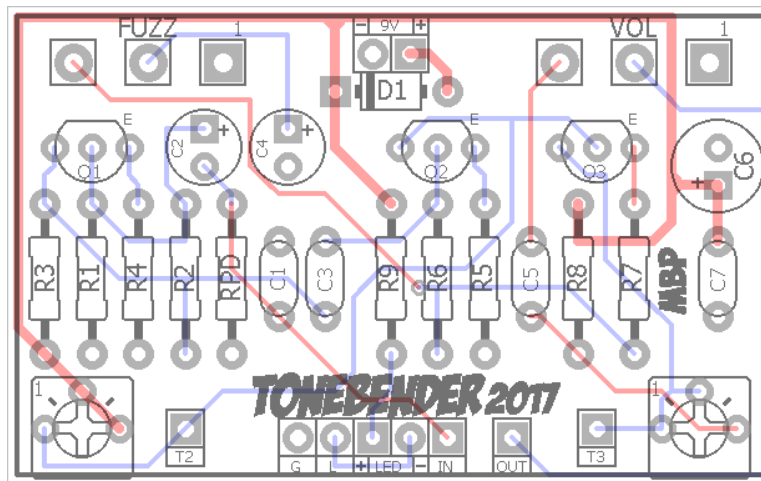
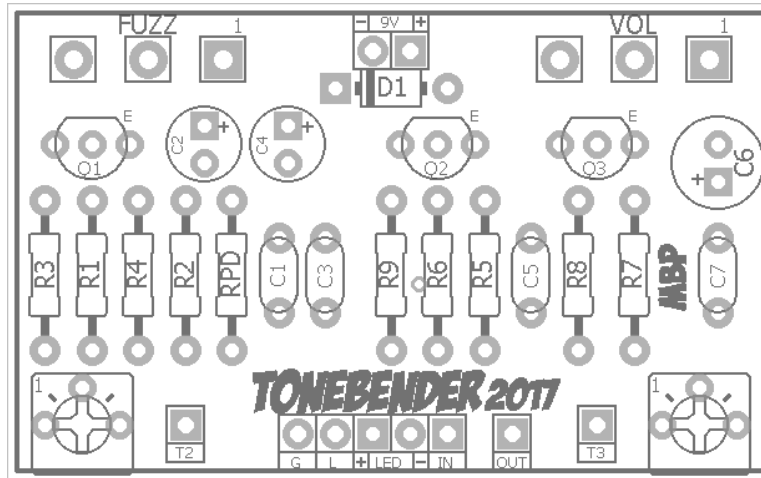


# TONEBENDER

FX TYPE: Fuzz

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2.05" W x 1.275" H



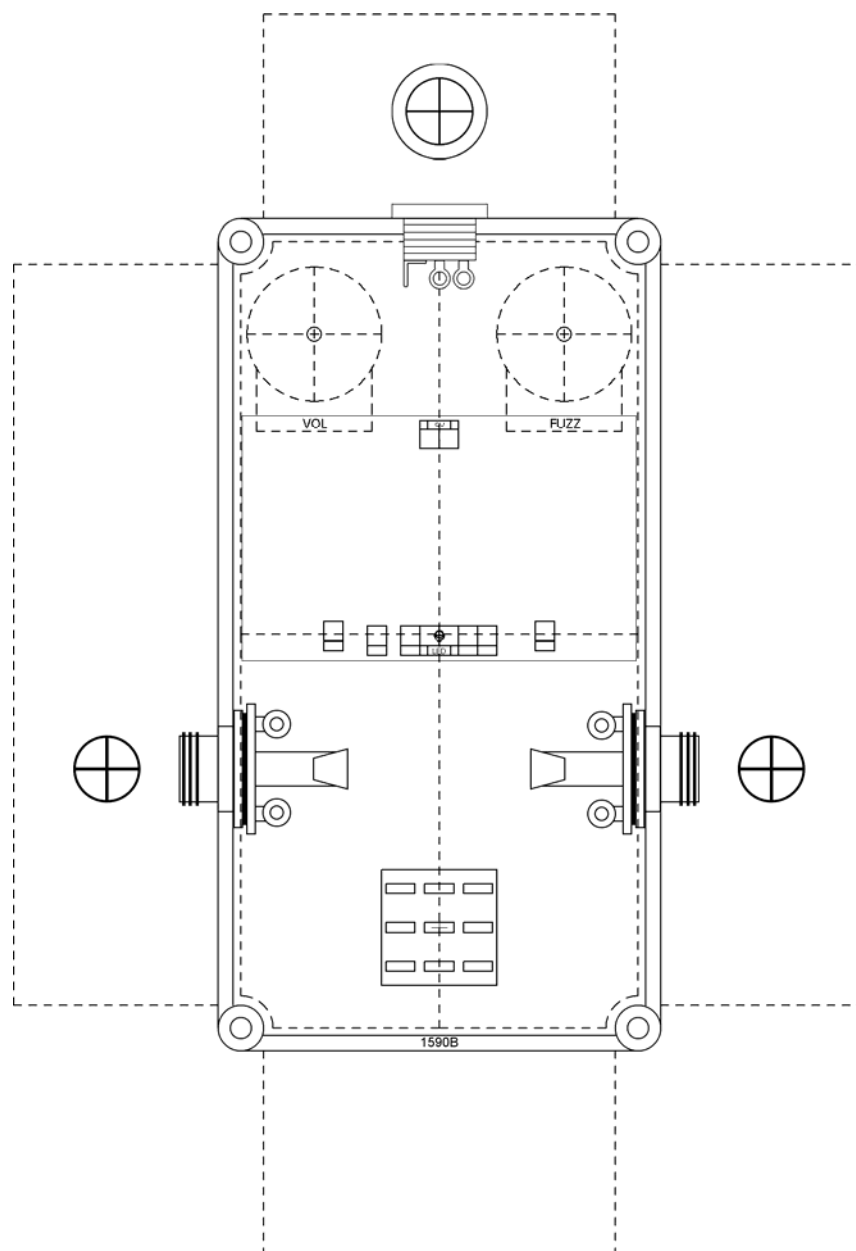
Previous versions: <http://www.madbeanpedals.com/projects/ARCHIVE/Fuzz/>

B.O.M.					
Resistors		Caps		Diodes	
R1	100k	C1	10n	D1	1N5817
R2	470k	C2	4u7	Transistors	
R3	10k	C3	100n	Q1 - Q3	Si
R4	2k7	C4	4u7	Trimmers	
R5	100R	C5	100n	T2	100k
R6	100k	C6	100uF	T3	25k
R7	220R	C7	100n	Pots	
R8	1k			VOL	100kA
R9	4k7			FUZZ	1kC
RPD	1M				

Shopping List				
Value	QTY	Type	Rating	
100R	1	Metal / Carbon Film	1/4W	
220R	1	Metal / Carbon Film	1/4W	
1k	1	Metal / Carbon Film	1/4W	
2k7	1	Metal / Carbon Film	1/4W	
4k7	1	Metal / Carbon Film	1/4W	
10k	1	Metal / Carbon Film	1/4W	
100k	2	Metal / Carbon Film	1/4W	
470k	1	Metal / Carbon Film	1/4W	
1M	1	Metal / Carbon Film	1/4W	
10n	1	Film	16v min.	
100n	3	Film	16v min.	
4u7	2	Electrolytic	16v min.	
100uF	1	Electrolytic	16v min.	
1N5817	1			
Si	3	NPN Silicon		
100k	1	Bourns 3362P		
25k	1	Bourns 3362P		
100kA	1	PCB Right Angle	16mm	
1kC	1	PCB Right Angle	16mm	

## 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/Tonebender/Tonebender2017\\_DRILL.zip](http://www.madbeanpedals.com/projects/Tonebender/Tonebender2017_DRILL.zip)

## Overview

2017 Changes: Reworked the layout for centralized I/O pads. Removed cap between Q3 collector and base (mostly not needed).

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*This project is a silicon version of the Tonebender fuzz, most closely comparing to the Coloursound® Mark ii™. There are many variations of Tonebenders using both germanium and silicon transistors with different tweaks and values. This project is a great “middle of the road” version. And, it is nothing less than an absolute Wall of Fuzz. So, have fun!*

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## Notes

- C5 listed as 10n on some schematics. I prefer 100n in this spot for extra bass.
- Q1 – Q3: There are many NPN transistors that will work in the Tonebender. Generally, you want to stick to the lower gains especially for Q1 and Q2. Good ones to use for Q1-Q3 are 2n3904, 2n2222a, BL182, 2n3565, BC108 and 109. You can try higher gain transistors on Q3 such as the 2N5088 or BC459B or C. Pinouts will vary with some of these transistors. The pinout on the PCB for Q1 – Q3 is the identical to the 2n3904 (C-B-E).
- T3 is to set the bias on the collector of Q3. Using your DMM, place the black lead to ground and the red lead on the “TP3” pad. Adjust T3 until you get a reading of about 4.5v. Lower values (between 3.5-4.5v will result a more compressed and squishy sound).
- T2 is purely for experimentation. Usually this is a fixed value resistor of 47k. So, start with the trimpot set halfway up for general bias. You can then experiment with the bias point to find your optimal fuzz tone using TP2 to monitor changes to Q2’s bias voltage.
- RPD is an optional pull-down resistor not used on most of the classic Tonebender circuits. It is not necessary for the circuit to function but can prevent “popping” from bypass switching. You can socket this resistor to see if you need it or not.

