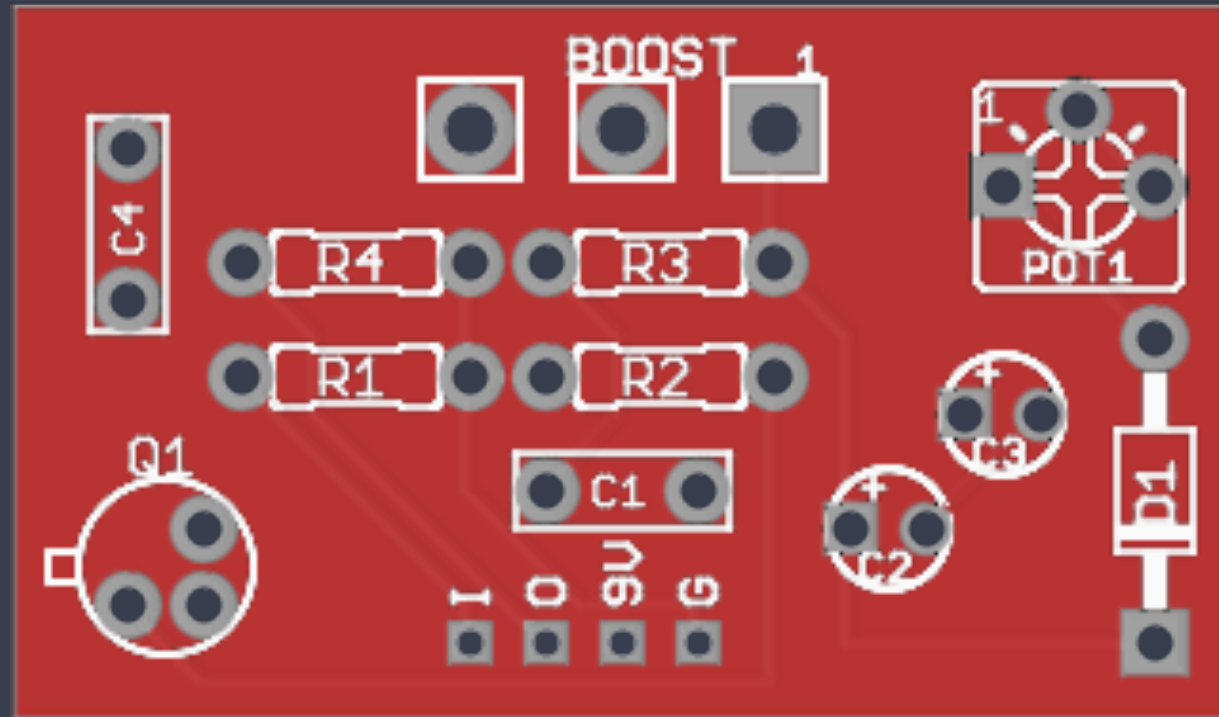


OtalgiaFX

TREBLE BOOSTER RM

Build Guide
October 2019

www.otalgiafx.co.uk



“A fantastic Treble Booster based on the classic Rangemaster”

BILL OF REQUIREMENTS

PART LIST

** Please note that this some of the parts in this list are interchangeable. For example you can use carbon resistors instead of metal film, however it is possible that changing these components might alter the sound slightly.

PART	VALUE	DEVICE TYPE
CAPACITORS		
C1	4n7	5mm Polyester Box, 63v (or higher)
C2	47uf	Polarised Electrolytic, 25v (or higher)
C3	47uF	Polarised Electrolytic, 25v (or higher)
C4	10nf	5mm Polyester Box, 63v (or higher)
TRANSISTOR		
Q1	AC176	Germanium NPN (HFED 65-100 optimal)
** Other NPN transistors can be used (though check their pinouts)		
RESISTORS		
R1	1M	1/4W Through Hole, Metal Film
R2	3k9	1/4W Through Hole, Metal Film
R3	470K	1/4W Through Hole, Metal Film
R4	1M	1/4W Through Hole, Metal Film
POTENTIOMETERS		
POT1	100K	Type 3362p Bourns trimmer
BOOST	10KA	16mm Pin terminals
DIODE		
D1	1N4001	Silicon Diode

BUILDERS NOTES

In the parts list each component has a component number. This number corresponds to the placement number silk screen printed on the top of the PCB. Components should be mounted on the printed side of the PCB and soldered into place on the underside of the board.

To aid in construction and make soldering easier it is suggested that components are soldered to the board in order of their height profile from low to high, starting with resistors, diodes and then progressing on to larger items such as sockets and capacitors. The potentiometer should be soldered last.

Some items may require correct orientation for the circuit to work correctly as documented below -

Polarised Capacitors -

The PCB will have a "+" mark printed. This mark indicates where the positive lead of the capacitor should be soldered. In general the positive lead of a polarised capacitor is longer than the negative. Also in many polarised capacitors the body of the component will be marked to indicate the polarity of each lead.

Resistors -

Resistors are not polarised so can be mounted either way around.

Non Polarised Capacitors-

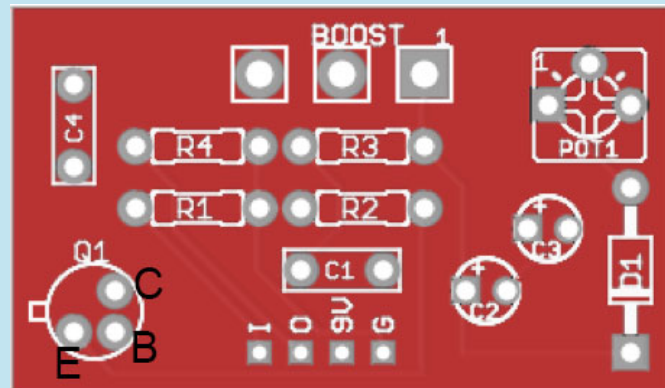
Non-Polarised capacitors can be mounted either way around.

BUILDERS NOTES (CTD)

Transistor selection -

The circuit has a negative ground and uses a NPN transistor.

A transistor has three legs - A collector, base and emitter (CBE) . The order of these legs can vary depending on the transistor selected. The PCB has the pins in the order EBC (see picture below). Ensure that the Pins of the transistor you use (called pinout) matches the pcb order otherwise the circuit will not work.



The transistor will need to be orientated correct and match the placement image marked on the PCB. If you intend to use a transistor that differ from the build list then please be aware than the Collector, Base and Emitter legs may be in a different order. The pinout legs of different transistors can be found by referring to their technical data sheets on the Web.

It is also worth noting that transistors are susceptible to heat damage so take care when soldering.

Alternatively use a transistor socket and insert the transistor after the sockets have been soldered into place.

As a rule of thumb, the HFE (Gain of the transistor) should be within the following range -

Q1 - 75 to 100 HFE

BIASING THE TRANSISTOR

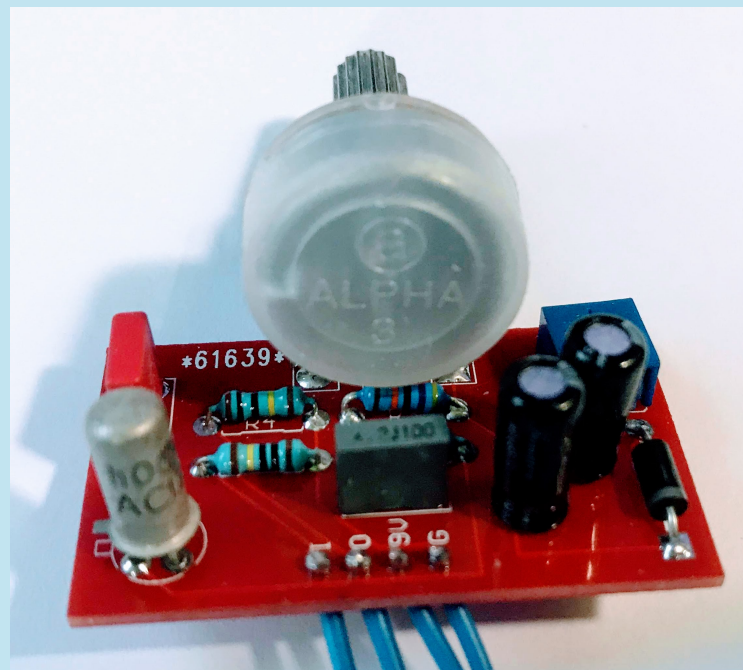
The key to building a good pedal is ensuring that the transistor is getting the correct voltage.

For the best results with this PCB the transistor in Q1 needs to have the correct voltage for optimum performance. The voltage required is 7v.

To bias the transistor you will require a Digital Multimeter that has the ability to measure voltage. To bias the transistor you must first wire up the circuit as detailed in the "Testing The Circuit" page below.

Once the circuit is correctly wired place the negative probe of the multimeter on the Ground pad of the pcb and the positive probe of the multimeter onto the collector of transistor Q1. Using the bias trimpot and a screwdriver, adjust the trimpot until a reading of 7v (or close as you can get) is achieved.

If you do not have access to a Digital Multimeter then it is still possible to bias the transistor by ear - wire up the circuit as detailed in the "Testing The Circuit" page below then adjust the trimpot until you are happy with the sound.



TESTING THE CIRCUIT

Before proceeding to the off board wiring of switches and LED's it is advised to test that the circuit is working as expected. To do this you need to solder four wires from the connectors on the PCB, marked I,O,9V & G.

The connectors are sized to accommodate AWG24 Single Strand Wire. If using this wire be careful not over bend it as it may snap. If you are not comfortable with handling single core wire then stranded may also be used.

To test your circuit -

1. Unplug the power supply
2. Plug a mono guitar cable into your guitar and a second mono guitar cable into your amplifier
3. Connect the wire from I (This is the input wire) to the tip of your guitar cable
4. Connect the wire from O (This is the output wire) to tip of your amp cable
5. Connect the wire from 9V (This is the Voltage wire) to the +9V of your power supply
6. Connect the wire from G (This is the Ground wire) to the sleeve of your guitar cable, the sleeve of the amp cable and to the Ground wire of your power supply.
7. Plug in the power supply and test the circuit is working. If it is then you can proceed to off board wiring.

The easiest way to perform off board wiring is to use a 3PDT switch daughterboard -

<https://www.otalgiafx.co.uk/wp-content/uploads/2017/09/3PDT-Instructions.pdf>