

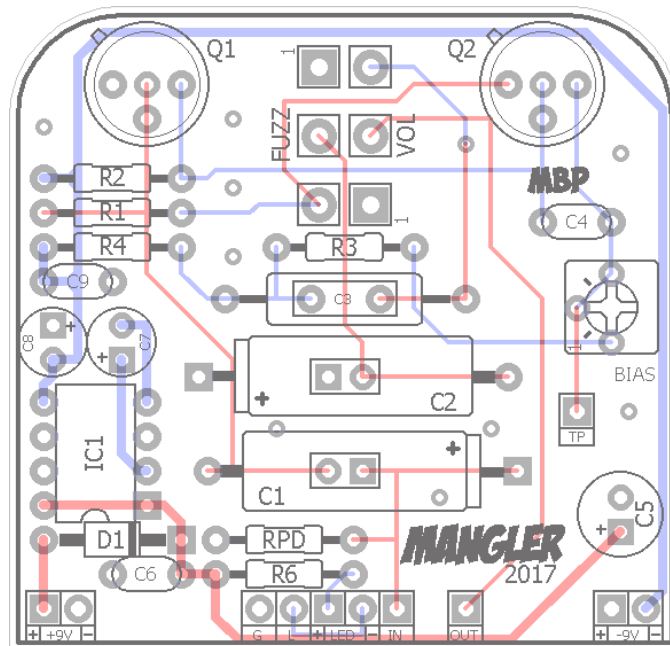
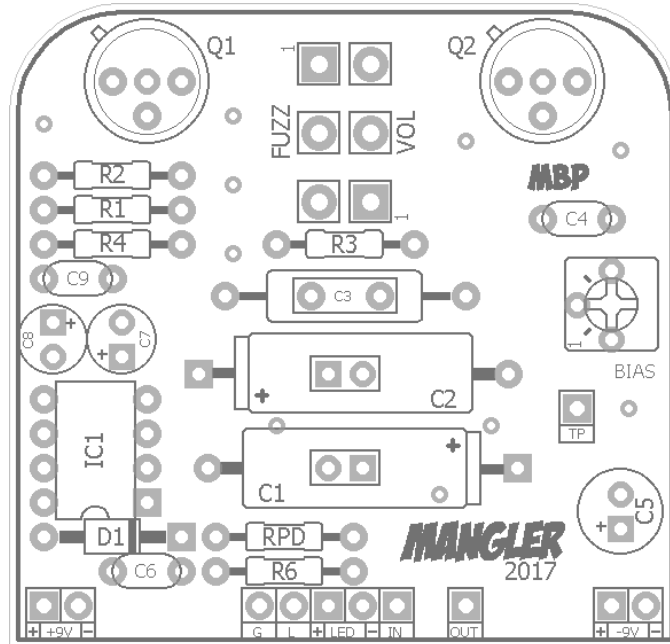
MANGLER

FX TYPE: Fuzz

Based on the Fuzz Face

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1.95" W x 1.875" H



Previous versions: <http://www.madbeanpedals.com/projects/ARCHIVE/Fuzz/>

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

B.O.M.					
Resistors		Caps		Diodes	
R1	100k	C1	2u2	D1	1N5817
R2	33k	C2	22uF	Transistors	
R3	220R	C3	10n	Q1, Q2	PNP GE
R4	470R	C4	100pF	IC	
R6	4k7	C5	100uF	IC1	TC1044SCPA
RPD	1M	C6	100n	Trimmer	
		C7	10uF	BIAS	20k
		C8	10uF	Pots	
		C9	100n	FUZZ	1kC
				VOL	500kA

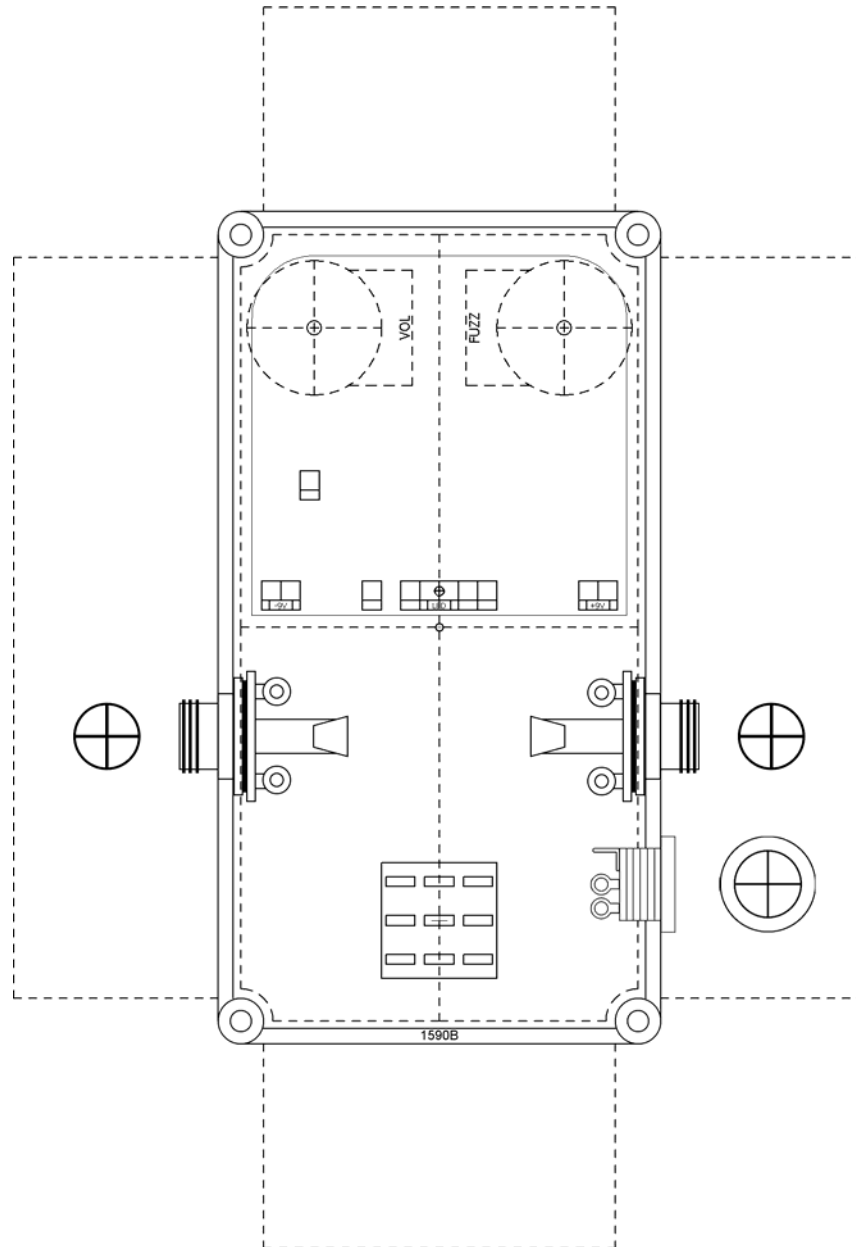
Shopping List			
Value	QTY	Type	Rating
220R	1	Carbon/Metal Film, Carbon Comp	1/4W
470R	1	Carbon/Metal Film, Carbon Comp	1/4W
4k7	1	Carbon/Metal Film, Carbon Comp	1/4W
33k	1	Carbon/Metal Film, Carbon Comp	1/4W
100k	1	Carbon/Metal Film, Carbon Comp	1/4W
1M	1	Carbon/Metal Film, Carbon Comp	1/4W
100pF	1	Ceramic, MLCC	16v min.
10n	1	Film	16v min.
100n	2	Film	16v min.
2u2	1	Electrolytic	16v min.
10uF	2	Electrolytic	16v min.
22uF	1	Electrolytic	16v min.
100uF	1	Electrolytic	16v min.
1N5817	1		
PNP GE	2	PNP Germanium Transistors	
TC1044 SCPA	1	or, MAX1044 CPA , ICL7660 SCPA	
20k	1	Bourns 3362P	
1kC	1	PCB Right Angle	16mm
500kA	1	PCB Right Angle	16mm

Subs

- You can use a 22k or 25k trimmer in place of the suggested 20k
- The TC1044**SCPA** is the recommended inverter, but you can also use a MAX1044**CPA** or ICL7660**SCPA**. Make sure you get the part that matches the **BOLDED SUFFIX**.

1590B Drill Guide

4.43"W x 6.47"H

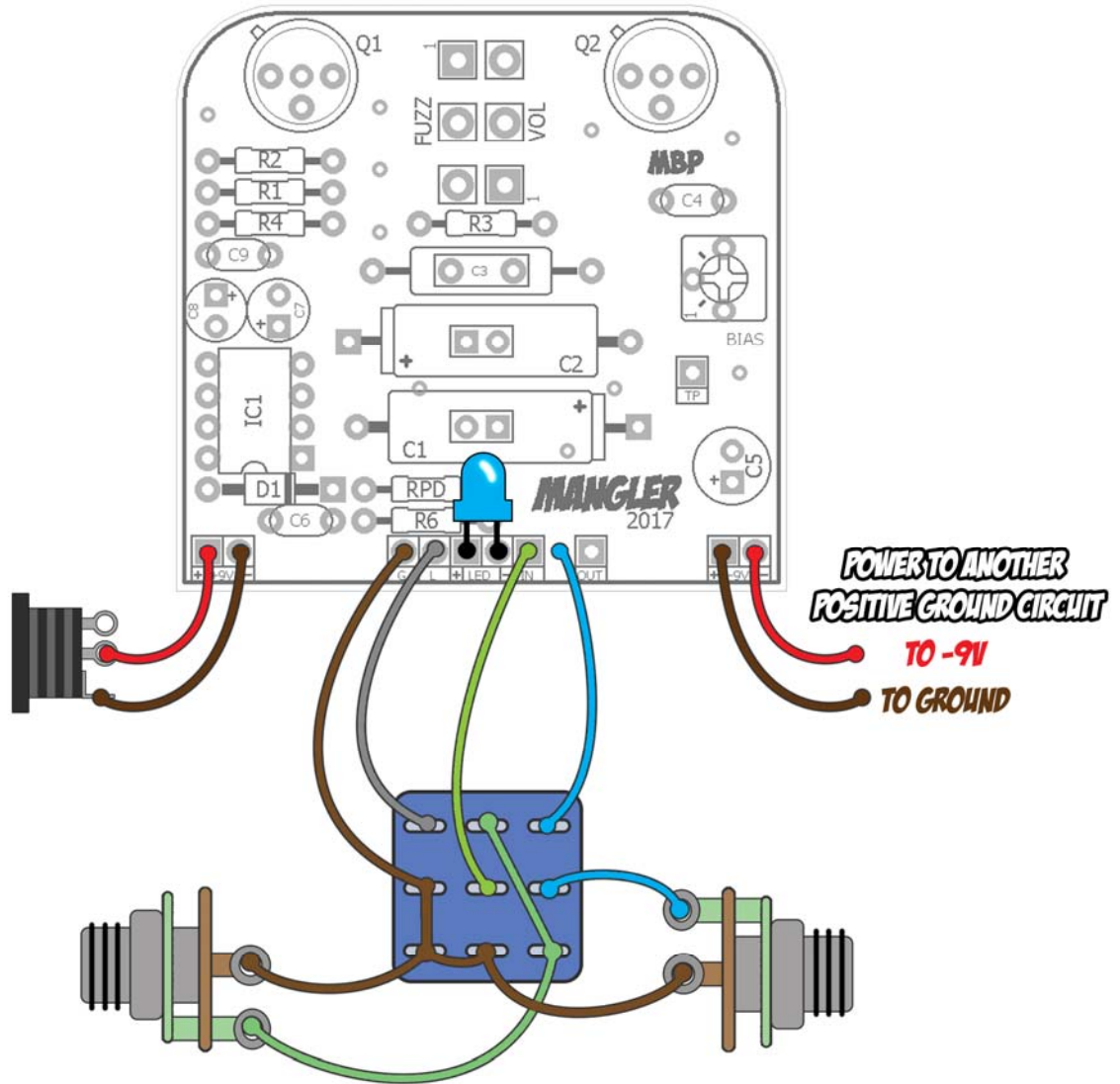


Bypass LED can be soldered directly to the PCB for external mounting.

Photoshop Drill Template:

http://www.madbeanpedals.com/projects/Mangler/Mangler2017_DRILL.zip

Wiring



The -9v, Ground connections on the lower right are courtesy power in case you are doing a 2 in 1 effect that is also positive ground, ex. the Mangler with a Rangemaster or PNP Tonebender. In this combination, you only need to use one inverter to power both circuits. If you are doing a 2 in 1 and need help figuring out how to power both, start a help thread on the MBP forum.

Overview

2017 Changes: Reworked the layout for centralized I/O pads. Added pull-down resistor option back to the circuit. Small changes in the power section.

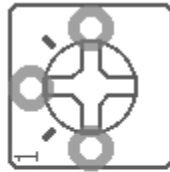
Either you love fuzz, or hate fuzz. There is no in-between. Fuzz for life! That said, the Mangler is ½ classic Fuzz Face and 2/3rd other stuff. I double-checked my math on that and it's solid.

The 2017 edition of the **Mangler** includes a voltage inverter on the PCB. You can use your standard center-tip negative 9v power supply to power this positive ground effect without having to use a Road Rage board or other trickery. This takes out all the guess work for newer builders who have not dealt with positive ground effects before: everything is hooked up and wired like a normal negative ground effect!

If you have never purchased PNP germanium transistors before, you can find several variations and offerings at <http://smallbear-electronics.mybigcommerce.com/>. These transistors are tested for gain and leakage beforehand. Smallbear also provides resistor values to properly bias the pair of transistors you purchase. Please feel free to use those values instead of the ones listed in the BOM of the Mangler. The tabs on the silk screen of the Mangler PCB indicated the emitter of **Q1** and **Q2**.

Calibration

To bias the Mangler, touch the black lead from your DMM to the **TP** pad under the **Bias** trimmer on the PCB and the red lead to any ground point on the circuit. Adjust the trimmer until your DMM reads approximately -4.5v. It does not have to be EXACTLY -4.5v...but keep it pretty close. One mod: try setting the bias voltage closer to -3.5v or even -3v. This typically squashes the fuzz down even further for super-compressed violin-like fuzz (a la Eric Johnson). It may not work with every transistor pair, though.

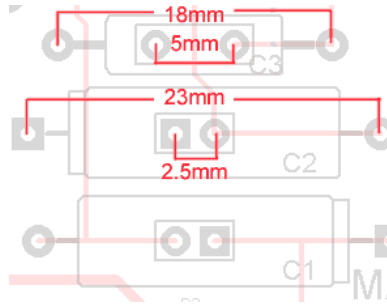


BIAS

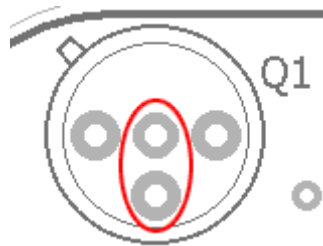


Notes

C1, C2 and C3 can be either axial or radial caps. The radial spacing is standard (5mm for C3, 2.5mm for C1 and C2). The axial spacing is 18mm for C3 and 23mm for C1 and C2. It doesn't matter with type you use...the axial caps are for pure mojo.



Q1 and Q2 have four pads for soldering. This is because some PNP transistors have their leads in a triangle spacing and some are straight across. Just remember that the two pads highlighted below are connected, so solder the middle lead of your transistor to one of those.



You can also use sockets. For triangle spacing these sockets are appropriate:

<http://smallbear-electronics.mybigcommerce.com/to-5-transistor-mill-max/>

They are expensive but a lot cheaper than replacing your transistors if you apply too much heat from bad soldering!

For straight-across leads, the typical single in-line sockets can be used:

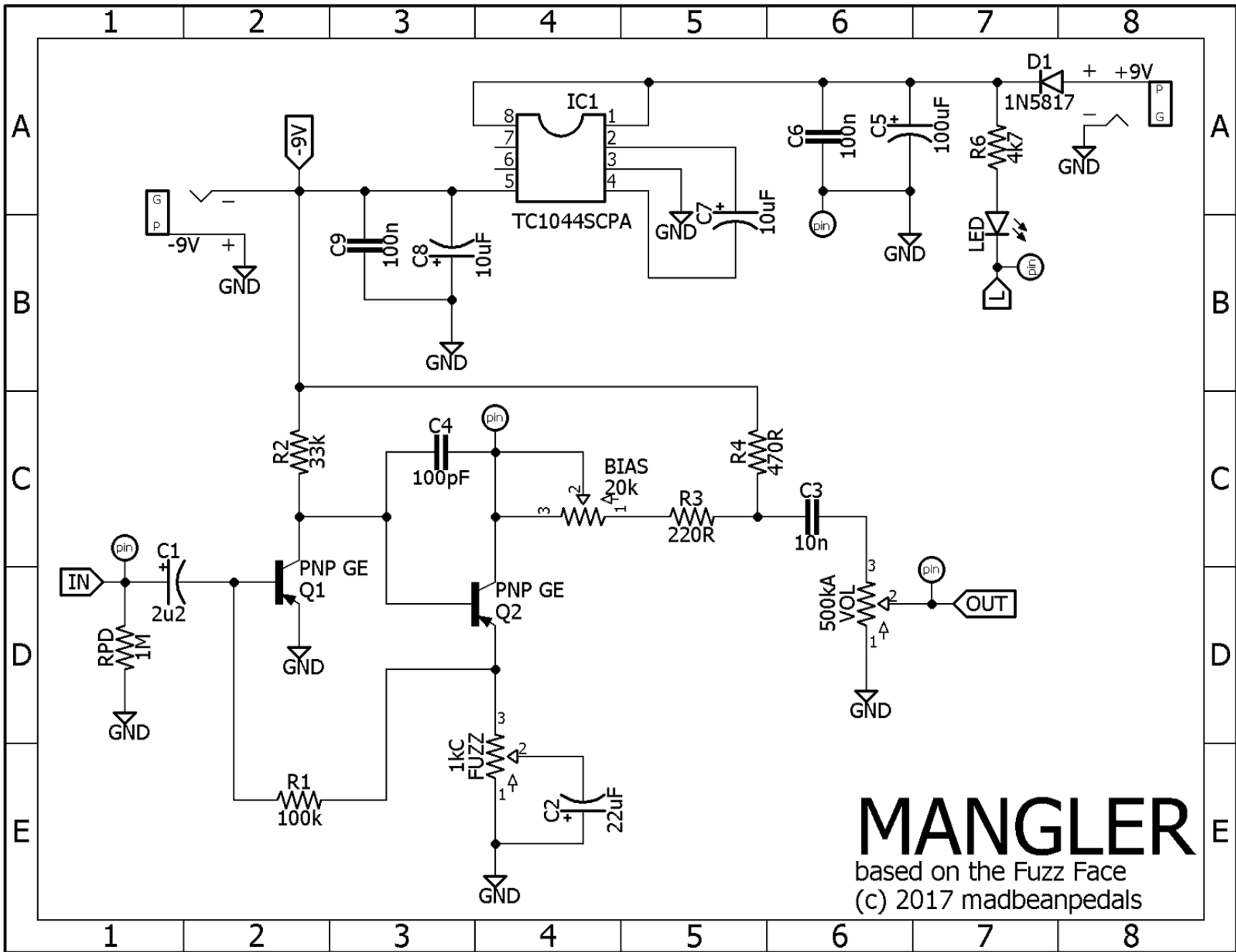
<http://smallbear-electronics.mybigcommerce.com/single-in-line-mill-max/>

Mods

There are two optional mods here: RPD and C4.

RPD: This is a pull-down resistor which was not used on the original fuzz faces. It is the “anti-pop” resistor to prevent mechanical switch noise or leaky input caps from making a pop when using a 3PDT for bypass. You can socket this resistor and decide if you need it or not. If you have no pop, then you can safely leave it off.

C4 is an optional small ceramic cap to reduce noise or hiss you might experience with PNP transistors in a high gain circuit. 100pF is a good starting point, but some may find it makes the fuzz dark sounding. You can use smaller value caps such as 47pF, 22pF or 10pF to see what works best. Or, not use it at all. It depends on the particular pair of transistors you have whether or not this mod is of any use. A socket for C4 is a good idea!



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