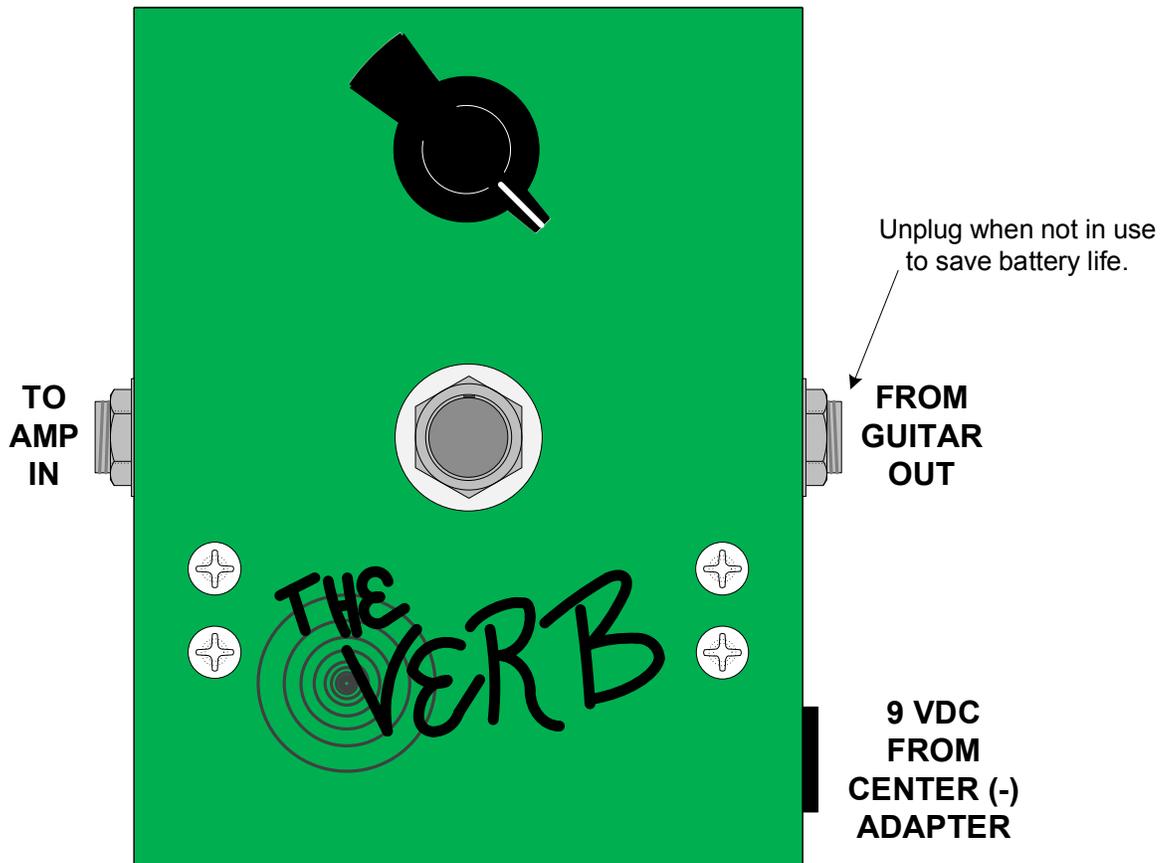


THE VERB (K-910)



Use these instructions to learn:

- How to build an effects pedal for reverb.

This pedal produces sweet warm reverb using the Belton Digi-Log module. It operates on a 9V battery or AC adapter (center negative), which are not included. When completed this pedal draws considerable current and battery life will be short. The use of an AC adapter is highly recommended.



TABLE OF CONTENTS

TOOL LIST	2
PARTS LIST DRAWINGS.....	3, 4
SOLDERING TIPS	5
STEP BY STEP ASSEMBLY INSTRUCTIONS	6
Section 1 – Mount Large Components	6
Section 2 – Prepare BTDR Reverb Module	7
Section 3 – Wire Large Components	7
Section 4 – Wire Footswitch	8
Section 5 – Install Reverb Module	8
Section 6 – Install Components to Terminals	9
Section 7 – Finishing Up	10

ASSEMBLY DRAWINGS (6 Drawings)

11 – 13
These are the last 3 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.

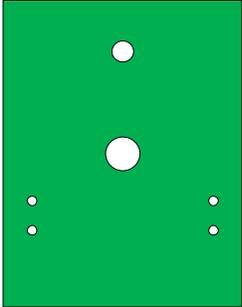
TOOL LIST

- 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) - Orange
S-W220 (4 FT)

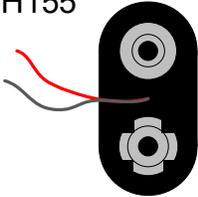
Enclosure
P-H1590BBCE-G (1)



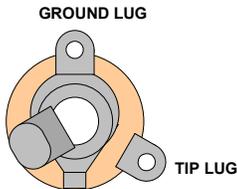
Chicken Head Knob
P-K300 (1)



Battery Clip
S-H155 (1)



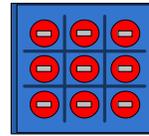
1/4" Mono Jack (Output Jack)
W-SC-11 (1)



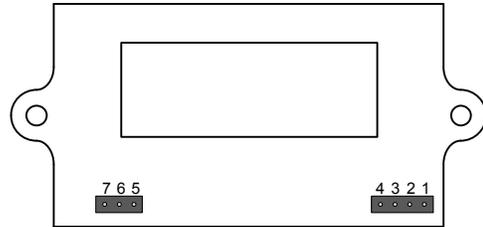
1/4" Stereo Jack (Input Jack)
W-SC-12B (1)



3PDT Foot Switch
P-H501 (1)



Reverb Module
P-RBTDR-1H-M (1)



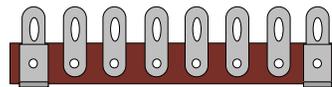
10kΩ Potentiometer with Linear Taper
R-VA10KL (1)



Terminal Strip with 2 Terminals
P-0201H (2)



Terminal Strip with 8 Terminals
P-0802H (2)



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



#6 Nuts
S-HHN632 (4)



PARTS LIST 2

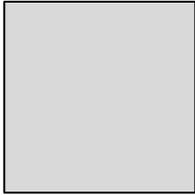
DC Power Jack

S-H750



(1)

Double Sided Foam Tape (1" x 1")



(1)

Voltage Regulator (78L05)

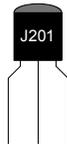
P-QMC78L05



(1)

N-Channel JFET (J201)

P-QJ201



(2)

0.1 μ F Capacitor

C-PFD1-50-R



(2)

0.047 μ F Capacitor

C-PFD047-50-R



(2)

10 μ F Polarized Capacitor 50V

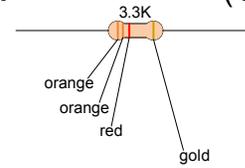
C-ET10-50



(1)

3.3k Ω Resistor $\frac{1}{2}$ W

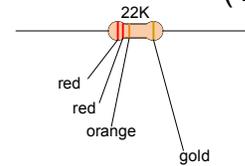
R-A3D3K



(1)

22k Ω Resistor $\frac{1}{2}$ W

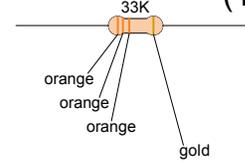
R-A22K



(1)

33k Ω Resistor $\frac{1}{2}$ W

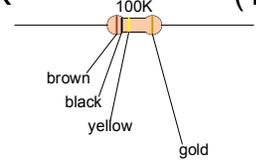
R-A33K



(1)

100k Ω Resistor $\frac{1}{2}$ W

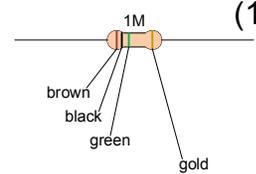
R-A100K



(1)

1M Ω Resistor $\frac{1}{2}$ W

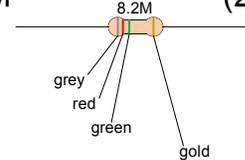
R-A1M



(1)

8.2M Ω Resistor $\frac{1}{2}$ W

R-A8D2M



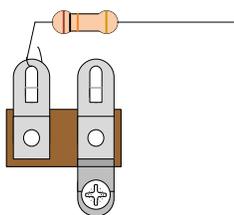
(2)

SOLDERING TIPS

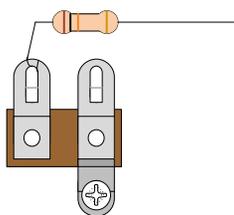
It is important to make a good solder joint at each connection point. A cold solder joint is a connection that may look connected but is actually disconnected or intermittently connected. (A cold solder joint can keep your project from working.)

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.*

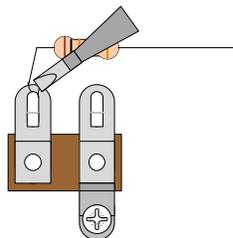
1. Bend the component lead or wire ending and wrap it around the connection point.
 - Make sure it is not too close to a neighboring component which could cause an unintended connection.
2. Wrap the component lead so that it can hold itself to the connection point.
3. Touch the soldering iron to both 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.



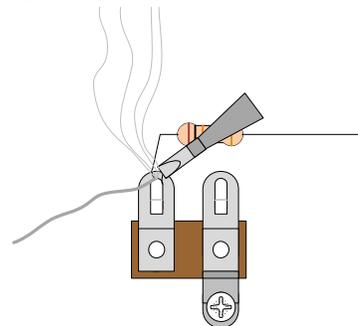
1. Bend the component lead and wrap it around the connection point.



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

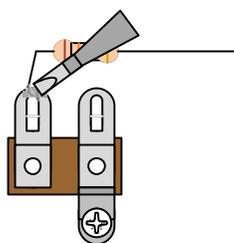


3. Heat up both component lead and connection point with the soldering iron.

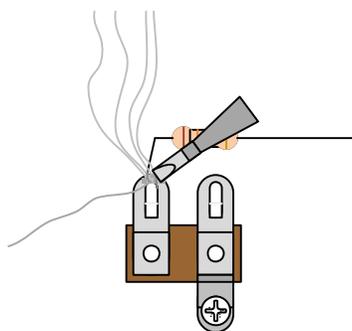


4. Apply solder to both component lead and connection point.

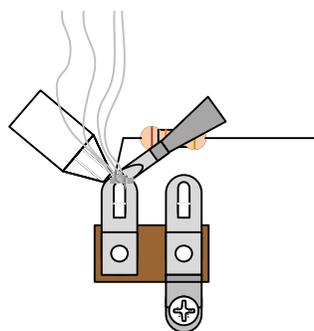
De-Soldering Tip



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

Stripping and 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 $\frac{1}{4}$ " 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 will prevent the stranded wire from fraying and will make the final soldering much easier.

Please refer to DRAWING 1 and DRAWING 2.

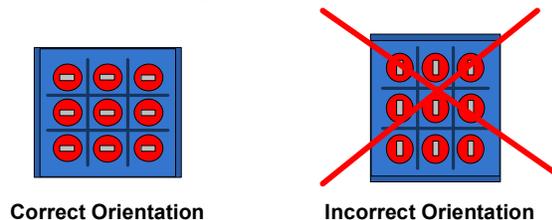
Orient box with single centered $\frac{5}{16}$ " hole on top and four $\frac{9}{64}$ " holes at bottom.

Mount potentiometer using hardware provided. Solder lugs should be pointed to large $\frac{1}{2}$ " hole for footswitch. (*You can break off the small mounting tab on the pot by bending it back with pliers*).

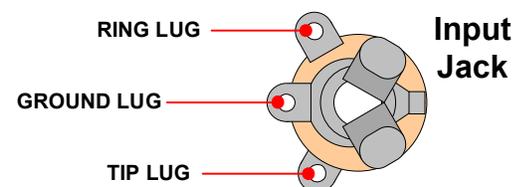
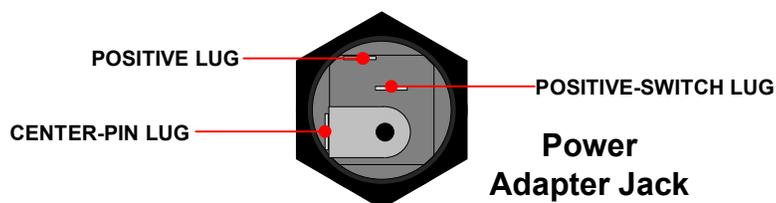
Mount input jack in $\frac{3}{8}$ " hole on left side of box with hardware provided. Washer goes under nut on outside of box. Make sure center solder lug of input jack is facing up. Correct positioning of jack will make soldering connections much easier. When positioned correctly, tighten nut.

Mount output jack in $\frac{3}{8}$ " 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 footswitch in $\frac{1}{2}$ " hole in center of box. 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 flat side of footswitch solder lugs are oriented left to right, not up and down as illustrated below.



Mount power adapter jack in $\frac{1}{2}$ " 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.



Locate battery snap connector. Cut 2 $\frac{1}{2}$ " off of the red lead. Strip $\frac{1}{8}$ " insulation off the end of the red lead. Connect and solder the red lead to the positive-switch lug of the power adapter jack. Connect and solder the black lead to the ring lug on the input jack.

Using hardware provided, fasten the two large terminal strips (8 lugs each). Fasten both terminal strips with screws and nuts on the left side first, snug, but not too tight. Mounting tabs for both large terminal strips should be oriented inward as illustrated in DRAWING 2.

Using one of the two, 2 lug terminal strips, bend the ground lug over flat. This lug will not be used.



Mount this tab on the same screw used to mount the right side of the top large terminal strip. Tighten this nut, making sure that the small terminal strip is perpendicular to the large terminal strip as illustrated. Mount the other 2 lug terminal strip on the same screw used to mount the right side of the second large terminal strip as illustrated.

It may be necessary to reorient the input and output jacks slightly so that they do not touch the terminal strips.

SECTION 2 – Prepare BTDR Reverb Module

Please refer to DRAWING 3.

Only four of the seven pins on the reverb module will be used. To help identify the pins not used and help prevent shorting of pins with other connections we will insulate the three unused pins.

Strip a piece of insulation off of the wire provided about 1 ½” long. Cut this insulation into three equal pieces. Gently press each piece of insulation over pins 2, 3 and 6 of the reverb module. (A little wax from a birthday candle applied to the pins may help in sliding the insulation onto the pins if needed).

Cut four 2 ½” lengths of wire, strip and tin ¼” on each end. Bend one end of each wire to form a small hook that can be slid around each pin. Bend pins out slightly to allow this if needed. Gently crimp this connection on each pin, then solder. Set module aside until installation later in instructions.



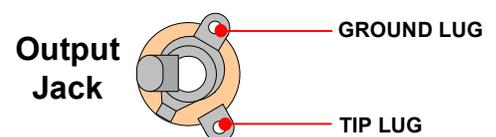
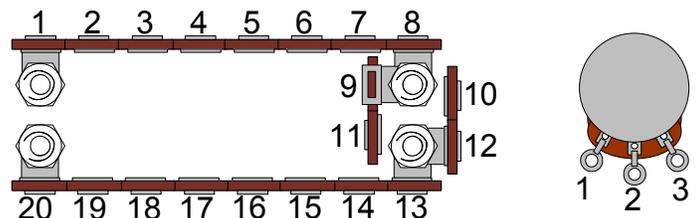
SECTION 3 – Wire Large Components

Please refer to DRAWING 4.

Please note that each terminal has been numbered as illustrated below and will be referred to as a “**terminal #_**” when connecting different components and wires throughout the assembly instructions.

Cut a 2 ½” length of wire, strip and tin each end. Connect this wire to solder lug 2 of the 10K pot and leave other end free for now.

Cut a 2 ½” length of wire, strip and tin. Connect one end to lug 3 of the 10K pot and other end to ground lug of output jack. Do not solder.



SECTION 4 – Wire Footswitch

Please refer to DRAWING 5

Each solder lug on the footswitch has been numbered as illustrated.

Strip ½” of wire. Twist tightly then lightly tin with solder. Cut off and bend into “U” shape small enough to fit through holes in lugs 7 and 8. Connect lugs 7 and 8, trim excess wire and solder.

Cut 3” length of wire, strip and tin. Connect to lug 4 of footswitch and tip lug of input jack. Solder both of these connections.

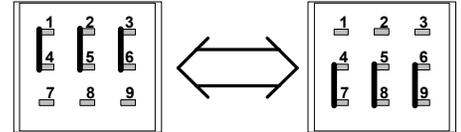
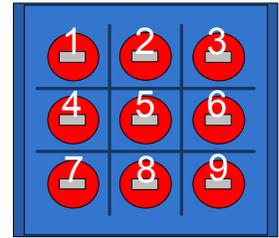
Cut 4” length of wire, strip and tin. Connect to lug 1 of footswitch. Solder this connection. Leave the other end free for now.

Cut 4” length of wire, strip and tin. Connect and solder one end to lug 2 of footswitch. Leave the other end free for now.

Cut 2 ½” length of wire, strip and tin. Connect one end to lug 5 of footswitch and the other end to tip lug of output jack. Solder both of these connections.

Cut 2” length of wire, strip and tin. Connect one end to lug 6 of footswitch and the other end to ground lug of output jack. Solder both of these connections.

Cut 2” length of wire, strip and tin. Connect one end to lug 9 of footswitch. Solder this connection. Leave the other end free for now.



Switching function of the 3PDT switch. The solid line illustrates an internal connection between terminals.

SECTION 5 – Install Reverb Module

Please refer to DRAWING 5.

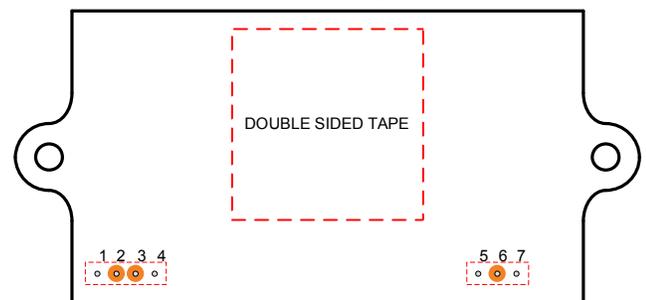
Remove backing from one side of double sided tape. Put sticky side centered on 10K pot.

Connect end of wire soldered to pin 1 of module to lug 1 of 10K pot. Solder this connection.

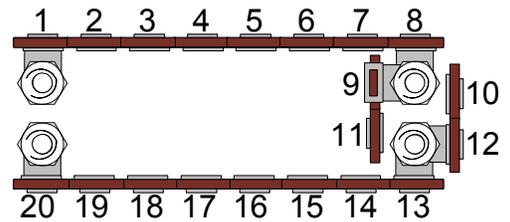
Connect end of wire soldered to pin 5 of module to lug 3 of 10K pot. Solder this connection. Lug 3 has 2 wires. One from pin 5 and one going to ground lug of output jack. Solder both in place.

Leave wires soldered to pin 4 and pin 7 free for now.

TRANSPARENT VIEW OF MODULE FROM ABOVE



Looking from above and through the reverb module in order to see pin number locations

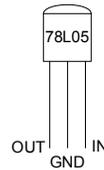


SECTION 6 – Install Components to Terminals

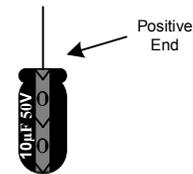
Please refer to **DRAWING 6**.

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).

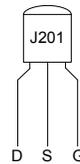
- Terminal #10:**
- “IN” pin of voltage regulator 78L05
 - 1 ½” length of wire
 - 3 ½” length of wire
- Terminal #8:**
- Ground pin of 78L05
- Terminal #7:**
- “OUT” pin of voltage regulator 78L05
 - Positive end of 10µF capacitor
 - Wire coming from reverb module pin #7



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



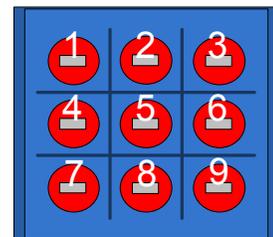
- Terminal #15:**
- “Source” pin of the J201 transistor
 - One lead from the 0.1 µF capacitor
 - One end of the 22K resistor



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

- Terminal #14:**
- “Drain” pin of the J201 transistor
 - Wire coming from terminal #10
 - One end of a 3 ½” length of wire
- Terminal #13:**
- Free end of the 22K resistor
 - Negative end of the 10µF capacitor
- Terminal #11:**
- Free end of 0.1 µF capacitor (other end was connected to #15)
 - Wire coming from lug 2 of footswitch

- Terminal #16:**
- “Gate” pin of the J201 transistor
 - One end of a 100K resistor
 - One end of a 2 ½” length of wire



- Terminal #17:**
- One end of two 0.047µF capacitors
 - One end of a 33K resistor
 - One end of a 1 ½” length of wire

- Terminal #18:**
- One end of a 8.2M resistor
 - One end of a 0.1µF capacitor
 - One end of a 1M resistor
 - One end of a 2” length of wire

- Terminal #20:**
- Free end of the 1M resistor
 - Free end of the 8.2M resistor

- Terminal #19:**
- Wire from lug 1 of footswitch
 - Free end of 0.1 μ F cap
 - Free end of wire coming from #16

- Terminal #6:**
- Free end of 100K resistor
 - Wire from lug 9 of footswitch
 - Wire coming from lug 2 of the pot

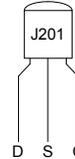
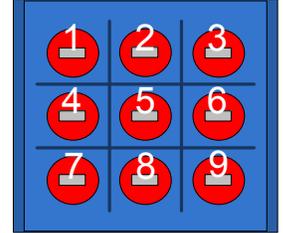
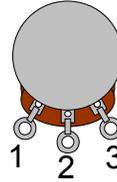
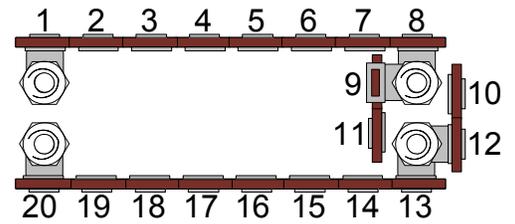
- Terminal #5:**
- Wire from #17
 - Wire from pin 4 of reverb module

- Terminal #4:**
- Wire coming from #10
 - "Drain" pin from the other J201 transistor
 - One end of 8.2M resistor

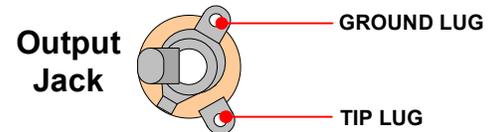
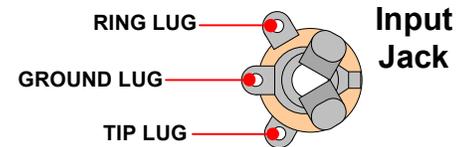
- Terminal #3:**
- Free end of 0.047 μ F cap from #17
 - Free end of 33K resistor from #17
 - "Source" pin from J201 transistor
 - One end of 3.3K resistor

- Terminal #2:**
- Free end of 8.2M resistor (from #4)
 - "Gate" pin of J201 transistor
 - Free end of wire from #18

- Terminal #1:**
- Free end of 0.047 μ F cap from #17
 - Free end of 3.3K resistor



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



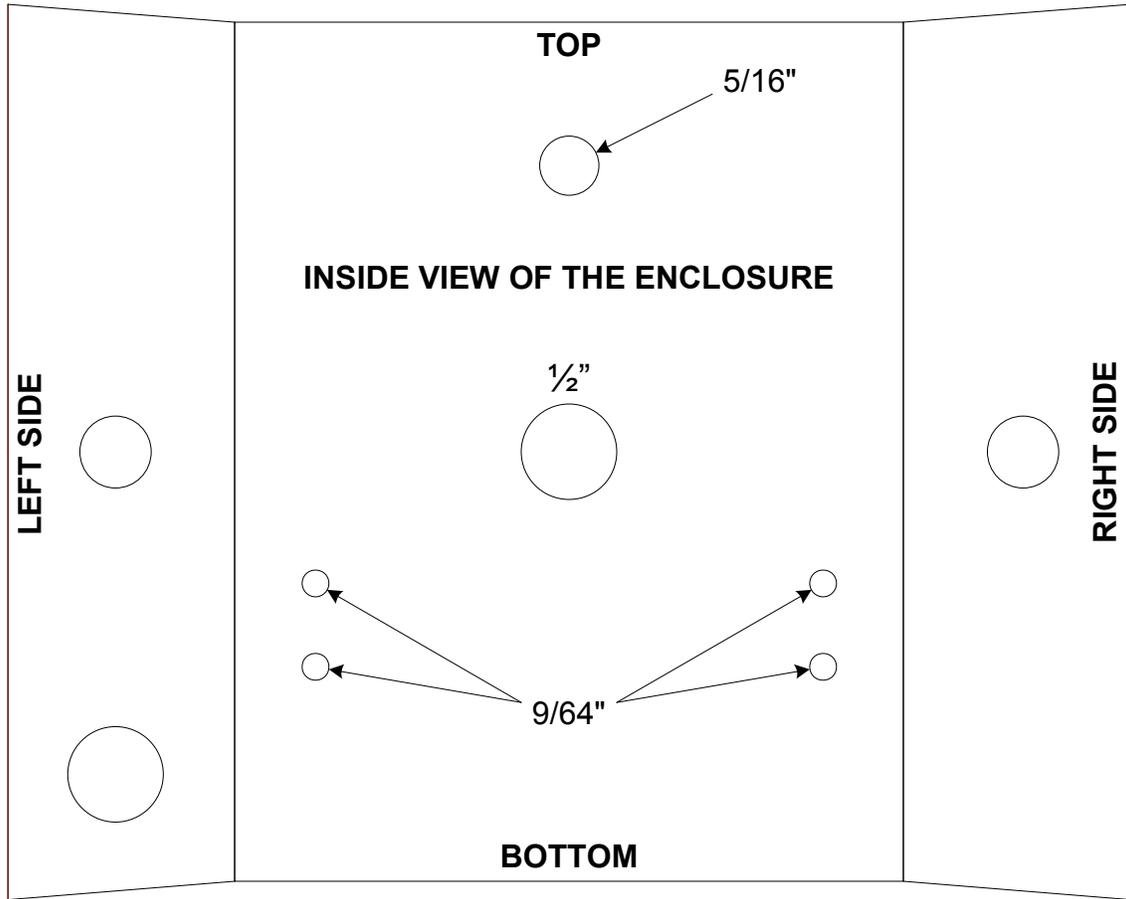
SECTION 7 – Finishing Up

- Free end of wire from #14 to the upper positive lug on the power adapter jack
- Remove backing from double sided tape and push reverb module into place taking care to move wires out of the way.
- Cut 3 1/2" length of wire, strip and tin. Connect and solder one end to the large center-pin lug on the adapter jack. Connect and solder the other end of this wire to the ground lug on the input jack.

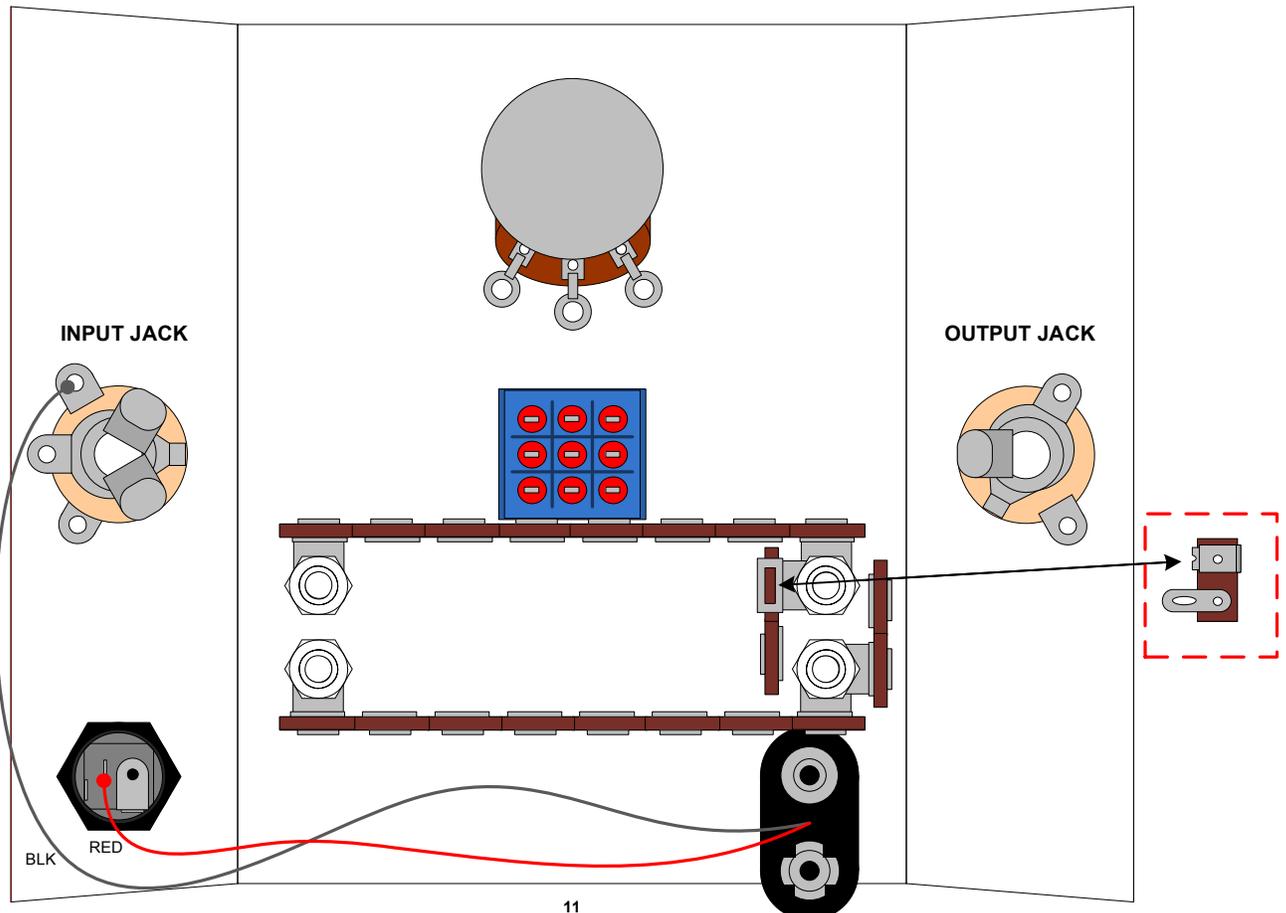
Attach knob provided to shaft of pot. Install 9 volt battery, close cover using screws provided. Plug guitar into input jack on right. This turns unit on. Plug cable into output jack and plug into your amplifier. Battery will last only about 1 1/2 hours of continuous operation. 9 volt, center negative 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.

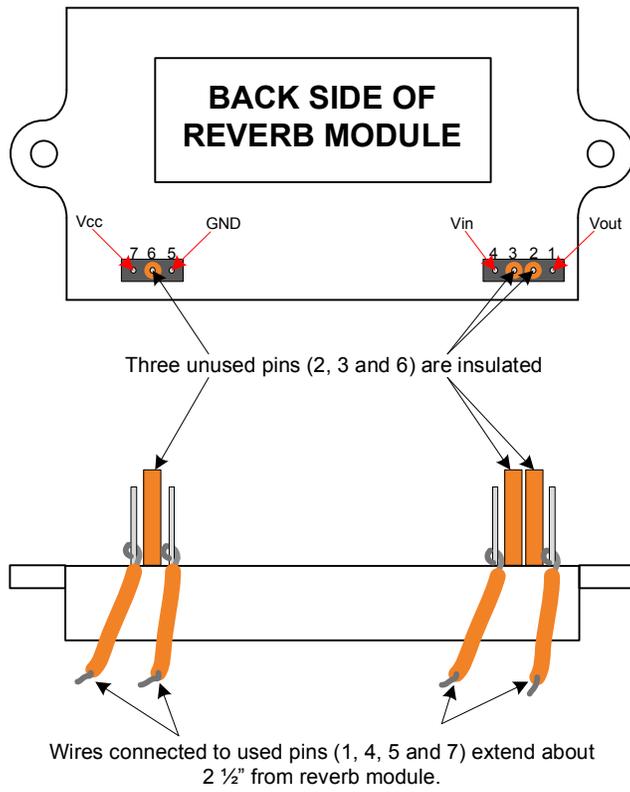
DRAWING 1



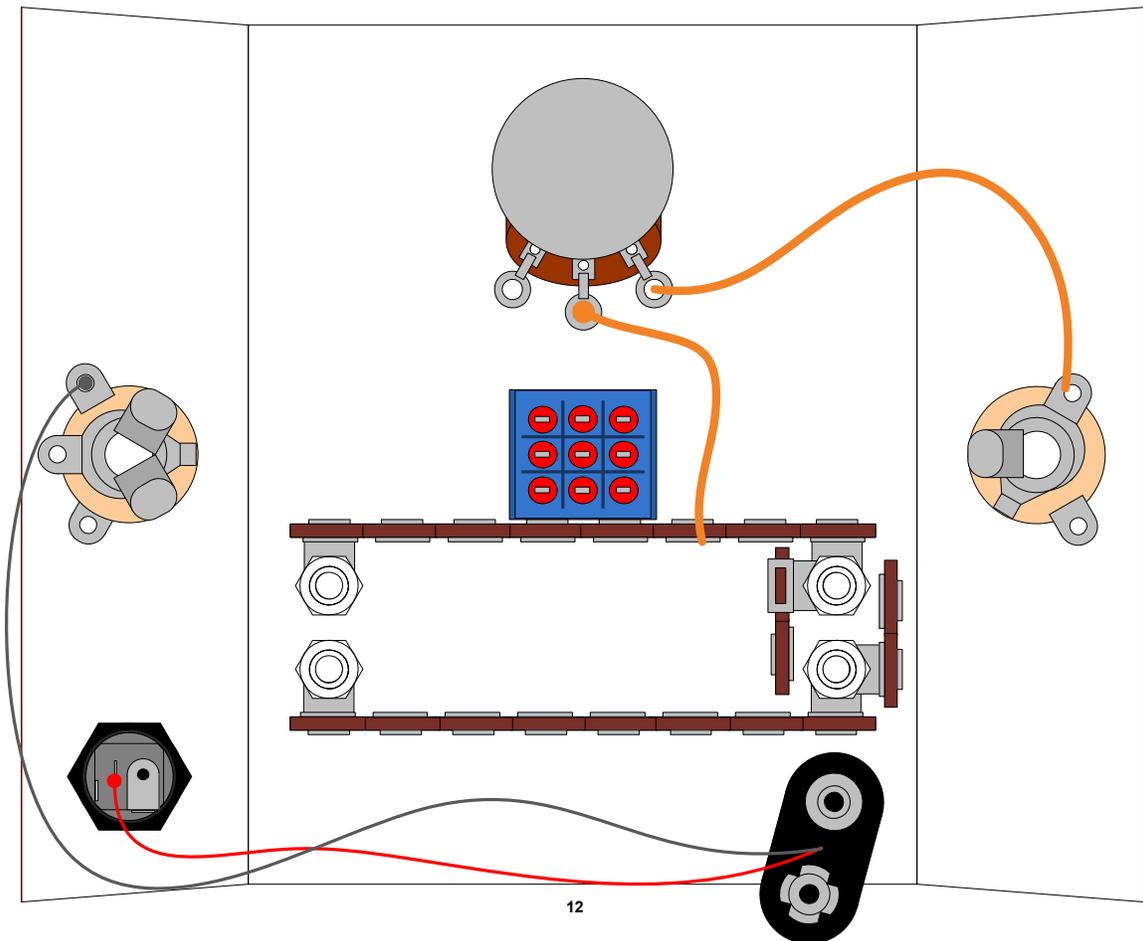
DRAWING 2



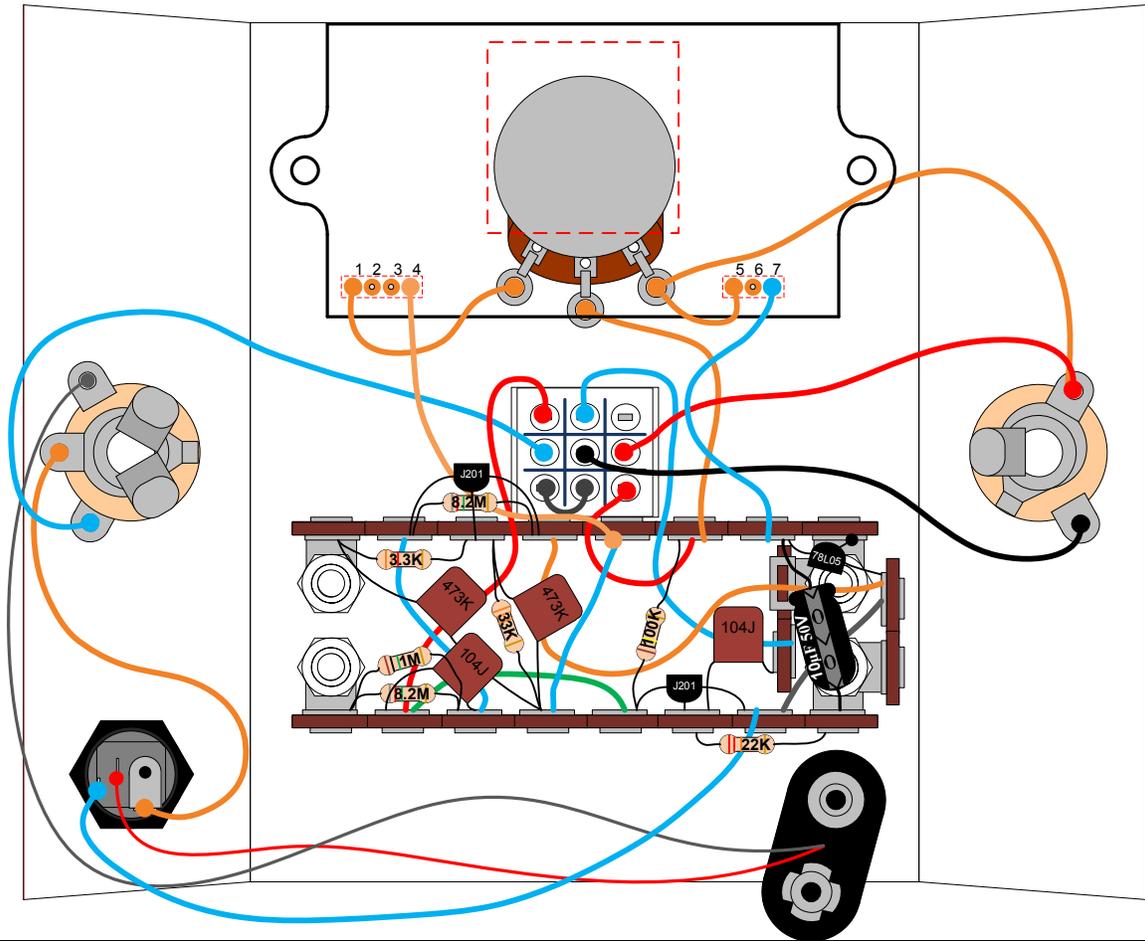
DRAWING 3



DRAWING 4



DRAWING 5



DRAWING 6

