



**BUILD.  
MODIFY.  
REPAIR.**

— AMP KIT MANUAL —

**mojo<sup>®</sup>**  
**tone**

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# THE MOJOTONE BRITISH STYLE 18WATT TMB 1 X 12 COMBO AMP / AMP HEAD

**M**ojotone's 18watt TMB Amplifier Kit addresses a common mod made to a classic circuit, but with a few new flavors of our own. The 18watt TMB is based on the circuit used in vintage Marshall models 1958, 1973, and 1974 (more affectionately known as the '18-watters'.)

These original Marshalls were only produced between the years 1965 and 1967, but were highly sought-after for having massive sounding JTM-45-like tones in a smaller, more manageable package. Because they were produced in comparatively low quantities, these amps still remain a 'lost ark' today.

18-watters became popular studio amps for many players and were used, at times, by everyone from Gary Moore, to The Pretenders, to AC/DC. Over the years, some players have

reported having no use for the amp's original tremolo channel and have opted to replace the tremolo controls with a 3-band EQ, since the original amps were only equipped with a single tone control for each channel. In the Mojotone version, we have done just this. We have integrated the entire preamp section and the tone stack from our British 800 kit (based on the original Marshall JCM 800 circuit) for a lean and mean, hot-rodded gain sound. We have also integrated a master volume control so this monstrous sound can be harnessed and used in any size room.

Two EL84s give the amp's normal channel a warm and round character which, when the volume is pushed higher, begins to break up into a smooth grind perfect for blues rock and classic rock rhythm sounds. On the dirty channel, one can access screaming lead tones perfect for everything from dim dirty grunge all the way to saturated hair metal sustain!

With our TMB mod in place, this take on a classic beast now has a normal channel with high sensitivity and low sensitivity inputs as well as a single volume and single tone control; the second channel has a single input with volume, treble, middle, and bass controls. And don't forget about the master volume!



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## SECTION 1: SAFETY

**SAFETY FIRST!** ELECTRONICS CAN BE DANGEROUS AND MUST BE TREATED WITH RESPECT. ANY CIRCUIT THAT WORKS WITH 120 VAC POWER FROM AN ELECTRICAL OUTLET IS ESPECIALLY DANGEROUS AND COULD POTENTIALLY KILL YOU. HERE ARE SOME SAFETY 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: TOOLS

CERTAIN TOOLS ARE REQUIRED TO SUCCESSFULLY BUILD YOUR AMP. THE FOLLOWING TOOLS ARE RECOMMENDED TO COMPLETE YOUR PROJECT:

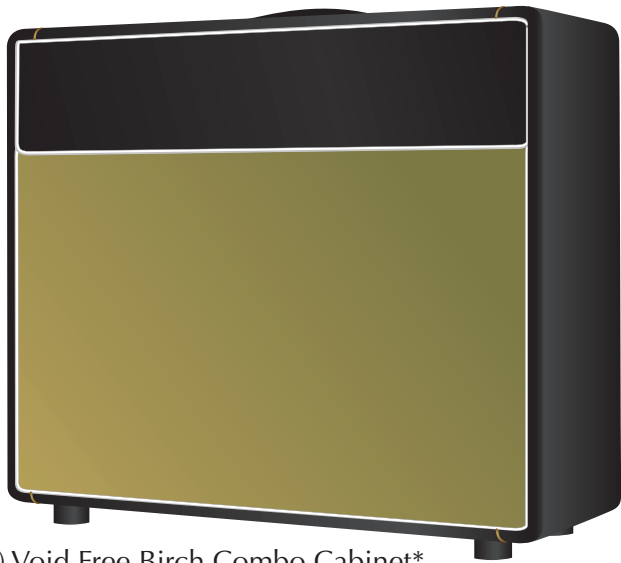
- 1/2" Nut Driver
- Set of needle nose pliers (*one with no grip and one with serrated edge*)
- Wire Cutters
- Wire Strippers
- Soldering Iron & Solder
- Adjustable Wrench
- Phillips Head Screwdriver
- Multimeter

**NEED A TOOL?** DO YOU SEE SOMETHING ON THIS LIST THAT YOU DON'T HAVE? TURN TO **PAGE 20** FOR A FULL LIST OF TOOLS, PARTS AND KITS TO ADD TO YOUR WORK BENCH.



# SECTION 3: PARTS INVENTORY

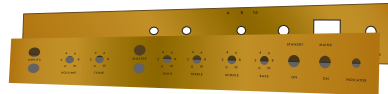
\*optional based on order



(1) Void Free Birch Combo Cabinet\*



(1) Void Free Birch Head Cabinet\*



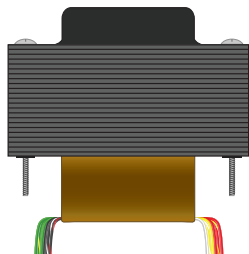
(1) Faceplates (front & back)\*



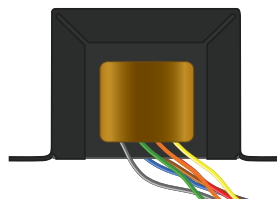
(1) Aluminum Chassis



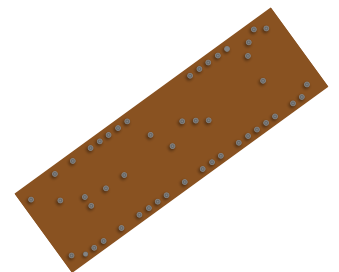
(1) Mojotone British Vintage 30w, 12", 8Ω Speaker\*



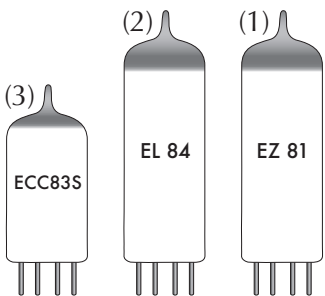
(1) British Style 18 Watt Power Transformer



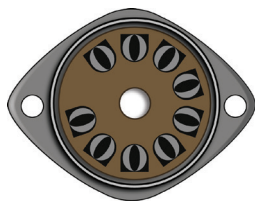
(1) British Style 18 Watt Output Transformer



(1) Turret Board



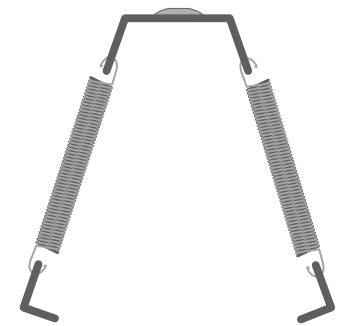
Vacuum Tubes\*



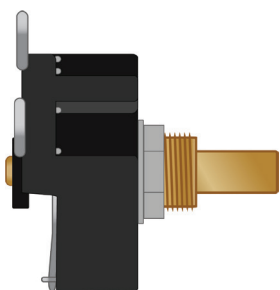
(6) 9 pin Tube Socket



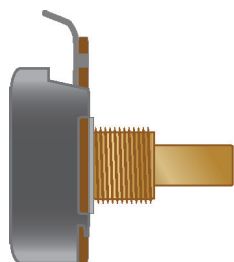
(3) Tube Shield for ECC836



(3) Spring Retainer for EL84 & EZ81



(3) Impedance Selector Switch w/ hardware



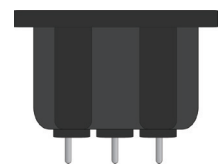
Potentiometers  
(1) 1MA (vol. / tone), (1) 250k (treb.)  
(1) 25kb (mid.), (4) 500ka (vol. / tone)



(1) Indicator Lamp w/ hardware

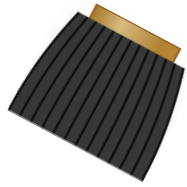


(1) 10' Removable Power Cord



(1) A/C Power Jack

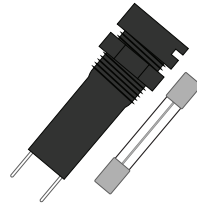




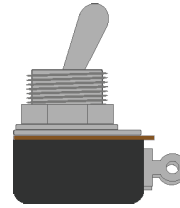
(8) Knobs



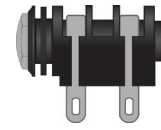
(1) 1/4" Mono Plug



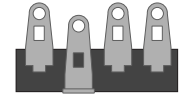
(1) Fuse Holder & Fuse w/ hardware



(2) Toggle Switch w/ hardware



Jacks w/ hardware  
(4) J1 4-Lug Jack  
(1) J2 2-Lug Jack



(2) Four-Lug Terminal



(2) Rubber Grommets



(2) Ground Tabs

### RESISTORS

#### Carbon Composite

	(2) 1/2W 1M
	(1) 1/2W 2.7k
	(2) 1/2W 5.1k
	(1) 1/2W 10K
	(1) 1/2W 47k
	(3) 1/2W 68k
	(7) 1/2W 100k
	(7) 1/2W 470k
	(3) 1/2W 820Ω
	(2) 1W 100Ω

#### Metal Oxide

	(2) 2W 10kΩ
	(2) 2W 2.7k

#### Wire Wound

	(1) 3W 130Ω
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### CAPACITORS

#### Silver Mica

	(1) 47pf @ 500V
	(2) 500pf @ 500V

#### Mojotone Dijon

	(1) 4.7nf @ 630V
	(4) 10nf @ 630V
	(5) 22nf @ 630V
	(1) 680nf @ 160V

	(2) Sprague Atom 25µf @ 50V
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	(1) Mojotone Electrolytic KingCap 16µf @ 475V
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	(2) Can Capacitor 32µf + 32µf @ 500v
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	(2) Can Capacitor Clamps
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### HARDWARE

- Standoffs for Turret Board
- (20) 4-40 1/4" Screw & Keps Nuts
- (2) 8-32 1/4" Screw & Keps Nuts
- (2) 6-32 1/2" Screw & Keps Nuts
- (4) 10-32 1 1/2" Screw & Keps Nuts

### WIRES

- 20 gauge Pre-Tinned PVC Coated Wire (4' of each color)
  - 
  - 
  - 
  - 
  - 
  -
- Copper Bus Wire (2')

## SECTION 4: COMPONENT IDENTITY & ORIENTATION

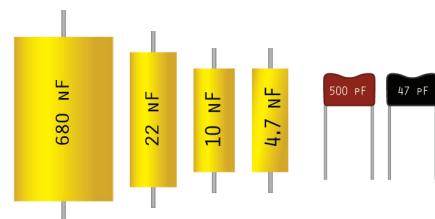
ENSURE ALL POLARIZED CAPS ARE IN THE CORRECT ORIENTATION WHEN INSTALLING ONTO THE BOARD. THIS IS TYPICALLY DENOTED BY AN ARROW POINTING TOWARDS THE NEGATIVE SIDE, OR A SMALL INDENTION ON THE POSITIVE SIDE.

**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



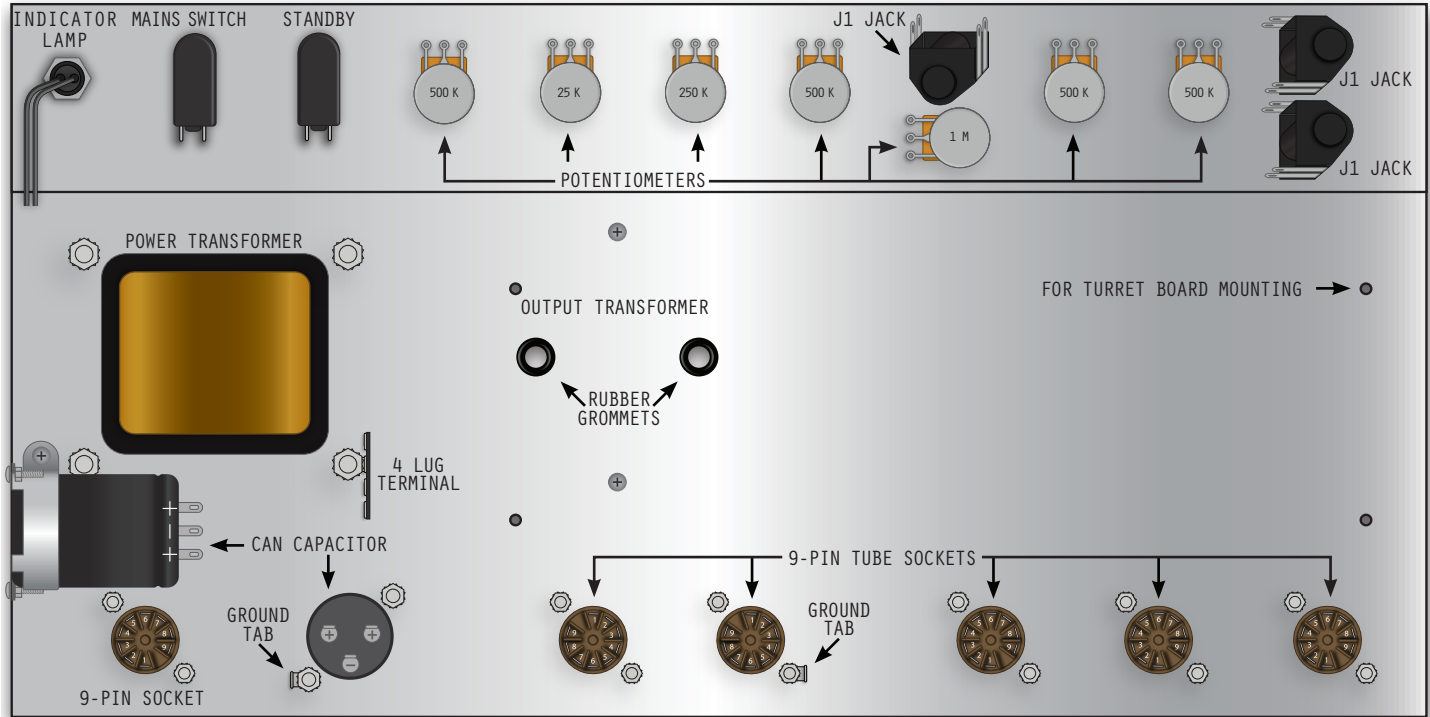
#### NON-POLARIZED



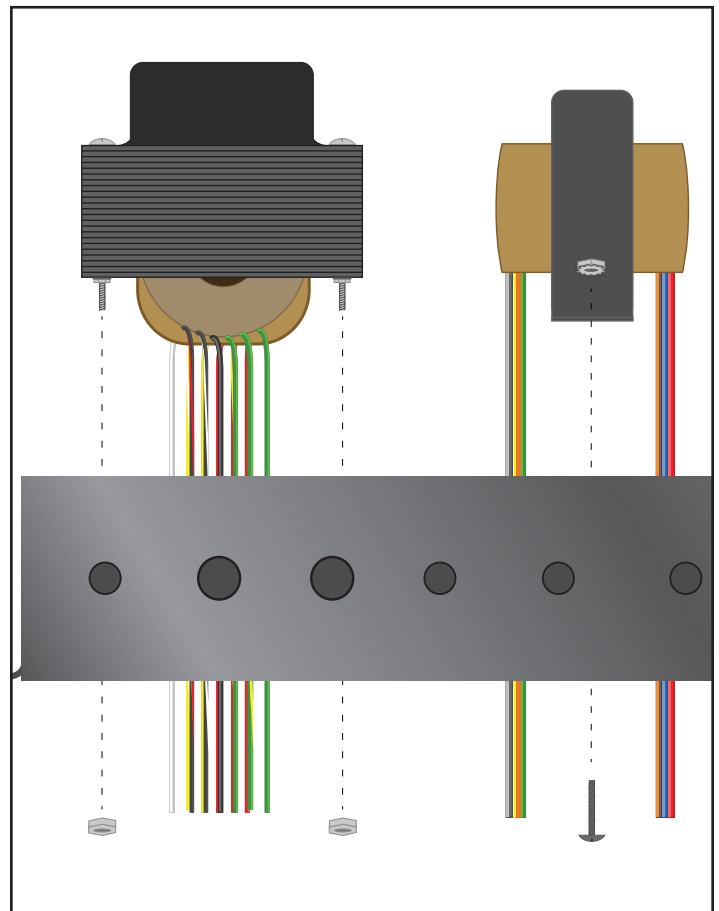
# SECTION 5: CHASSIS ASSEMBLY

**PLEASE NOTE:** ALL PARTS LISTED IN THE CHASSIS PREP SECTION STARTS AT ONE END OF THE CHASSIS AND COMPLETES ON THE OPPOSITE END, BOTH TOP AND BOTTOM.

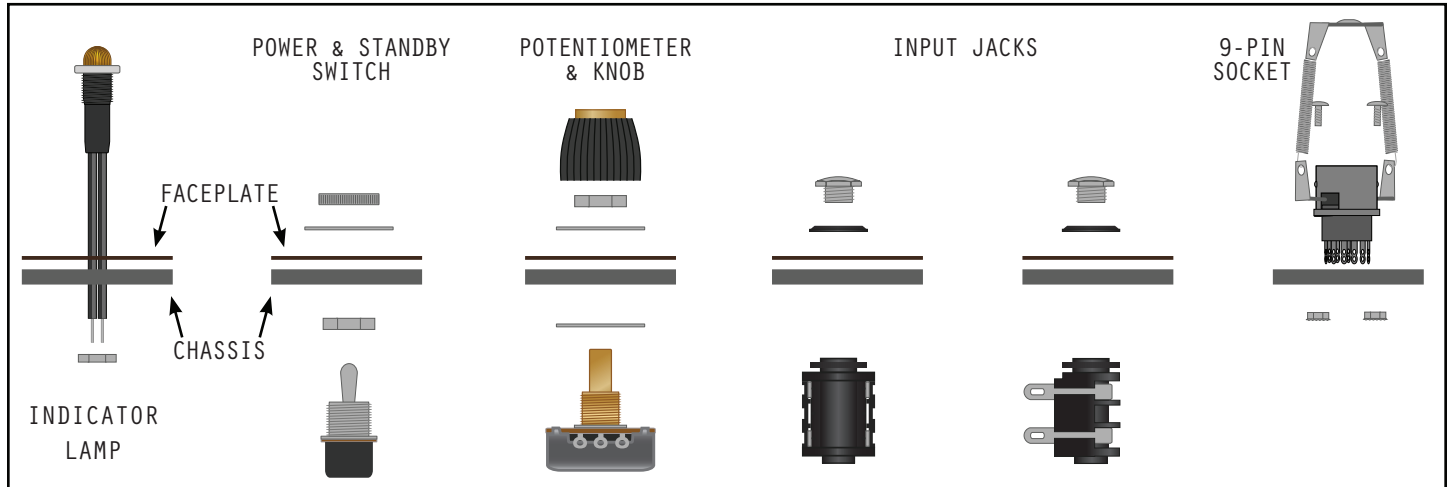
## FLATTENED VIEW OF INSIDE OF CHASSIS



- **Mount the power transformer** using its pre-assembled hardware and your adjustable wrench. The transformer will be recessed through the rectangular cutout in the “belly” of the chassis.
- **Install rubber grommets** in holes for output 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 furthest from the power transformer. The **Yellow, Black, Green and Orange** go through the grommet closest to the power transformer. The screws will go through the outside of the chassis, and the nuts will be installed in the inside. Use a screwdriver and adjustable wrench to tighten.



## CHASSIS CROSS-SECTION FOR COMPONENT ASSEMBLY

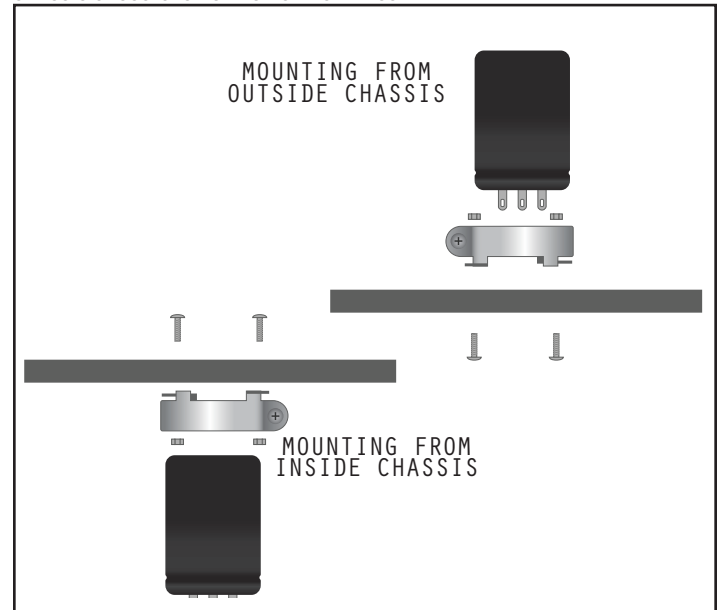


- **The faceplate will be secured** by the washers and nuts from the components being mounted through it. Ensure the faceplate is straight before tightening down the components and installing the knobs.
- **Mount indicator lamp** using its pre-assembled hardware. Unthread the hardware from the component and insert it through the chassis and corresponding faceplate cut out. Reapply hardware and tighten with adjustable wrench and pliers.
- **Mount your Main and Standby switches** using their pre-assembled hardware.
- **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 pointer of the knob is pointing to "0" 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.

## CHASSIS CROSS-SECTION FOR CAN CAP. ASSEMBLY



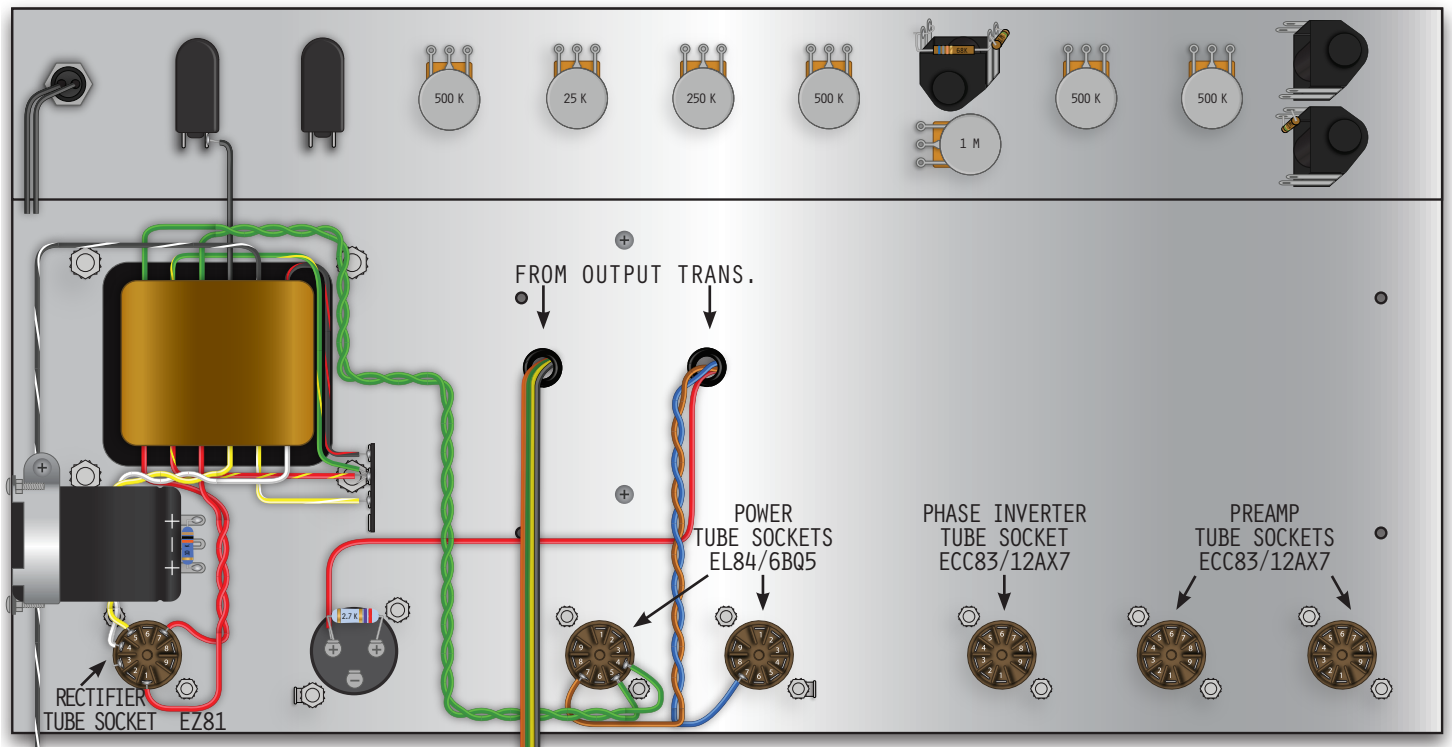
- **Mount J2 input jacks** using their pre-assembled hardware and an adjustable wrench. Pay close attention to the orientation of the jacks on the wiring diagram.

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

- **Mount 9-pin tube sockets** using (4) 4-40 1/4" (for the preamp tube sockets) and 4-40 x 3/8" (for the power tube sockets and spring retainers) screws and keps nuts and tighten down with adjustable wrench and screwdriver. Be sure to mount the retainer springs on the EL84 and EZ81 sockets and the ground tab.
- **Mount can capacitors** using (4) 6-32 1/2" screws and keps nuts and tighten down with adjustable wrench and screwdriver. Be sure to mount the ground tab.



# SECTION 6: TRANSFORMER WIRING



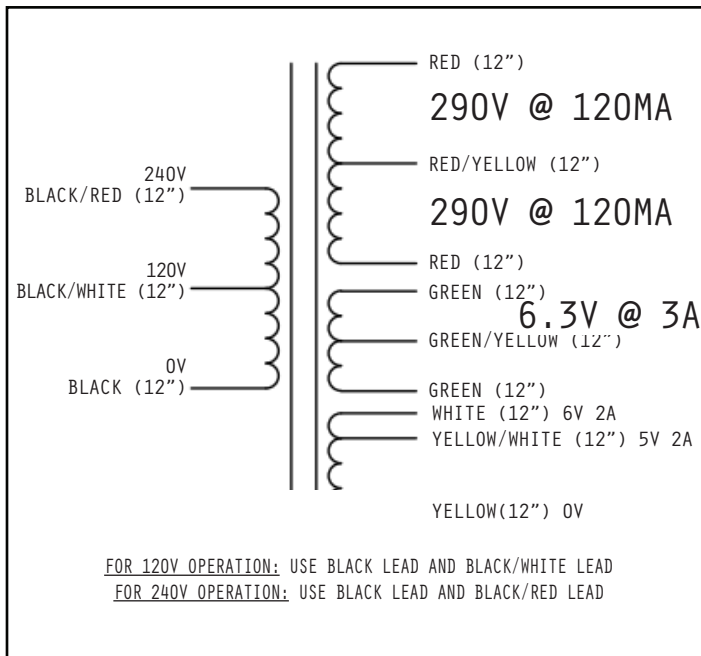
- **Twist all matching pairs of wires** coming out of the power transformer.
- **Measure length needed for each wire**, allow yourself extra lead and cut to length. This will eliminate excess wire and free up space in your chassis. Apply this principle to all leads.
- **Prepare the two Red** wires from the power transformer (HV secondary). Connect one wire to pin 1 and the other to pin 7 of the rectifier tube socket.  
*NOTE: These wires carry AC voltage, so either wire can go to either pin 1 or 7.*
- **Prepare the Yellow and White** wires from the power transformer (5v rectifier filament). Connect the **Yellow** to pin 5 and **White** to pin 4 of the rectifier tube socket.
- **PRO TIP:** On stranded wire, twist the stranded end tight before tinning. This will make it easier to put through the lug.
- **Prepare the two Green** wires from the power transformer (6.3v tube filament) and connect them to the 5 and 4 pins on the power tube
- socket closest to the power transformer.
- **Prepare the Black wire** and connect to the mains switch on the lug furthest from the power transformer.
- **Prepare the Green wire with the Yellow stripe.** Prepare the **Red** with the **Yellow** stripe and connect both wires to the grounded lug on the terminal strip.
- **Prepare the Black wire with the Red stripe** and connect it to an empty, non-grounded lug on the terminal strip.
- **Prepare the Yellow wire with the White stripe** and connect it to an empty, non-grounded lug on the terminal strip.
- **Run the Black wire with the White stripe** toward the back panel of the chassis where the power plug will be installed.

- On the output transformer the **Red, Blue** and **Brown** wires are the primary and the **Black, Yellow, Green** and **Orange** are the secondary.
- Twist the **Blue** and **Brown** wires together and run them between the two output sockets.
- Prepare and connect the **Brown** wire to the 7 pin of the output tube socket closest to the power transformer.
- Prepare and connect the **Blue** wire to the 7 pin of the

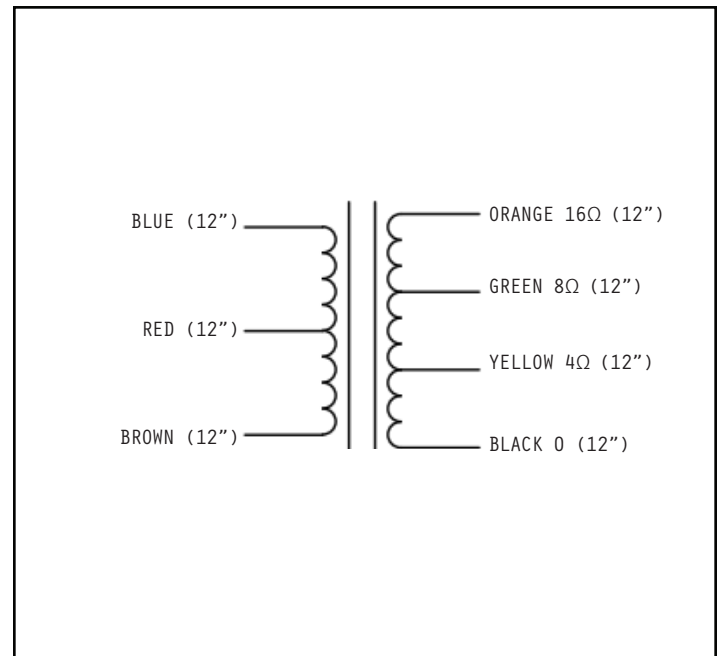
output tube socket furthest from the power transformer.

- Prepare and connect the **Red** wire to the left (+) terminal of the can capacitor that is installed between the rectifier socket (EZ81) and the power tube socket (EL84).
- Run the secondary wires toward the rear panel where the impedance selector will be installed.
- Double check wiring and begin soldering.

POWER TRANSFORMER SCHEMATIC



OUTPUT TRANSFORMER SCHEMATIC



## PRO TIP: SOLDERING BASICS

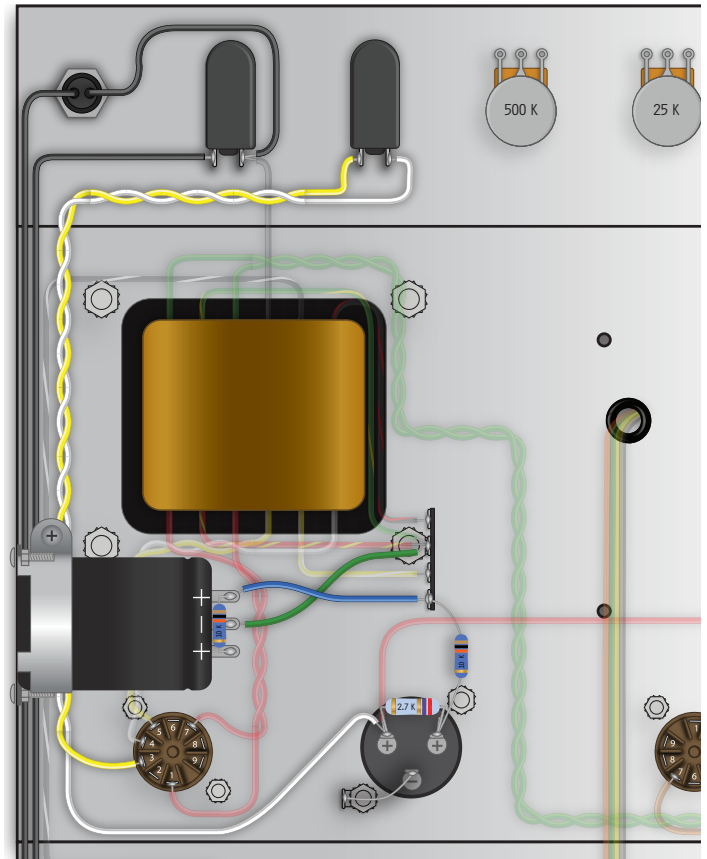
SOLDERING IS AN ESSENTIAL SKILL FOR EVERY LEVEL OF AMP BUILDER. HERE ARE A FEW TIPS FROM THE AMP PROS AT MOJOTONE.

**SAFETY FIRST!** THE SOLDERING IRON TIP REACHES A TEMPERATURE OF 400° C SO NEVER DIRECTLY TOUCH IT OR ANY COMPONENT THAT YOU ARE SOLDERING WHEN IT IS HEATED. ALWAYS WORK IN A WELL VENTILATED AREA.

- Prepare the joint to be soldered. Strip PVC coating 1/2" from end of wire, hook your leads into lugs or turrets, twist leads together, etc.
- Tin (apply solder to) the tip of the soldering iron. This will keep it from oxidizing and prolong the life of your soldering tip. Wipe excess on sponge.
- Clean the tip often while soldering. This will help the iron heat more consistently and evenly.
- Be sure to use clamps or tweezers if needed to hold the components to be soldered in place.
- Touch the iron directly on the joint to be soldered for about two seconds to get it hot enough to melt the solder.
- Touch the solder to the joint. As it melts let it flow onto the joint to create a solid bond.
- Lift the solder off first and then remove the iron from the component.
- Another method is to tin the stripped wire and then touch it directly to the heated component. Some wires will be pre-tinned. They will have a shiny silver layer twisted around the wire.

## SECTION 7: COMPONENT WIRING

- **Connect** The **10k metal oxide resistor** between the Positive (+) terminals on the *can capacitor* mounted from the inside, and the **2.7k metal oxide resistor** between the positive (+) terminals on the *can capacitor* mounted from the outside.
- **Prepare the White and Yellow wire** and twist together for the *standby switch*. Connect the **Yellow** wire from the LEFT terminal of the switch to the 3 pin on the rectifier tube socket. **White** from the right terminal to the LEFT (+) terminal on the can capacitor mounted from the outside of the chassis.
- **Prepare the Black wire** for the *mains switch*. Connect to the left terminal of the switch and run it to where the fuse holder will be installed.
- **Connect one wire from the indicator lamp** to the RIGHT terminal on the mains switch. Run the other wire to where the power plug will be installed.
- **Prepare the Blue and Green wire** for the *can capacitor* mounted from the inside of the chassis. Connect the **Blue** wire from the RIGHT positive (+) terminal to an open, non-grounded, lug on the terminal strip. Connect the **Green** wire from the Bottom negative (-) terminal to the grounded lug on the terminal strip.



- **Prepare bare wire** and connect from the BOTTOM negative (-) terminal on the *can capacitor* mounted from the outside of the chassis to the closest ground lug. Connect a **10k metal oxide resistor** from the RIGHT positive (+) terminal to the same lug the **Blue** wire is connected to on the terminal strip.
- **Double check wiring** and solder.

## SECTION 8: BOARD ASSEMBLY & INSTALLATION

**SAFETY FIRST!** BE SURE TO TAKE NOTE OF POLARIZED CAPACITOR ORIENTATION FOR THE 16 UF CAP, AND (2) 25UF CAPS.

- **Begin by applying traces** (or “**jumper wires**”) to the board.  
**PRO TIP:** Utilize the different sections on the post of the turret when attaching your wires and components. This makes for easier soldering and repair.
- **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 compo-

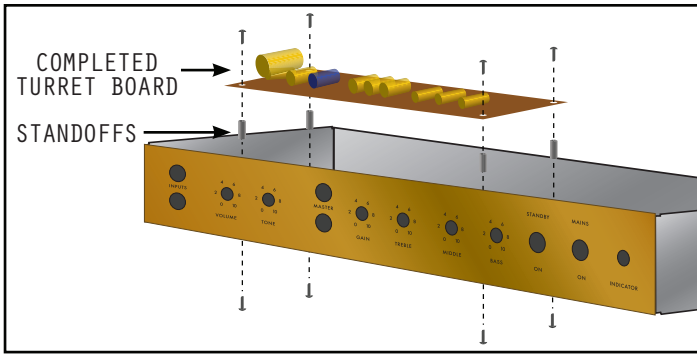
nents in the circuit. Insert these leads down through the front of the board and bend around back to secure.

**PRO TIP:** Use the included Wiring Diagram to approximate lead lengths.

- **Starting at one end of the front side** of the board, identify the necessary components for each turret connection and begin placing the leads into the hole on top of the turret.







- **Locate the four small pre-drilled holes** in the chassis for mounting the *turret board*. Install a *turret board standoff* on each hole using the 1/4" 4-40 screws.
- **Line the mounting holes on the turret board** with the turret board standoffs and secure using the 1/4" 4-40 screws.

## SECTION 9: WIRING THE SOCKETS, JACKS & POTS

### TUBE SOCKET FILAMENT WIRING:

**PRO TIP:** This is a high gain preamp and is more sensitive to filament hum from wiring lead dress. Take care that signal wires are routed away from the filament wirings and previous gain stages.

- **Twist tightly together** a length of about 3' of **Red** and **Black** wire to start wiring the tube filaments. Starting with the power tube that is closest to the rectifier tube, prepare and connect the twisted wire between the tube sockets.

**PRO TIP:** Make sure the power tube filaments are "in phase". This means that the filament wires (**Red** and **Black** twisted wire running between the power tubes sockets) must connect to the corresponding pins between the sockets. Pin 4 to pin 4, Pin 5 to pin 5. *Preamp tubes do not have to be in phase.*

- **When wiring the preamp tubes**, Be sure to keep the **Red** wires close together and centered when running them across the tube socket to pin 5. Also note that there is a jumper between pins 4 & 5.

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

### TUBE SOCKET WIRING:

- **Follow the wiring diagram** and begin wiring the tubes sockets starting from the power tubes and work your way across the chassis towards the preamp tubes.
- **Prepare two Green wires** and connect one to pin 7 of the far right preamp tube and run toward the

"INPUTS" jacks. Connect the other from pin 2 and run toward the "MASTER" jack.

### POTENTIOMETER WIRING:

- **Prepare the bus wire** that will mount across the back of all the pots. Start from the "BASS" 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.

- **Prepare the two Black wires** and connect from the board to the ground buss wire that is installed on the back of the pots.

- **Follow the wiring diagram** and begin wiring the pots on the front of the chassis. Start from the left "BASS" control and work your way across the chassis towards the input jacks.

### INPUT JACK WIRING:

- **Prepare the Green signal wire** from pin 2 of the preamp tube and connect it to the rear left lug on the "MASTER" input jack.

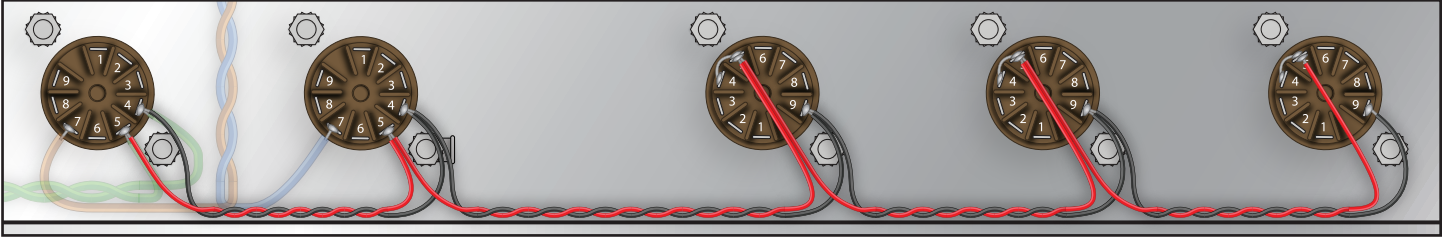
- **Prepare the three jumper wires** and connect to the "INPUTS" input jacks as shown.

- **Prepare the two Black ground wires** and connect to the "INPUTS" input jacks as shown.

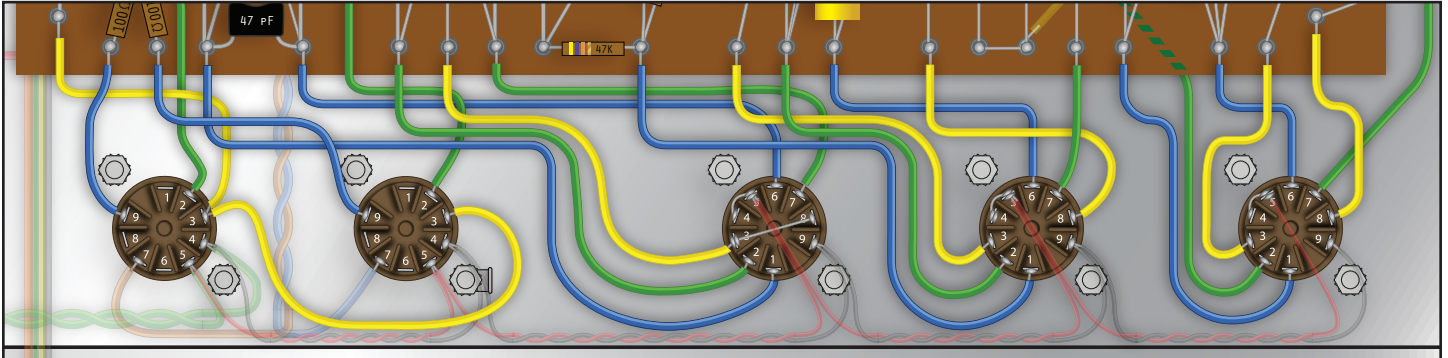
- **Prepare the two 68K resistors** and connect to the "INPUTS" input jacks as shown. Then twist the other ends together.

- **Prepare the Green signal wire** from pin 7 of the preamp tube and connect at the junction of the two 68K resistors. Trim the excess wire from the 68K resistors.

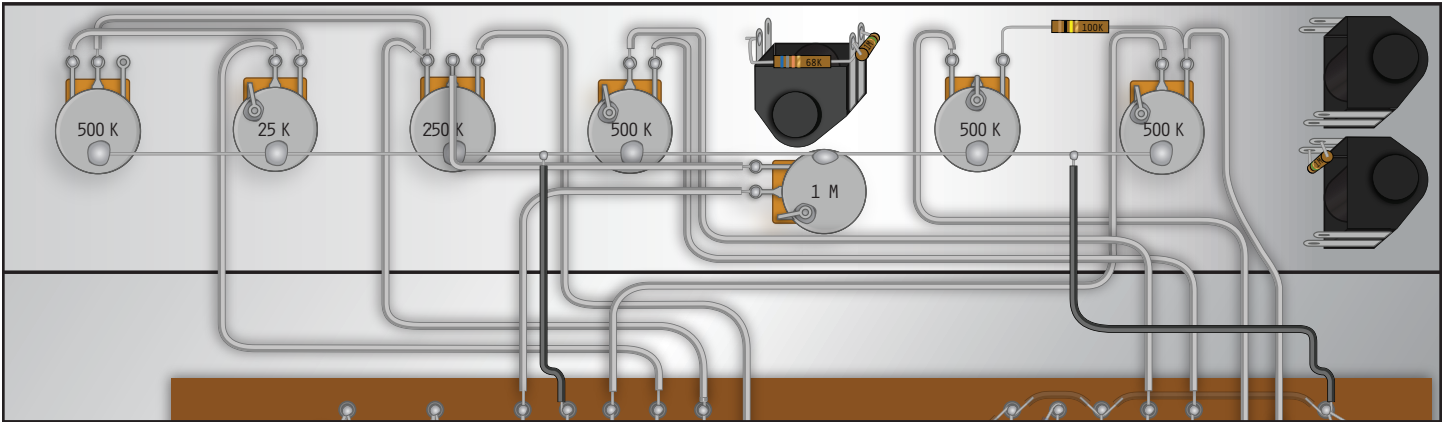
### TUBE SOCKET FILAMENT WIRING



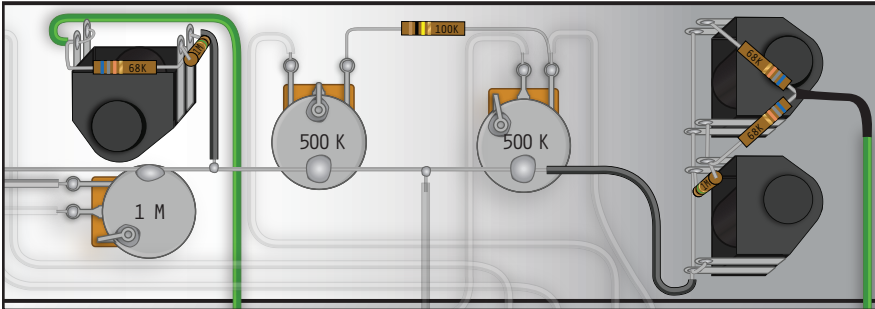
### TUBE SOCKET WIRING



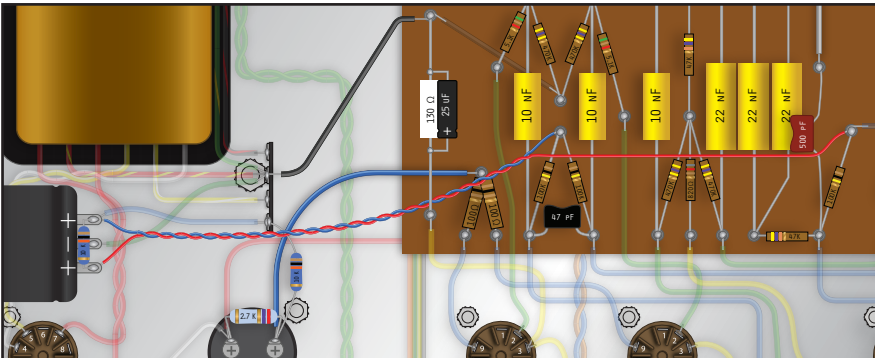
### POTENTIOMETER WIRING



### INPUT JACK WIRING



### CAN CAPACITOR WIRING

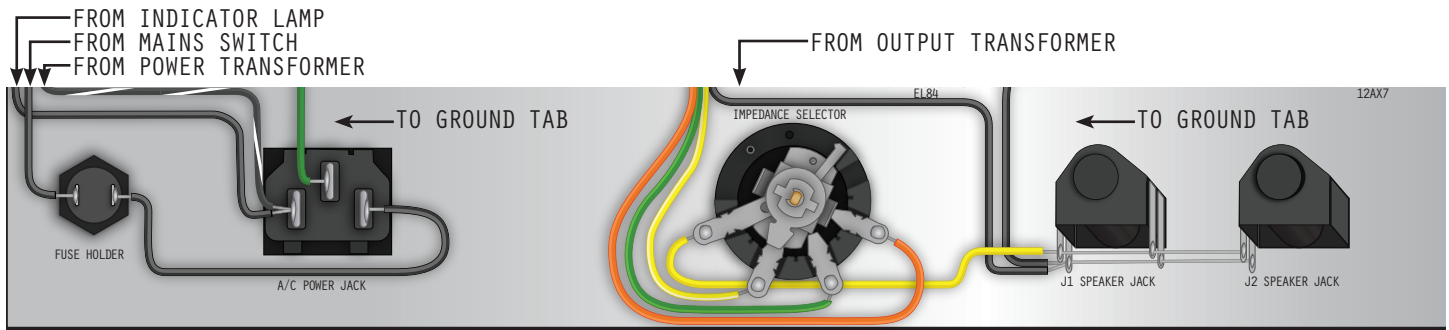


### CAN CAPACITOR WIRING:

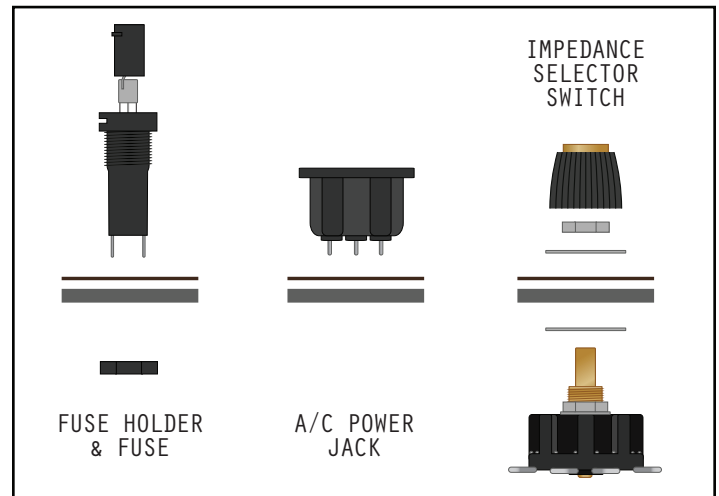
- Prepare the **Blue** wire and connect from the can cap mounted between the rectifier tube and power tube, to the turret where the two 100 Ohm 1 watt resistors meet.
- Prepare the **Black** wire and connect from the grounded lug terminal, mounted by the power transformer, to the turret closest to the front of the chassis where the 130 Ω resistor / 25uf capacitor are mounted.
- Prepare the **Blue** and **Red** wires and connect from the can capacitor mounted on the left side of the chassis to the two points on the board as shown.



# SECTION 10: REAR PANEL COMPONENT INSTALLATION AND WIRING



- **Install rear faceplate**, fuse holder, impedance selector and speaker jacks on the back of the chassis using included hardware. Make sure the impedance selector is snug so that it does not rotate when you are switching between different output impedances.
- **Snap in A/C Power Jack** into chassis with the center pin oriented closest to the inside of the chassis.
- **Follow the wiring diagram** and begin with wiring the fuse holder and working to the right towards the speaker jacks.
- **Install the knob on the impedance selector**, Note which color wire that the selector tab is pointing to, and align the knob to that number on the back panel, tighten the set screw. (**Yellow** 4 Ω, **Green** 8 Ω, **Orange** 16 Ω).



- **Use a small flat head screw driver** to remove the fuse holder cap. Install the fuse into the cap and reinstall into the fuse holder, push in and twist to the right about a quarter turn.

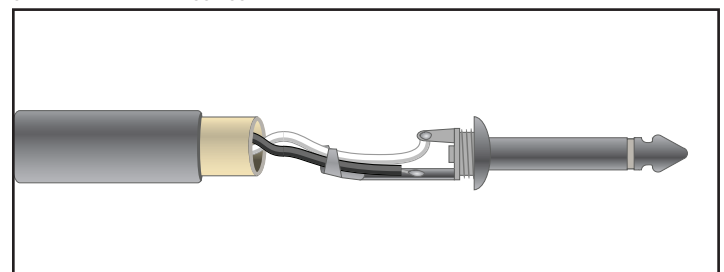
# SECTION 11: SPEAKER WIRING & INSTALLATION (FOR COMBO AMP ONLY)

## SPEAKER WIRE HARNESS ASSEMBLY:

- **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 cover** off of the 1/4" plug. Solder the white wire to the tip terminal. Solder the black wire to the sleeve as shown in the illustration.
- **Bend the two retaining tabs over** to hold the wires to the jack.

- **Install the clear plastic shielding** over the wiring, then install the cover on the jack.
- **On the other end of the wiring harness**, push back the insulation on the wires by 1/2", twist and tin them.

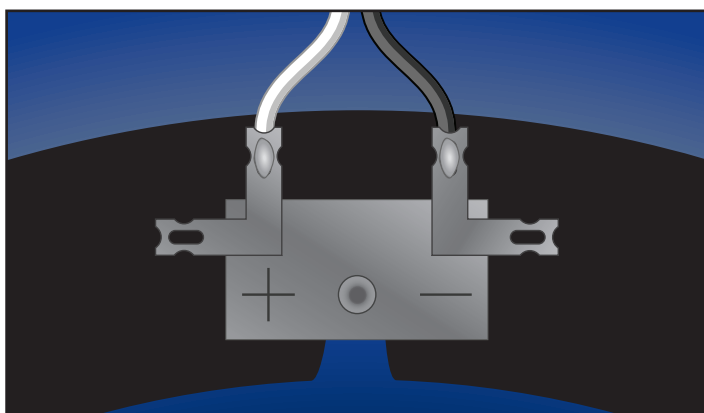
## SPEAKER WIRE HARNESS ASSEMBLY



- **With a pair of needle nose pliers**, take the tinned wire and make a small “hook” on both the white & 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.
- **Remove the four mounting screws** from the speaker baffle.
- **With the cabinet laying face down**, place the speaker on the baffle, line up the speaker mounting holes with the holes on the baffle.
- **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.

#### SPEAKER INSTALLATION:

- **Remove the upper and lower back panel** of the cabinet.
- **Mounting holes for the chassis** have already been drilled on the upper back panel.



- **Reinstall the lower back panel.**



## SECTION 12: 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 on amp** 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 and 5 and pin 9 on the preamp tubes and pins 4 and 5 on the EL84's.
- **Turn off the amp** and install the EZ81/6CA4 rectifier tube.
- **Turn on amp, do NOT turn on the Standby switch yet**, 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.
- **Check the B+ voltages** on pin 3 on the rectifier socket.
- **Turn the Standby Switch to ON.** 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.

**SAFETY FIRST! THERE ARE NOW HIGH VOLTAGES PRESENT IN THE AMPLIFIER.**

- **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 voltages on the (+) terminals on the can capacitors. Then measure the voltage at the 16uf capacitor on the board. 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 the amp to Standby** and then turn off the amp. **REMEMBER**, if you have not drained the capacitors, there are still high voltages present.
- **Install the preamp tubes**, then power up the amplifier and ensure the filaments are working. Then turn

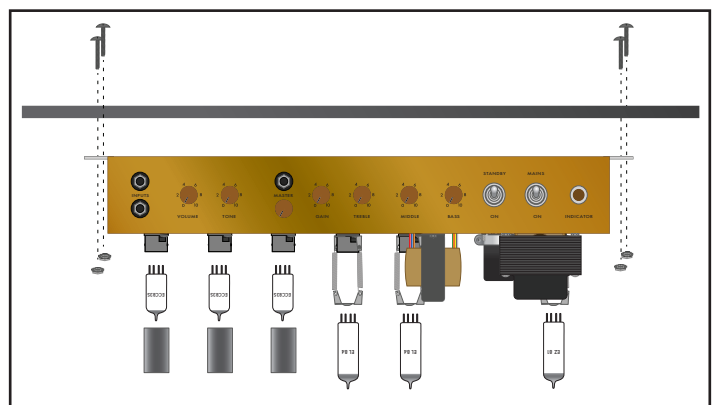
the Standby switch to ON. Check the B+ voltages on pin 1 and pin 6 of the preamp tubes.

- **Turn the amp back to Standby** and then turn off the amp. Install the output tubes. Plug in the speaker.
- **Turn the amp on** and check for proper filament operation.
- **Turn the Standby switch to ON**. Check the voltages at the test points on the wiring diagram. Check the voltage on pin 2 of each EL84 tube. Ensure the voltage reading is near 0V +/- 50mV to avoid "red-plating" of the tubes.
  - 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.
- **Turn the amp back to Standby** and then turn the amp off.

## SECTION 13: CHASSIS INSTALLATION & FINAL ASSEMBLY

### COMBO CABINET

- **Turn the chassis over** so that the open end is facing up. If you still have the tubes installed be **VERY** careful not to break the tubes. Take the top back panel and line up the pre-drilled mounting holes with the hole on the wings of the chassis.
- **Secure the back panel to the chassis** using the four 1-1/2" 10-32 screw and keps nuts.
- **Secure the EL84 power tubes and EZ81 rectifier** with the spring retainers.
- **Install the preamp tube shields**. Align the pins on the tube base with the grooves in the tube shield. Press them on to the tubes and turn a quarter turn to the right.
- **Install the back panel**, with the controls facing up, into

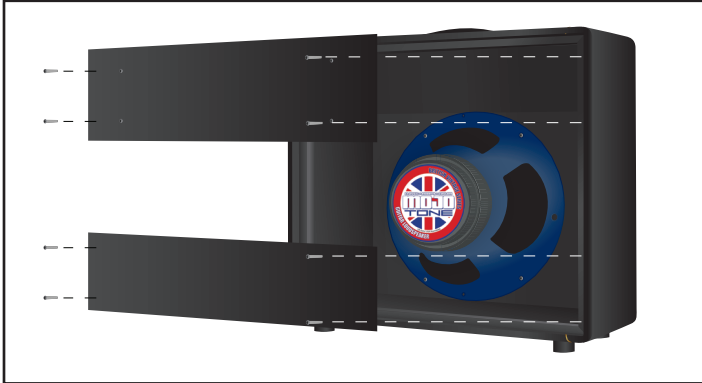


the back of the combo cabinet using the four machine screws that originally held the back panel in place.

- **Set the Impedance selector** on the back of the chassis to match the impedance of the speaker installed in the cabinet.



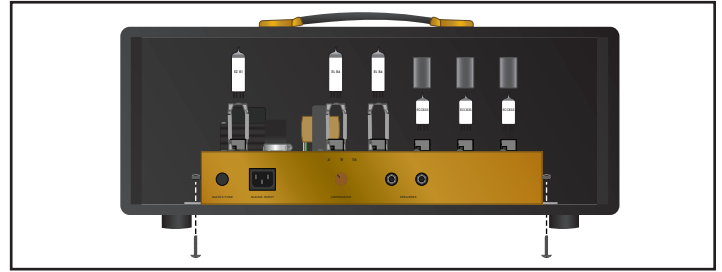
- Plug the speaker into the speaker jack closest to the impedance selector.
- Plug in the power cord into the A/C jack on the back of the chassis.



#### HEAD CABINET

- Using a screwdriver, remove the four screws holding the back panel on the cabinet.

- Carefully slide the chassis into the cabinet until the front faceplate is flush against the front panel of the cabinet.
- Carefully turn the cabinet so that it is facing down.
- Locate the mounting holes on the bottom of the cabinet. Install the four 1-1/2" 10-32 screws into the bottom of the cabinet, through the mounting holes in the chassis. Secure the screws with the 10-32 keps nuts.
- Re-install the rear panel on the cabinet. Plug in power cord into A/C outlet.



## SECTION 14: 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 MOJOTONE 18WATT TMB. 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.

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## SECTION 15: 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.

#### RESOURCE WEBSITES

**[www.ampwares.com](http://www.ampwares.com)** *The best resource with the most extensive info on most vintage amps.*

#### 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.*

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# 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  
**BIAS TYPE:** CATHODE BIASED  
**OUTPUT:** ~5W  
**BUILD TIME:** 4 HOURS  
**CIRCUIT:** 5F1  
**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  
**BIAS TYPE:** CATHODE BIASED  
**OUTPUT:** ~15 WATTS  
**BUILD TIME:** 5 HOURS  
**CIRCUIT:** 5E3  
**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  
**BIAS TYPE:** FIXED  
**OUTPUT:** ~40 WATTS  
**BUILD TIME:** 6 HOURS  
**CIRCUIT:** 5F6-A  
**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**  
**BIAS TYPE:** FIXED  
**OUTPUT:** ~12-15 WATTS  
**BUILD TIME:** 5 HOURS  
**CIRCUIT:** AA1164  
**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  
**BIAS TYPE:** FIXED WITH AN ADJUSTABLE BIAS POTENTIOMETER  
**OUTPUT:** ~22 WATTS  
**BUILD TIME:** 7 HOURS  
**CIRCUIT:** AB763  
**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: ●●●○○**



## BRITISH 800 STYLE AMP

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 45 STYLE 2X12 COMBO

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: ●●●○○**



## 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. Great for recording or small gigs. The amp can go from a tweed clean/dirty to a British style overdrive with the 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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**KESTER "44" ROSIN CORE SOLDER**  
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**XCELITE 6-PIECE PRECISION SCREWDRIVER SET** SKU# N4TOL125



**GROOVETECH JACK/POT WRENCH**  
SKU# Q2GTJPT1757



**RENE MARTINEZ 24-PIECE MICRO-TIP SCREWDRIVER SET**  
SKU# Q2GTJPT1757



**WELLER ANTI-STATIC DE-SOLDER PUMP** SKU# N4TOL085



**XCELITE ELECTRICAL CUTTING AND STRIPPING PLIERS** SKU# N4TOL113



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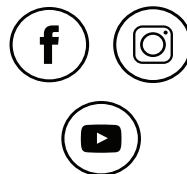
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