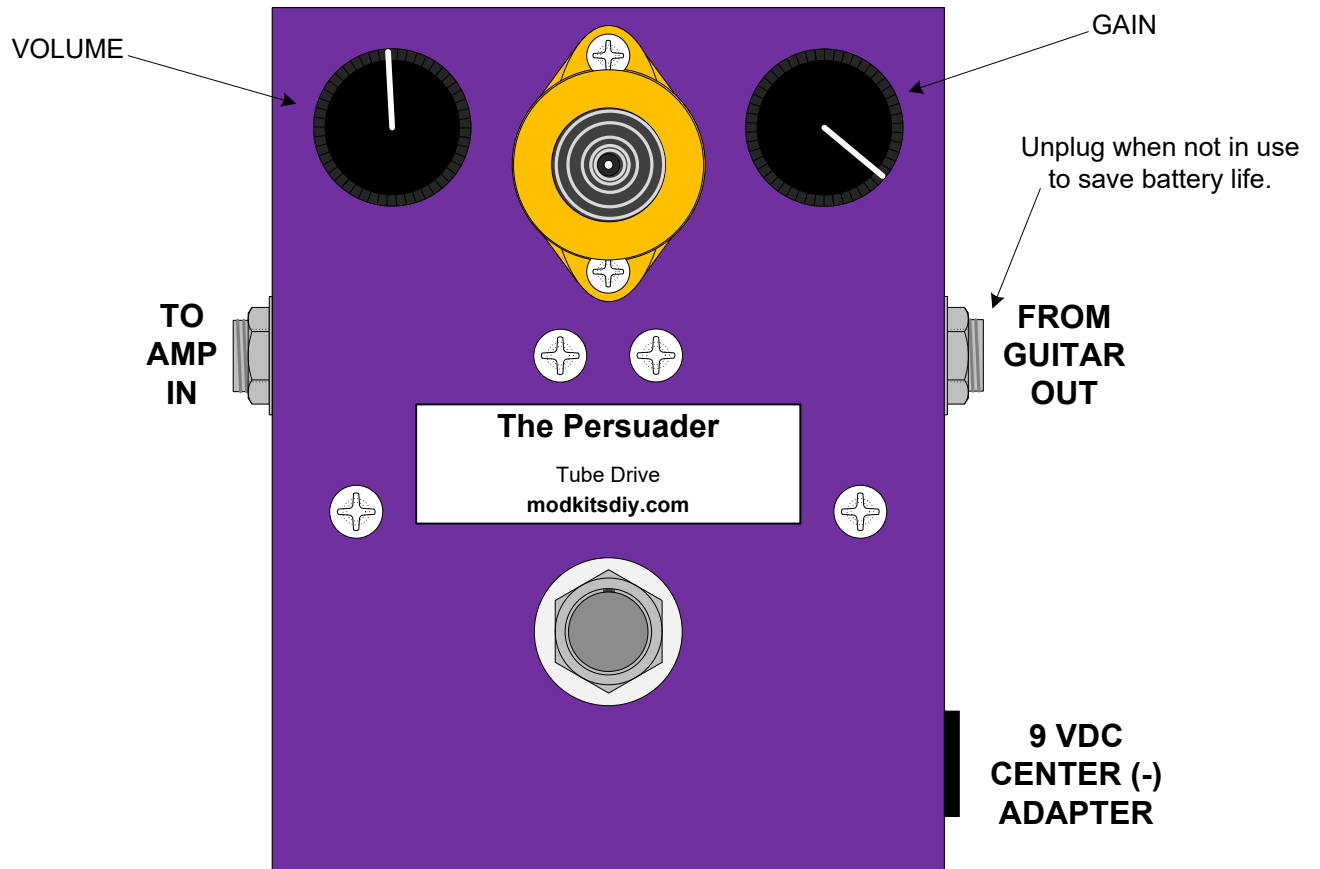


THE PERSUADER (K-930)



Use these instructions to learn:

- How to build a tube preamp pedal

The Persuader uses a gain boost circuit driving a 12AX7 preamp tube operating in starved plate mode to go from clean, warm tone to smooth, real tube overdrive.

Warning: *This circuit was designed for use with a 9 VDC power supply only.*

MOD[®]
www.modkitsdiy.com

TABLE OF CONTENTS

TOOL LIST	2
PARTS LIST DRAWINGS.....	3, 4
FINAL ASSEMBLY REFERENCE DRAWING.....	5
SOLDERING TIPS	6
STEP BY STEP ASSEMBLY INSTRUCTIONS	7 - 12
Section 1 – Mount ¼” Jacks and Terminal Strip Components	7
Section 2 – Mount the Potentiometer, Footswitch and DC Power Jack	8
Section 3 – Connect the 5KL Potentiometer	9
Section 4 – Mount the Tube Socket, Shield and 5 Lug Terminal Strips	9
Section 5 – Connect the DC Power Components	10
Section 6 – Wiring Connections in the Vacuum Tube Section	10
Section 7 – Mounting Components in the Vacuum Tube Section	11
Section 8 – Wire the Output Jack and Footswitch Connections	12
Section 9 – Finishing Up	12
 <u>ASSEMBLY DRAWINGS</u> (9 Drawings)	13 – 17

These are the last 5 pages. They should be separated and used as a reference to help assemble the kit correctly.

Visit www.modkitsdiy.com if you have any problems when first turning on your pedal for troubleshooting help. Remember to use caution when applying power to the pedal to avoid electric shock.

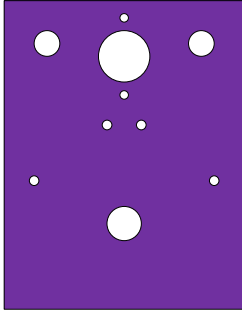
TOOL LIST

- Wire Strippers
- Needle Nose Pliers
- Cutting Pliers
- Desoldering Pump
- Solder (60/40 rosin core)
- Soldering Station
- Phillips Head Screwdrivers
- Slotted tip screwdrivers (3 mm tip)
- Channellock Pliers (or similar type)
- Ruler
- Hobby Vise (or other means to secure box while working)

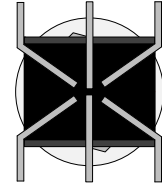
PARTS LIST 1

Stranded Wire (22 AWG) - Blue
K-PUL1569-BLUE (5 FT)

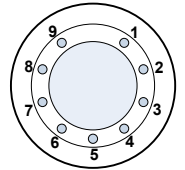
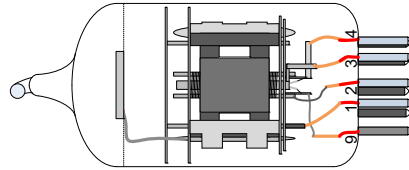
Enclosure
P-H1590BBCE-P (1)



DPDT Foot Switch
P-H498 (1)



Preamp Tube (Dual Triode, High Mu)
T-12AX7-CHINA (1)

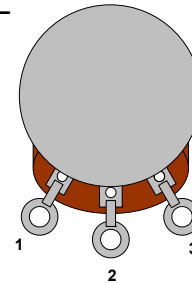


BOTTOM VIEW OF
BASE PIN
ORIENTATION

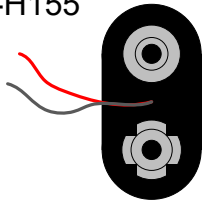
Round Black Knob
P-K325 (2)



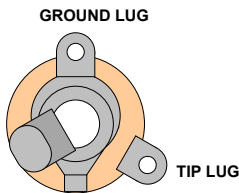
Potentiometers: 250KA and 5KL
R-V38-250KA (1)
R-V38-5KL (1)



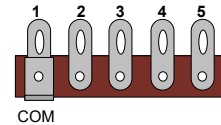
Battery Clip
S-H155 (1)



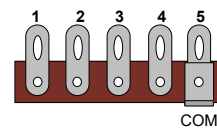
1/4" Mono Jack (Output Jack)
W-SC-11-T (1)



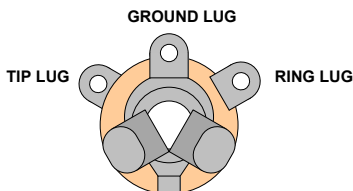
Terminal Strips with 5 Terminals
P-0501H01 (1)
1st Lug Common



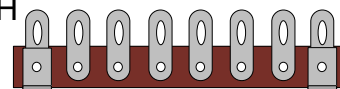
P-0501H05 (1)
5th Lug Common



1/4" Stereo Jack (Input Jack)
W-SC-12B (1)



Terminal Strip with 8 Terminals
P-0802H (1)



#6 Screws (3/8" long)
S-HS632-38 (4)



#6 Nuts
S-HHN632 (4)



PARTS LIST 2

#4 Screws (3/8" long)

S-HS440-38 (2)



#4 Nuts

S-HHN440 (2)



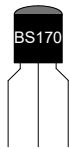
DC Power Jack

S-H750 (1)



N-Channel MOSFET (BS170)

P-QBS170 (1)



Caution: MOSFETs can easily be damaged by static electricity. Handle with care.

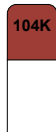
Diode (solid state) 1N4005

P-Q1N4005 (2)



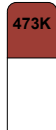
0.1μF Capacitor

C-PFD1-50-R (2)



0.047μF Capacitor

C-PFD047-50-R (1)



10μF Polarized Capacitor 50V

C-ET10-50 (1)



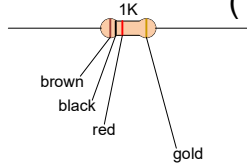
220μF Polarized Capacitor 50V

C-ET220-50 (2)



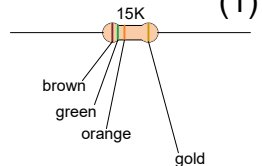
1KΩ Resistor ½ W

R-A1K (1)



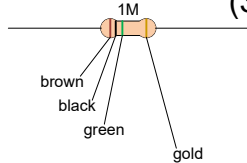
15KΩ Resistor ½ W

R-A15K (1)



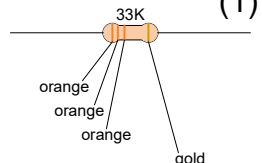
1MΩ Resistor ½ W

R-A1M (3)



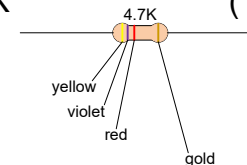
33kΩ Resistor ½ W

R-A33K (1)



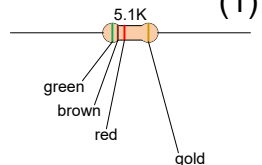
4.7KΩ Resistor ½ W

R-A4D7K (1)



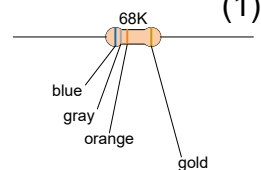
5.1KΩ Resistor ½ W

R-A5D1K (1)



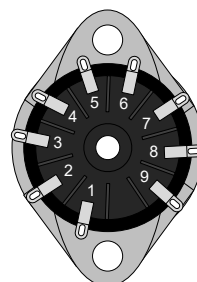
68KΩ Resistor ½ W

R-A68K (1)

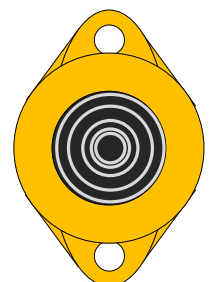


Tube Socket and Shield

P-ST9-300 (1)

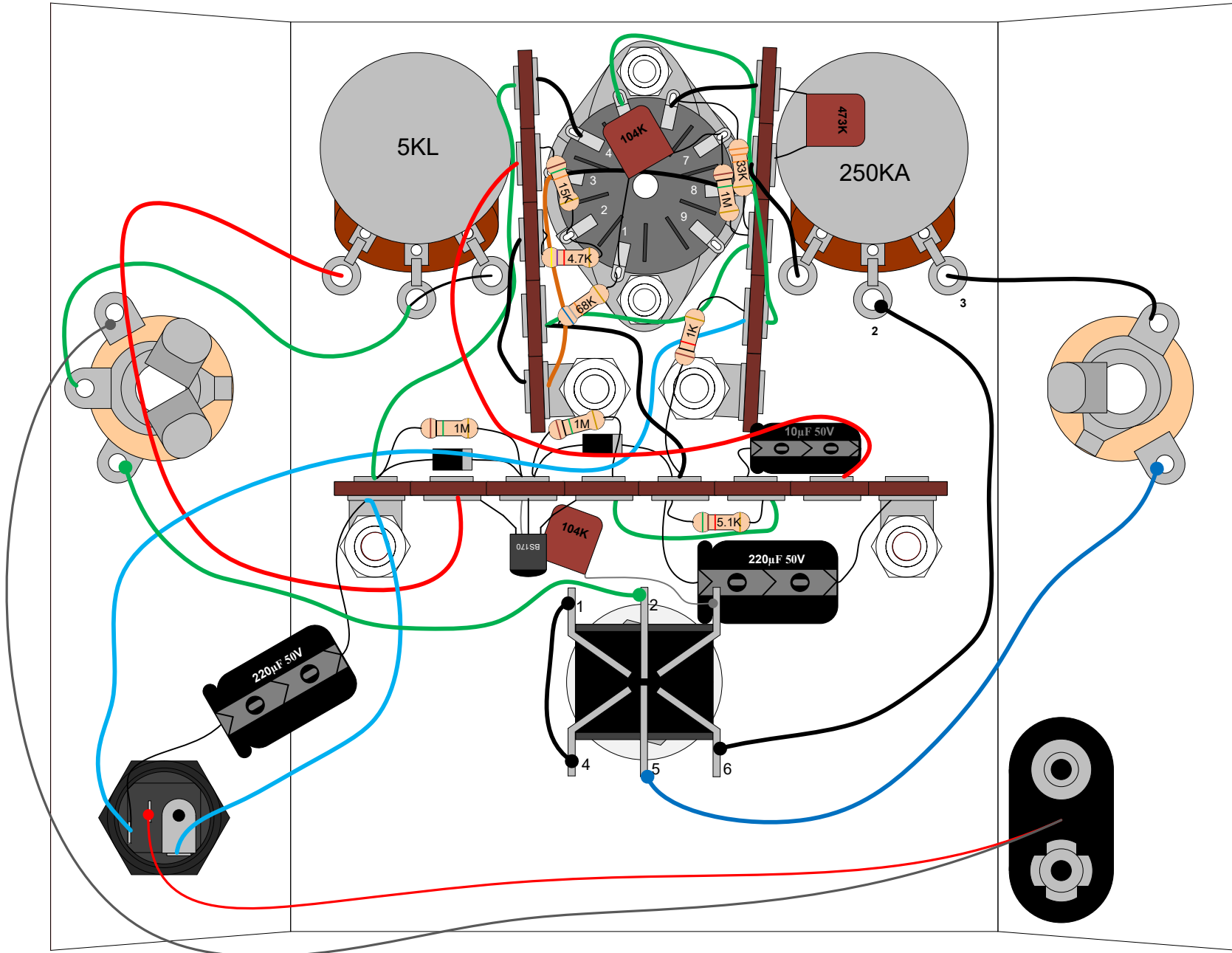


P-SS9-325-Y (1)



FINAL ASSEMBLY REFERENCE DRAWING

This is a large version of the final assembly drawing. Refer to this drawing as you make your way through each step of the instructions. Before you make a new connection at a particular terminal or solder lug, notice how many other connections will be made at that terminal. That way you can decide whether it's best for you to solder the connection and leave space open for future connections or hold off on soldering until after every connection at that location has been made.

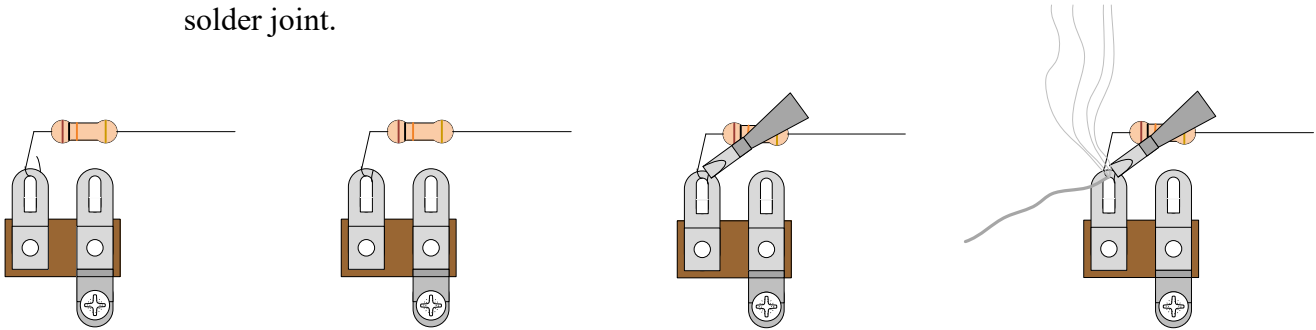


SOLDERING TIPS

It is important to make a good solder joint at each connection point. A cold solder joint is a connection that may look connected but is actually disconnected or intermittently connected. (A cold solder joint can keep your project from working.)

Follow these tips to make a good solder joint. *Take your time with each connection and make sure that all components are connected and will remain connected if your project is bumped or shaken.*

1. Bend the component lead or wire ending and wrap it around the connection point.
 - Make sure it is not too close to a neighboring component which could cause an unintended connection.
2. Wrap the component lead so that it can hold itself to the connection point.
3. Touch the soldering iron to both the component lead and the connection point allowing both to warm up just before applying the solder to them.
4. Be sure to adequately cover both component lead and connection point with melted solder.
 - Remove the soldering iron from your work and allow the solder joint to cool. (The solder joint should be shiny and smooth after solidifying.)
 - Cut off any excess wire or component leads with cutting pliers.
 - Clean the soldering iron's tip by wiping it across the wet sponge again after making the solder joint.



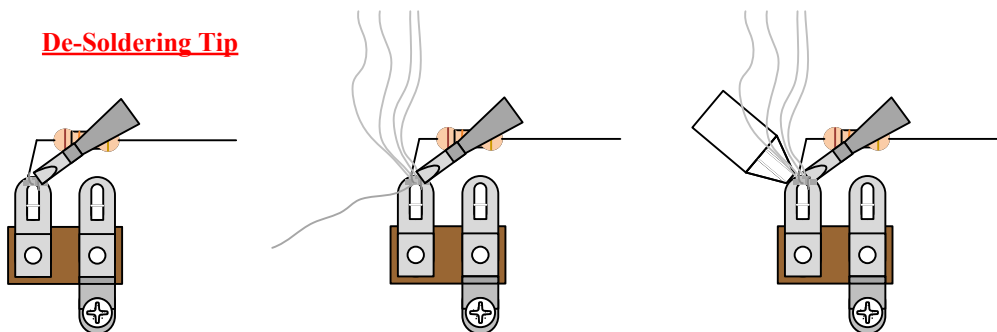
1. Bend the component lead and wrap it around the connection point.

2. Wrap the component lead so that it can hold itself to the connection point.

3. Heat up both component lead and connection point with the soldering iron.

4. Apply solder to both component lead and connection point.

De-Soldering Tip



1. Heat up old solder joint with the soldering iron.

2. Apply fresh solder to mix in with old solder joint

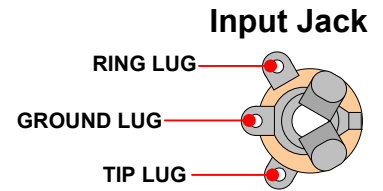
3. Use a de-soldering tool to remove the old solder joint while it is heated.

SECTION 1 – Mount 1/4" Jacks and Terminal Strip Components

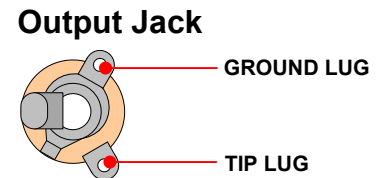
Please refer to **DRAWING 1** and **DRAWING 2**.

Orient box with two 3/8" holes on top and 1/2" hole nearest you.

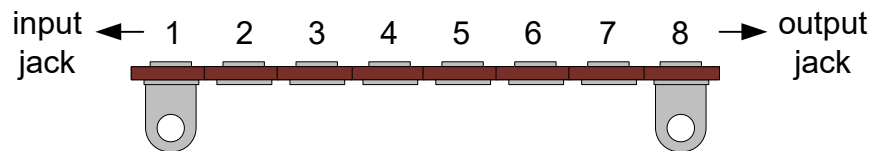
Mount input jack in 3/8" hole on left side of box with hardware provided. Washer goes under nut on outside of box. Make sure center solder lug of input jack is facing up. Correct positioning of jack will make soldering connections much easier. When positioned correctly, tighten nut.



Mount output jack in 3/8" hole on right side of box with hardware provided. Washer goes under nut on outside of box. Make sure two solder lugs are in most upright position before tightening nut.



Mount the 8 lug terminal strip to the two 9/64" holes as shown in drawing 2 using #6 hardware. We will refer to terminal numbers as illustrated below when connecting components.



Stripping and tinning wire: Throughout these instructions you will be told to strip and tin a length of wire numerous times. Unless noted otherwise, cut the wire to the length stated in the instructions, then strip 1/4" of insulation off each end. Twist each end of the stranded wire and apply a small amount of solder to each end (tin the wire ends). This prevents the stranded wire from fraying and makes soldering much easier.

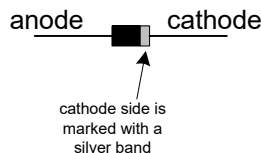
Connect and solder all of the following to their respective terminals as listed. (Make sure none of the component leads are so close together that it could lead to an unintended connection). *Be careful not to overheat the solid state devices (diodes and transistor) when soldering.*

Terminal #3 will have six components connected to it. Because of this we will use both the upper and lower portion of the terminal.

1) Mount the diodes to the *lower set of holes*, but do not solder.

Terminals #1 & 3:

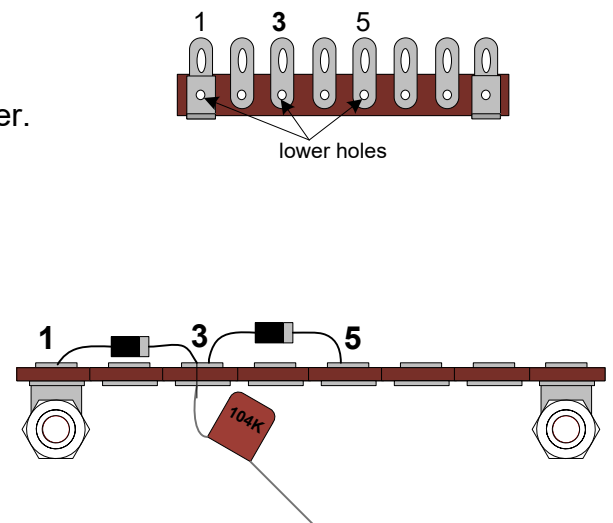
- "Anode" to terminal #1
- "Cathode" to terminal #3



Terminals #3 & 5:

- "Anode" to terminal #3
- "Cathode" to terminal #5

2) Mount one end of a .1µF capacitor to the *lower hole* of terminal #3. Now solder the lower set of holes at terminals #1, 3, and 5.



Note: The other end of the .1 µF capacitor will be connected on p. 11 of these instructions.

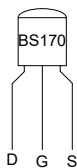
The remaining components and wires can be connected to the upper portion of their respective terminals. Unless otherwise noted, "mount" means to mount the component, solder the component in place and trim the leads.

3) Mount the BS170 MOSFET.

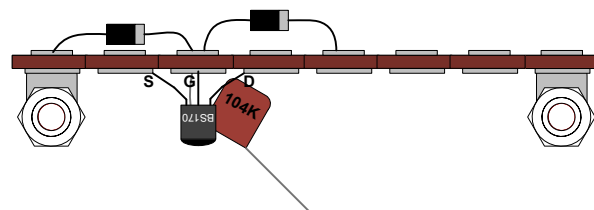
Caution: MOSFETs can easily be damaged by static electricity. Handle with care.

Terminals #2, 3 & 4:

- "Source" to terminal #2
- "Gate" to terminal #3
- "Drain" to terminal #4



This component is delicate, be careful not to burn it or break off the leads by bending them repeatedly.



4) Mount the 1M resistors.

Terminals #1 & 3:

- mount one of the 1M resistors to 1 & 3.

Terminals #3 & 4:

- mount the other 1M resistor to 3 & 4.

5) Mount the 5.1K resistor.

Terminals #5 & 6:

6) Mount a 2" jumper wire.

Terminals #4 & 6:

7) Mount the 10µF capacitor.

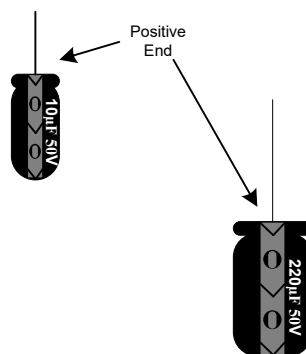
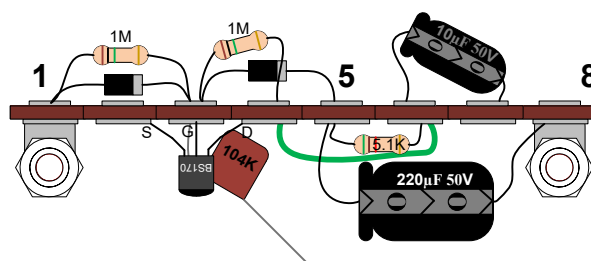
Terminals #6 & 7:

- mount the positive end to terminal 6.
- mount the negative end to terminal 7.

8) Mount a 220µF capacitor.

Terminals #5 & 8:

- mount the positive end to terminal 5.
- mount the negative end to terminal 8.

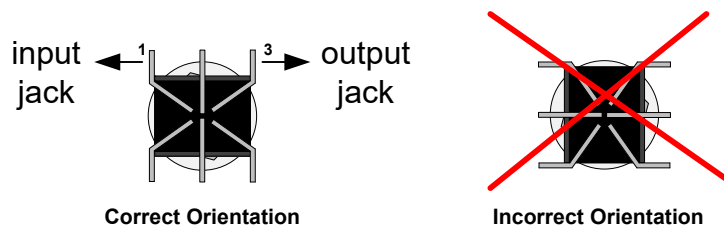


SECTION 2 – Mount the Potentiometer, Footswitch and DC Power Jack

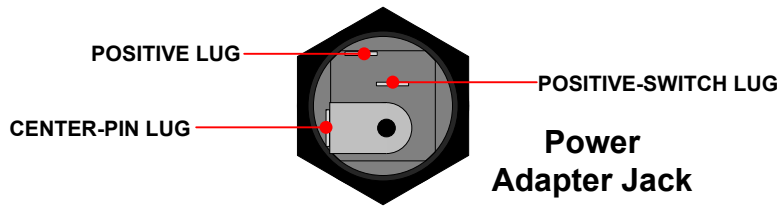
Please refer to **DRAWING 3**.

Mount the 5K potentiometer in the upper left hole using hardware provided. Mount the 250K potentiometer in the upper right hole using the hardware provided. Solder lugs for both pots should be pointed toward the bottom side of the enclosure. (Remove the small mounting tab on each pot by bending it back with pliers and clipping it off with cutters).

Mount footswitch in 1/2" hole. Large nylon washer goes under mounting nut on outside of box. Lock washer mounts on inside of box between the box surface and the other nut. Make sure that the footswitch solder lugs are oriented left to right, not up and down as illustrated here.



Mount power adapter jack in 15/32" hole on bottom left side of box. Orient solder lugs on power adapter jack so larger center-pin lug is facing the bottom side of box. Tighten adapter jack.

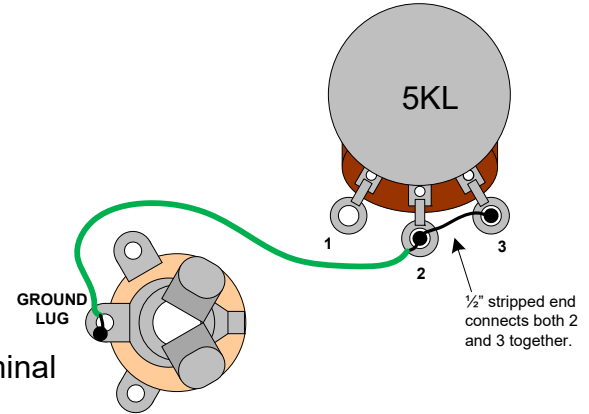


SECTION 3 – Connect the 5KL Potentiometer

Please refer to **DRAWING 3**.

Cut a 2" length of wire, strip 1/2" of insulation off of one end and tin. Use this one end to connect the 5K pot lug #2 with lug #3. Connect the other end of the wire to the ground lug of the input jack.

Cut a 3" length of wire and connect the 5K pot lug #1 to the terminal strip terminal #2.



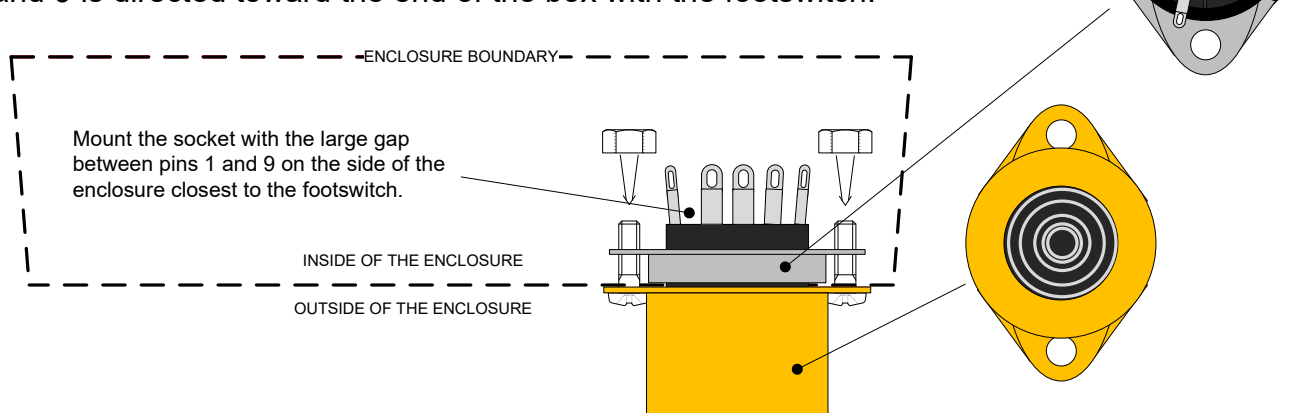
SECTION 4 – Mount the Tube Socket, Shield and 5 Lug Terminal Strips

Please refer to **DRAWING 4**.

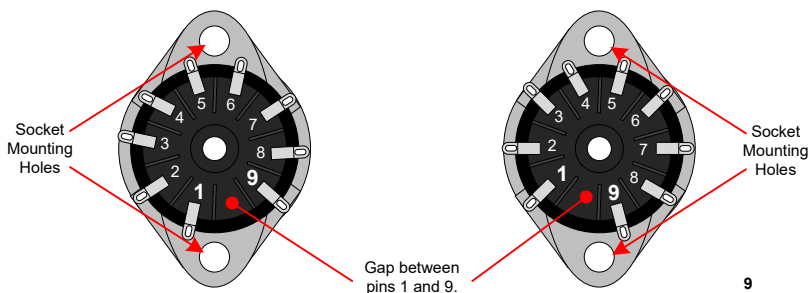
Use the #4 screws and nuts to mount the tube socket and shield as shown below.

1) From outside of the enclosure, insert the two #4 screws through the mounting holes of the tube shield base and into the two 1/8" chassis holes.

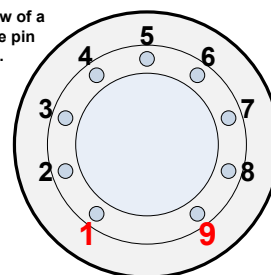
2) Place the tube socket onto the two screws so that the gap between pins 1 and 9 is directed toward the end of the box with the footswitch.



Note: Due to variance in socket manufacturing, the pins on your socket may not be in the same position relative to the socket's mounting holes as shown in the layout drawings; however, the gap in the socket will always be between pins 1 and 9. Make sure you are making your tube socket connections to the correct pin numbers with respect to the gap and not their position relative to the mounting holes.



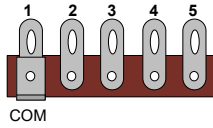
Bottom view of a 12AX7 base pin orientation.



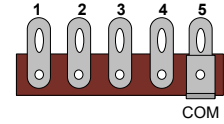
3) Fasten the two #4 nuts onto the two screws and tighten.

4) Mount the 5 lug terminal strip with the grounded terminal #1 between the 5K pot and the tube socket using #6 hardware.

5) Mount the 5 lug terminal strip with the grounded terminal #5 between the 250K pot and the tube socket using #6 hardware.



Be careful to mount these so that none of the terminals are unintentionally shorted to ground from touching the potentiometer bodies or the tube socket mounting ring.



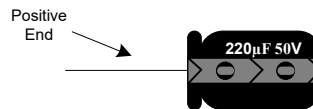
SECTION 5 – Connect the DC Power Components

Please refer to **DRAWING 5** and **DRAWING 6**.

Locate the battery snap connector. Connect and solder the red lead to the positive-switch lug of the power adapter jack.

Connect and solder the black lead to ring lug on the input jack.

Connect the positive lead of the remaining 220 μ F capacitor to the positive lug on the adapter jack (do not solder here, yet). Connect the negative lead of this cap to terminal #1.



Cut a 4 1/2" length of wire. Strip 1/4" insulation from each end. Wrap one end around the positive lug of the adapter jack (same terminal as the 220 μ F capacitor). Now solder this connection and make sure the positive capacitor lead and wire end are not touching the nearby adapter jack lugs.

Connect the other end of this 4 1/2" wire to the lower hole terminal #17.

Cut a 2 1/2" length of wire and connect the adapter jack center-pin lug to terminal #1.

SECTION 6 – Wiring Connections in the Vacuum Tube Section

Please refer to **DRAWING 7**.

1) Strip and tin a 2" piece of wire and connect:

Terminals #5 & #12

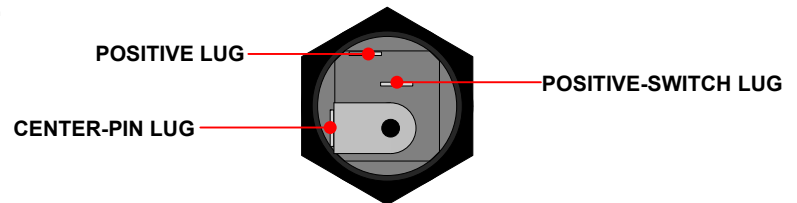
Suggestion: Connect to the lower hole of terminal #12 to make it easier when connecting other components to this same terminal later in the instructions.

2) Strip and tin a 3 1/2" piece of wire and connect:

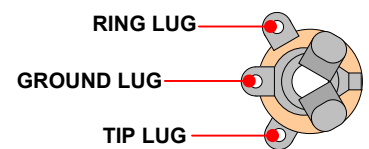
Terminals #1 & #9

Suggestion: Connect to the lower hole of terminal #9 and route the wire along a path so that its insulation also serves as a spacer between the terminal strip and the 5K potentiometer body.

Power Adapter Jack



Input Jack



3) Cut a 3" piece of wire. Strip $\frac{3}{4}$ " of insulation from one end and tin. Strip $\frac{1}{4}$ " of insulation from the other end and tin. Connect:

Tube Pins #3 & #8 to Terminal #13

Use the $\frac{3}{4}$ " end to connect both tube pins #3 and #8.

Suggestion: Route the wire along a path to terminal #13 so that its insulation also serves as a spacer between the terminal strip and the tube socket.

4) Cut a 1" piece of wire and connect:

Tube Pin #4 & Terminal #9

5) Strip and tin a 3 $\frac{1}{2}$ " piece of wire and connect:

Tube Pin #5 & Terminal #17

Suggestion: Route the wire along a path to terminal #17 so that its insulation also serves as a spacer between the terminal strip and the 250K potentiometer.

6) Strip and tin a 1" piece of wire and connect:

Tube Pin #6 & Terminal #14

7) Strip and tin a 1 $\frac{1}{2}$ " piece of wire and connect:

Terminal #15 & 250K pot lug #1

8) Strip and tin a 1 $\frac{1}{2}$ " piece of wire and connect:

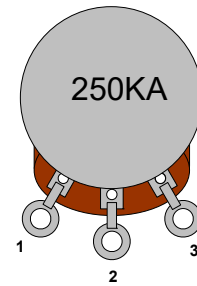
Terminal #11 & Terminal #13

9) Strip and tin a 1 $\frac{3}{4}$ " piece of wire and connect:

Terminal #12 & Terminal #16

10) Strip and tin a 4" piece of wire and connect:

Terminal #7 & Terminal #10



SECTION 7 – Mounting Components in the Vacuum Tube Section

Please refer to DRAWING 8.

1) Mount the 1K resistor to:

Terminals #5 & #17

2) Mount the 1M resistor to:

Terminals #16 & Tube pin #7 (*Do not solder the connection at pin #7, yet.*)

3) Mount the 0.1 μ F capacitor to:

Tube pin #1 & Tube pin #7 (*Now solder the connection at pin #7.*)

4) Mount the 33K resistor to:

Terminal #16 & Tube pin #6

5) Mount the 0.047 μ F capacitor to:

Terminals #14 & #15

6) Mount the 15K resistor to:

Terminal #10 & Tube pin #2 (*Do not solder the connection at pin #2, yet.*)

7) Mount the 4.7K resistor to:

Terminal #11 & Tube pin #2 (*Now solder the connection at pin #2.*)

8) Mount the 68K resistor to:

Terminal #12 & Tube pin #1

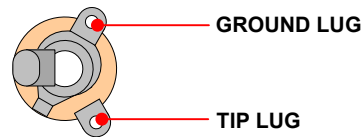
SECTION 8 – Wire the Output Jack and Footswitch Connections

Please refer to **DRAWING 9**.

1) Strip and tin a 1" piece of wire and connect:

250K Pot lug #3 & Output Jack ground lug

Output Jack

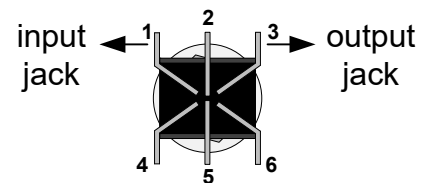


2) Connect the free end of the 0.1 μ F cap from Terminal #3 to Footswitch lug #3

3) Strip and tin a 2 1/2" piece of wire and connect:

Input Jack tip lug & Footswitch lug #2

Footswitch lug numbering convention



4) Strip and tin a 4 1/2" piece of wire and connect:

250K Pot lug #2 & Footswitch lug #6

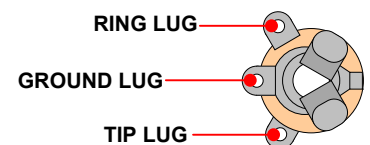
5) Strip and tin a 1 1/2" piece of wire and connect:

Footswitch lug #1 & Footswitch lug #4

6) Strip and tin a 3 1/2" piece of wire and connect:

Output Jack tip lug & Footswitch lug #5

Input Jack



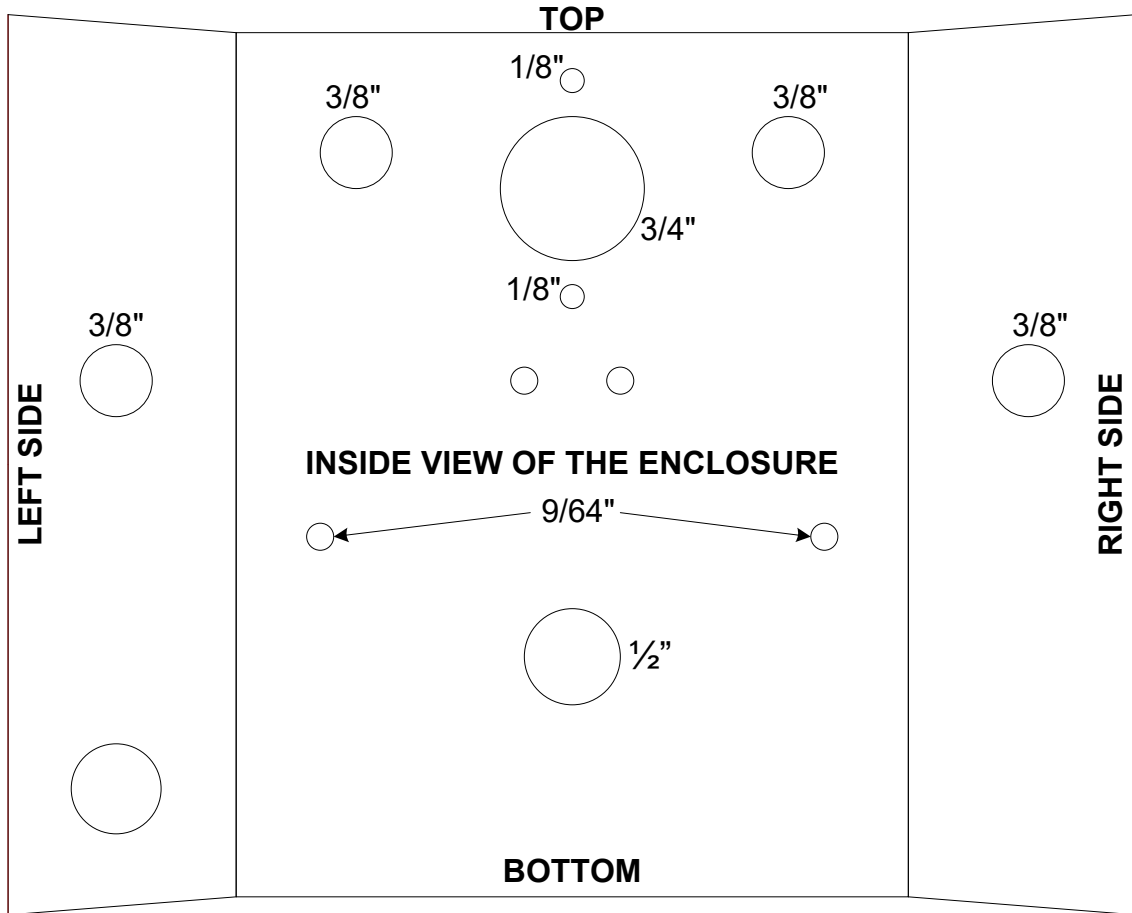
SECTION 9 – Finishing Up

It's always a good idea to thoroughly double-check your connections before applying power.

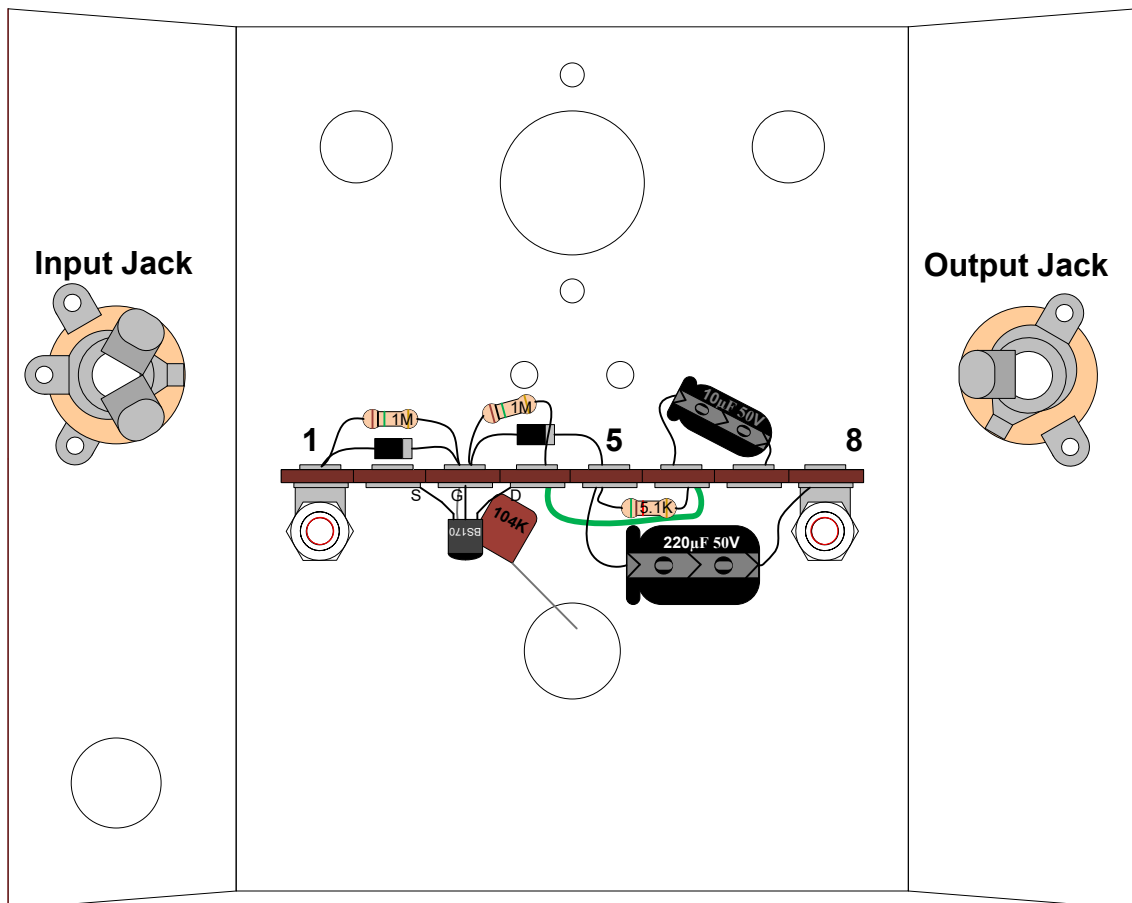
Attach the knobs provided to the two potentiometer shafts. Install 9 volt battery, close cover using screws provided. Plug guitar into input jack on right. This turns unit on. Plug cable into output jack and plug into your amplifier. Battery will last only about 1 hour of continuous operation. 9 volt, center negative power supply is highly recommended for use with this unit.

Unplug from the input jack of the unit to turn it off and save power.

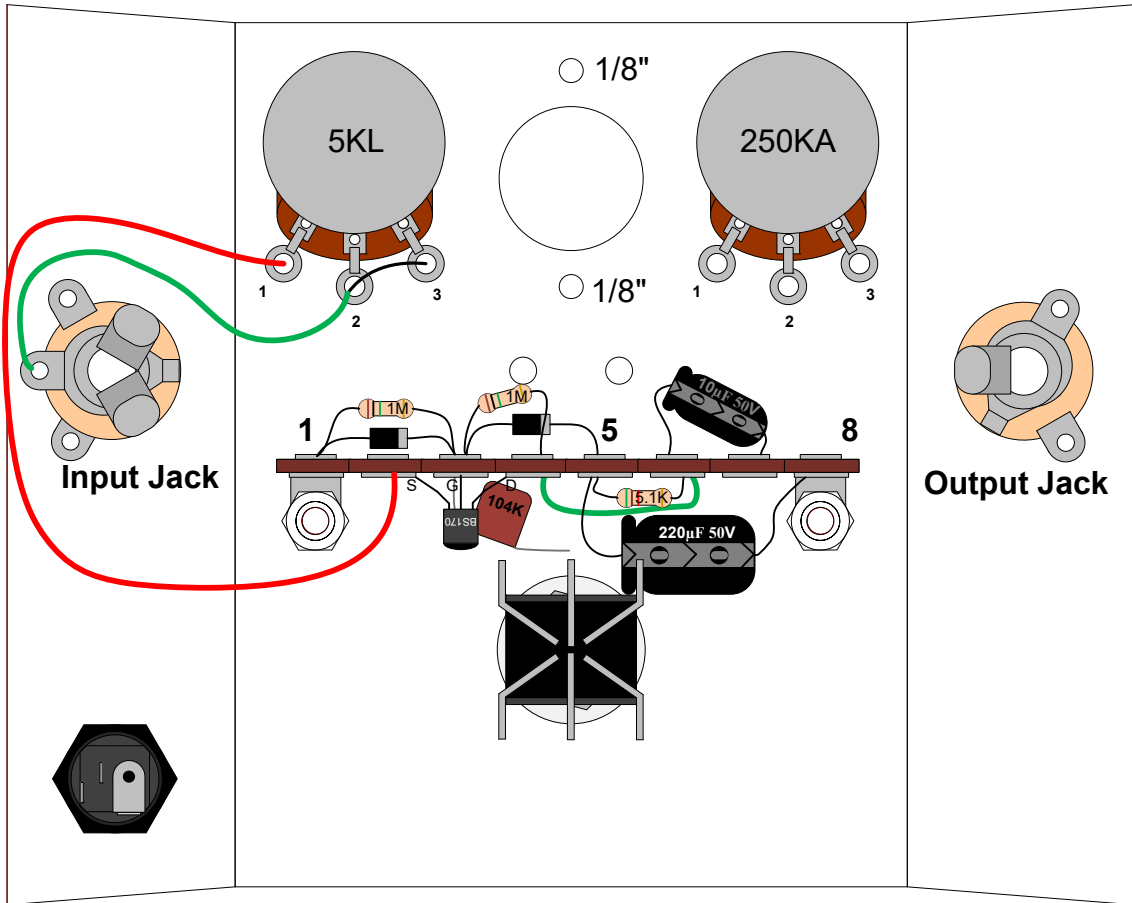
DRAWING 1



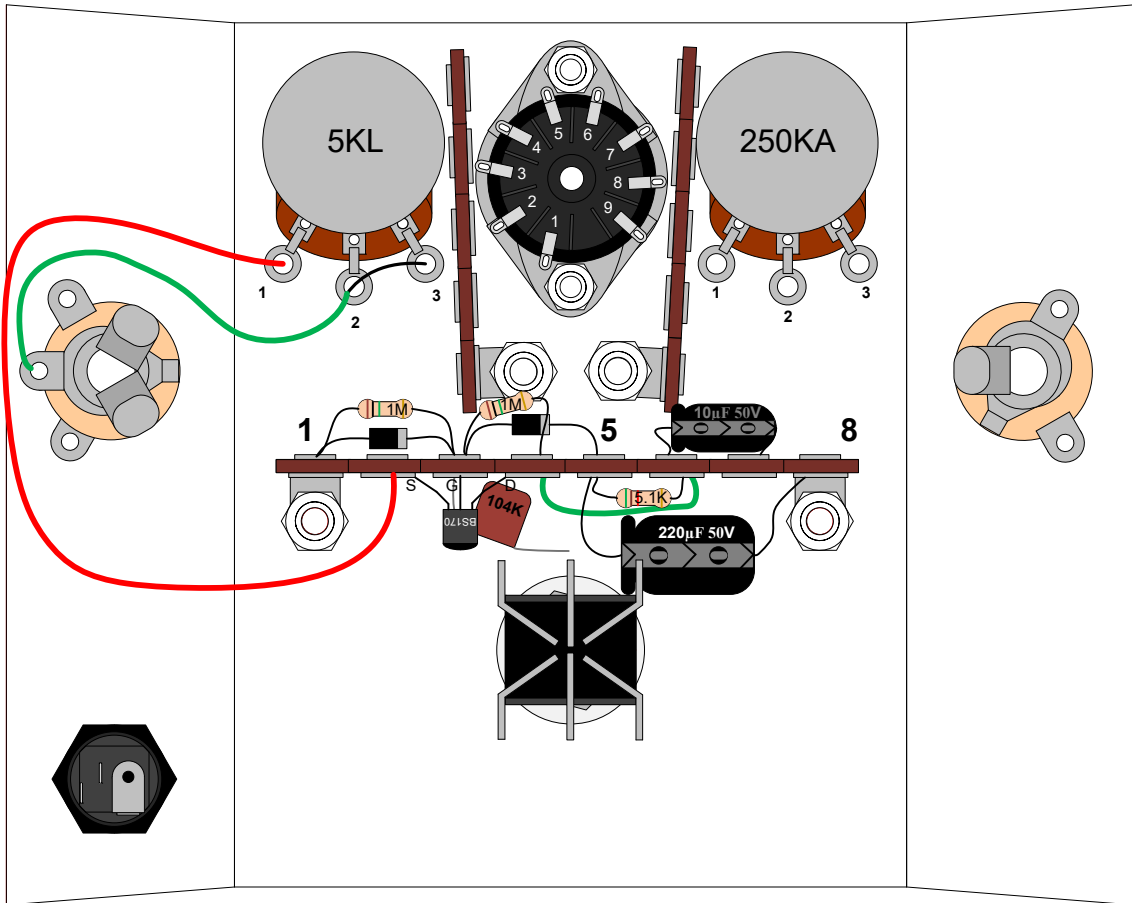
DRAWING 2



DRAWING 3



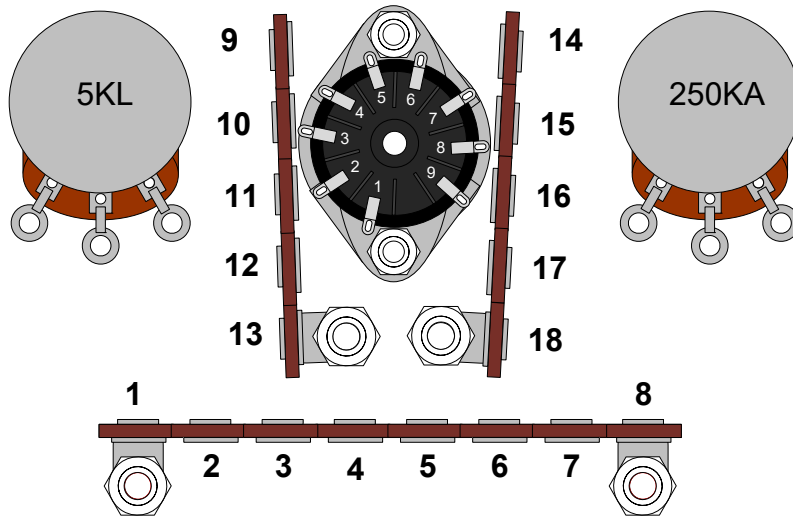
DRAWING 4



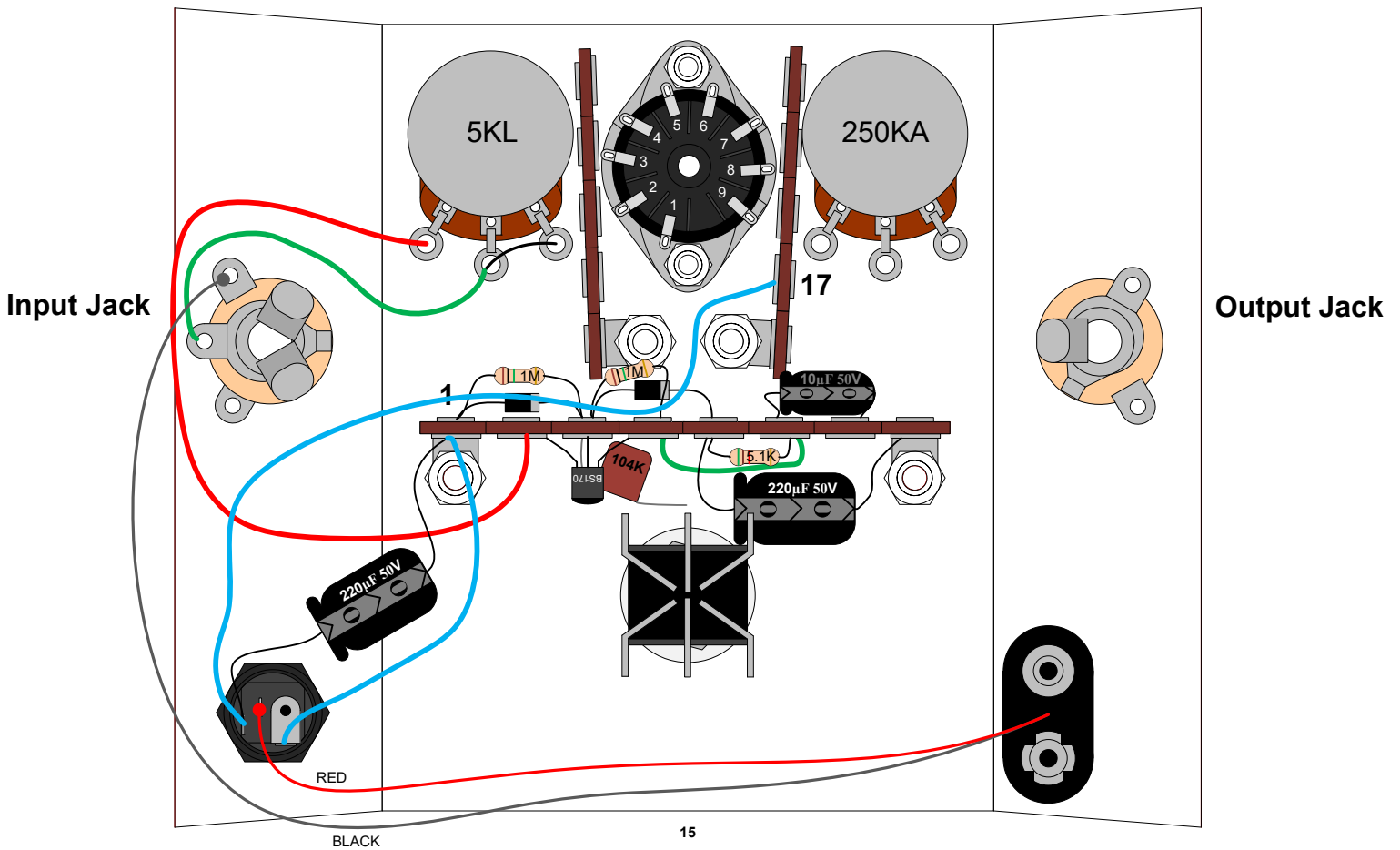
DRAWING 5

When the instructions mention a terminal #__, this drawing illustrates the terminal numbering convention used for all three terminal strips.

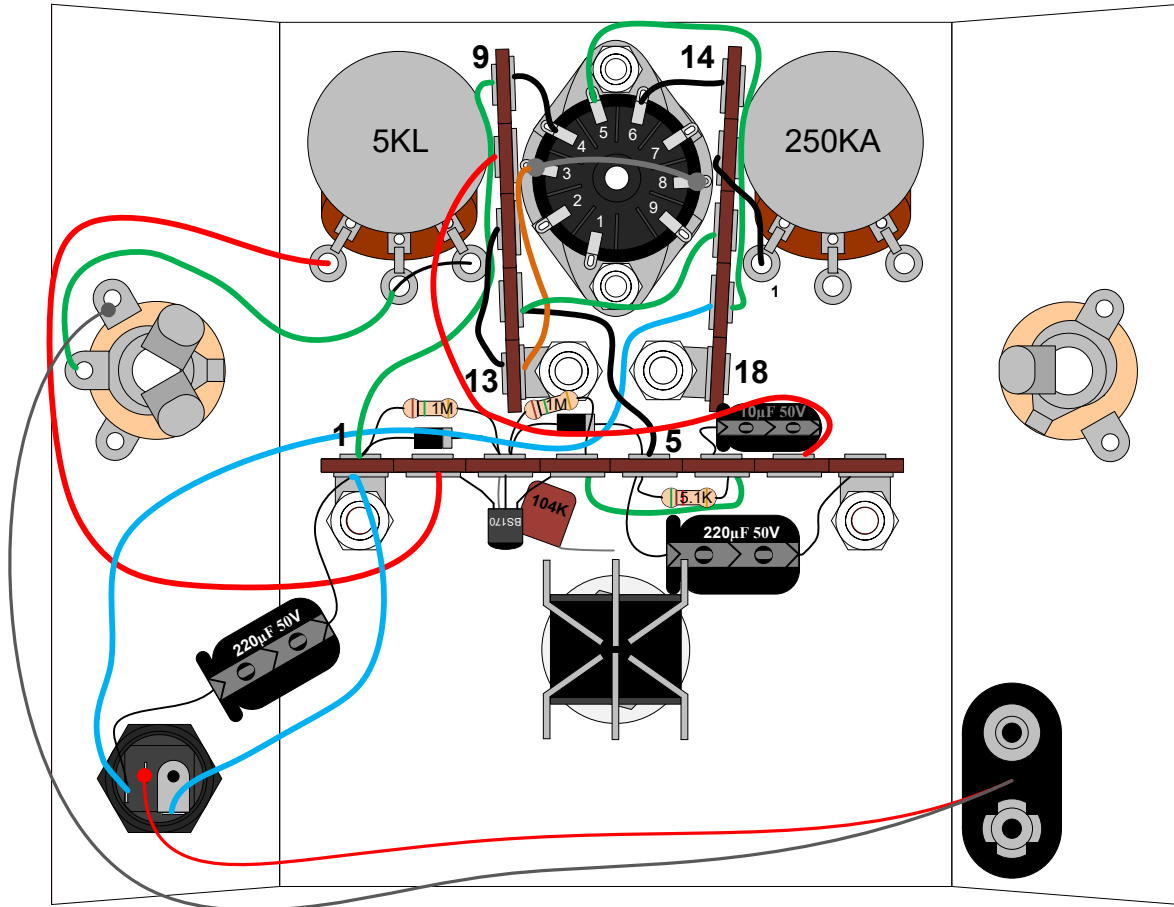
Terminal Numbering Convention



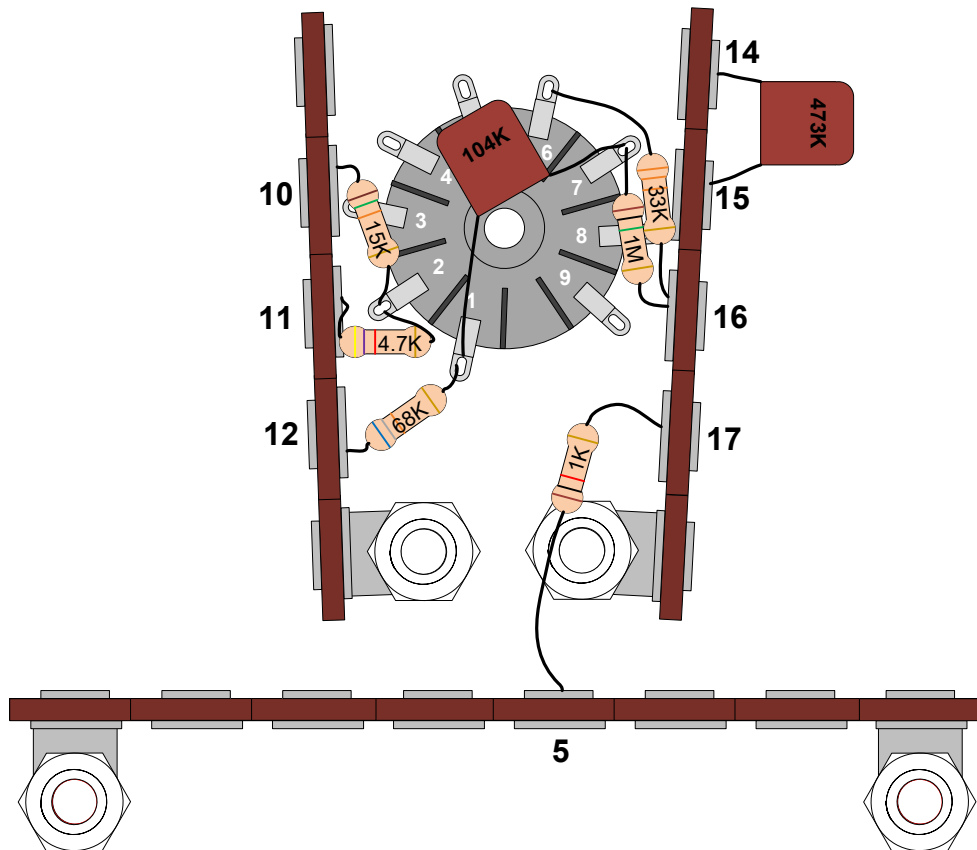
DRAWING 6



DRAWING 7



DRAWING 8



DRAWING 9

