Build Your Own Clone
Spring Reverb
Kit Instructions

Warranty:

BYOC, Inc. 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, INC guarantees that the instructions for your kit will be free of any majors 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, INC 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 This would include any missing parts issues.

Return:

BYOC, Inc. 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 deliver as well. Please contact sales@buildyourownclone.com to receive a return authorization before mailing.

Tech Support:

BYOC, Inc. makes no promises or guarantees that you will successfully complete your kit in a satisfactory manor. Nor does BYOC, Inc. promise or guarantee that you will receive any technical support. Purchasing a product from BYOC, Inc. does not entitle you to any amount of technical support. BYOC, Inc. 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.byocelectronics.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: Rev 1.2 - Major change to PCB designed to accommodate the new BTDR-3H reverb module.

Previous Instructions: First version reverb (3 knob version)
www.byocelectroncis.com/reverb3knob.pdf
Rev 1.0 http://www.byocelectronics.com/reverb1.0.pdf

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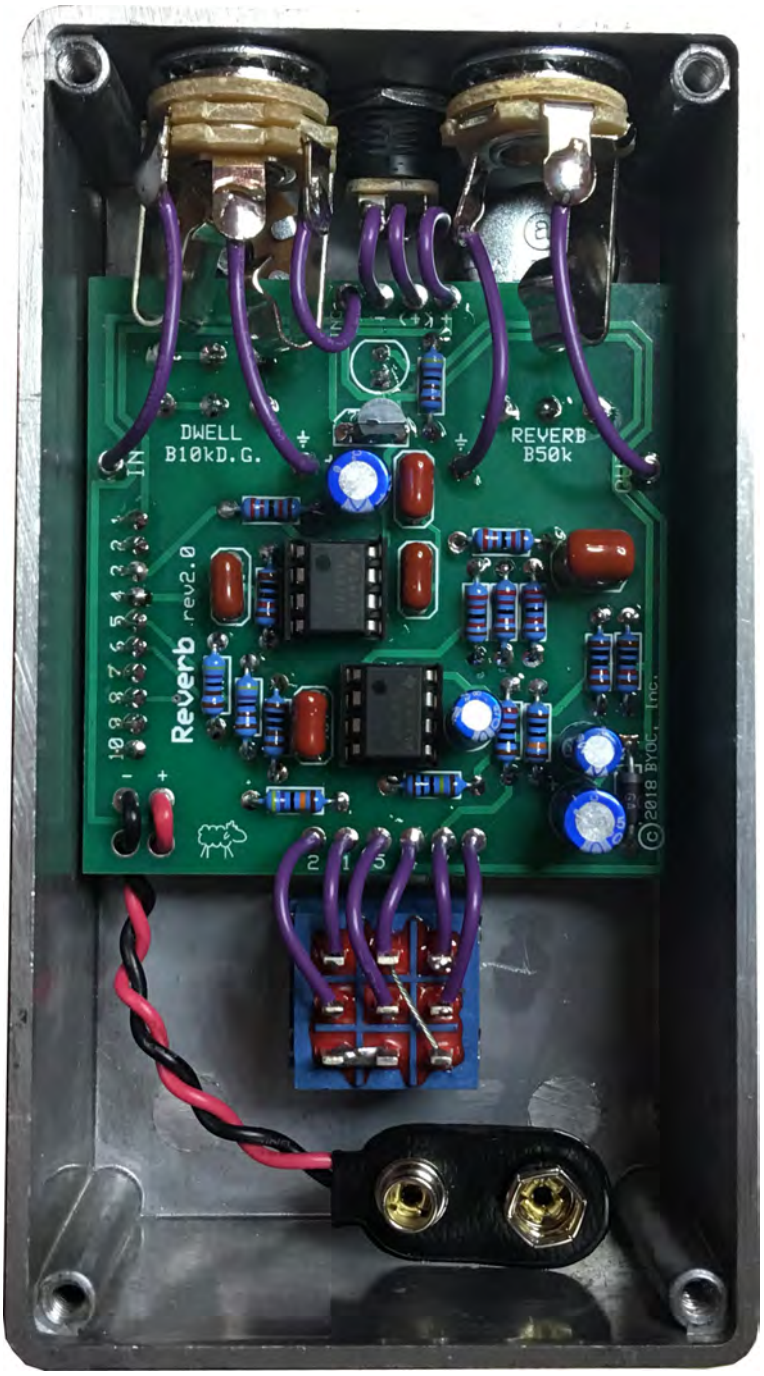
DWELL
B10kD.G.
REVERB
B50k
IN
Reverb .rev2.0
2 1 5
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Spring Reverb Kit Instruction Index

Parts Checklist…….....…..page 6

Populating the Circuit Board…….....…….page 8

Main PCB Assembly.....page 20

Wiring…….....page 25

Installing the IC/Finishing up…….....page 30

Operation Overview.....page 31

Schematic.....page 32

Parts Checklist for the Spring Reverb Kit

Resistors:

1 - 220R (red/red/black/black/brown)
1 - 1k (brown/black/black/brown/brown)
3 - 4k7 (yellow/purple/black/brown/brown)
3 - 10k (brown/black/black/red/brown)
5 - 22k (red/red/black/red/brown)
1 - 100k (brown/black/black/orange/brown)
1 - 470k (yellow/purple/black/orange/brown)
1 - 1M (brown/black/black/yellow/brown)

Capacitors:

1 - 10n or .01µ film (103)
1 - 22n or 0.022µ film (223)
2 - 100n or 0.1µ film (104)
1 - 1µ film (105)
2 - 10µf aluminum electrolytic
2 - 100µf aluminum electrolytic

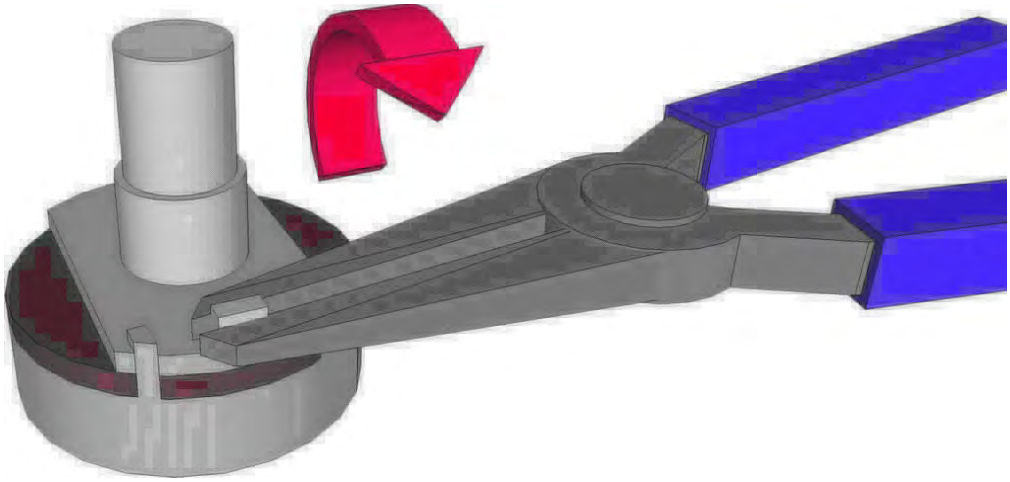
Diodes:

1 - 1N4001 (larger black plastic with silver stripe)

IC's:

2 - TL072 or similar dual Opamp
2 - 8 pin sockets
1 - Belton Digi-log BTDR-3H Reverb Module
1 - 78L05 5volt regulator

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

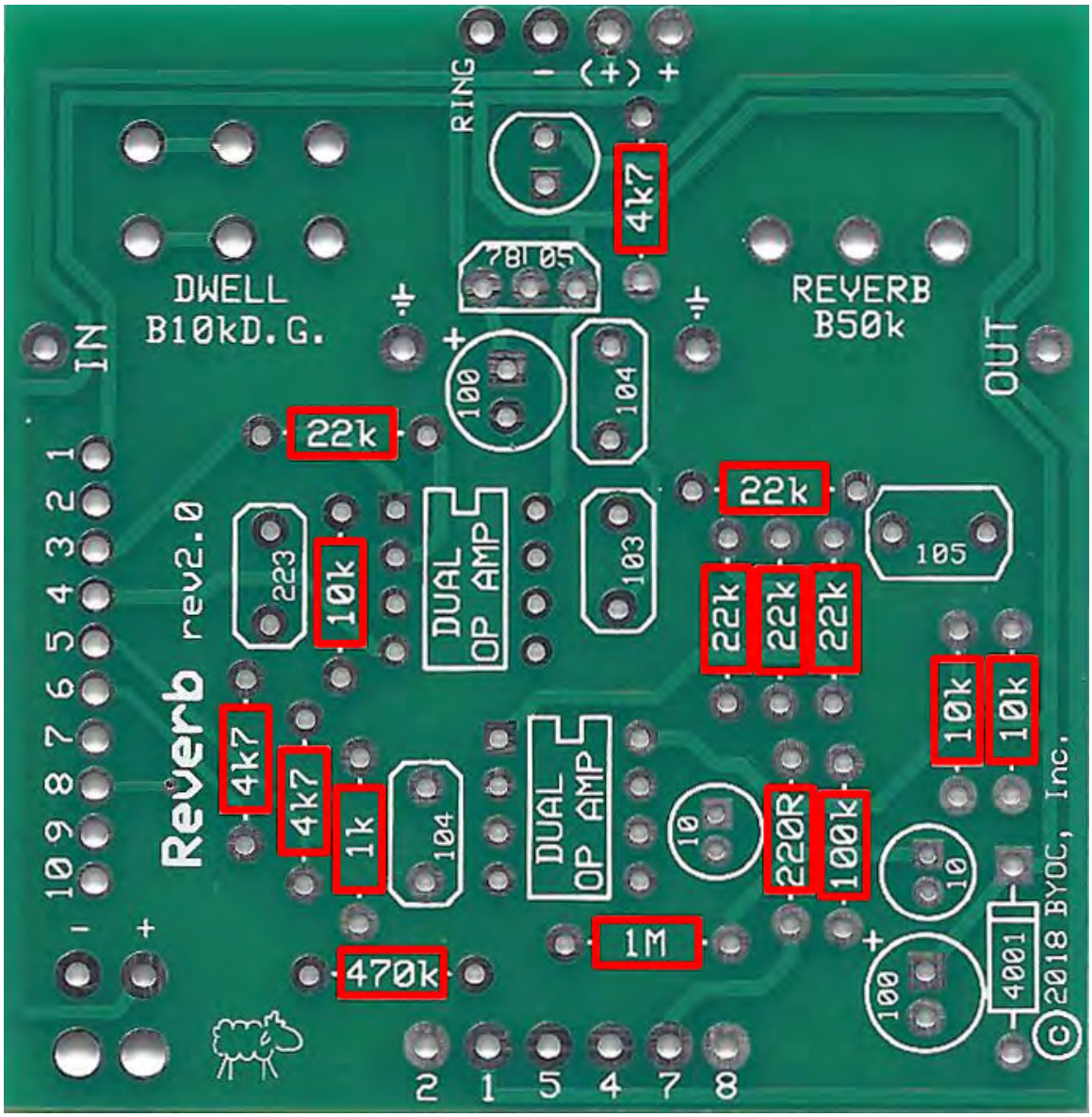


1 – B50k (REVERB)
1 – B10k Dual Gang (DWELL)

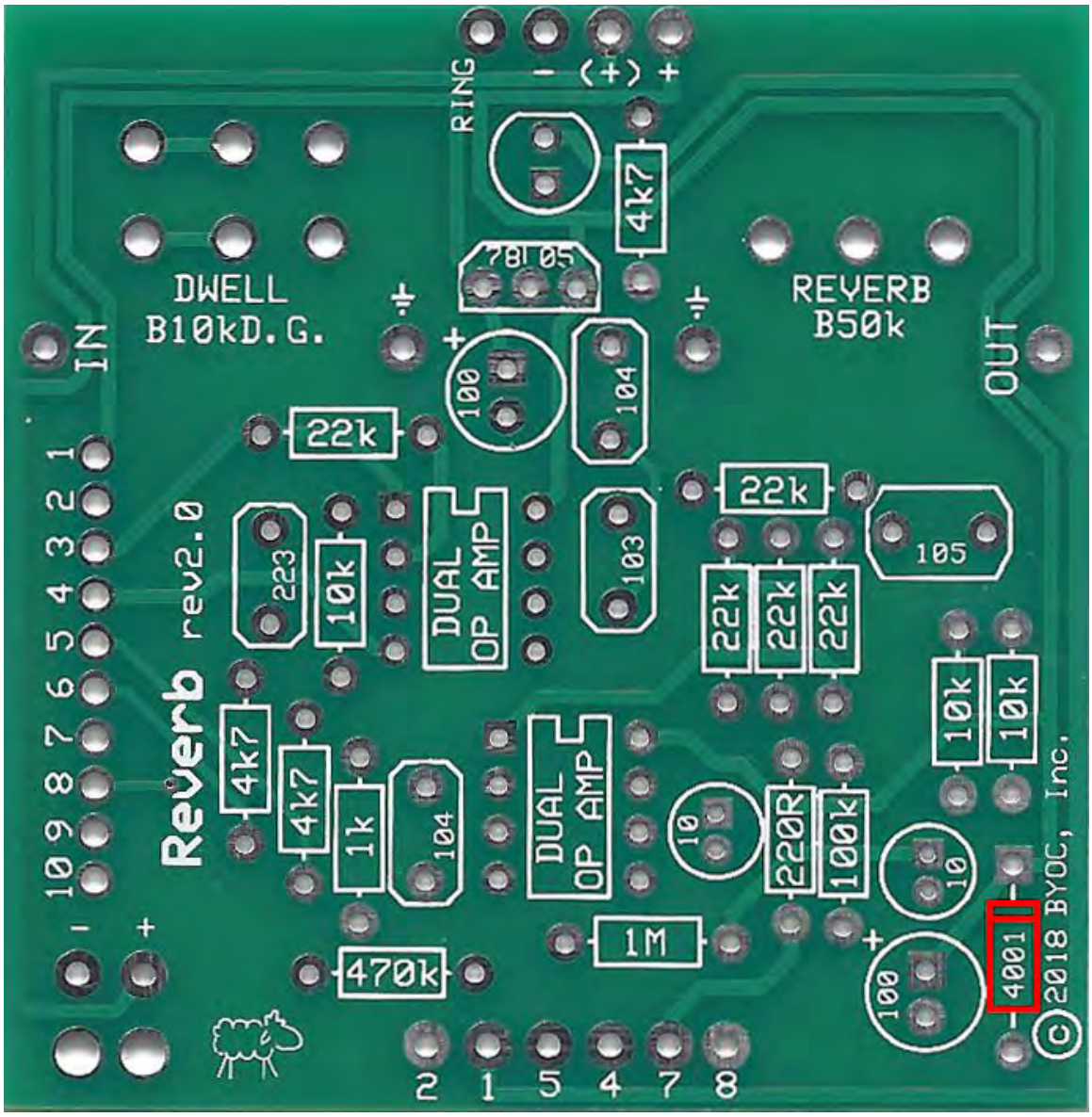
Hardware:
1 - predrilled enclosure w/ 4 screws
1 – BYOC Spring Reverb kit circuit board
1 - 3pdt footswitch
2 - knobs
1 - AC adaptor jack
2 - ¼" Enclosed jacks
2 - Internal Tooth Lock Washers
1 - battery snap
1 - red LED
hook-up wire

Populating the Circuit Board

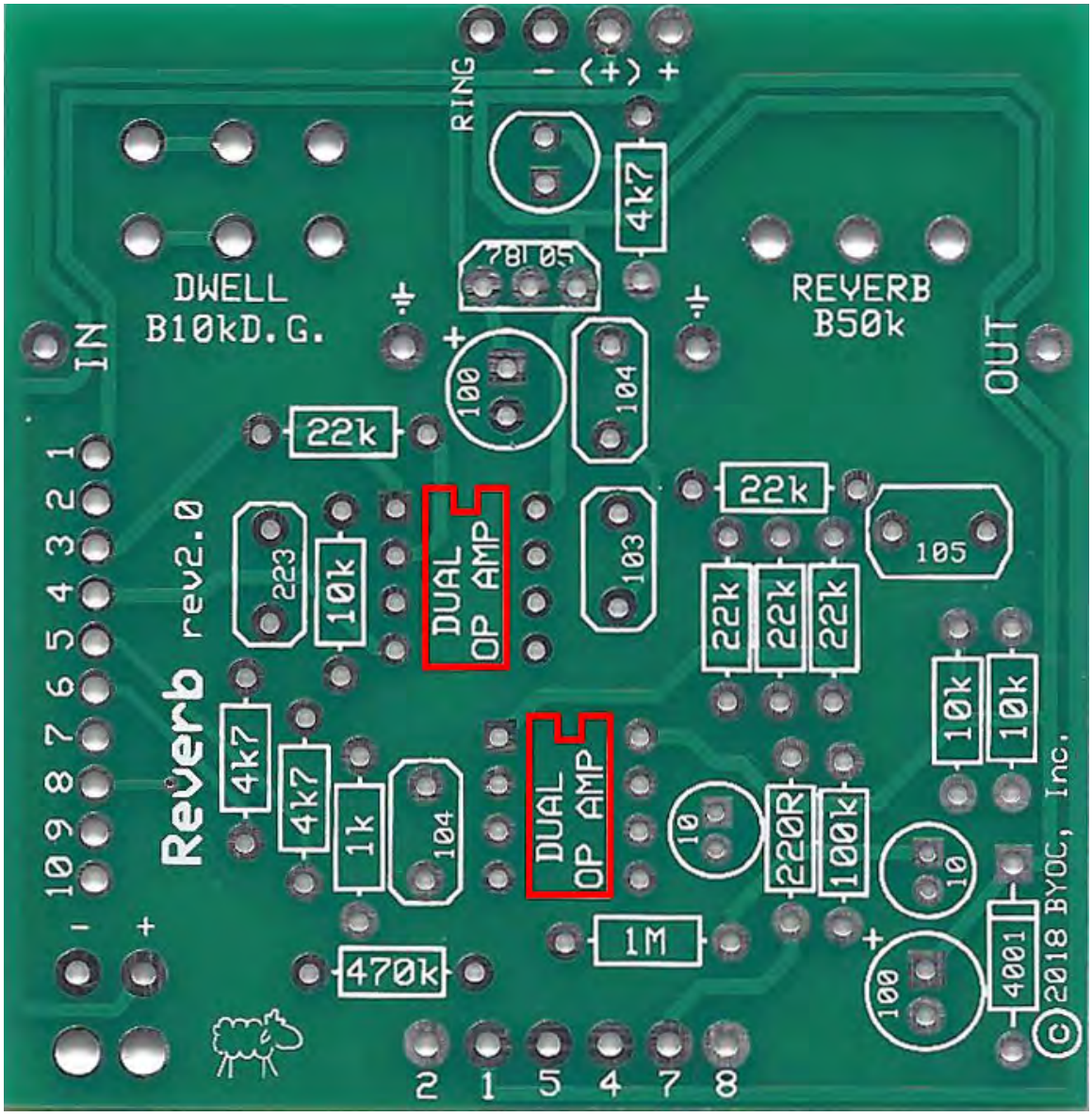
Step 1: Add all the resistors. Resistors are not polarized and can be inserted in either direction.



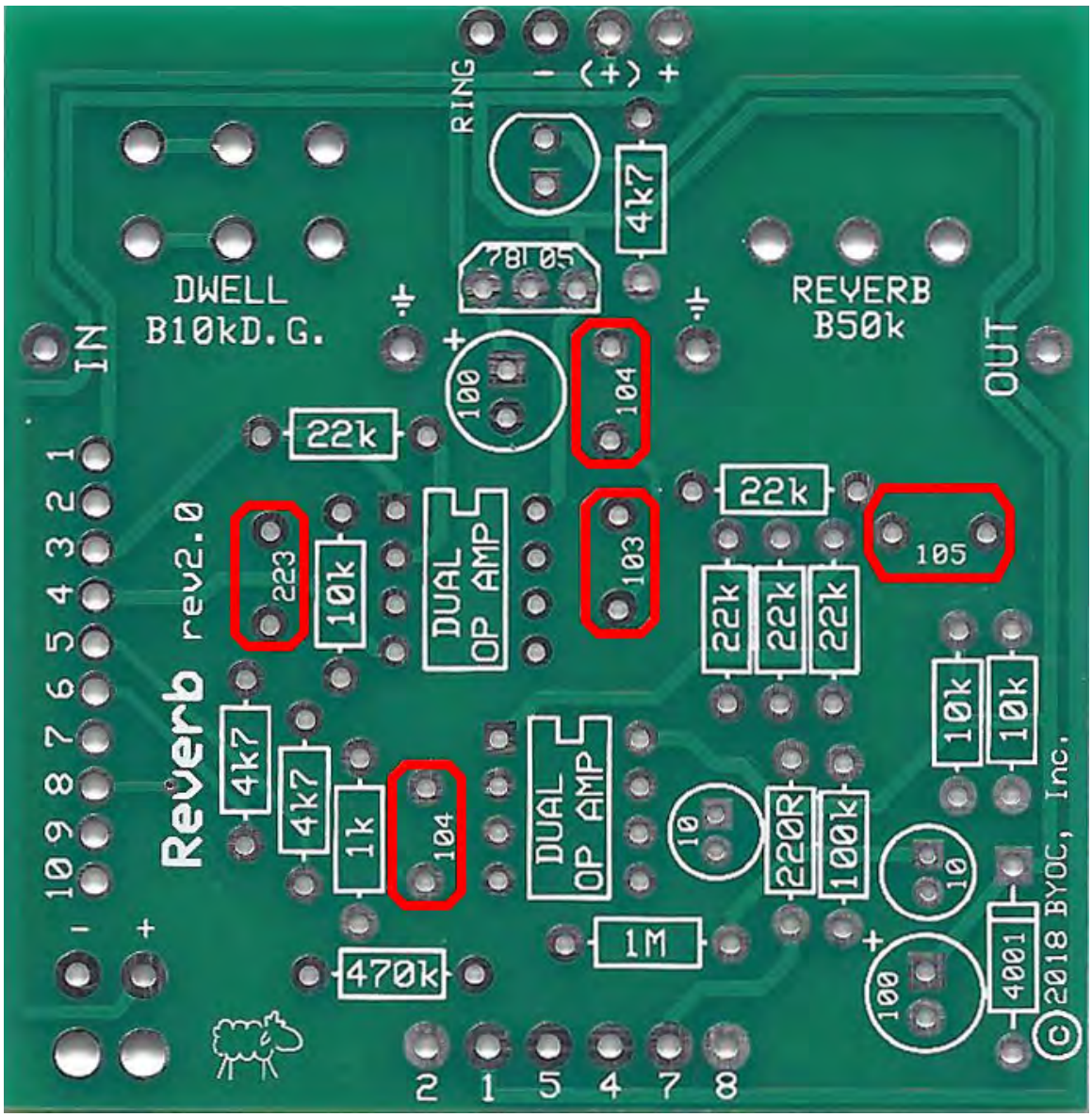
Step 2: Add the 1n4001 diode. Be sure to match the end of the diode with the stripe to the layout on the PCB. The striped end should go in the square solder pad.



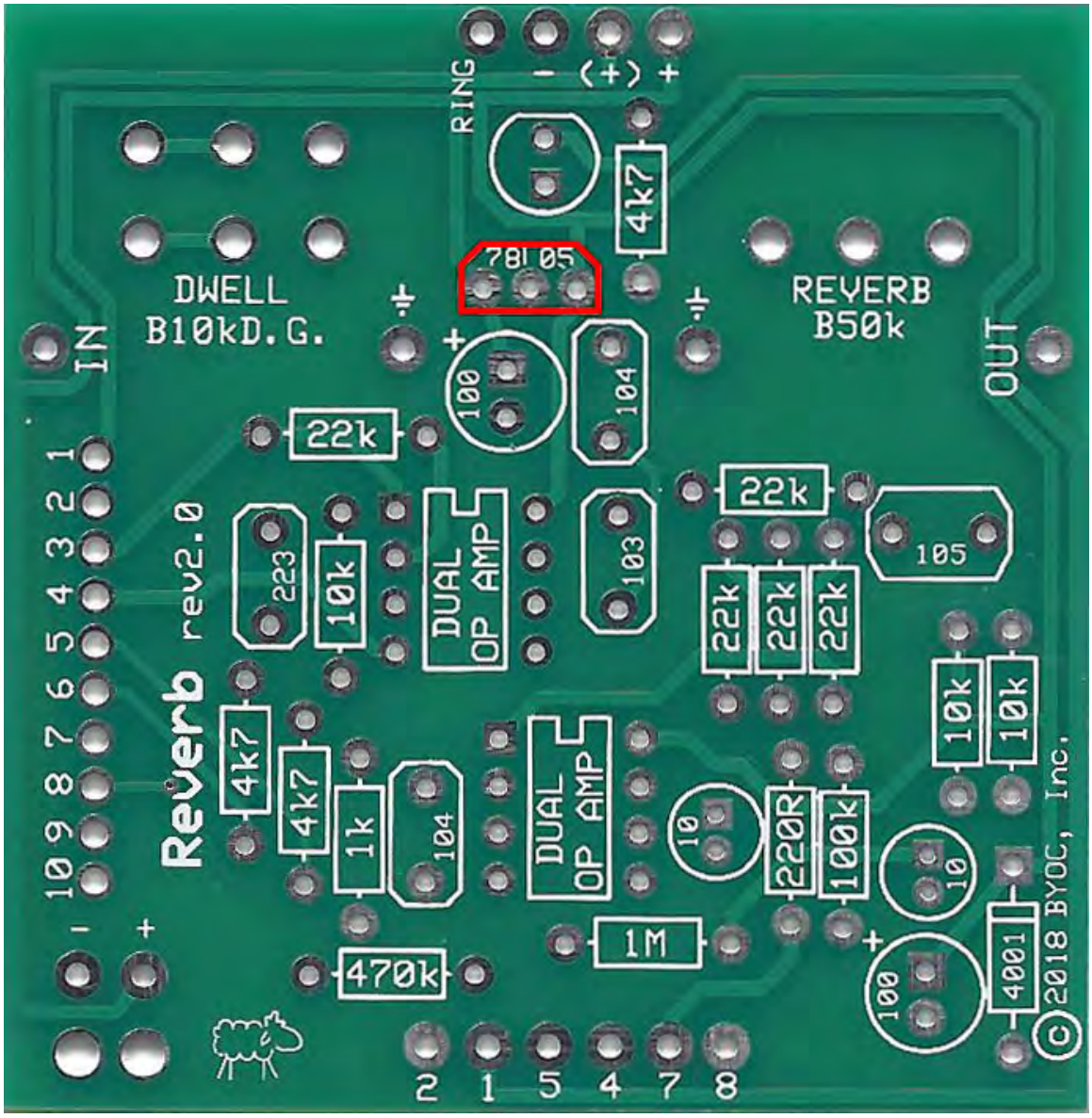
Step 3: Add the 8 pin IC sockets. **ONLY SOLDER THE SOCKETS! NOT THE ACTUAL IC!** This is a socket. The sockets get soldered to the PCB. The ICs get inserted into the sockets. The actual IC chip itself, never gets soldered. You will insert the IC into the socket after the entire pedal has been built. Orient the sockets so that the end with the notch matches up with the notch on the layout.



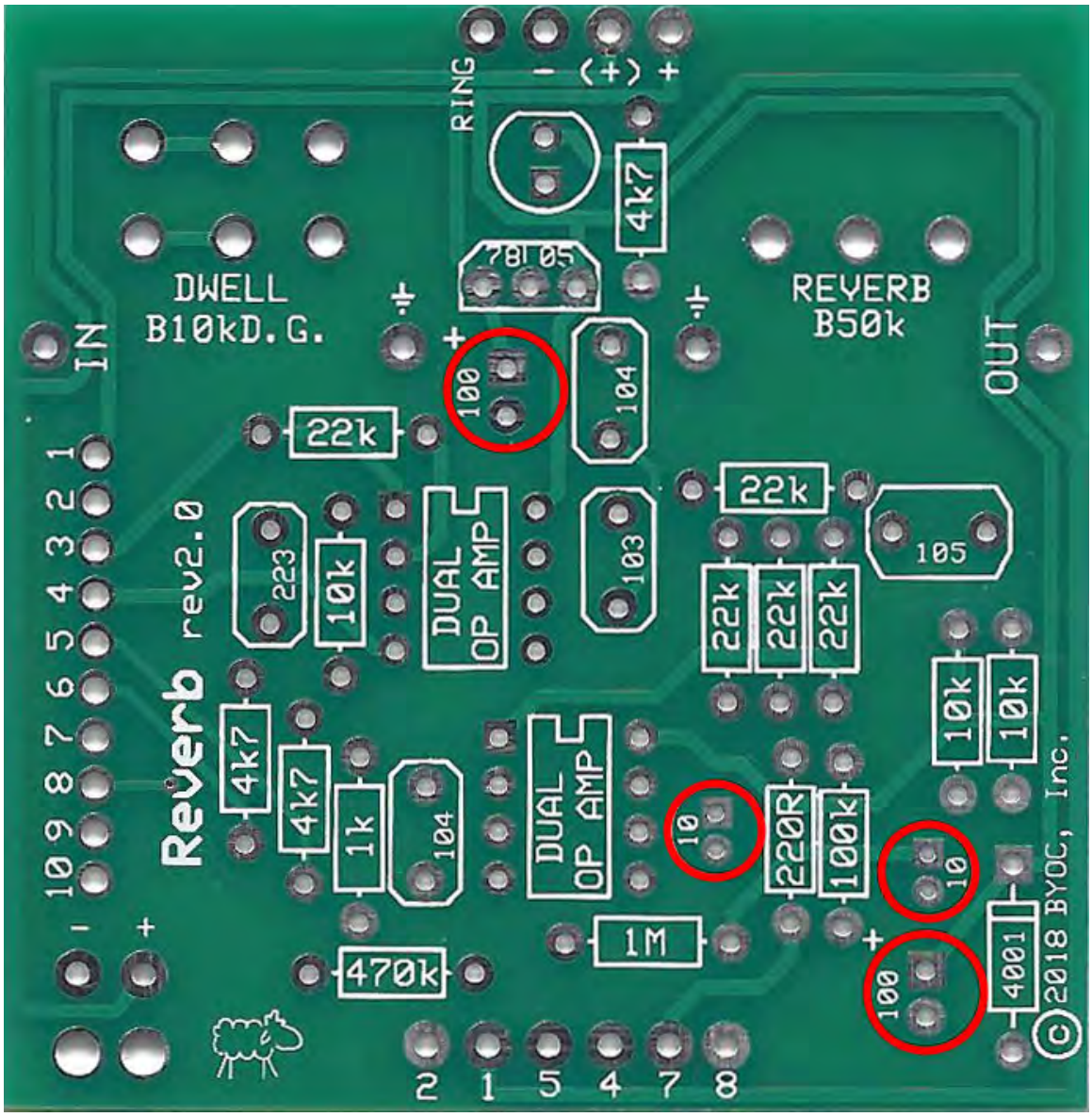
Step 4: Add the film capacitors. These are non-polarized so it can go in either direction.



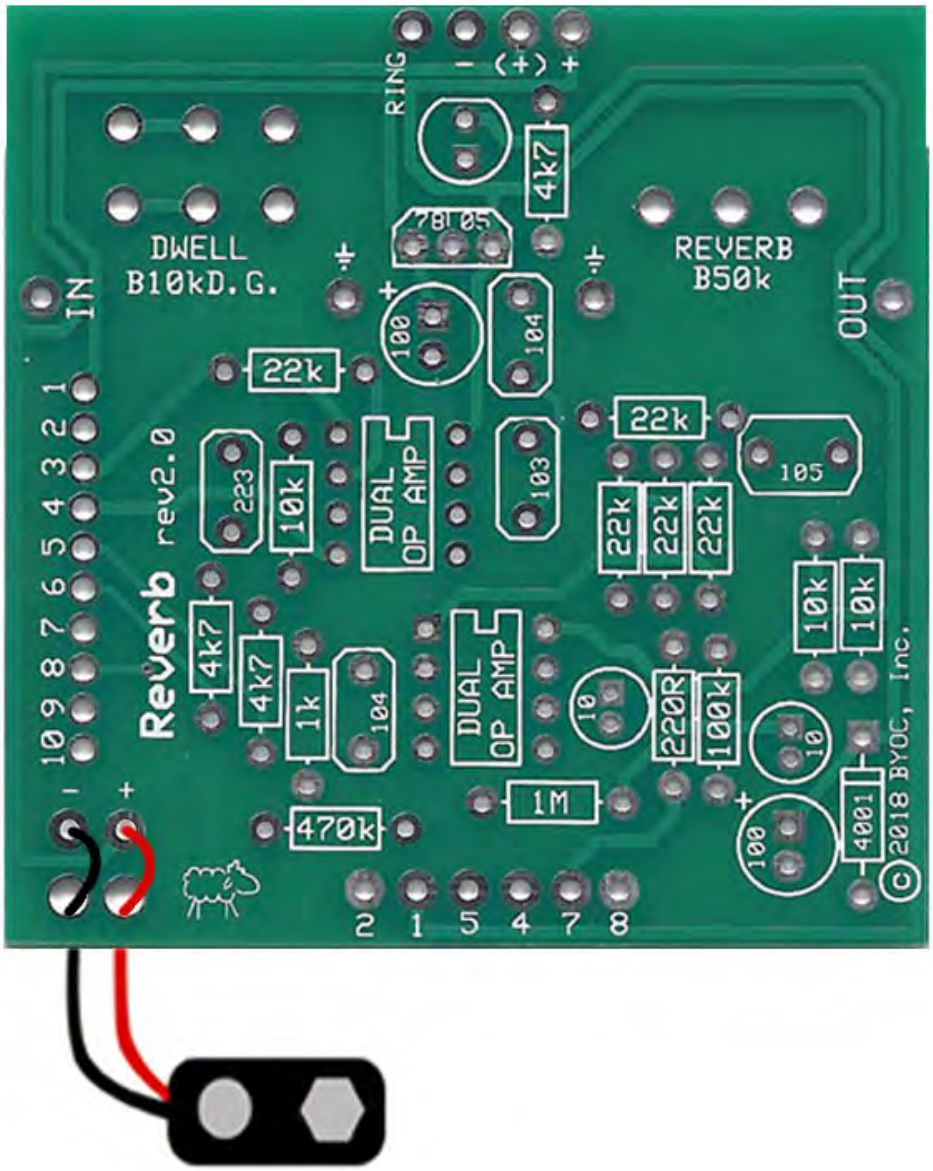
Step 5: Add the voltage regulator. Insert it into the PCB so that the flat side of the component matches up with the flat side of the PCB layout.



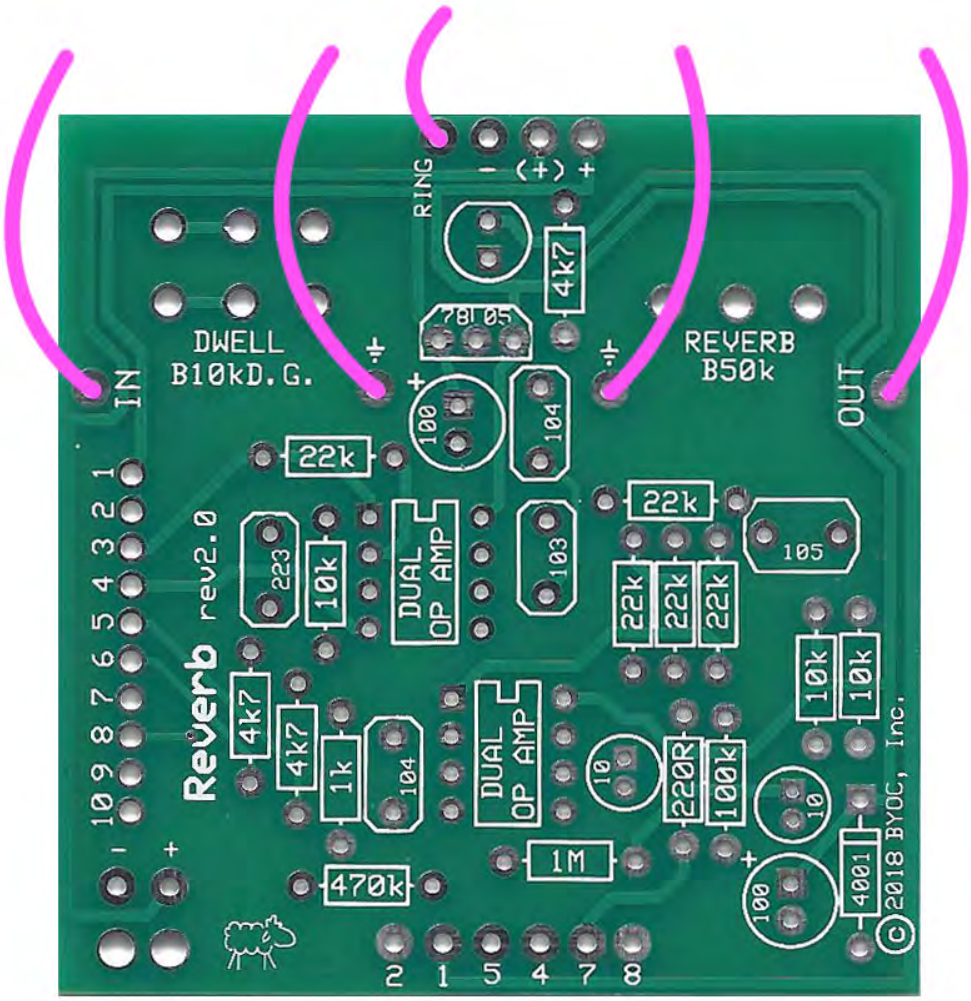
Step 6: Add the aluminum electrolytic capacitors. These are polarized, meaning there is a positive and negative end. The positive side will have a longer lead and goes in the square solder pad. The negative side will have a shorter lead and a stripe running along the body of the cap, and goes in the round solder pad.



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.

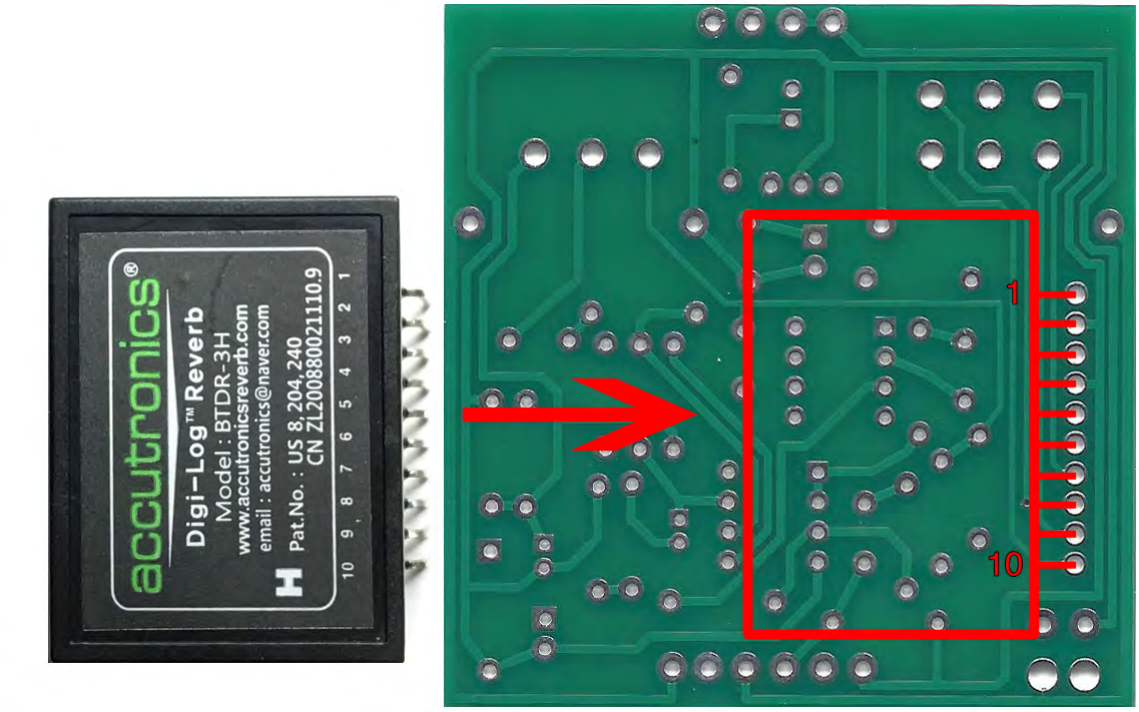


Step 8: Add wires to the IN, OUT, RING, and two Ground eyelets. Start by cutting four 2.5” pieces of wire, and one 1.5” piece. Strip 1/4” off each end and tin the ends. Tinning means to apply some solder to the stripped ends of the wires. This keeps the strands from fraying and primes the wire for soldering. Solder a 2.5” piece of wire to each of the IN, OUT, and Ground eyelets on the PCB. Solder the 1.5” piece to RING eyelet on the PCB. Load the wires in from the top and solder on the bottom of the PCB.



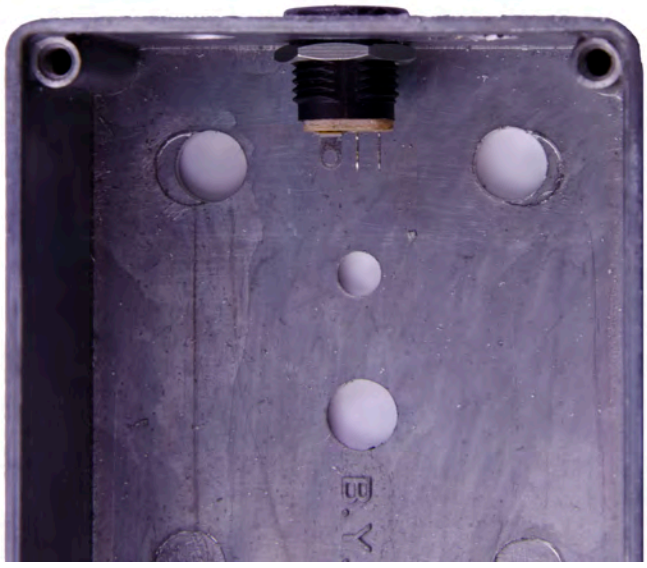
STEP 9: Add the Reverb Module to the underside of the PCB. BUT FIRST!!!! Take a break. Once you've soldered the reverb module in place, you will have locked many of the components that are on the other side of the PCB in. And to get to them, you'll need to desolder and remove the Reverb Module. It's not the end of the world if you do, but you want to avoid having to desolder and fix mistakes whenever possible. So take a rest at this point. Then come back and check your work so far. Are you absolutely certain you have all the resistors and capacitors in their correct spots? How do your solder joints look?

Once you've done this, install and solder the Reverb Module to the underside of the PCB. There is only one way the Module will fit in the PCB if you are inserting it into the underside. Solder the 10 pins on the topside of the PCB.

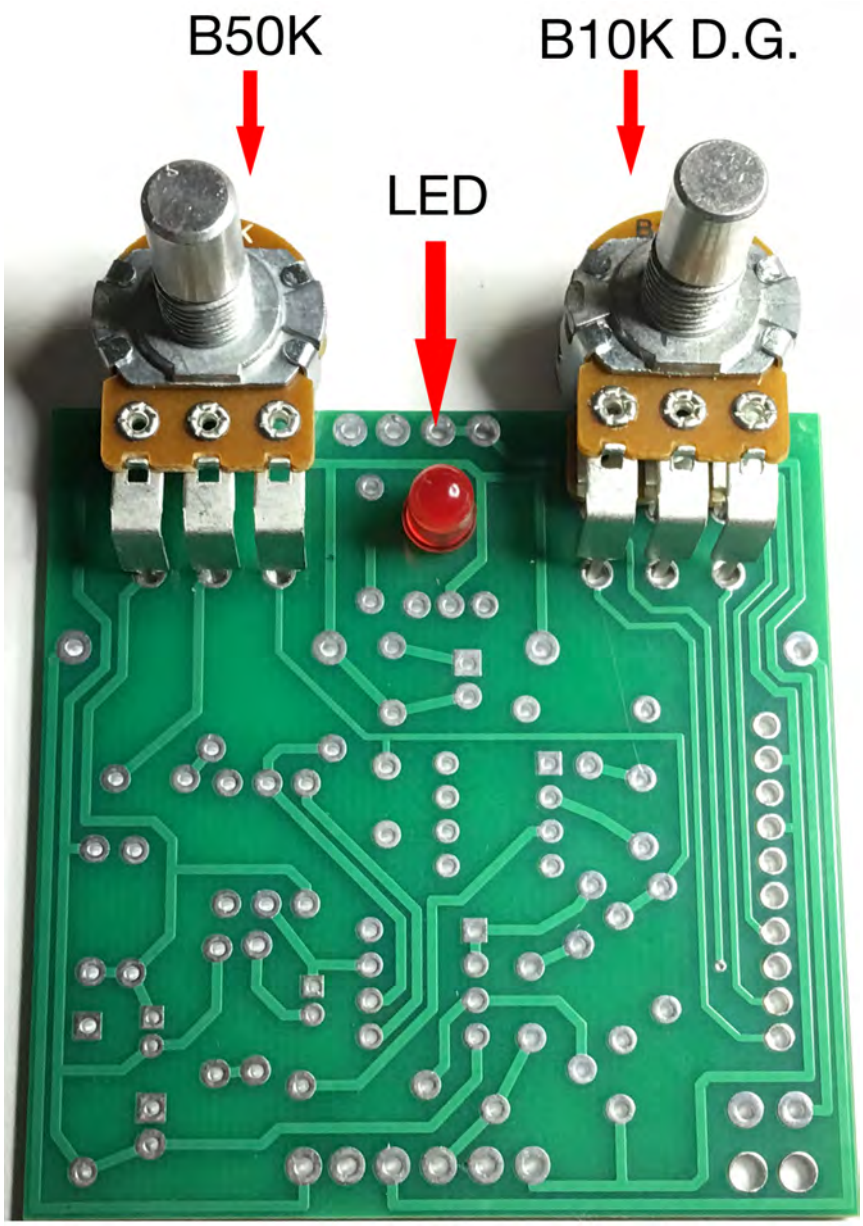


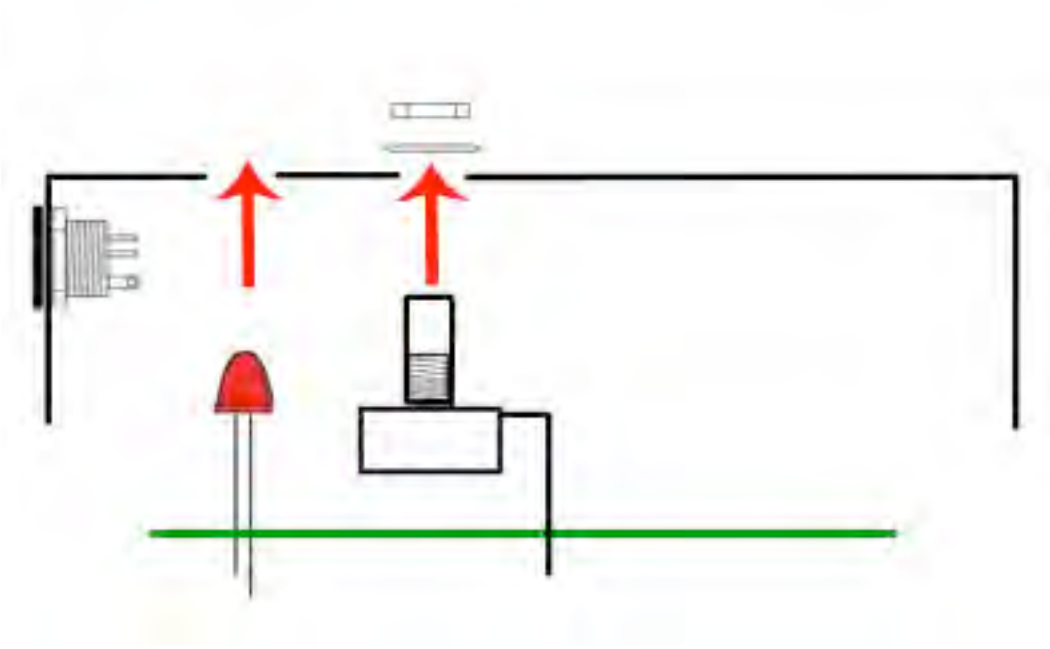
Main PCB Assembly

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 jack.



Step 2: Flip the PCB over so that the bottom or solder side is up. Insert the A100k (Volume), B50k (Resonance), B500k (Filter) & B50k(Gain) 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. THIS WILL GO INTO THE SQUARE SOLDER HOLE.

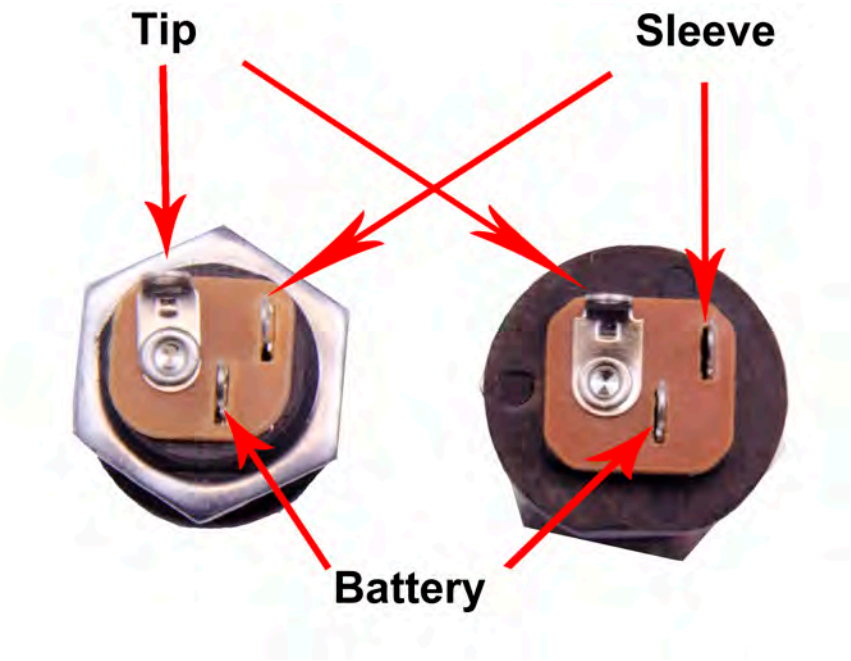




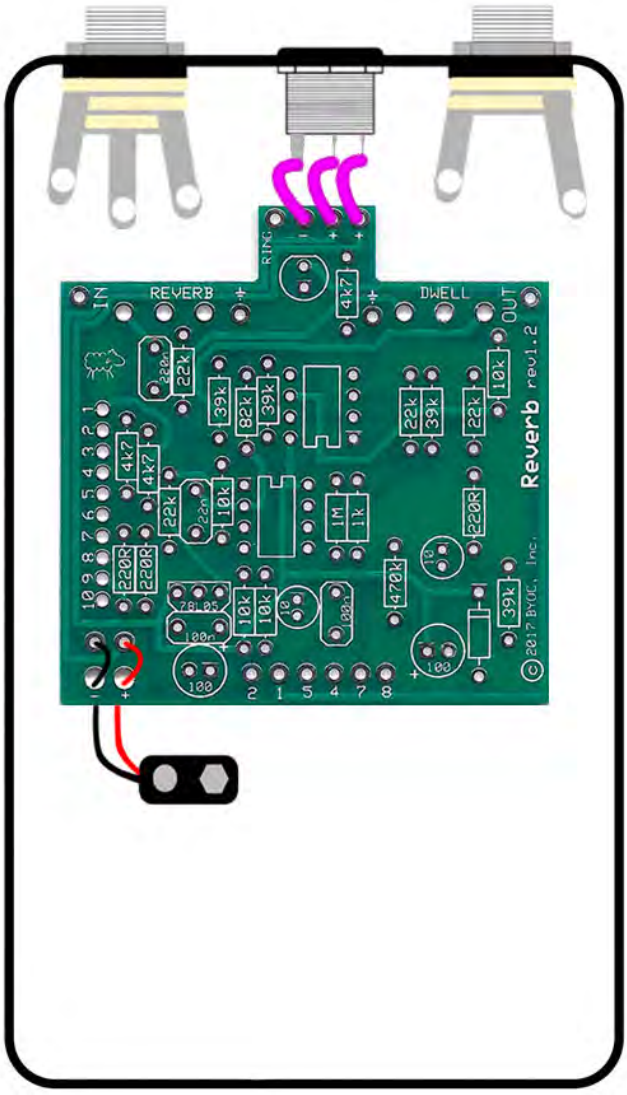
Step 3: Hold the PCB in one hand so that the component side of the PCB is in the palm of your hand and the bottom side with the pots, toggle switch and LED is facing up. Now use your other hand to guide the predrilled enclosure onto the PCB assembly so that the pots and LED all go into their respective 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 "+" farthest to the right. Connect the battery disconnect terminal of the DC adaptor jack to the second eyelet on the PCB labeled "+" located in the middle of the other two eyelets . See diagram on the next page.


RING
IN
REVERB
DWELL
OUT
Reverb rev1.2
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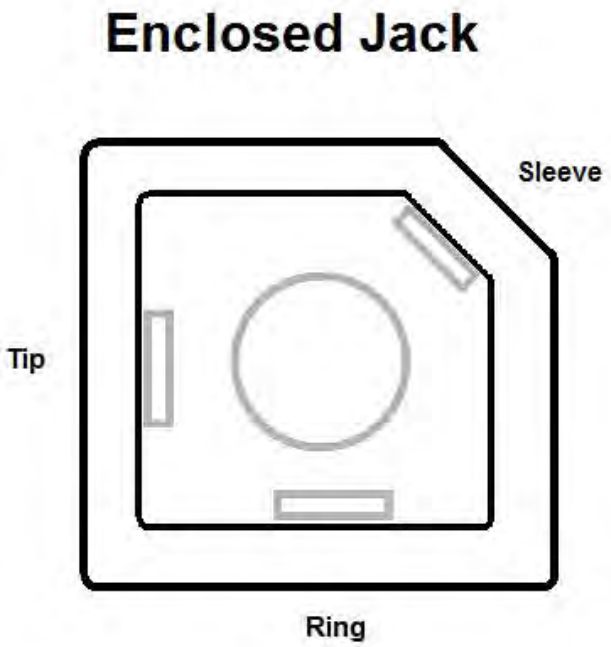
Wiring

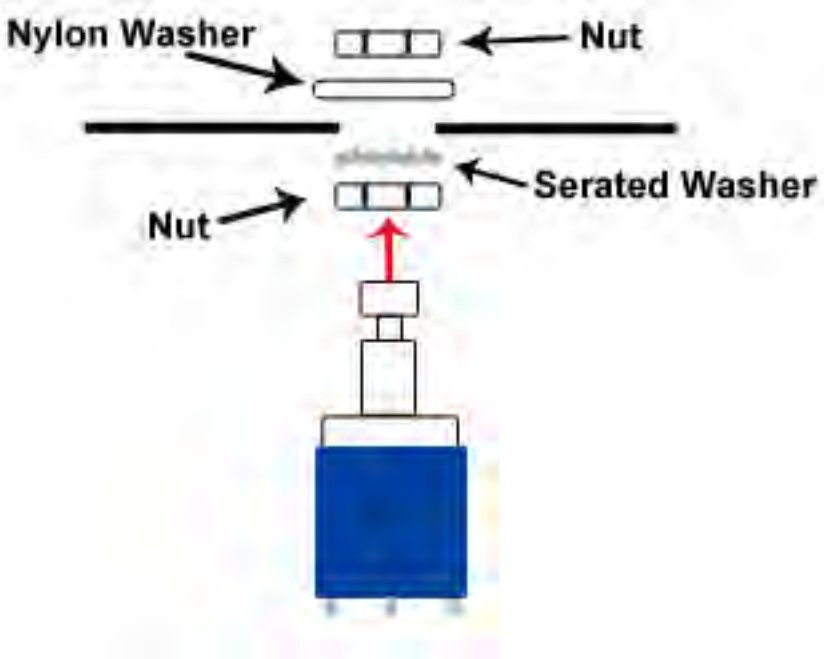
Stereo (input) Jack

Mono (output) Jack

Step 1: Install the 1/4” jacks to the enclosure.

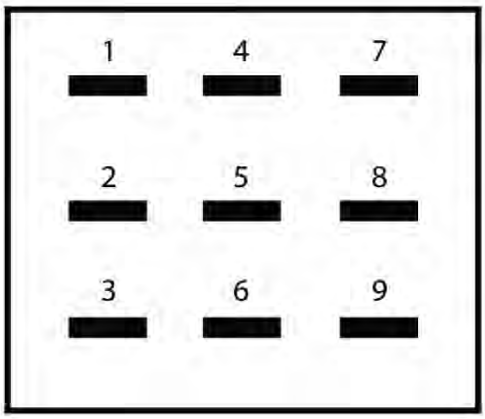
Your kit might come with enclosed jacks instead.

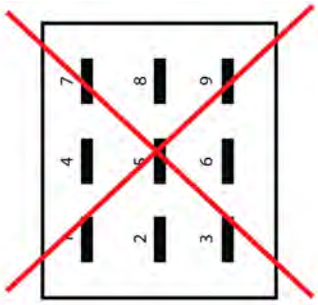




Step 2: Install the footswitch. Orient the footswitch so that the flat sides of the solder lugs are like the diagram below.
NOTE: There are no actual number markings on the footswitch. There are two correct ways you can orient the footswitch. They are both 180 degrees of each other. Either way is fine. 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.

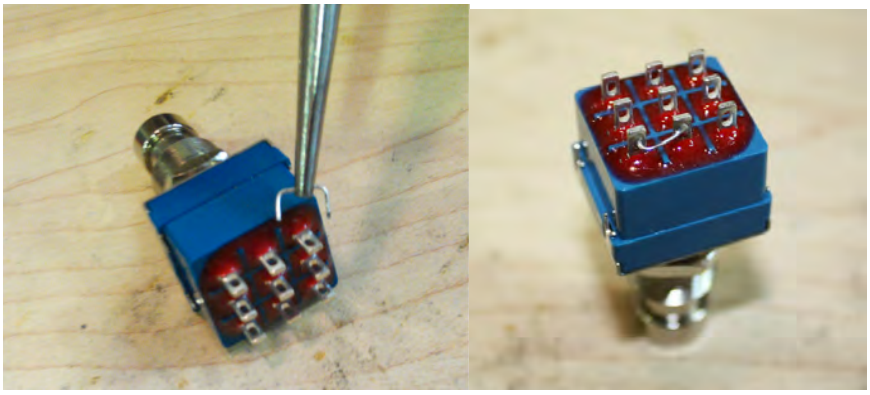
FOOT SWITCH SOLDER LUG DESIGNATIONS



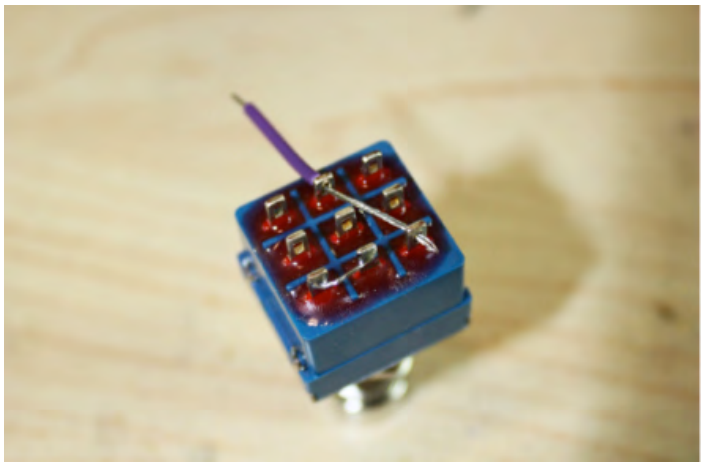


Step 3: Wiring the foot switch.

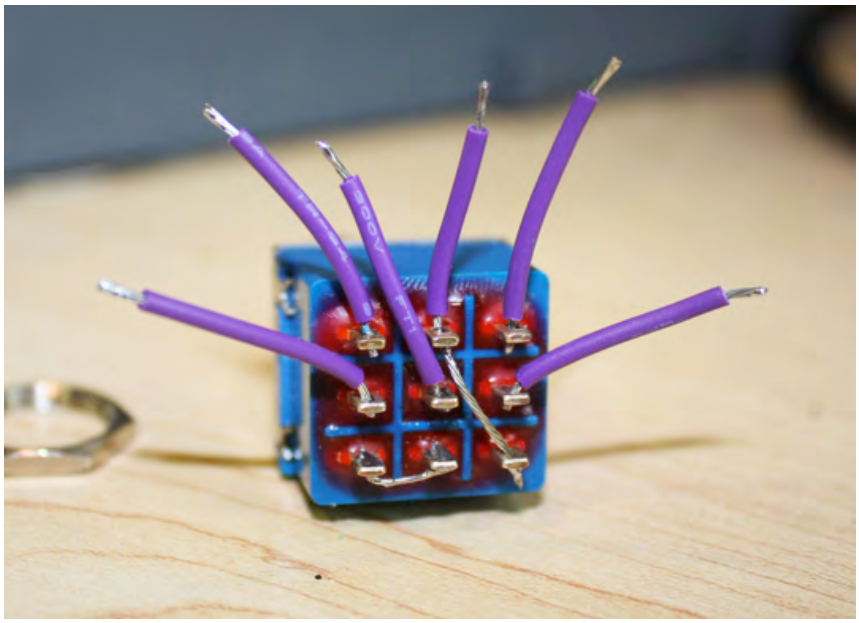
- Make a jumper between lugs 3 & 6 from clippings from the resistors. Simply use your needle nose pliers to make a U shape & insert into lugs 3 & 6, then solder.



- 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.

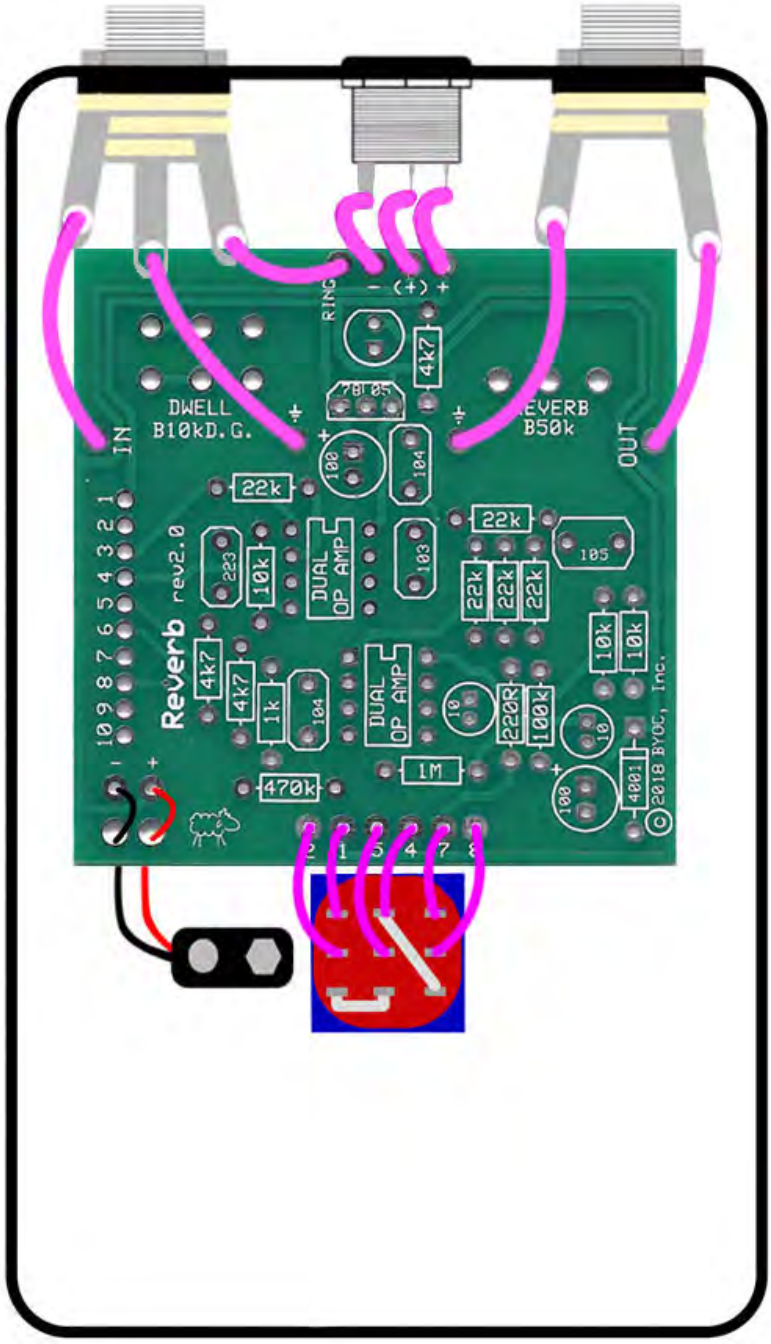


- Cut two 1” pieces of wire. Strip 1/8” off each end and tin. These will be used to connect lugs/eyelets 1 & 7
- Cut three 1.25” pieces of wire. Strip 1/8” off each end and tin. This will be used to connect lugs/eyelets 2, 5, & 8

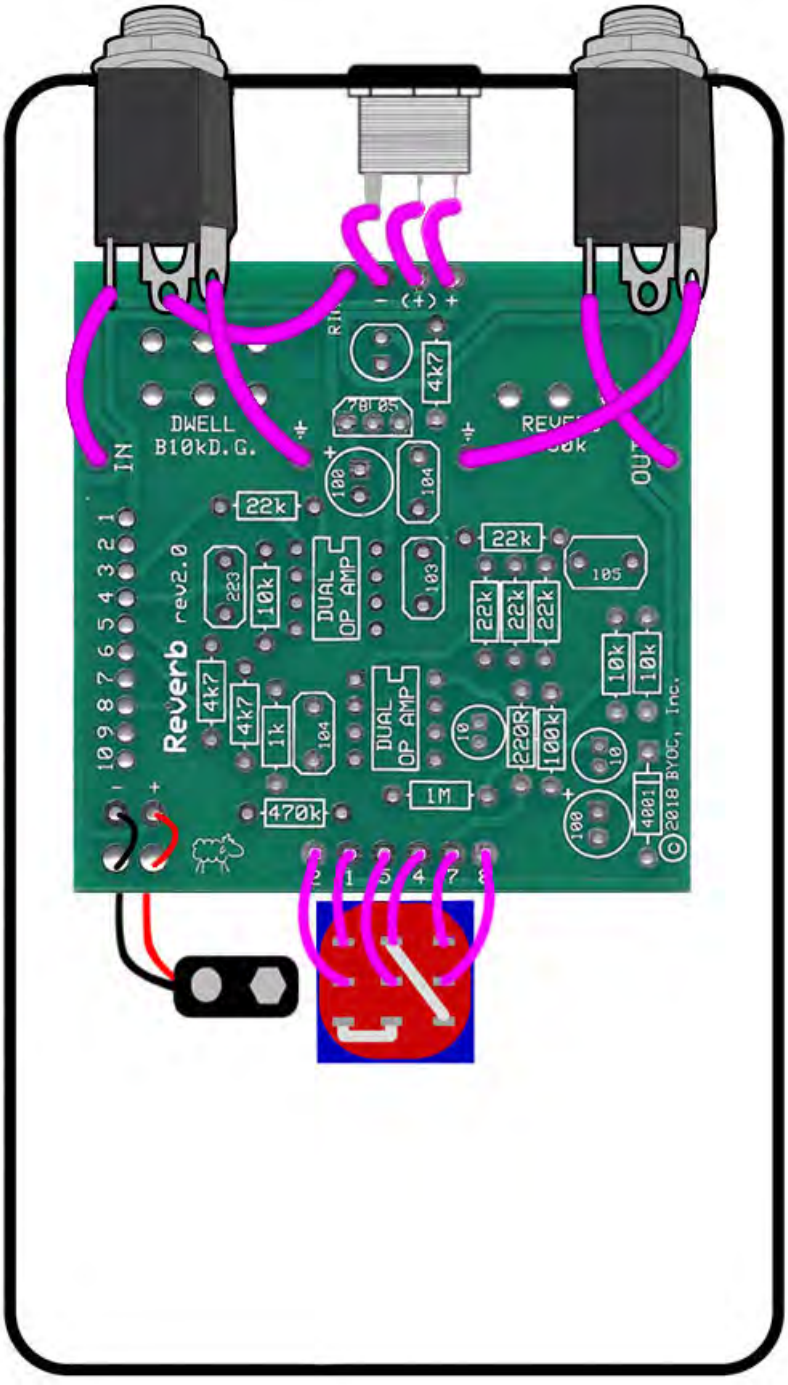


Step 4: Install the foot switch into the enclosure if it isn’t already. Insert the foot switch wires into their respective eyelets on the PCB. You can insert them into the top side and solder on the top side as well. The solder pads should be large enough (if you are using a soldering iron that isn’t 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.

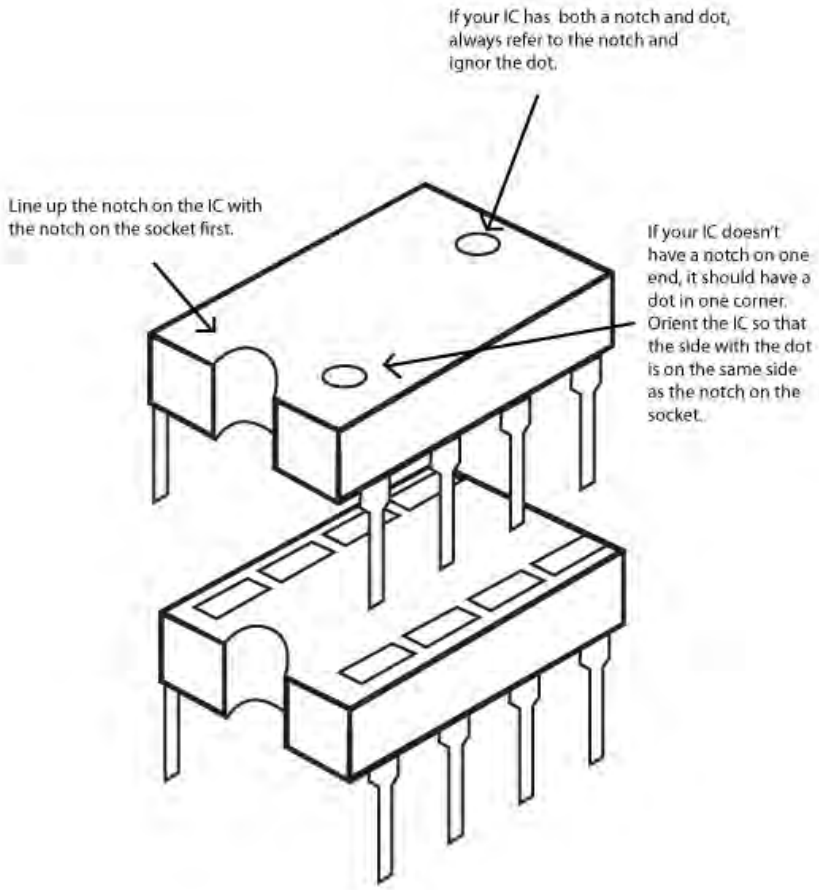
Step 5: Connect the pre stripped and tinned wires to the 1/4” jacks.



Enclosed Jack Wiring



Installing IC/Finish up



Don't forget to put the cover on the enclosure and apply the bumpers to the cover.

Operating Overview

Dwell: Controls how long the reverb lingers

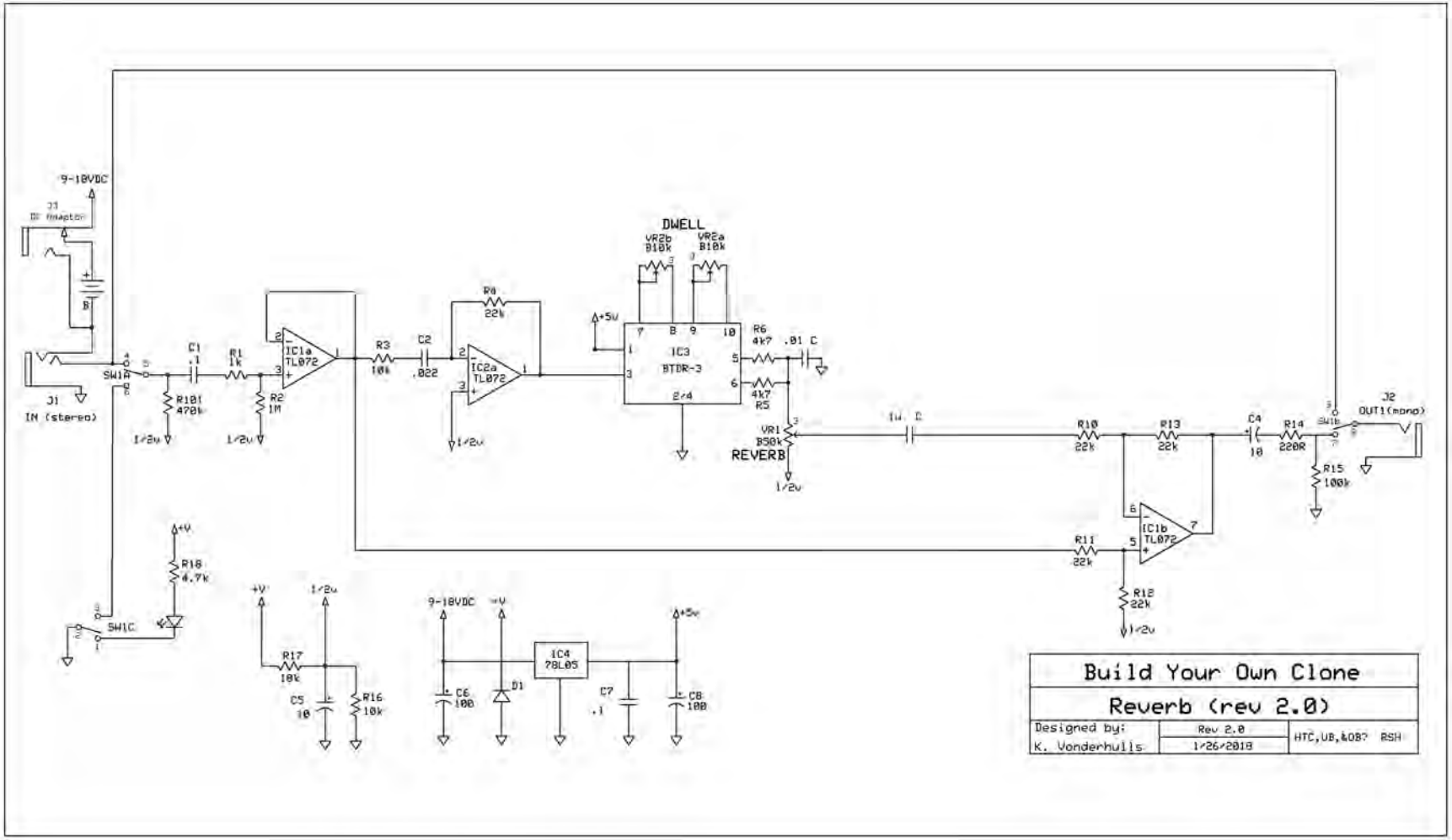
Reverb: Controls the level of reverb

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

Current Draw: 6.5mA

Input Impedance: 470k ohms

Output Impedance: 100k ohms


9-18VDC
J3
DC Adaptor
B
J1
IN (stereo)
SW1A
SW1B
SW1C
C1
.1
R1
1k
R101
470k
1/2v
R2
1M
IC1a
TL072
R3
10k
C2
.022
R9
22k
IC2a
TL072
+5v
DWELL
VR2b
B10k
VR2a
B10k
IC3
BTDR-3
2/4
R6
4k7
.01 C
R5
4k7
VR1
B50k
REVERB
1u C
R10
22k
R13
22k
C4
10
R14
220R
R15
100k
J2
OUT1(mono)
IC1b
TL072
R11
22k
R12
22k
R18
4.7k
+V
R17
10k
C5
10
R16
10k
9-18VDC
IC4
78L05
C6
100
D1
C7
.1
C8
100
Build Your Own Clone
Reverb (rev 2.0)
Designed by:
K. Vonderhulls
Rev 2.0
1/26/2018
HTC,UB,&087 RSH

Please visit
http://byocelectronics.com/board
for any technical support

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