BLUFFER♠

Technical data

Power:
Input voltage: 9v or 12v - center negative.
(The analysis below is made with 9v input)
Current consumption: 3mA maximum.
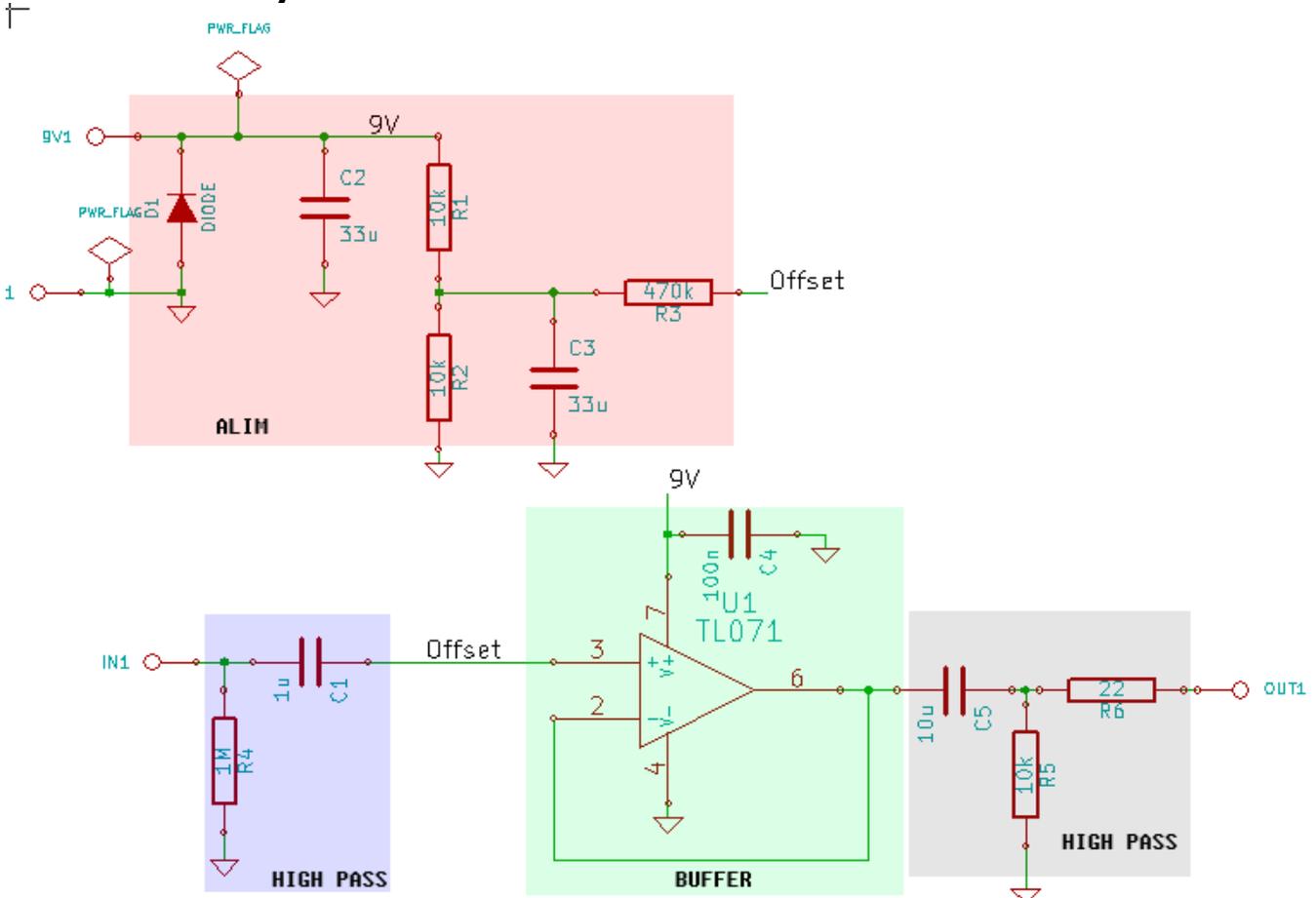
Dimensions:
H/W/L: 31mm/49mm/96mm
Weight:150g

Frequency response:
Flat from 3Hz to 20KHz.

Schematic analysis:

The schematic is really basic tend can be divided in 4 parts:

1- Alim block
2- Input high pass filter
3- The buffer itself.
4- High pass output stage.

Alim block:
The 1N4001 diode is here to prevent reverse voltage accidents.
C2 is a voltage filter capacitance.
R1 and R2 is a tension divider used to create a virtual ground at 4.5v, C3 filter this virtual ground. R3 insures that little current is used in this virtual ground when connecting it to U1 pin.

Input high pass filter:

This input stage acts as a high pass filter cutting at $1/(2xPIxR4xC1) = 0{,}16Hz$.

It also acts to fix input impedance really high around R1 value: 1Mohms.

Finally it prevents the virtual ground (4.5V offset) to escape to devices plugged into the Bluffer input.

After the high pass filter, the signal is offset of 4.5v coming from the alim block. This trick is used to amplify negative and positive part of the input signal while only using a positive voltage. Guitar signals being between 1v and -1v, the offset moves the signal between 3.5v and 5.5v and it can now be amplified with only a positive alimentation as no signal is negative anymore.

The buffer:

This is a simple op-amp buffer. A TL071 is used to provide low noise, low consumption and accurate buffering.

The capacitance C4 is a decoupling capacitor to remove some alim noises.

High pass output stage:

This output stage acts as a high pass filter cutting at $1/(2xPIxR5xC5) = 1{,}6Hz$.

It also acts to fix output impedance really low around R5 value: 10kOhms.

R6 small value is here to prevent cracks and noises from pedals after the buffer.