

# **Build Your Own Clone E.S.V. Fuzz (Germanium) PNP Positive Ground Kit Instructions**



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[www.buildyourownclone.com/board](http://www.buildyourownclone.com/board)

When posting a tech support thread on the BYOC forum, please post it in the correct lounge, and please title your thread appropriately. If everyone titles their threads "HELP!" then it makes it impossible for the people who are helping you to keep track of your progress. A very brief description of your specific problem will do. It will also make it easier to see if someone else is having or has had the same problem as you. The question you are about to ask may already be answered. Here is a list of things that you should include in the body of your tech support thread:

1. A detailed explanation of what the problem is. (more than, "It doesn't work, help")
2. Pic of the topside of your PCB.
3. Pic of the underside of your PCB.
4. Pic that clearly shows your footswitch/jack wiring and the wires going to the PCB
5. A pic that clearly shows your wiring going from the PCB to the pots and any other switches(only if your kit has non-PC mounted pots and switches)
6. Is bypass working?
7. Does the LED come on?
8. If you answered yes to 6 and 7, what does the pedal do when it is in the "on" position?
9. Battery or adapter (if battery, is it good? If adapter, what type?)

Also, please only post photos that are in focus.

## **Revision Notes:**

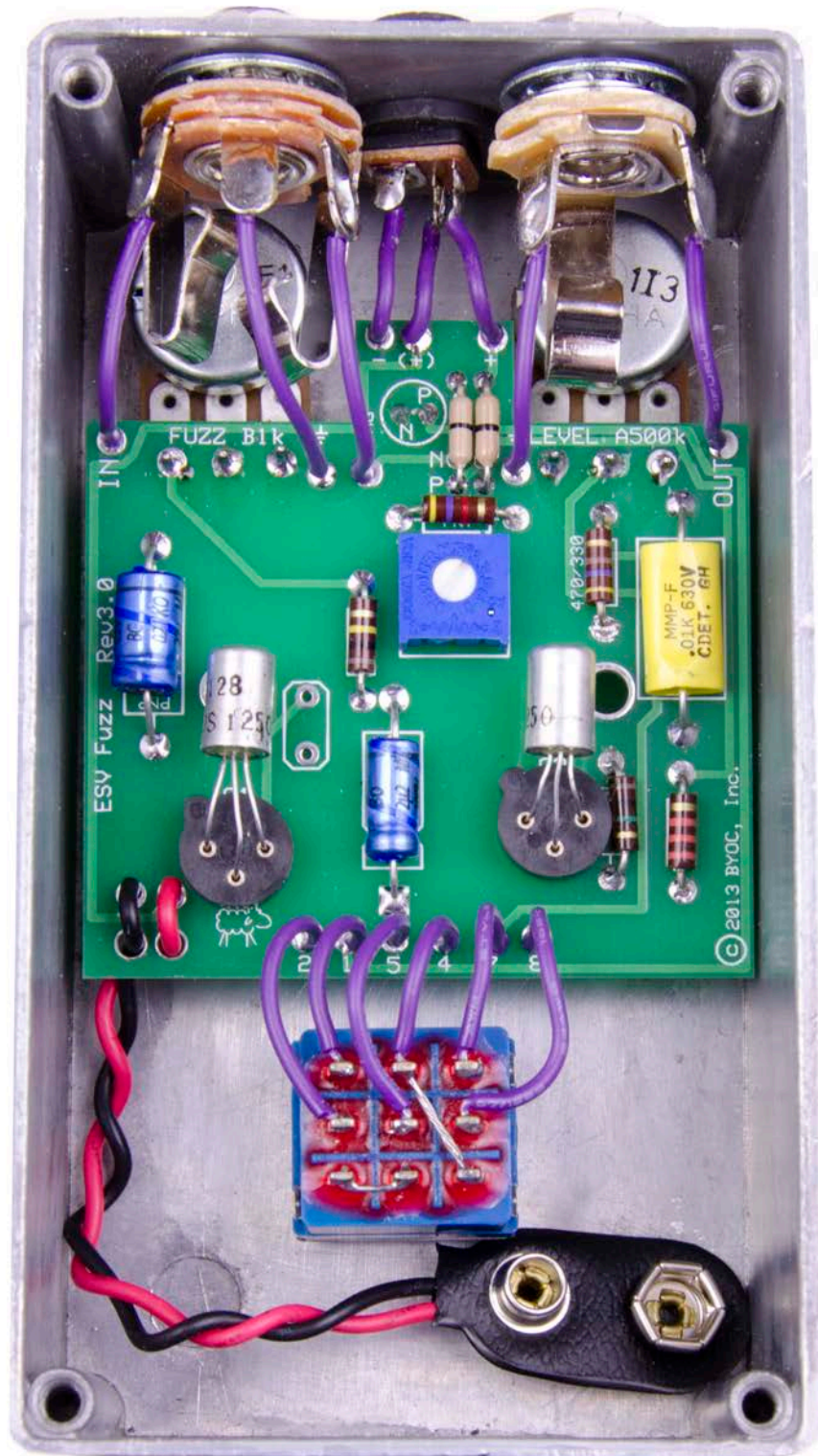
E.S.V. Fuzz Rev 3.0 No known errors.

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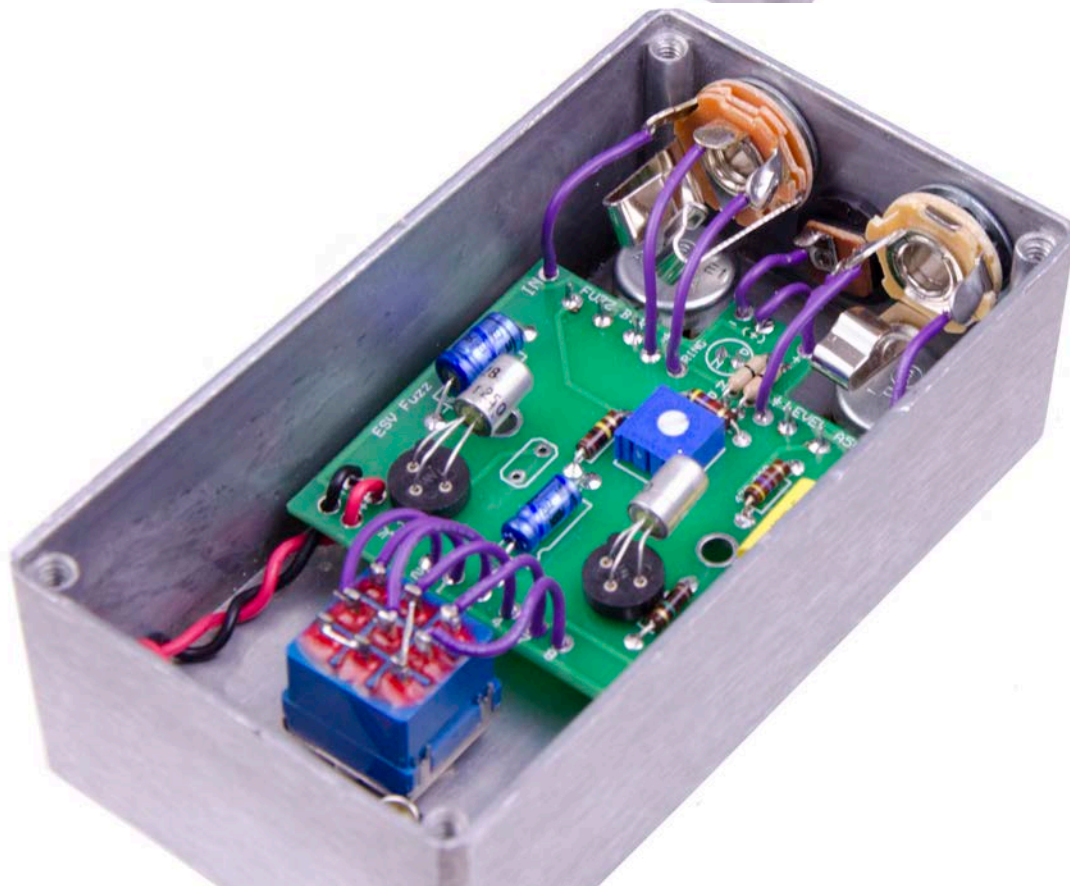
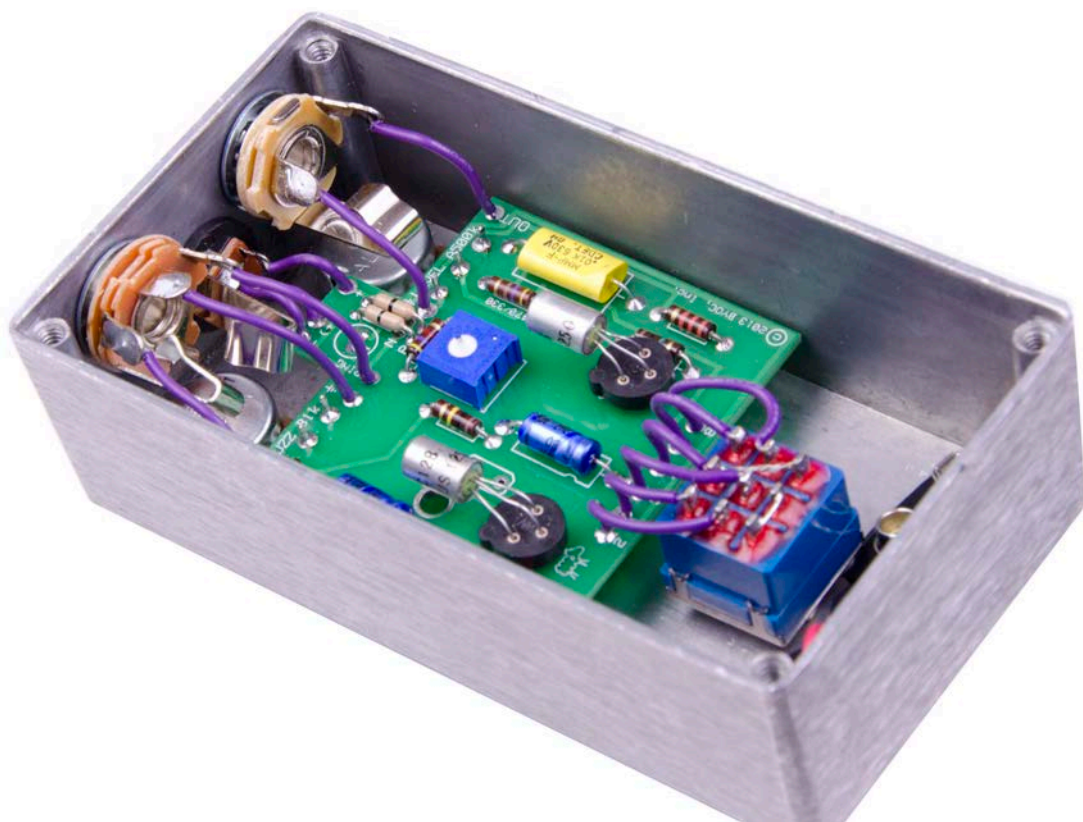
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## Parts Checklist for ESV Fuzz PNP Positive Ground Kit

### Resistors:

- 2 – zero ohm jumpers (single black stripe)
- 1 - 470ohm (yellow/purple/brown/gold)
- 1 - 4.7k (yellow/purple/red/gold)
- 1 - 33k (orange/orange/orange/gold)
- 1 - 100k (brown/black/yellow/gold)
- 1 - 1M (brown/black/green/gold)

### Trimpot:

- 1 - 25k trimmer

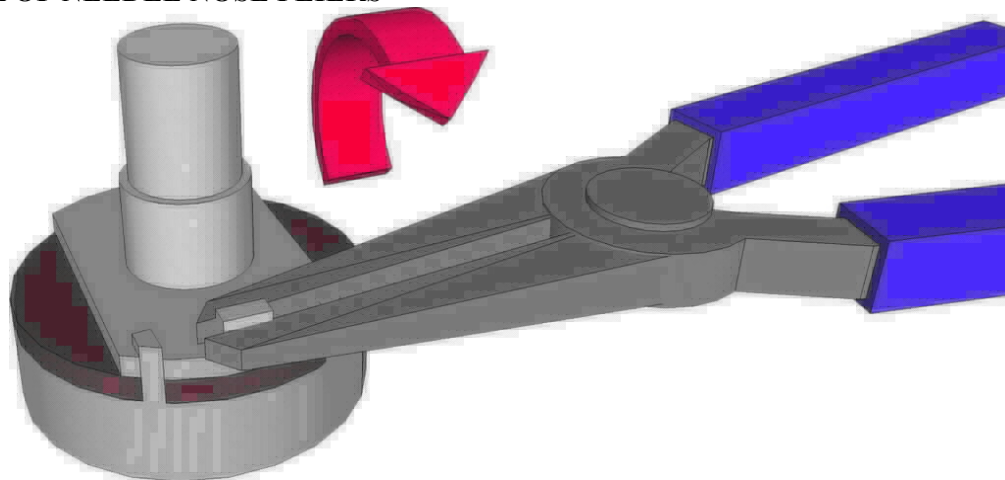
### Capacitors:

- 1 - 0.01uf film
- 1 - 2.2uf aluminum electrolytic
- 1 - 22uf aluminum electrolytic

### Transistors:

- 2 – AC128 Germanium Transistors
- 2 - Transistor sockets

**Potentiometers: SNAP THE SMALL TABS ON THE TOP OF THE POTS OFF WITH A PAIR OF NEEDLE NOSE PLIERS**



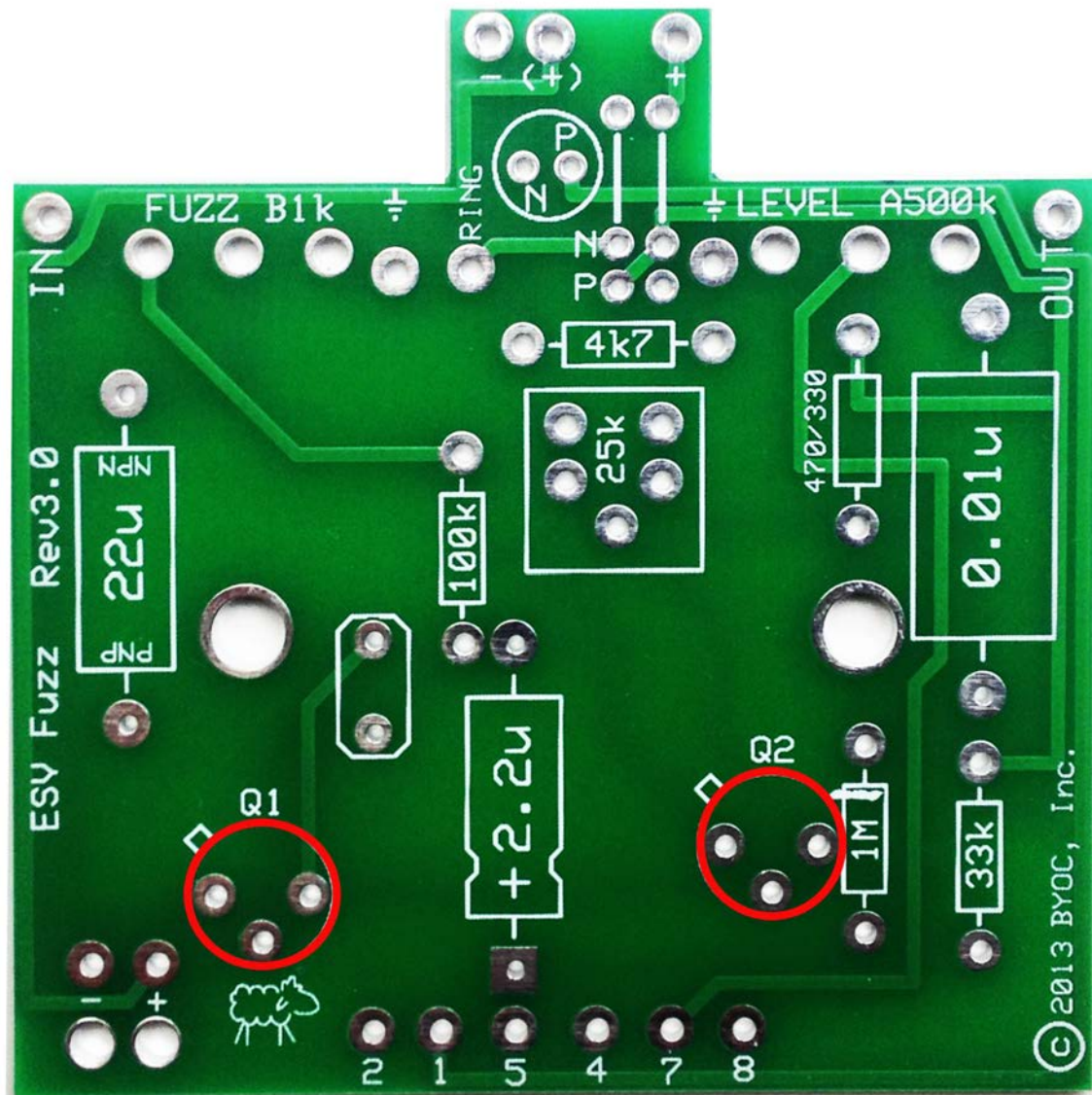
- 1 - A500K Audio Volume pot
- 1 - B1K Linear Fuzz pot

### Hardware:

- 1 - predrilled enclosure w/ 4 screws
- 1 - esv fuzz kit circuit board
- 1 - 3pdt footswitch
- 2 - knobs
- 1 - AC adaptor jack
- 1 - 1/4" stereo jack
- 1 - 1/4" mono jack
- 1 - battery snap
- 1 - red LED
- hook-up wire

# Populating the Circuit Board

**Step 1:** Add the transistor sockets. Make sure that the tab on the socket matches up with the tab on the circuit board. **Do not add the transistors yet and do not solder the transistors to anything.** Only solder the sockets.

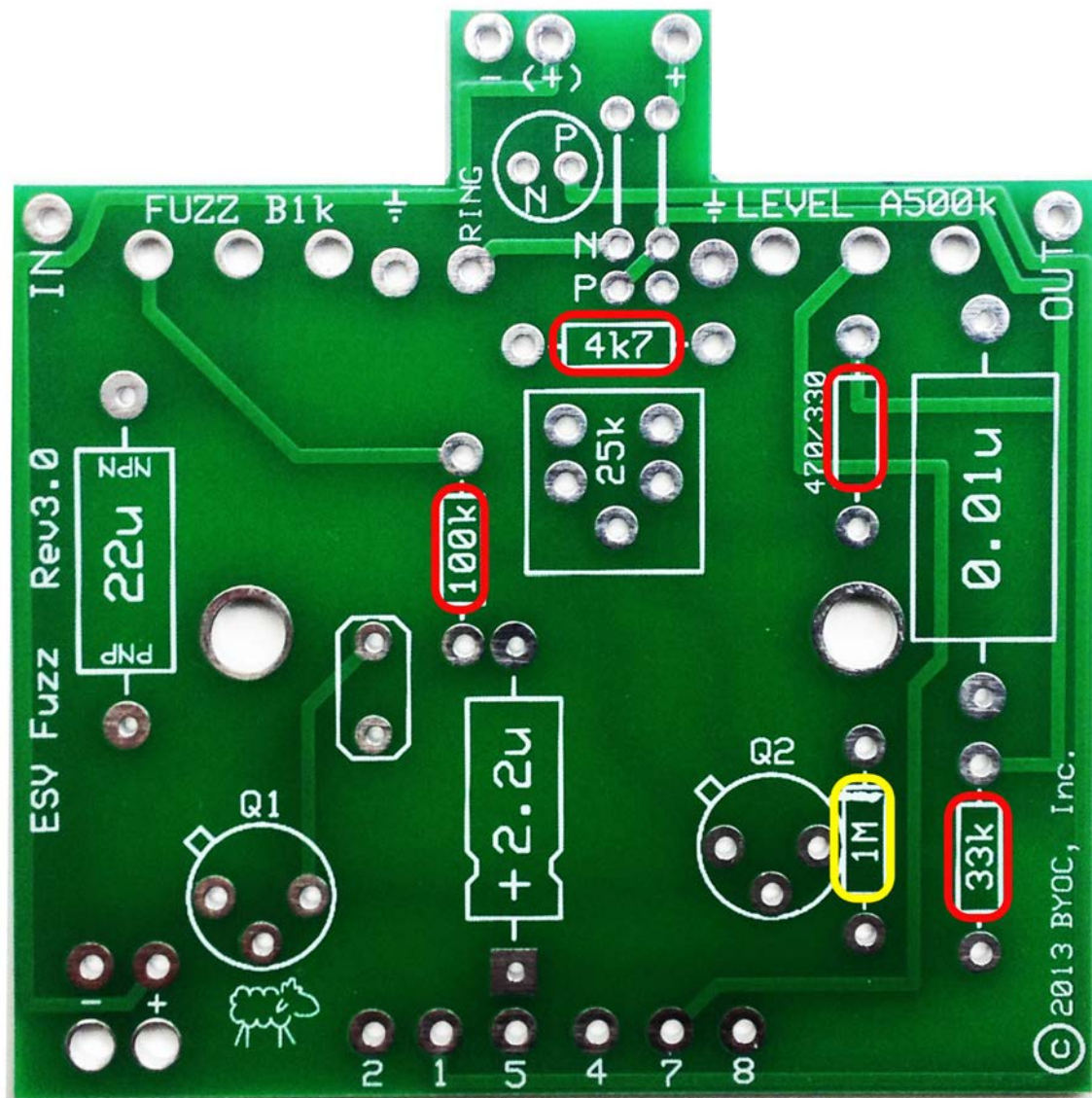




**Step 2:** Add all the resistors. Resistors are not polarized and can be inserted in either direction. Save the excess lead clippings from these resistors. You will need them to make jumpers in the next step.

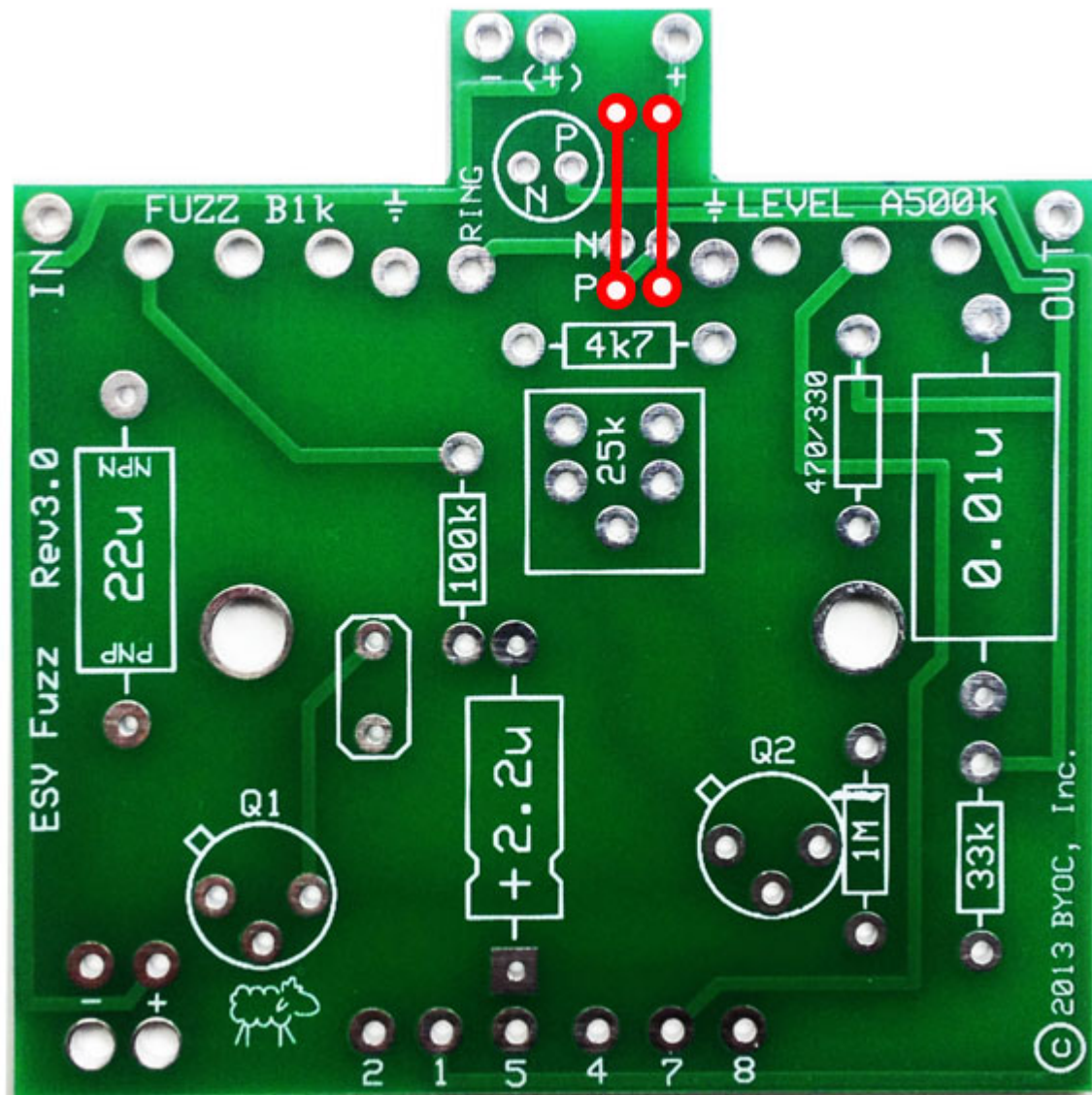
Use the 470 ohm resistor for germanium transistors. You would only want to use a 330 ohm for silicon transistors.

**1M WILL NEED TO BE SLIGHTLY BENT TO THE RIGHT TO FIT NEXT TO THE Q2 SOCKET**

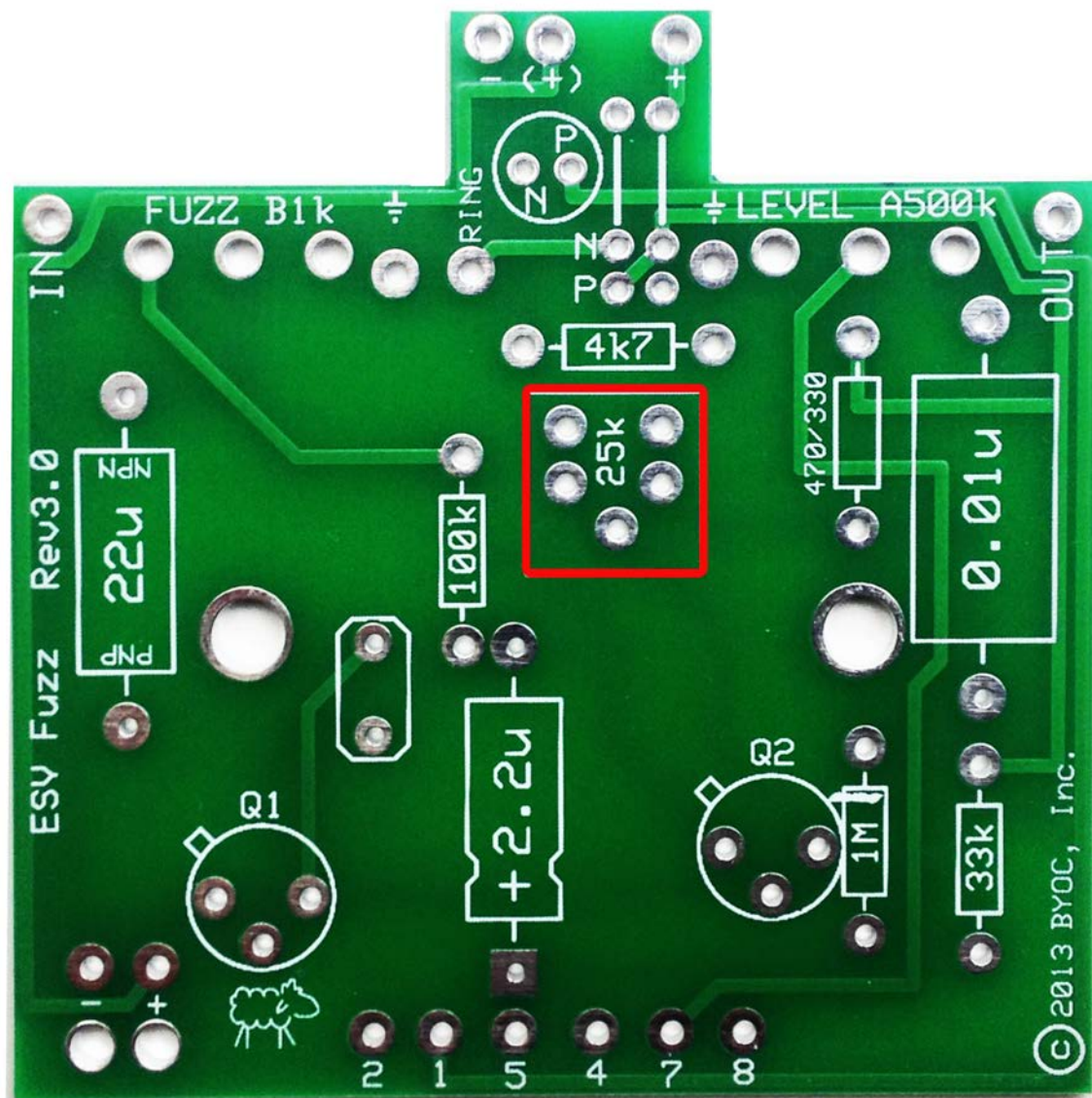




**Step 2:** Make jumpers between the two “P” eyelets and the eyelets without any label as shown in the diagram below. Your PNP kit should have come with two ZERO ohm resistors. You can use these or you can use some left over clippings from the other resistors. These jumpers will make the circuit have a positive ground. If you were to make the jumpers to the “N” eyelets, that would give the circuit a negative ground.

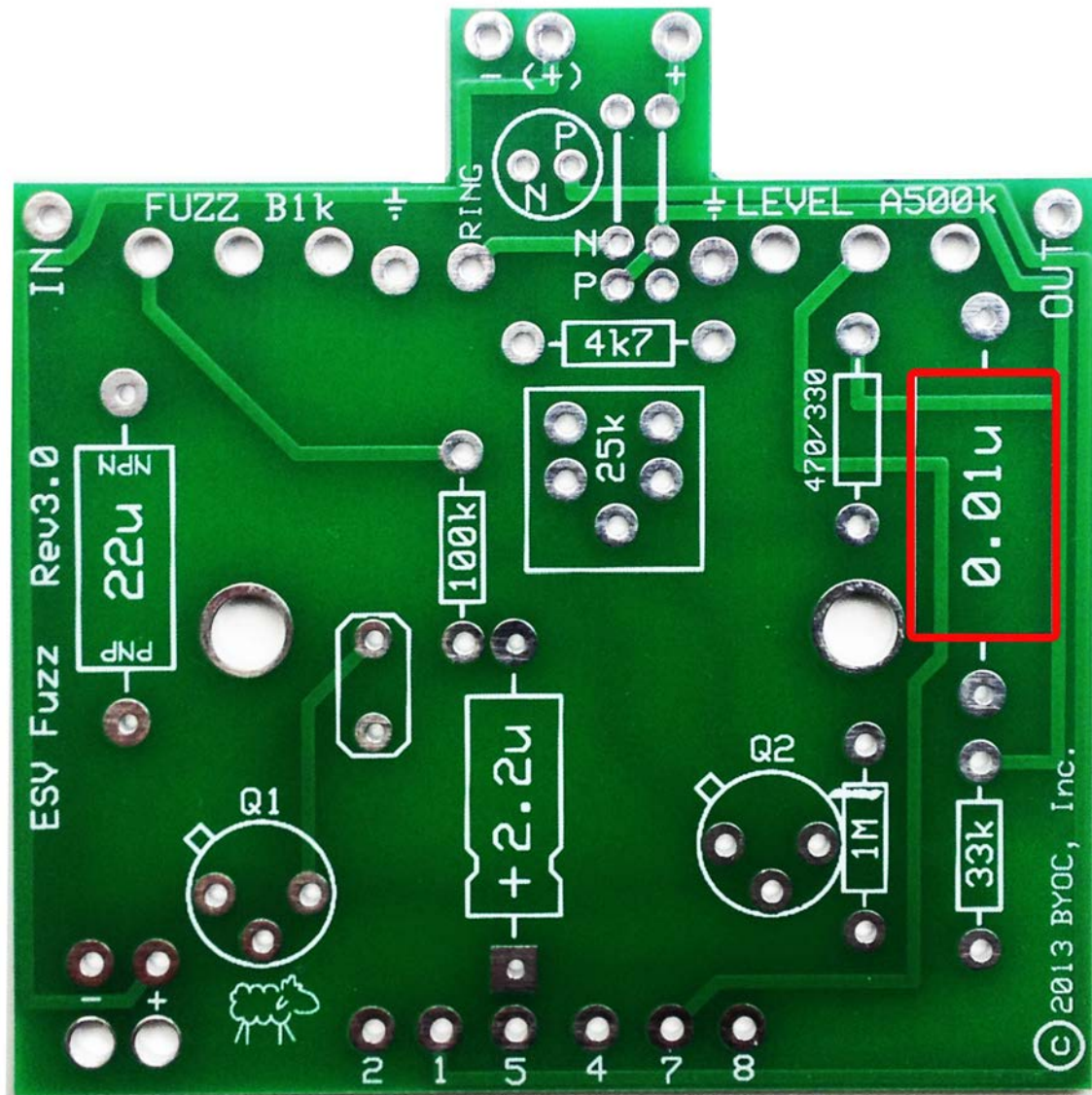


**Step 4:** Add the bias trimpot. The board is designed to accept several brands of trimmers, but there is only one way to insert the trimpot that comes with the kit. Directions for setting the trimpot are in the “Finish Up” portion of the directions.

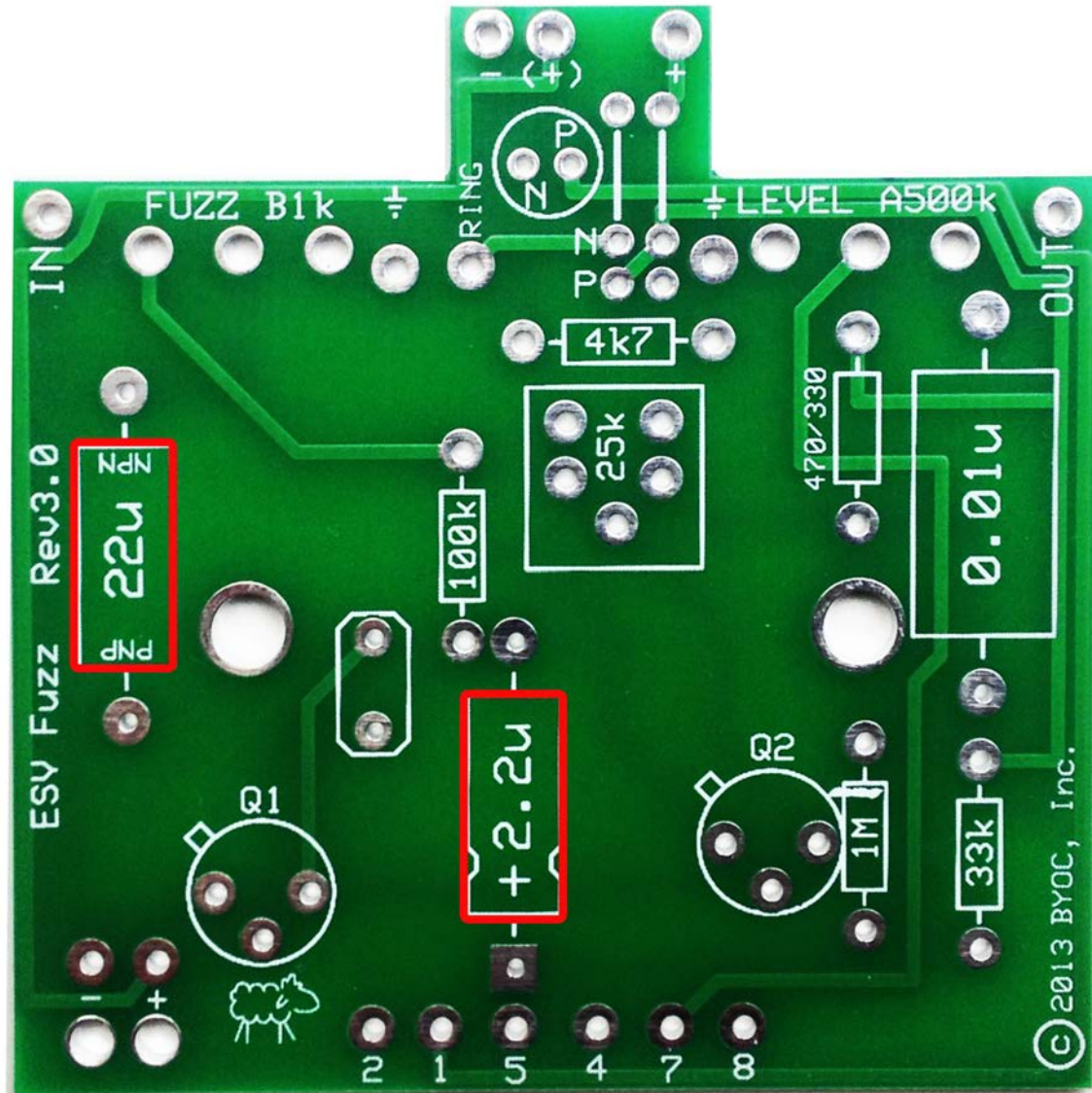




**Step 5:** Add the 0.01uf film capacitor. This is non-polarized so it can go in either direction.

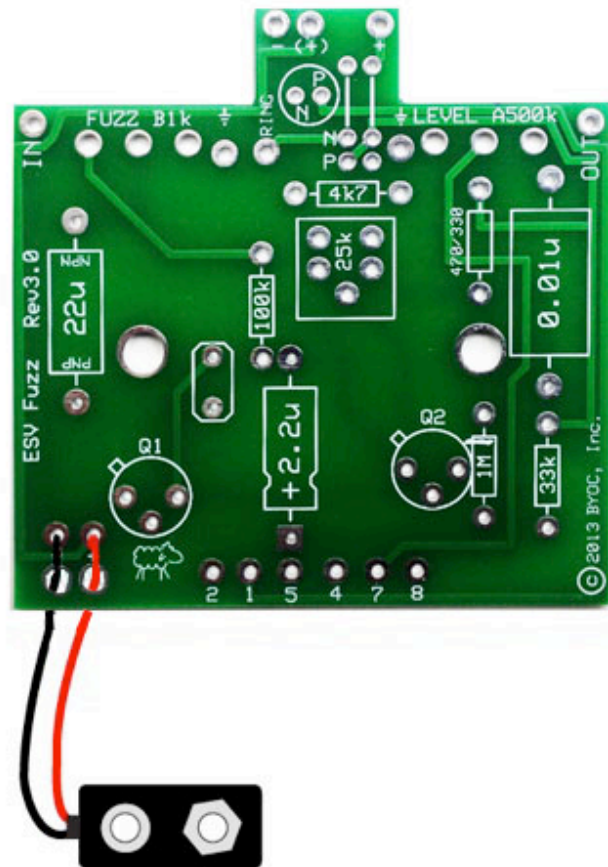


**Step 6:** Add the aluminum electrolytic capacitors. These are polarized, meaning there is a positive and negative end. You will be able to identify the positive end by the indented collar around that side. For the 2.2uF cap, the positive end goes in the square solder pad. It should be obvious from the layout how to orient the 2.2uF. The 22uF depends on whether you are building for NPN or PNP. Here we are building for PNP, so **the positive end of the 22uF cap goes in the side that says “PNP”**.

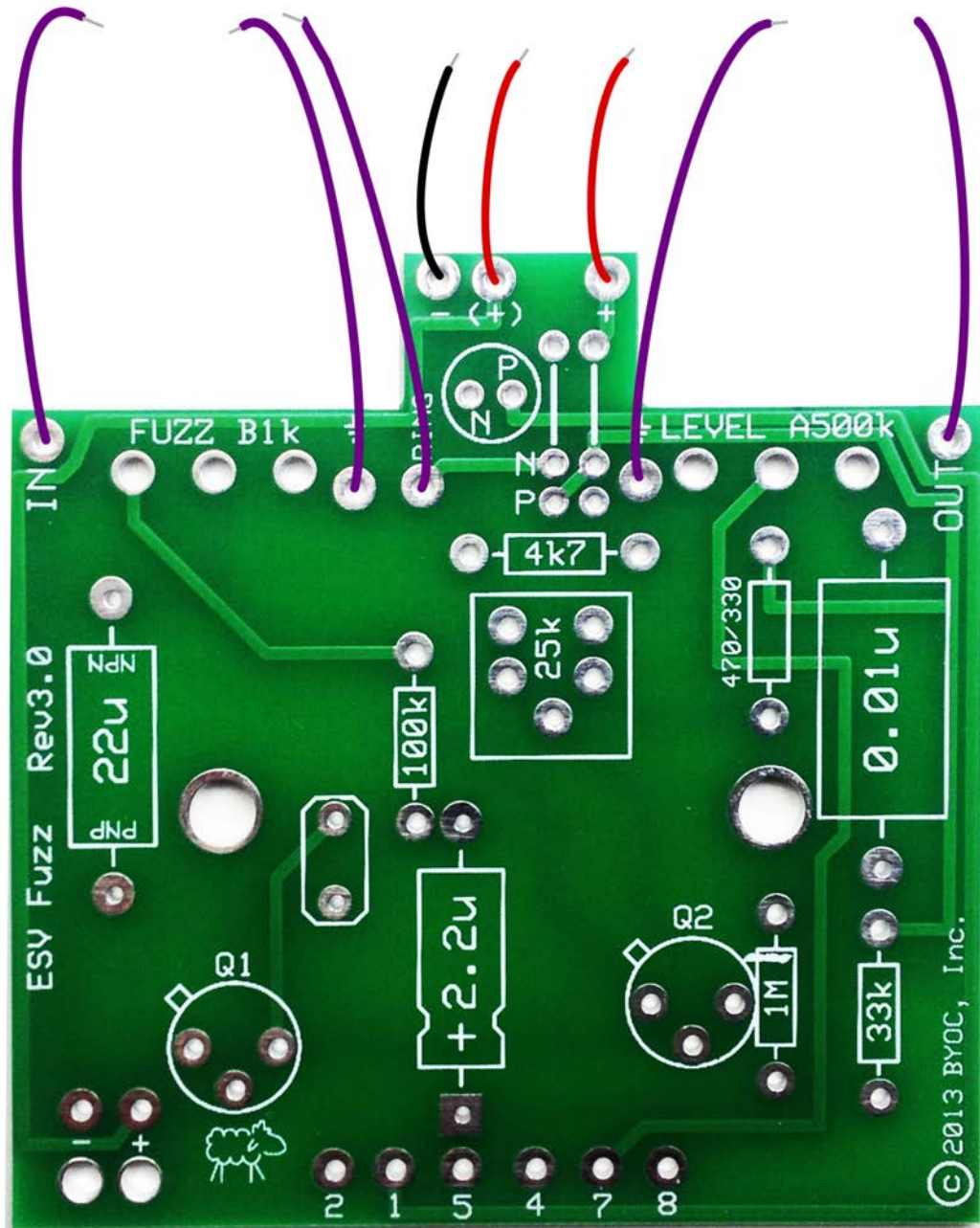




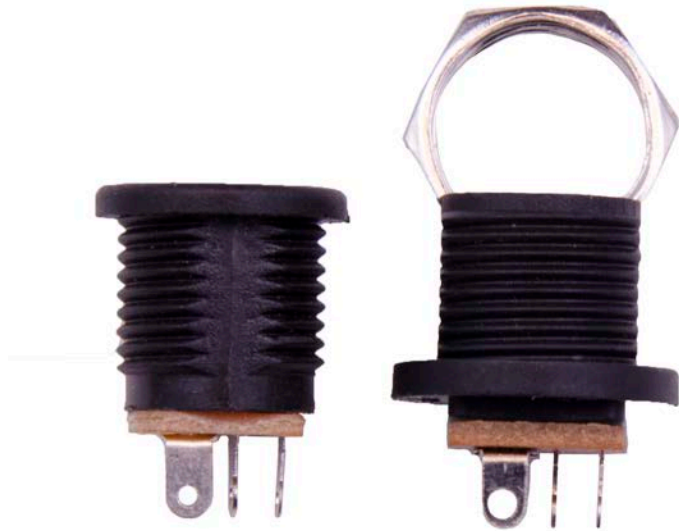
**Step 7:** Add the battery snap. Thread the solder ends of the battery snap into the strain relief holes from the bottom solder side of the PCB and out through the top. Insert the solder ends of the battery snap wires into the topside of their respective solder pads. Solder on the bottom side of the PCB. **Remember the red wire goes in the “+” hole and the black wire goes in the “-” hole.**



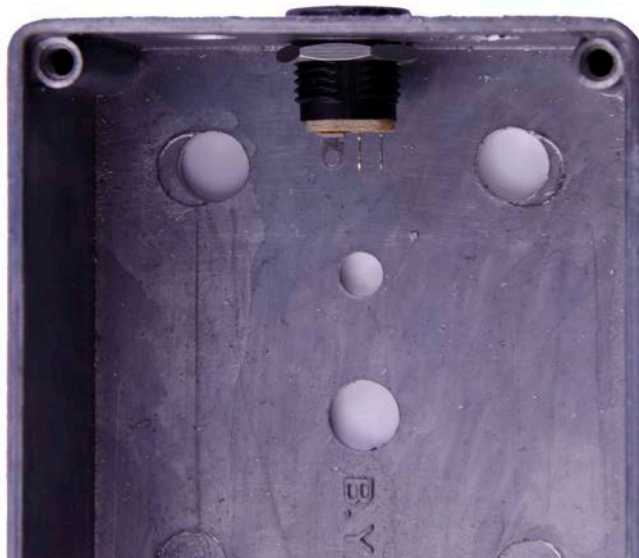
**Step 8:** Add wires to the IN, OUT, RING, two Ground eyelets, and DC adapter eyelets. Start by cutting five 2.5" pieces of wire, and three 1" pieces. Strip 1/4" off each end and tin the ends. Tinning means to apply some solder to the stripped ends of the wires. Solder a 2.5" piece of wire to each of the IN, OUT, RING, and Ground eyelets on the PCB. Solder a 1" piece to each of wire to the DC adapter jack eyelets on the PCB. Load the wires in from the top and solder on the bottom of the PCB.



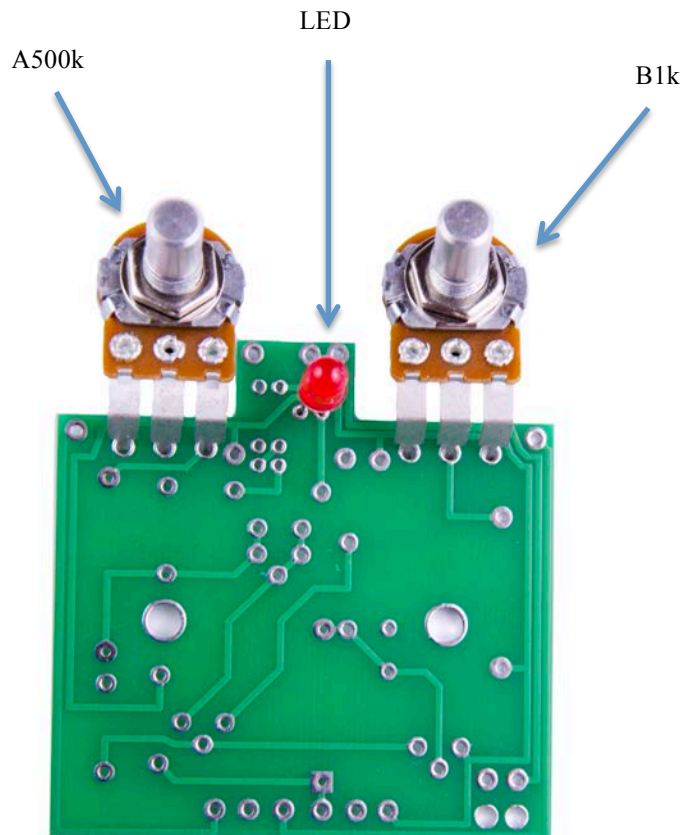
# Main PCB Assembly



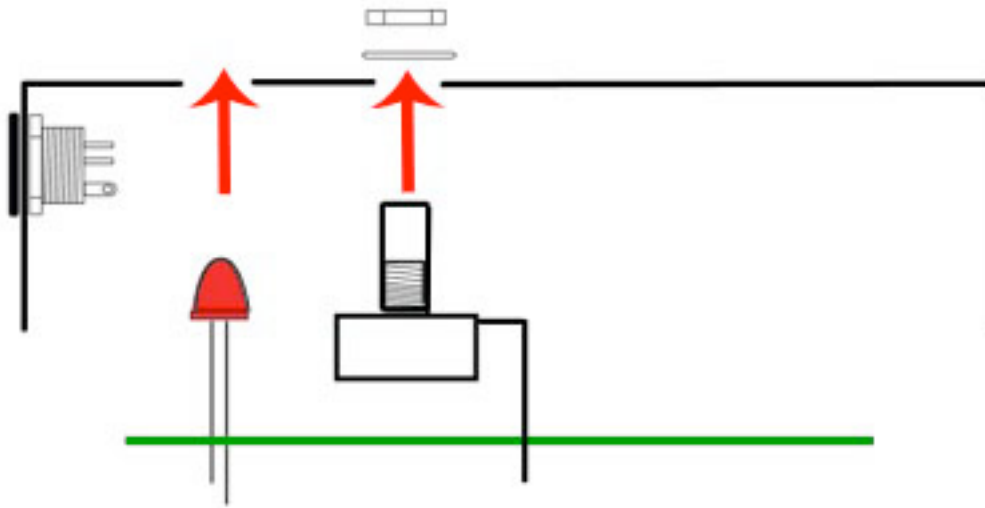
**Step 1:** Mount the AC adapter jack to the enclosure. Your kit may come with either an external thread or internal thread. Don't get confused by this. They still function exactly the same. You just thread the external nut on the outside and the internal nut on the inside. The picture below is of an internal nut jac



**Step 2:** Flip the PCB over so that the bottom or solder side is up. Insert the B1k (FUZZ) & A500k (VOLUME) potentiometers, and the LED into the bottom side of the PCB. **DO NOT SOLDER ANYTHING YET!!!** The LED will have one lead that is longer than the other. **MAKE SURE THE LONGER LEAD GOES IN THE HOLE MARKED “P” AND THE SHORTER LEAD IN THE HOLE MARKED “N”!!!!**



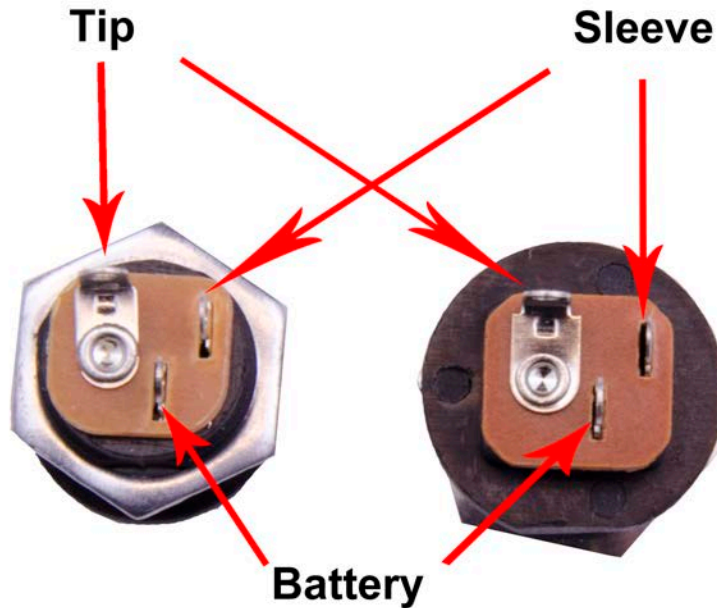




**Step 3:** Hold the PCB in one hand so that the component side of the PCB is in the palm of your hand and the bottom side with the pots, toggle switch and LED is facing up. Now use your other hand to guide the predrilled enclosure onto the PCB assembly so that the pots and LED all go into their respective holes. Once the PCB assembly is in place, secure it by screwing on the washers and nuts for the pots. Only tighten them with your fingers. **You do not want them very tight yet.**

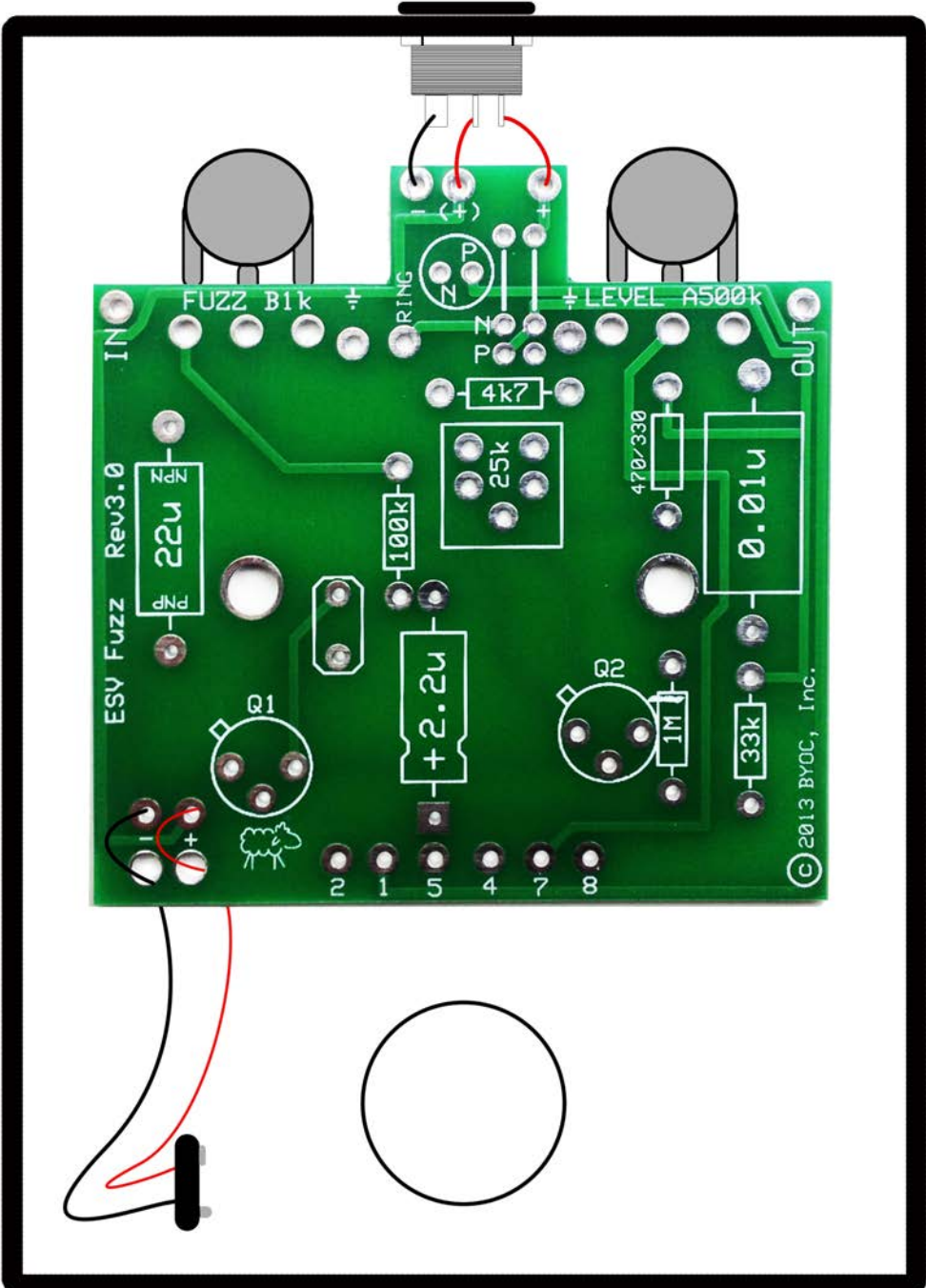
**Step 4:** Turn the entire pedal over so that the component side of the PCB is facing up. Lift the PCB up off the pots about 2mm just to make sure that the back of the PCB does not short out against the pots. Make sure the PCB is level and symmetrically seated inside the enclosure.

**Step 5:** Solder the pots and LED. You will solder these parts on the component side of the PCB. After you have soldered them in place, be sure to tighten up their nuts.



**Step 6:** Connect the TIP (negative) terminal of the DC adaptor jack to the eyelet on the PCB labeled “-“. Connect the SLEEVE of the DC adaptor jack to the eyelet on the PCB labeled “+”. Connect the battery disconnect terminal of the DC adaptor jack to the eyelet on the PCB labeled “(+)”. See diagram on the next page.

Please do not overthink this part. Just because your pedal has a positive ground does NOT mean you have to do anything different with your DC adapter jack. It still gets wired for a negative tip. You will still use a regular, standard, normal negative tip adapter. If you don't fully understand why yet, you'll just have to trust us. The ONLY thing you need to worry about with this pedal is not using a daisy chain power supply unless all of the other pedals on the daisy chain have a positive ground.



# Wiring

## Stereo (input) Jack



## Mono (output) Jack



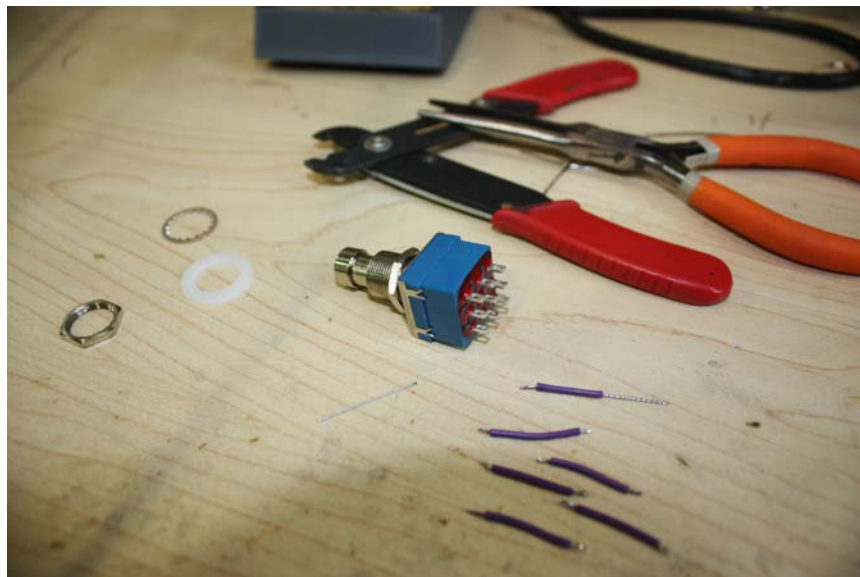
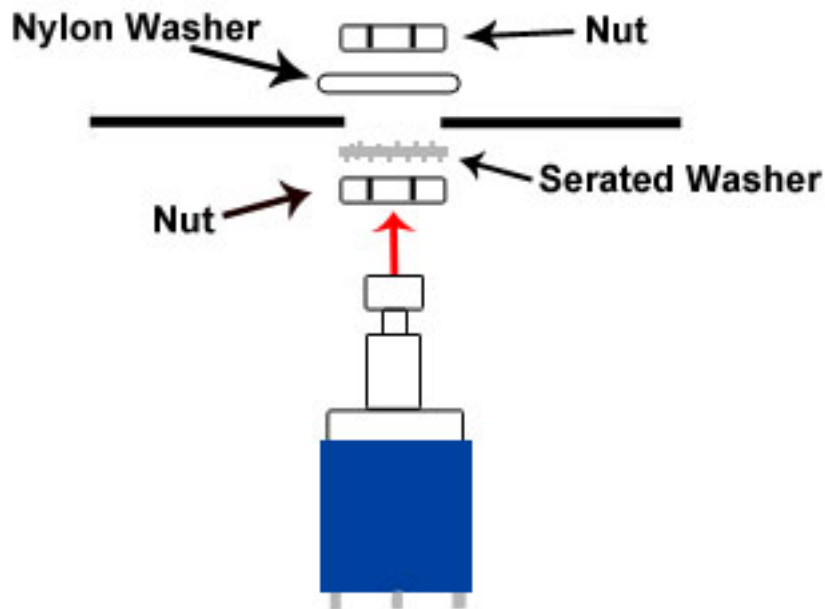
**Step 1:** Install the 1/4" jacks to the enclosure.



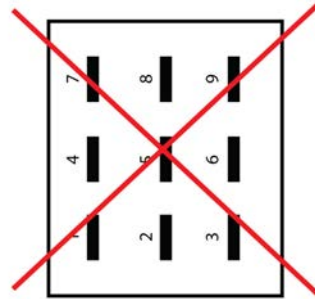
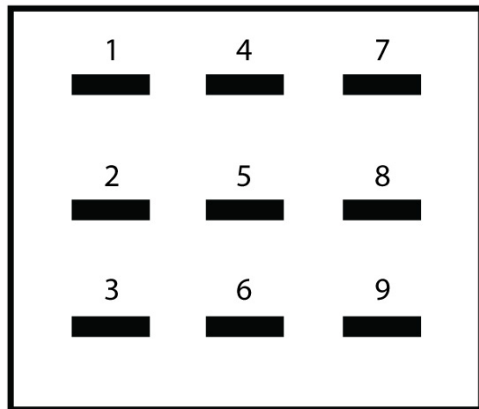
**Step 2:** Install the footswitch. Orient the footswitch so that the flat sides of the solder lugs are like the diagram below.

**NOTE:** There are no actual number markings on the footswitch. There are two correct ways you can orient the footswitch. They are both 180 degrees of each other. Either way is fine. It does not matter as long as the flat sides of the solder lugs are running horizontal, not vertical.

**NOTE:** It may be easier to wire up the foot switch before installing it into the pedal. There will be more room to work & it will be much easier to thread the lug 4 to lug 9 jumper.



## FOOT SWITCH SOLDER LUG DESIGNATIONS



### Step 3: Wiring the foot switch.

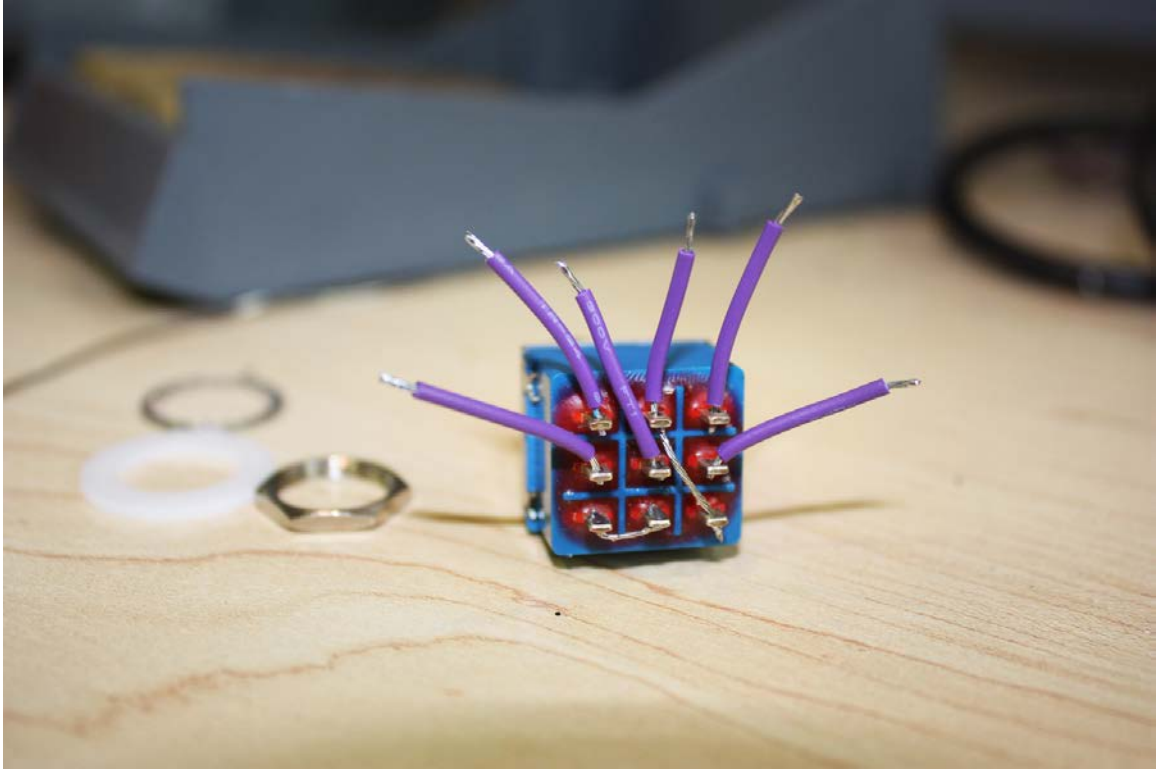
- Make a jumper between lugs 3 & 6 from clippings from the resistors. Simply use your needle nose pliers to make a U shape & insert into lugs 3 & 6, then solder.



- Cut a 1.5" piece of wire. Strip 1/8" of one end. Strip 1/2" off the other end. Tin both ends. This will be used to connect lug/eyelet 4. The longer stripped end will be used to jumper lug 4 to 9.



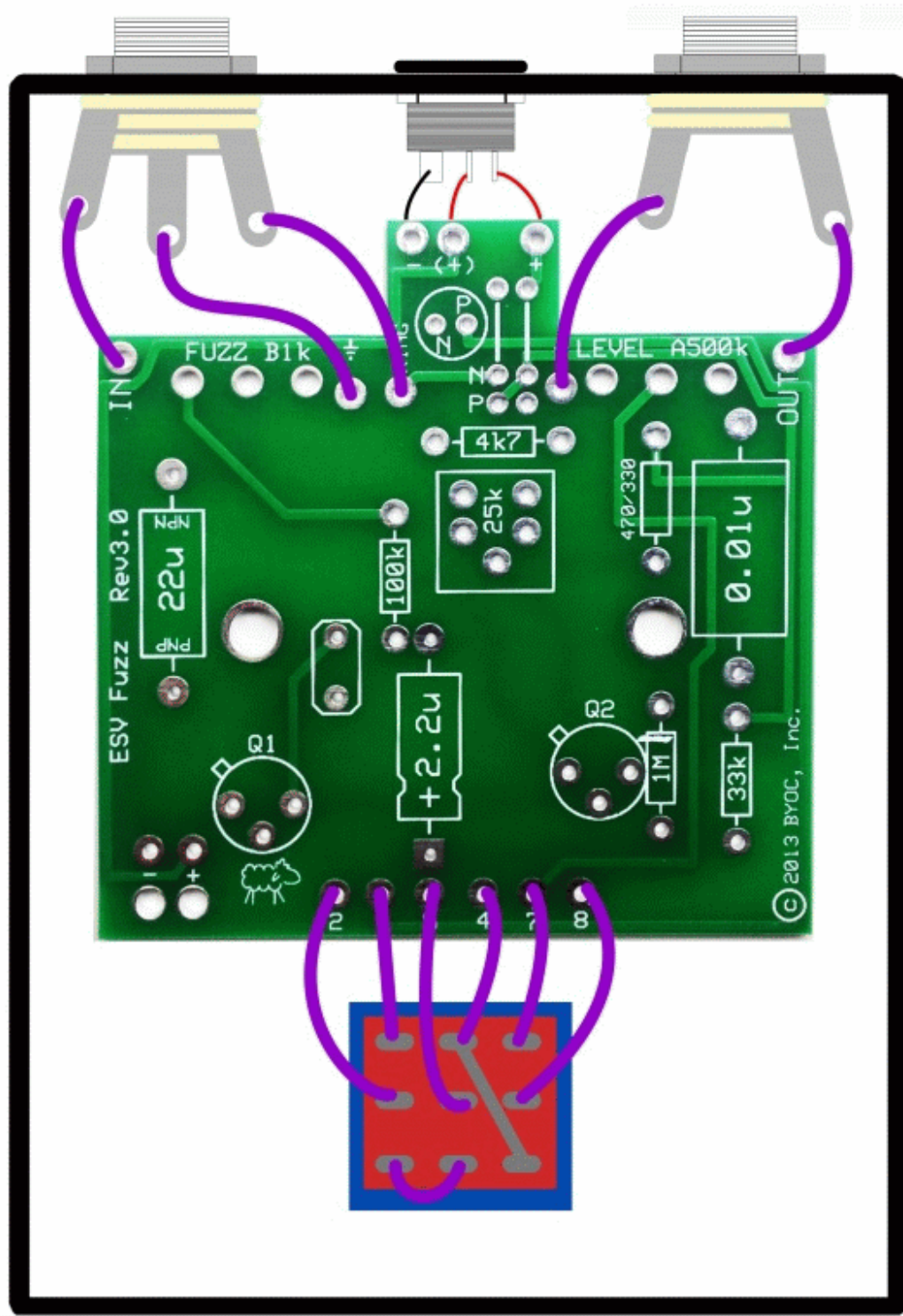
- Cut two 1" pieces of wire. Strip 1/8" off each end and tin. These will be used to connect lugs/eyelets 1 & 7
- Cut three 1.25" pieces of wire. Strip 1/8" off each end and tin. This will be used to connect lugs/eyelets 2, 5, & 8



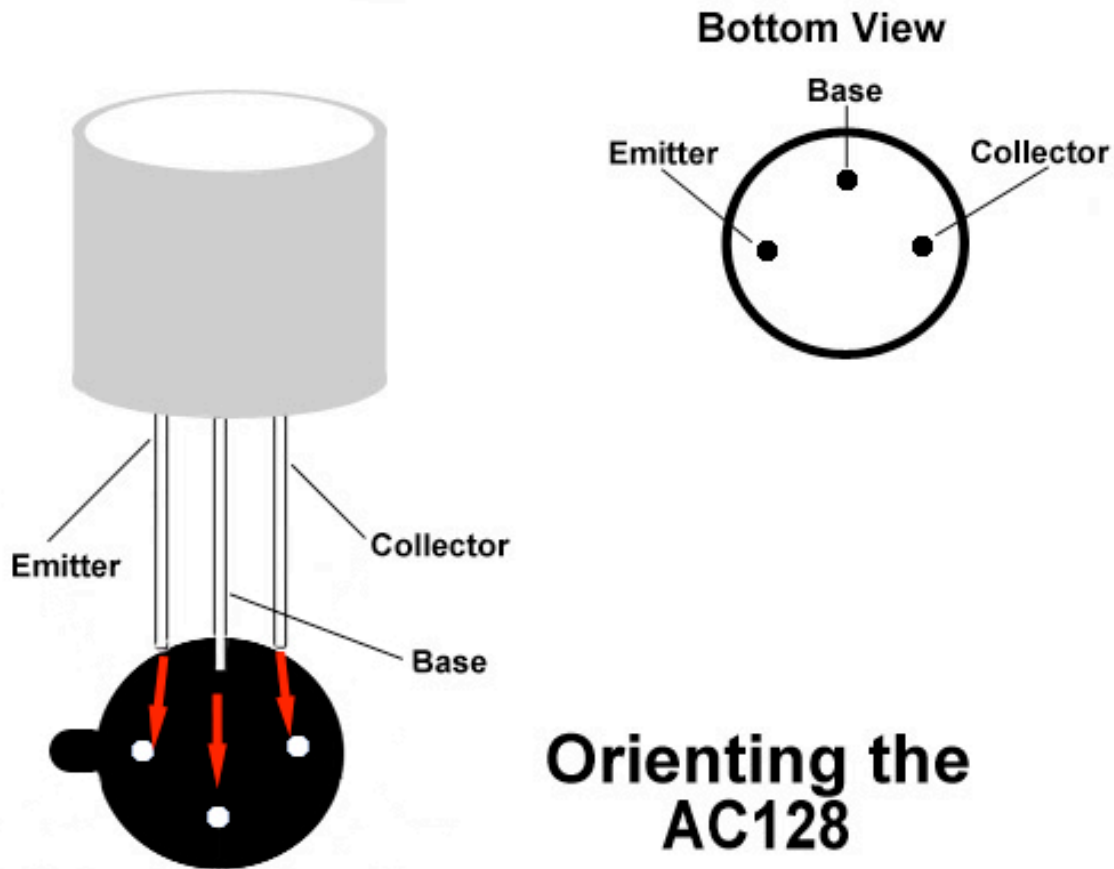
**Step 4:** Install the foot switch into the enclosure if it isn't already. Insert the foot switch wires into their respective eyelets on the PCB. You can insert them into the top side and solder on the top side as well. The solder pads should be large enough (if you are using a soldering iron that isn't too big) to allow you to do this without burning the PVC coating on the wires if you are careful. If you do singe the plastic on the wires, it's OK. It's not going to hurt anything. It's purely aesthetic.

**Step 5:** Connect the pre stripped and tinned wires to the 1/4" jacks.  
NOTE: Wires shown in black & red are merely to indicate ground wires & positive power wires, respectfully. Your kit provides purple wire; you may choose to detonate these in a wire color of your choice





## Orienting Transistors/Finish up



## Orienting the AC128

### Step 1: Install the transistors

Install the transistors. **Do not solder the transistors.** Simply push the lead wires into the appropriate socket holes. The transistor socket hole with the tab next to it will be the emitter. The lead wires on the germanium transistors will be rather long, so you will want to clip off the excess. But be sure to leave enough so you can bend the transistor down and out of the way when you seal the enclosure. But do not clip the transistor leads until you have tested your pedal and know that they work.

### Step 2: Adjusting the bias trimpot.

There is no special trick to this. Simply turn the trimpot till it sounds good to you. Some people say that you must set the bias so that the collector of Q2 measures 4.5 - 5.5v, but this is only a matter of opinion. Trust your ears for this step. If you like the way it sounds at 6.5v, that's perfectly fine.

# Operating Overview



**Fuzz:** Pretty simple – turn it clockwise to get more fuzz. But with germanium, it's sometimes better to turn the fuzz knob all the way up and use your guitar's volume knob as the actual fuzz control.

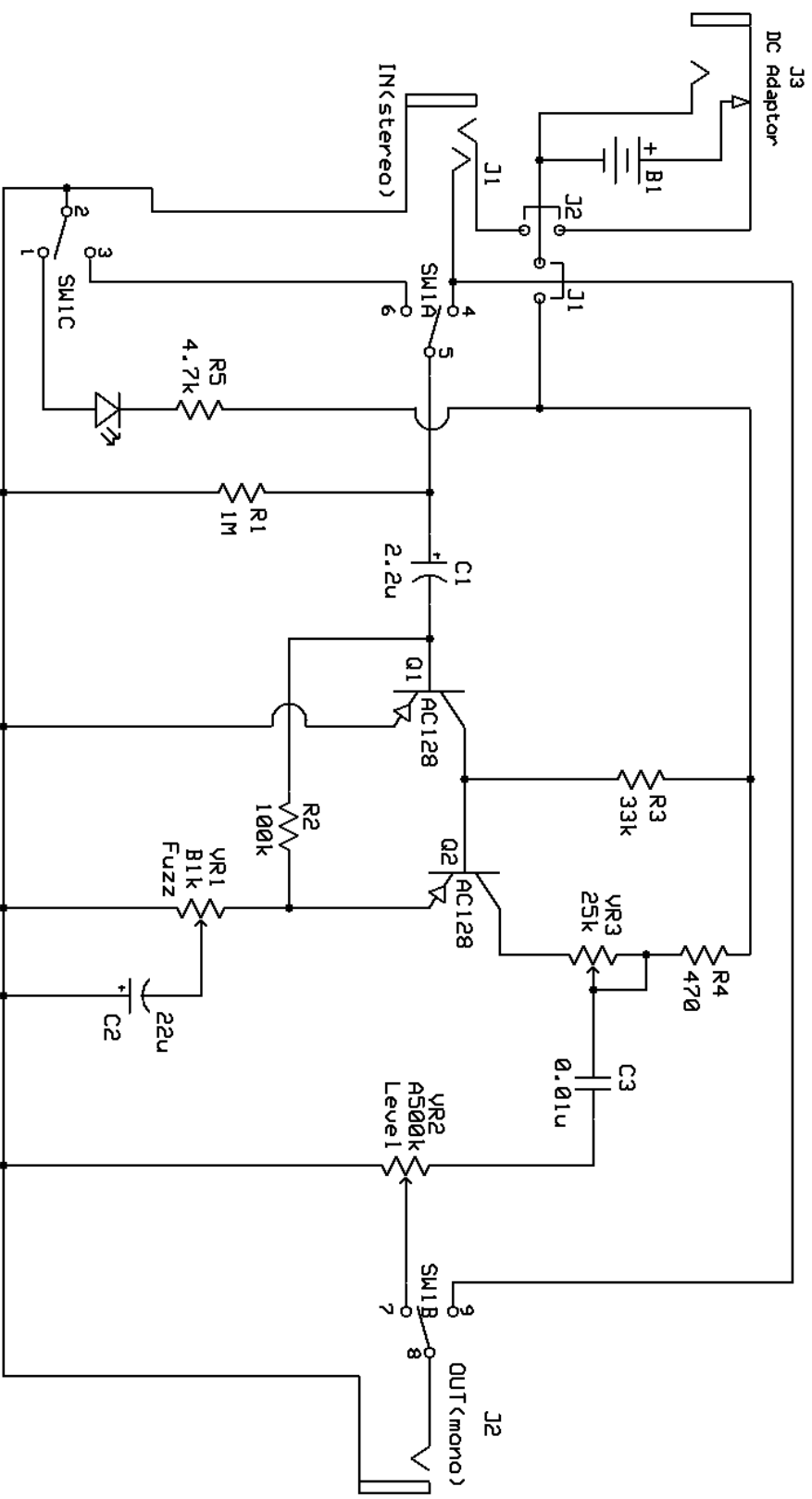
**Volume:** Really? If you need this explained to you, you probably weren't capable of building the pedal in the first place.

**Power supply:** Normal standard 2.1mm negative tip 9VDC power supply

**Current Draw:** 2.5mA

**Input Impedance:** 1Meg ohms

**Output Impedance:** 500k ohms



## Build Your Own Clone

### E.S.V. Fuzz Positive Ground

drawn by:  
k. vanderhulst

Rev 3  
4/19/2013

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