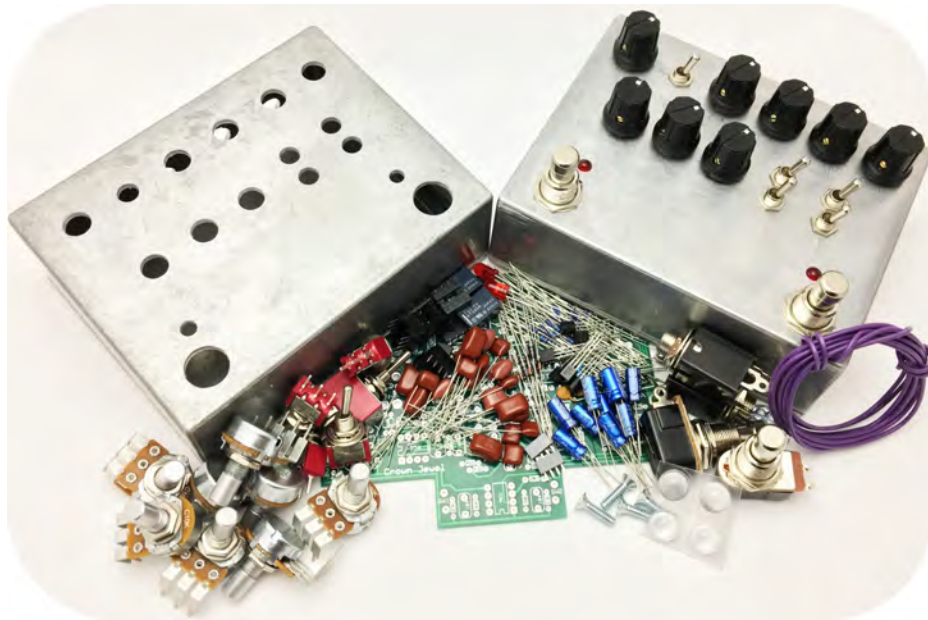


# Build Your Own Clone Crown Jewel Kit Instructions



## **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 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, 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](mailto: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](mailto: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 manner. 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.byoelectronics.com/board](http://www.byoelectronics.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.

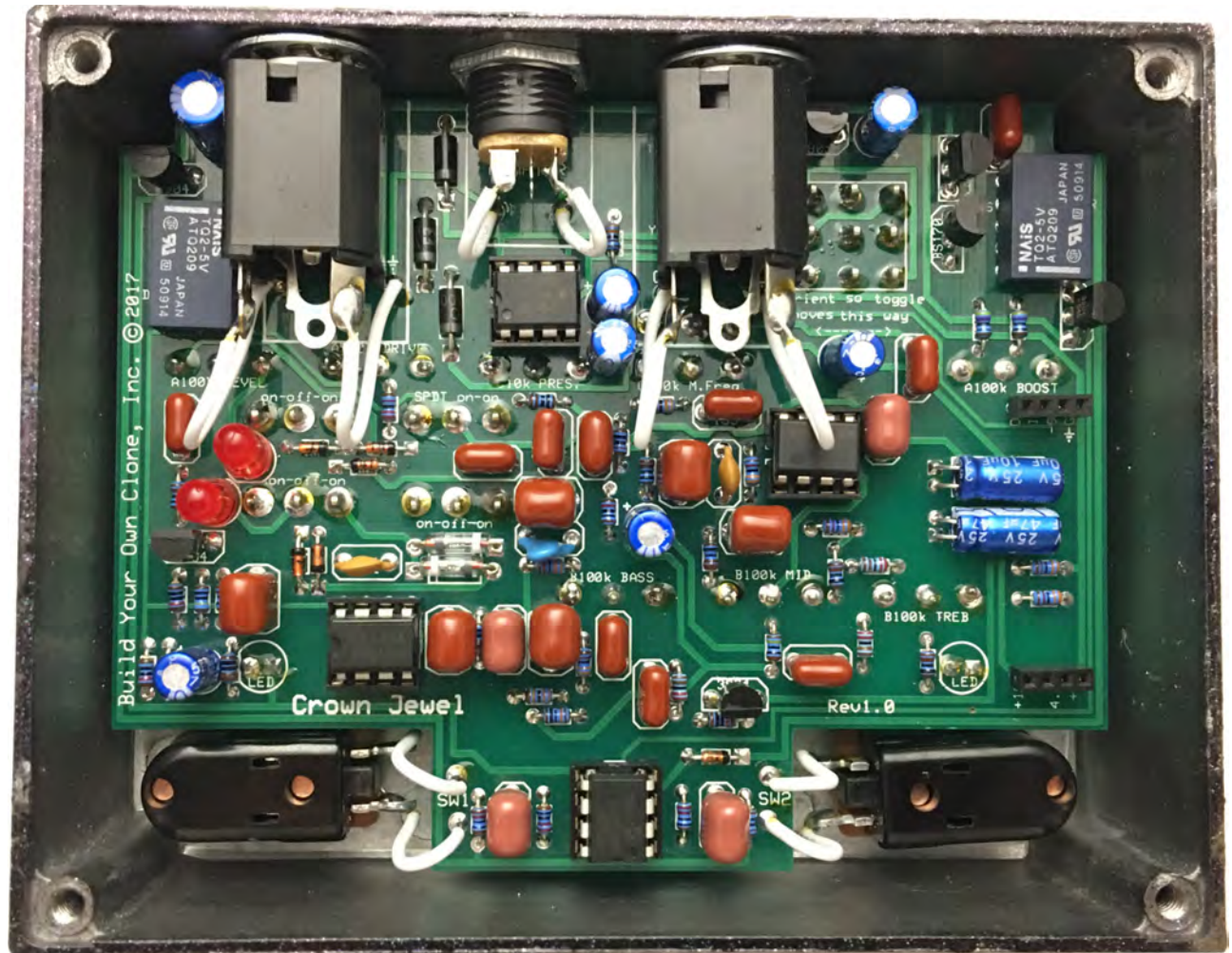
## **Copyrights:**

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**This is what your kit should look like when it's complete. Your kit may come with different color capacitors, switches ect. Don't be alarmed by this. They all still do the exact same thing.**



## Parts Checklist for the Crown Jewel Kit

### Resistors: (Metal Film (5 Bands) / Carbon Film (4 Bands))

- 2 - 220R/221 (Red/Red/Black/Black/Brown) / (Red/Red/Brown/Brown)
- 2 - 470R/471 (Yellow/Purple/Black/Black/Brown) / (Yellow/Purple/Brown/Brown)
- 8 - 1k/102 (Brown/Black/Black/Brown/Brown) / (Brown/Black/Red/Brown)
- 3 - 2k2/222 (Red/Red/Black/Brown/Brown) / (Red/Red/Red/Brown)
- 2 - 3k3/332 (Orange/Orange/Black/Brown/Brown) / (Orange/Orange/Red/Brown)
- 9 - 10k/103 (Brown/Black/Black/Red/Brown) / (Brown/Black/Orange/Brown)
- 1 - 22k/223 (Red/Red/Black/Red/Brown) / (Red/Red/Orange/Brown)
- 6 - 33k/333 (Orange/Orange/Black/Red/Brown) / (Orange/Orange/Orange/Brown)
- 1 - 100k/104 (Brown/Black/Black/Orange/Brown) / (Brown/Black/Yellow/Brown)
- 1 - 330k/334 (Orange/Orange/Black/Orange/Brown) / (Orange/Orange/Yellow/Brown)
- 2 - 1M/105 (Brown/Black/Black/Yellow/Brown) / (Brown/Black/Green/Brown)

Visit [www.byocelectronics.com/resistorcodes.pdf](http://www.byocelectronics.com/resistorcodes.pdf) for more information on how to differentiate resistors.

### Capacitors:

- 1 - 33p ceramic disc cap (may say "33" on the body)
- 2 - 100p ceramic disc cap (may say "101" on the body)
- 1 - .0056u/5n6 film cap (may say "562" on the body)
- 2 - .01u/10n film cap (may say "103" on the body)
- 1 - .015u/15n film cap (may say "153" on the body)
- 1 - .022u/22n film cap (may say "223" on the body)
- 2 - .047u/47n film cap (may say "473" on the body)
- 1 - .068u/68n film cap (may say "683" on the body)
- 4 - .1u/100n film cap (may say "104" on the body)
- 2 - .22u/220n film cap (may say "224" on the body)
- 6 - 1u film caps (may say "105" on the body)
- 4 - 10uf Aluminum Electrolytic
- 4 - 47uf Aluminum Electrolytic
- 1 - 100uf Aluminum Electrolytic

Visit [www.byocelectronics.com/capcodes.pdf](http://www.byocelectronics.com/capcodes.pdf) for more info on how to differentiate capacitors.

### Diodes:

- 1 - 4.3v Zener diode
- 3 - 1N4001 diode
- 5 - 1N4148 or 1N914 diodes
- 2 - D9D or similar Germanium Diodes
- 2 - Red LED

### IC's:

- 1 - TL072
- 1 - 4558
- 1 - 12F609
- 1 - 7660S Charge Pump

4 - DIP8 sockets

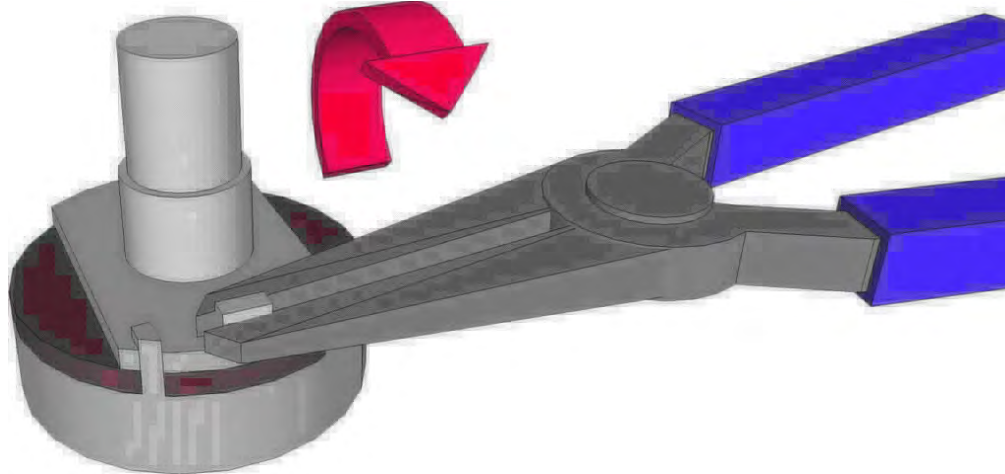
**Transistors:**

1 - 78L05  
4 - 2N3904  
2 - BS170

**Relays:**

2 - TQ2-5V Relays

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



2 - A100k (LEVEL)  
1 - A500k (DRIVE)  
3 - B100k (BASS, MID, TREB)  
1 - C10k (PRESENCE)  
1 - C100k Dual Gang (MID FREQ)

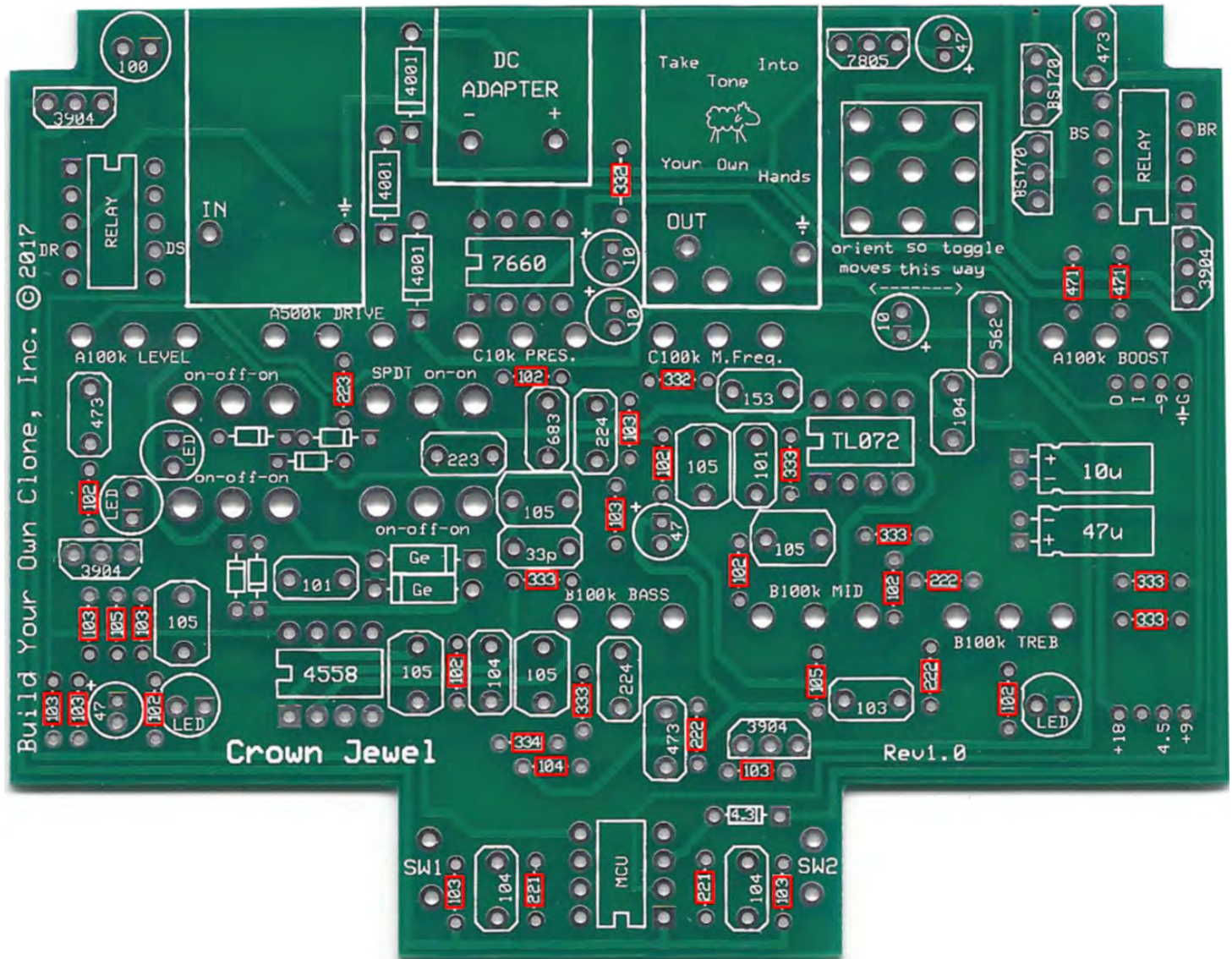
**Hardware:**

1 - predrilled enclosure w/ 4 screws  
1 - Crown Jewel Printed Circuit Board  
2 - momentary footswitch  
1 - 3PDT Toggle  
1 - SPDT on-on Toggle  
3 - SPDT on-off-on Toggle  
2 - 1X4 Header socket  
2 - Enclosed jacks  
4 - rubber bumpers  
2 - lock washers (for in and out jacks)  
hook-up wire



## Populating the Circuit Board

**Step 1:** Add all the resistors. Resistors are not polarized and can be inserted into the PCB in either direction, meaning you don't have to worry about orienting them.



**Your kit will come with mostly 1/8 watt resistors. If you receive 1/4 watt resistors, simply bend them so the body is vertical on the PCB. Below is an example**





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DC ADAPTER

Take Tone Into  
Your Own Hands

RELAY

IN

OUT

orient so toggle moves this way

A100k LEVEL

on-off-on

SPDT on-on

C10k PRES.

C100k M.Freq.

A100k BOOST

on-off-on

on-off-on

Ge

Ge

B100k BASS

B100k MID

B100k TREB

10u

47u

4558

TL072

7660

Rev1.0

Crown Jewel

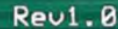
SW1

MCU

SW2

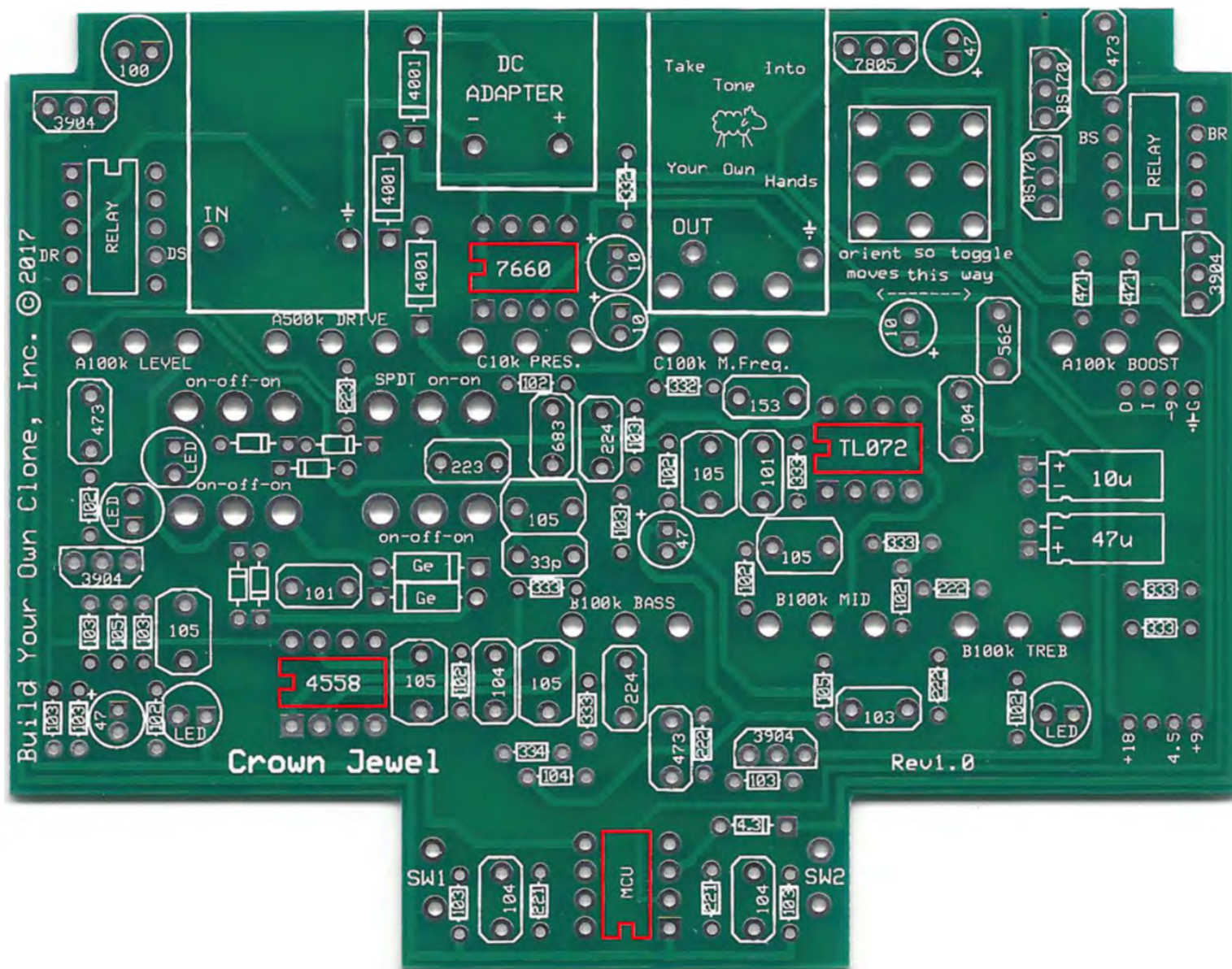
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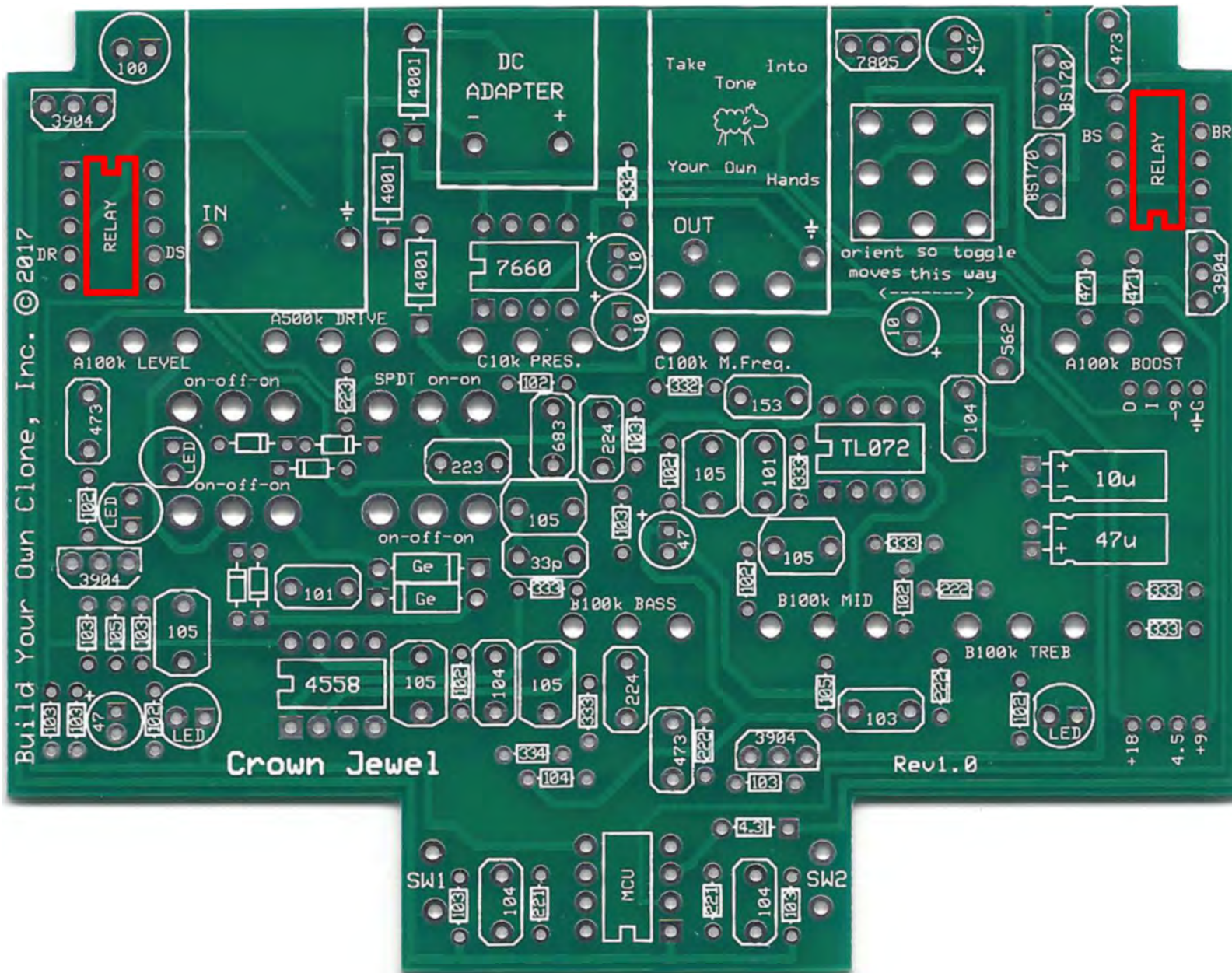


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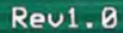


**Step 6:** Add the relays. Be sure to orient them correctly. The relay will have a line on one end of the body indicating the side where pin 1 and pin 8 are. Place the relays so the stripe side is on the notch on the PCB screenprint.



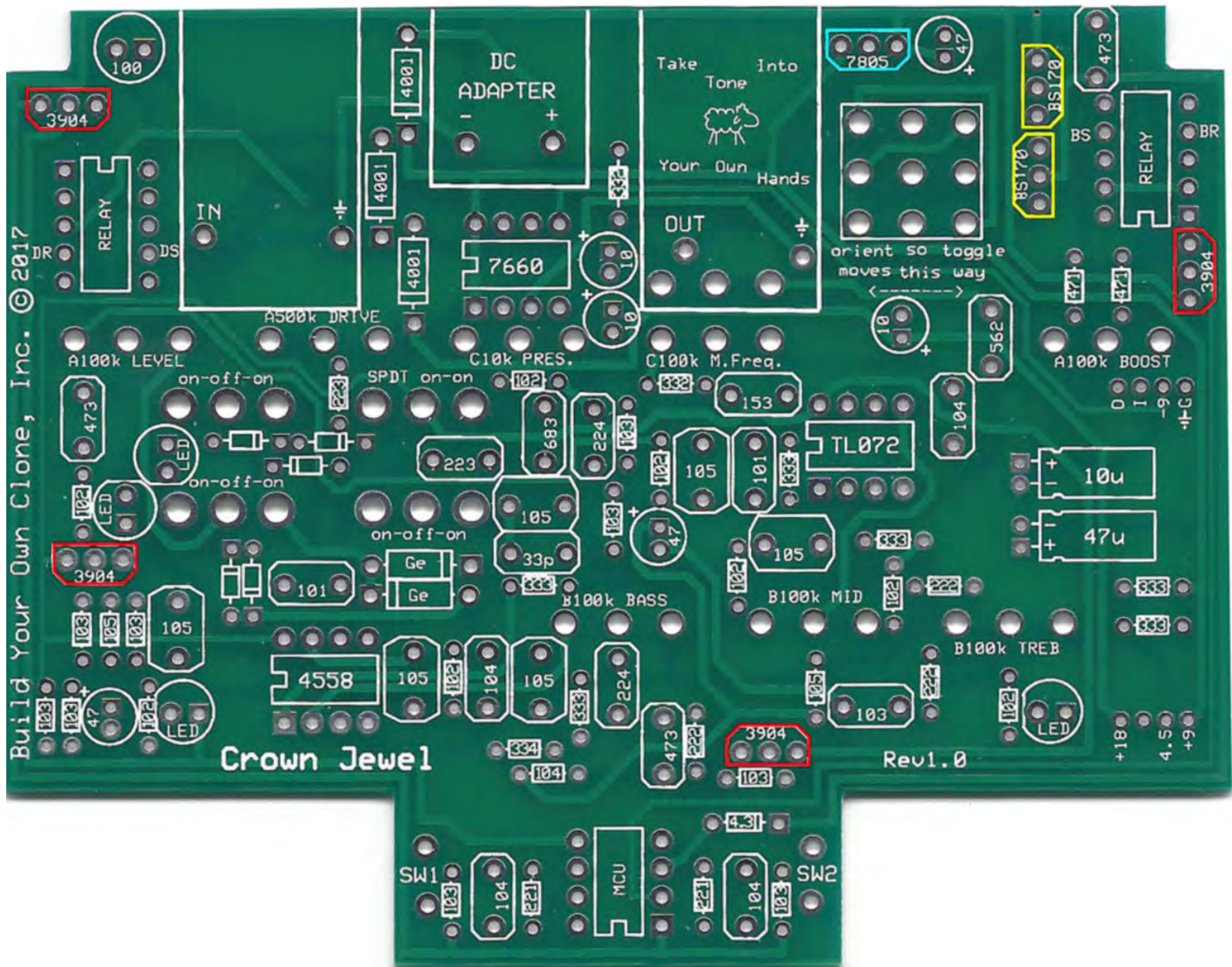


Build Your Own Clone, Inc. ©2017 H



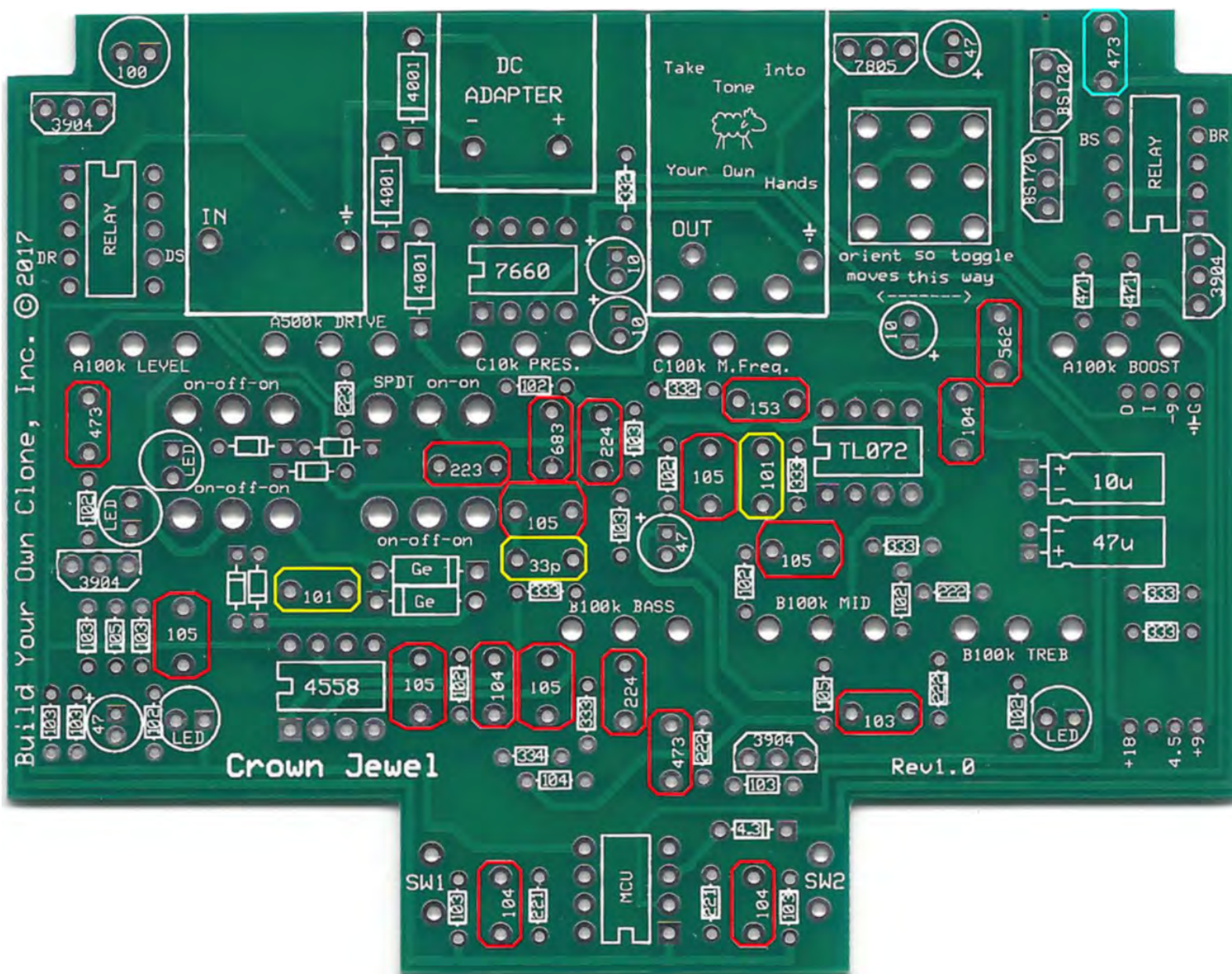


**Step 8:** Add the transistors. Be sure to match the flat side of the transistor with the flat side of the transistor on PCB layout. Red outline is 2N3904, blue outline is 78L05, and the yellow outline is for the BS170s.

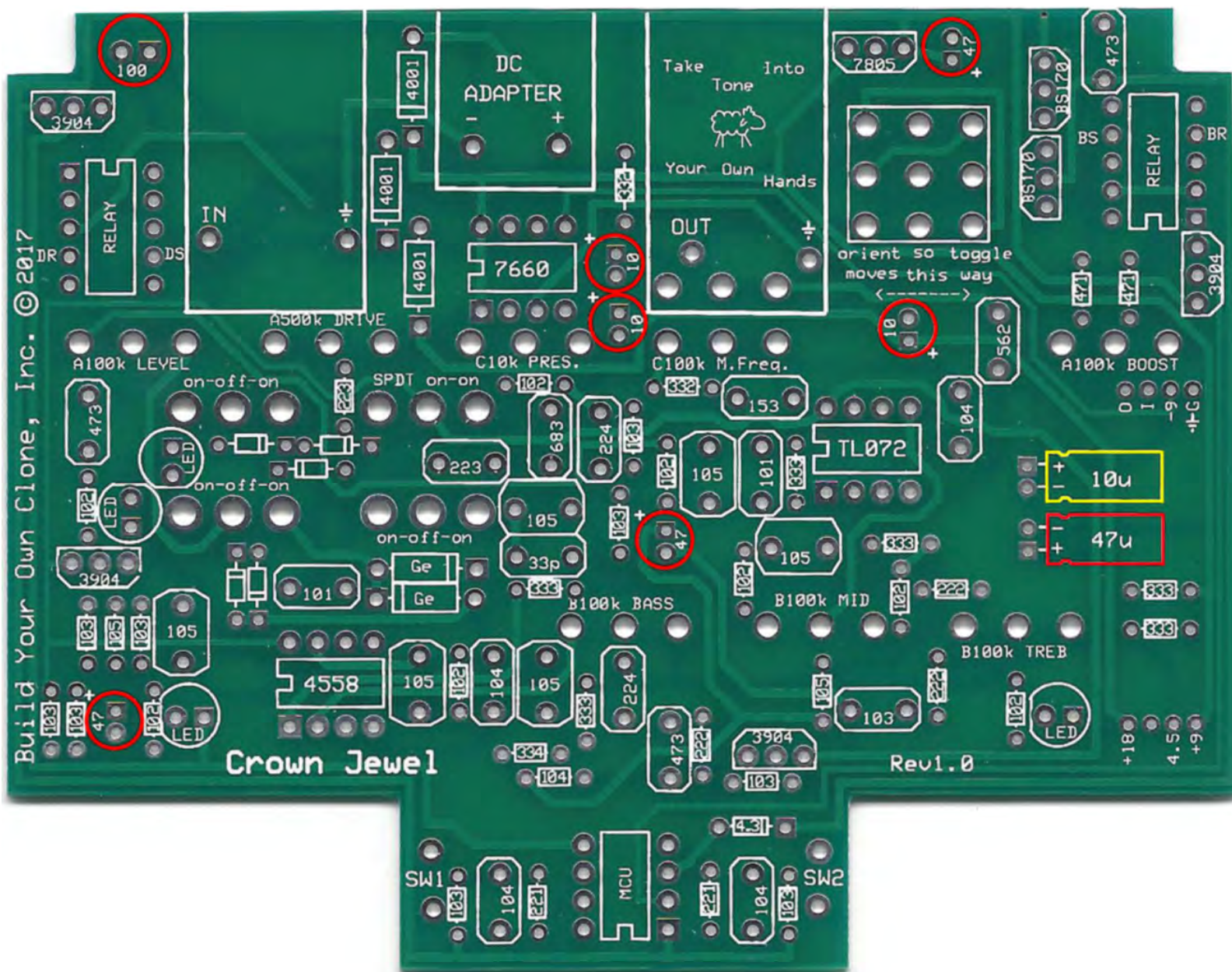




**Step 9:** Add the film and ceramic disc capacitors. These are non-polarized so they can go in either direction. The ceramic disc capacitors are highlighted in yellow, and are also non-polarized. The “473” highlighted in blue is supposed to be a .01uf film cap.







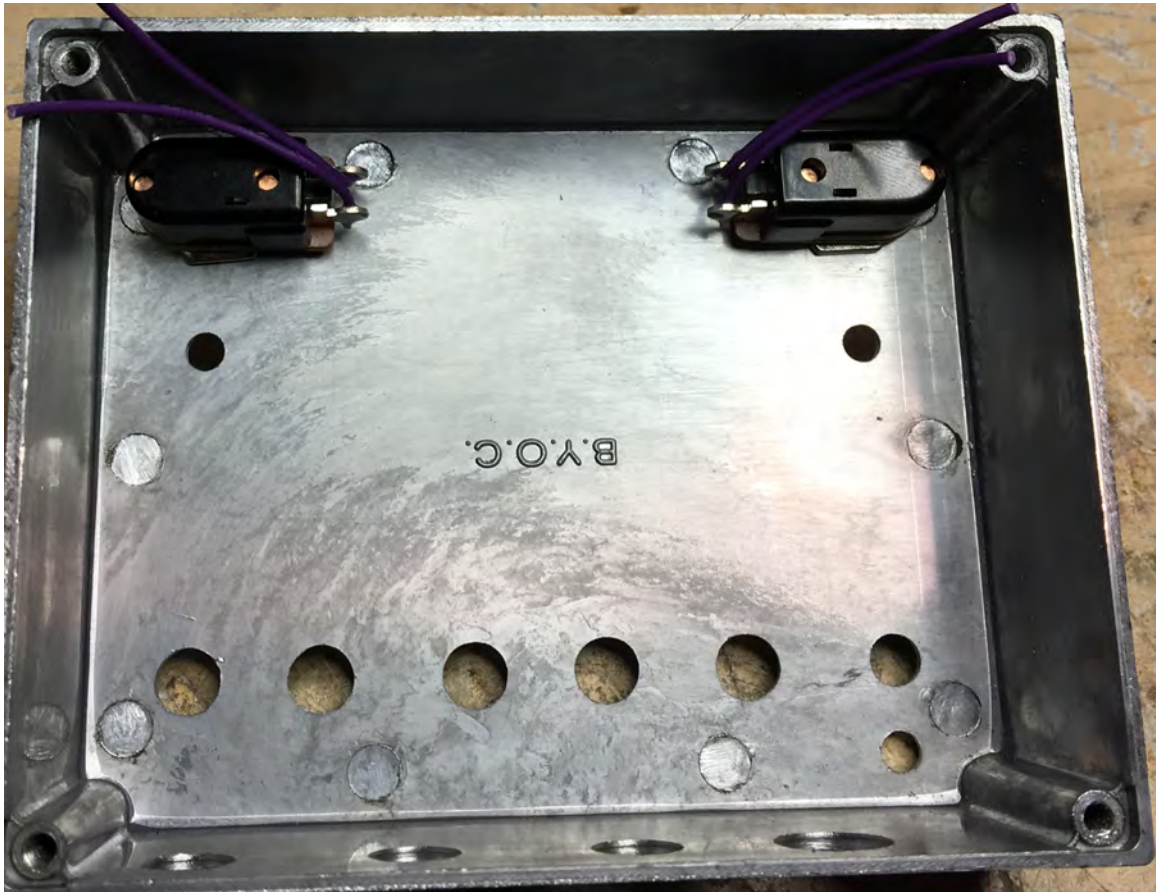


# Main PCB Assembly

**Step 1:** Prepare the footswitches. Cut four 3 inch pieces of wire and solder them to the footswitches as shown.



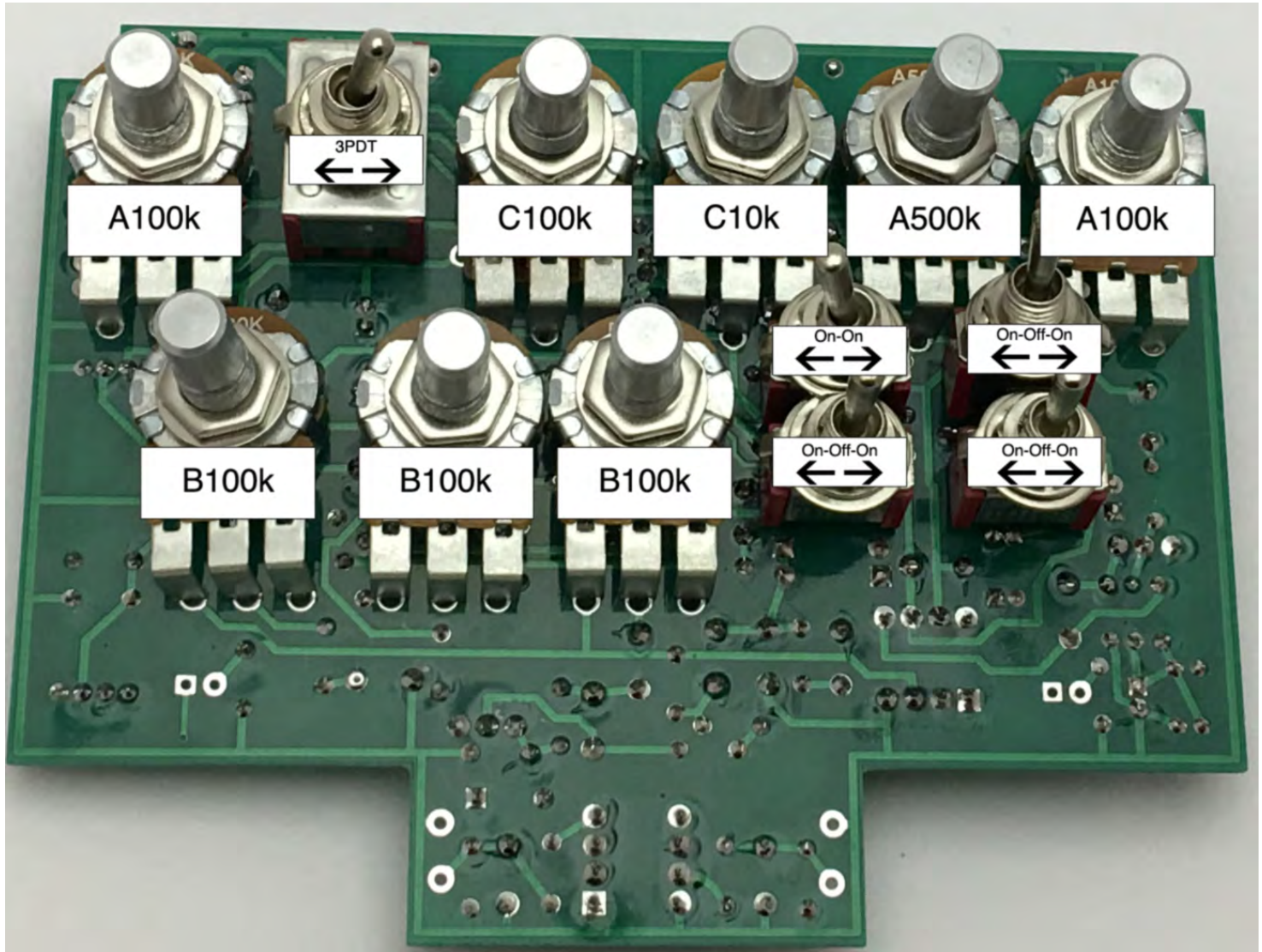
**Step 2:** Install the footswitches in the enclosure. Orient the footswitches so the solder lugs are facing each other

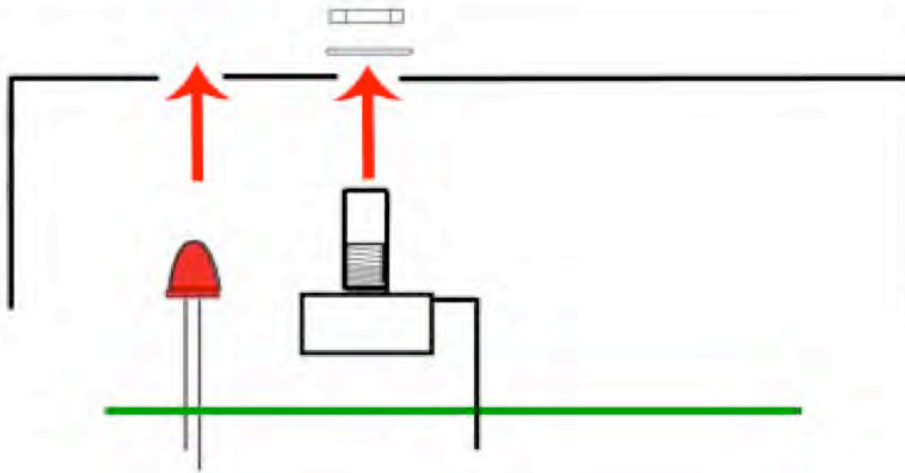




**Step 3:** Flip the PCB over so that the bottom or solder side is up. Insert the potentiometers, toggle switches, and the LEDs into the bottom side of the PCB. **DO NOT SOLDER ANYTHING YET!!!**

The LEDs will have one lead that is longer than the other. **THIS WILL GO INTO THE SQUARE SOLDER HOLE.**





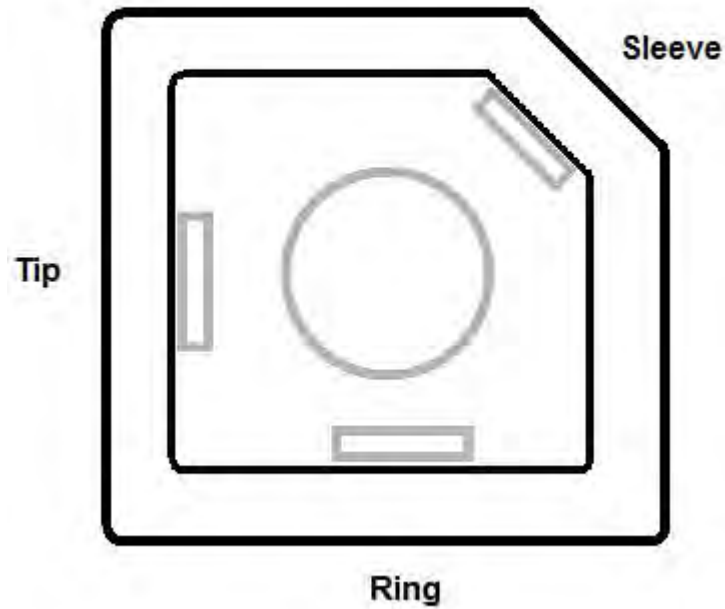
**Step 4:** Hold the PCB in one hand so that the component side of the PCB is in the palm of your hand and the bottom side with the pots, toggle switch and LED is facing up. Now use your other hand to guide the predrilled enclosure onto the PCB assembly so that the pots, toggle switch and LED all go 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.** Make sure you've removed the nuts and washers from the pots and that you've also snapped the tabs off the pots as well before installing.

**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, 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.



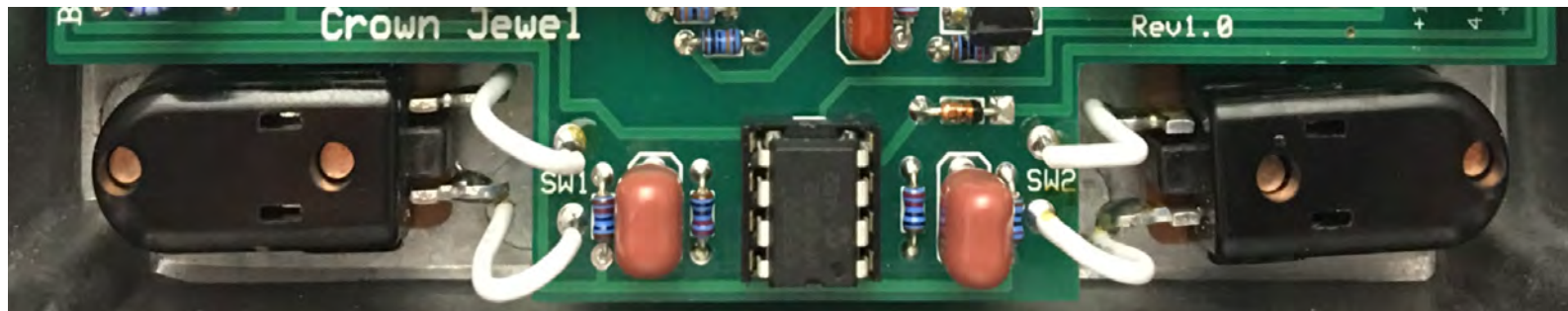
# Enclosed Jack

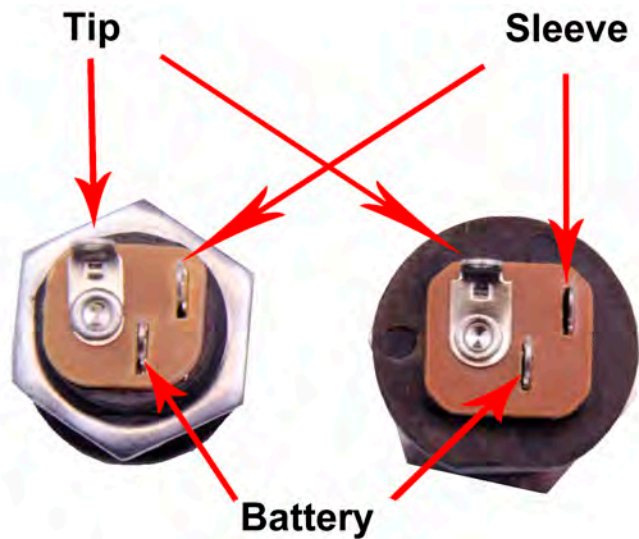


You will want to place the jacks into the enclosure so the sleeve terminal is facing the right like the picture above. Be sure to remember the lock washers so the jacks don't spin on their own.

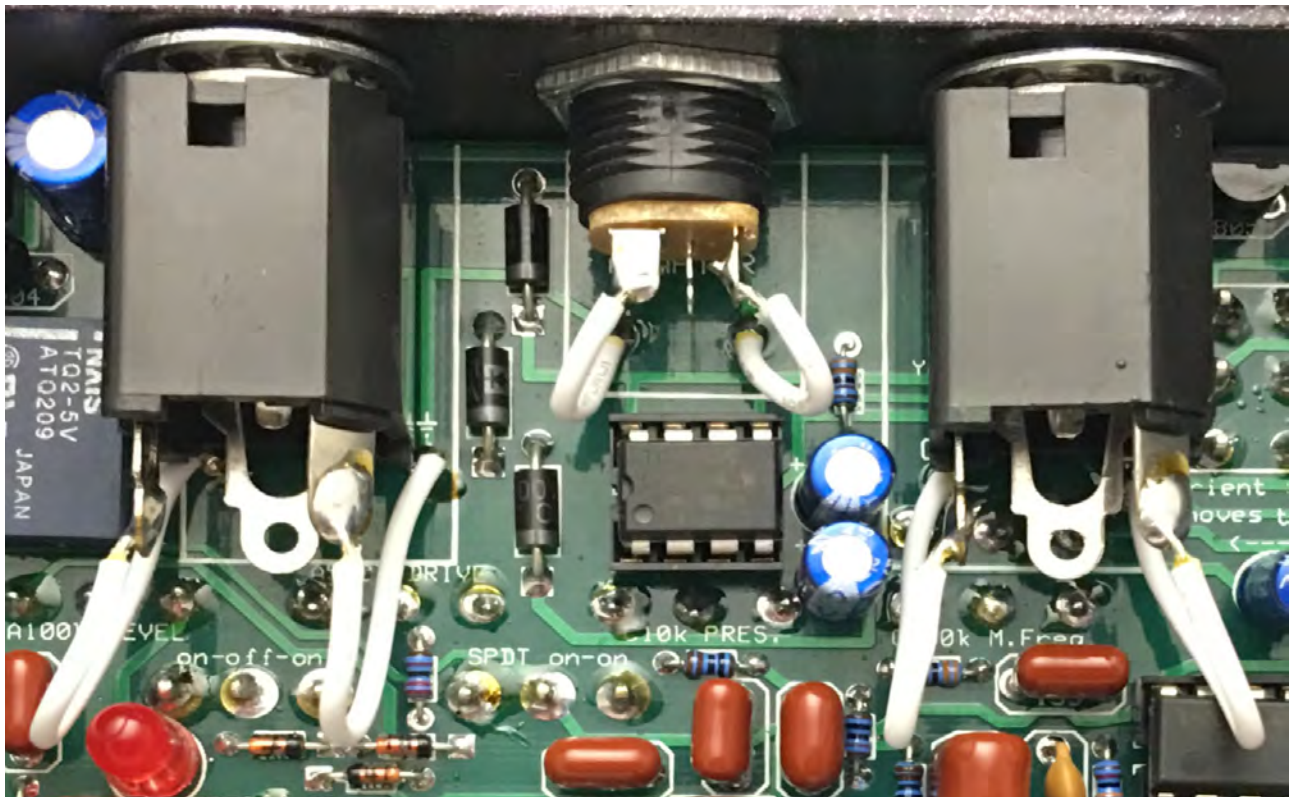
# WIRING

**Step 6:** attach the footswitches to the “SW1” and “SW2” spots as shown below

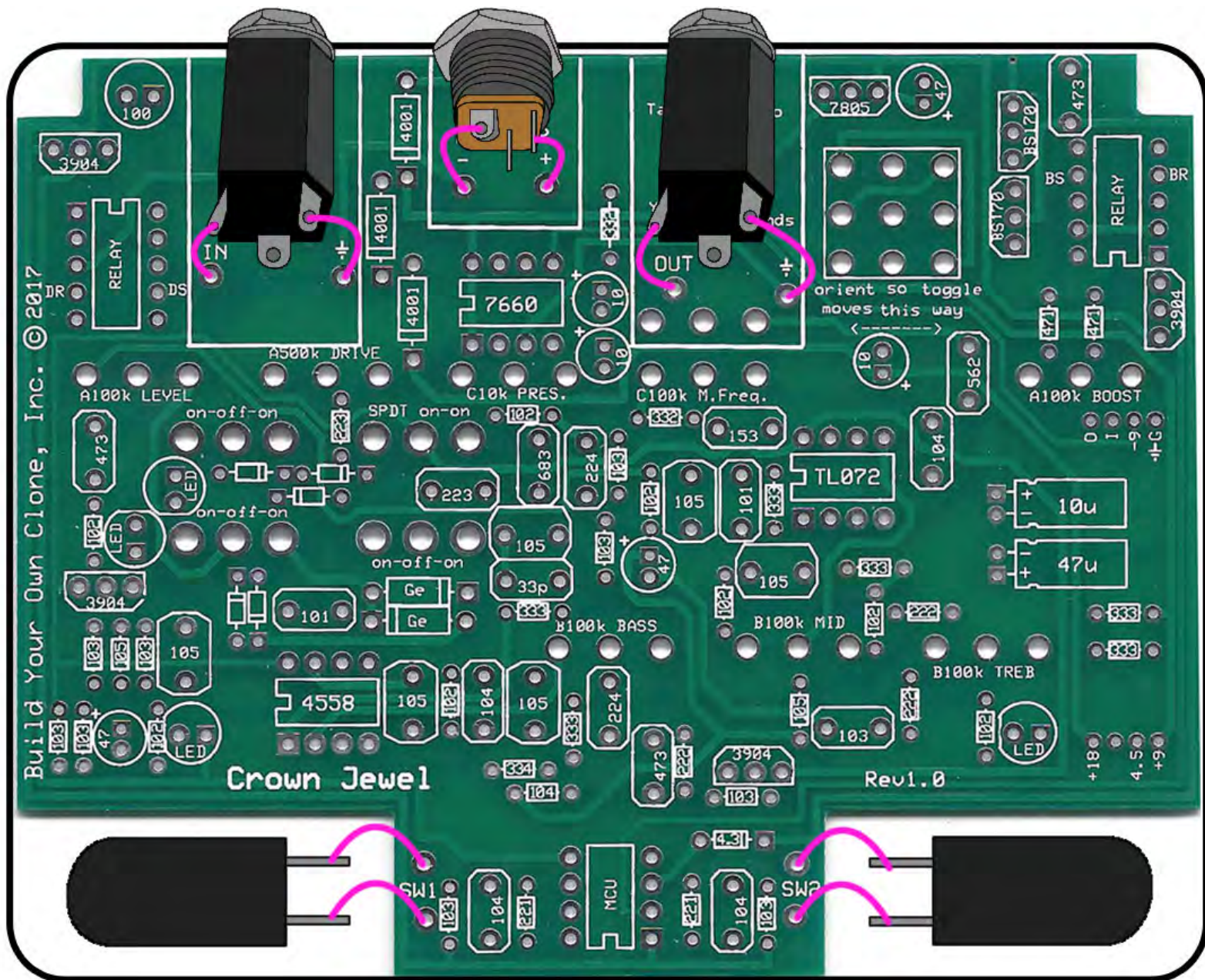




**Step 7:** Connect the TIP (negative) terminal of the DC adapter jack to the eyelet on the PCB labeled “-“. Connect the SLEEVE of the DC adapter jack to the eyelet on the PCB labeled “+” farthest to the right. Also connect the enclosed audio jacks to the PCB. The SLEEVE connection will go into the ground spots, and the TIP connection will connect to the ‘in’ and ‘out’ eyelets as shown below.









# Operating Overview



## **BOOST:**

**Level:** Controls the overall boost output.

**First/Last Switch:** changes the order of the effect. First means that the boost is first in the circuit, last means that the boost follows the overdrive circuit.

## **OVERDRIVE:**

**M. Freq:** controls the frequency of the middle band.

**Pres.:** Controls the presence

**Drive:** Controls the amount of distortion.

**Level:** Controls the overdrive output volume.

**Treb:** controls the treble. Clockwise = more treble, counter-clockwise = less treble.

**Mids:** Controls the middle band. Clockwise = more mids, counter-clockwise = less mids.

**Bass:** Controls the bass. Clockwise = more bass, counter-clockwise = less bass



**SWITCHES:**

**18V-9V:** Toggles between 9v and 18v operation.

**MID Q:** Controls the width of the middle band. Left is 'normal', middle is narrow, right is wide.

**SOFT:** Toggles between the soft clipping options. Left is LED clipping, middle is NONE, right is Silicon diode clipping.

**HARD:** Toggles between the hard clipping options. Left is Silicon diode clipping, middle is NONE, right is Germanium diode clipping.

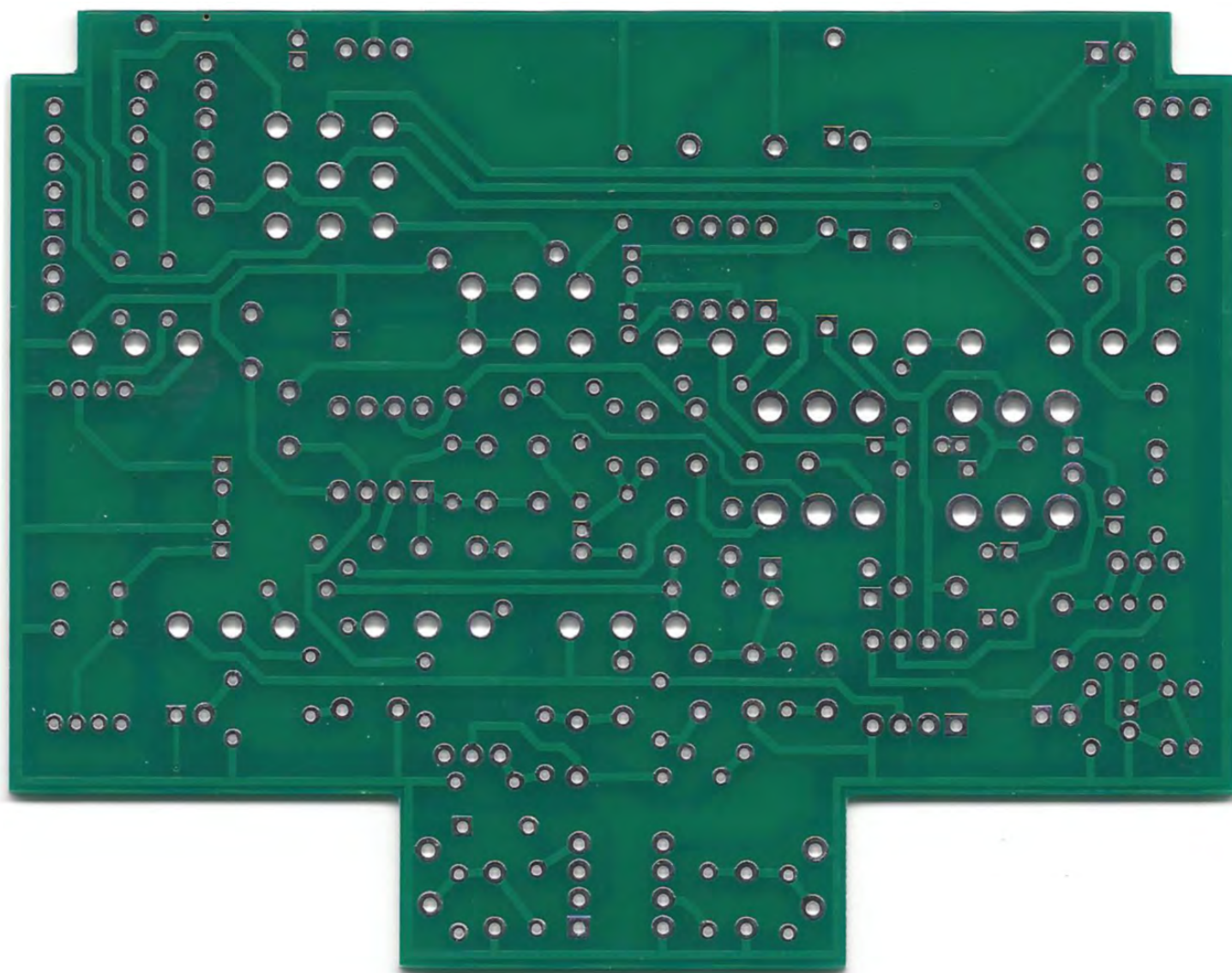
**Power supply:** 2.1mm negative tip

**Current Draw:** 80mA

**Input Impedance:** 1M Ohm

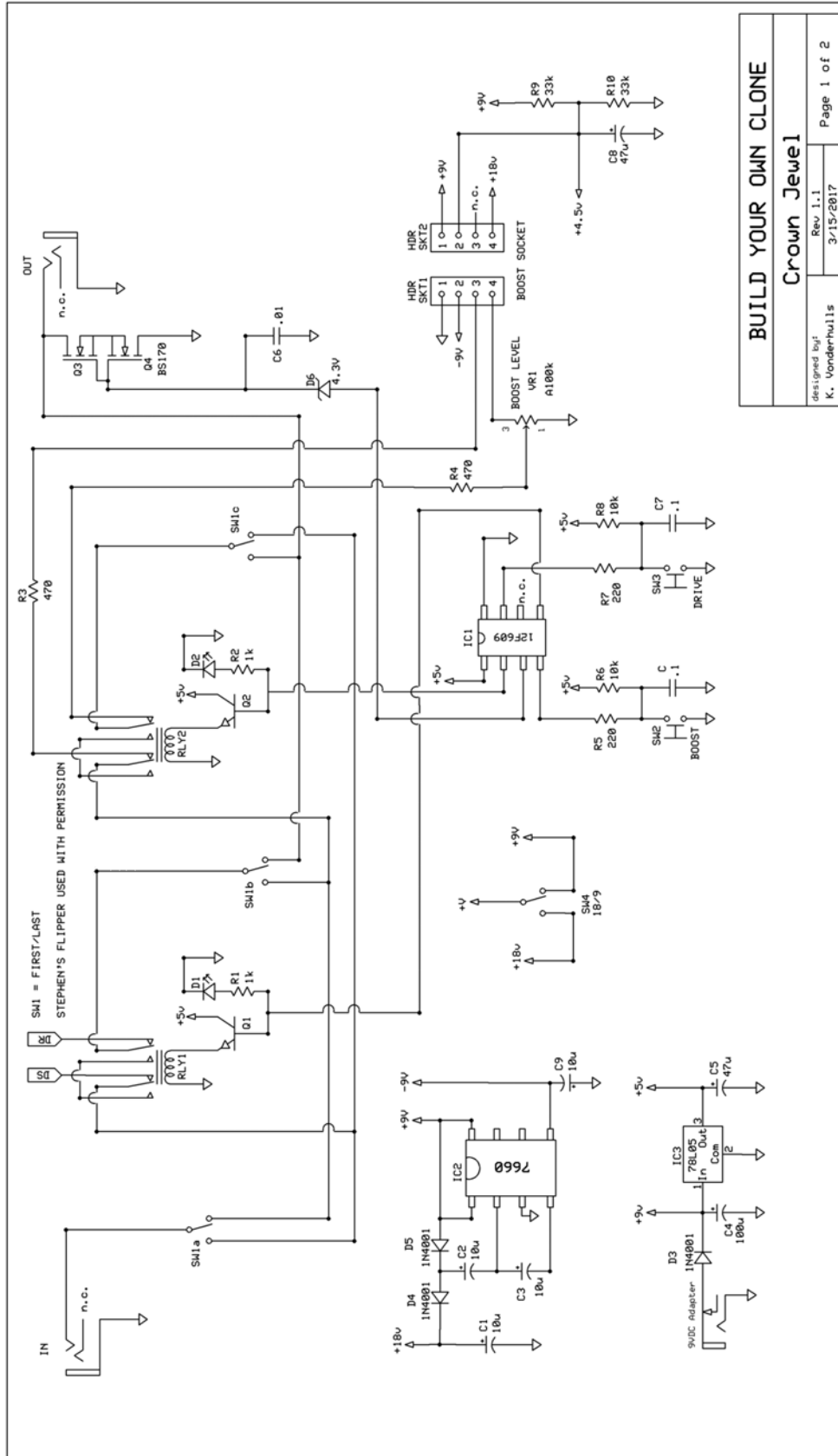
**Output Impedance:** 47k Ohm

**Back-side PCB Photo**





# Part 1



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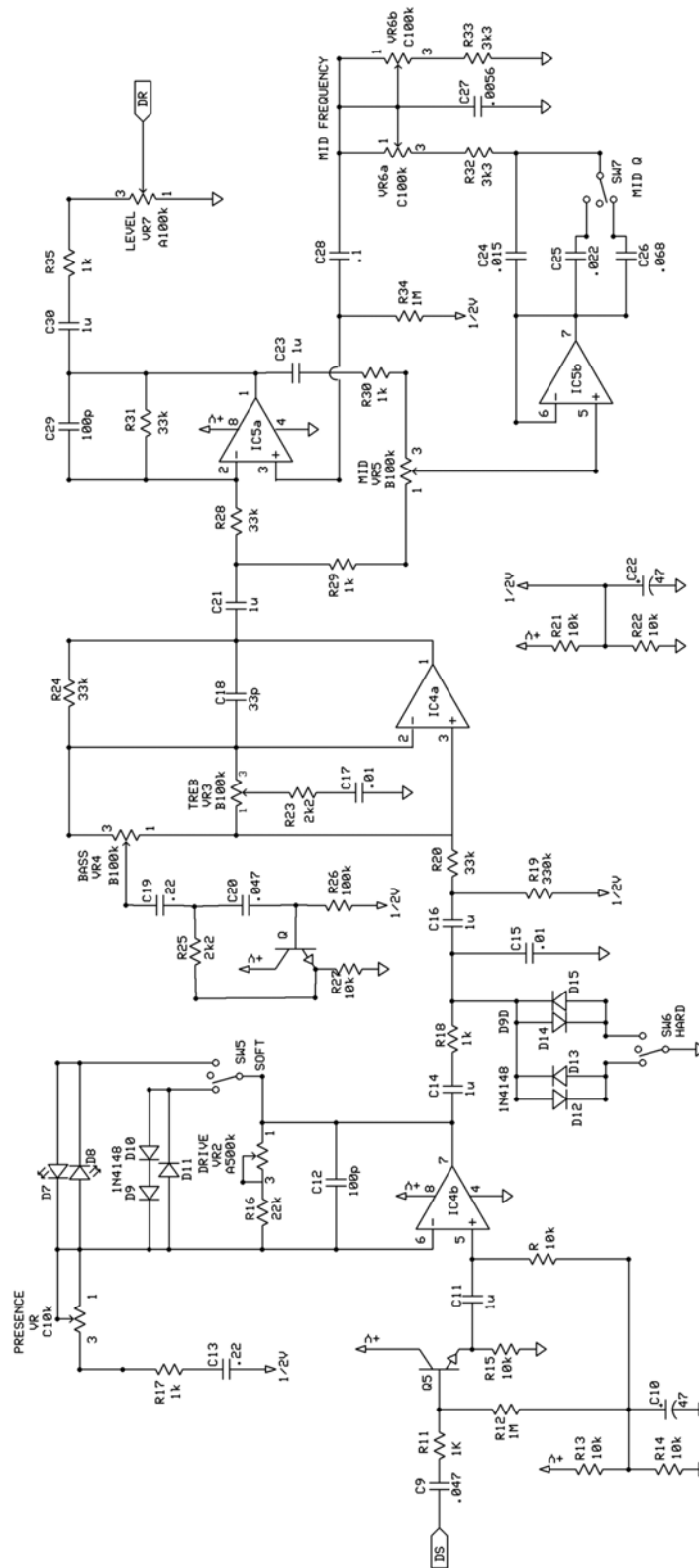
**Crown Jewel**

Designed by  
K. Vonderhulst

Rev 1.1  
3/15/2017

Page 1 of 2

## Part 2



## Build Your Own Clone

Crown Jewel

Designed by: K. Vonderhulls	Rev 1.1	Page 2 of 2 TEV=LMO
	3/15/2017	



For hi-res schematic visit:

<http://byoelectronics.com/crownjewelschematic1.pdf>

<http://byoelectronics.com/crownjewelschematic2.pdf>

**Please visit**

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

**For any technical support**

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