

# THE AGGRESSOR (K-995)



## Use these instructions to learn:

- How to build an effects pedal for aggressive distortion sounds.

The Aggressor was designed to melt your face off. It's an aggressive distortion pedal with a mid-shift switch that allows for an instantaneous scoop or bump of the mid frequencies.

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

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These are the last 3 pages. They should be used as a reference for assembly.

Visit [www.modkitsdiy.com](http://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.

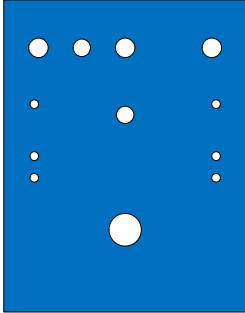
## **TOOL LIST**

- 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)

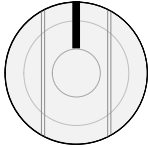
# PARTS LIST 1

Stranded Wire (22 AWG) - White  
K-PUL1569-WHITE (5 FT)

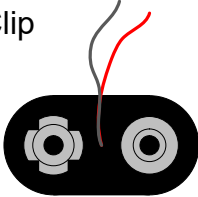
Enclosure  
P-H1590BBCE-DB (1)



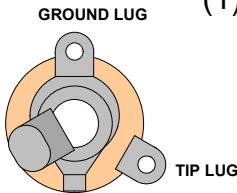
Clear Knob with Black Line  
P-K380CL (3)



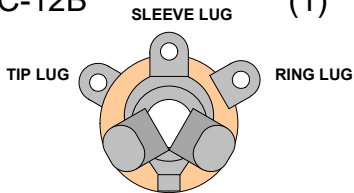
Battery Clip  
S-H155 (1)



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



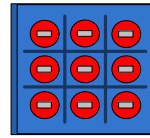
1/4" Stereo Jack (Input Jack)  
W-SC-12B (1)



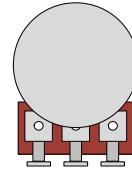
DC Power Jack  
S-H750 (1)



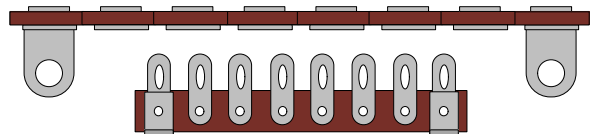
3PDT Foot Switch  
P-H501 (1)



Potentiometers:  
R-VAM10KL-SS ("B10K") (1)  
R-VAM100KL-SS ("B100K") (1)  
R-VAM100KA-SS ("A100K") (1)



Terminal Strip with 8 Terminals  
P-0802H (3)



#4 Screw (3/8" long)  
S-HS440-38 (6)



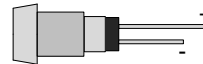
#4 Nut  
S-HHN440 (6)



#4 Lock Washer  
S-HLW4 (6)



Bezel with red LED  
P-L400 (1)

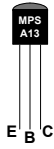


Red LED  
P-L302 (2)



## PARTS LIST 2

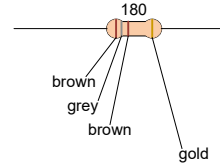
NPN Darlington (MPSA13)  
P-QMPSA13 (1)



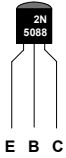
220pF Capacitor 500V  
C-D220-500 (1)



180 Ω Resistor ½ W  
R-A180 (1)



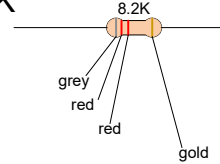
NPN BJT (2N5088)  
P-Q2N5088 (1)



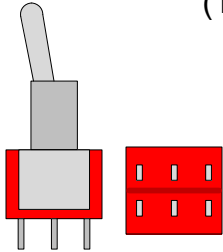
470pF Capacitor 2kV  
C-D470-2000 (1)



8.2kΩ Resistor ½ W  
R-A8D2K (2)



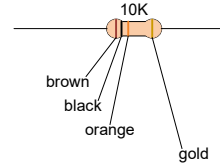
DPDT Mini Toggle Switch  
P-H541 (1)



.0039μF Capacitor 100V  
C-PEID0039-100 (2)



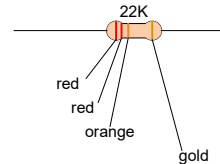
10kΩ Resistor ½ W  
R-A10K (1)



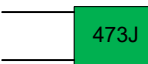
0.01μF Capacitor  
C-PEID01-100 (2)



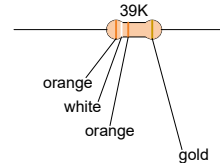
22kΩ Resistor ½ W  
R-A22K (1)



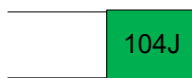
0.047μF Capacitor  
C-PEID047-100 (1)



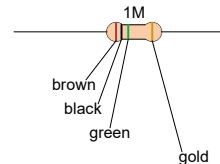
39kΩ Resistor ½ W  
R-A39K (1)



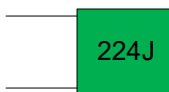
0.1μF Capacitor 100V  
C-PEID1-100 (2)



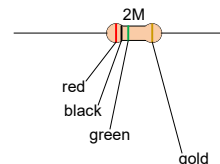
1MΩ Resistor ½ W  
R-A1M (3)



0.22μF Capacitor 100V  
C-PEID22-100 (1)



2MΩ Resistor ½ W  
R-A2M (2)

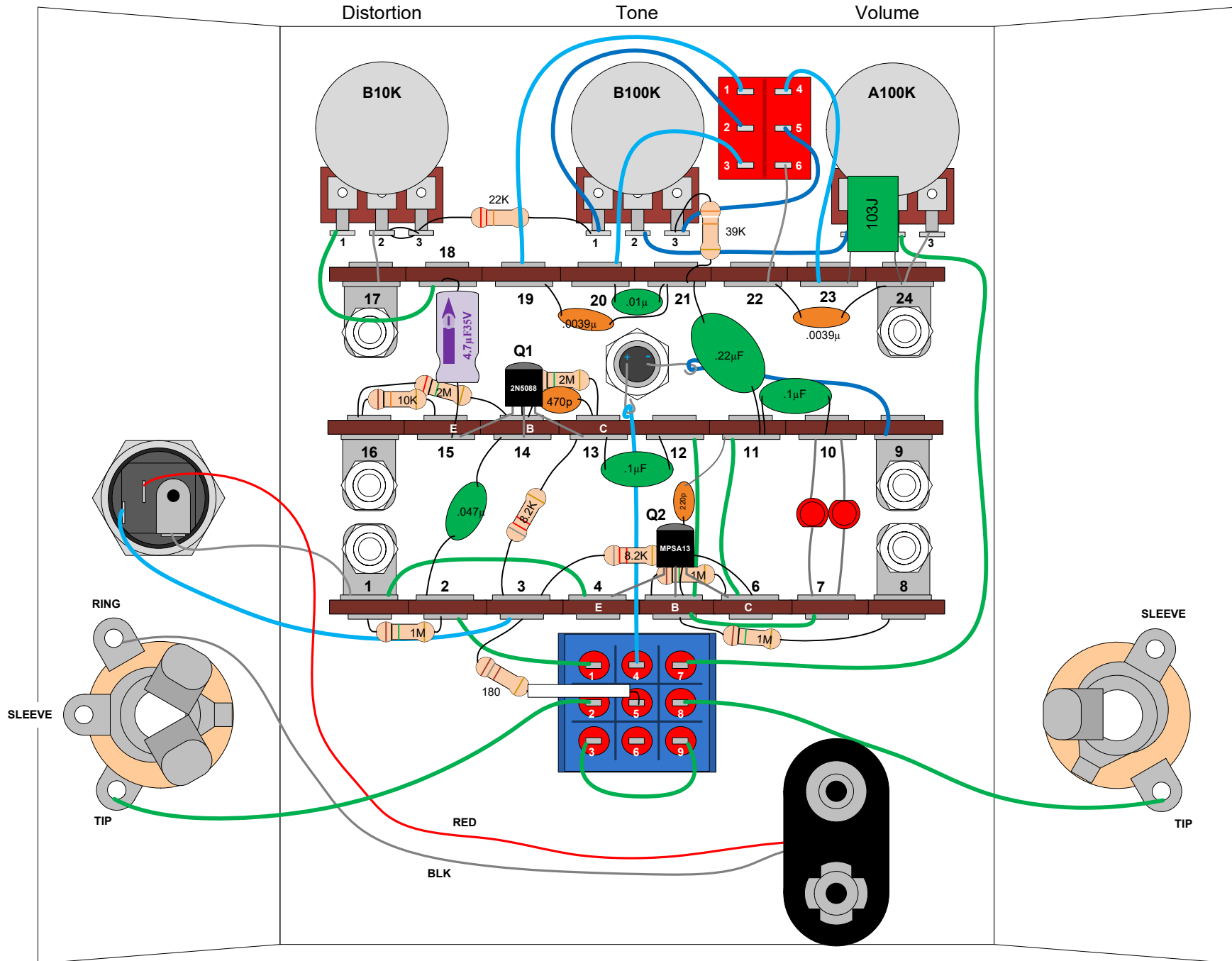


4.7μF Polarized Capacitor 35V  
K-PC4D7-35 (1)



# 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.

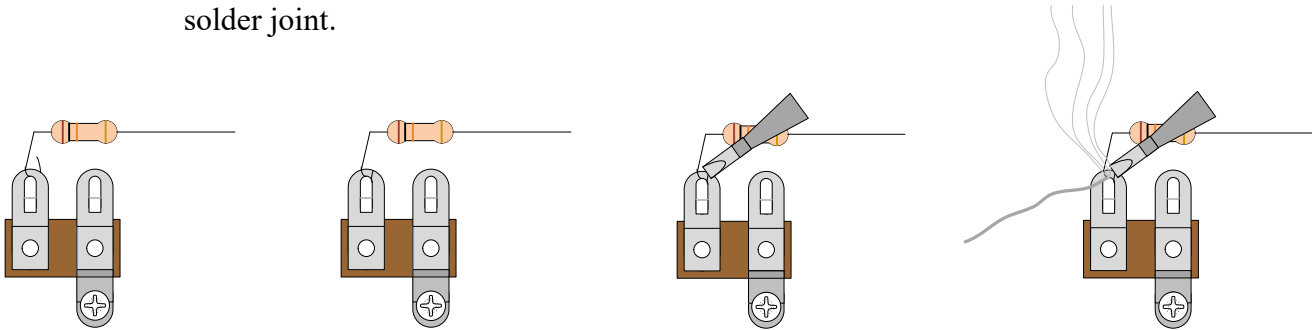


## SOLDERING TIPS

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.



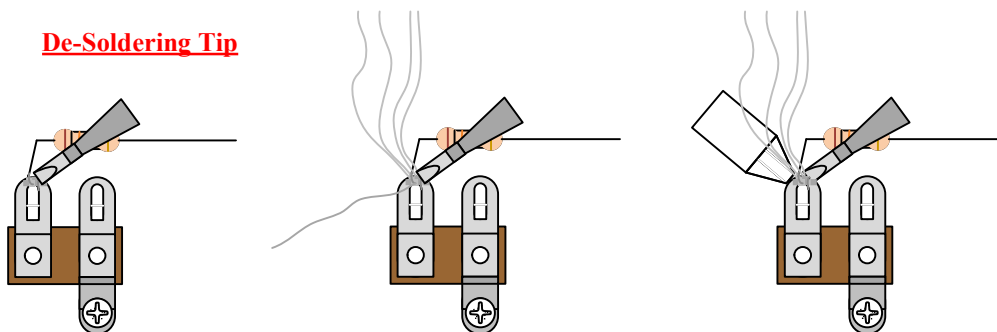
1. Bend the component lead and wrap it around the connection point.

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 Large Components

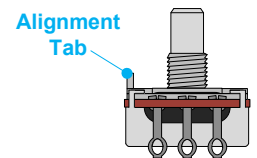
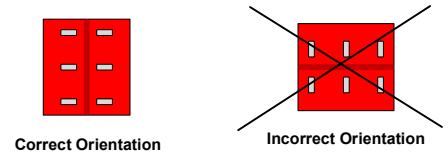
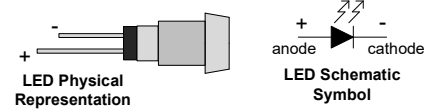
Please refer to **DRAWING 1** and **DRAWING 2**.

Orient the enclosure with the three 9/32" holes on top.

- Mount the LED and bezel holder in the 1/4" hole below the middle 9/32" hole. Align the LED leads so that the anode (positive lead) is closer to the left side of the enclosure as shown in Drawing 2.
- Mount the toggle switch in the 1/4" hole between the middle and right side of the enclosure. Make sure its solder lugs are oriented as shown in Drawing 2.
- Mount the three pots in their respective 9/32" holes as shown in Drawing 2.

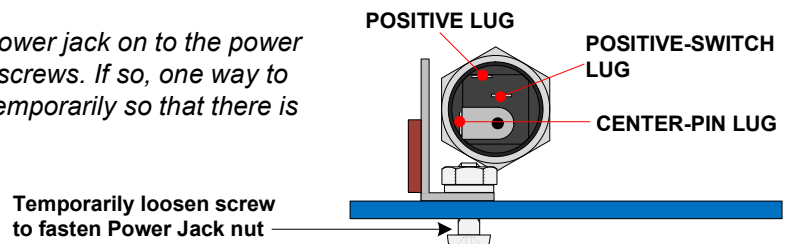
*Bend back and remove the alignment tab on the top of each potentiometer using a pair of pliers before mounting the pots so that they can mount flush against the enclosure surface.*

The Anode (+) side of the LED is indicated by a slightly longer lead and/or a positive sign.



- Using the 6 screws, nuts and lock washers, fasten the 3 terminal strips to match Drawing 2.
- Mount the DC power jack in the 15/32" hole on the left side of the enclosure. Orient its solder lugs so that the center-pin lug is facing the bottom side of the enclosure.

*You might find it difficult to fit the nut for the DC power jack on to the power jack due to the proximity of the two terminal strip screws. If so, one way to make it easier would be to loosen those screws temporarily so that there is more space for the power jack's nut to fit through.*



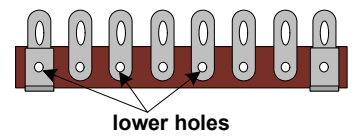
- Mount the input jack in the 3/8" hole on the left side of the enclosure with the hardware provided. The washer goes under the nut on the outside of the enclosure. Make sure the center solder lug of the input jack is facing up. Correct positioning of the jack makes soldering the connections easier.
- Mount the output jack in the 3/8" hole on the right side of the enclosure. Make sure the two solder lugs are in their most upright position before tightening the nut.
- Mount the footswitch in the 15/32" hole in the center of the enclosure. The nylon washer goes under the mounting nut on the outside of the enclosure. Then the lock washer mounts on the inside between the enclosure surface and the other nut. Make sure that the footswitch is oriented to match DRAWING 2.

## SECTION 2 – Wire Large Components

Please refer to **DRAWING 3**.

**Stripping wire, tinning wire and soldering.** 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 (i.e. tin the wire ends). This will prevent the stranded wire from fraying and will make the final soldering much easier.

**Tip:** Some terminals will have three or more wire/component connections which can make it difficult to find room for everything that needs to be connect to that terminal. In this case, we will provide a warning and suggest connecting wires to the lower terminal holes.



When connecting wires to lower terminal holes, just be sure that the exposed wire end is resting against the metal of the terminal while adding solder. Hold the wire in place for a few seconds while the connection cools. After cooling, tug on the wire slightly to ensure it is secured to the lower terminal hole.

- Strip and tin a 2" piece of wire and connect footswitch lug 8 to the output jack's tip lug.
- Strip and tin a 1 ½" piece of wire and connect footswitch lugs 3 and 9.
- Strip and tin a 2" piece of wire and connect footswitch lug 2 to the input jack's tip lug.
- Strip and tin a 5" piece of wire and connect footswitch lug 7 to volume pot lug2.
- Strip and tin a 1 ¾" piece of wire and connect footswitch lug 1 to terminal #2.
- Strip and tin a 2 ½" piece of wire and connect footswitch lug 4 to the anode (+) lead of the indicator LED. After connections are made, push this wire down so it runs along the surface of the enclosure (between the two terminal strips). This will leave more room for components that will be mounted to the terminal strips later in these instructions.

*Tip: Form a hook in both the LED's lead and the wire-end. Hook them to each other and press the hooks closed together. Apply solder after the LED lead and wire-end are tightly hooked to each other.*

- Strip and tin a 2" piece of wire and connect terminal #9 to the cathode (-) lead of the indicator LED.
- Strip and tin a 2" piece of wire and connect to terminals #1 and #4. After connections are made push this wire down so it runs along the surface of the enclosure.
- Strip and tin a 2" piece of wire and connect to terminals #5 and #12. After connections are made push this wire down so it runs along the surface of the enclosure.
- Strip and tin a 1 ½" piece of wire and connect to terminals #5 and #7. This piece of wire should be connected on the side of the terminal strip that faces the footswitch.
- Strip and tin a ¾" piece of insulation from one end of the wire provided. Twist and tin this end. Clip off this tinned length of wire and use it to connect terminal #1 to the DC power jack's center-pin lug.
- Strip and tin a 1 ½" piece of wire and connect terminal #3 to the DC power jack's positive lug.
- Strip and tin a 2" piece of wire and connect terminals #6 and #11.
- Strip and tin a ¾" piece of insulation from one end of the wire provided. Twist and tin this end. Clip off this tinned length of wire and use it to connect terminal #17 to distortion pot lug 2. **(Do not solder the pot lug 2 connection, yet).**
- Strip and tin a 1 ½" piece of wire and connect terminal #18 to distortion pot lug 1.
- Strip and tin a 3" piece of wire and connect terminal #19 to toggle switch lug 1.

*Tip: The toggle switch lugs are small and close together. Consider clipping the tinned wire-ends to 1/8" before inserting them through the toggle switch lugs.*



- Strip and tin a 2 ½" piece of wire and connect tone pot lug 1 to toggle switch lug 2. **(Do not solder the connection on lug 1 of the tone pot, yet).**
- Strip and tin a 1 ½" piece of wire and connect tone pot lug 2 to volume pot lug 1.
- Strip and tin a 1 ½" piece of wire and connect toggle switch lug 3 to terminal #20.
- Strip and tin a 2" piece of wire and connect toggle switch lug 4 to terminal #23.
- Strip and tin a 1 ¾" piece of wire and connect toggle switch lug 5 to tone pot lug 3. **(Do not solder the tone pot lug 3 connection, yet).**
- Strip 1" of insulation off of the wire provided. Twist and tin the 1" bare wire-end. When cool, clip the tinned wire off and use it to connect terminal #22 to toggle switch lug 6.
- Strip 1" of insulation off of the wire provided. Twist and tin the 1" bare wire-end. When cool, clip the tinned wire off and use it to connect volume pot lug 3 to terminal #24.

### **SECTION 3 – Mount Components to Terminal Strips**

**Please refer to DRAWING 4.**

Connect and solder all the following components to their respective terminals as listed. *(Make sure that none of the component leads are so close together that it could cause an unintended short).*

*Unless noted otherwise, "connect" means to trim the component's leads to a reasonable length, wrap them tightly around their connection points and then add solder. (See "Soldering Tips" on page 5).*

- Connect the 22K resistor from distortion pot lugs 2 & 3 to tone pot lug 1. **(Solder the connections at all three potentiometer lugs, now).**

To do this, thread one lead of the resistor through distortion pot lug 3 and bend it back to go through lug 2 as well.

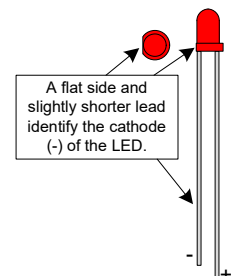
- Connect the 39K resistor from terminal #21 to tone pot lug 3. **(Solder the connections at tone pot lug 3, now).**

*Warning: Make sure the resistor lead connected to the tone pot does not touch the pot's body. This would short out the signal path of the effects circuit and could result in no sound output when the effect is engaged.*

- Connect one of the .0039µF capacitors from terminal #22 to #24. This cap should be mounted upside down to allow room for other components.
- Connect one of the .01µF caps from terminal #23 to #24.
- Connect the .22µF cap from terminal #11 to #21. Mount this cap upside down.
- Connect the remaining .01µF cap from terminal #20 to #21. Mount this cap upside down.
- Connect the remaining .0039µF cap from terminal #19 to #21. Mount this cap upside down.
- Connect one of the 2M resistors from terminal #16 to #14.  
*Tip: 5 components will be connected to terminal #14. Consider connecting to the lower terminal holes and do not solder the connection at #14's lower hole, yet.*
- Connect the remaining 2M resistors from terminal #14 to #13.

*Tip: Consider connecting to the lower terminal holes and now solder the connection at #14's lower hole.*

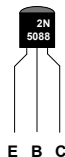
- Connect the 10K resistor from terminal #16 to #15.
- Connect the positive (+) lead of the 4.7 $\mu$ F capacitor to terminal #15 and connect its negative (-) lead to terminal #18.
- Connect the 470pF cap from terminal #13 to #14. Mount this cap upside down and position it so there will be room to mount components above it later.
- Connect one of the 8.2K resistors from terminals #3 to #6.  
 Tip: More than 3 components will be connected to terminals #3 and #6. Consider connecting to the lower terminal holes and do not solder the connection at terminal #6's lower hole, yet.
- Connect one of the 1M resistors from terminal #5 to #6.  
 Tip: Consider connecting to the lower terminal holes. Solder the connection at terminal #6's lower hole, but leave terminal #5's lower hold unsoldered.
- Connect one of the 1M resistors from terminal #5 to #8.  
 Tip: Consider connecting to the lower terminal holes. Now solder the connection at terminal #5's lower hole.
- Connect one the remaining 1M resistor from terminal #1 to #2.
- Connect the remaining 8.2K resistor from terminal #3 to #13.
- Connect the 220pF cap from terminal #5 to #11. Mount this cap upside down and make sure the leads do not touch the leads of other components.  
 Tip: You will also be connecting the "base" lead of the MPSA13 to terminal #5, so be sure to leave some room for it.
- Connect the two red LED's from terminals #7 to #10. The LED's are polarized and will be mounted in opposing directions. The LED cathode (-) side is flat. Mount the LED's so that the flat side of one LED faces terminal #7 and the flat side of the other LED faces terminal #10.
- Connect a .1 $\mu$ F cap from terminal #10 to #11.
- Connect the remaining .1 $\mu$ F cap from terminal #12 to #13. Mount this capacitor upside down.
- Connect the .047 $\mu$ F cap from terminal #2 to #14. Mount this capacitor upside down.



**Please refer to DRAWING 5.**

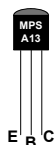
- Connect the 2N5088 transistor ("Q1") to terminals #15, #14 and #13 as listed:

Terminal #15: Emitter  
 Terminal #14: Base  
 Terminal #13: Collector

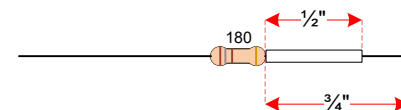


- Connect the MPSA13 transistor ("Q2") to terminals #4, #5 and #6 as listed:

Terminal #4: Emitter  
 Terminal #5: Base  
 Terminal #6: Collector



- Connect the 180Ω resistor from terminal #3 to footswitch lug 5.



Tip: To prevent the resistor from shorting to the other lugs, insulate that lead of the resistor. Strip a 1/2" piece of insulation from the wire provided. Next, cut one lead of the resistor to a length of 3/4". Slide the 1/2" piece of insulation over this lead. Connect the insulated lead to lug 5 with the resistor going to the left side of the switch. Connect the other lead to terminal #3 and cut off any excess.

- Locate the battery snap connector. Connect its red wire to the DC power jack's "positive-switch" lug and connect its black wire to the input jack's ring lug.

## **SECTION 4 – Finishing Up**

*It's always a good idea to thoroughly double-check your connections before applying power. This will minimize the risk of damaging components.*

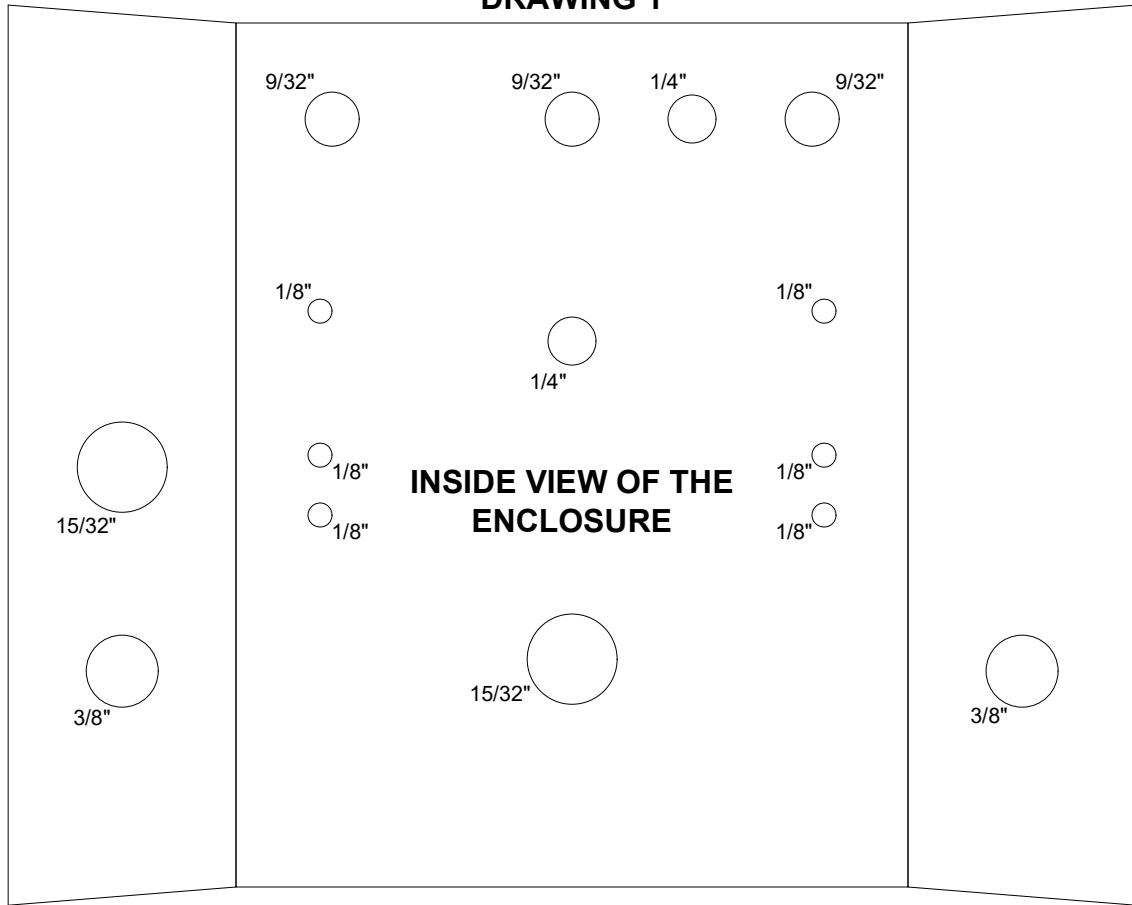
- Fasten the knobs to the potentiometer shafts by tightening their set screws. Install a 9 volt battery if needed. Fasten the cover using the four screws provided. Plug your guitar into the input jack on the right side of the pedal. This turns power on when you are not using an AC adapter for power. Plug another cable from the output jack (left side) to your amp's input.
- When using a battery for power, remember to unplug from the input jack of the pedal to turn it off and save battery life.

*If your pedal does not work properly, the first step is always to double-check your connections. If everything looks good, then e-mail [info@modkitsdiy.com](mailto:info@modkitsdiy.com) for troubleshooting help.*

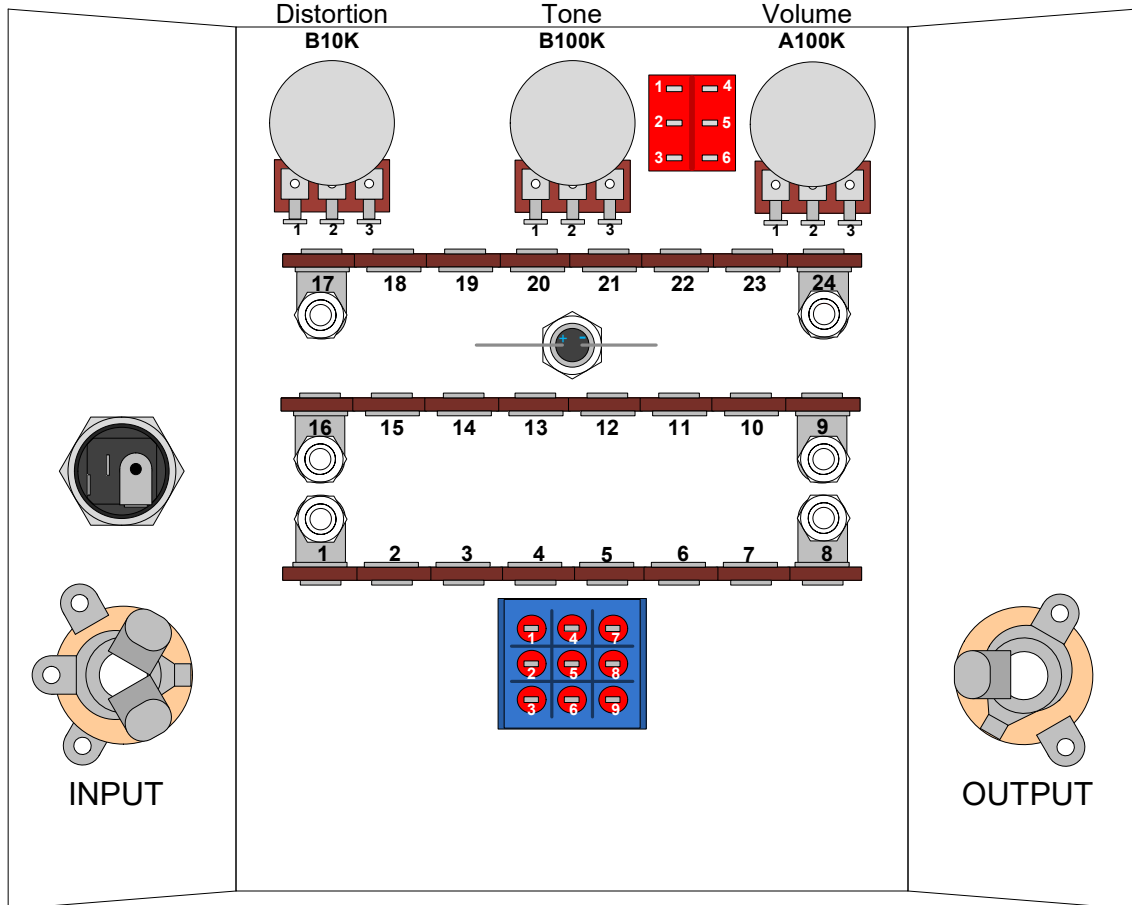
# DRAWING 1

LEFT SIDE

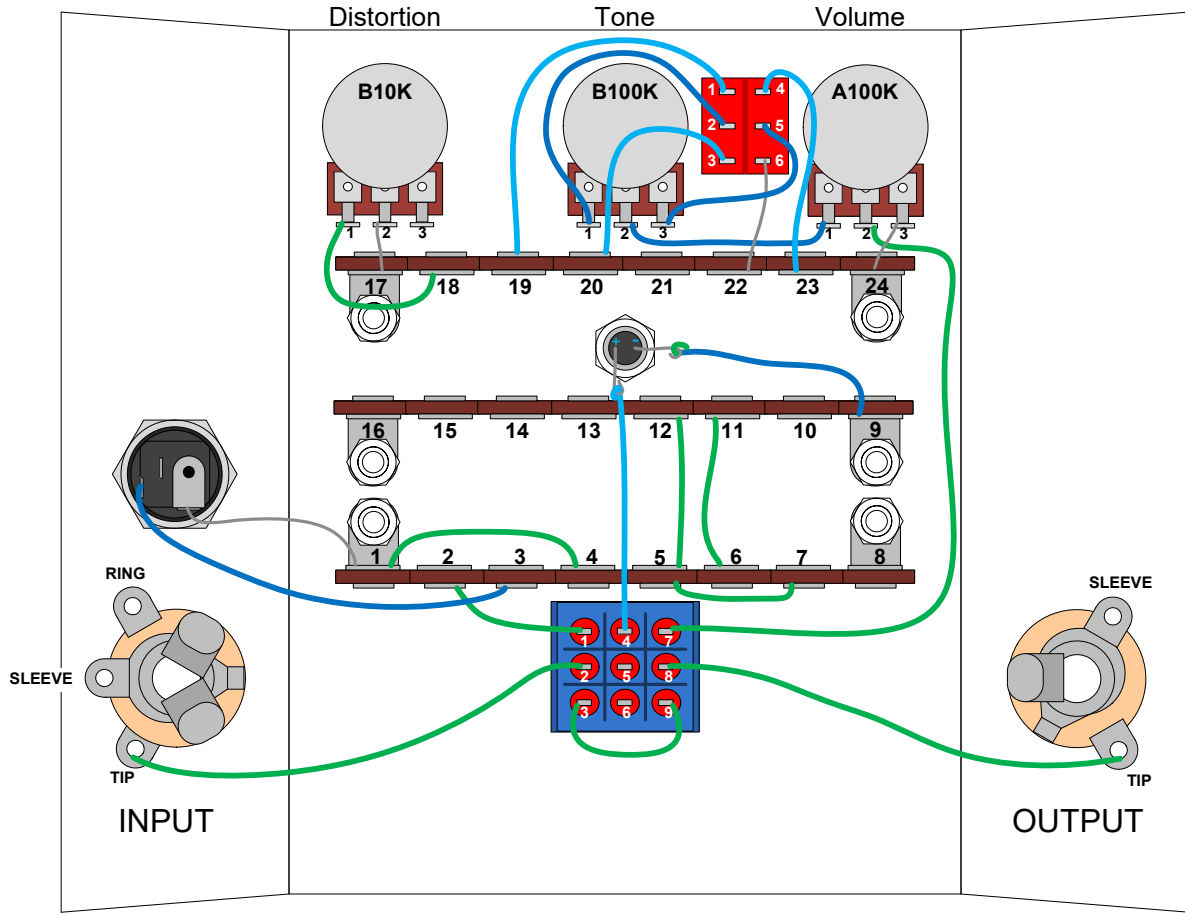
RIGHT SIDE



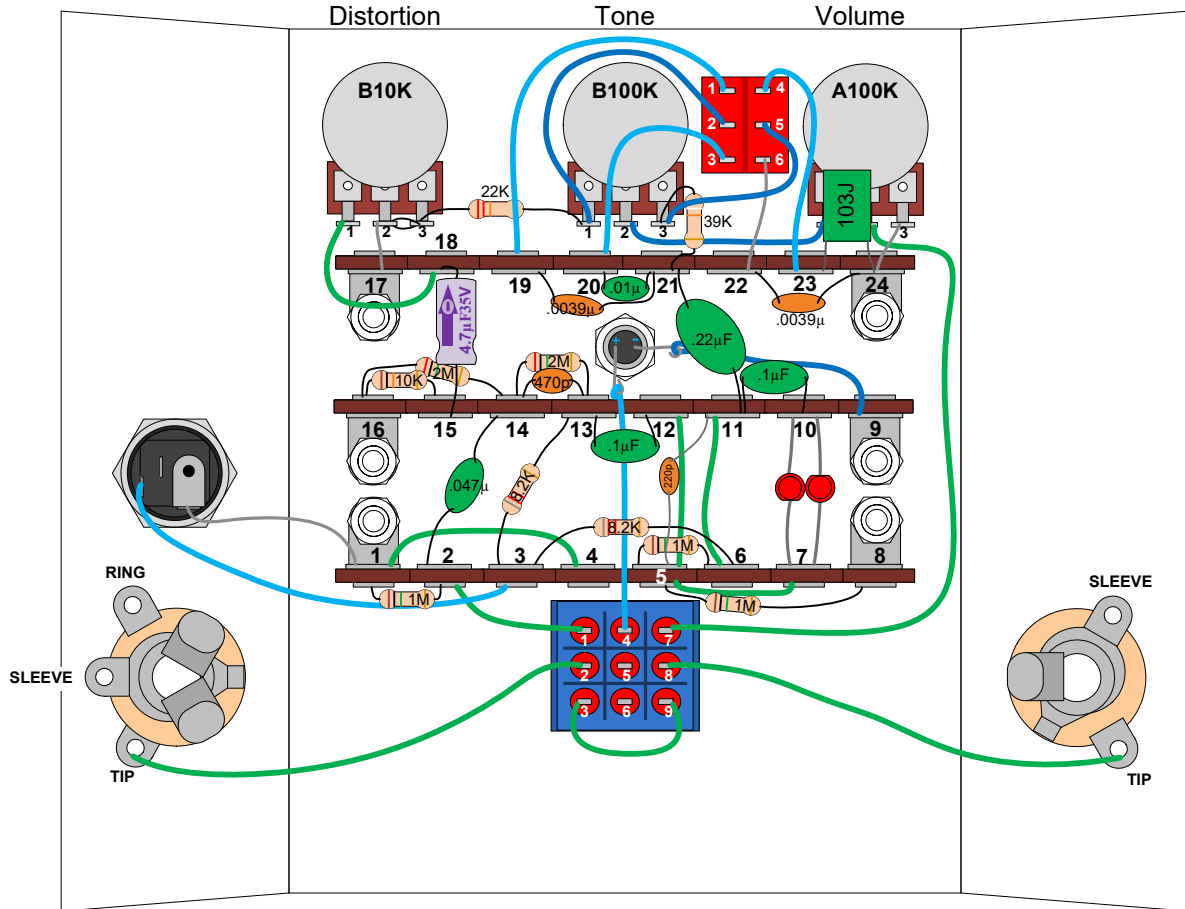
# DRAWING 2



### DRAWING 3



### DRAWING 4



# DRAWING 5

