StewMac®

White Light

CLASSIC PEDAL KIT

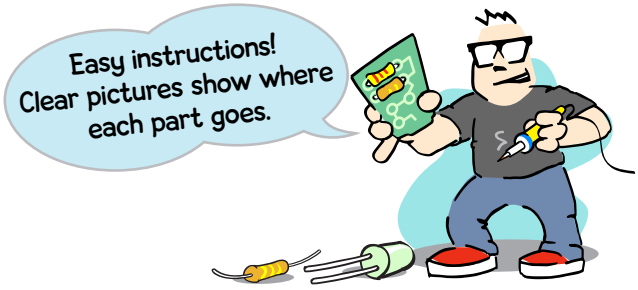
Kit case is unpainted

IN COLLABORATION WITH

EarthQuakerDevices™

Assembly Instructions

The **White Light Overdrive** is based on vintage overdrives that defined the sounds of classic hard rock. This vintage voiced stompbox is similar to a vintage DOD 250 or MXR Distortion+, but don't mistake it for a direct clone of these OD's of yesteryear. The White Light gives total control over the voice of the dirt along with a modern presence that is both dynamic and responsive to your playing. The Weight control allows you to adjust the saturation and low end, giving you plenty of tonal shaping options. The White Light Overdrive doesn't discriminate – it likes both humbuckers and single coils, and will add some real 70's grit to your tone. The Compression switch lets you choose between an open voiced overdrive with more high-mids and bite, or more compression with less bite and flatter mid-range.



RARE / VINTAGE / HARD TO GET

WHEN YOU CAN'T BUY IT BUILD IT

An EarthQuaker Devices original, the **White Light Overdrive** has been out of production for some time, but now you can build your own!

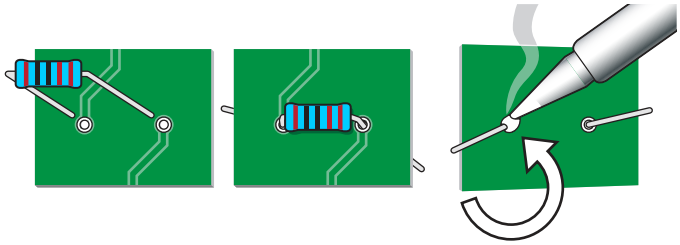
Tools and supplies

Required:	Soldering iron with fine point tip
	Solder
	Wire cutter/stripper
	3/8" nut driver or socket
	1/2" nut driver or socket
	10mm nut driver or socket
	14mm wrench
	#1 Phillips screwdriver
Also helpful:	Clear silicone adhesive
	Circuit card holder
	Magnifying glass or OptiVISOR
	StewMac Soldering Aids
Power:	This pedal requires a standard 9V DC center-negative power supply or 9V battery (neither included) and consumes less than 100mA.

Tips for soldering

The solder joints you'll make on the circuit board are very small, and too much heat can damage the board. The idea is to make joints quickly, without scorching the eyelets.

Hold components in place for soldering by threading the leads through the board and bending them apart on the reverse side.



Make your solder joints on the reverse side. Insert the tip into the eyelet and let it heat for 4-5 seconds before touching it with solder. This heats the contact enough for the solder to flow nicely without damage. You don't need much solder, just enough to fill the eyelet. After soldering, trim away the excess lead wire.

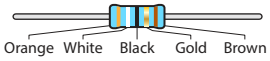
Give your pedal a custom paint job!

Any paint sold for use on metal will work well on the kit case. Spray paints like Rustoleum® or Krylon® are a durable finish. You might want to paint the case before building the kit, so you won't need to take the parts back out for painting.

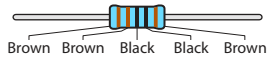
A way to add custom graphics is to print them from your computer onto waterslide decal paper. If you use decals, protect them from scratches by spraying clear topcoats over them.

Parts list

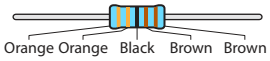
Resistor values are indicated by colored bands, read from left to right. The first color in the code is usually the one painted closest to a lead wire. When a gold or silver band is present, it's always one of the last colors in the code. A magnifier is a big help in reading these codes.



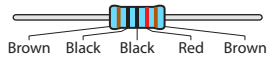
39Ω resistor (1) #7374



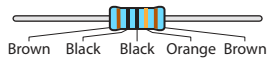
1KΩ resistor (1) #7357



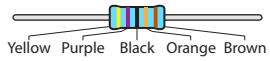
3K3Ω resistors (2) #7377



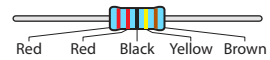
10KΩ resistors (5) #7362



100KΩ resistor (1) #7365

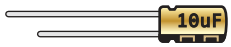


470KΩ resistor (1) #7382



2M2Ω resistor (1) #7368

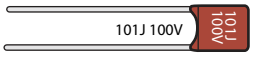
1µF capacitor (1) #7337



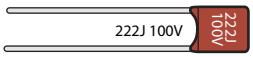
10µF capacitor (1) #7338

100µF capacitor (1) #7339

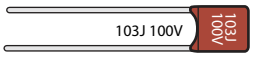
4.7µF capacitor (1) #7316



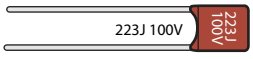
100pF capacitor (1) #7326



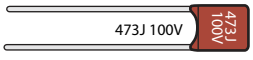
.0022µF capacitor (1) #7330



.01µF capacitor (1) #7331

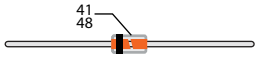


.022µF capacitor (1) #7332

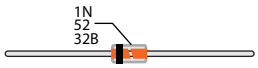


.047µF capacitor (1) #7333

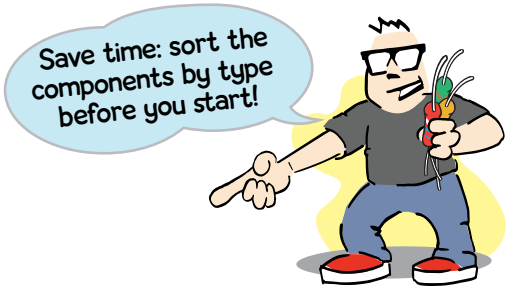
1N4001 rectifier diode (1) #7404

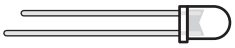


1N4148 rectifier diodes (3) #7470



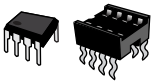
1N5239B Rectifier diodes (4) #7471





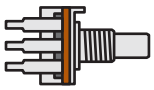
5mm white LED (1) #7422

5mm LED mounting bezel (1) #7432



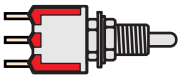
LM833 low noise op-amp (1) #7443
Socket for op-amp (1) #7484

24" of lead wire (1) #5960

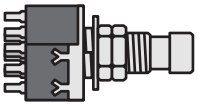


B25KΩ linear taper pot (1) #7461
A1MΩ audio taper pot (1) #7459
100KΩ audio taper pot (1) #7455

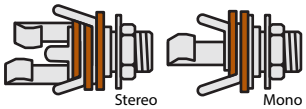
Adhesive foam tape squares (4) #7560



On-on mini toggle (1) #7466

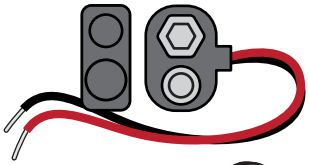


3PDT latching footswitch (1) #1611



1/4" stereo jack (1) #4653
1/4" mono jack (1) #4652

2.1mm DC power connector (1) #7467



9V battery clip (1) #1222
Protective cap (1) #1227

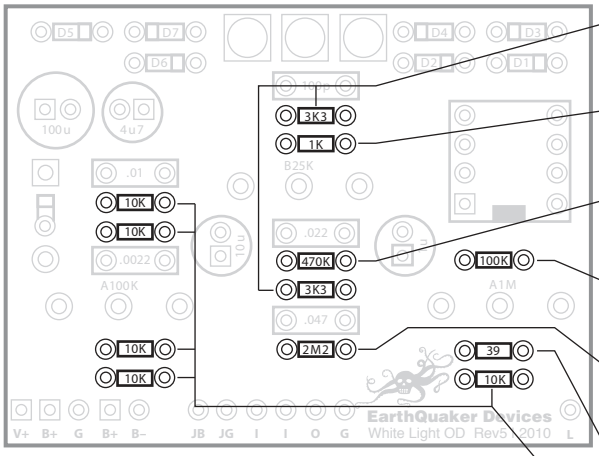
Small control knob (1) #7504

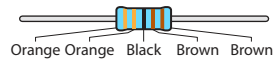
Large control knobs (2) #7503

(Not pictured) Circuit board (1)

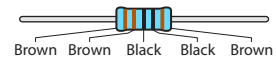
(Not pictured) Metal case with 4 screws (1) #7602

Step 1: Install twelve resistors

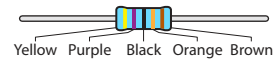




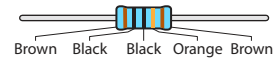
3K3Ω resistors (2) #7377



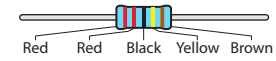
1KΩ resistor (1) #7357



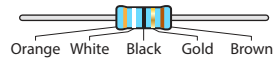
470KΩ resistor (1) #7382



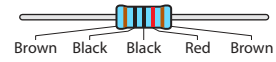
100KΩ resistor (1) #7365



2M2Ω resistor (1) #7368



39Ω resistor (1) #7374



10KΩ resistors (5) #7362

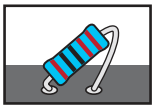
As you get started, note that the values of each component are printed in their proper location on the circuit board unless otherwise noted.

Resistors have a low profile, sitting closer to the board than taller components, so install them first. Their locations are marked on the board with the value of the part.

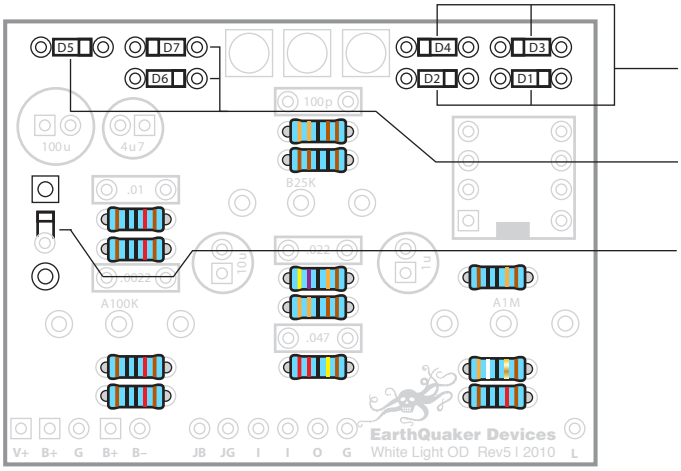
Resistors are not polarized, so it doesn't matter which lead goes in which eyelet. They can be installed in either direction.

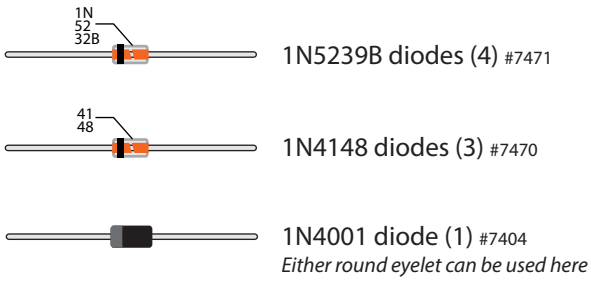
Note: Some resistors are smaller than others. Use a magnifier to read color codes, or a multimeter to measure their value.

Larger resistors will need to be placed on the board at an angle due to their size.



Step 2: Install eight diodes





1N5239B diodes (4) #7471

1N4148 diodes (3) #7470

1N4001 diode (1) #7404

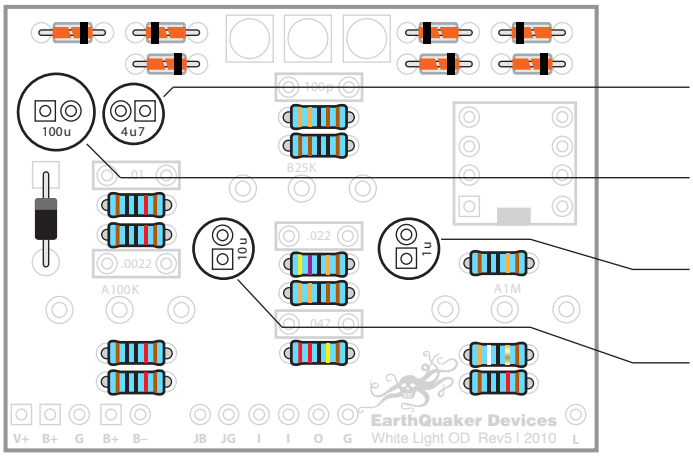
Either round eyelet can be used here

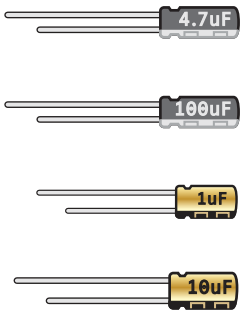
Diodes are polarized, so they need to be installed in the correct orientation.

Note the stripe around one end of the diode: this marks the negative (minus) lead. On the circuit board, the printed outline of the diodes also shows a stripe. Install each diode so that its stripe matches the direction shown on the circuit board.

Note: The 1N4001 diode is not labeled on the circuit board. On the left side of the board you will see an unlabeled diode outline. This is where the 1N4001 will be placed.

Step 3: Install nine capacitors





4.7µF capacitor (1) #7316

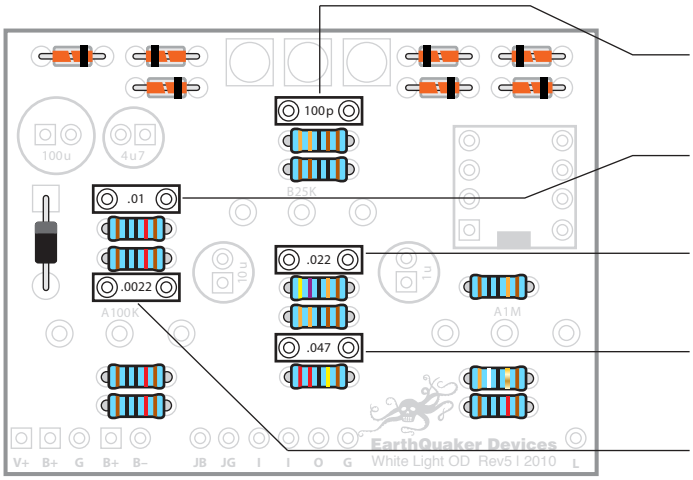
100µF capacitor (1) #7339

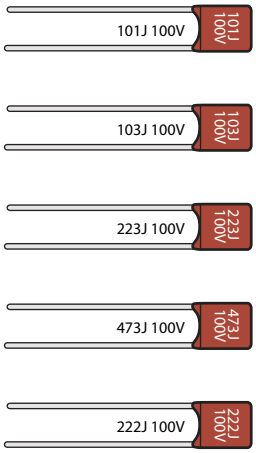
1µF capacitor (1) #7337

10µ capacitor (1) #7338

The four capacitors shown above are electrolytic capacitors and are polarized. They have to be installed in the correct orientation. Note the stripe running the length of each cap; this is negative (minus) lead. On the circuit board, the circle for these caps locations have a round through-hole on one side, and a square through-hole on the other side. Insert the caps with a stripe side towards the round hole side. (On electrolytic capacitors like these, there's another way to identify the negative lead: it is the shorter of the two leads).

The remaining five capacitors below are non-polarized. Solder these caps onto the board in the correct spots facing either direction.





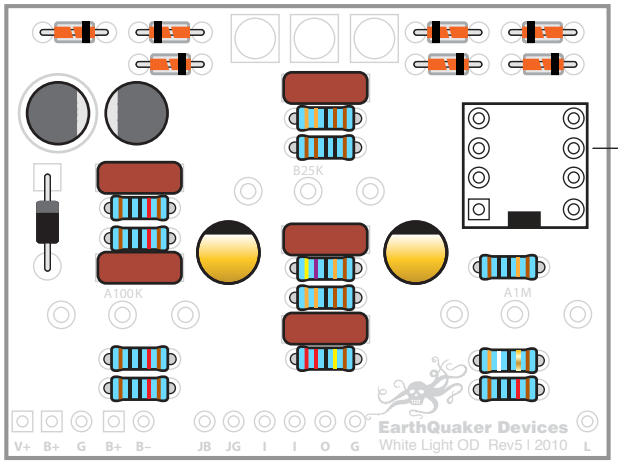
100pF capacitor (1) #7326

.01µF capacitor (1) #7331

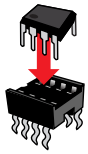
.022µF capacitor (1) #7332

.047µF capacitor (1) #7333

.0022µF capacitor (1) #7330



Step 4: Install one op-amp and socket

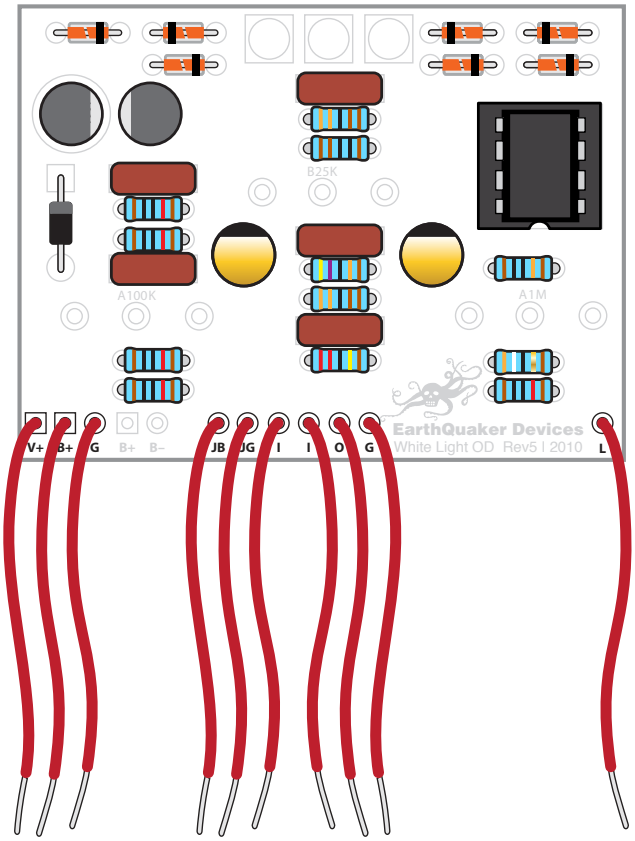


LM833 low noise op-amp (1) #7443

Socket for op-amp (1) #7484

Included in with the op-amp is an 8-pin socket. Solder the socket so the notch on one side faces the solid rectangle marked inside the outlines for the component on the circuit board. Using the socket protects the op-amp from the heat produced by the soldering iron. After soldering the socket to the board, insert the op-amp in the socket with the small notch on the op-amp facing the notch on the socket and the square on the board. The op-amp has to be oriented correctly to function properly.

Note: Socketing the op-amp allows you to easily swap with any dual Op-Amp for different tones. According to the White Light's original instructions; TL072, JRC4558, LM1458, and NE5532 are good substitutes.



Step 5: Install ten lead wires

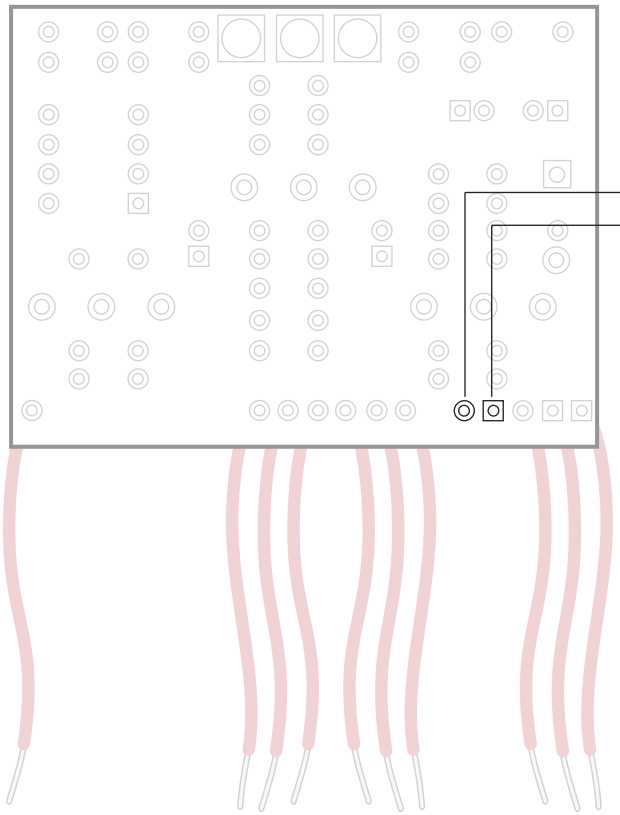
24" of lead wire (1) #5960

The kit comes with 24" of lead wire. Cut the wire into 2" sections. This will give you twelve 2" sections.

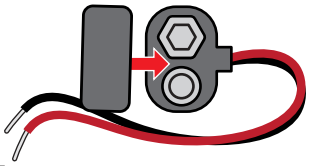
Strip around 3/32" of both ends of the 2" pieces. On one of the 2" pieces, strip 1/4" off one end and 3/32" off the other. This allows this wire to jump lugs on the footswitch.

Ten lead wires will be installed in eyelets; V+, B+, G, JB, JG, I, I, O, G, and L. Leave the second B+ and B- eyelets open for the next step.

The last two wires will be used to connect the jacks to the footswitch. Note: save the wire with 1/4" stripped for this step.



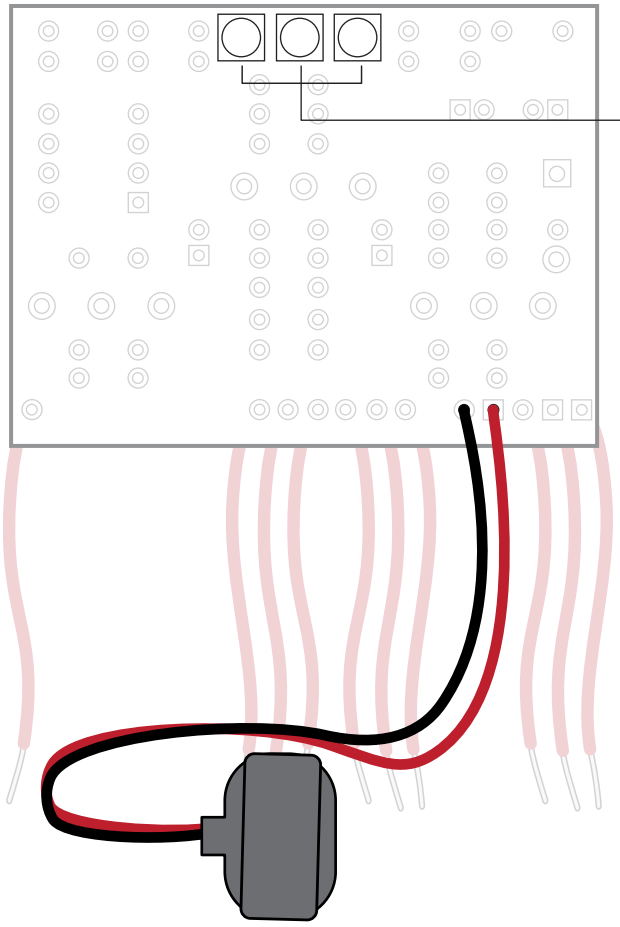
Step 6: Install one 9V battery clip



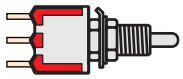
9V battery clip (1) #1222
Protective cap (1) #1227

Place the 9V protective cap on the 9V clip. This cap protects the battery clip from coming in contact with the other electronic components.

Flip the board over, the 9V battery clip will be installed on the **back of the board**. The 9V battery clip has two leads, black (negative) and red (positive). The black lead goes to eyelet B- and the red lead goes to eyelet B+. The leads must be installed in the proper eyelets to function properly.



Step 7: Install one toggle switch



On-on mini toggle (1) #7466

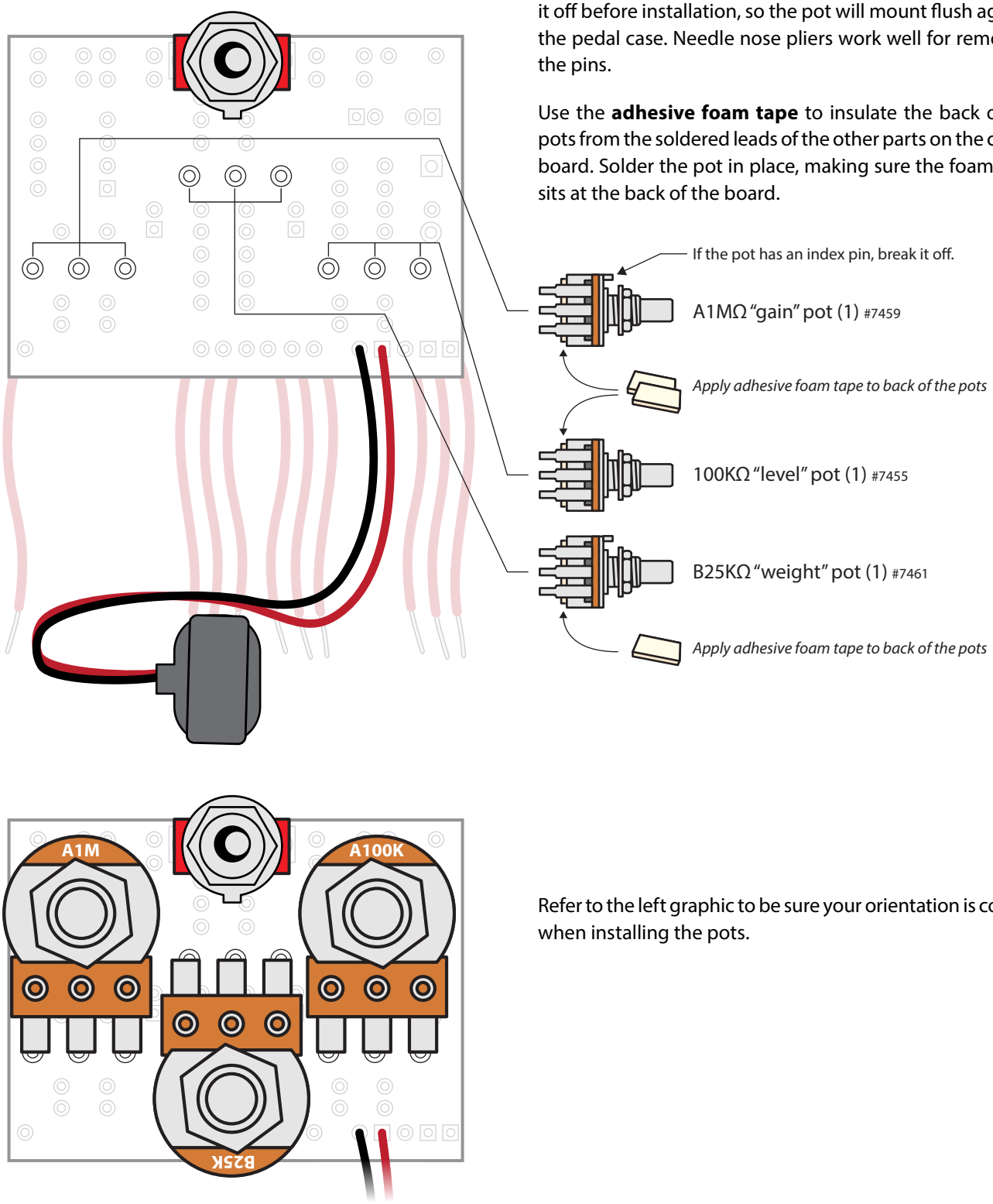
The switch is installed on the **back of the board**, like the control pots. The switch is placed on the board between the A1MΩ and A100KΩ pots on the board. The switch can be placed facing either direction on board.

Step 8: Install three control pots

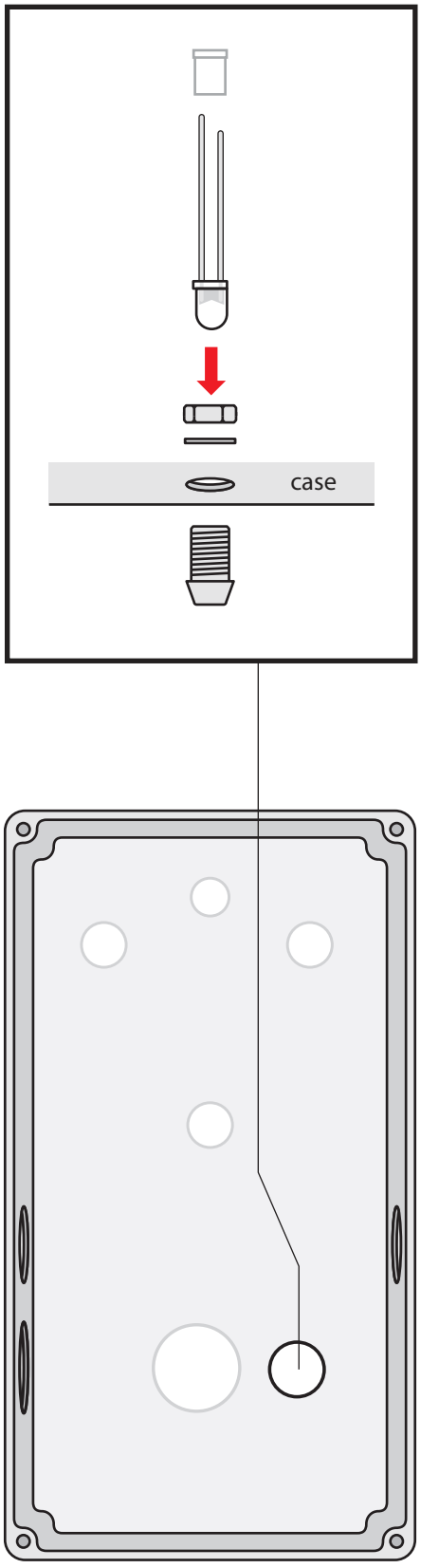
The last components to go onto the circuit board are the four control pots. They install on the **back of the board**. Each pot has three connecting lugs, refer to the below left graphic to be sure your orientation is correct when installing the pots.

If any pot has an index pin protruding from the case, break it off before installation, so the pot will mount flush against the pedal case. Needle nose pliers work well for removing the pins.

Use the **adhesive foam tape** to insulate the back of the pots from the soldered leads of the other parts on the circuit board. Solder the pot in place, making sure the foam back sits at the back of the board.



Refer to the left graphic to be sure your orientation is correct when installing the pots.



Step 9: Install one LED indicator light

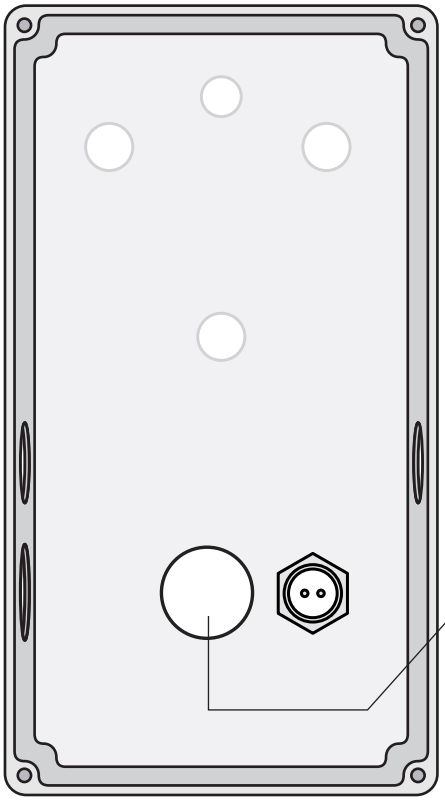
The LED mounting bezel consists of two main parts: A ring that the LED fits into, and a plastic plug that goes over the LED from the back side to keep it in place.

5mm white LED (1) #7422

5mm LED mounting bezel (1) #7

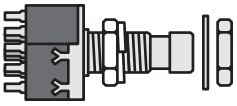
Like some of the caps and diodes, the LED is polarized and has to be installed in a specific direction. One side of the diode has a flat edge, indicating the negative lead. Another indication is that the negative lead is shorter than the positive.

Install the mounting bezel through the front of the enclosure. From the inside, slip a lock washer and nut on and tighten it up using a **3/8" socket**. Insert the LED into the bezel so the flat side (short lead) faces the hole for the footswitch. Feed the leads through the plastic plug, press the plug down until it's tight in the bezel. The LED will be held in place when you solder the leads to the switches and circuit board. For a more secure mount, you can run a bead of clear silicone adhesive around the plastic plug.

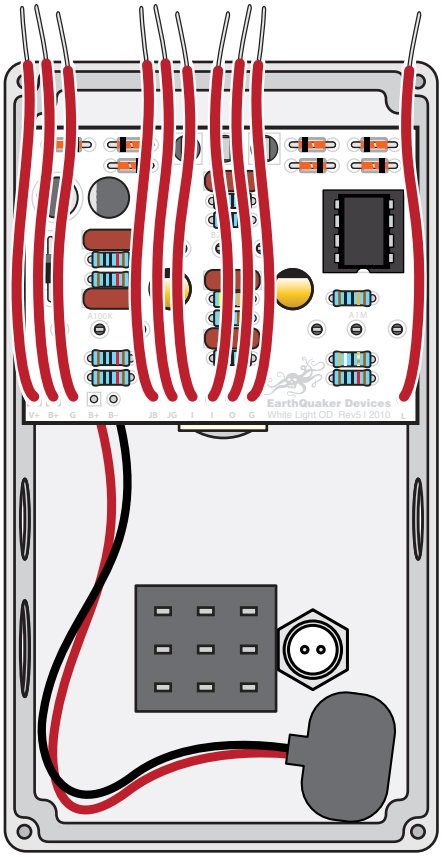


Step 10: Install one footswitch

Install the footswitch so the part number printed on the side faces the bottom of the enclosure. Use a **14mm wrench** to tighten it up. The footswitch is the effect bypass switch that turns on the pedal.



3PDT latching footswitch (1) #1611

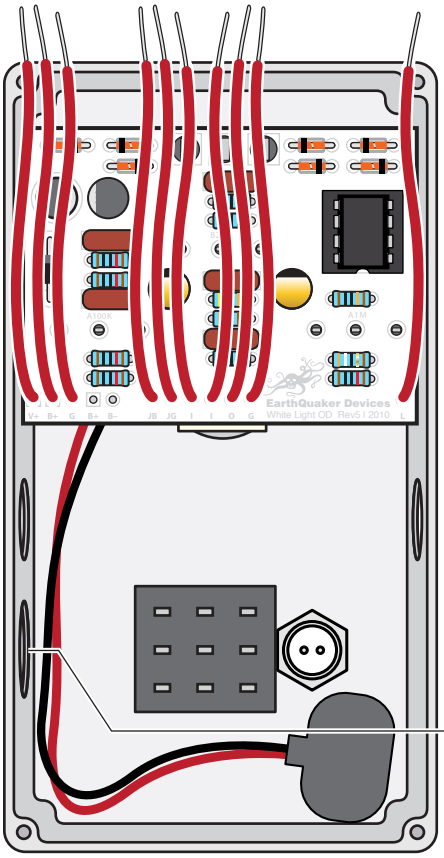


Step 11: Install the circuit board

The circuit board is held in place by the control pots.

Install their shafts through the top of the case, and thread washers onto them on the outside. Using a **10mm wrench** install the mounting nuts so they are good and snug, but take care not to over-tighten.

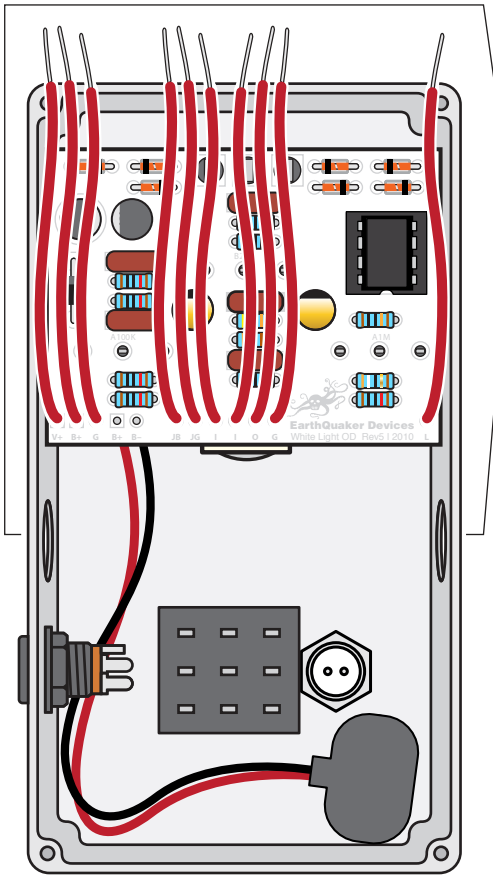
Do not connect any of the lead wires at this point.



Step 12: Install one DC jack

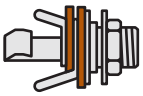
Install the DC jack using a **14mm wrench**.

2.1mm DC power connector (1) #7



Step 13: Install two jacks

1/4" stereo jack (1) #4653

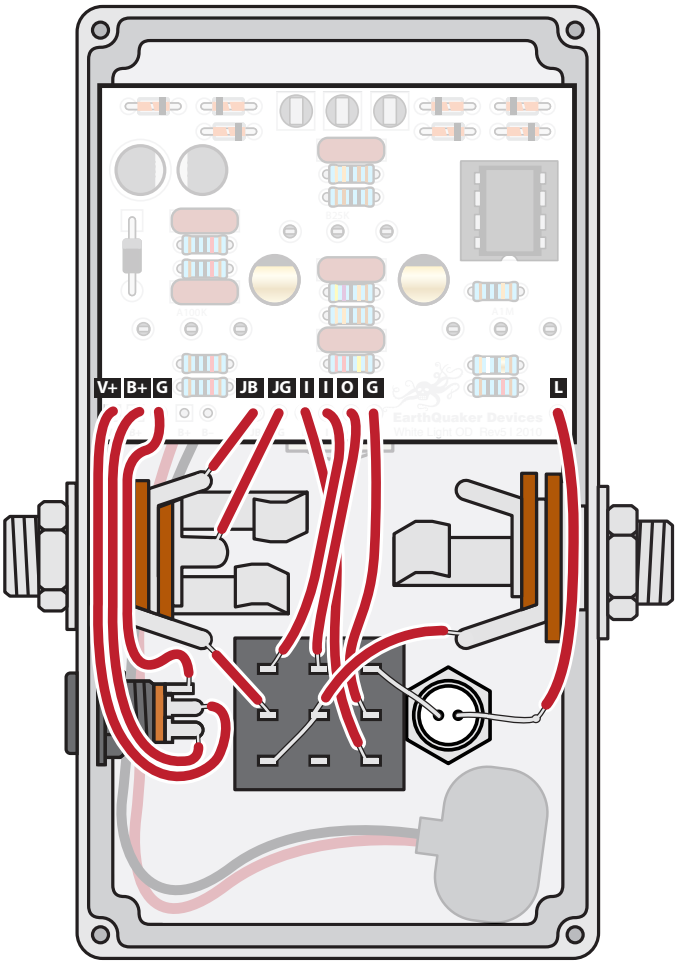


1/4" mono jack (1) #4652

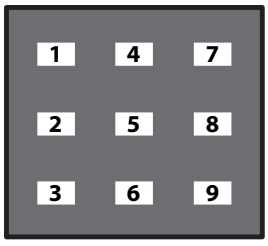
There are two different jacks for this kit, one stereo and one mono. The stereo jack is the input and the mono is the output. When looking at the back of the enclosure, the stereo jack will go on the left side and the mono on the right. Install the input and output jacks with the solder lugs facing up. This will make soldering easier later.

Run the 9V battery clip under the jack to keep it out of the way.

A **1/2" wrench** is recommended to tighten the jacks in place.



The lugs on the DC jack are as show above.



The lugs on the footswitch are numbered as shown above.

Step 13: Final wire-up

With all of the components in place, it is time to wire it all up. Starting on the left-hand side of the circuit board, wire up the DC jack first. The wire labeled V+ connects to the +9V lug. B+ connects to Battery + lug. G connects to Masse (GND) lug.

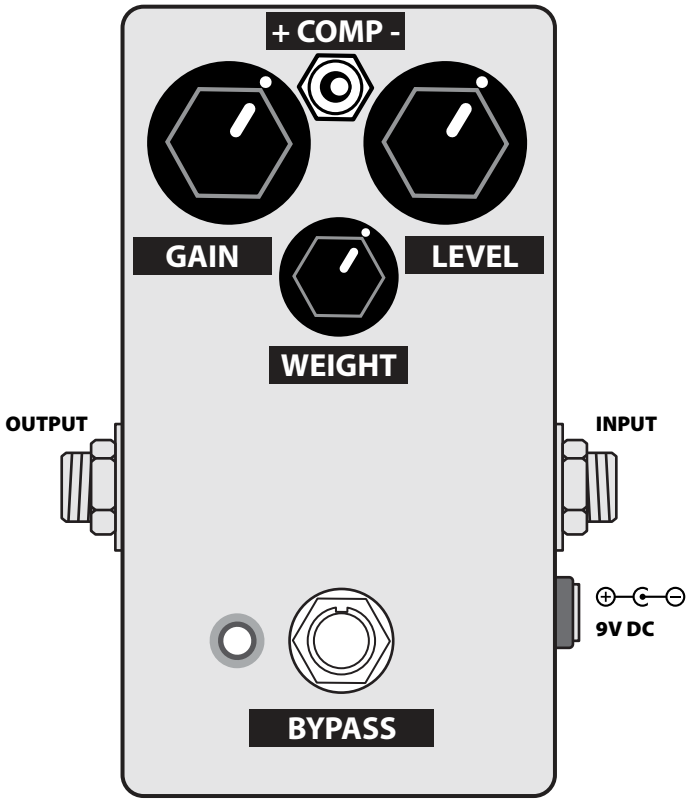
Next solder the input jack. Solder the wire labeled JB to the lug that connects to the shorter tip of input jack. This will disconnect the battery when unplugged. Next solder the wire labeled JG to the sleeve lug on the input jack. This lug connects to the threaded shaft of the jack.

Continuing, solder the first wire labeled I to lug #9 on the footswitch. Next solder the second wire labeled I to lug #1. Solder the wire labeled O to lug #4. Finally, solder the wire labeled G to lug #8.

Solder the final wire labeled L to the positive (long) lead of the LED.

Moving on to the footswitch, solder a wire to lug #2 then solder the same wire to the lug of the input jack that connects to the longer tip. Solder the wire with the 1/4" striped end to jumper lugs #3 and #5 on the footswitch, then solder the same wire to the tip lug of the output jack. Finally solder the negative (shorter) lead of the LED to the #7 lug of the footswitch.

Add a battery, if you would like. Screw on the back panel and plug in!



Here's how the controls work:

Gain: Controls the amount of distortion.

Weight: A multi-functional control, allows the level of saturation, bass response and the over all feel of the device to be altered.

Level: Controls the output.

Compression Switch: Less gives you open with more high-mids and bite. More gives you crunchy and compressed with a bit less bite and more flat mids.

Power: Use a standard 9 volt DC power supply with a 2.1mm negative-center barrel (not included). We always recommend pedal-specific, transformer-isolated wall-wart power supplies or supplies with separate isolated outputs. Pedals will make extra noise if there is ripple or unclean power. Switching-type power supplies, daisy chains and non-pedal specific power supplies do not filter dirty power as well and let through unwanted noise. **Do not run at higher voltages!** Current draw is 6 mA.