



# RETROGRADE 2019

**FX TYPE: Octavia**

Based on the Tycobrahe Octavia

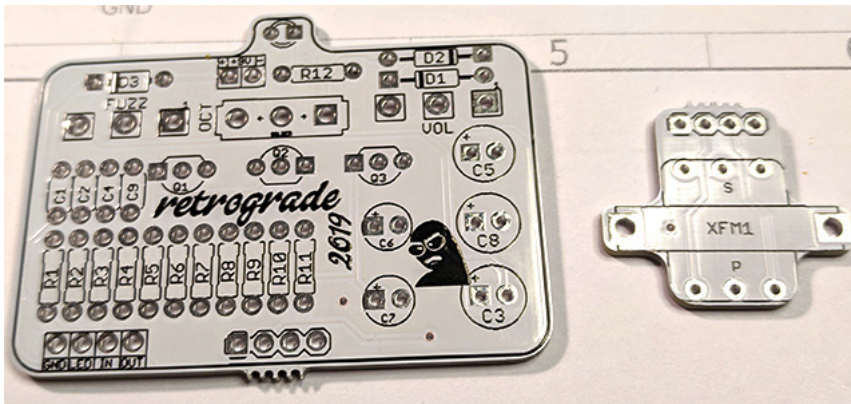
**Changes for 2019:** New layout, no circuit changes. The layout was re-done to allow the builder to use PCB mounted pots instead of wired ones (used on all previous versions). This was achieved by placing the transformer on a daughter board which is wired to the main board.

The **Retrograde** derives from the Tycobrahe Octavia™ which is another one of those mythical and practically unobtainable classic stompboxes. This one is very popular for collectors and it is not rare to see them go for over \$1000 on eBay. Or, you could build it for \$30. Just sayin'.

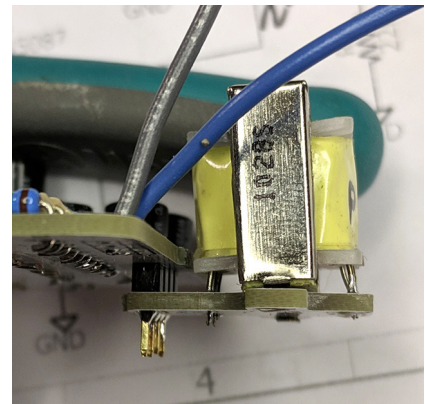
The Retrograde is a wall of nasty fuzz, with a pronounced octave generated by an inexpensive transformer. It also features the ability to turn the octave off with the flip of a switch, and can be built into a 1590B. As with almost any analog octave effect, the most pronounced upper octave is achieved by using the guitar's neck pickup, with the tone rolled all the way off and notes played around the 12th fret. You can also get ring modulator type sounds with chords or with the volume knob on your guitar rolled down. Best of all, you get a great "dive-bomb" effect when doing double-stop bends!

You can read up a little more on the circuit here: <http://fuzzcentral.ssguitar.com/octavia.php>

Controls are self-explanatory. The octave engages when the switch is in the right position.



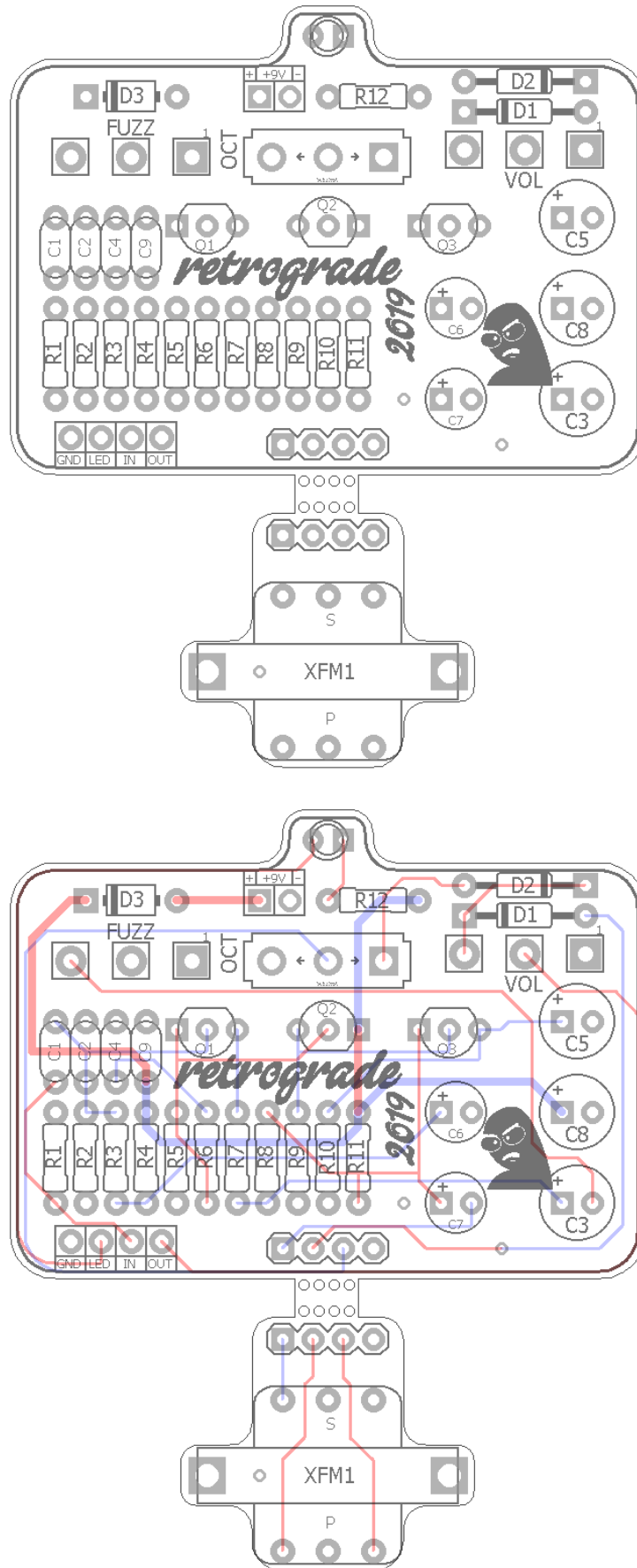
**TIP!** Before you start, break the two PCB apart at the bridge between them. You can do it with just finger pressure. Use wire cutters to trim up the edges of the PCBs, if you prefer.



You can use wires or straight pin headers to connect the two boards (after populating the main board).

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

## Layout & Traces



## B.O.M.

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Resistors		Caps		Diodes	
R1	1M	C1	100n	D1, D2	1n34a
R2	680k	C2	150pF	D3	1N5817
R3	820k	C3	100uF	Transistors	
R4	180k	C4	1n	Q1	2N5087
R5	220k	C5	220uF	Q2, Q3	2N4401
R6	220R	C6	33uF	Transformer	
R7	1k	C7	33uF	XFM1	42TM022
R8	47k	C8	100uF	Switch	
R9	22k	C9	100n	OCT	SPDT
R10	470R	Pots			
R11	1k2			FUZZ	1kB
R12	4k7			VOL	500kA

## Shopping List

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Value	QTY	Type	Rating
220R	1	Metal / Carbon Film	1/4W
470R	1	Metal / Carbon Film	1/4W
1k	1	Metal / Carbon Film	1/4W
1k2	1	Metal / Carbon Film	1/4W
4k7	1	Metal / Carbon Film	1/4W
22k	1	Metal / Carbon Film	1/4W
47k	1	Metal / Carbon Film	1/4W
180k	1	Metal / Carbon Film	1/4W
220k	1	Metal / Carbon Film	1/4W
680k	1	Metal / Carbon Film	1/4W
820k	1	Metal / Carbon Film	1/4W
1M	1	Metal / Carbon Film	1/4W
150pF	1	Ceramic	16v min.
1n	1	Film	16v min.
100n	2	Film	16v min.
33uF	2	Electrolytic	16v min.
100uF	2	Electrolytic	16v min.
220uF	1	Electrolytic	16v min.
1n34a	2	or, BAT46	
1N5817	1		
2N5087	1		
2N4401	2		
42TM022	1	300Hz - 3.4kHz, 1.5k	
SPDT	1	On/On Pin Mount	
1kB	1	Right Angle PC Mount	16mm
500kA	1	Right Angle PC Mount	16mm

## **Parts Guide**

### **2N4401 transistors (max 300 Hfe recommended):**

<http://www.mouser.com/ProductDetail/Fairchild-Semiconductor/2N4401TFR/?qs=sGAEpiMZZMutXGli8Ay4kMNgep-6F%2fk5e7170TNaYA%252bA%3d>

<http://smallbear-electronics.mybigcommerce.com/transistor-2n4401/>

### **42TM022 transformer:**

<http://www.mouser.com/ProductDetail/Xicon/42TM022-RC/?qs=sGAEpiMZZMv0IfuNuy2LUaR7iCoLh1pO-qvQ%252bUAwdFkk%3d>

42TM022 transformer: <http://smallbear-electronics.mybigcommerce.com/transformer-for-tycho-octavia/>

### **SPDT:**

<http://smallbear-electronics.mybigcommerce.com/spdt-on-on-short-lever-pc-mount/>

### **16mm Right Angle Pots:**

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

### **BAT46:**

<http://smallbear-electronics.mybigcommerce.com/diode-schottky-bat46/>

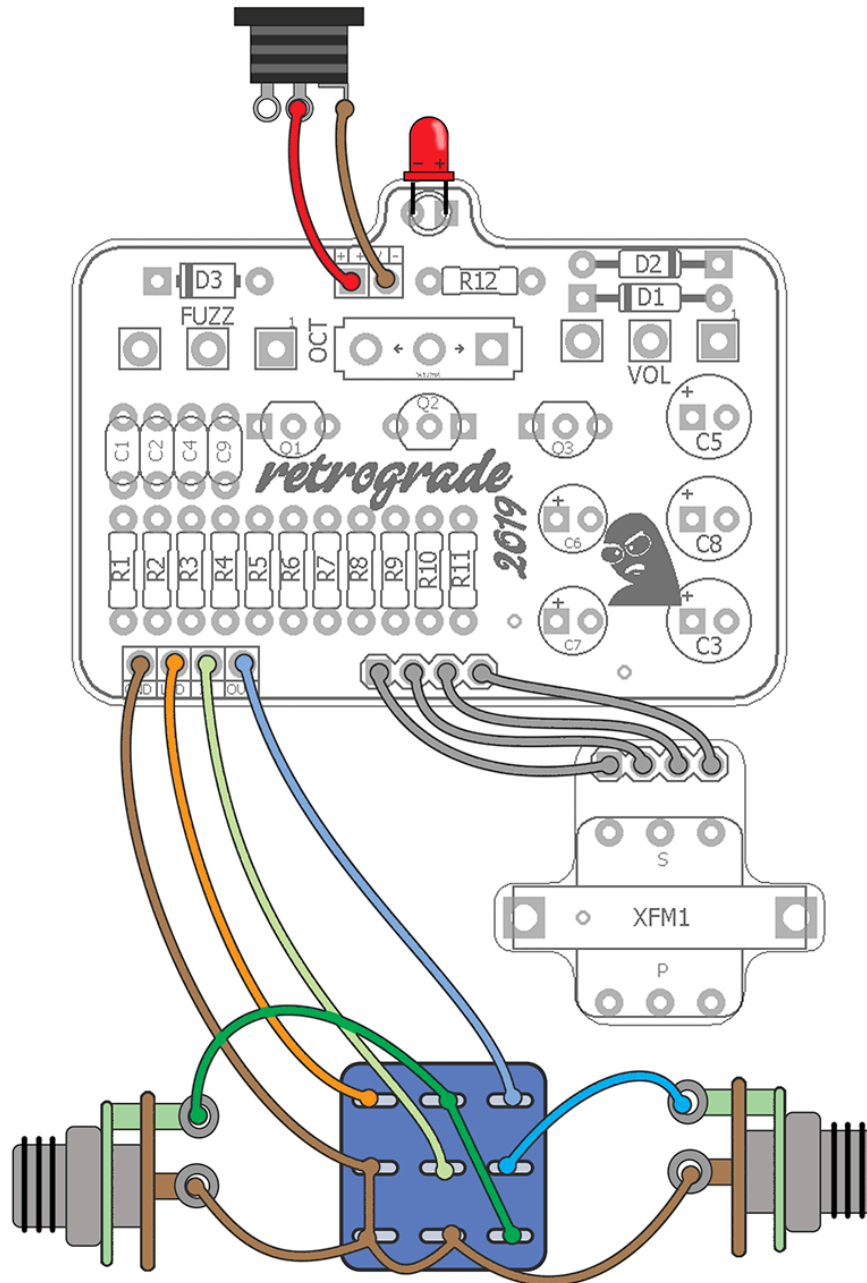
### **1n34a:**

<http://smallbear-electronics.mybigcommerce.com/diode-nos-germanium/>

### **Single In-Line pins:**

<http://smallbear-electronics.mybigcommerce.com/double-sided-single-in-line-pin/>

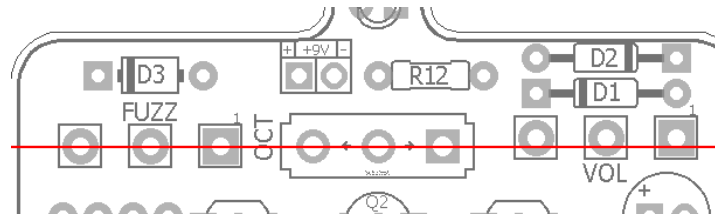
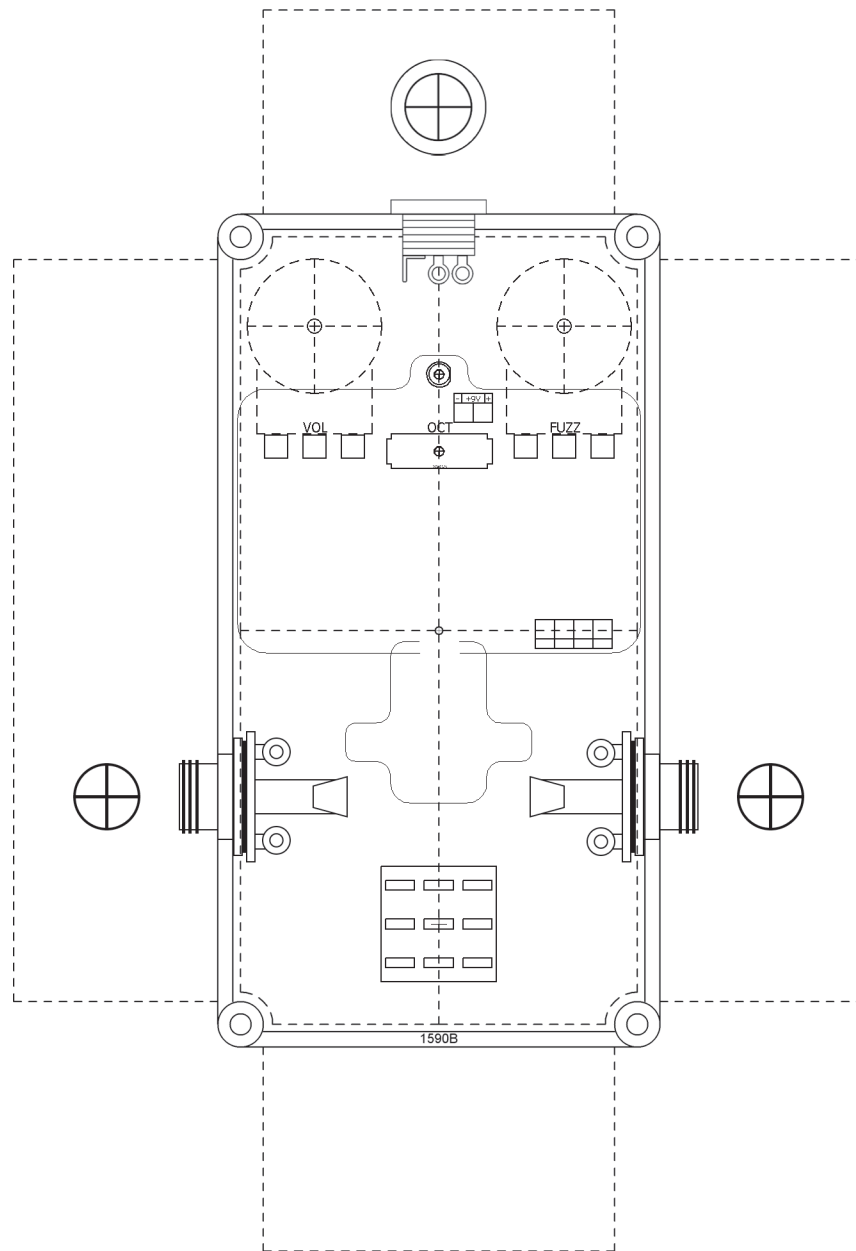
## Wiring



The bypass LED can be soldered directly to the main PCB.

If you want to be fancy, use 2.54mm SIL straight header pins to connect the two PCBs instead of wires!

## 1590B Drill Guide



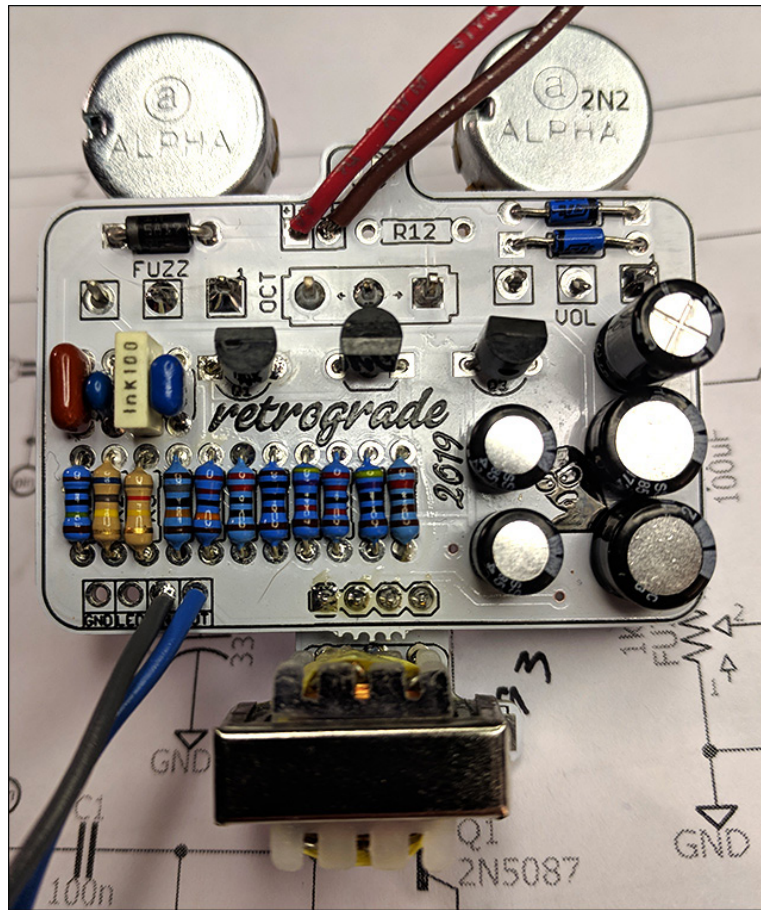
There is a small error on the PCB where the Volume and Fuzz pots are slightly out of alignment on the horizontal axis (they are a little less than 1mm off from one another). The drilling template above corrects that and has them perfectly in line.

You can install the PCB directly in the re-aligned drill holes. Bend the pins of the Vol pot inward slightly if you wish, or just over-drill the hole for the Fuzz pot by a stop.

This error will be fixed on the next batch of boards.



## Build Pic



I used BAT46 Schottky diodes instead of 1n34a. It works perfectly fine (we used these on the Function F(x) Cannon, as well.)

For the transformer, I used 2.54mm straight header pins to connect the two boards. I made sure the top of the transformer was no higher than the 11mm 220uF electrolytic cap when I soldered the two boards together (to ensure that the transformer would not contact an enclosure lid).

## Voltages

