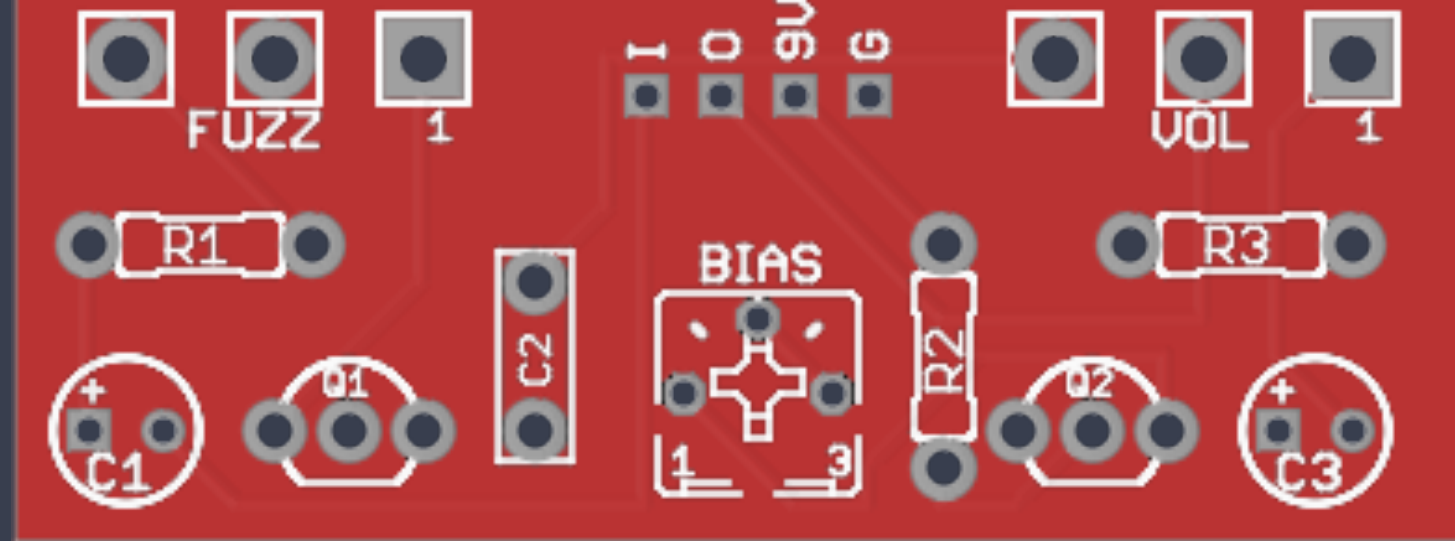


OtalgiaFX

# NPN FUZZ FACE

Build Guide  
October 2019

[www.otalgiafx.co.uk](http://www.otalgiafx.co.uk)



“A Classic Fuzz pedal that is  
Pedal board friendly”

## 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	2u2	Polarised Electrolytic, 25v (or higher)
C2	10nf	5mm Polyester Box, 63v (or higher)
C3	22uF	Polarised Electrolytic, 25v (or higher)
RESISTORS		
R1	100K	1/4W Through Hole, Metal Film
R2	33K	1/4W Through Hole, Metal Film
R3	470 OHM	1/4W Through Hole, Metal Film
TRANSISTORS		
Q1	BC108c	* Lots of options available. Socket the transistors and try other NPN transistors, making sure their pinouts match the PCB pinout order.
Q2	BC108c	
TRIMMER		
T1	20K Trimmer	Bourns type 3362p or similar
POTENTIOMETERS		
VOL	A500K	16mm Log, Pin Terminals
FUZZ	B1K	16mm Log, Pin Terminals

# 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.

## **Non Polarised Capacitors-**

Non-Polarised capacitors can be mounted either way around.

## **Resistors -**

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

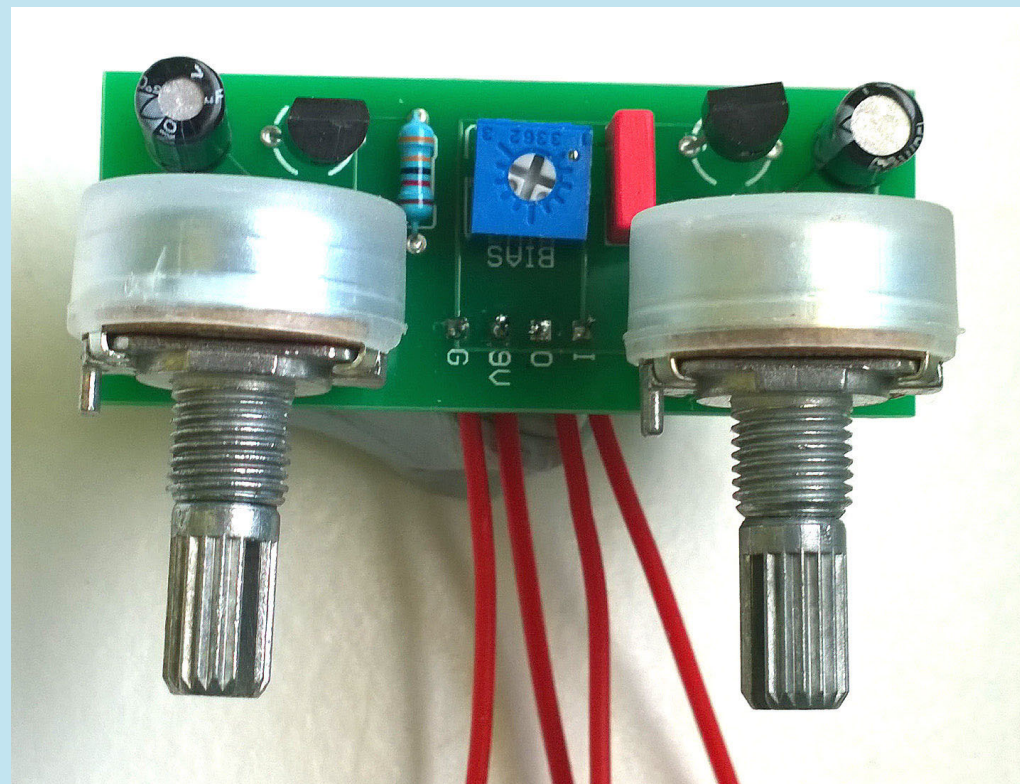
# BUILDERS NOTES (CTD)

## Potentiometer -

The potentiometer should be mounted onto the topside of the PCB with its splined shaft facing outwards. See picture below for reference.

When mounting this circuit into an enclosure the potentiometer will hold the PCB in place within the enclosure and stop the circuit board from moving around.

Please take care when mounting the potentiometer not to over tighten the nut or you might damage the potentiometer's thread.

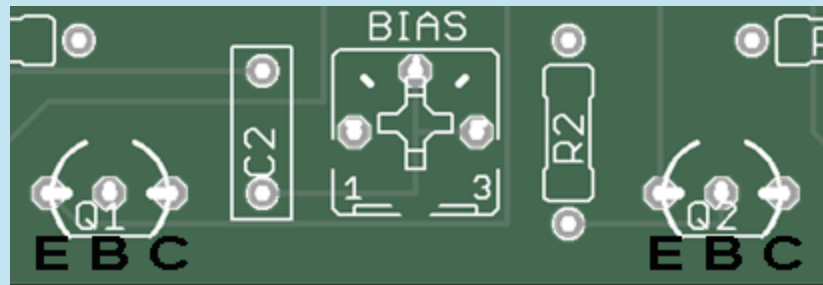


# BUILDERS NOTES (CTD)

## Transistors and their selection -

The circuit has a negative ground and uses NPN transistors.

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 transistors you use (called pinout) matches the pcb order otherwise the circuit will not work.



The transistors will need to be orientated correct and match the placement image marked on the PCB. If you intend to use transistors that differ from the build list then please be aware that 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 transistor sockets and insert the transistors after the sockets have been soldered into place.

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

Q1 - 70 to 85 HFE and Q2 120-190 HFE

# BIASING THE TRANSISTORS

The key to building a good fuzz face is ensuring that transistors are getting the correct voltage.

For the best results with this PCB the transistor in Q2 needs to have the correct voltage for optimum performance. The voltage required is 4.5v.

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 Q2. Using the bias trimpot and a screwdriver, adjust the trimpot until a reading of 4.5v (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>

# SCHEMATIC

