

Wolfshirt

FX Type: **OCTAVE/FUZZ**

Build Level: Beginner

Based On: Foxx® Tone Machine™

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Overview

I've said more than once that the Foxx Tone Machine is my favorite fuzz/octave pedal. I think I've said the same thing about the Tychobrahe Octavia. I've come to accept that both statements are true :)

If the Octavia (mbp **Retrograde**) is the classic Hendrix style oct-up fuzz, then the Tone Machine (**Wolfshirt**) is its unruly cousin; the one that has a few too many at family gatherings and then proceeds to mortify everyone. The fuzz is thicker and the octave up is more prominent. Basically, a bit of a face melter.

As with all analog octave-up generators, the Wolfshirt is monophonic. It doesn't do chords well and will create all kinds of odd harmonics. But, for lead and single note playing it cuts through exceedingly well.

Controls

- **VOL:** Total effect output.
- **SUS:** Fuzz amount.
- **TONE:** A simple blend control using a low pass filter on the bottom end of the range (CCW).
- **OCT:** Switch up - octave up, switch middle - fuzz only, switch down - alternate fuzz mode.

Further Study:

<https://fuzzcentral.ssguitar.com/foxx.php>

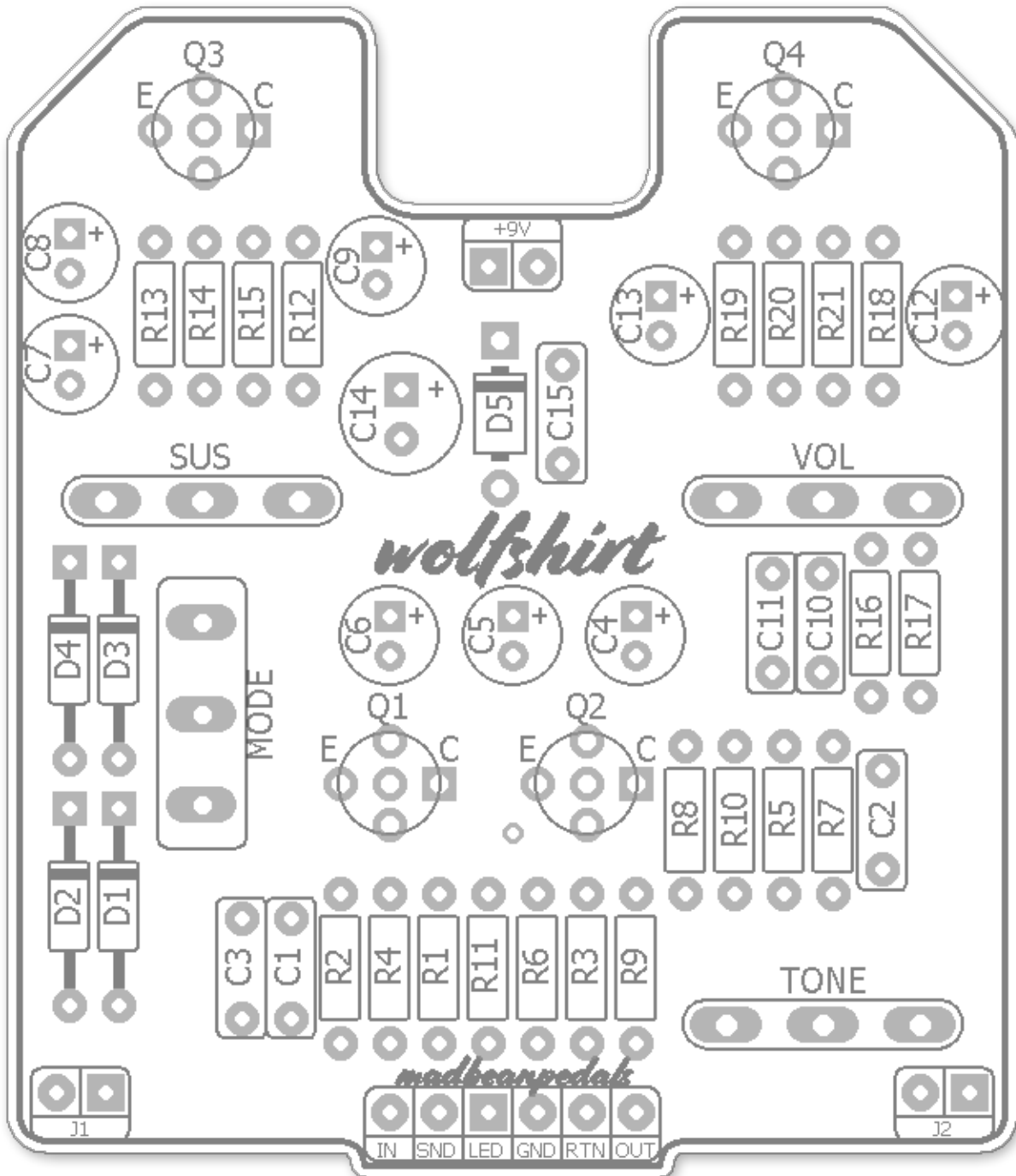
<https://www.guitarplayer.com/gear/the-foxx-tone-machine-was-the-fuzz-of-choice-for-peter-frampton-billy-gibbons-and-adrian-belew>

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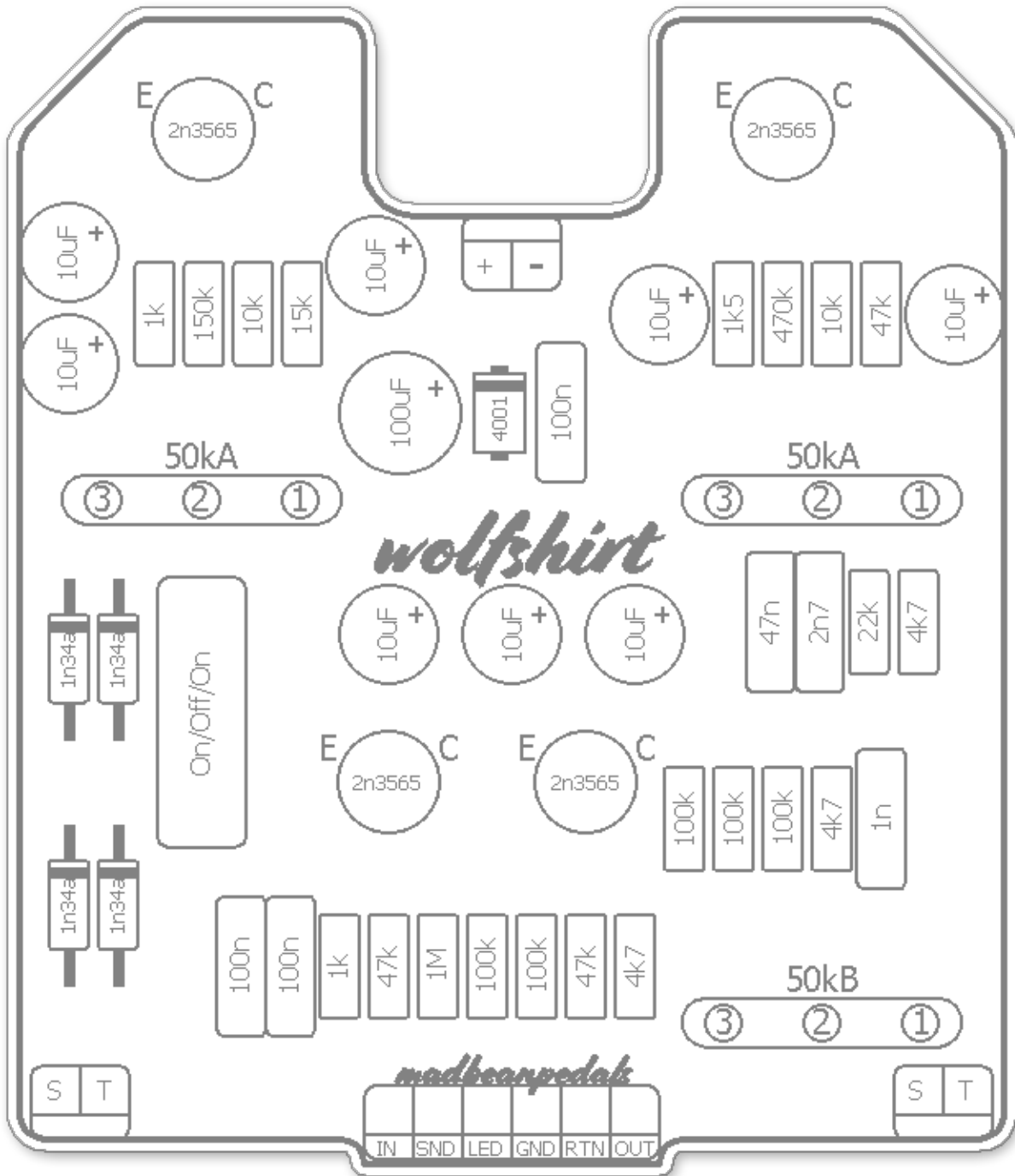
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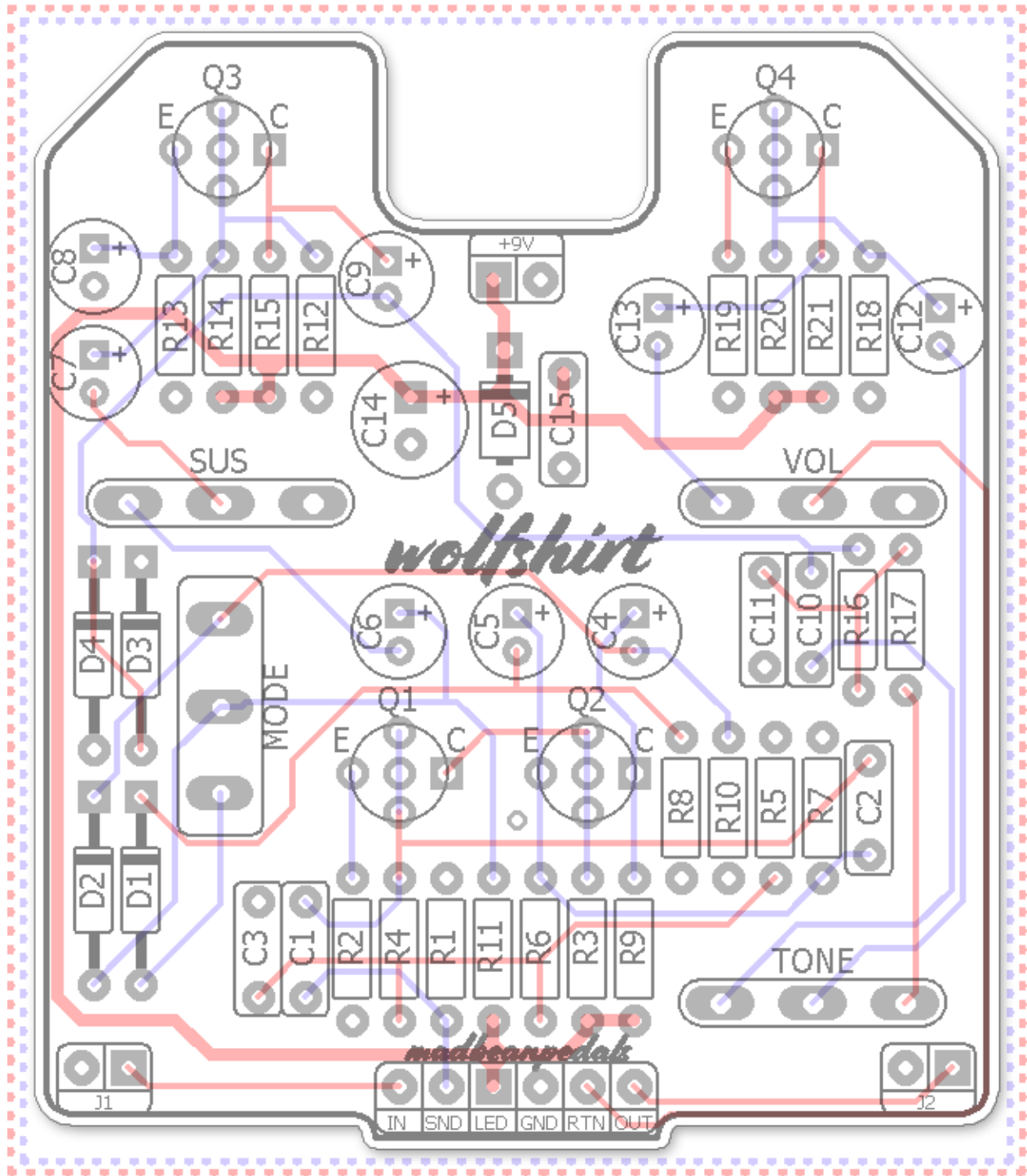
Parts Layout



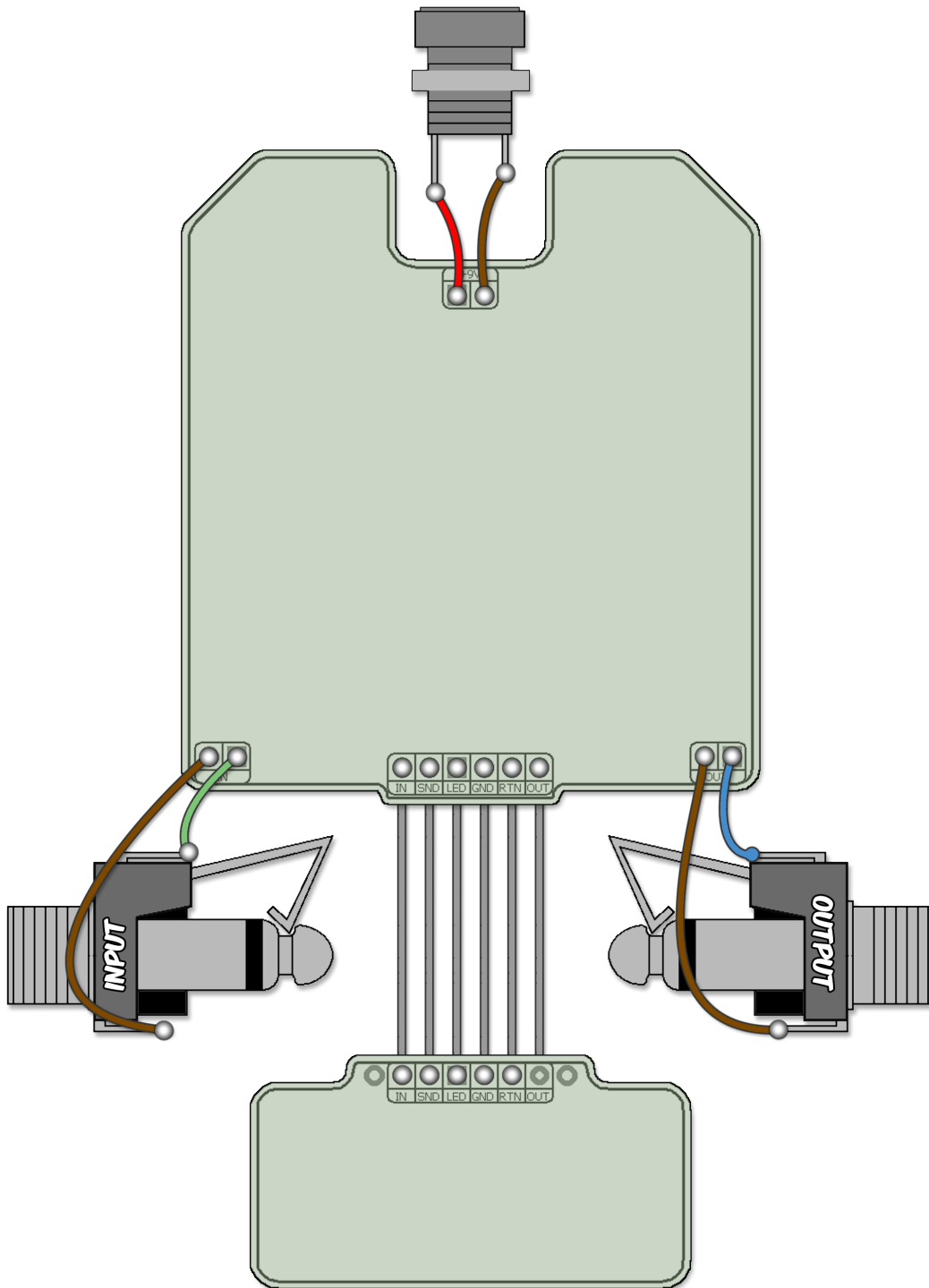
Component Values



Trace Layout



Wiring



Unless otherwise noted, all Standard Series projects have the same wiring regardless of which 3PDT bypass board is used. A 6-pin, 2" ribbon cable is recommended for soldering the connections between the two PCBs.

B.O.M.

Resistors		Caps		Diodes	
R1	1M	C1	100n	D1	1n34a
R2	1k	C2	1n	D2	1n34a
R3	47k	C3	100n	D3	1n34a
R4	47k	C4	10uF	D4	1n34a
R5	100k	C5	10uF	D5	1n4001
R6	100k	C6	10uF	Transistors	
R7	4k7	C7	10uF	Q1	2n3565
R8	100k	C8	10uF	Q2	2n3565
R9	4k7	C9	10uF	Q3	2n3565
R10	100k	C10	2n7	Q4	2n3565
R11	100k	C11	47n	Switches	
R12	15k	C12	10uF	MODE	On/Off/On
R13	1k	C13	10uF	Pots	
R14	150k	C14	100uF	SUS	50kA
R15	10k	C15	100n	VOL	50kA
R16	22k			TONE	50kB
R17	4k7				
R18	47k				
R19	1k5				
R20	470k				
R21	10k				

Shopping List

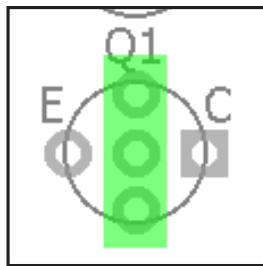
Value	QTY	Type	Rating
1k	2	Metal / Carbon Film	1/4W
1k5	1	Metal / Carbon Film	1/4W
4k7	3	Metal / Carbon Film	1/4W
10k	2	Metal / Carbon Film	1/4W
15k	1	Metal / Carbon Film	1/4W
22k	1	Metal / Carbon Film	1/4W
47k	3	Metal / Carbon Film	1/4W
100k	5	Metal / Carbon Film	1/4W
150k	1	Metal / Carbon Film	1/4W
470k	1	Metal / Carbon Film	1/4W
1M	1	Metal / Carbon Film	1/4W
1n	1	Film	16v min.
2n7	1	Film	16v min.
47n	1	Film	16v min.
100n	3	Film	16v min.
10uF	8	Electrolytic	16v min.
100uF	1	Electrolytic	16v min.
1n34a	4		
1n4001	1		
2n3565	4		
SPDT	1	On/Off/On, Solder Lug	
50kA	2	PCB Right Angle	16mm
50kB	1	PCB Right Angle	16mm

Additional Hardware

- (1) 1590B enclosure
- (2) Lumberg 1/4" Compact mono jacks
- (1) Slim 2.1mm DC jack
- (1) Standard 3PDT footswitch
- (1) 5mm LED

Build Notes

- The SUS and VOL pots have been changed from linear to audio taper in the Wolfshirt. IMO, the audio taper sounds more natural. But, use linear if you prefer to build it stock.
- D1 and D2 must have a low forward voltage and are designated as 1n34a (typically 0.33v). If you do not have 1n34a, use BAT46 Schottky diodes which have a V_F of 0.35v. Diodes with higher V_F will produce inconsistent or no results at all.
- You can also sub BAT46 for D3 and D4, which are the clipping diodes. There is more flexibility in diode type with D3/D4. I tried some D9E and they sounded very good to me. The D9E V_F is typically around 0.45v.
- The Octave switch has been changed to an On/Off/On for one extra fuzz setting. The stock Tone Machine™ uses a phase splitter with diode rectifiers to produce the octave up effect (switch up position). The non-octave mode simply lifts 1/2 of the phase splitter (switch middle) and is a smooth and darker tone. The added fuzz mode (switch down) shorts D2. This produces a highly compressed tone that sounds great up and down the neck. I actually prefer it to the middle position for its cool “bumblebee” texture.
- Previous versions of the Wolfshirt used 1uF film coupling caps. Since this project has been ported to the Standard Series, less PCB real estate is available. I changed the coupling caps back to the 10uF electrolytic used in the stock pedal.
- If you are new to analog octave up, keep in mind that the most prominent octave sound is generally produced around the 12th fret on the neck pickup and with the tone control turned down. You can still get some oct-up on bridge pups with full tone, but it is less noticeable.
- I recommend sticking with the 2n3565 for Q1-Q4. However, the transistor footprint has multiple pins to accommodate different pinouts if you are subbing transistors. Each transistor has three pads in the central column which are all connected and correspond to the transistor BASE. If you are using 2n3565, the slanted side of the transistor indicates the emitter and is shown below by the orange bar.



2n3565: <https://smallbear-electronics.mybigcommerce.com/transistor-2n3565/>

Circuit Voltages

Q1	2n3565
C	2.29
B	0.75
E	153mV

Q2	2n3565
C	7.78
B	2.29
E	1.66

Q3	2n3565
C	7.21
B	0.84
E	226mV

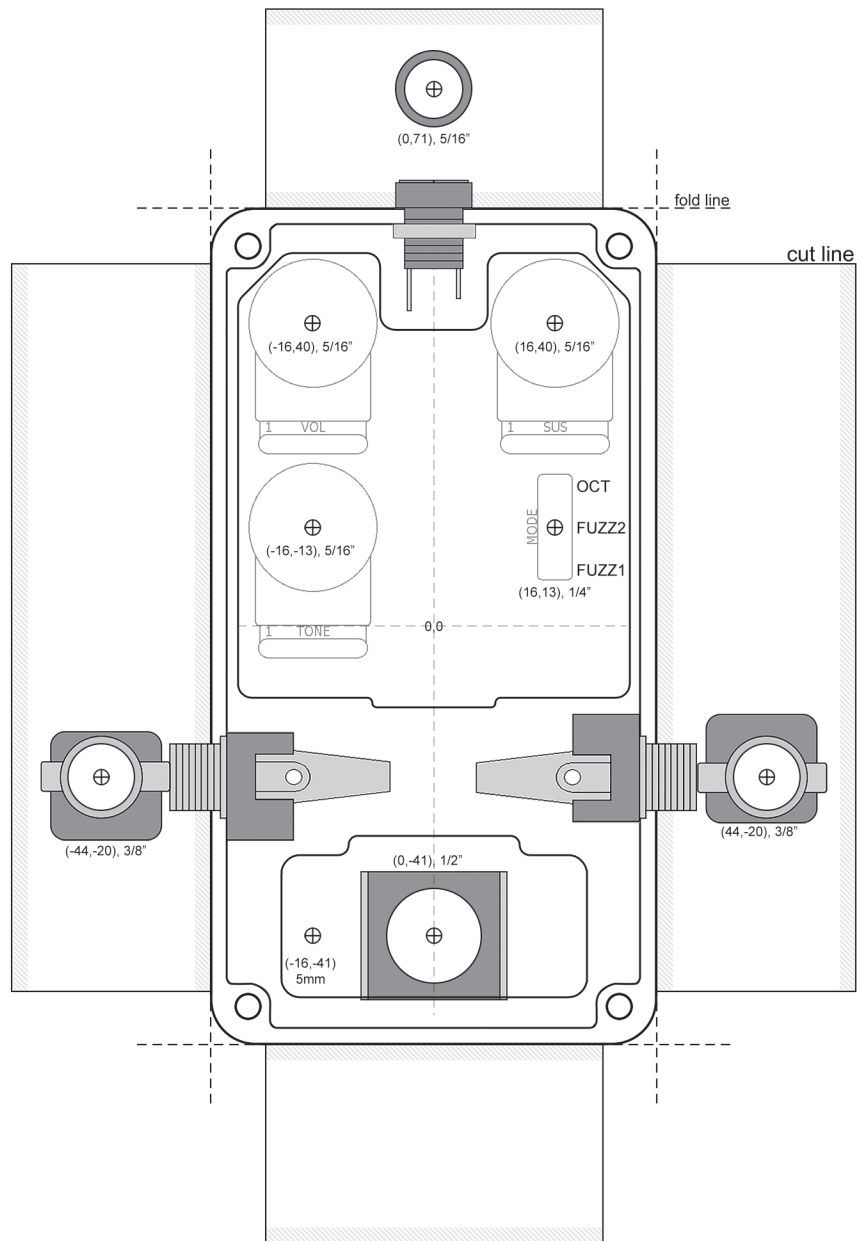
Q4	2n3565
C	8.06
B	0.83
E	214mV

9.44vDC One Spot supply
Current Draw: ~2mA
Knobs @ 50%, switch down

1590B Drill Template

Coordinates are denoted in (X,Y), drill size format starting from the center (0,0) location of the enclosure.

[Link to Tayda Standard Series master drill template](#)

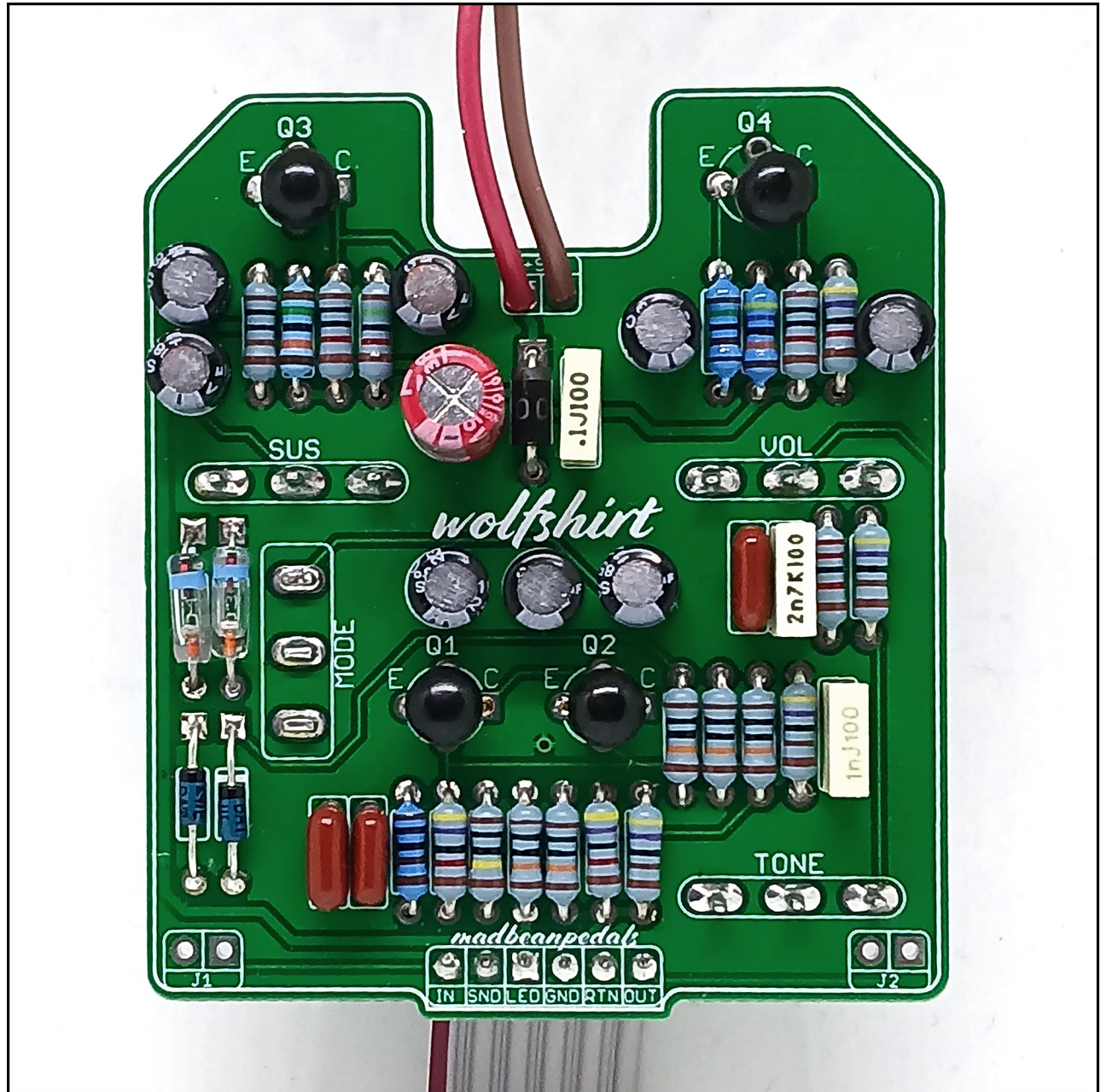


Hardware

1590B enclosure
Lumberg $1/4"$ Compact mono jacks
Slim 2.1mm DC jack
Standard 3PDT footswitch
5mm LED

NOTE: Different $1/4"$ and DC jack styles may require different sized drill holes.

Build Pic



Schematic

