

# **BYOC Vibrato Kit Instructions**

**BA6110 version**

**[<http://buildyourownclone.com/662.pdf>](http://buildyourownclone.com/662.pdf)**

**Please read these instructions very thoroughly before building even if you are an experience builder. Because of the layout, there is a certain order which must be followed.**

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# PARTS CHECKLIST (BA6110 Version)

RESISTORS: Some kits may come with 1%metal film (light blue) or 5%carbon film(light brown)

- 1 - 100ohm (brown/black/black/black/brown) or (brown/black/brown/gold)
- 3 - 1k (brown/black/black/brown/brown) or (brown/black/red/gold)
- 1 - 1.8k (brown/gray/black/brown/brown) or (brown/gray/red/gold)
- 1 - 2.7k (red/purple/black/brown/brown) or (red/purple/red/gold)
- 4 - 4.7k (yellow/purple/black/brown/brown) or (yellow/purple/red/gold)
- 1 - 6.8k (blue/gray/black/brown/brown) or (blue/gray/red/gold)
- 1 - 7.5k (purple/green/black/brown/brown) or (purple/green/red/gold)
- 1 - 8.2k (gray/red/black/brown/brown) or (gray/red/red/gold)
- 15 - 10k (brown/black/black/red/brown) or (brown/black/orange/gold)
- 3 - 15k (brown/green/black/red/brown) or (brown/green/orange/gold)
- 4 - 33k (orange/orange/black/red/brown) or (orange/orange/orange)
- 8 - 47k (yellow/purple/black/red/brown) or (yellow/purple/orange/gold)
- 1 - 56k (green/blue/black/red/brown) or (green/blue/orange/gold)
- 4 - 100k (brown/black/black/orange/brown) or (brown/black/yellow/gold)
- 1 - 150k (brown/green/black/orange/brown) or (brown/green/yellow/gold)
- 1 - 180k (brown/gray/black/orange/brown) or (brown/gray/yellow/gold)
- 2 - 330k (orange/orange/black/orange/brown) or (orange/orange/yellow/gold)
- 2 - 470k (yellow/purple/black/orange/brown) or (yellow/purple/yellow/gold)
- 4 - 1Meg (brown/black/black/yellow/brown) or (brown/black/green/gold)

CAPACITORS:

- 1 - 100uf electrolytic
- 1 - 47uf electrolytic
- 1 - 10uf electrolytic
- 3 - 1uf electrolytic
- 1 - 0.47uf electrolytic
- 1 - 6.8uf tantalum
- 1 - .1uf film
- 4 - .047uf film
- 1 - .022uf film
- 2 - .01uf film
- 2 - .0068uf film
- 1 - .0047uf film
- 1 - .0039uf film
- 1 - .0027uf film
- 1 - 220pf ceramic disc
- 1 - 200pf ceramic disc
- 2 - 47pf ceramic disc
- 2 - 33pf ceramic disc

DIODES:

- 6 - 1N4148 or 1N914

TRANSISTORS:

- 4 - BC550 or 2SC732 (nnp CBE pinout)
- 7 - 2SC945 (nnp ECB pinout)
- 3 - 2SA733 (pnp EBC pinout)

ICs:

- 1 - BA6110 vca
- 1 - 3207 bbd
- 1 - 3102 clock
- 1 - 4558 op amp
- 1 - TL022 or 4558 op amp

POTENTIOMETERS:

- 1 - 10k trimpot
- 1 - 500k trimpot
- 1 - B50k (depth)
- 1 - A250k (rise time)
- 1 - C250k (rate)

SWITCHES:

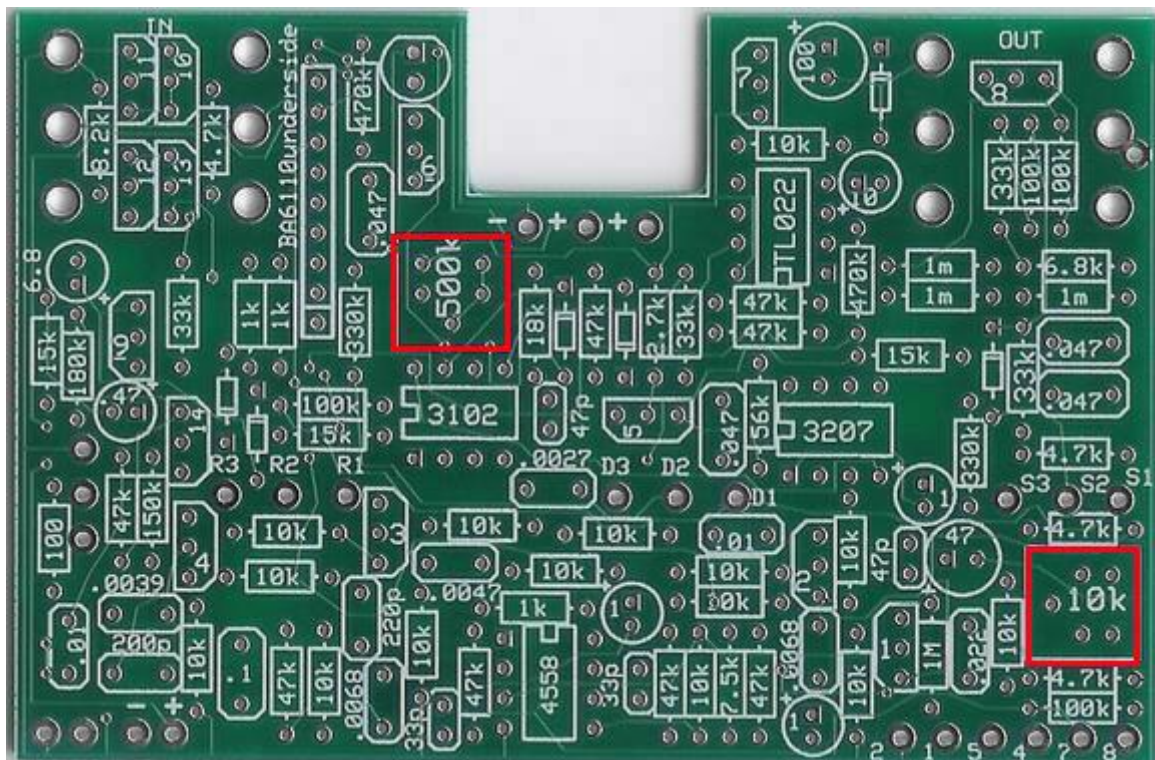
- 1 - 3PDT footswitch
- 1 - SPST momentary footswitch
- 1 SPDT toggle switch

MISC.:

- 4 - DIP8 sockets
- 1 - SIP9 socket
- 1 - predrilled enclosure w/ screws
- 1 - ready to solder circuit board
- 1 - red LED
- 2 - 1/4" PCB mount stereo jacks
- 1 - AC adaptor jack
- 3 - knobs
- 1 - battery snap
- 4 - self-adhesive clear rubber bumpers
- hook-up wire

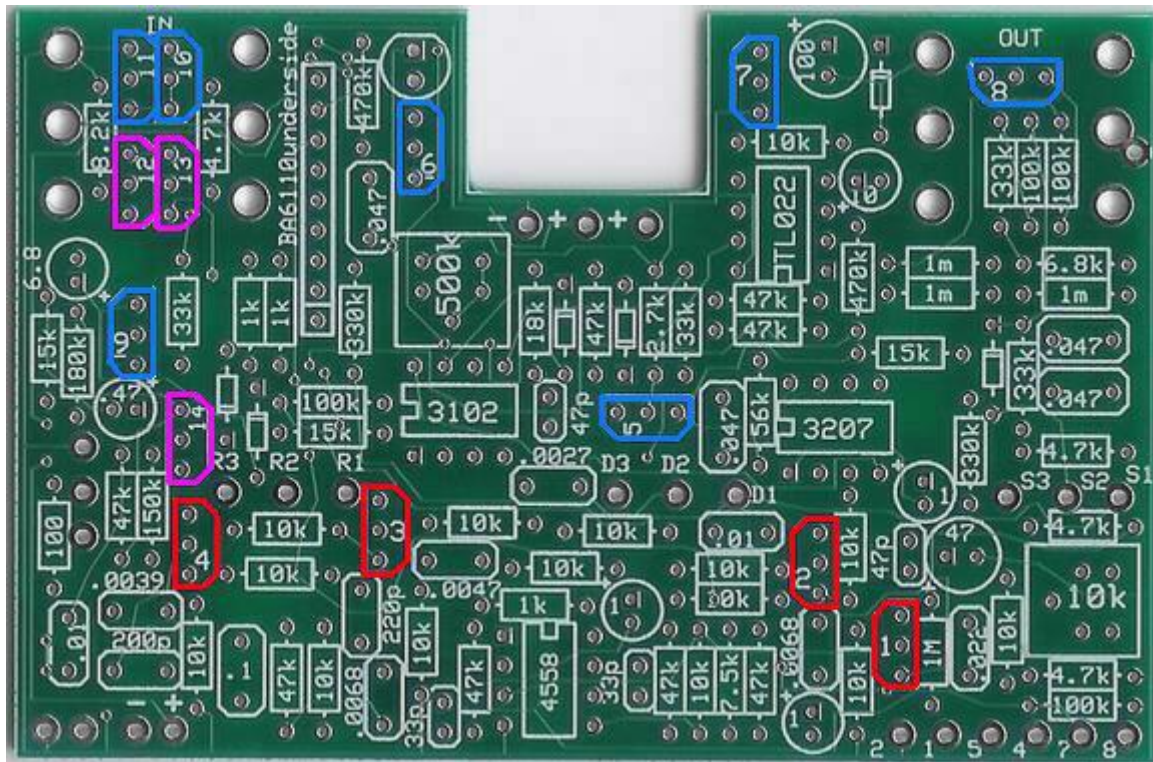
[illegible]







Step 4: install the trimpots. They will only have 3 legs, but the board has 5 holes. This is so that the board can accommodate more than one brand of trimpot. There should only be one way to fit your trimpot into the space provided without having to bend the legs very much. You may have to bend them a little bit if they were bent in shipping, but you should not have to “stretch” the legs to get it to fit. If you do, then you are doing something wrong. The 500k adjusts the clock. You want to set this so that the vibrato sounds as full as possible without sounding too noisy. The 10k biases the reference voltage for the buffer circuit. You want to set the pedal to “ramp ON” so that you hear a buffered dry signal. Strum your guitar very hard. Adjust this trimpot untill the buffered dry signal is clean there is no distortion.

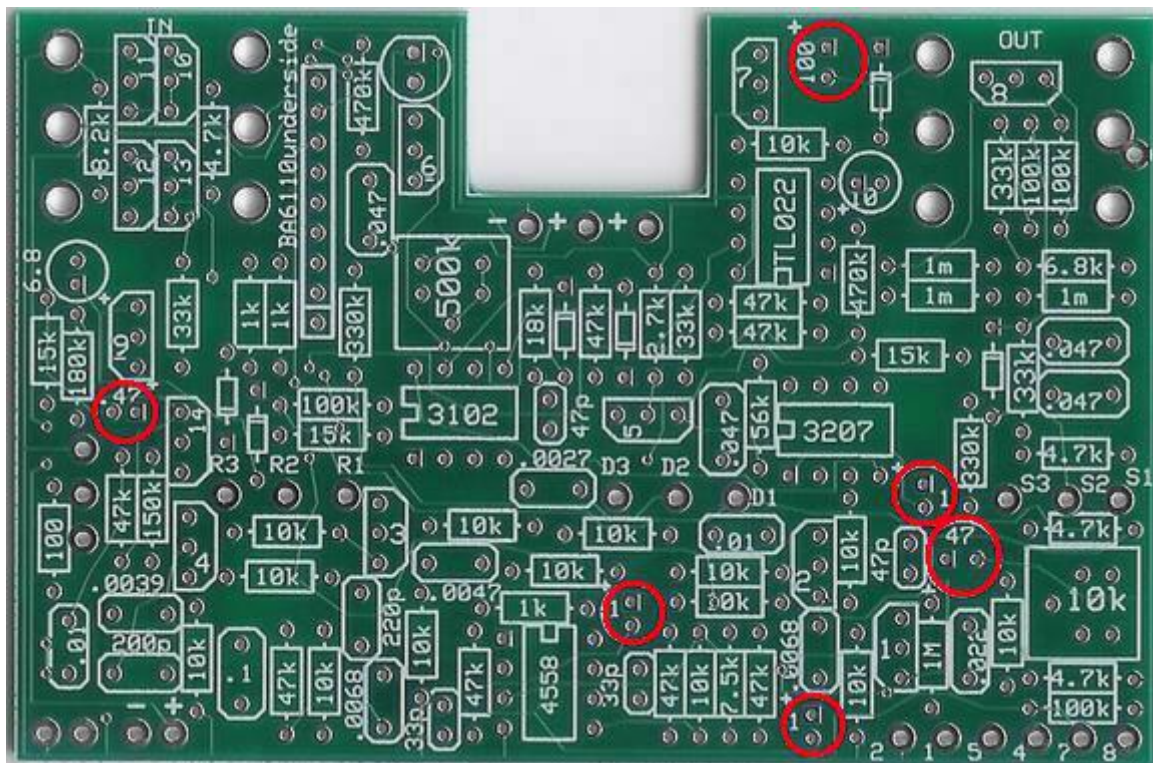


Step5: install the first 4 transistors (Q1 - Q4) highlighted in red. These are the BC550.

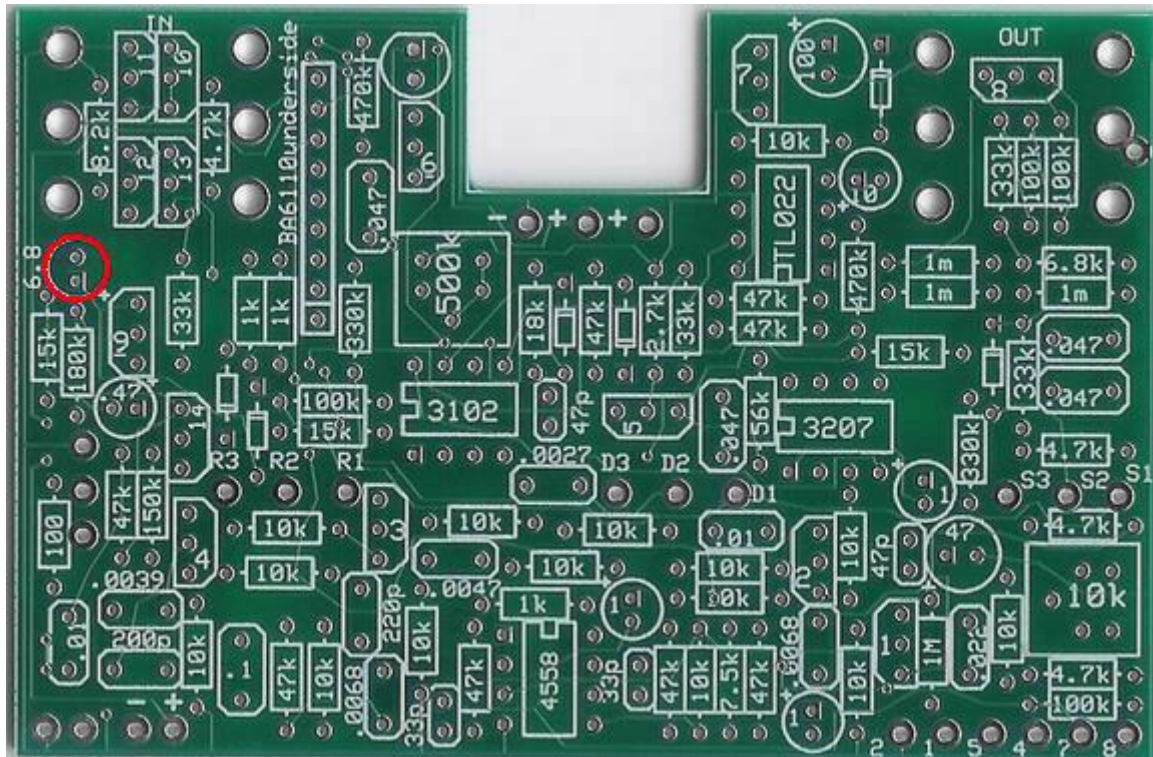
Step 6: install the next 7 transistors (Q5 - Q11) highlighted in blue. These are the 2SC945. The transistors will probably only be labelled C945.

Step7: Install the last 3 transistors (Q12 - Q14)highlighted in purple. These are the 2SA733 but will probably only be labelled A733.





Step 8: Install the aluminum electrolytic capacitors. These are polarized and should be orientated a certain way. The positive end will have the longer lead and should go in the hole with the square solder pad. The negative end will have the shorter lead and have a stripe going down the side of the cap.

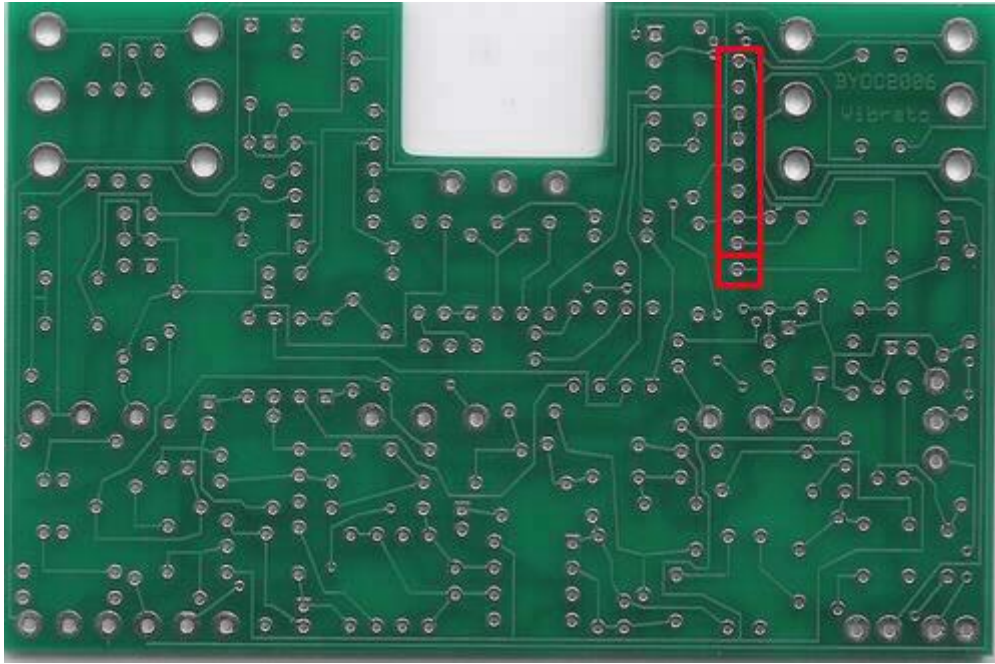


Step 9: Install the 6.8uF tantalum cap. This cap will either be blue or yellow and look “bulbous” or “dipped”. It is polarized as well. The positive end should be labelled with “++” markings and that lead goes in the square solder pad.

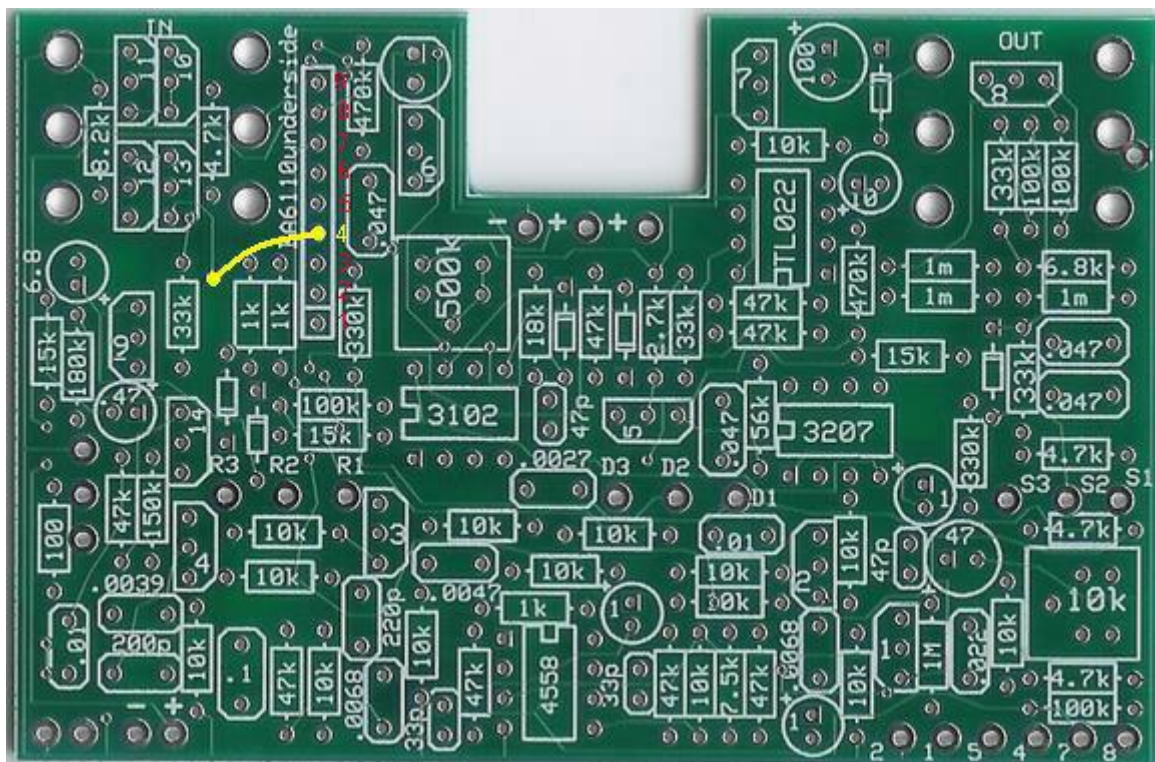








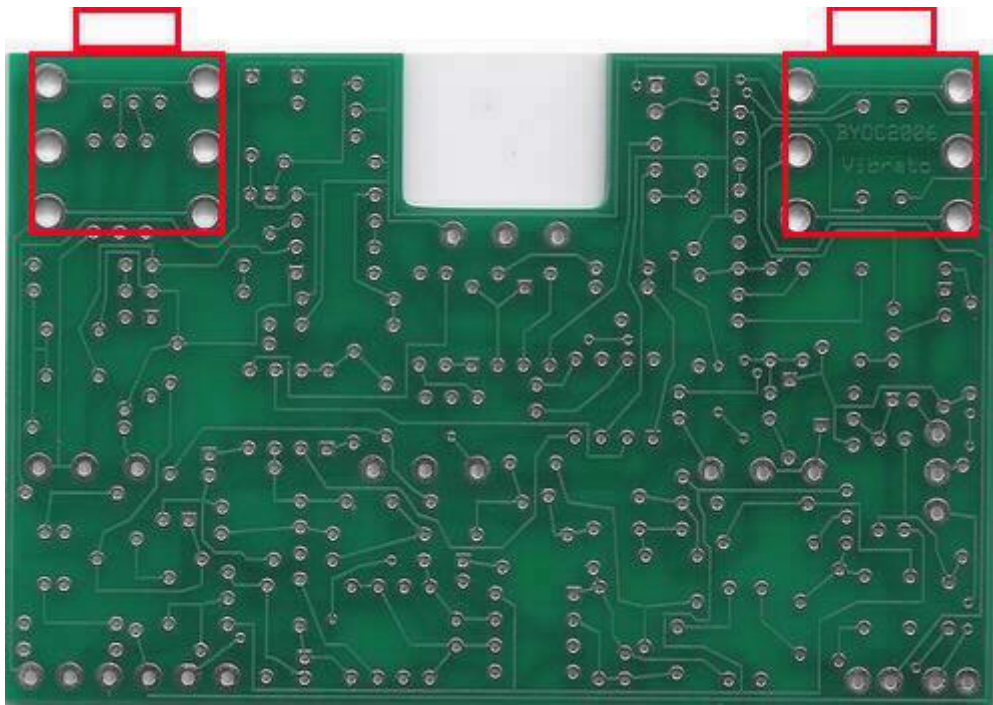
Step12: DO NOT SOLDER the BA6110!!!! Only solder the SIP9 socket. And make sure you solder it to the UNDERSIDE of the board. Install the Chip into the socket when you are ready to test the pedal.(this is a pic of the 622 board, but the layouts are virtually identical)



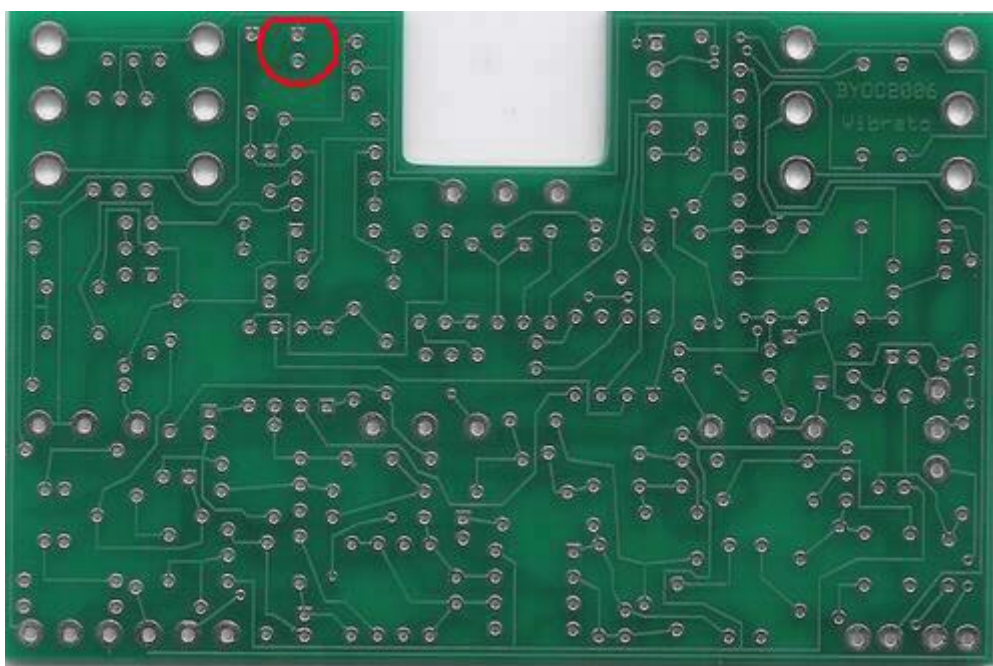
DO NOT DO STEP 13 IF YOU HAVE A RECENT KIT!!!!!!!!!!!!This jumper is needed on the first run of PCBs to compensate for a very minor error. This error has been fixed on the new PCBs. The older board that need the jumper will have two small cuts in the copper traces on the underside of the board. The newer boards will not have any cuts on them and should be marked "V2" on the underside of the board.

Step 13: Make a jumper using left over clipping from one of the resistors to connect pin 4 of the BA6110 to the open eyelet between the 33k resistor and 1k resistor.





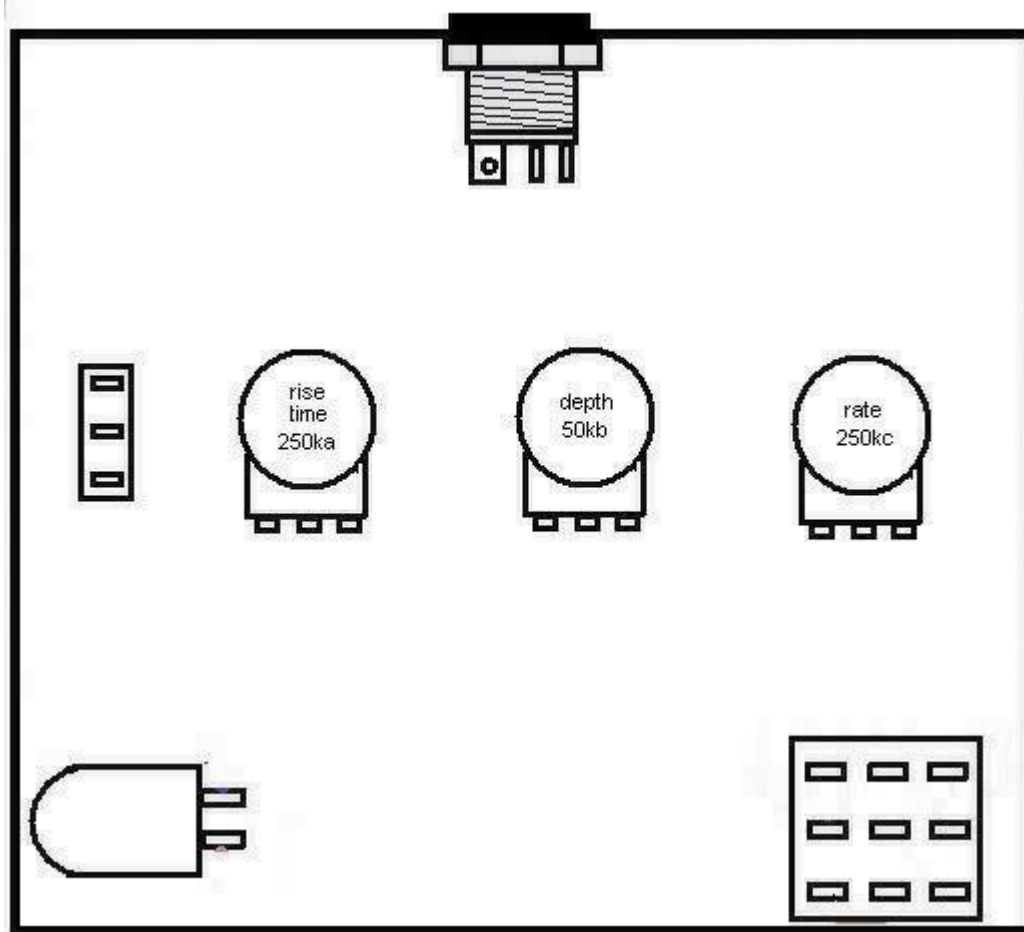
Step 14: Add the 1/4" jacks. Both are stereo, so it makes no difference which is "in" or "out". **MAKE SURE YOU SOLDER THEM TO THE UNDERSIDE OF THE BOARD!!!!**



Step 15: **DO NOT SOLDER!!!!!!!!!!!!!!!!!!!!!!!!!!!!** Only insert the LED into its place on the underside of the circuit board but do not solder it. This time the negative lead goes in the square solder pad. It will be the side that is flat. The positive lead goes in the round hole and will be the longer lead. Bend the leads on the top side so that the LED does not fall out. After you test the pedal and you are certain that it works, then you will position the LED into the hole in the enclosure and solder it. Once you solder it, it's very difficult to get the LED back in the enclosure hole if you take the board out to trouble shoot.

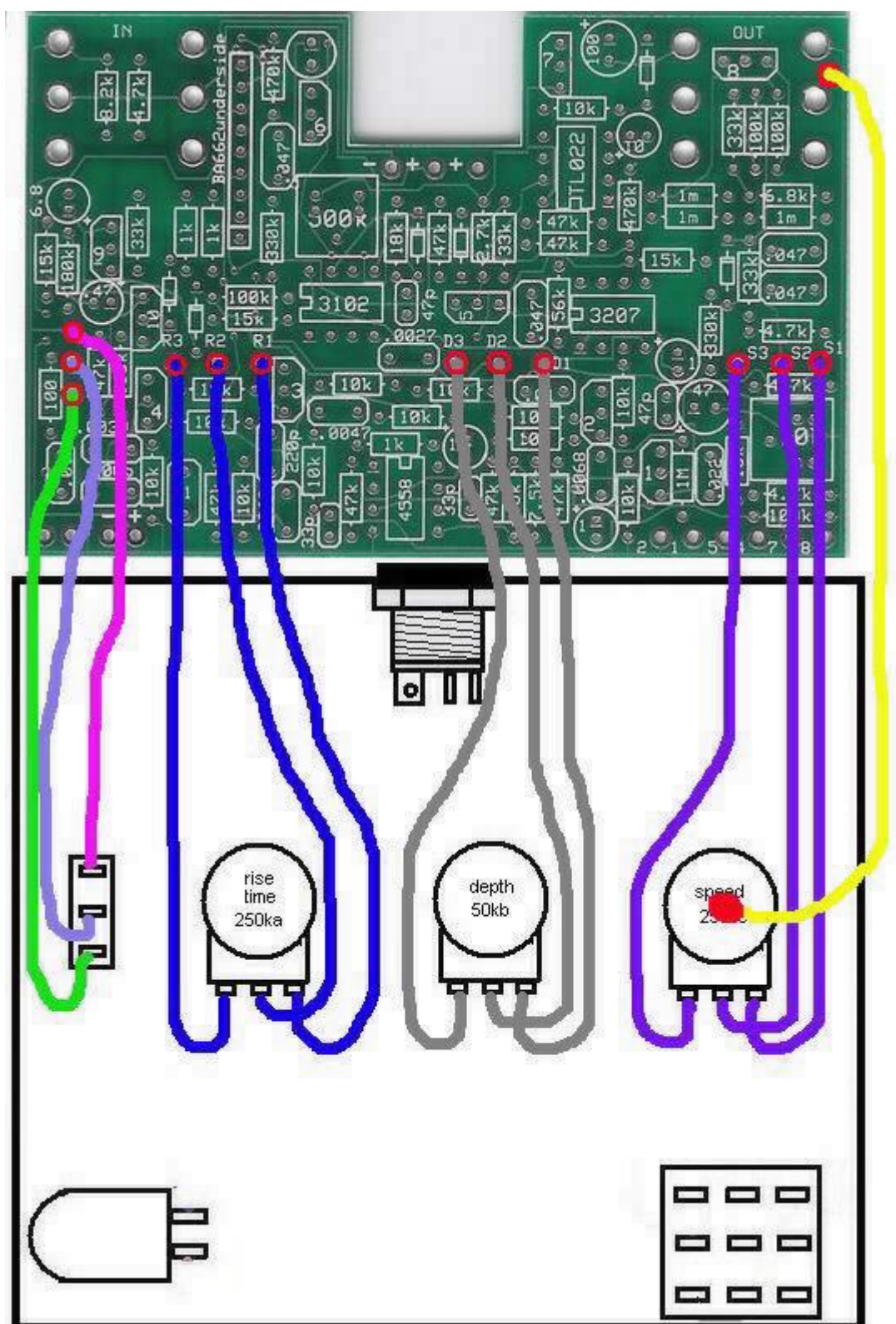


## Assembly



1. Install the SPDT toggle switch **VERY IMPORTANT!!!!** Take off the extra nut and washer from the inside of the brushing so that there is only one nut and one washer (the serrated washer) on the outside of the enclosure so that the body of the switch is flush against the inside of the enclosure. When the switch is in the up position, this will be “ramp on”.
2. Install the pots so that the depth pot is in the middle, the rate pot is on the right and the rise time pot is on the left.
3. Install the footswitches so that the ramp switch is on the left and the bypass switch is on the right. Orientate the bypass switch so that the solder lugs are facing horizontally. The ramp switch is a SPST switch, so it doesn't matter which is the pole and which is the throw.
4. Install the AD adaptor jack. Orientate it so that the negative “tip” terminal is on the left, the battery connect + terminal is in the middle and the constant + terminal is on the right.

## Wiring



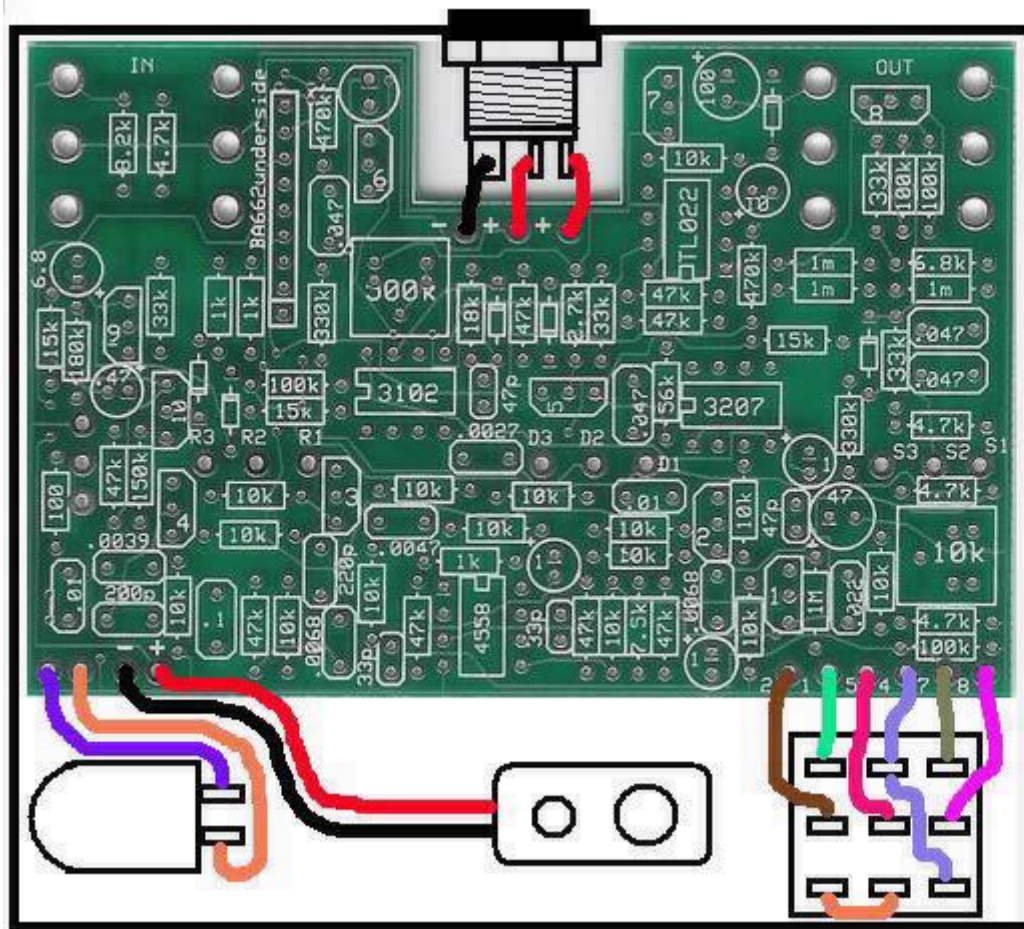
1. Make these wiring connections on underneath the board. Also keep in mind that these wires should be very short. They are shown here as being relatively long for illustration



purposes.

2. Look at the yellow wire. This is the “chassis ground wire”. Because all of the jacks are plastic, the circuit ground is isolated from the chassis. This can cause some grounding noise when you press the metal footswitches. Connecting the circuit ground to the chassis will eliminate this.

The yellow wire is shown connected to the metal back of the potentiometer which also makes contact with the enclosure and all of the other metal bolts connected to the enclosure. You can connect the chassis ground wire to just about anything metal that touches the enclosure, but the back of the pots is the thinnest metal and will be the easiest to solder to.



Step 3: Insert the board into the enclosure so that the jack brushings fit in their holes. You may need to remove the pots and or toggle switch to get it in and then put them back. After you get everything in place, put the bolts on the jacks.

Step 4: Wire up the rest of the hardware as shown in the diagram. The connections from the Bypass switch and the AC jack will be very short and it may be easier to use left over clippings from the resistors and caps.

## Finishing Up

1. Test the pedal to make sure it works properly before you solder the LED.
2. Add all the IC's to their sockets. The DIP8 ICs may have a “u-shaped” notch. If they do, match them up with the notch in the socket that should also be matched up with the layout. If there is no notch, then there should be a small dot in the corner of the IC that denotes pin 1. Pin 1 on the circuit board will always be denoted by a square solder pad. The SIP9 IC will have a notch between Pin1 and Pin2 and should be matched up with the line on the layout.
3. Adjust the trim pots as describe earlier.
4. If everything works, unbend the LED leads and guide it into its hole in the enclosure. You probably don't want to push the LED in as far as it will go. Just push it in far enough so that it is flush with the outside of the enclosure.

Hold the LED in place and solder it.

5. Put the lid on the enclosure, screw it down, and then apply the self adhesive rubber bumpers.

If you are having trouble, please visit [board.buildyourowncolone.com](http://board.buildyourowncolone.com) for tech support.