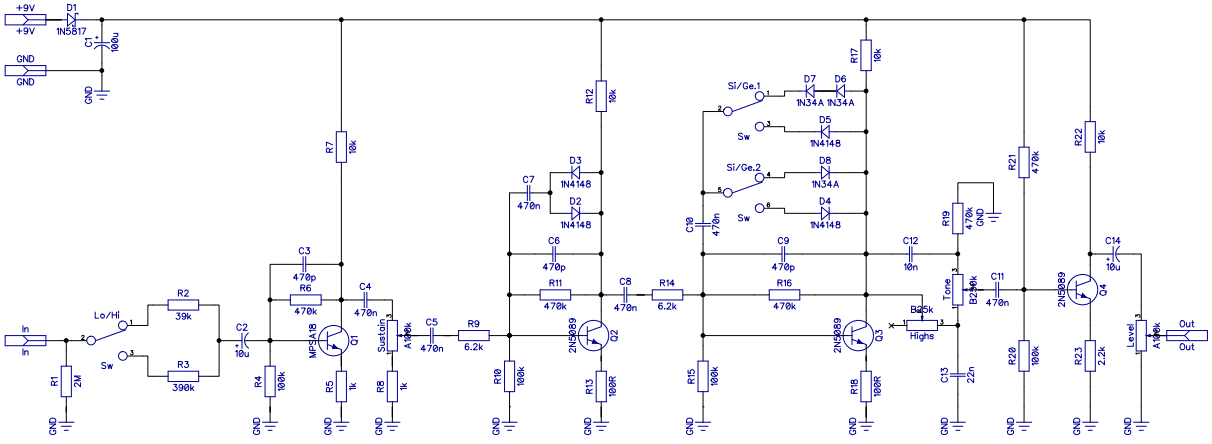
Seth

Based on Black Arts Toneworks Pharaoh
PCB artwork ©2019 drdFX
Release date: 2019. 11. 09.

Seth is a clone of Black Arts Toneworks' Pharaoh fuzz. It is a high gain Big Muff variant with some nice twists. The fully featured version fits only in 125B type of enclosure, but since I found myself using only one set of options I have created a simplified version that fits into the more common 1590B enclosure. In this one I omit the two toggle switches and use fixed values instead.

FULL VERSION

SCHEMATIC

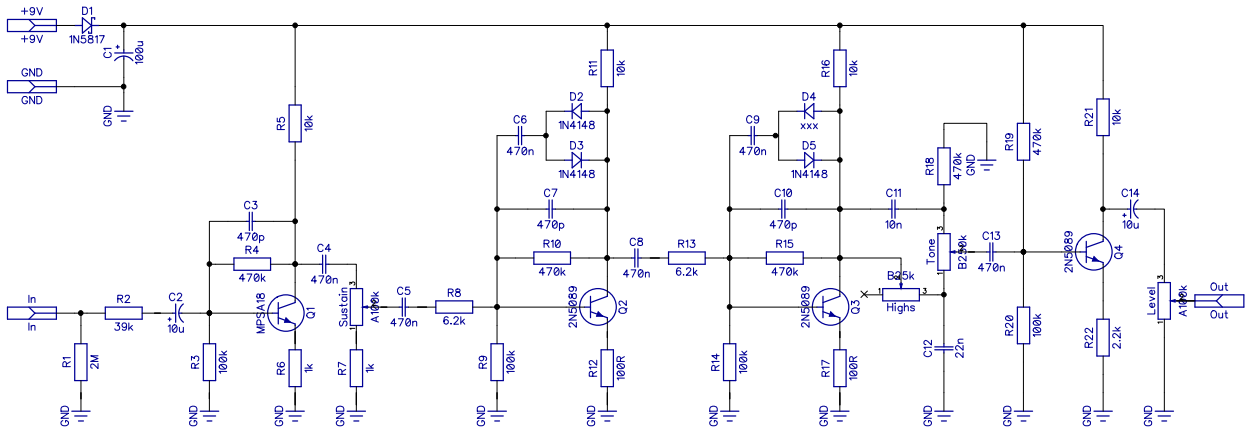


BOM							
Resistors		Capacitors		Semiconductors		Others	
R1	2M	C1	100u	D1	1N5817	Level	A100k
R2	39k	C2	10u	D2	1N4148	Sustain	A100k
R3	390k	C3	470p	D3	1N4148	TOne	B250k
R4	100k	C4	470n	D4	1N4148	Highs	B25k
R5	1k	C5	470n	D5	1N4148	Lo/Hi	SPDT
R6	470k	C6	470p	D6	1N34A	Si/Ge	DPDT
R7	10k	C7	470n	D7	1N34A		
R8	1k	C8	470n	D8	1N34A		
R9	6.2k	C9	470p	Q1	MPSA18		
R10	100k	C10	470n	Q2	2N5089		
R11	470k	C11	470n	Q3	2N5089		
R12	10k	C12	10n	Q4	2N5089		
R13	100R	C13	22n				
R14	6.2k	C14	10u				
R15	100k						
R16	470k						
R17	10k						
R18	100R						
R19	470k						
R20	100k						
R21	470k						
R22	10k						
R23	2.2k						

SIMPLIFIED VERSION

In the simplified version I omitted the two toggle switches and went with the high input sensitivity and the symmetrical Si clipping diode arrangement in the third stage. You can still use wires in place of R2 and D4, connect these to DPDT switches and solder the desired value components directly to the switch lugs. It will not be very easy to mount the two extra switches in the 1590B box, but with some experience it is by far not impossible. I did this for the clipping diodes, however found myself using the symmetrical Si diode arrangement only.

SCHEMATIC



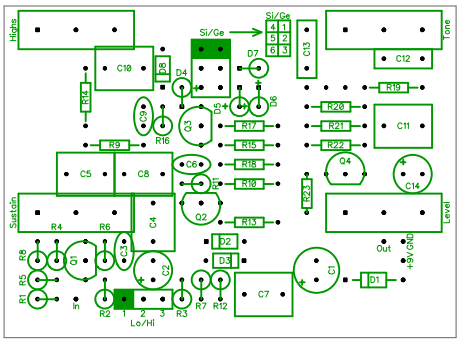
BOM

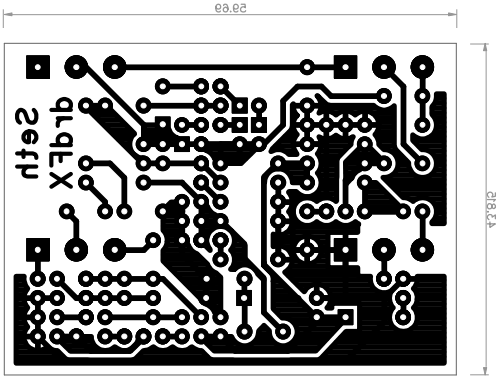
Resistors		Capacitors		Semiconductors		Others	
R1	2M	C1	100u	D1	1N5817	Highs	B25k
R2	39k	C2	10u	D2	1N4148	Tone	B250k
R3	100k	C3	470p	D3	1N4148	Level	A100k
R4	470k	C4	470n	D4	xxx	Sustain	A100k
R5	10k	C5	470n	D5	1N4148		
R6	1k	C6	470n	Q1	MPSA18		
R7	1k	C7	470p	Q2	2N5089		
R8	6.2k	C8	470n	Q3	2N5089		
R9	100k	C9	470n	Q4	2N5089		
R10	470k	C10	470p				
R11	10k	C11	10n				
R12	100R	C12	22n				
R13	6.2k	C13	470n				
R14	100k	C14	10u				
R15	470k						
R16	10k						
R17	100R						
R18	470k						
R19	470k						
R20	100k						
R21	10k						
R22	2.2k						

LAYOUT

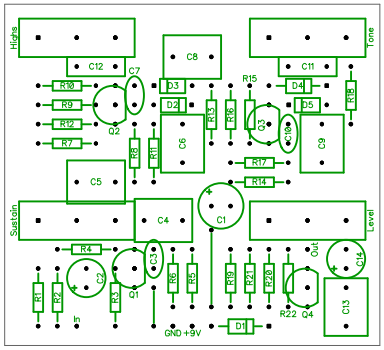
Print out the PCB design without any resizing options and make sure you switch off the “fit to page” option. The design is free for personal/home use and you also may build one or two for your friends, but the PCB layout is my artwork, therefore protected by copyright and is not permitted to be used for commercial purposes. The full version fits into a 125B and the simplified version fits into a 1590B enclosure.

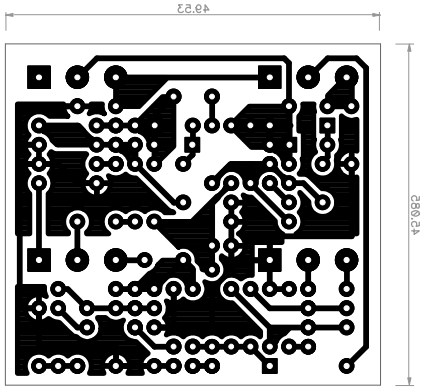
FULL VERSION



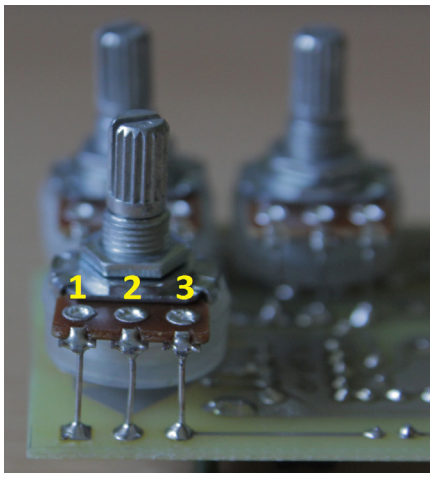


SIMPLIFIED VERSION





NOTES



All pots are board mounted, the square pads mark lug 1. For the numbering of the lugs see the picture. The switches on the full version are offboard mounted with wires.
The numbering of the pads is indicated on the layout.

As with all Big Muff variants there are several major fields where you can experiment with modifications:

1. The transistor types and the gain of each stage. You can either change the transistor types or change the emitter resistor values. Both achieve the same goal: you change the gain of the stages. The original values provide quite high gains for each stage, so though theoretically you can increase them further, it won't give you much change. Decreasing might be an option, however I see the beauty of this effect exactly in the quite high overall gain.

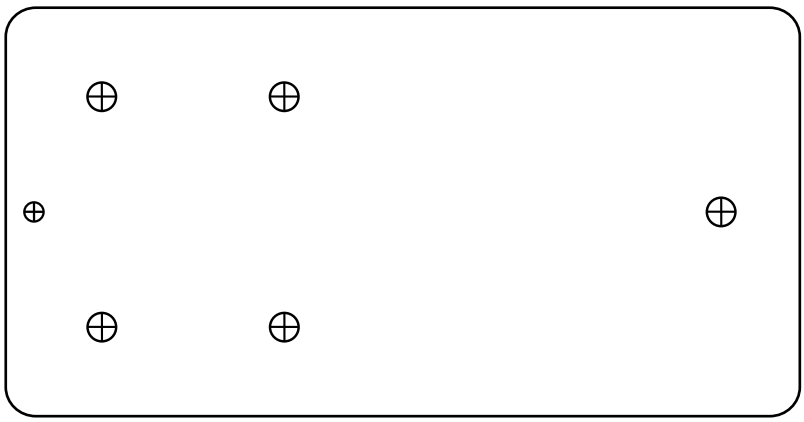
2. The clipping diode arrangement in stage two and three. The original has a switch there to change between an asymmetrical Ge diode arrangement and a symmetrical Si diode arrangement. These yield different levels of distortion, different levels of compression and a different overall feel of the distortion. I've found the symmetrical Si diode arrangement in both stages as best for myself (actually the original Big Muff setup), but your mileage my vary. Don't hesitate to experiment with all kinds of diodes (Schottky, Si, Ge, LEDs, etc.) and different arrangements as well.

3. The tonestack. This is where the Pharaoh definitely distinguishes from the original Big Muff. The tonestack itself is the same architecture, but the values are different and instead of one of the fixed resistors there is a pot wired as a variable resistor. Now these give you a tonestack that is not mid-scooped at all and can be varied in a wide range. Of course here you can again freely experiment, for that I would highly recommend the Duncan Tone Stack Calculator available at Duncan Amps (http://www.duncanamps.com/tsc/). If you are brave enough you can even change the architecture and use something like a Marshall/Fender or a James tonestack. This would of course bring you pretty far from the original Pharaoh design, but this is also how new designs are born.

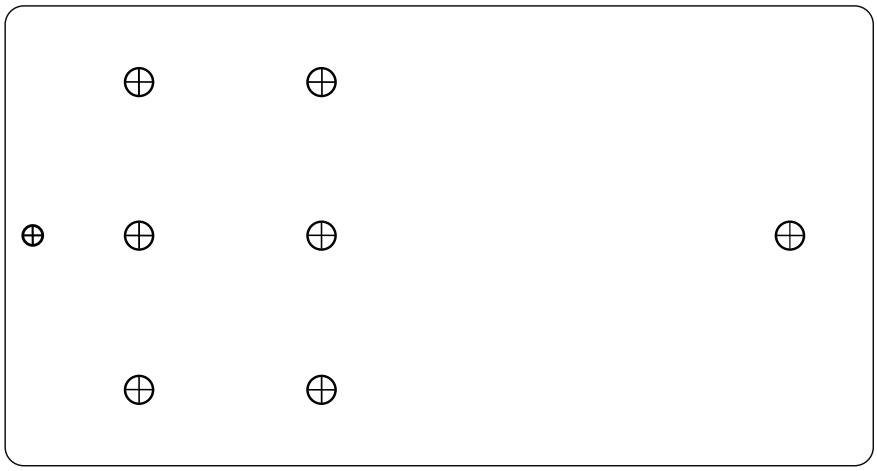
4. The coupling capacitors. The Pharaoh follows the „47” Ram’s Head version of the original Big Muff in this regard: it has 470nF coupling capacitors as well as 470nF capacitors in the feedback loops. This makes the effect pretty bass heavy. There are versions of the Big Muff that use even higher values, like 1uF, but generally these caps are way lower, somewhere around 100nF. If you find yours a bit too boomy this might be a place to start with modding.

DRILLING TEMPLATES

Here are two templates for the top of the box for the various box sizes. The original design fits in 125B and the simplified one fits into a 1590B.



1590B



125B