

CHAOSAGENT

FX TYPE: FUZZ

Based on the "Factory" style fuzz

Enclosure Size: 1590B

"Softie" compatibility: Softie2&3

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Overview

The **Chaos Agent** was birthed from discussions I've seen over the years in DIY forums. Namely whether or not it would be possible to modify the well known "Factory" style fuzz to use different types of transistors. The original effect is a negative ground Fuzz Face variant with PNP germanium transistors and lots of controls to make some wild and unwieldy sounds. The Chaos Agent takes the design and converts it to work with NPN silicon transistors (which makes it a cheaper project to build). There are a few additional tweaks like current limiting on the power supply line and effect output.

In this format, the design will look really familiar to anyone who has built a regular NPN Fuzz Face. We've seen most of these controls in DIY projects over the years in some form or another. So, the Chaos Agent is nothing too new. But, it is fun!

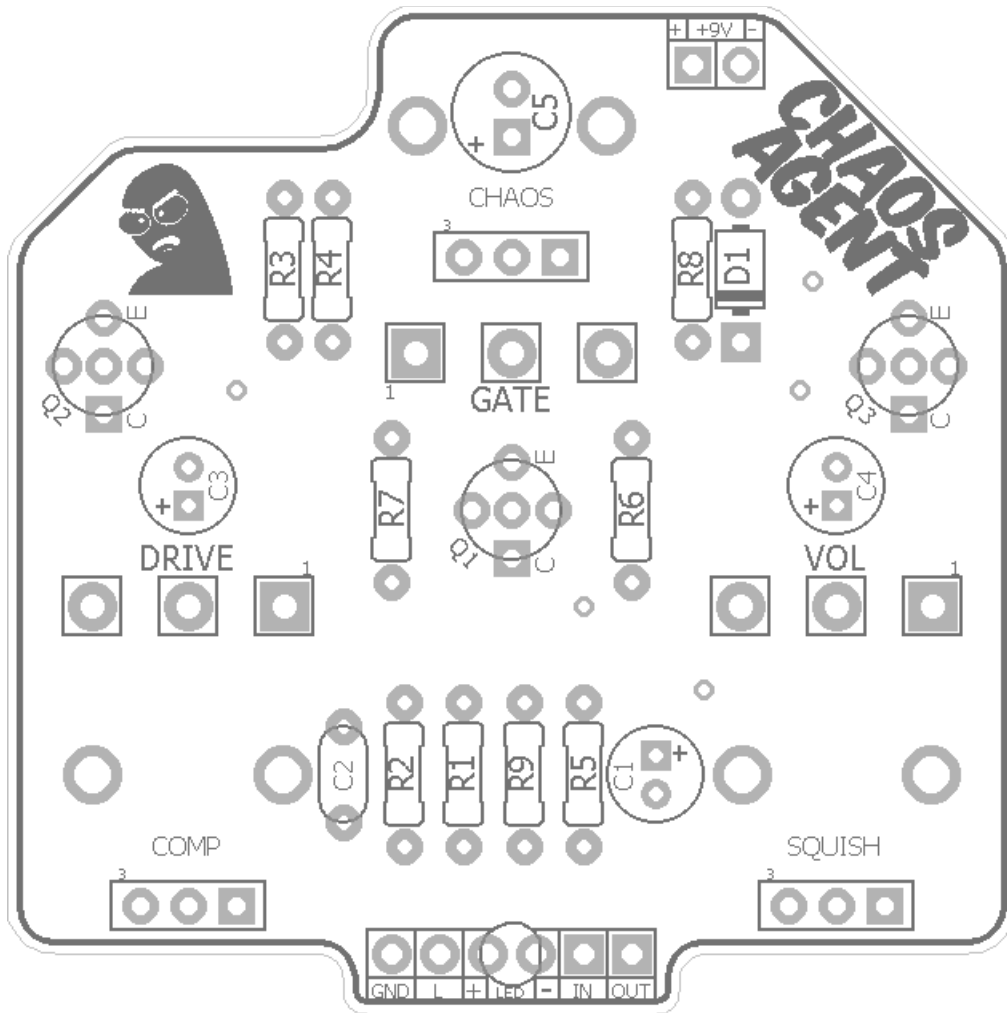
You've noticed that I have not used the name of the company or product to which I am referring. That is because they have, at times, had a bit of an uneven relationship with the DIY community. To be clear: I would not call the Chaos Agent a clone. It's more of an anti-clone. Or, reverse vampire clone because these terms are meaningless. IOW, it takes a familiar design and goes about it a different way. While the Chaos Agent retains some of the same sounds and feel as the original I don't think it's exact by any means. With the right transistor choice (see Notes) you should get something close and at least fun to play!

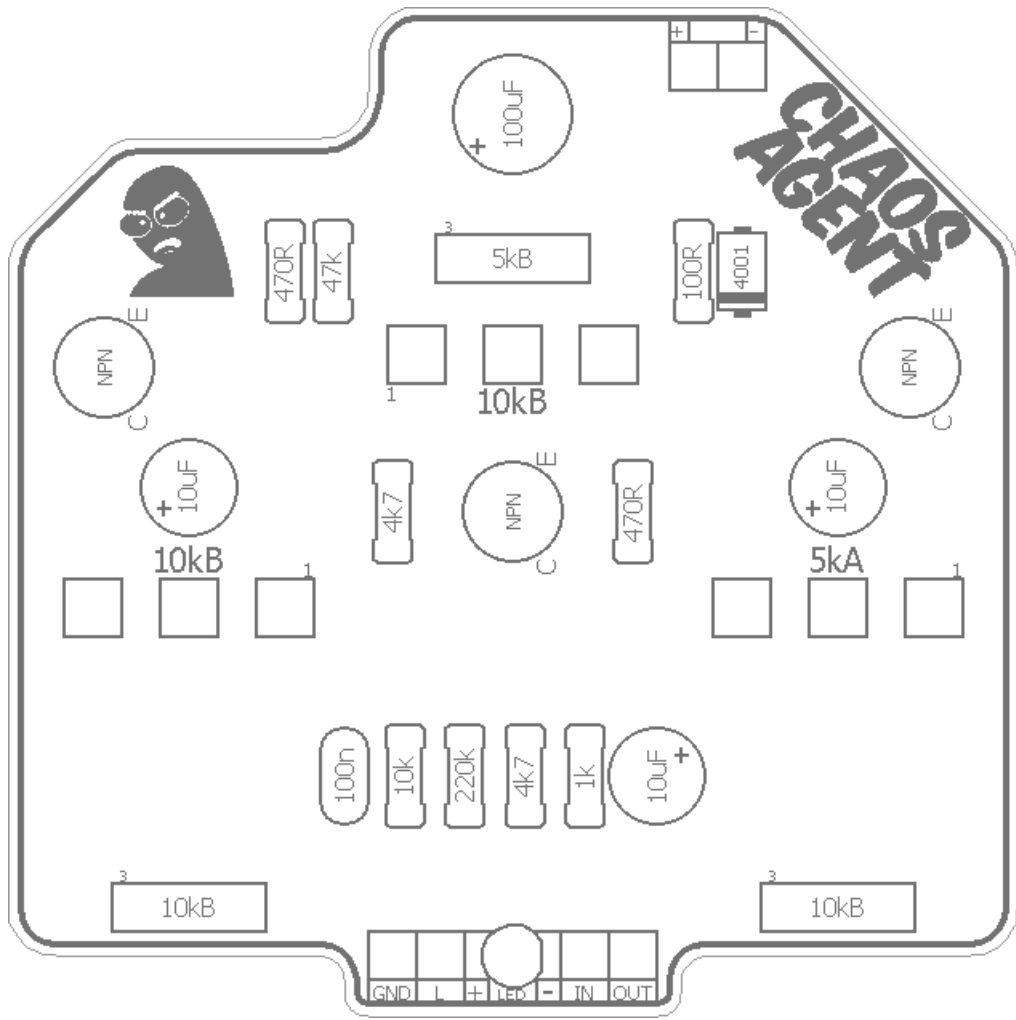
Controls

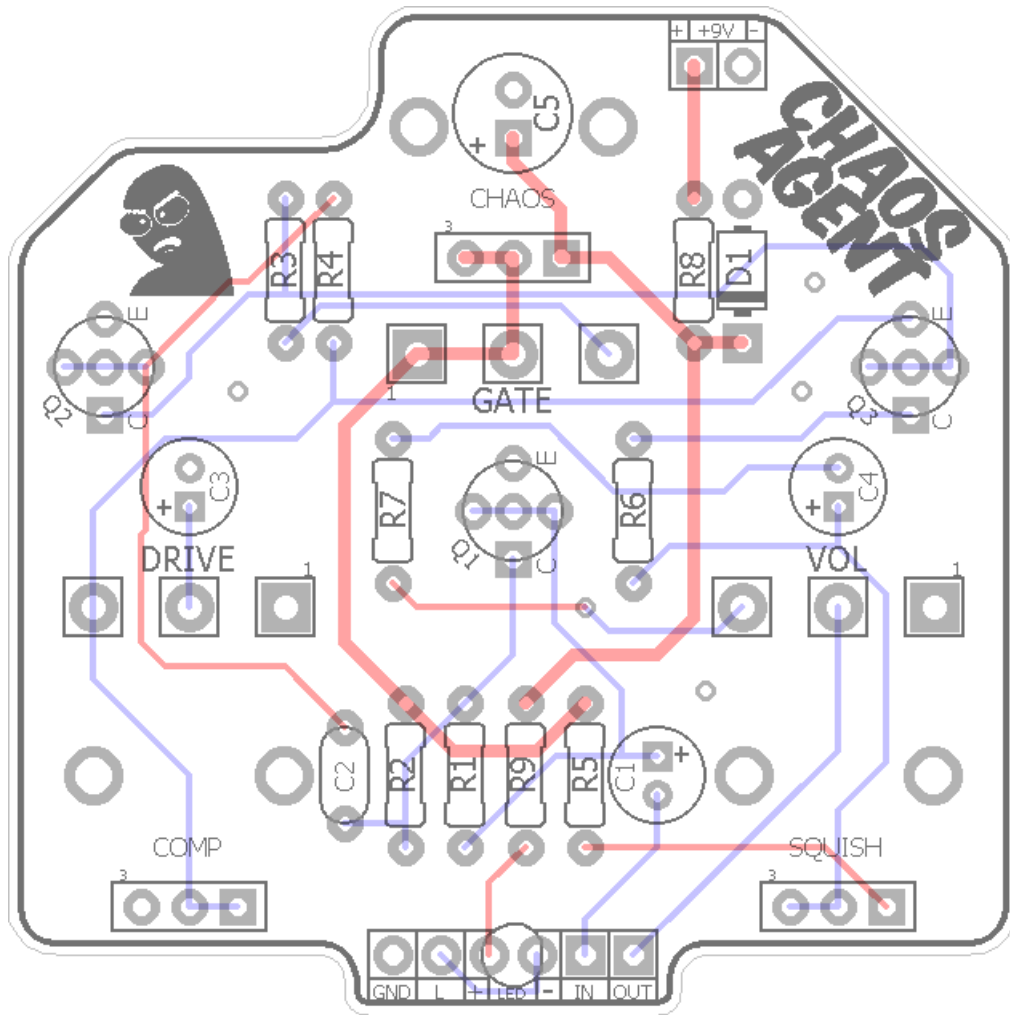
- **VOL** - Effect output level.
- **DRIVE** - Fuzz amount.
- **GATE** - When turned CW, this control chops off sustain. At full up, it will reduce the overall volume.
- **COMP** - This control alters the negative feedback. Turning CW increases the overall compression. At full up the fuzz becomes more narrow and buzzy.
- **CHAOS** - When turned CW, the fuzz goes into voltage starve mode. This will produce oscillation which can be brought under control with the GATE and COMP. CCW is full voltage (most stable).
- **SQUISH** - This added control varies the bias of Q3. As it is turned CW the fuzz will compress further.

Terms of Use: You are free to use purchased **ChaosAgent** circuit boards for both DIY and small commercial operations. You may not offer **ChaosAgent** PCBs for resale or as part of a "kit" in a commercial fashion. Peer to peer re-sale is fine, though.

Technical assistance for your build(s) is available via the [madbeanpedals forum](http://madbeanpedals.com). Please go there rather than emailing me for assistance on [builds](#). This is because (1) I'm not always available to respond via email in a timely and continuous manner, and (2) posting technical problems and solutions in the forum creates a record from which other members may benefit.







Resistors		Caps		Diodes	
R1	220k	C1	10uF	D1	1N4001
R2	10k	C2	100n	Transistors	
R3	470R	C3	10uF	Q1 - Q3	NPN
R4	47k	C4	10uF	Pots	
R5	1k	C5	100uF	VOL	5kA
R6	470R			DRIVE	10kB
R7	4k7			GATE	10kB
R8	100R			CHAOS	5kB
R9	4k7			COMP	10kB
				SQUISH	10kB

Value	QTY	Type	Rating
100R	1	Metal / Carbon Film	1/4W
470R	2	Metal / Carbon Film	1/4W
1k	1	Metal / Carbon Film	1/4W
4k7	2	Metal / Carbon Film	1/4W
10k	1	Metal / Carbon Film	1/4W
47k	1	Metal / Carbon Film	1/4W
220k	1	Metal / Carbon Film	1/4W
100n	1	Film	16v min.
10uF	3	Electrolytic	16v min.
100uF	1	Electrolytic	16v min.
1N4001	1		
NPN	3	*see notes	
5kB	1	PCB Mount, Plastic Shaft	9mm
10kB	2	PCB Mount, Plastic Shaft	9mm
5kA	1	PCB Mount, Right Angle	16mm
10kB	2	PCB Mount, Right Angle	16mm

16mm pots (5kA, 10kB):

<http://smallbear-electronics.mybigcommerce.com/alpha-single-gang-16mm-right-angle-pc-mount/>

9mm Plastic Shaft pot (5kB, 10kB):

<http://smallbear-electronics.mybigcommerce.com/alpha-single-gang-9mm-right-angle-pc-mount-w-knurled-plastic-shaft/>

Thinline DC Jack:

<http://smallbear-electronics.mybigcommerce.com/dc-power-jack-all-plastic-unswitched-2-1-mm/>

Enclosed Mono:

<http://smallbear-electronics.mybigcommerce.com/1-4-in-mono-enclosed-jack/>

<http://smallbear-electronics.mybigcommerce.com/1-4-in-mono-enclosed-switchcraft-111x/>

Lumberg Mono:

<http://smallbear-electronics.mybigcommerce.com/lumberg-1-4-compact-shrouded-mono-jack/>

For transistors, you should be able to use a wide variety of NPN silicon but the best results will occur with lower gain ones. You can stick 2n5088 in there and call it a day, but you'll probably have more noise and less usable fuzz than you'd like. I did not try them, but 2n3904 may work okay since they are more moderate gain compared to the 2n5088.

I did list the exact transistors and gains for my build (see the schematic on the last page). I chose these because the BC108 and SE4002 sound great in Fuzz Faces. Having only a half dozen of each, I measured their HFE and simply picked the best range I could get with them (lowest to highest gains from Q1 to Q3). You are certainly welcome to try these exact transistors and you'll probably have good results even without measuring HFE.

You can also find a nice variety of suitable lower gain transistors on smallbear. Just look for ones that are generally 300 and under for gain and also make sure you know their pinouts. Some transistors might have their collectors as the middle leg and those will be harder to put in the CBE arrangement used on the ChaosAgent PCB.

BC108:

<http://smallbear-electronics.mybigcommerce.com/bc10x-1/>

SE4002:

<http://smallbear-electronics.mybigcommerce.com/transistor-se4002-fairchild/>

I've used these in other fuzz builds:

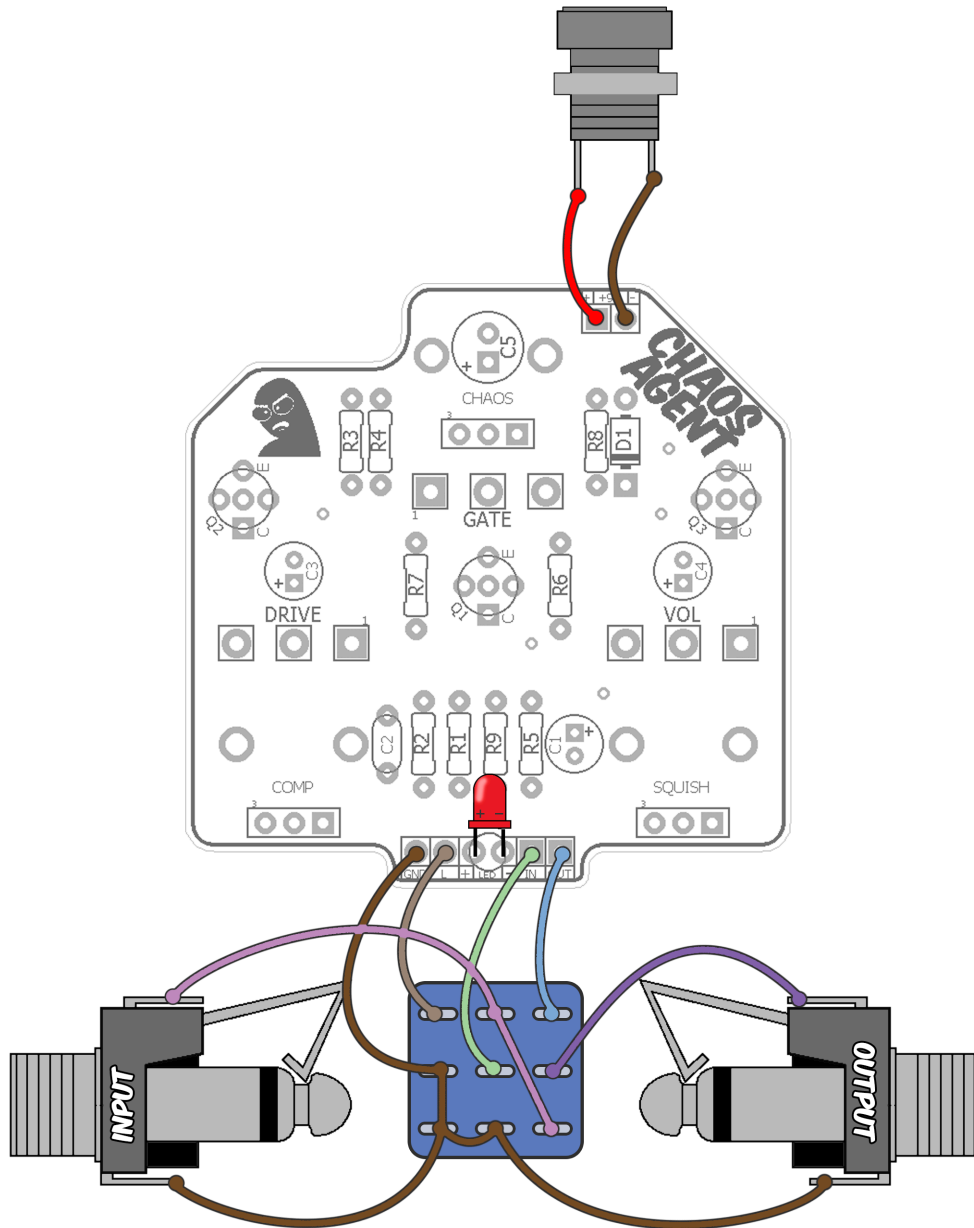
<http://smallbear-electronics.mybigcommerce.com/transistor-se1002-fairchild/>

Several other possibilities:

<http://smallbear-electronics.mybigcommerce.com/to-106-to-109-and-to-110-dots-1/>

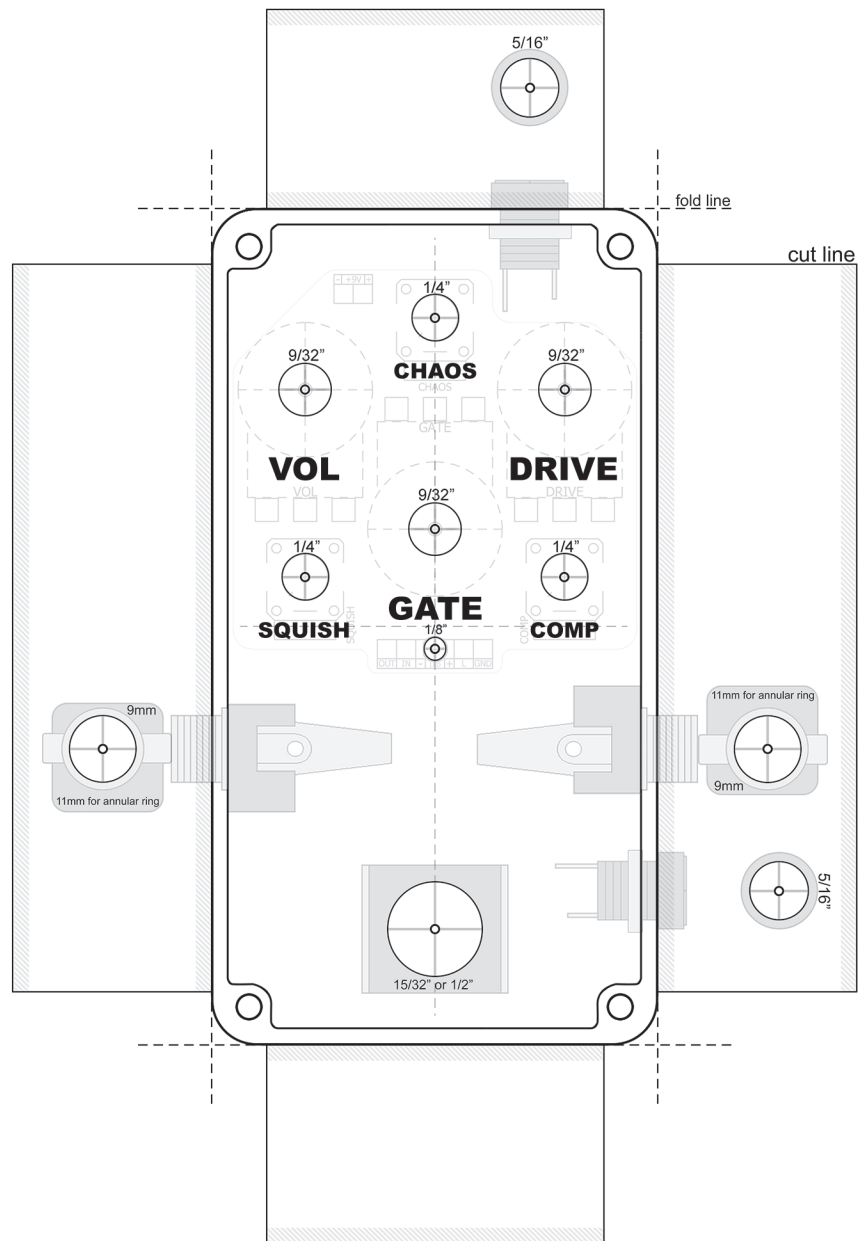
- A multi-pin part is used for the transistors (for in-line and triangular leads). The middle 3 pads are all Base connections so you can solder your Base lead to any of them.
- Also consider socketing your transistors so you can easily try different types.





The bypass LED can be soldered directly to the PCB.

Note: Drill Guides are approximate and may require tweaking depending on the types of jacks, switches and pots you use.



- This drill diagram shows two locations for the DC jack, depending on if you prefer top or side mounted. Just be sure you only drill one of them!
- You can use open metal frame jacks, if you like.
- The Chaos Agent will accommodate the Softie 2 or 3 (for soft touch switching). You will need to make adjustments to the bypass switch and LED locations if you use either.

Q1	NPN
C	1.68
B	0.63
E	0

Q1	NPN
C	1.57
B	0.63
E	0

Q1	NPN
C	8.8
B	1.57
E	0.97

- 9.42vDC One Spot
- Current Draw ~ 5mA

- VOL, DRIVE, GATE: center position
- SQUISH, COMP, CHAOS: full CCW
- Some readings will change at different control positions.

