# Fur Face

Fuzz Pedal Kit by Pedal Markt

Apr 25, 2025
Rev1.0

# Contents

# 1 Introduction

Fur Face is our take on a classic fuzz circuit. It sounds great on string instruments, guitars, synths and drum machines. It's a hefty, in your face silicon fuzz.

Enclosures for Fur Face and other pedals in the Beastly Series were designed by Agata Fiz.


Figure 1: Fur Face: oustide and inside

Fur Face is designed to be easy to build and tune. The pedal uses npn-transistors instead of traditional pnp to simplify the power circuitry.

Fur Face has internal biasing pots for both transistors to allow builders to experiment swapping parts and tuning the device. We include recommended bias voltages for both transistors. Feel free to use those as a starting point. Part of the fun of this kit is exploring how bias affects the sound of the pedal.

You will need a multimeter or another way to measure DC voltage to complete this build. See Biasing transistors section for more details.

# 2 BOM – Bill of Materials

BOM is a document that lists the parts you'd need to build a project. Each row corresponds to a component with a certain value, for example, a 'ceramic capacitor with value 1nF.' There could be one or more actual physical parts per row, their designators are listed in the *Reference* column.

In the BOM *text in italic font* gives tips about how to mount or solder parts.

If you'd like to experiment with using different transistors, please socket them. See the guide here.

Table 1: BOM

| | Ref | Value | Qnty | Description |
|---|---|---|---|---|
| **Outboard** | | | | |
| | – | Enclosure | 1 | *Mount both pots, DC jack, Footswitch and Lampshade into the enclosure before soldering* |
| | – | Lampshade | 1 | Small transparent plastic part for the LED, *mount in enclosure before putting the boards in* |
| | – | Rubber Ring | 1 | *Use it to keep Lampshade in place* |
| | – | DC Jack | 1 | Black plastic part with a nut, *mount in enclosure before soldering* |
| | – | DC Cable | 1 | Red and black cables in a JST connector, *cut to* $\approx 5cm$ *and solder to DC Jack once it's mounted in enclosure. Black wire to larger lug, red to the lug opposite it. Middle lug should stay unconnected.* |
| | – | Audio Jack | 2 | *Only mount these in the enclosure together with the main board once they are wired up* |
| **Main board, floor side** | | | | |
| | GND | Wire | 2 | $\approx 8cm$, black, *strip and tin the ends* |
| | IN | Wire | 1 | $\approx 8cm$, any color, *strip and tin the ends* |
| | OUT | Wire | 1 | $\approx 8cm$, any other color, *strip and tin the ends* |
| | R2 | 1K | 1 | Resistor for the LED, larger value will make the LED dimmer |
| | R1 | 100K | 1 | Resistor |
| | R3 | 470 | 1 | Resistor |
| | Q1, Q2 | BC108 | 2 | Pinout: E=emitter, B=base, C=collector. *See this section if you'd like to try other transistors* |
| | J1 | Power Socket | 1 | JST 2-pin m, in the top-center part of the board |
| | C2 | 100n | 1 | Film capacitor |
| | C1 | 2.2u | 1 | Electrolytic capacitor, *orientation matters* |
| | C3 | 22u | 1 | Electrolytic capacitor, *orientation matters* |
| | C4 | 47u | 1 | Electrolytic capacitor, *orientation matters* |
| | RV1, RV2 | 100k | 2 | Trimpots, *orientation matters* |

Continued on next page

Table 1: BOM (Continued)

| | | | | |
|---|---|---|---|---|
| **Main board, player side** | | | | |
| | – | Ribbon cable | 1 | Pads for that cable are in the bottom-center of the main board, *solder one end to main board, another to switch board,* ***make sure pin names on the two boards match, IN on one board is connected to IN on the other board etc*** |
| | RV3 (Screech) | B1k | 1 | Potentiometer, *mount in enclosure before soldering* |
| | RV4 (Prrrr) | A500k | 1 | Potentiometer, *mount in enclosure before soldering* |
| | – | LED | 1 | *Insert in PCB first. Solder last, once the main board is in the enclosure. Orientation matters* |
| **Switch board, player side** | | | | |
| | – | Footswitch | 1 | *Mount in enclosure before putting the boards in* |

## 2.1 Note on values

Different kits and schematics designate values differently. For example, these usually mean the same value:
$2.2\,\mathrm{k\Omega} = 2.2k = 2k2 = 2.2 \times 10^3 Ohm = 2200 Ohm$
$4.7\,\mu\mathrm{F} = 4.7u = 4u7 = 4.7 \times 10^{-6} Farad = 0.0000047 Farad$

Table 2: Component values

| Value | Multiplier | Unit |
|---|---|---|
| **Resistance** | | |
| 100 Ω, 100R, 100 | 1 | Ohm |
| 1 kΩ, 1k | $10^3$ | Ohm |
| 1 MΩ, 1M | $10^6$ | Ohm |
| **Capacitance** | | |
| 1 pF, 1p | $10^{-12}$ | Farad |
| 1 nF, 1n | $10^{-9}$ | Farad |
| 1 µF, 1u | $10^{-6}$ | Farad |

# 3 Transistors

The circuit consists of just a handful of parts. Transistor selection and bias play a huge role in the sound of the pedal.

The stock transistors we use for Fur Face are BC108, Q1 biased to about 1.3 V, Q2 to about 5.8 V.

If you'd like to try out and hear different transistors, the best way is to solder sockets in place of Q1 and Q2 on the PCB. Swap transistors in those sockets without soldering them.

When inserting the transistors, please match their pinout to the expected pinout indicated on the PCB: E to emitter, B to base, C to Collector. To find out the pinout of a transistor, you could use image search, try to find its datasheet, or use a transistor tester.

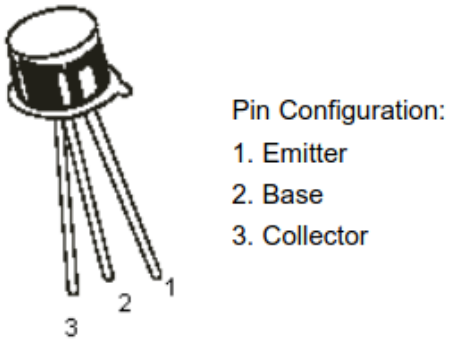



Figure 2: BC108 pinout

## 3.1 Biasing transistors

Biasing transistors in this context means setting their collector voltage to a certain value, while there is no audio signal coming in.

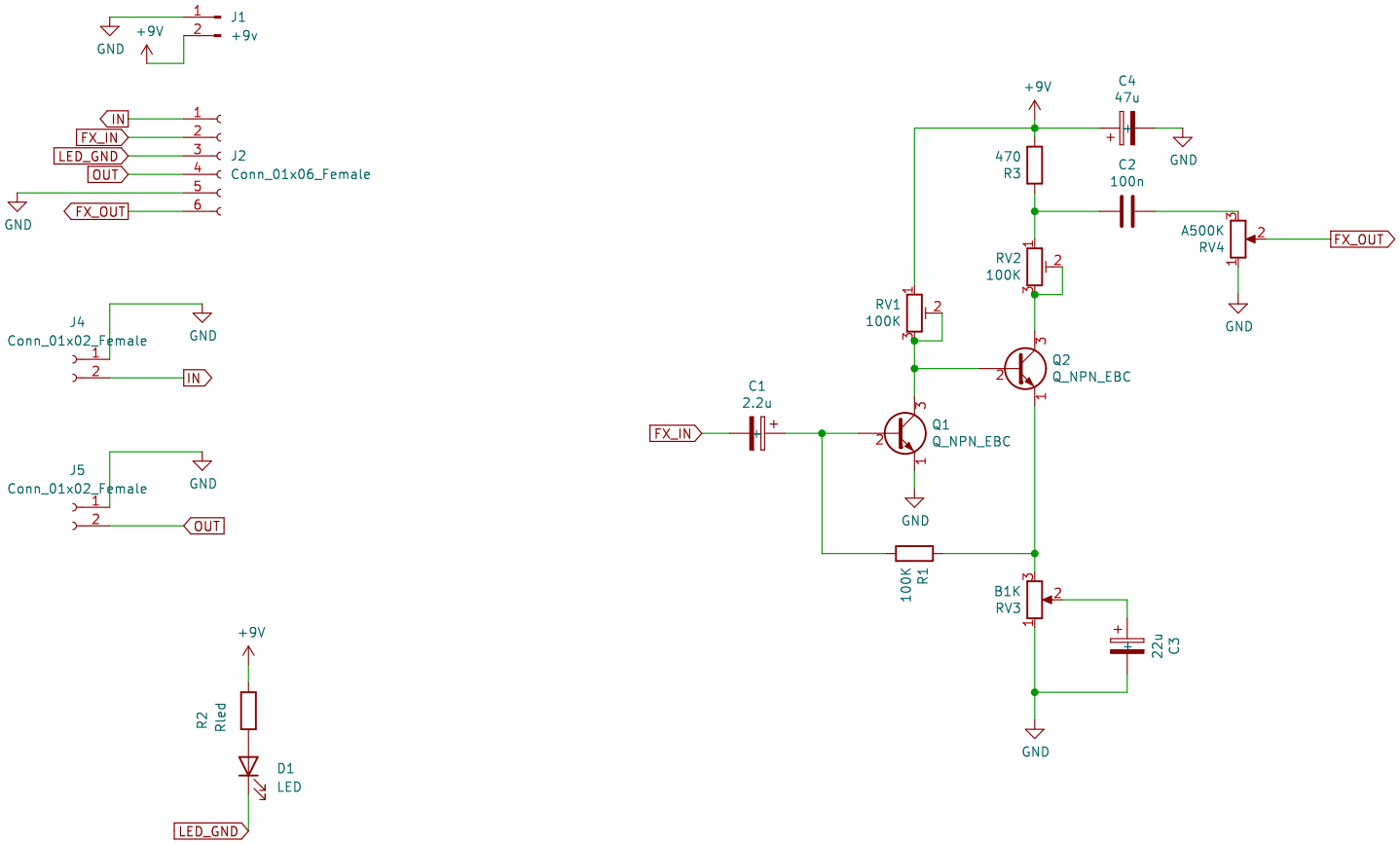
Because Fur Face internally uses feedback for bias, you'd have to go back and forth a couple of times between Q1 and Q2 to make sure the voltages are right. That's because changing the bias of one of the transistors affects the other.

Here's the biasing procedure:

- Set your multimeter up for measuring DC voltage. We'll be measuring values between 0 V and 9 V;

- Clip or touch the black (ground) lead of the multimeter to any ground point in the circuit. For example the lug on the audio jacks that's connected via a black wire to GND on the PCB;
- Starting with transistor Q2, then moving to Q1, then back and forth between the two a couple of times:
  - Clip or touch the red (hot) lead of the multimeter to the collector of the transistor;
  - Make sure you can see there's some voltage readout on the multimeter;
  - With a small screwdriver twist the screw of the trimpot above that transistor, so that the voltage gets close to the desired value (Q1 to about 1.3 V, Q2 to about 5.8 V). The change is going to be slow initially, but as the voltage grows, the increments are going to be more and more significant;

# 4 Schematic


J1
GND
+9V
+9v
IN
FX_IN
LED_GND
OUT
FX_OUT
J2
Conn_01x06_Female
GND
J4
Conn_01x02_Female
GND
IN
J5
Conn_01x02_Female
GND
OUT
+9V
R2
Rled
D1
LED
LED_GND
+9V
C4
47u
GND
470
R3
C2
100n
A500K
RV4
FX_OUT
GND
RV2
100K
RV1
100K
Q2
Q_NPN_EBC
C1
2.2u
FX_IN
Q1
Q_NPN_EBC
GND
100K
R1
B1K
RV3
22u
C3
GND

# 5 Revision History

| Revision | Date | Author(s) | Description |
|---|---|---|---|
| 1.0 | Apr 25, 2025 | AS | Created |