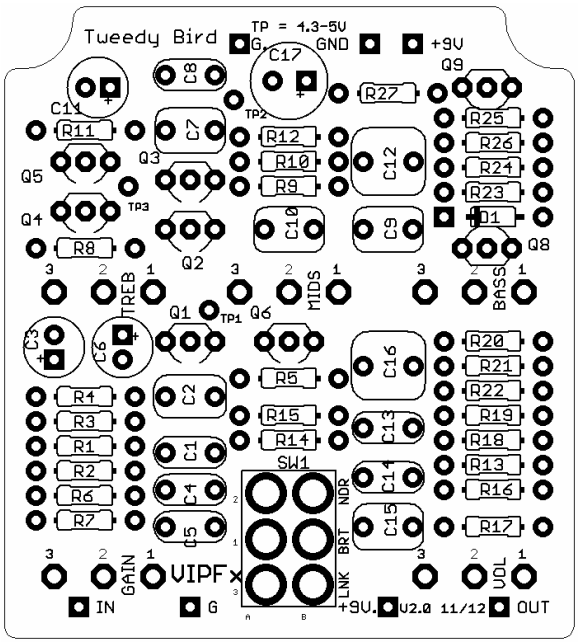
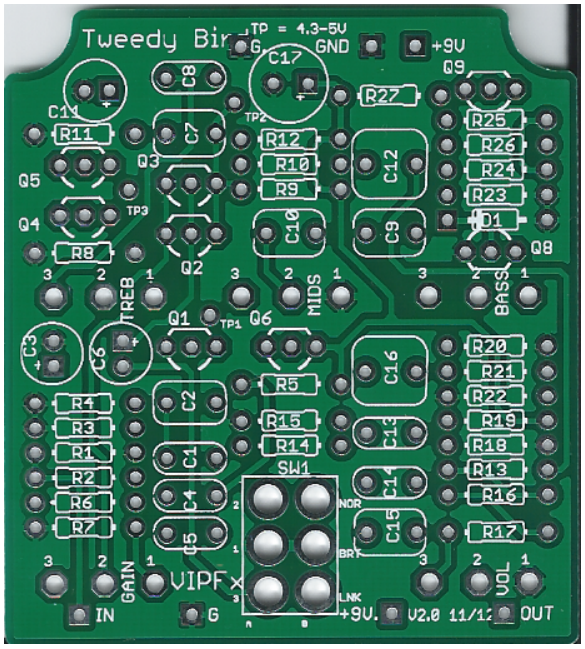
Tweedy Bird

Overdrive

REVISED BUILD DOC V2

The Tweedybird is an overdrive pedal based on an overdrive 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.
Eletrolytic 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.

BOM

Resistors		Caps		Diode	
R1	1M	C1	470p	D1	1N914
R2	12K	C2	100n		
R3	1M	C3	47uF	Transistors	
R4	1K	C4	1n5	Q1-Q6	J201
R5	5k6-16k	C5	100p	Q8	2N3904
R6	10k	C6	47uF	Q9	2N3906-
R7	68K	C7	220n		
R8	1K	C8	2n2	Switch	
R9	5k6-22k	C9	220n	DPDT	On/Off/On
R10	5k6	C10	220n		
R11	1K	C11	22uF	Pots	
R12	5k6-22k	C12	1uF	VOL	A100K
R13	10k	C13	1n5	GAIN	A500K
R14	22k	C14	1n5	BASS	A100K
R15	1M	C15	220n	MIDS	B2K
R16	10k	C16	1uF	TREB	B25k
R17	100k	C17	220uF		
R18	1M				
R19	1M				
R20	10k				
R21	10K				
R22	1M				
R23	100k				
R24	10k				
R25	4M7				
R26	3k3				
R27	91R				

Note: The value for R5, R9 and R12 must be determined when biasing the JFET's

Notes

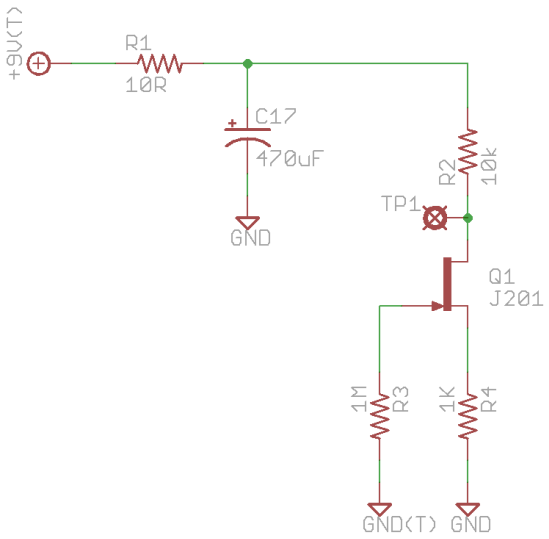
Transistors

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 Q5. 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 6 J201's that are pretty much the same so that they can be biased with the same value resistor. Q6 is just a buffer so it doesn't need to be perfectly matched, but if we are sorting anyway we may as well keep an eye out for something close.

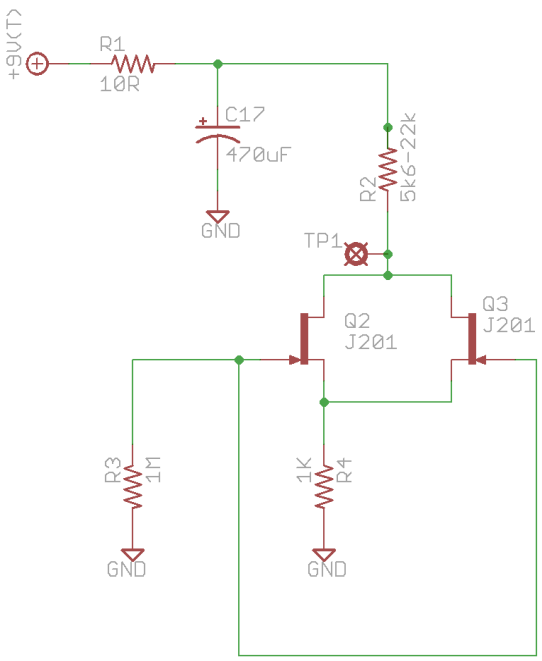
The procedure I used is as follows:

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 5 that are well matched plus 1 that is close to that group to use for Q6. Set Q6 aside so it doesn't get mixed with the others.
8) Select 1 J201 to be Q1 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 set aside that J201 and the resistor you had in R2. That pair will be used for Q1 and R5 on the board.
10) Next reconfigure your breadboard to the following test circuit. That simply means replacing R2 and adding 2 J201's from the remaining matched group. The second J201 will be oriented in the same direction as the first, meaning the flat sides face the same direction.



Test Circuit 2

11) Sub in different values for R2 again until the voltage at TP1 is 4.5V to 5.0V. The idea again is to aim for 4.5V.
12) Your J201's should be matched well enough so that regardless of how the 4 are combined in Test Circuit 2, the voltage at TP1 remains pretty much the same with the SAME value for R2.
13) Use those 4 J201's for Q2-Q5, and the final value you found for R2 in the test circuit for R9 and R12 on the board.

For my build Q1-Q5 all matched within 0.1V when in Test Circuit 1. The value for R5 was 10k and the value for R9 and R12 was 7.5k.

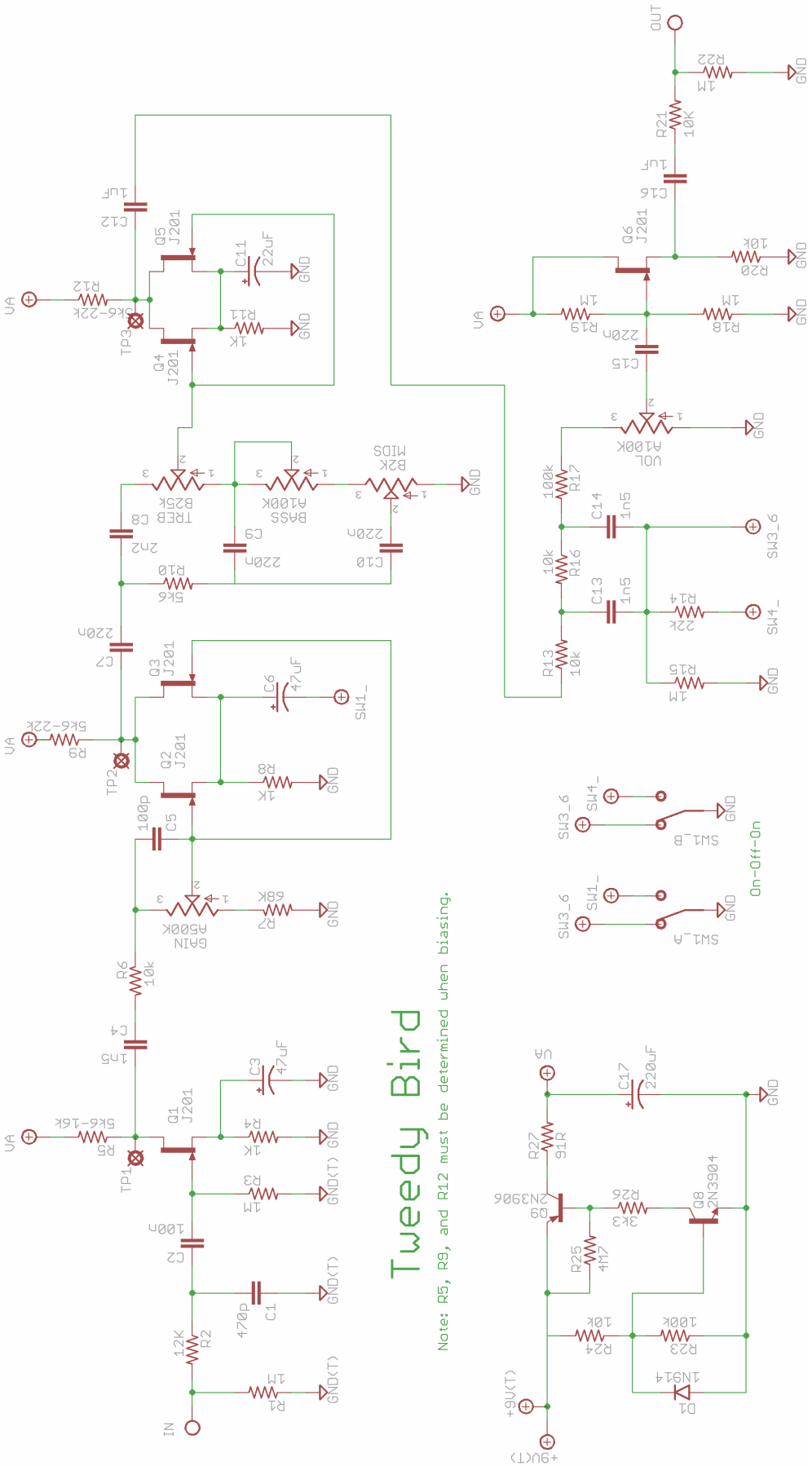
Reverse Polarity Protection

The reverse polarity portion of the circuit is taken directly from R.G. Keen's article "A Cheap - and Good - Polarity Protector." That article is available here:

http://www.geofex.com/article_folders/cheapgoodprot.htm

The small circuit works fine and results in an extremely small voltage drop. I saw 0.02V drop, so in essence, there is no drop.

Schematic



Drill Template

This is the drill template I used to order my box from Pedal Parts Plus. The box I specified was their standard 125B, code 1400.