Black Goat

Based on:
Black Art Toneworks Black Sheep

Number of parts:
Average, total 47 components

Enclosure type:
125b

Effect type:
Vintage/modern muddy Fuzz

Technology:
Silicon transistors

Get your board at:
Black Goat

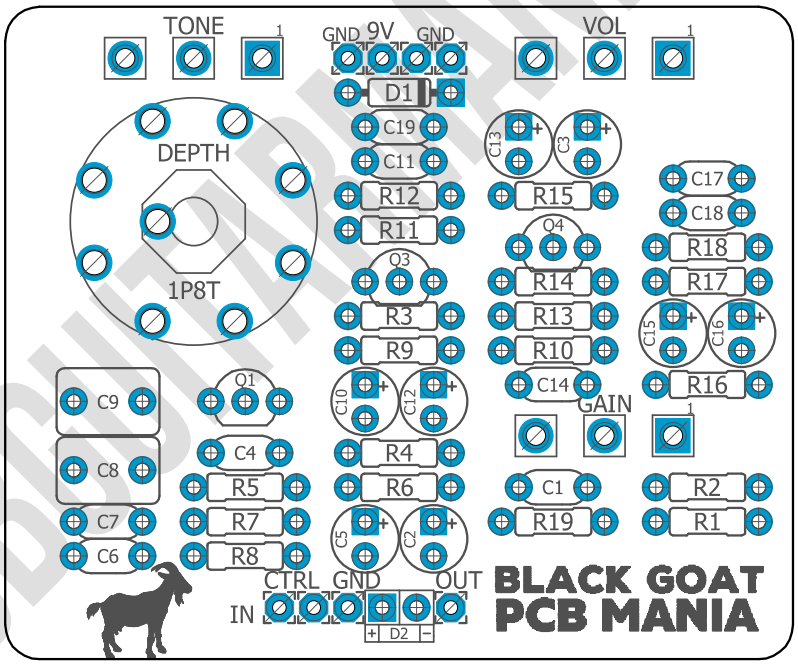
Build difficult:
Intermediate

Power consumption:
9V

Get your kit at:
Das Musikding (Europe)

Project overview:

Every family has a black sheep (or goat), and the Fuzz family is no exception. Black Goat is difficult to categorize, managing to sound both vintage and modern at the same time. What is certain is that you can't help but feel a bit dirty when you plug in, enjoy playing in the mud with this crazy animal, and get all those grimy tones you were looking for.



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Introduction

Yes, Black Goat may be dirty, mean-spirited, and wicked, but it is a blast to hang around with. Just don't tell your mom that you're with such bad company and everything is gonna be alright...

Let's go back to the origins of this vicious board to know more about it. It all started when Black Arts Toneworks made a rework of a real-life "black sheep" fuzz pedal: the Roland Bee Baa. Originally sold as a dual-mode fuzz with a switchable treble boost mode, this circuit was full of controversy since the begging. Lots of people fell in love with its mid-range rasp; an equal amount just hated it.

However, Black Arts did an excellent job by highlighting the best qualities of the original and taking aside the bad. Its inherent brittleness was solved by implementing a variable input selector, the same trusted rotary as is present on the Black Forest. The raspiness of the fuzz effect itself was reduced by using more modern transistors and tweaking some of the values inside.

The controls are Depth, Tone, Volume, and Gain. The Gain knob has plenty of it on tap, that is a remnant from the Bee Baa. The Tone knob has also been significantly reworked for a much more usable range.

Controls

Potentiometers

- Tone
- Volume
- Gain

Switches

- Depth

Bill of materials

Resistors	
Part	**Value**
R1	100r
R2	1k
R3	1k
R4	1k
R5	100k
R6	10k
R7	1k8
R8	18k
R9	15k
R10	1k5
R11	100k
R12	10k
R13	15k
R14	1k5
R15	100k
R16	10k
R17	47k
R18	22k
R19	1m

Capacitors	
Part	**Value**
C1	470p
C4	330p
C6	4n7
C7	47n
C8	470n
C9	1u
C11	1n
C14	10n
C17	2n7
C18	10n
C19	22n

Electrolytics Capacitors	
Part	**Value**
C2	47u
C3	100u
C5	10u
C10	1u
C12	10u
C13	1u
C15	10u
C16	1u

Switches	
Part	**Value**
Depth	1p8t mini rotary

Potentiometers	
Part	**Value**
GAIN	100K A
TONE	100K A
VOL	100K A

Transistors	
Part	**Value**
Q1	2N5089
Q3	2N5089
Q4	2N5089

Diods	
Part	**Value**
D1	1n4001
D2	3mm red LED

Shopping list

Resistors		
Qty	**Value**	**Parts**
3	100k	R5, R11, R15
1	100r	R1
3	10k	R6, R12, R16
2	15k	R9, R13
1	18k	R8
3	1k	R2, R3, R4
2	1k5	R10, R14
1	1k8	R7
1	22k	R18
1	47k	R17
1	1m	R19

Capacitors		
Qty	**Value**	**Parts**
2	10n	C14, C18
1	1n	C11
1	1u	C9
1	22n	C19
1	2n7	C17
1	330p	C4
1	470n	C8
1	470p	C1
1	47n	C7
1	4n7	C6

Electrolytics Capacitors		
Qty	**Value**	**Parts**
1	100u	C3
3	10u	C5, C12, C15
3	1u	C10, C13, C16
1	47u	C2

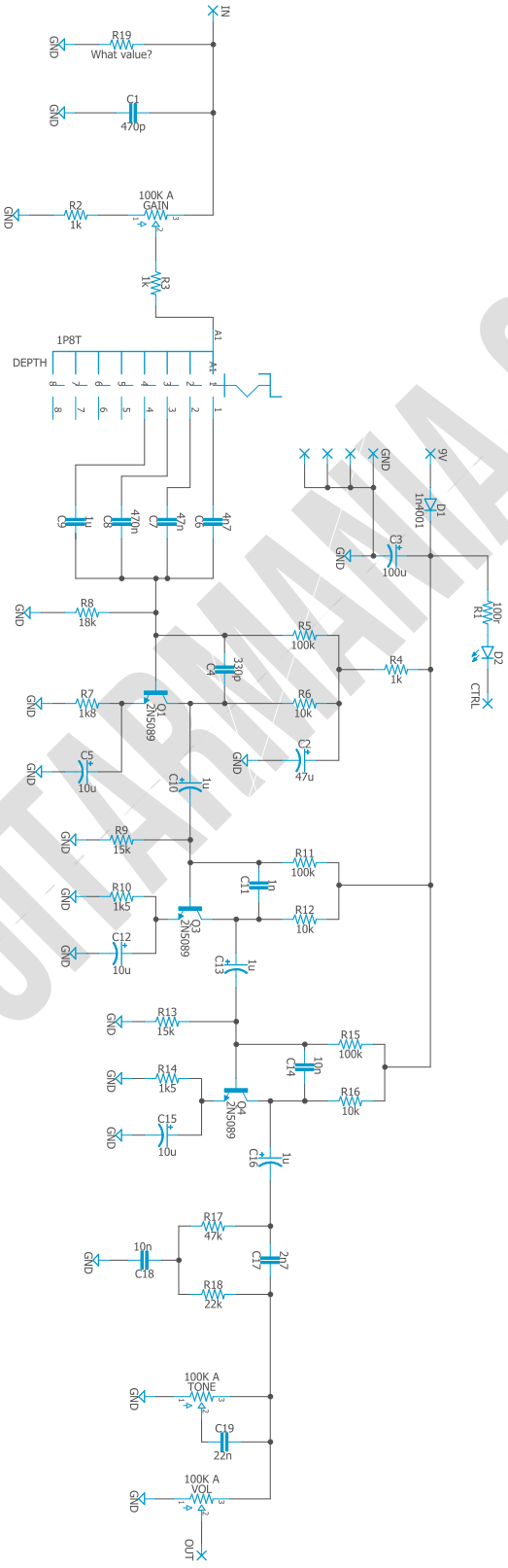
Switches		
Qty	**Value**	**Parts**
1	1p8t mini rotary	Depth

Potentiometers		
Qty	**Value**	**Parts**
3	100K A	GAIN, TONE, VOL

Transistors		
Qty	**Value**	**Parts**
3	2N5089	Q1, Q3, Q4

Diods		
Qty	**Value**	**Parts**
1	1n4001	D1
1	3mm red LED	D2

Schematic



Components Recommendations

As many people like to experiment with some pedals with higher voltage, always ensure your **electrolytic capacitors'** max tolerance is over 25v.

This board has been tested using Film box capacitors for most of the values over 1nf and ceramics discs for those under 1nf. However, high-quality components such as Wima's Capacitors and Panasonic's electrolytics can deliver a better performance.

All the resistors used for testing this project are 1/4W Metal Film.

The BOM and Shopping list are exclusive regarding this project. It doesn't include all the hardware like the 3PDT bypass switch, audio/dc jacks, enclosure, etc.

Build Notes

If this is one of your first projects, I recommend you to take a look at our Pedal Building Guide.

For a successful and tidy build, it's recommended the following order:

1. Resistors & diodes
2. Capacitors, starting with the smaller ones and the ceramic ones.
3. Electrolytic capacitors (always check the polarity)
4. Transistors
5. Wires
6. Potentiometers and switches
7. Off-board wiring

Wiring Diagram

All our projects include a free 3PDT Board to make the wiring easier and tidier. Also, all of our PCBs feature the status LED on board.

The pad named "Ctrl" or "LED" is the one that controls the status of the led; wire it to the "LED" pad on the 3PDT board or in the control slug of your 3PDT.

This board has been designed to match our EZ 3PDT PCB; check it here to access our Pedal Wiring Guide.

Drill Template

This Project has been planned to fit into a 125b enclosure type.

Check the Attached “Drilling templates” to drill the box properly. The files are on Scale 1:1, ready to print on an A4 page.

Licensing and Usage

We really appreciate your trust and support in buying this PCB, as well as your will to dive into the DIY electronics world. For us, that's why you can make this project work properly and enjoy not only the building process but also experiment and play with it on your rig.

We try to reply to every question we receive on our email or our social media. Still, we try to encourage all our customers to join our PCB Guitar Mania – Builders Group on Facebook to post all your doubts, issues, suggestions, or requests, share your builds, and have some feedback from other fellow builders and us!

We tested all our projects following this same guide on their standard configurations. Although, not all of the variations and mods have necessarily been checked. These are suggestions based on the schematic analysis and the experiences and opinions of others. Feel free to share with us your views and recommendations regarding the mods your personal experimentation.

These boards may be used for commercial endeavors in any quantity unless expressly noted. No attribution is necessary, though accreditation or a link back is always much appreciated.

If you are a builder planning to make your own run of pedals, we also offer the service of custom-made boards with your brand and logo, design according to your specifications.

The only usage restrictions are that, first, you cannot resell the PCB as part of a kit without prior arrangement with us, and second, you cannot scratch off the silkscreen or other way of trying to hide our logos and the source of the PCBs. Like it's written above, if you want to have your designs with your brand and logo, we could undoubtedly reach an agreement.

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