on the wires by 1/2", twist and tin them.

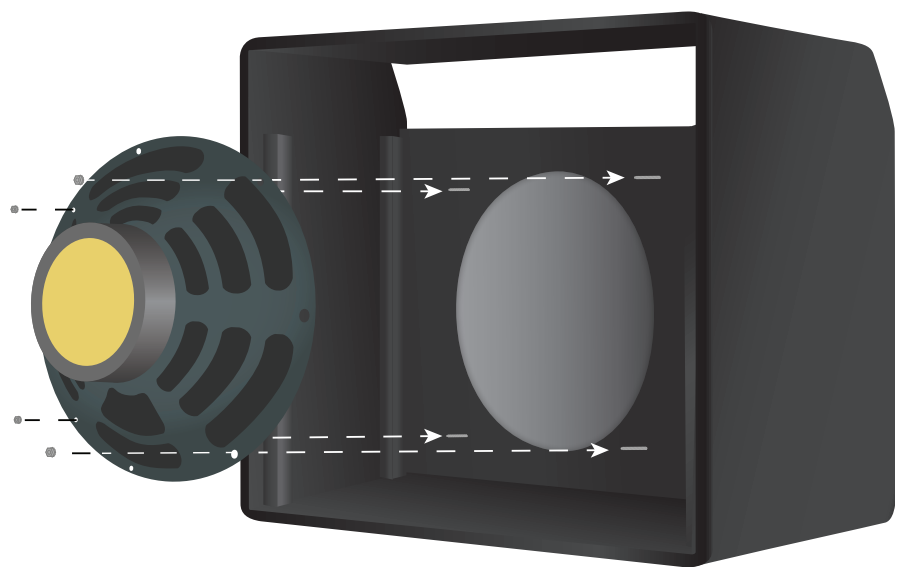
○ With a pair of needle nose pliers, take the tinned wire and make a small "hook" on both the **White** and **Black** wires.

○ Insert the **White** wire "hook" into the positive (+) terminal on the back of the speaker. Use the needle nose pliers to carefully crimp the "hook" on the terminal, forming a mechanical connection. Then solder the wire to the terminal. Repeat the same process with the **Black** wire on the negative (-) terminal.



SPEAKER INSTALLATION:

- Remove the upper and lower back panel of the cabinet.
- Remove the four Keps nuts from the speaker studs on the baffle.
- With the cabinet laying face down, line up the mounting holes on the speaker with the studs on the baffle and carefully instal the speaker onto all four studs at the same time.
- Finger tighten the mounting speaker screws starting with the top left screw, tighten with a screwdriver, then tighten the screw diagonally from it. Then tighten the remaining screws in the same way.



SECTION 12:

REVERB CABLE WIRING

○ **Reverb wiring** should consist to two piece of wire, one about 3' and the other about 5'.

○ **Un-braid the outer external braiding** on the reverb wire about 1.5" leaving the center wire and insulation in place.

○ **Strip 1/2" of the internal wire.** Twist the stranded wires together tightly.

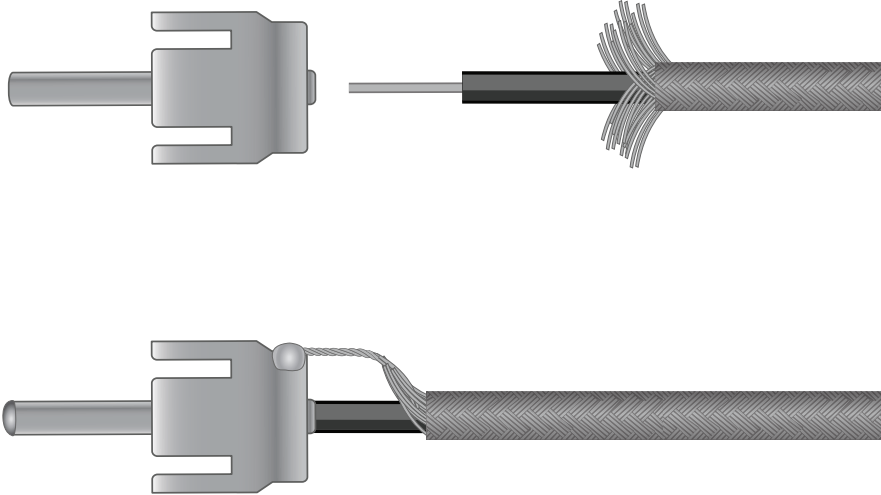
○ **Insert the internal wire** into the RCA plug from the bottom until it comes out the center about 1/4".

○ **Solder the tip of the RCA plug** and wire. Clip off excess wire.

○ **Push the external braiding** up against the shield of the RCA plug.

○ **Twist the un-braided portion together** and solder to the back of the RCA plug.

○ **Repeat** for the other end and other cable.



SECTION 13:

INITIAL CHASSIS TESTING

○ **Starting from the left side of the chassis,** ensure all solder joints and connections are good.

○ **Physically inspect** every tube socket closely, making sure there are not any extra wires touching other pins.

○ **Look and listen** for loose hardware by shaking chassis.

○ **Ensure** chassis is free from debris before plugging in. Check for pinched or burnt wire insulation.

○ **Adjust lead dress** so it is easy to see components.

○ **Power amp on** without the tubes installed.

○ **Using a multimeter** set to AC voltage, Check the power transformer secondary AC voltages (at tube socket for filaments). This will be pins 4+5 and pin 9 on the preamp tubes and pins 2 and 7 on the 6V6.

○ **Turn amp off** and install the GZ34 rectifier tube.

○ **Turn amp on** and allow it to warm up (approximately one minute). Watch for any kind of arcing or smoke from any component or transformer. If you see anything, shut down the amp immediately. Disconnect the amplifier from wall socket, check voltages on the filter capacitors (DC voltage), make sure they are drained, and then recheck your wiring.

○ **Set your multimeter** to its highest DC Voltage setting. Attach the ground / common probe to the metal chassis.

○ **With one hand,** take the positive (Red) probe and carefully measure the voltage on pin 8 on the rectifier tube socket. Then measure the voltages at four terminals on the can capacitor labeled O, U, X & Y. The voltages will be higher than the voltage readings on the wiring diagram due to the remaining tubes not being installed in the circuit. If you do not have voltages at these points, power down the amplifier, allow the capacitors to drain, DO NOT short them to ground as this can damage the capacitors or cause them to explode. Test with your multimeter to make sure the voltages are below 10V DC before working on the amp.

○ **Turn amp off.** Remember, if you have not drained the capacitors, there are still high voltages present.

○ **Install the preamp tubes.** Note the correct socket that the 12AX7s and 12AT7 tubes go into. Then power up the amplifier and ensure the filaments are working. Check the B+ voltages on pin 1 and pin 6 of the preamp tubes.

○ **Turn amp off.** Install the output tubes, make sure when installing the tubes that you line up the guide pin correctly. Plug the speaker into the speaker jack that is closest to the On / Off power switch.

○ **Turn the amp on** and check for proper filament operation on the power tubes.

○ **Check the voltages** at the test points on the wiring diagram. Check the voltage on pin 5 of each 6V6 tube. Ensure the voltage reading near ~40v. If the voltage is less than ~25 or if you are reading a positive voltage, power down the amplifier immediately and double check the wiring on the bias board as well as the orientation of the diode.

PRO TIP: Red plating occurs when too much current is applied to the plate (anode) of a vacuum tube. It will overheat and glow cherry red. Turn the power off immediately if this happens.

○ **Let the amp idle on** for half an hour or so for the chassis to be warm and do the bump test.

PRO TIP: A bump test is exactly what it means. Use a non conductive tool, such as a wooden handle of hammer or plastic handle of a screw driver, to hit the edge of the chassis or pick your amp up about an inch and drop it. Don't worry it won't harm your amp. This helps you test for bad solder joints and any loose hardware as well as lets you know if there is a physical problem with one of your tubes.

SECTION 14:

CHASSIS & REVERB INSTALLATION

CHASSIS INSTALLATION

○ **Make sure** that the 4 mounting holes in the chassis are clear of any stray wires so that they are not damaged or short against the mount screws.

○ **Install the chassis** into the cabinet from the rear. The faceplate should line up with the front edge of the speaker baffle.

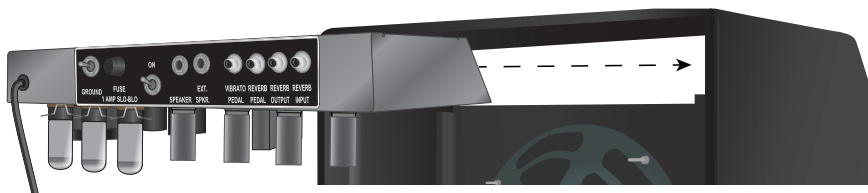
PRO TIP: Be mindful of tweed and tolex when installing. Use painter's tape if you need to at pinch points for the cab, as it can protect from tearing or lifting up the tweed covering.

○ **Install chassis straps** and screws through the top of the cabinet.

○ **Tighten the screws and keps nuts** using a screwdriver and adjustable wrench. As they are tightened, the chassis will pull up towards the top of the chassis.

○ **Install the white cord strain relief** to the side of the cabinet using #6 screw.

○ **Plug speaker into speaker jack** that is closest to the power tubes



REVERB TANK INSTALLATION

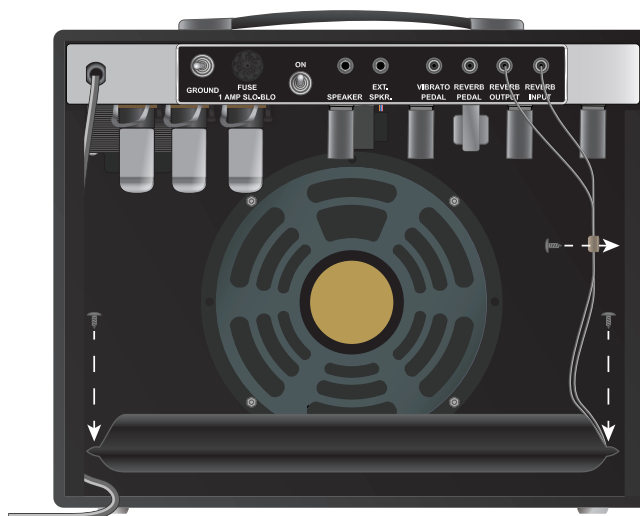
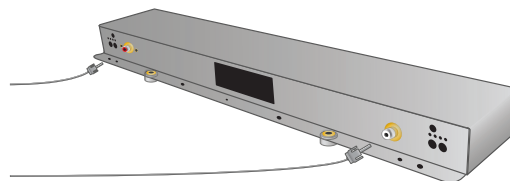
○ **Connect the shorter reverb cable** to the "OUT" connection on the reverb tank. Connect the longer to the IN connection on the reverb tank.

○ **Remove any foam blocks** from inside the reverb tank.

○ **Carefully slide the reverb tank** into the reverb bag oriented with the flap on the top.

○ **Place the reverb bag** into the bottom of the cabinet so that the wires are on the same side as the input jacks of the amp.

○ **Use (2) #6 Screws** to secure the reverb bag to the cabinet.



○ Use the **white cord strain relief** to the secure the reverb wires to the right side of the cabinet using #6 screw.

○ **Plug the longer reverb cable** into the Reverb Input on the back of the chassis.

○ **Plug the shorter reverb cable** into the Reverb Output on the back of the chassis.

○ **Install the upper and lower back panels.** Do not over-tighten the screws.



SECTION 15:

SOUND TEST

○ **Turn on the amp** and let it warm up.

○ **After warm-up**, ensure the tubes are not “red plating.”

○ **Rotate all controls fully** and listen for noise. It is normal to have some noise at high volume levels.

○ **Plug in an instrument cable** and listen for any crackle, pops, strange oscillations or feedback.

○ **Leave on for a while** so the tubes and components can “burn in” - (not literally)

○ **ROCK OUT!!!**

CONGRATULATIONS!! You have just built your very own Tweed Deluxe. There is only one on the planet that is like yours. We hope you have enjoyed this experience and gained knowledge to help you become more confident to build many more amps and spread your knowledge.

SECTION 16:

TROUBLESHOOTING

Depending on the issue you have, you will need to diagnose which part of the circuit is faulty. Try to work the problem analytically, you can make problems worse or create new ones by doing unnecessary repairs. 99% of the time it is simple, a bad solder joint, no solder on joint, capacitor in backwards, etc.. Here are a few resources we suggest.

RESOURCE WEBSITES

○ **www.ampwares.com**

The best resource with the most extensive info on most vintage amps.

○ **robbinette.com**

The non-electronic tech's guide to understanding the classic 5E3 tube amplifier and how it works.

○ **TDPRI.com**

Telecaster discussion page reissue - various builders are on this forum and a wealth of info for history and help.

RESOURCE LITERATURE

○ **Tube Guitar Amplifier Essentials and All About Vacuum Tube Guitar Amplifiers** by Gerald Weber

Truly must read books by Gerald Weber for any amp tech. You can purchase these at Mojotone.

○ **The Tube Amp Book**

By Aspen Pitman.

A great resource for schematics and basic tube info. Comes with DVD that has over 800 schematics of vintage tube amp technology.

○ **RCA Tube Receiving Manual**

This is one of the books that really started the guitar amp craze. In the back of the book, there are many drawings that will look familiar to you. Leo Fender used this very book to develop his first amps. These are out of print, but you can find them on Ebay and Amazon.

READY FOR YOUR NEXT BUILD?

TWEED CHAMP 5F1 STYLE COMBO



Mojotone's Tweed Champ Style Amp Kit is based on the beloved 5 watt amp from the 1950s. These amps were perfect for recording and were featured on a wide array of recordings from Joe Walsh's "Rocky Mountain Way" all the way to Derek & the Dominos' "Layla." Modeled after the historic Class-A 6V6 platform, this amp delivers warm tones that are harmonically rich and have a beautiful low volume crunch. **SKU # G1TCK910**

CLASS TYPE: SINGLE ENDED CLASS A ALL TUBE AMPLIFIER
OUTPUT: ~5W
CIRCUIT: 5F1

BIAS TYPE: CATHODE BIASED
BUILD TIME: 4 HOURS
DIFFICULTY: ● ○ ○ ○ ○

TWEED DELUXE 5E3 STYLE COMBO



Mojotone's Tweed Deluxe Style Amp is based on the popular 5E3 circuit from the 1950s and is by far our most popular amplifier. These amps were originally designed as medium power amps that would allow a musician to plug in more than one amplified instrument at a time. At higher volumes, this amp produces saturated tones that were adopted as signature tones for the likes of Billy Gibbons, Neil Young, Don Felder, and Larry Carlton. **SKU # G1FTD819**

CLASS TYPE: CLASS A/B ALL TUBE AMPLIFIER
OUTPUT: ~15 WATTS
CIRCUIT: 5E3

BIAS TYPE: CATHODE BIASED
BUILD TIME: 5 HOURS
DIFFICULTY: ● ● ○ ○ ○

MOJOTONE TWEED BASSMAN 5F6-A STYLE COMBO



Mojotone's Tweed Bassman Style Amp is based on the late 50s 5F6-A circuit which seems to be the most commonly used of the Bassman circuits. These 40 Watt amps are known for their bold and pristine clean sounds as well as their classic unmistakable dirt. The Bassman is extremely versatile and has been used by tons of iconic guitarists from Mike McCready, of Pearl Jam fame, all the way to Stevie Ray Vaughan himself. **SKU # G1TWK942**

CLASS TYPE: A/B ALL TUBE AMPLIFIER
OUTPUT: ~40 WATTS
CIRCUIT: 5F6-A

BIAS TYPE: FIXED
BUILD TIME: 6 HOURS
DIFFICULTY: ● ● ● ○ ○

BLACKFACE PRINCETON REVERB® STYLE COMBO



The Blackface Princeton Reverb has been a staple in guitar tone since its inception in 1964. The Princeton Reverb was essentially all the good parts of its predecessor, the Tweed Princeton, but with a long-spring reverb and tube-driven tremolo circuit added. Over the years the Princeton Reverb has worked its way into the gear repertoire of many renowned guitarists such as Ryan Adams, Larry Carlton, Glen Campbell, and Tommy Tedesco. **SKU # G1BPR108**

CLASS A/B ALL TUBE AMPLIFIER
OUTPUT: ~12-15 WATTS
CIRCUIT: AA1164

BIAS TYPE: FIXED
BUILD TIME: 5 HOURS
DIFFICULTY: ● ● ● ○ ○

BLACKFACE DELUXE REVERB® STYLE COMBO



One of our most popular amps, the Mojotone Deluxe Reverb Style Kit, is based on arguably the most widely used guitar amp of all time. Just about every iconic guitarist imaginable has played through a Deluxe Reverb at some point or another, but this amp has been specifically touted by artists such as Mike Campbell, Vince Gill, Jackson Brown, and even Elvis Costello. **SKU # G1BDR092**

CLASS TYPE: A/B ALL TUBE AMPLIFIER
OUTPUT: ~22 WATTS
CIRCUIT: AB763

BIAS TYPE: FIXED WITH AN ADJUSTABLE BIAS
POTENTIOMETER
BUILD TIME: 7 HOURS
DIFFICULTY: ● ● ● ● ○

BRITISH 18 WATT STYLE 1X12 COMBO

If you are looking for an amplifier that is compact, lightweight, but powerful, this is the jewel for you. It produces beautiful cleans and one of the best distortion tones ever produced. The 18 watt amplifier is the epitome of perfect vintage Marshall® tone. **SKU # G1BCK212**

CLASS TYPE: A/B ALL TUBE AMPLIFIER
OUTPUT: ~18 WATT
CIRCUIT: 1974

CATHODE BIASED
BUILD TIME: 6 HOURS
DIFFICULTY: ●●●○○



This kit produces similar tones to a 81-90 Marshall® JCM800 2204. **SKU # G1800969**

CLASS TYPE: A/B TUBE AMPLIFIER
OUTPUT: ~50 WATTS
CIRCUIT: 2204

FIXED BIAS WITH AN ADJUSTABLE BIAS POTENTIOMETER
BUILD TIME: 7 HOURS
DIFFICULTY: ●●●●○

BRITISH 800 STYLE AMP



This was the first amplifier Marshall® ever built, based off of the 5F6A circuit. Favored by blues and rock guitarists, this amp can produce a warm sustain and elegant clean tones, with a pronounced rectifier “sag.” Played by guitar greats such as Angus Young and Gary Moore. **SKU # G145C228**

CLASS TYPE: A/B ALL TUBE AMPLIFIER
OUTPUT: ~45 WATTS
CIRCUIT: M45

BIAS TYPE: FIXED BIAS W/ ADJUSTABLE POTENTIOMETER
BUILD TIME: 6 HOURS
DIFFICULTY: ●●●○○

BRITISH 45 STYLE 2X12 COMBO



BLACKFACE SUPER REVERB® STYLE COMBO

Few amps have rivaled the commanding image and sound of the Super Reverb. Since its introduction in 1963, the Super Reverb has remained highly sought-after due to its unique tonal qualities and extreme versatility. Having a use on stages of all sizes and in any studio situation, the Mojotone Super Reverb style amp has the potential to handle literally any task at hand. **SKU # G1BSR125**

CLASS TYPE: A/B TUBE AMPLIFIER
OUTPUT: ~40 WATTS
CIRCUIT: AB763

BIAS TYPE: FIXED BIAS W/ ADJUSTABLE BIAS POTENTIOMETER
BUILD TIME: 8 HOURS
DIFFICULTY: ●●●●●



BROWNFACE DELUXE STYLE COMBO

Our Brownface Deluxe Style kits are modeled after the brown era model 6G3 from the earlier 1960s. G for recording or small gigs. The amp can go from a tweed clean/dirty to a British style overdrive with turn of the volume knob. Includes bias modulated tremolo. **SKU # G1BFD067**

CLASS TYPE: AB ALL TUBE AMPLIFIER
OUTPUT: ~15 WATTS
CIRCUIT: 6G3

BIAS TYPE: FIXED BIAS
BUILD TIME: 5 HOURS
DIFFICULTY: ●●○○○



TWEED TWIN 5E8-A LOW POWER STYLE COMBO

Mojotone's Tweed Twin Low Power Style Amp Kit is a complete tonal powerhouse. Sporting 45 Watts of power, the amp has all the sweet, vocal qualities and rich dynamic response as the original. Known for being a plug-and-play amp, the 5E8-A circuit has been used most notably by Eric Clapton and has been said to “cut” more than its higher powered counterpart (Tweed Twin High Power). **SKU # G1TTL031**

CLASS TYPE: AB ALL TUBE AMPLIFIER
OUTPUT: ~45 WATTS
CIRCUIT: 5E8-A

BIAS TYPE: FIXED
BUILD TIME: 6 HOURS
DIFFICULTY: ●●●○○



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MULTIMETER** SKU# 4152015



**MOJOTONE PICKUP WINDING
MACHINE** SKU# 4152015



KESTER "44" ROSIN CORE SOLDER
SKU# 1000015A



**XCELITE 6-PIECE PRECISION
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GROOVETECH JACK/POT WRENCH
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