

# BYOC Analog Delay Kit Instructions



## Warranty:

BYOC, LLC guarantees that your kit will be complete and that all parts and components will arrive as described, functioning and free of defect. Soldering, clipping, cutting, stripping, or using any of the components in any way voids this guarantee. BYOC, LLC guarantees that the instructions for your kit will be free of any major errors that would cause you to permanently damage any components in your kit, but does not guarantee that the instructions will be free of typos or minor errors. BYOC, LLC does not warranty the completed pedal as a whole functioning unit nor do we warranty any of the individual parts once they have been used. If you have a component that is used, but feel it was defective prior to you using it, we reserve the right to determine whether or not the component was faulty upon arrival. Please direct all warranty issues to: [sales@buildyourownclone.com](mailto:sales@buildyourownclone.com) This would include any missing parts issues.

## Return:

BYOC, LLC accepts returns and exchanges on all products for any reason, as long as they are unused. We do not accept partial kit returns. Returns and exchanges are for the full purchase price less the cost of shipping and/or any promotional pricing. Return shipping is the customer's responsibility. This responsibility not only includes the cost of shipping, but accountability of delivery as well. Please contact [sales@buildyourownclone.com](mailto:sales@buildyourownclone.com) to receive a return authorization before mailing.

#### Tech Support:

BYOC, LLC makes no promises or guarantees that you will successfully complete your kit in a satisfactory manner. Nor does BYOC, LLC promise or guarantee that you will receive any technical support. Purchasing a product from BYOC, LLC does not entitle you to any amount of technical support. BYOC, LLC does not promise or guarantee that any technical support you may receive will be able to resolve any or all issues you may be experiencing.

That being said, we will do our best to help you as much as we can. Our philosophy at BYOC is that we will help you only as much as you are willing to help yourself. We have a wonderful and friendly DIY discussion forum with an entire section devoted to the technical support and modifications of BYOC kits.

[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 are 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. (not just, "It doesn't work, help")
2. Pic of the top side 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 answer yes to 6 and 7, what does the pedal do when it is "on"?
9. Battery or adapter.(if battery, is it good? If adapter, what type?)

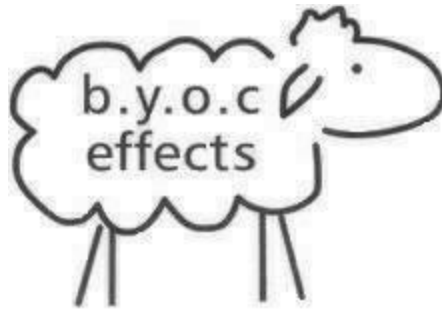
Also, please only post pics that are in focus. You're only wasting both parties' time if you post out of focus, low res pics from your cell phone.

#### Revision Notes:

Rev 2.0 (Current) No issues.

#### Copyrights:

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## Parts Checklist for BYOC Analog Delay Kit

### Resistors:

- 1 - 22ohm (Red/Red/Black/Gold/Brown)
- 1 - 470ohm (Yellow/Purple/Black/Black/Brown)
- 1 - 2k2 (Red/Red/Black/Brown/Brown)
- 2 - 6k8 (Blue/Gray/Black/Brown/Brown)
- 20 - 10k (Brown/Black/Black/Red/Brown)
- 1 - 18k (Brown/Gray/Black/Red/Brown)
- 1 - 22k (Red/Red/Black/Red/Brown)
- 5 - 47k (Yellow/Purple/Black/Red/Brown)
- 5 - 100k (brown/black/black/orange/brown)
- 2 - 470k (yellow/purple/black/orange/brown)

### Capacitors:

- 5 - 100pf ceramic disc (101)
- 2 - 330pf ceramic disc (331)
- 1 - .001uf/102 film may say '102' on the body
- 1 - .0022uf/222 film may say '222' on the body
- 3 - .0068uf/682 film may say '682' on the body
- 1 - .033uf/333 film may say '333' on the body
- 1 - .039uf/393 film may say '393' on the body
- 1 - .047uf/473 film may say '473' on the body
- 1 - .082uf/823 film may say '823' on the body
- 1 - .1uf/104 film may say '104' on the body
- 2 - .22uf/224 film may say '224' on the body
- 5 - 1uf/105 film may say '105' on the body
- 2 - 1uf aluminum electrolytic
- 4 - 10uf aluminum electrolytic
- 1 - 47uf aluminum electrolytic
- 1 - 100u aluminum electrolytic
- 1 - 220uf aluminum electrolytic

### Diodes:

- 1 - 1N4148 or 1N914
- 1 - 1N4001

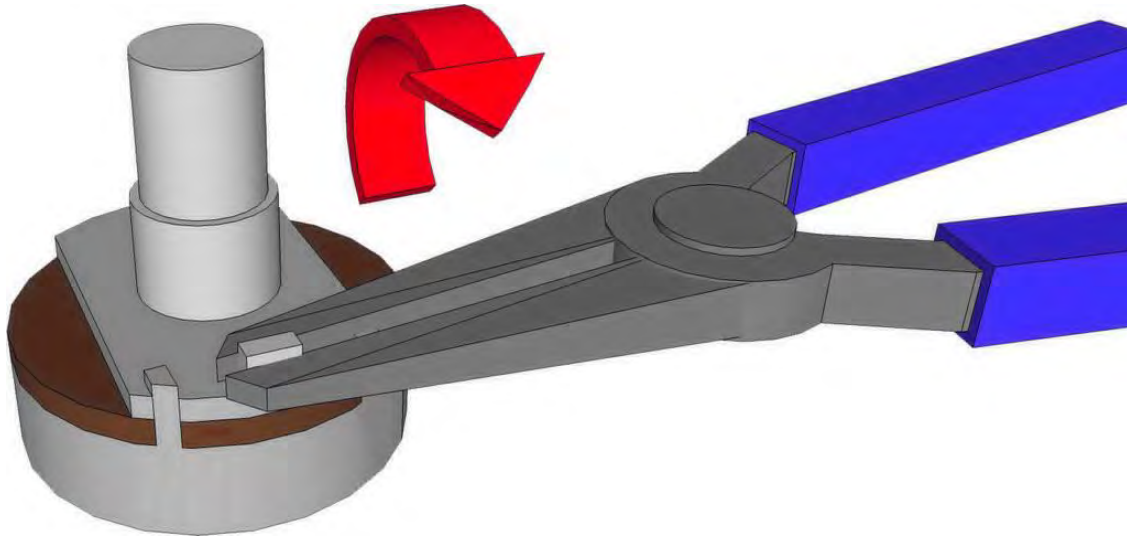
### IC's and IC sockets:

- 1 - TL082, TL072, 4558 or other dual op amp
- 1 - MN3102, V3102D, or BL3102
- 1 - MN3205 or V3205D
- 1 - V571 or SA571 compandor
- 2 - DIP 8 socket
- 1 - DIP14 socket
- 1 - DIP16 socket

### Transistors:

- 4 - 2N5088 or 2N3904

**Potentiometers:** Be sure to snap off the small tab on the side of each pot.



- 2 - B50k (LEVEL & REPEATS)**
- 1 - B1M (DELAY)**
- 2 - 10k trimpots (103)**
- 1 - 100k trimpot (104)**
- 1 - 1M trimpot (105)**

**Hardware:**

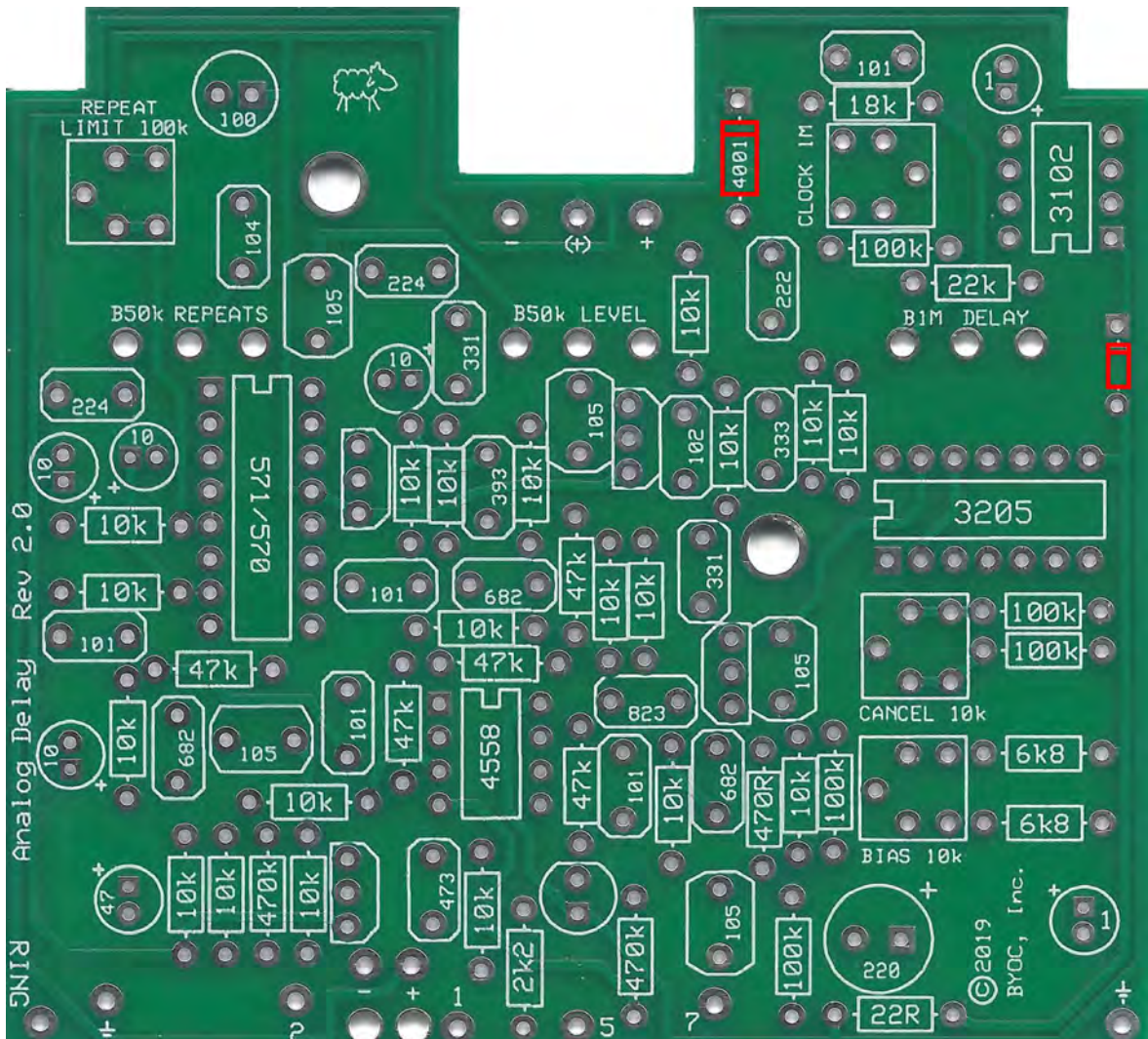
- 1 - Drilled enclosure w/ 4 screws (optional)**
- 1 - BYOC Analog Delay Kit circuit board**
- 1 - 3PDT footswitch**
- 1 - LED (optional)**
- 1 - AC adaptor jack (optional)**
- 2 - Enclosed audio jacks**
- 2 - Lock washers (for IN/OUT jacks)**
- 4 - Bumpers**
- hook-up wire**



**Step 1:** Add the resistors. Resistors are not polarized, so it does not matter which end goes in which solder pad.

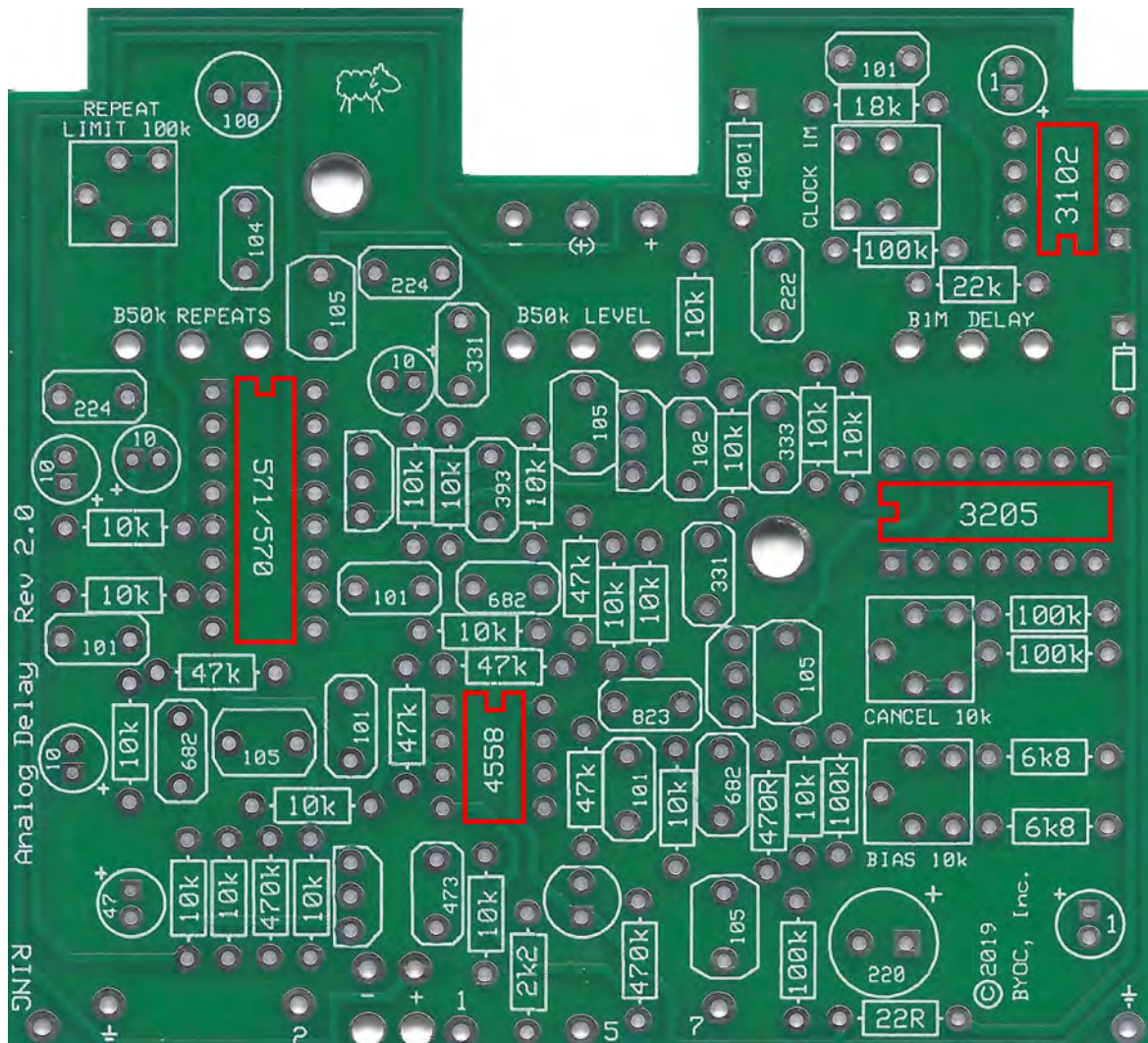


**Step 2:** Add the diodes. Be sure to match the stripe on the end of the diode with the stripe on the PCB screenprint. The stripped end should go in the square solder pad.



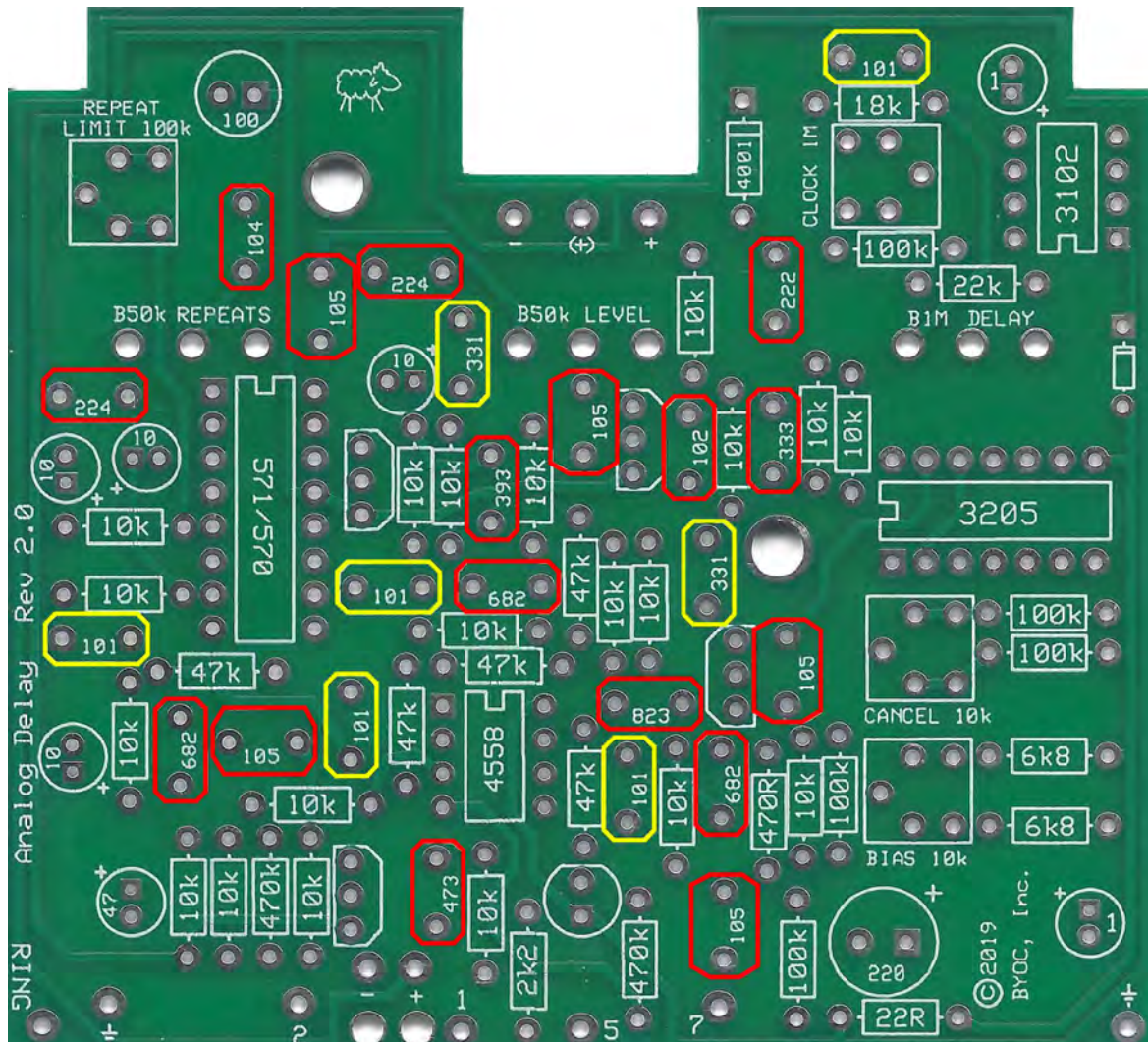


**Step 3:** Add the IC Sockets. **DO NOT SOLDER THE ACTUAL CHIPS!!!!** You will put the chips into the sockets in the "Installing the ICs" portion of the instructions. See page 22 - 23 for more details. Each socket has a notch in one end. You should match that notch up with the layout on the PCB and solder the socket directly to the PCB.





**Step 4:** Add the film and ceramic disc capacitors. These are not polarized and can go in any orientation. The caps highlighted in yellow are the ceramic disc capacitors.







REPEAT LIMIT 100k

B50k REPEATS

B50k LEVEL

CLOCK 1M

B1M DELAY

CANCEL 10k

BIAS 10k

741

555

3205

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GNIIR Analog Delay Rev 2.0

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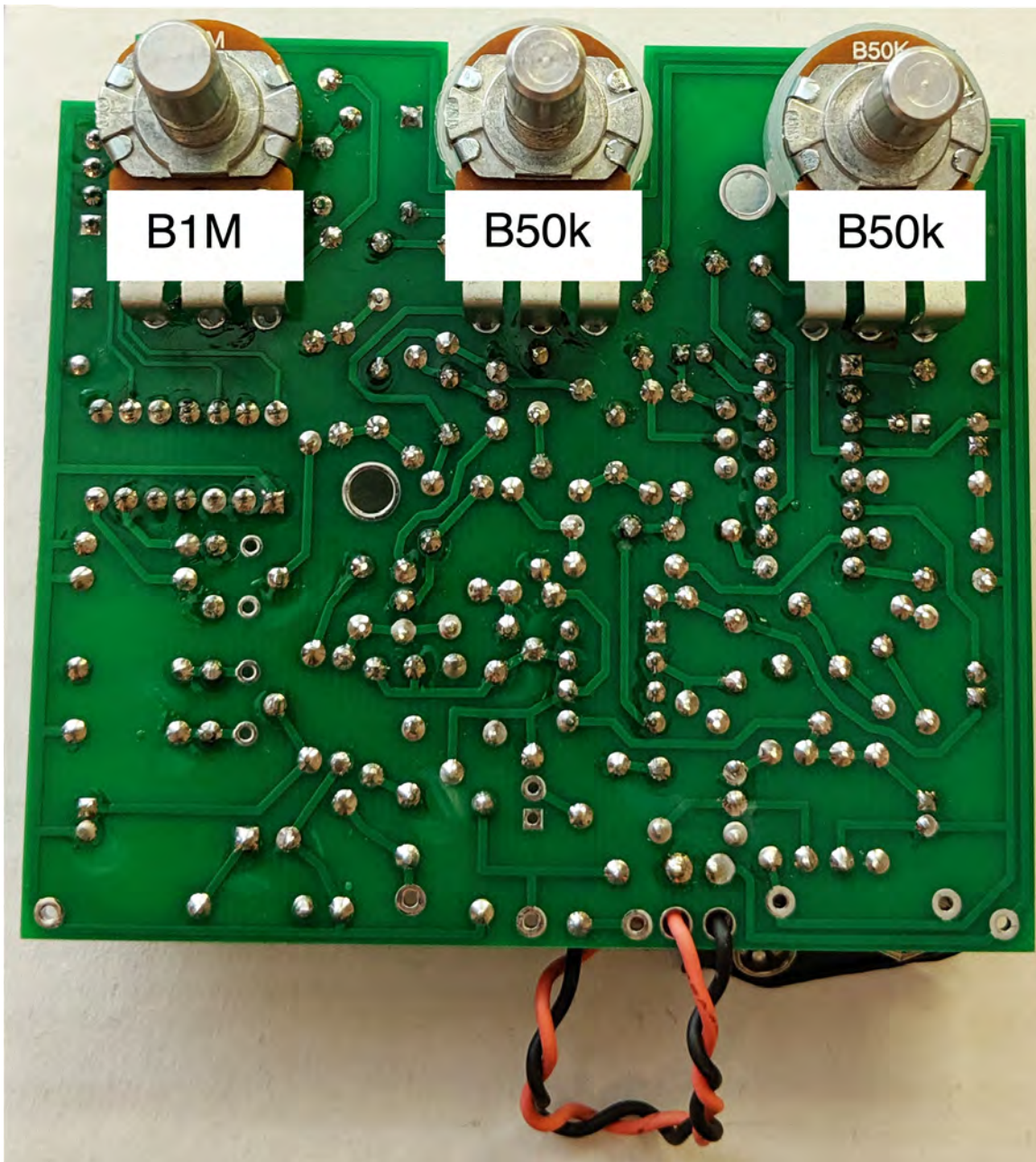




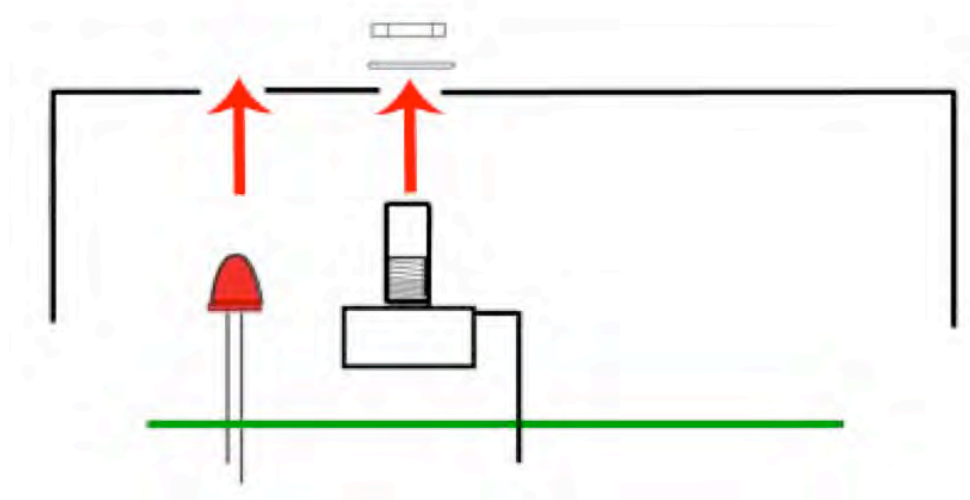
# Main PCB Assembly

**Step 1:** Flip the PCB over so that the bottom or solder side is up. Insert the three potentiometers and the LED into the bottom side of the PCB. **DO NOT SOLDER anything yet!!!**

The LED will have one longer lead. The longer lead goes in the square solder pad. There will be two B50k potentiometers and one B1M potentiometer. The B1M pot is your delay time pot and should be mounted towards the top of the PCB. The other two pots are for delay level and repeats.



**Step 2:** 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 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. Be sure to keep your hand on the PCB so that it does not fall off the PC mounting posts of the pots.

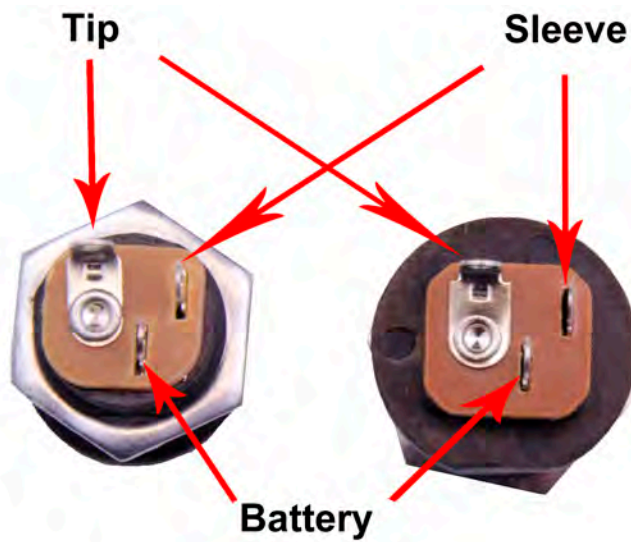


**Step 3:** Turn the entire pedal over so that the component side of the PCB is facing up. Lift the PCB up off the pots about 2mm just to make sure that the back of the PCB does not short out against the pots. Make sure the PCB is level and symmetrically seated inside the enclosure.

**Step 4:** Solder the pots, toggle switch and LEDs. You will be soldering on the component side (top) of the PCB. After you have soldered them in place, be sure to tighten up their nuts. **TIP:** only solder one lug of each component at first. This will secure everything in place and still allow you to wiggle things around if you need to adjust the fit of anything. Once you have everything perfect, go ahead and solder everything else.

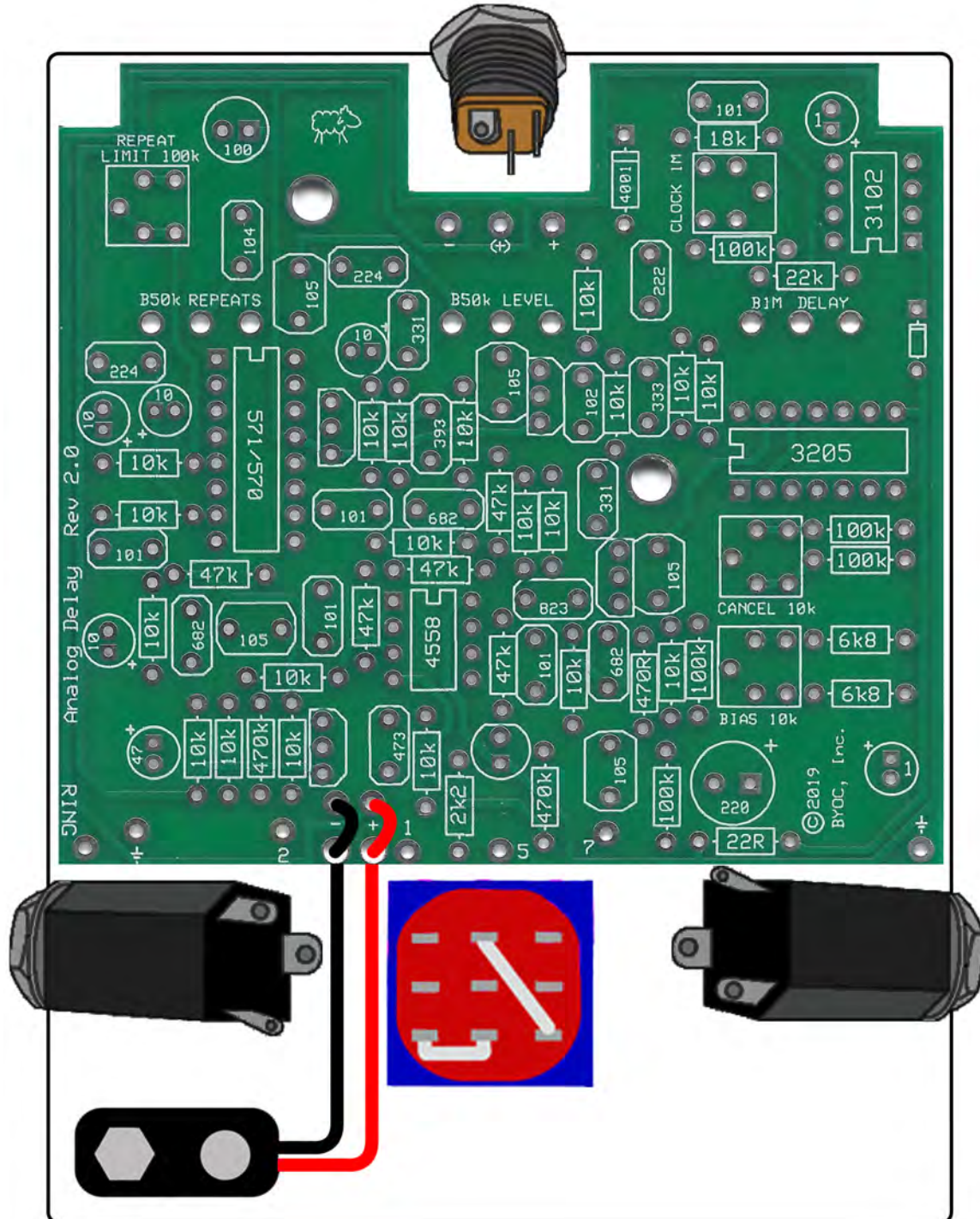


**Step 5:** Install the DC Jack into the enclosure. Orient it as shown below.

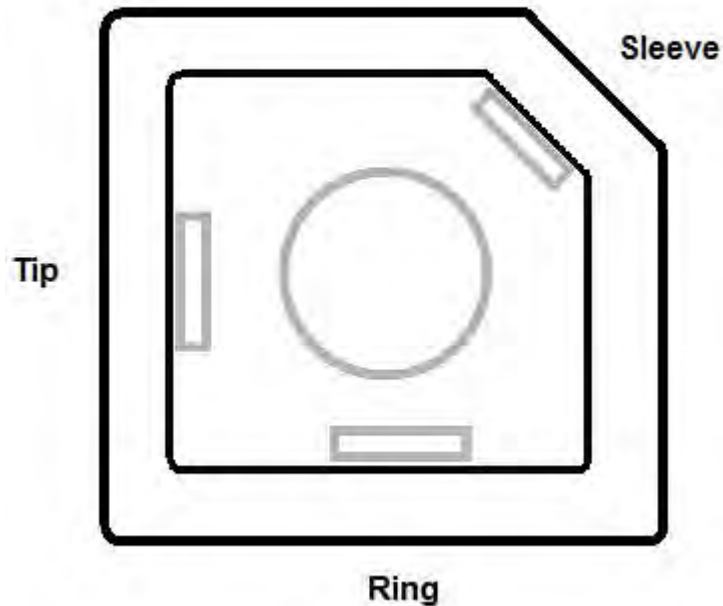




**Step 6:** Install the footswitch and IN/OUT jacks.



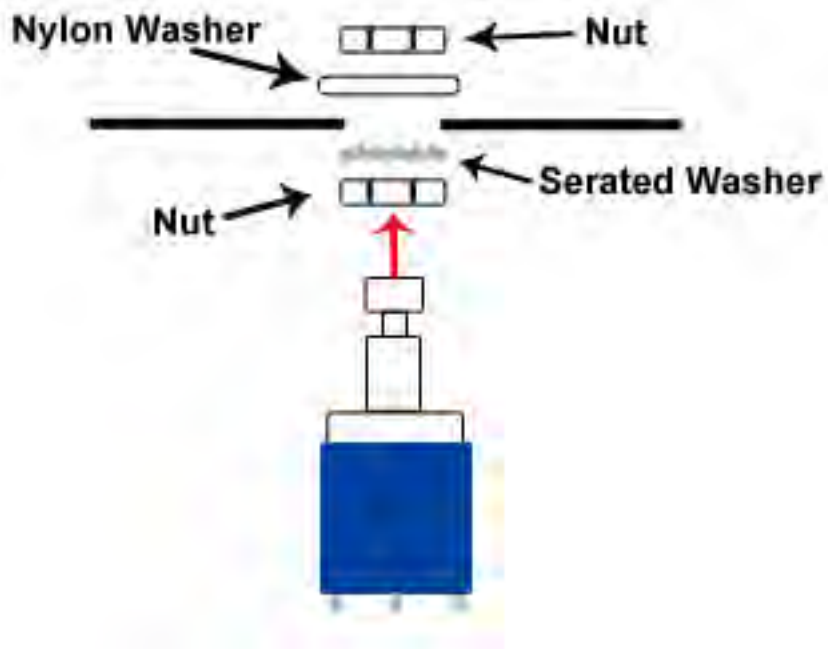
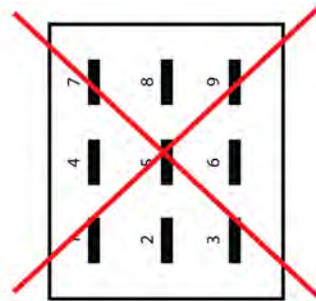
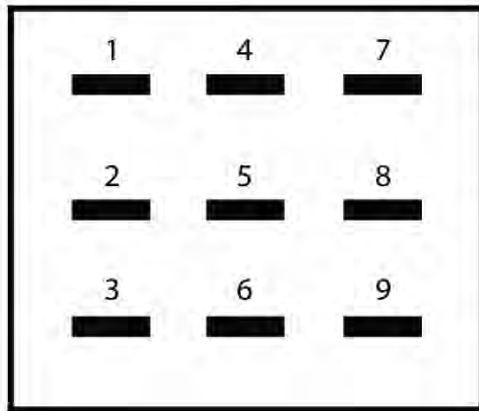
## Enclosed Jack



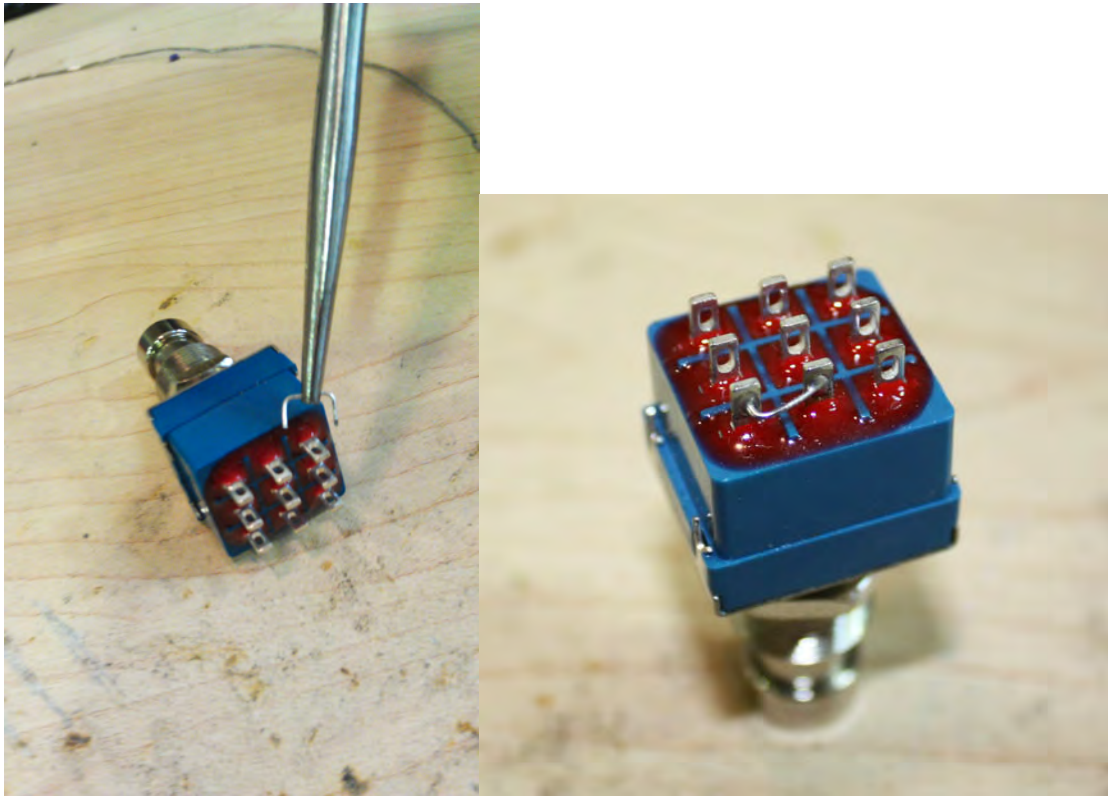
**Step 6a:** Prepare the Footswitch. Orient the footswitch so that the flat sides of the solder lugs are like the diagram below.

**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.

## FOOT SWITCH SOLDER LUG DESIGNATIONS



**Step 6b:** 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.



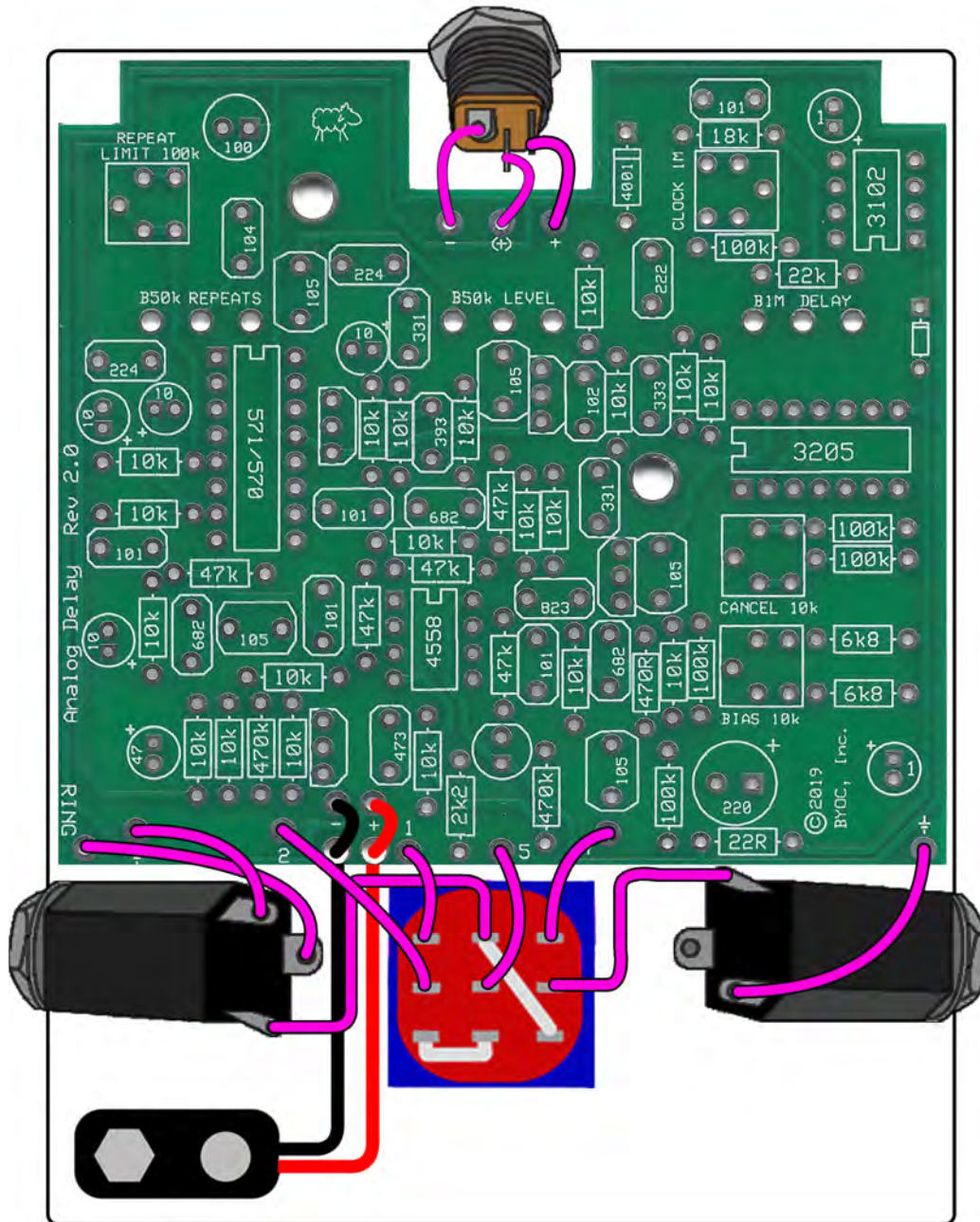




# Wiring

**Step 1:** Connect the TIP (negative) terminal of the DC adaptor jack to the "-" eyelet on the PCB with 2 inches of hook up wire. Connect the SLEEVE of the DC adaptor jack to the "+" eyelet on the PCB with 2 inches of hook up wire. Connect the BATTERY of the DC adaptor jack to the "(+)" eyelet on the PCB.

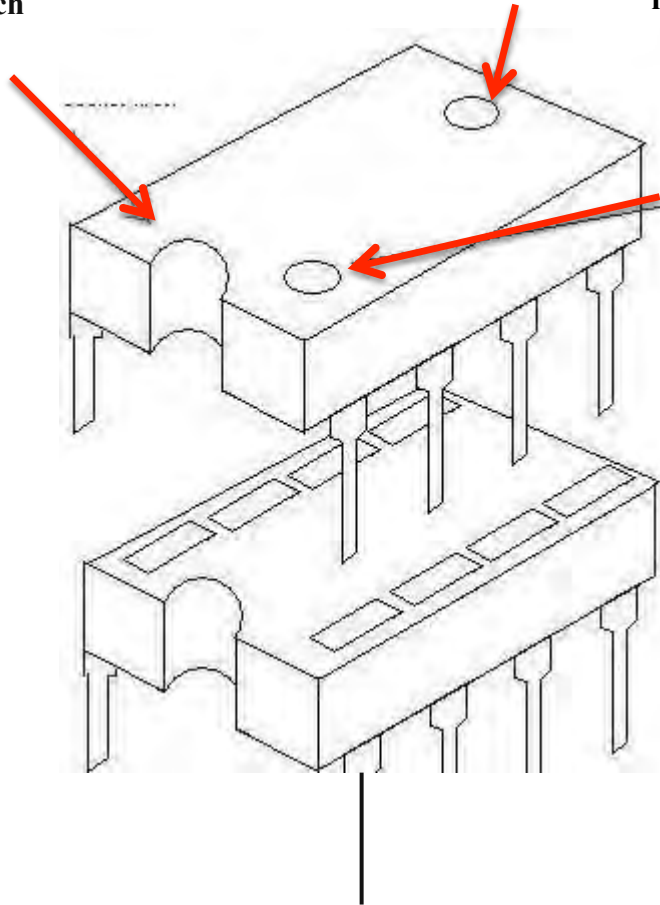
**Step 2:** Wire the IN/out jacks and the footswitch as shown below.



# Installing the ICs

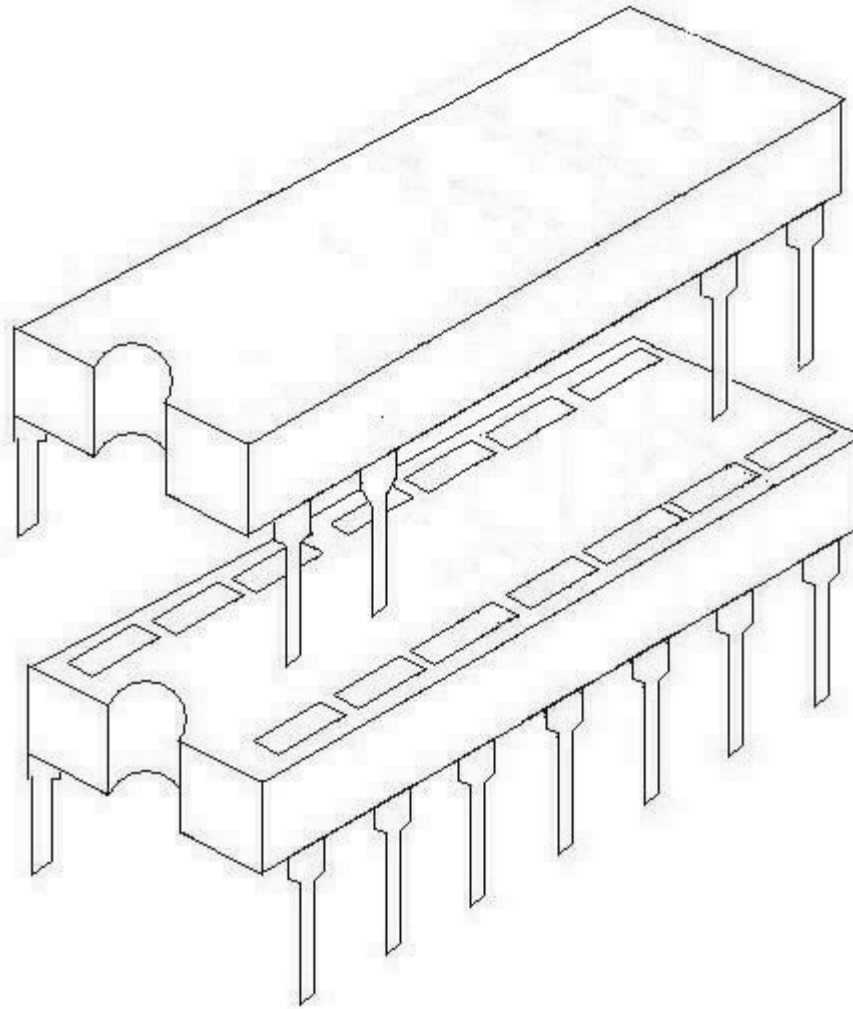
**Line up the notch on the IC with the notch on the socket.**

**If your IC has both a notch and dot, always refer to the notch and ignore the dot**



**If your IC doesn't have a notch on one end, it should have a dot in one corner. Orient the IC so that the side with the dot is on the same side as the notch on the socket.**



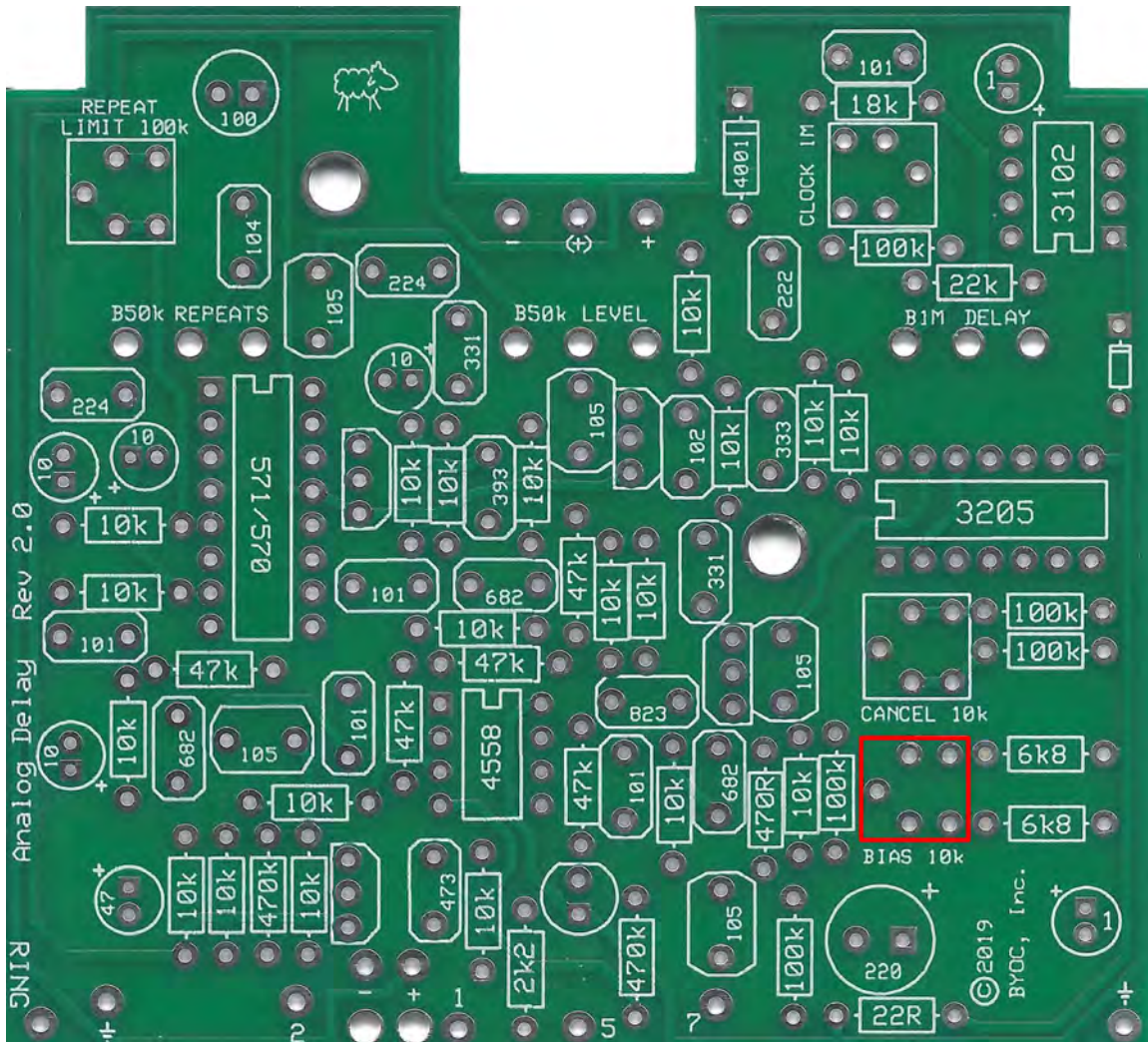


**The BBD chips will be slightly different. They will only have 8 pins, but in a 14 pin space. The 6 center pins (3 on each side) of the socket are not used. You may see traces on the PCB, but they are simply being used as vias. So don't let this confuse you. Treat the BBD chips as if they were 14 pin chips and put them in the 14 pin socket.**

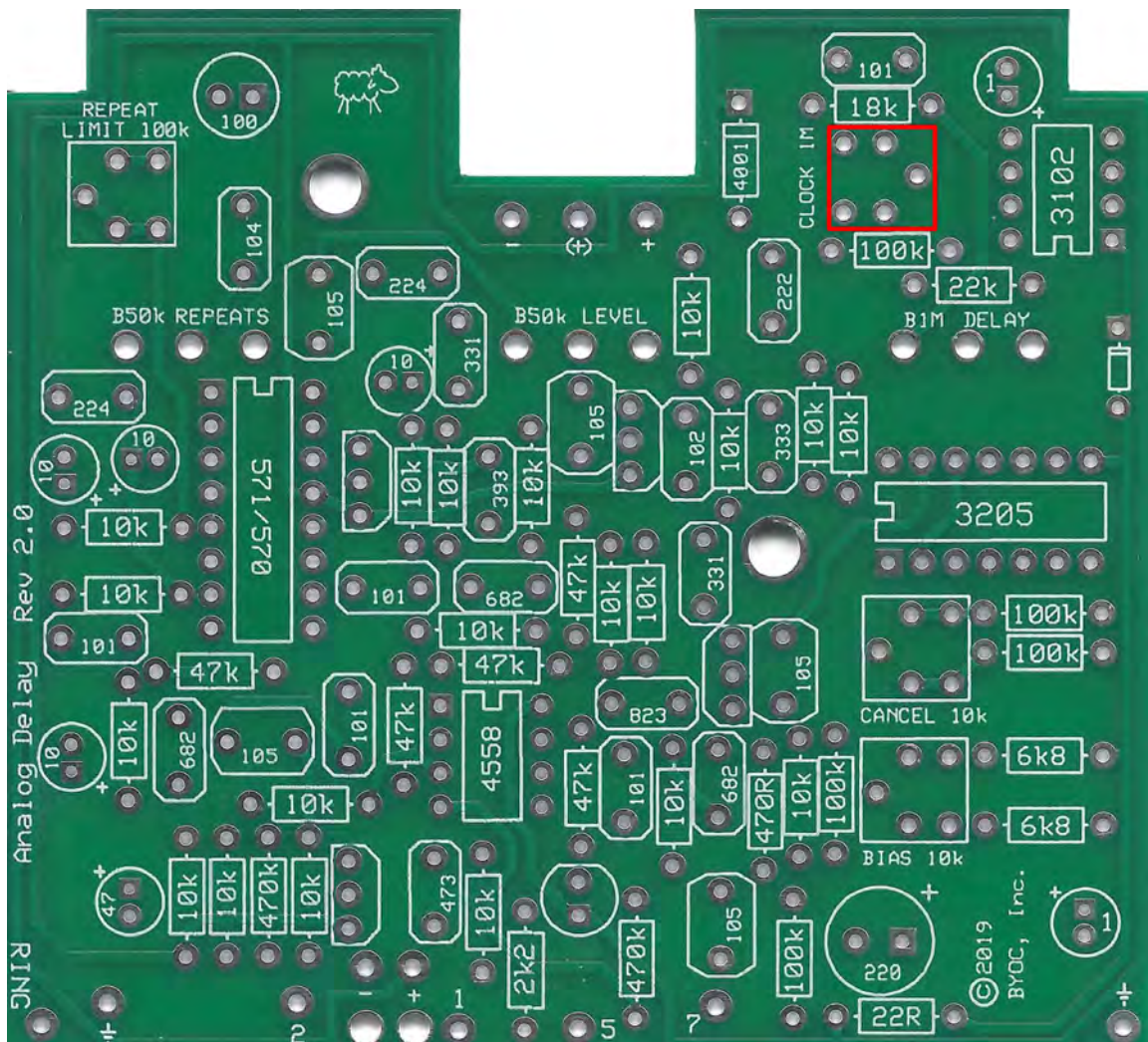


# Setting up The Internal Trimpots

**Step 1:** Set all of the trimpots to noon. Set the DELAY, LEVEL, and REPEATS knobs to noon. Plug into an amp and guitar and power the pedal with either battery or 9V adapter.

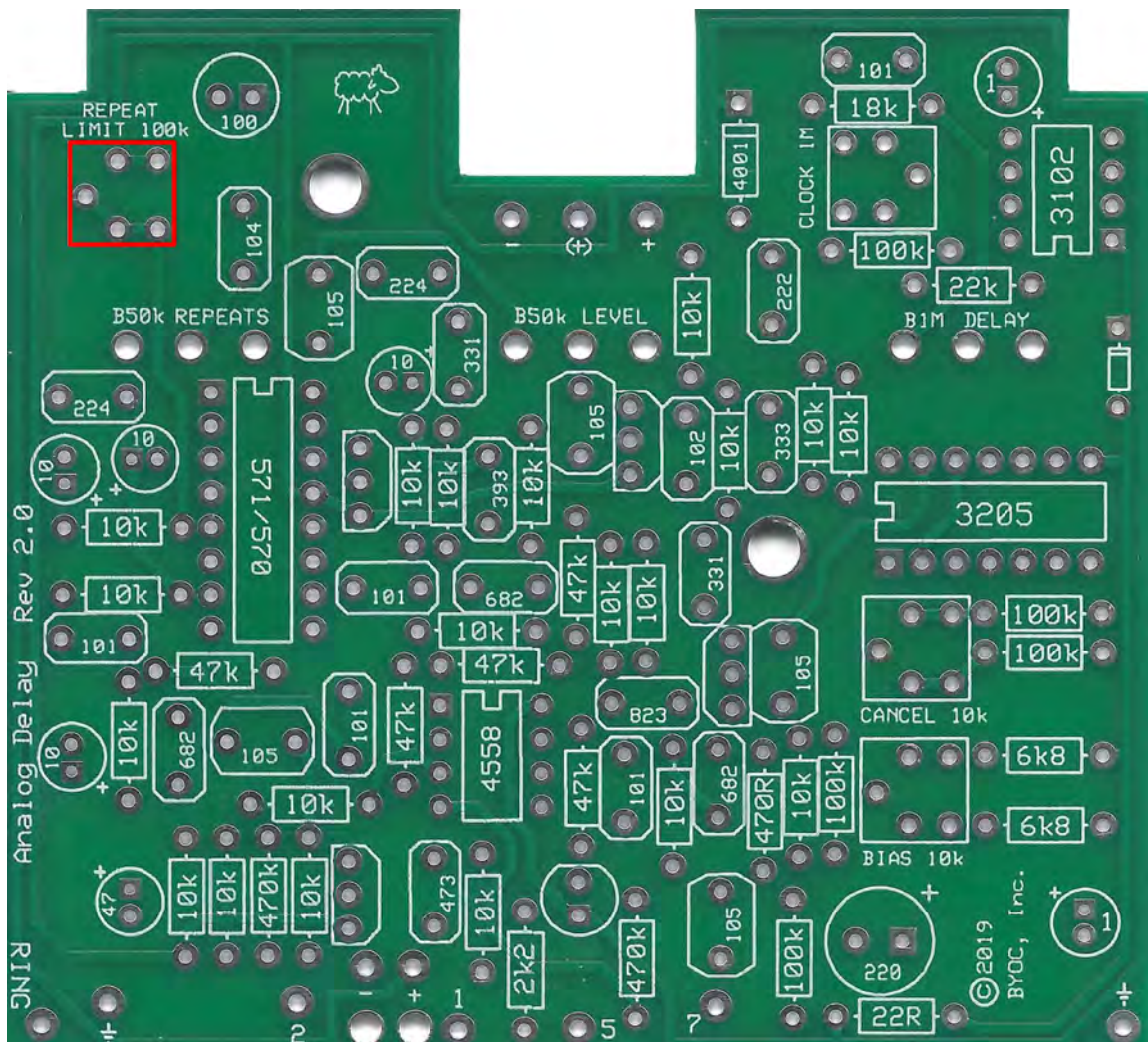


**Step 2:** Adjust the BIAS trimpot. Use your ear. Set it for the cleanest and loudest echoes. This will most likely be at noon in the rotation or just slightly off. You may want to repeat this step after completing steps 3, 4, and 5.



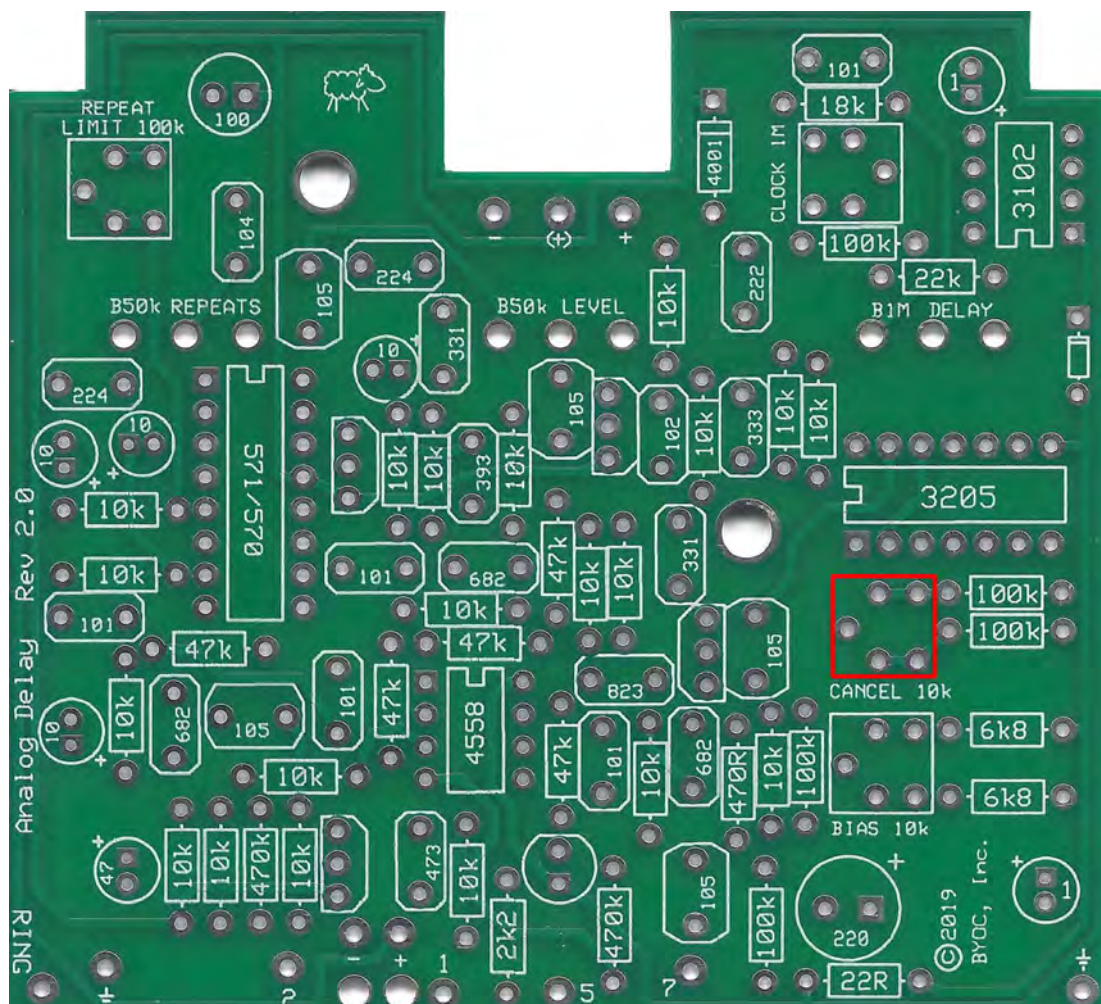
**Step 3:** Adjust the CLOCK trimpot. Start by turning the delay time knob all the way up to the longest delay time (full turn counter clockwise). Adjust the CLOCK trimpot till echoes are approximately 300ms apart. Use a metronome if possible.





**Step 4:** Adjust the REPEAT LIMIT trimpot. The setting of this trimpot is up to you. This sets the maximum number of repeats. You can set it for just a few repeats or infinite repeats.

Keep in mind that shorter delay times will repeat longer, so you should probably set the DELAY knob on the outside to a very short delay time when adjusting this internal trimpot.



Step 5: Adjust the CANCEL trimpot. Start by turning the outside DELAY knob to the longest delay time (full turn counter clockwise). Turn the LEVEL knob full turn clockwise. Turn the REPEATS knob up clockwise for the most echoes without going into self-oscillation (infinite repeat). Play a note and listen for a high pitch background noise as you turn the CANCEL trimpot back and forth clockwise and counter clockwise. Find the spot in the CANCEL trimpots rotation that best cancels out the high pitched noise. This will most likely be around noon in the rotation or just slightly off.

If you don't really notice any high pitched noise, this means that you can probably squeeze a little more delay time out of the bucket brigade delay chip, and you can adjust the CLOCK trimpot for a slightly longer delay time. You can repeat steps 2, 3, and 5 till you get the longest possible delay time before getting any high pitched background/clock noise. Don't confuse clock noise with the typical noise associated with analog delay. You may hear a faint "swooshing" noise in, like waves crashing on a beach. This is normal and to be expected.



# Operating Overview



**DELAY:** Sets the delay time. Counter Clockwise is longer delay time.

**LEVEL:** Controls the dry to delay ratio.

**Repeats:** Controls the amount of repeats in the delay.

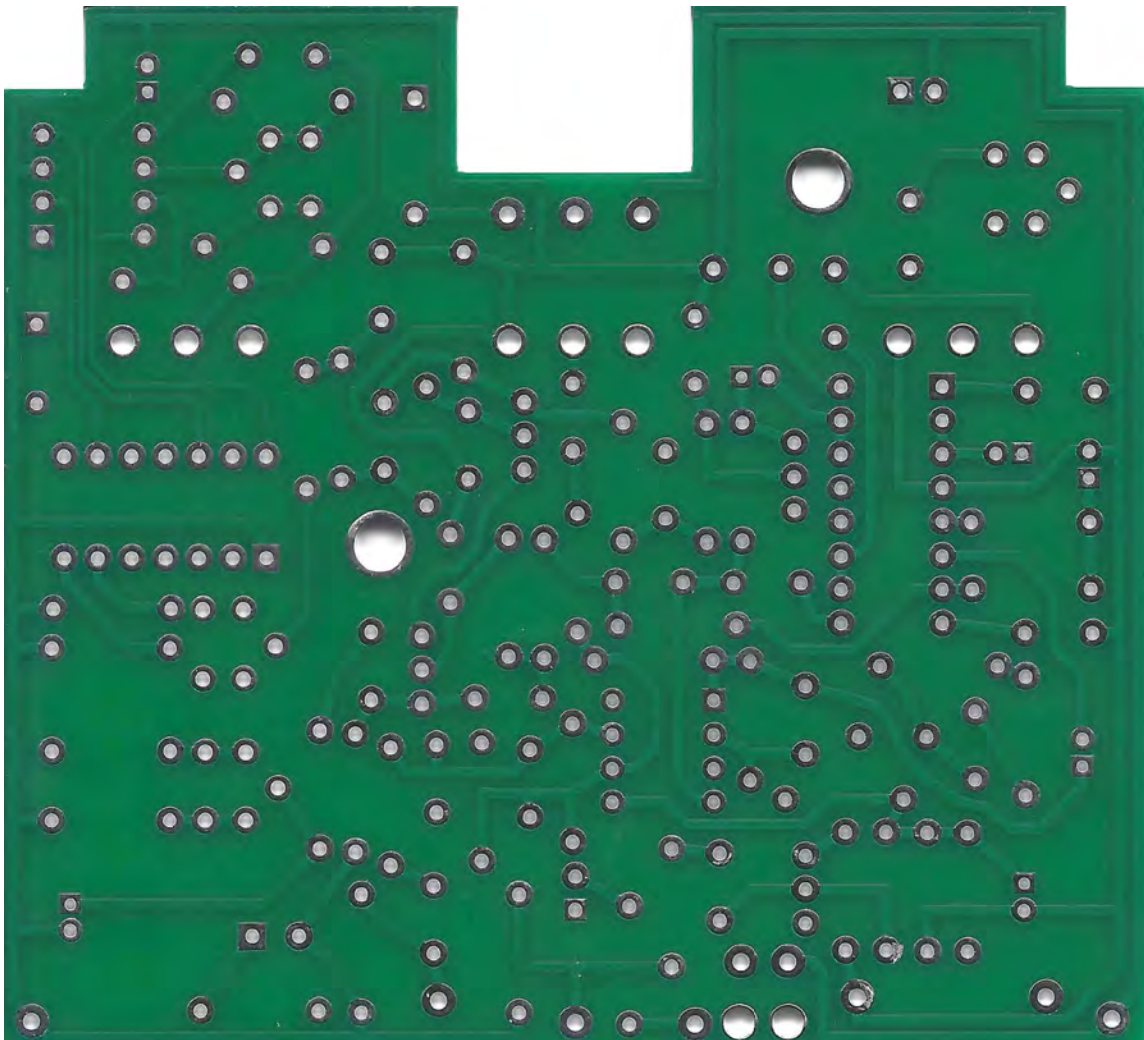
**Power supply:** 2.1mm negative tip 9V or battery

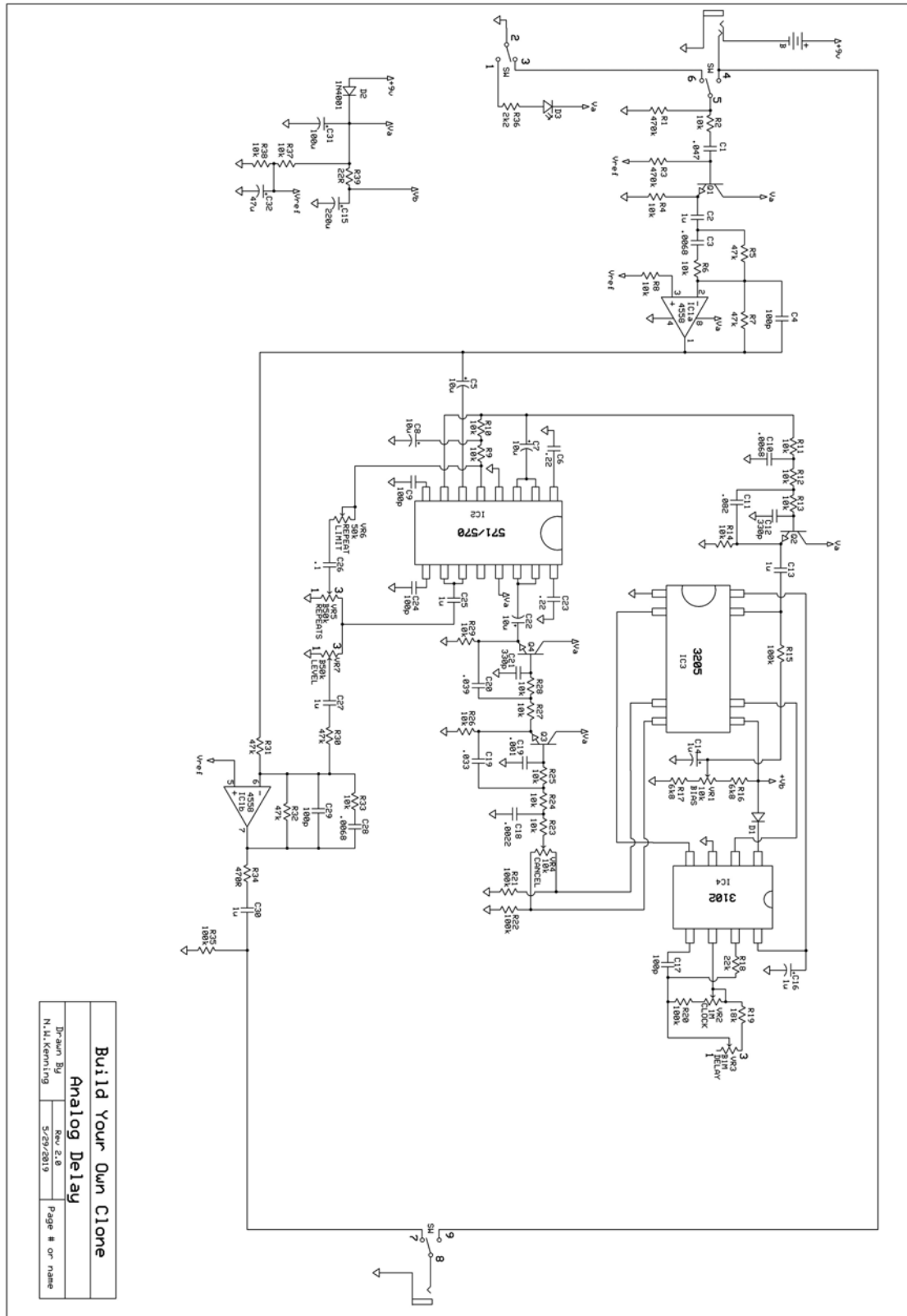
**Current Draw:** 14mA

**Input Impedance:** 470k Ohm

**Output Impedance:** 100k Ohm

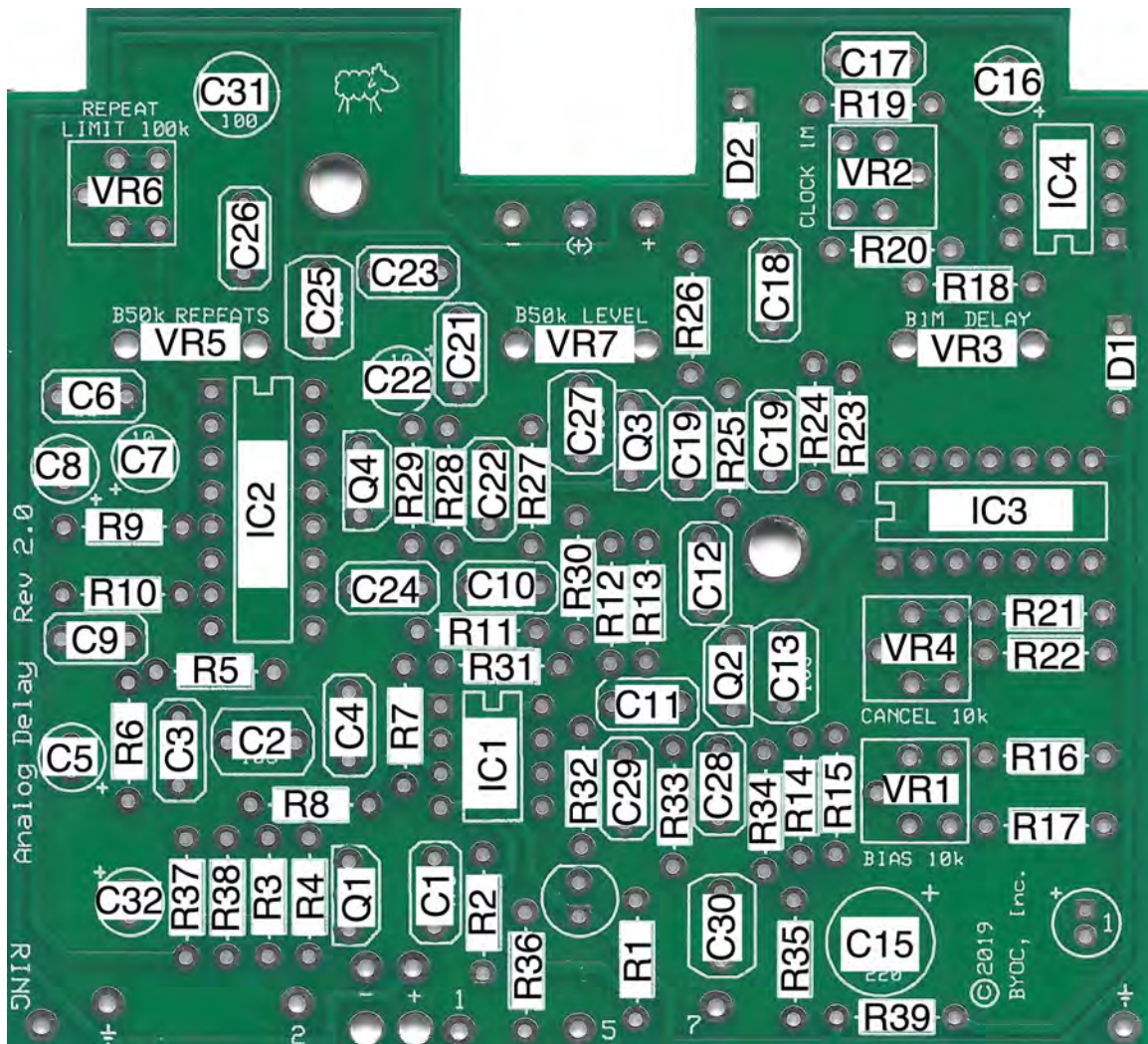
**Back-side PCB Photo**





For hi-res schematic visit <http://www.byoelectronics.com/analogdelayschematic.pdf>





PCB MAP

**Please visit**

**<http://byoceletronics.com/board>**

**For any technical support**

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