

Build Your Own Clone Orange Distortion 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 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 to receive a return authorization before mailing.

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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

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.

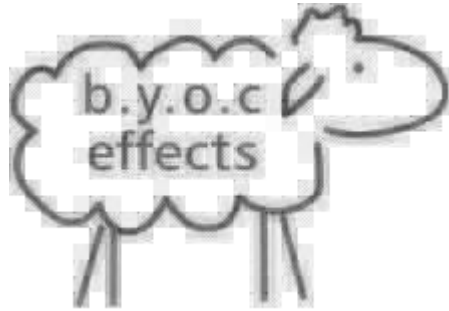
Revision Notes:

Rev 1.0: Two of the clipping diodes are backwards. See page 6.

Rev 1.1: Clipping diode error is fixed. No known errors.

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Parts Checklist for BYOC Orange Distortion

Resistors:

- 1 - 22R (red/red/black/gold/brown)
- 4 - 1k (brown/black/black/brown/brown)
- 2 - 2k2 (red/red/black/brown/brown)
- 2 - 4k7 (yellow/purple/black/brown/brown)
- 2 - 6k8 (blue/gray/black/brown/brown)
- 6 - 10k (brown/black/black/red/brown)
- 1 - 27k (red/purple/black/black/red/brown)
- 4 - 100k (brown/black/black/orange/brown)
- 3 - 470k (yellow/purple/black/orange/brown)
- 1 - 1M (brown/black/black/yellow/brown)

Capacitors:

- 1 - 150pf ceramic disc (151)
- 2 - 250pf ceramic disc (251)
- 1 - 470pf ceramic disc (471)
- 1 - .01 μ /10n film (103)
- 2 - 0.022 μ /22n film (223)
- 3 - 0.047 μ /47n film (473)
- 2 - 0.1 μ /100n film (104)
- 5 - 1 μ film (105)
- 1 - 47 μ aluminum electrolytic
- 1 - 100 μ aluminum electrolytic

Diodes:

- 6 - 1N914 or 1N4148 (small orange glass with black stripe)
- 3 - 1N4001 (larger black plastic with silver stripe)
- 2 - Red LEDs (smaller 3mm)

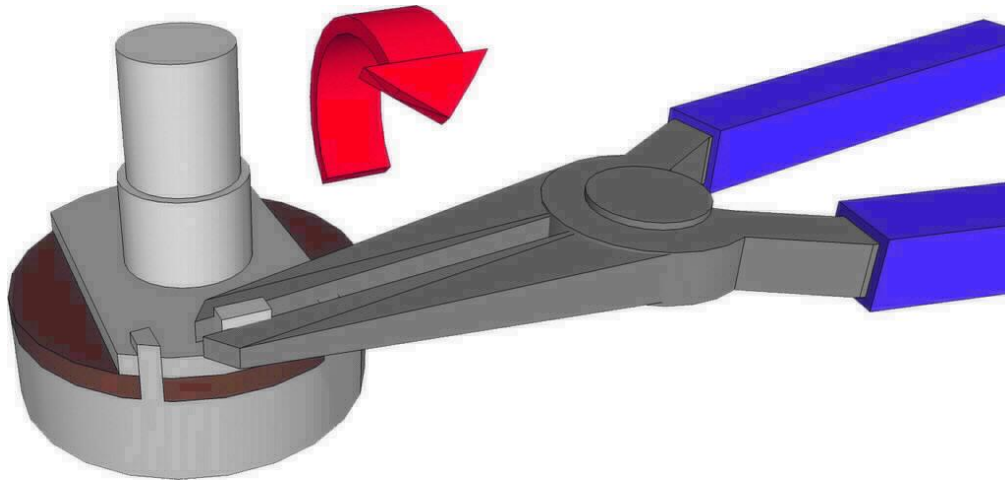
IC's:

- 1 - TA7136P

Transistors:

- 3 - 2N5088

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

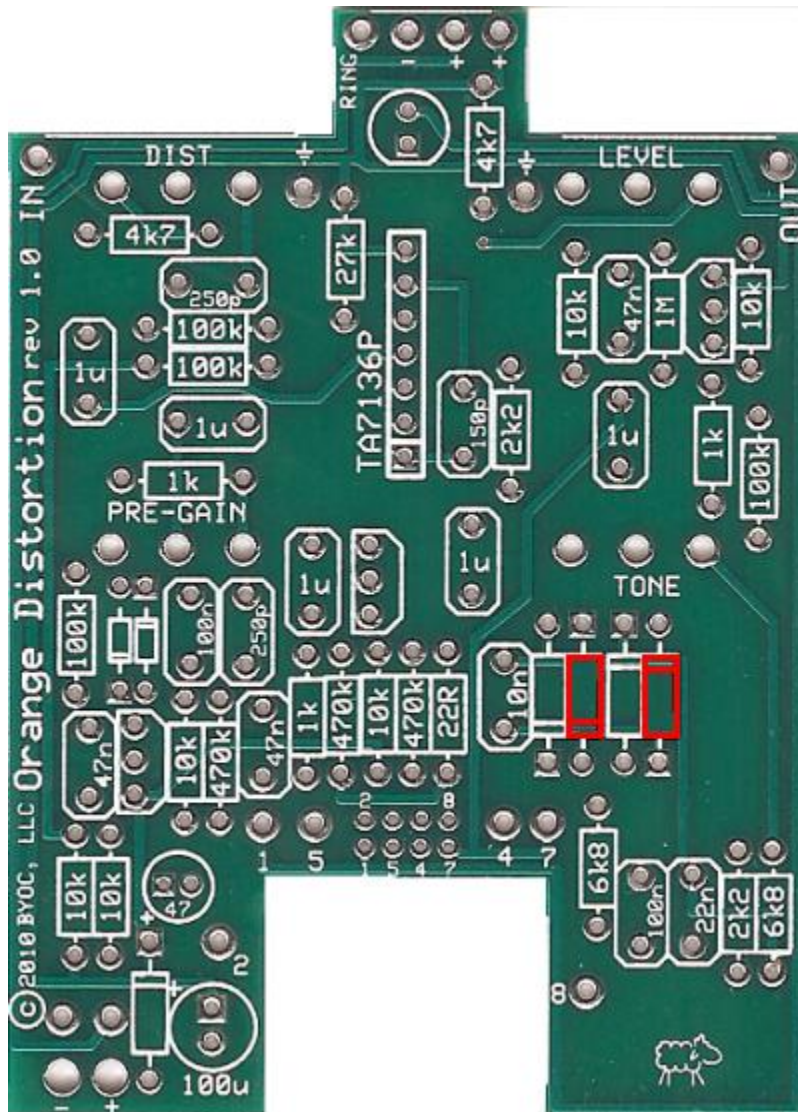


- 2 - B100k linear (Distortion & Level knobs)
- 1 - A100k audio (Pre-Gain knob)
- 1 - B25k linear (Tone knob)

Hardware:

- 1 - drilled enclosure w/ 4 screws
- 1 - byoc Orange Distortion PCB
- 1 - 3PDT footswitch
- 4 - knobs
- 1 - AC adaptor jack
- 1 - 1/4" mono jack
- 1 - 1/4" stereo jack
- 1 - red 5mm LED
- hook-up wire

Fixing an Error on the PCB



This is only for Rev 1.0. If you have a Rev 1.1 pcb or higher, please ignore this.

Two of the diode spaces on the PCB are labelled backwards. The two diodes highlighted in red are the diodes that are backwards. If you orient them so that their cathodes (the striped side) matches the diagram above, it will fix the problem. You want the two diodes on the left to point in the same direction and you want the two diodes on the right to point in the same direction. You only need to do this if you are “stacking” diodes. If you are building to stock specs or using jumpers in your clipping section, this error doesn't make any difference. Simply continue with the instructions and ignore this.

Modifications

(this is an example of a finished Orange Distortion kit built to stock specs with the added “muff mod”. Notice the jumpers used in the clipping diode spaces.)

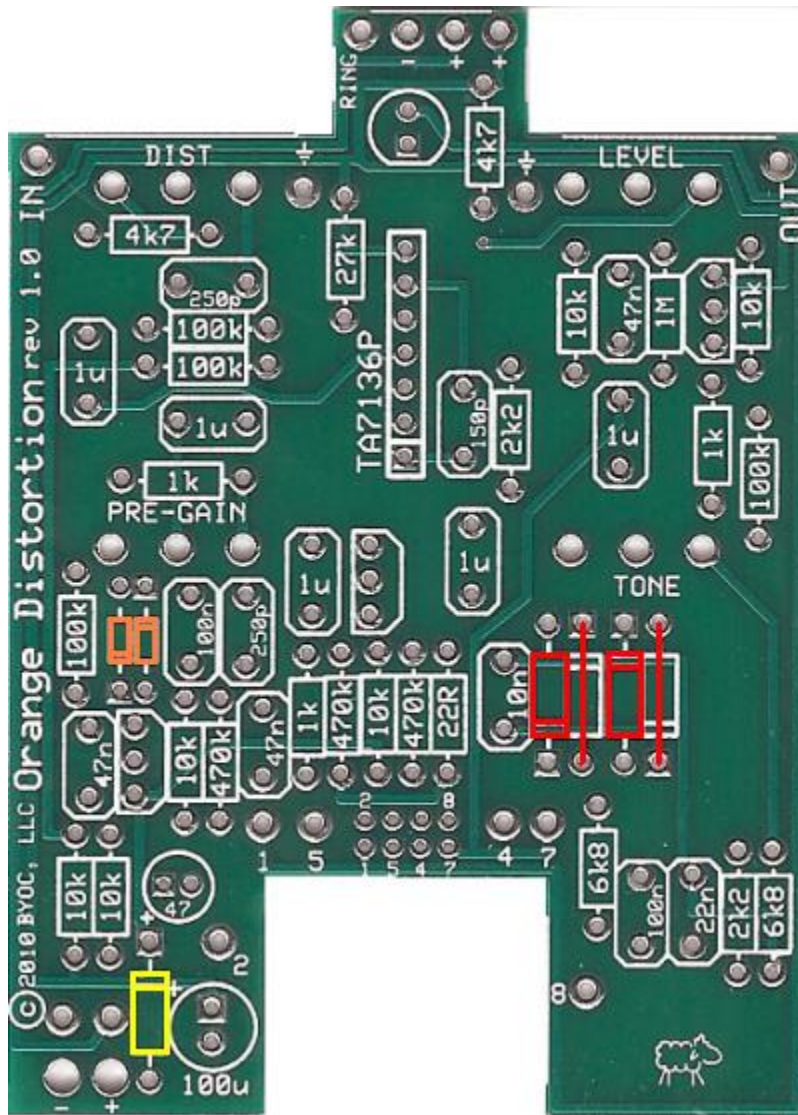


For example, the stock clipping diode configuration for the DS-1 are two symmetrical 1N4148 diodes. So one of the diode spaces in each series set is jumpered. Take a look at the picture of the complete pedal on page 6. A common clipping mod done to the DS-1 to get more of a “Marshal crunch” is to use two symmetrical LEDs. Also keep in mind that one diode on each side is backwards as explained on page 6. The diagram on page 8 shows the correct direction in which you should orient your diodes.

Adding Midrange: The stock tone control of the DS-1 is very similar to the stock tone control of the Big Muff Pi. And as such, it scoops out the majority of your midrange frequencies. You can replace the midrange frequencies and even boost them a little bit by simply swapping the 22n and 100n capacitors highlighted in red, i.e. put the 22n cap in the 100n space and put the 100n cap in the 22n space. This is a great mod if you want to use your Orange Distortion as more of an overdrive, if you're looking for more of a bluesy tone, if you want to use it for leads, or if you're looking for a tone that will cut through the band mix a little better.

Muff Mod: There is a transistor gain stage at the front of the circuit that amplifies the guitar signal going into the operational amplifier to increase distortion. This transistor gain stage has a circuit topography that is very similar to one of the transistor gain stages in the Big Muff Pi. By modifying this transistor gain stage to big muff specs, it produces a fuller and tighter bass response. These components are highlighted in pink. Change the 250pf cap to a 470pf and add the two 1N4148 diodes and 100n capacitor. If you do not want to do the Muff Mod, do not add anything to the two diode, and 100n component spaces. These components were not part of the original DS-1 circuit.

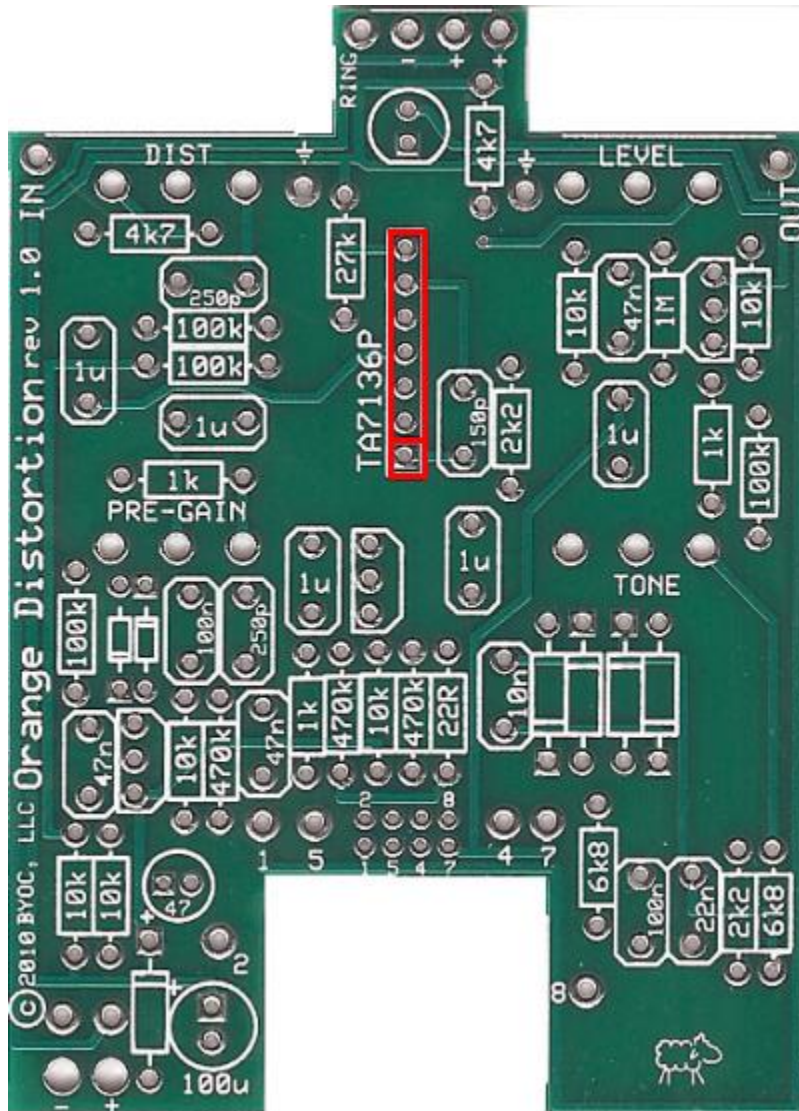
Populating the Circuit Board



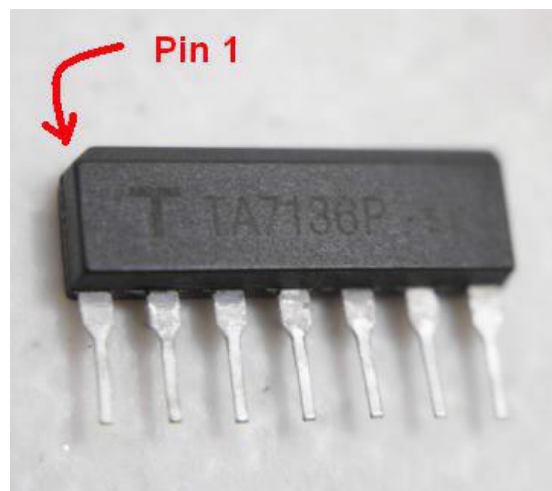
STEP 1: Add the diodes. Be sure to match the end of the diode with the stripe to the layout on the PCB. The stripped end should go in the square solder pad. Note that the 1N4001 diode goes in the space highlighted in yellow. The two small orange 1N4148 diode spaces are only if you are doing the Muff Mod. If you are building your Orange Distortion kit to stock DS-1 specs, add 1N4148 diodes to the spaces highlighted in red. Use the left over lead clippings to make jumpers in the spaces highlighted with single red lines. Look at the picture of the finished pedal on page 6 for an example.

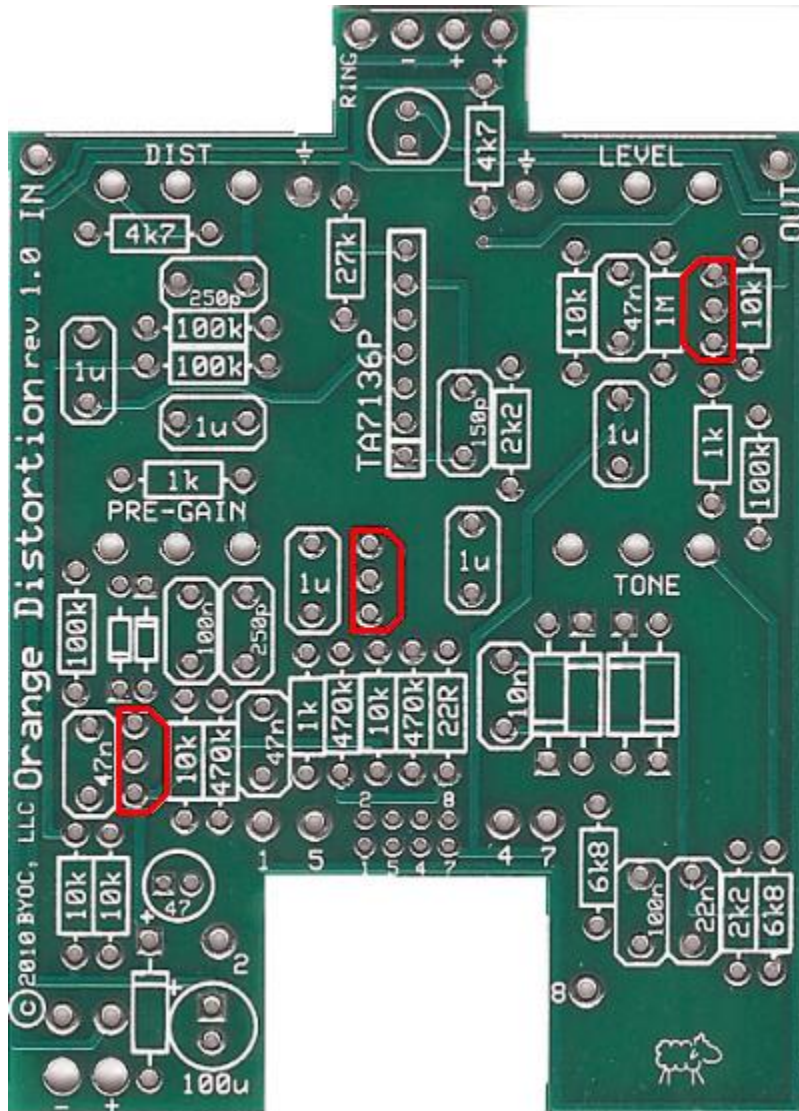
Remember that if you are building to stock DS-1 specs and using jumpers, the backwards diode error will not affect you and you should build exactly as show in the picture.

More distortion mod: If you plan to do the more distortion mod, use a 1k resistor in place of the 4k7 resistor.



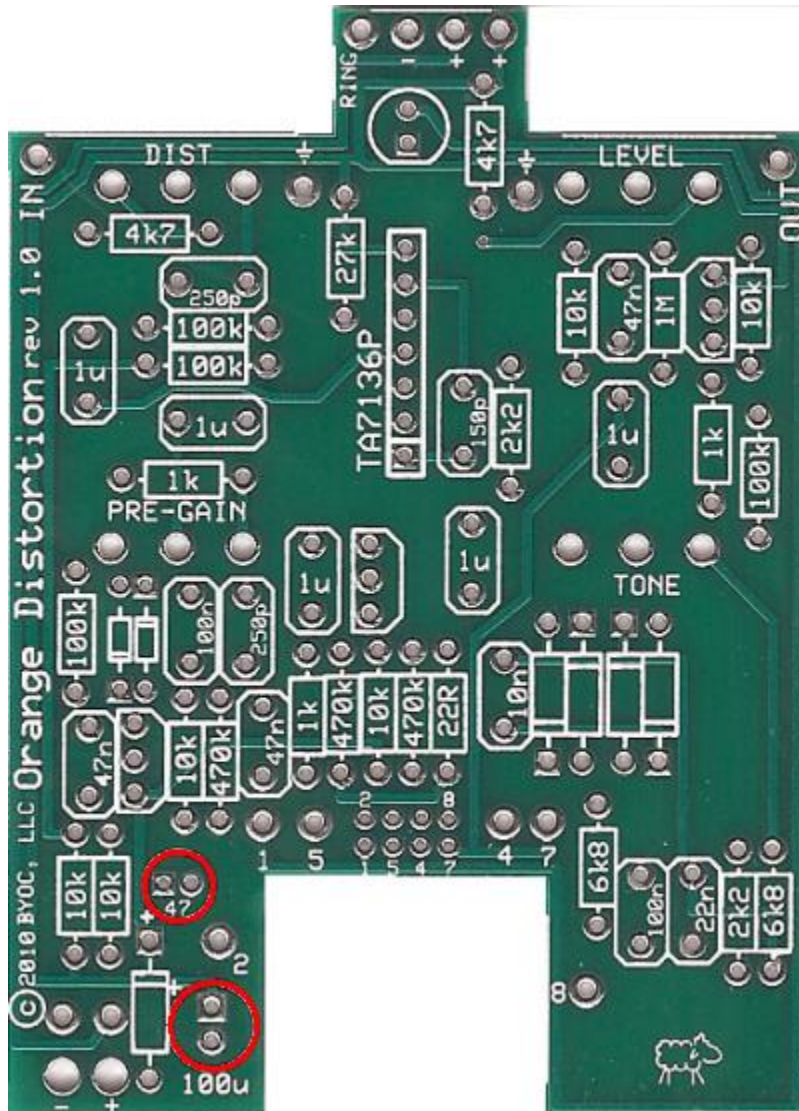
Step3: Add the TA7136P chip. Pin 1 goes in the square solder pad. Pin one will be on the side of the chip that has the bevelled corner.



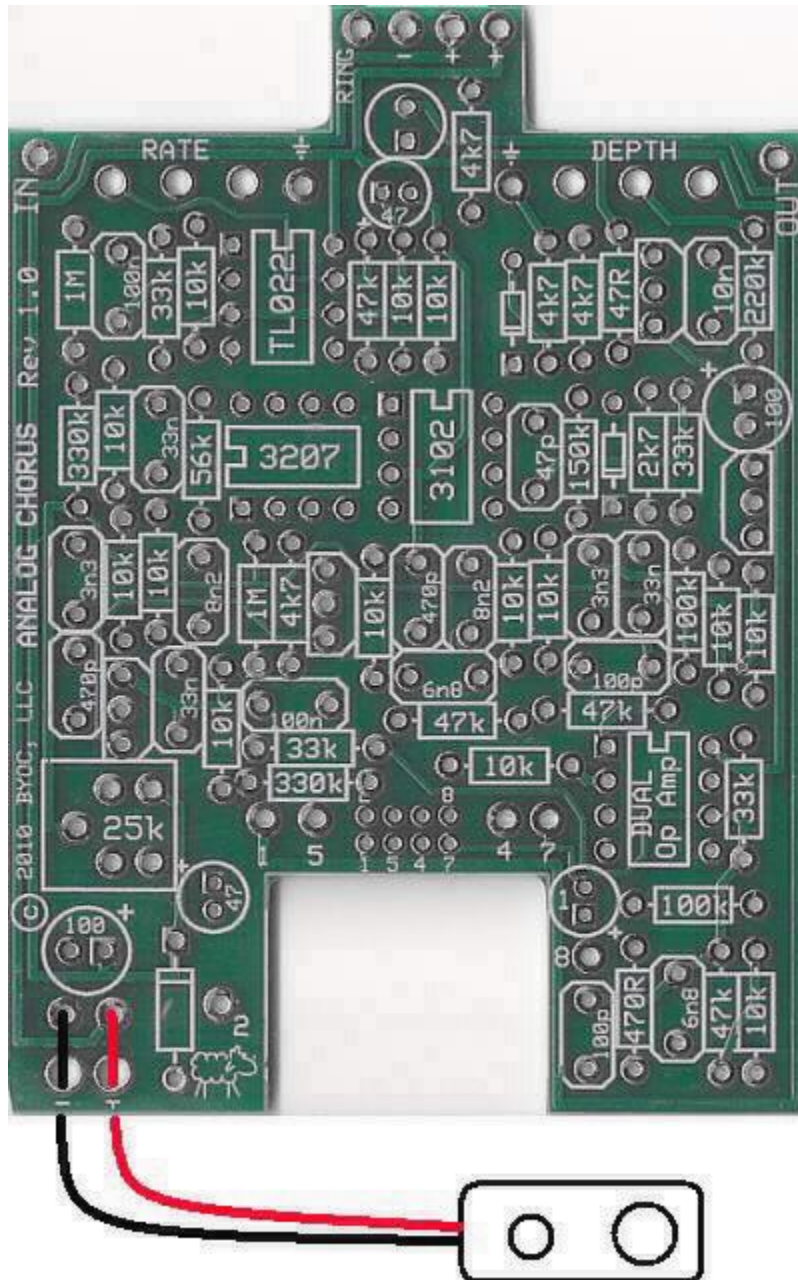


Step 4: Add the transistors. Insert these components into the PCB so that the flat side of the component matches up with the flat side of the PCB layout.

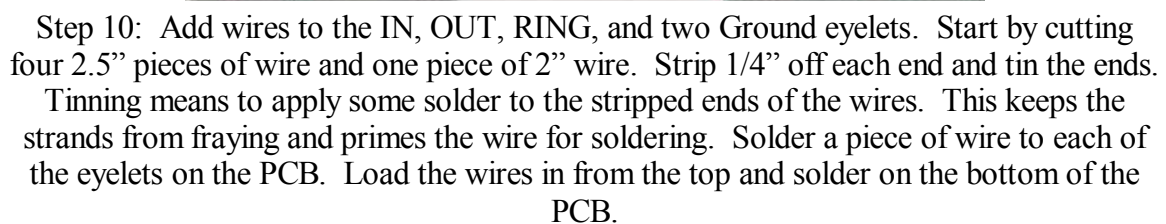
MOD ALERT!: If you plan on doing any or all of the Muff mod, Shrill Highs reduction mod, and or More Midrange mod, this is where you'd want to do it.



STEP 6: Add the aluminum electrolytic capacitors. These are polarized. The positive end will have a longer lead and should go in the square solder pad. The negative end will have a shorter lead with a black strip running down the body of the capacitor.

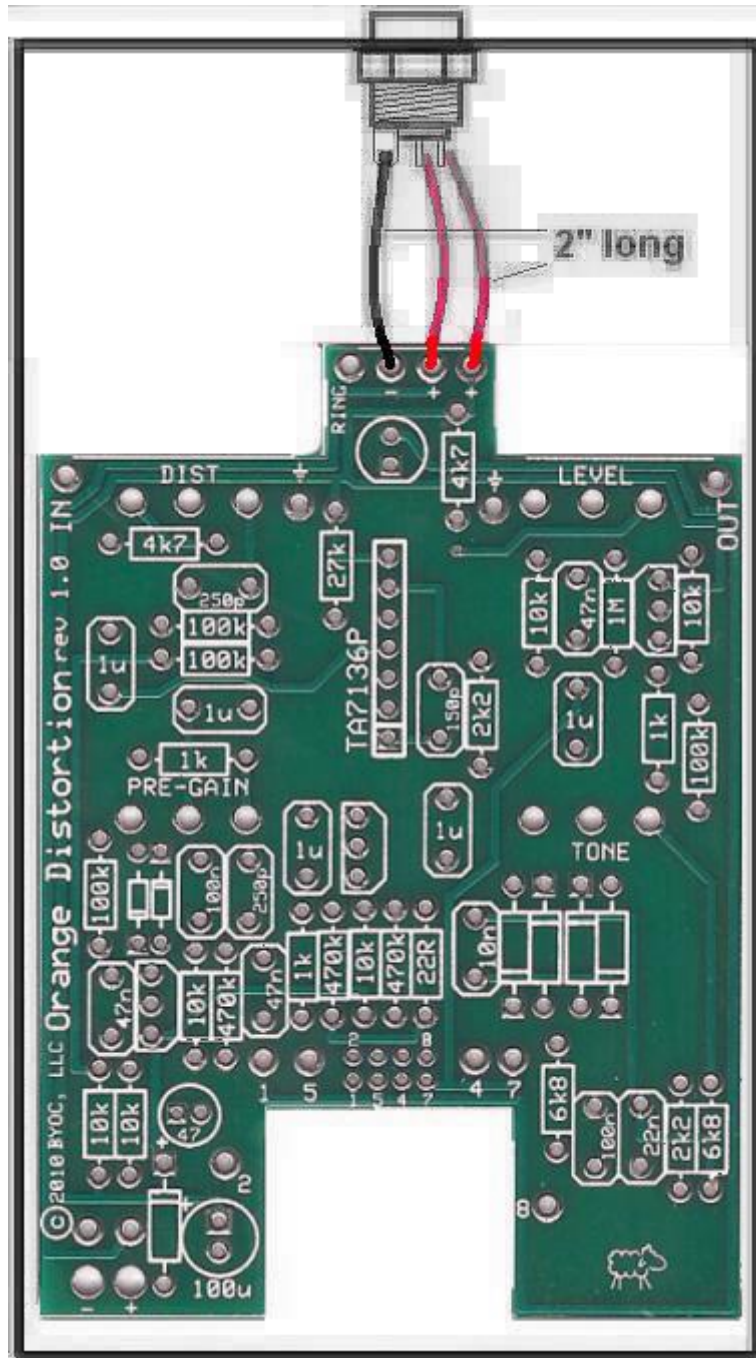


Step 9: Add the battery snap. Thread the solder ends of the battery snap into the strain relief holes from the bottom solderside of the PCB and out through the top. Insert the solder ends of the battery snap wires into the topside of their respective solder pads. Solder on the bottom side of the PCB. Remember the red wire goes in the “+” hole and the black wire goes in the “-” hole. Note that the PCB in the picture above is not the Orange Distortion PCB, but the battery snap connections are exactly the same.

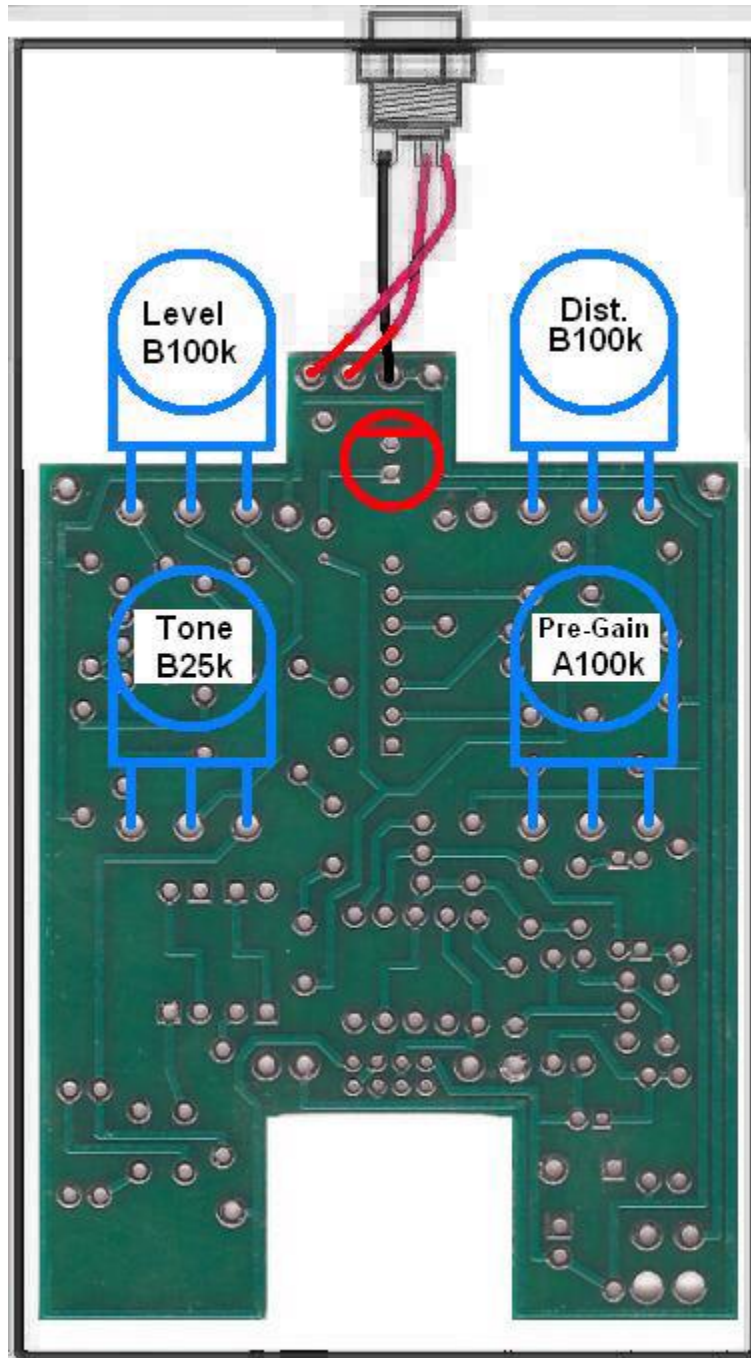


Assembly

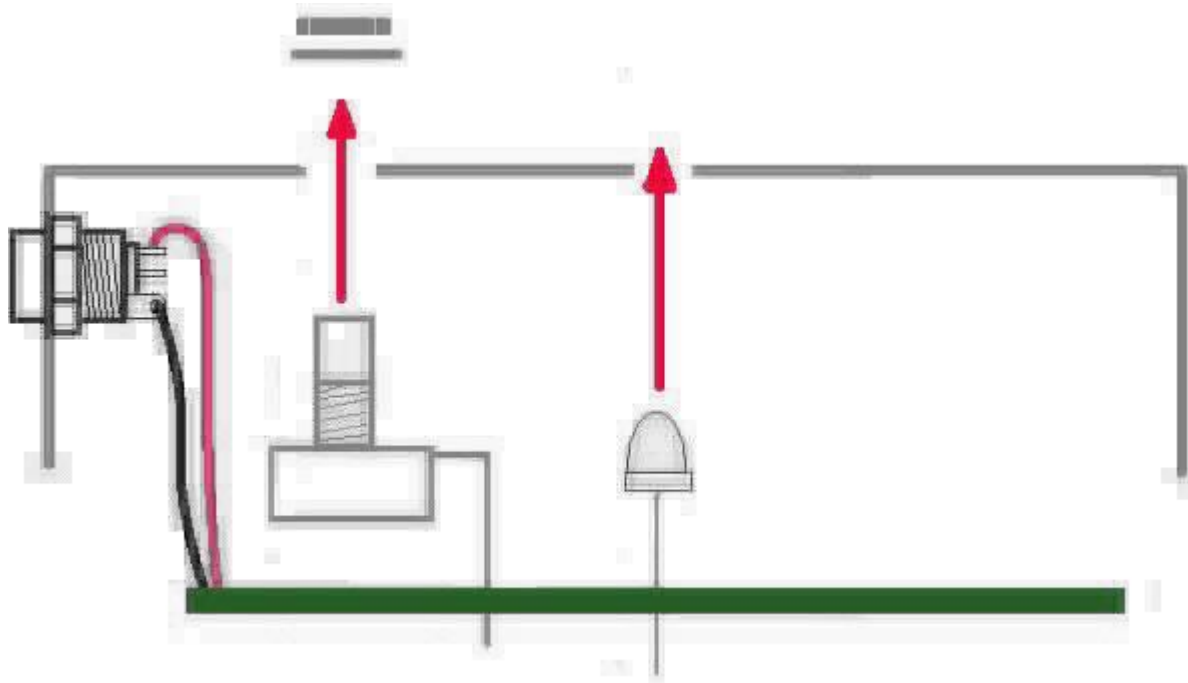
Step 1: Mount the DC adaptor jack to the enclosure.



Step 2: 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 (positive terminal) of the DC adaptor jack to the “+” eyelet on the far right side of the PCB with 2 inches of hook up wire.



Step 3: Flip the PCB over so that the bottom or solder side is up. Insert the two B100k(Distortion & level), A100k (Pre-Gain), and B25k (Tone) potentiometers, and the LED into the bottom side of the PCB. **DO NOT SOLDER YET!!!** The LED will have one lead that is longer than the other. The longer lead goes in the hole of the square solder pad.

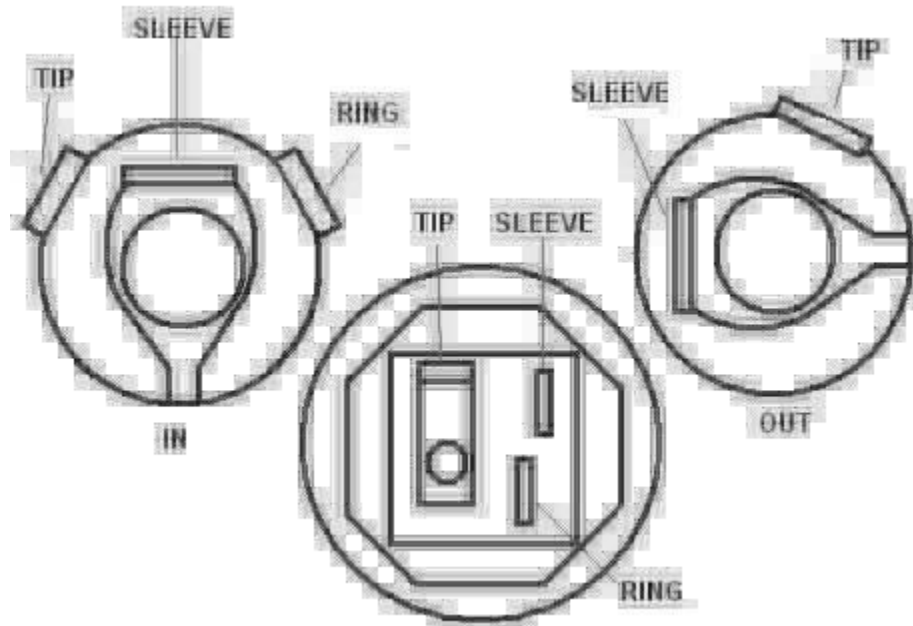


Step 4: Hold the PCB in one hand so that the component side of the PCB is in the palm of your hand and the bottom side with the pots, toggle switch and LED is facing up. Now use your other hand to guide the predrilled enclosure onto the PCB assembly so that the pots and LED all go into their respective holes. Once the PCB assembly is in place, secure it by screwing on the washers and nuts for the pots and toggle switch. 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 and toggle switch.

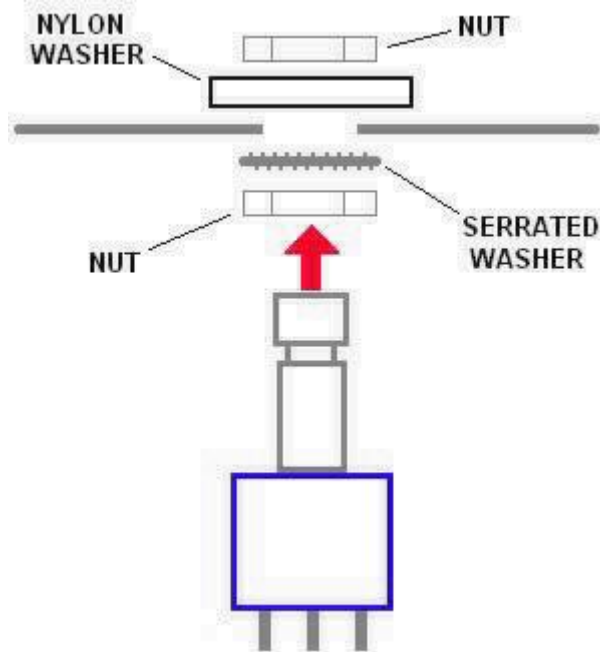
Step 5: Turn the entire pedal over so that the component side of the PCB is facing up. Lift the PCB up off the pots and toggle switch about 2mm just to make sure that the back of the PCB does not short out against that pots. Make sure the PCB is level and symmetrically seated inside the enclosure.

Step 6: Solder the pots and LEDs. 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.

Wiring



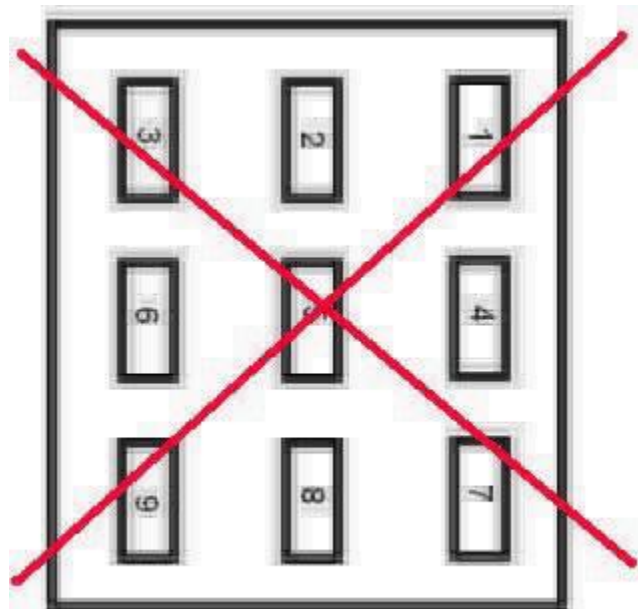
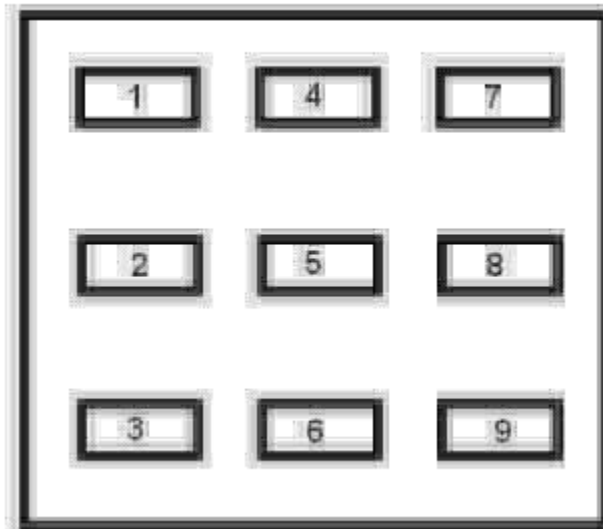
Step 1: Install the 1/4" jacks to the enclosure. Be sure to turn the OUT jack a 1/4 turn counter clockwise so that solder terminal for the tip does not short out against the enclosure.



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.

Footswitch Solder Lug Designations



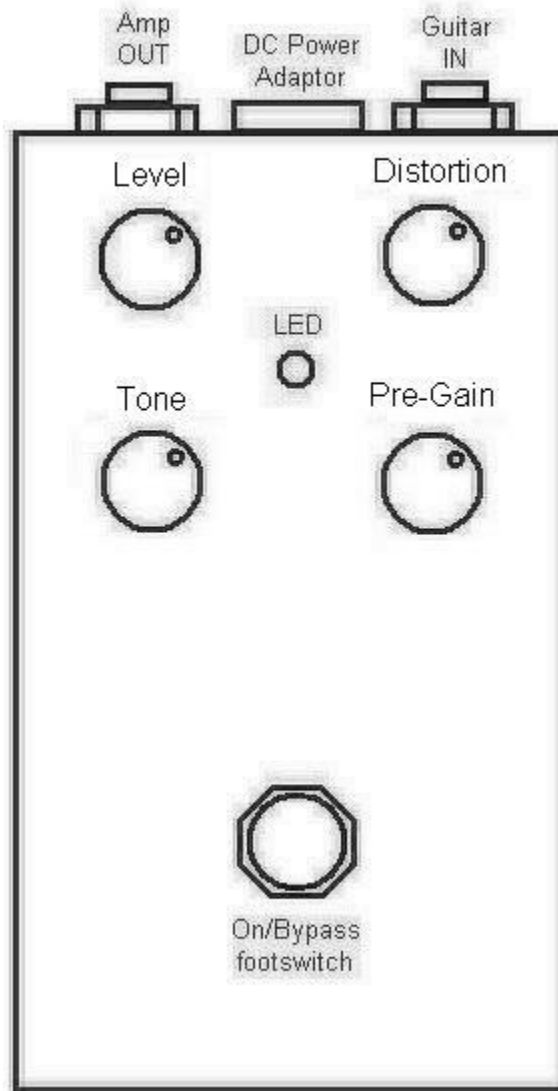
- Cut 4 x 3/4" pieces of wire. Strip 1/8" off each end. These will be used to connect lugs/eyelets 1, 2, 7, & 8
- Cut 1 x 1" piece of wire. Strip 1/8" off each end. This will be used to connect lug/eyelet 5
- Cut 1 x 1.5" piece of wire. Strip 1/8" off one end. Strip 1/2" off the other end. This will be used to connect lug/eyelet 4. The longer stripped end will be used to jumper lug 4 to 9.

- Cut 3 x 2" pieces of wire. Strip 1/4" off each end. These will be used to connect the tip and sleeve of the IN jack and the tip of the OUT jack to the PCB.
- Cut 1 x 1.5" piece of wire. Strip 1/4" off each end. This will be used to connect the ring of the IN jack to the ring eyelet on the PCB.

Step 5: Solder one end of the pre-cut and pre-stripped wires to the footswitch.

Step 6: Insert the other remaining ends of the pre-cut and pre-stripped wires into the topside of the PCB and solder. You can solder these on the topside as well. It is easier this way, but you may burn a small amount of the PVC coating on the wires. This is purely aesthetic and won't damage the wires in anyway. But you can avoid this by removing the PCB assembly and footswitch from the enclosure entirely (the PCB assembly will still be attached to the enclosure via the DC jack wiring) so that you have access to solder the underside of the PCB.

Operating Overview



Level: Controls the volume or output of the effect

Distortion: Controls the amount of gain or drive of the effect

Tone: Clockwise cuts bass, counter-clockwise cuts treble

Pre-Gain: Controls the boosted signal level going into the actual distortion circuit

DC power supply - Use a 2.5mm negative tip 9VDC adaptor (this is your standard guitar fx style adaptor). If using battery power, only use a single 9V battery.

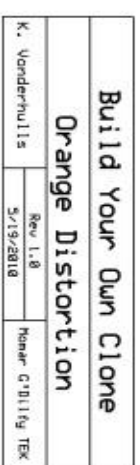
Current Draw - 3.5mA

Input Impedance - 470k ohms

Output Impedance - 100k ohms

Go to the next page for low res schematic. Double click [here](#) or go to www.buildyourownclone.com/orangedistscheme.pdf for hi res schematic.

Please visit
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for any technical support



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