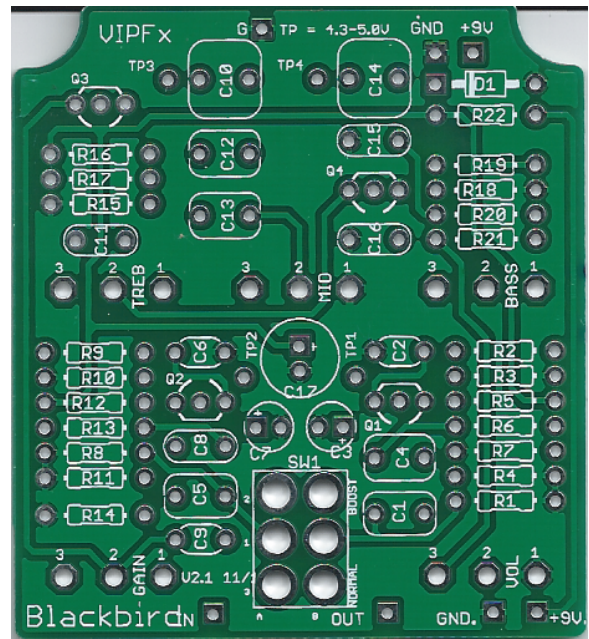
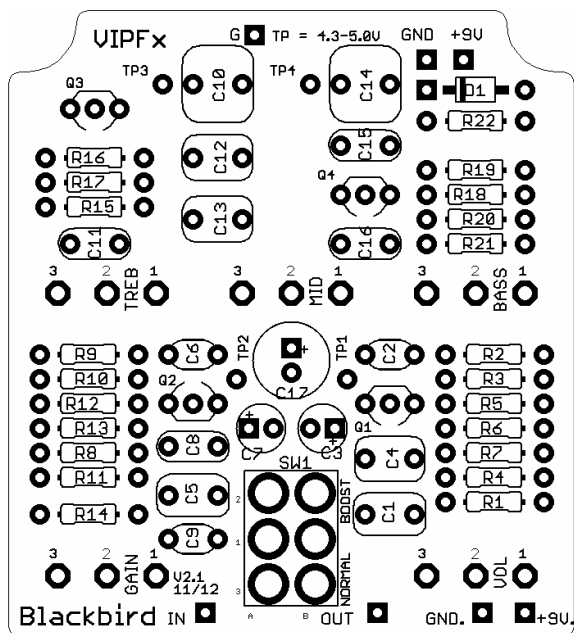


# Blackbird

## Overdrive

### REVISED BUILD DOC V2

The Blackbird is an overdrive pedal based on a pedal that was reverse engineered and posted at Freestompboxes.com. All credit for that work goes entirely to the outstanding DIY community at Freestompboxes.



### Parts Guide

Resistors: 1/4 watt metal film

Film Caps: The board is laid out for Panasonic ECQ-V caps, but any standard 5mm caps will fit.

Electrolytic Caps: 16v or better

pF Caps: Ceramic or other 5mm caps.

Pots: Layout is for Alpha PCB mount pots, RV16AF-41-15R1-Value, but any pots will work.

This product is intended for DIY use only. Commercial use, including the sale of PCBs, kits or pedals utilizing this information, is strictly prohibited.

## BOM

Resistors		Caps		Diode	
R1	1M	C1	0.1uF	D1	1N4001
R2	10k	C2	10pF		
R3	1M	C3	47uF	Switch	
R4	1k	C4	0.22uF	DPDT	On/On
R5	5k6-16k	C5	0.1uF		
R6	240k	C6	10pF	Transistors	
R7	240k	C7	47uF	Q1-Q4	J201
R8	1M	C8	1n5		
R9	10k	C9	10pF	Pots	
R10	1M	C10	1.0uF	VOL	100kA
R11	1k	C11	2n2	GAIN	500kA
R12	5k6-16k	C12	0.22uF	BASS	100kA
R13	22k	C13	0.22uf	MID	2kB
R14	68k	C14	1.0uF	TREB	25kB
R15	1k	C15	1n		
R16	5k6-22k	C16	1n5		
R17	5k6	C17	470uF		
R18	1k				
R19	5k6-22k				
R20	10k				
R21	10k				
R22	10R				

Note: The value for R5, R12, R16 and R19 must be determined when biasing the JFET's

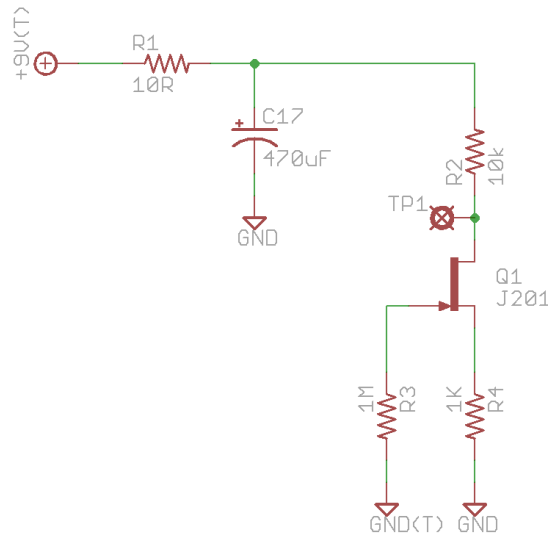
## Notes

### Transistors

The success and ultimate sound of this project is entirely based on the proper selection and biasing of the J201 JFET's in positions Q1 through Q4. There are different strategies for matching and biasing and while I don't have much of a real opinion on the topic, something still had to be done to make this thing work. I took what I learned on the forums and came up with what I have shown below. If you know or use a better way, feel free to use it, but this worked very well for me. The goal here is to find 4 J201's that are pretty much the same so that they can be biased with the same value resistor.

The procedure I used is as follows:

- 1) Locate a pile of J201's. I bought a pack of 100 Fairchild's on eBay and they worked out fine.
- 2) Breadboard the following test circuit:

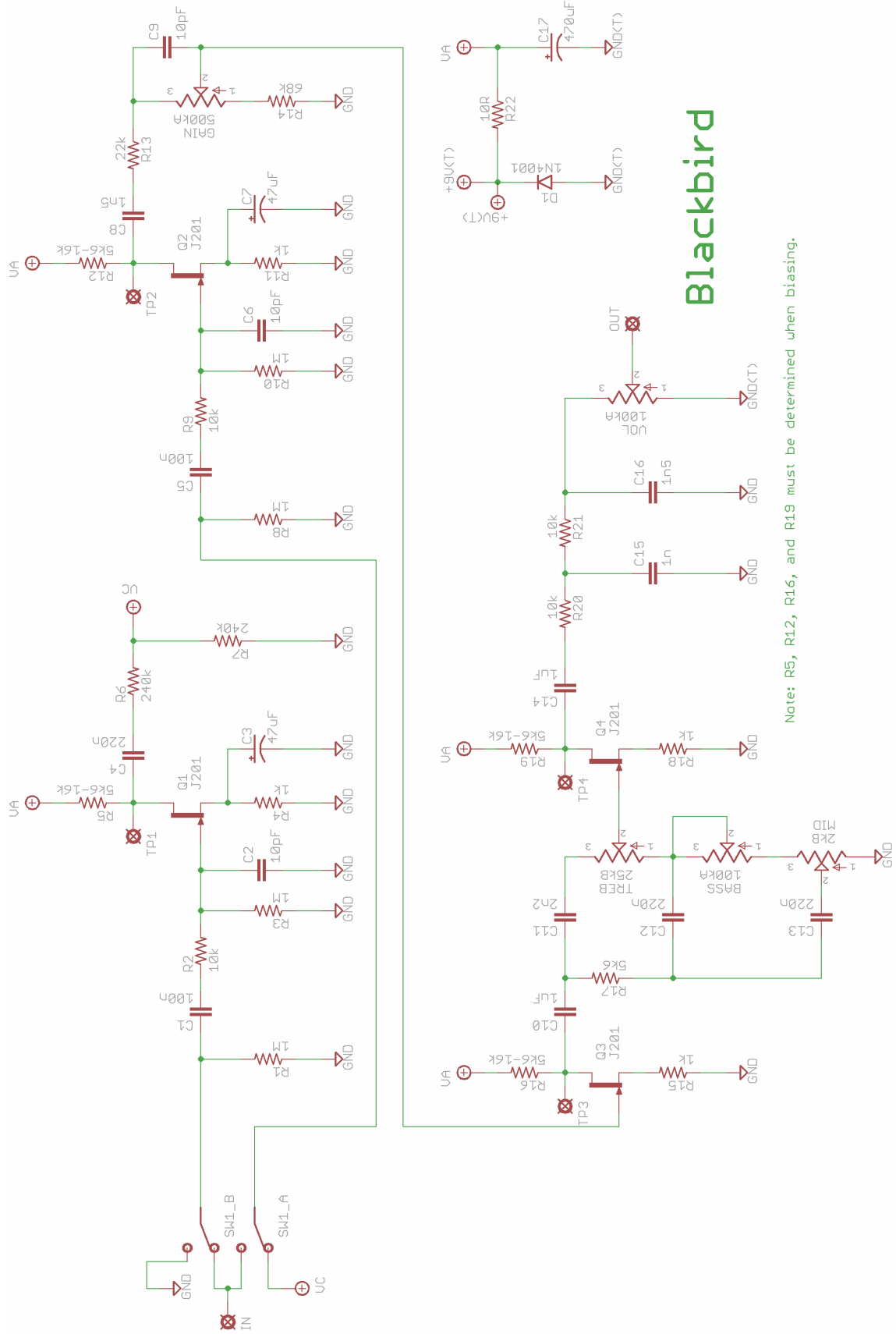


Test Circuit 1

- 3) Connect your DMM to TP1 and ground.
- 4) Start testing each J201 and record the TP1 voltage for each one. I used an egg carton and first did a rough sort in 0.25V increments. The actual voltage you see at this stage is unimportant. It won't be 4.5V and we don't care. This is just the sorting stage.
- 5) After the rough sort, find the pile that has the most J201's.
- 6) From that pile, all should be within 0.25V of each other. Repeat the sort on that smaller population, but this time try matching them as closely as possible. From the group I had I was able to find sets that matched within 0.1V without too much effort.
- 7) You will need 4 that are well matched.
- 8) From your set of 4, select 1 J201 and put it back into Test Circuit 1. Remove R2 and sub in other values until the voltage at TP1 is 4.5V to 5.0V. The idea is to aim for 4.5V.
- 9) When you are satisfied with the voltage try the other J201's you matched and make sure the voltage at TP1 is the same or similar for all members of the set.
- 10) Your J201's should be matched well enough so that regardless of which one is placed in Test Circuit 1, the voltage at TP1 remains pretty much the same with the SAME value for R2.
- 11) Use those 4 J201's for Q1-Q4, and the final value you found for R2 in the test circuit for R5, R12, R16 and R19 on the board.

For my build Q1-Q4 all matched within 0.1V when in Test Circuit 1. The value for R5, R12, R16 and R19 was 8.2k.

# Schematic



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