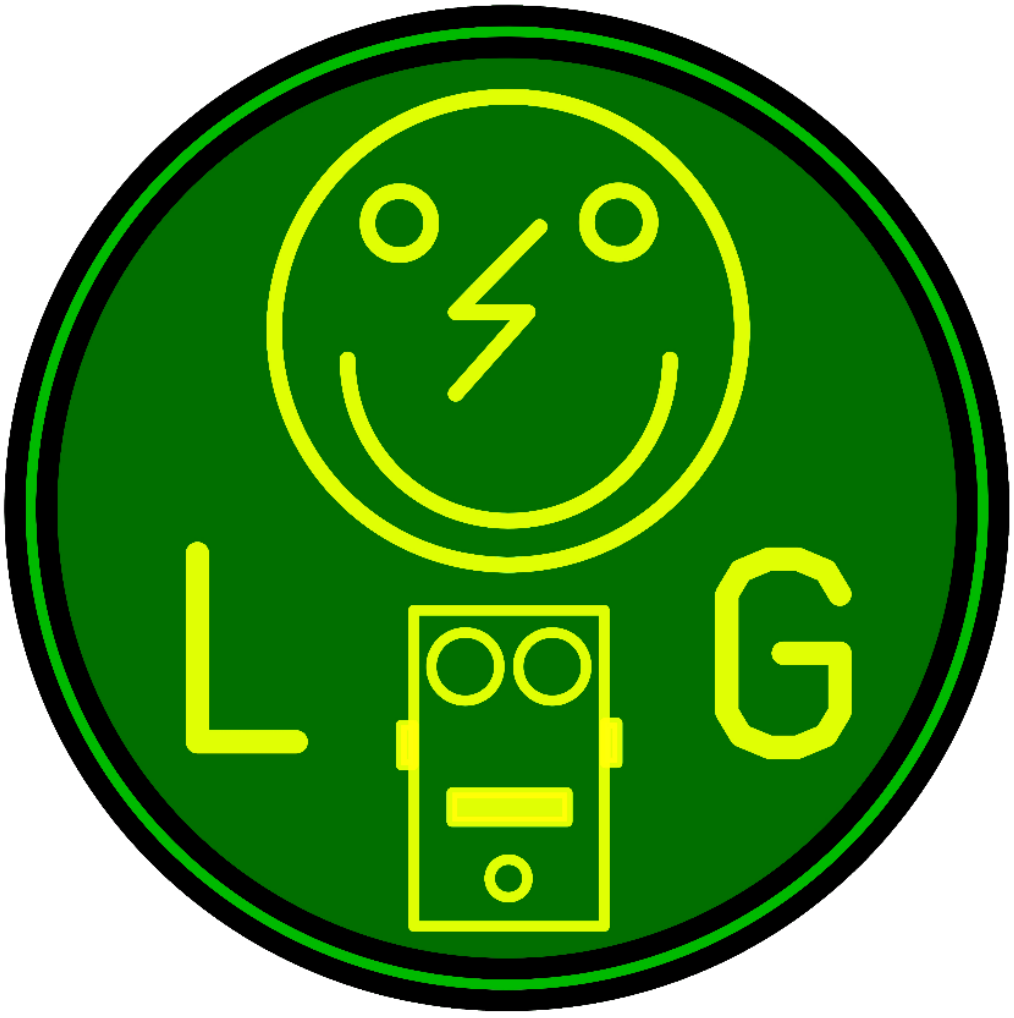
Humming Bee OD
Building instructions
V1.0.1



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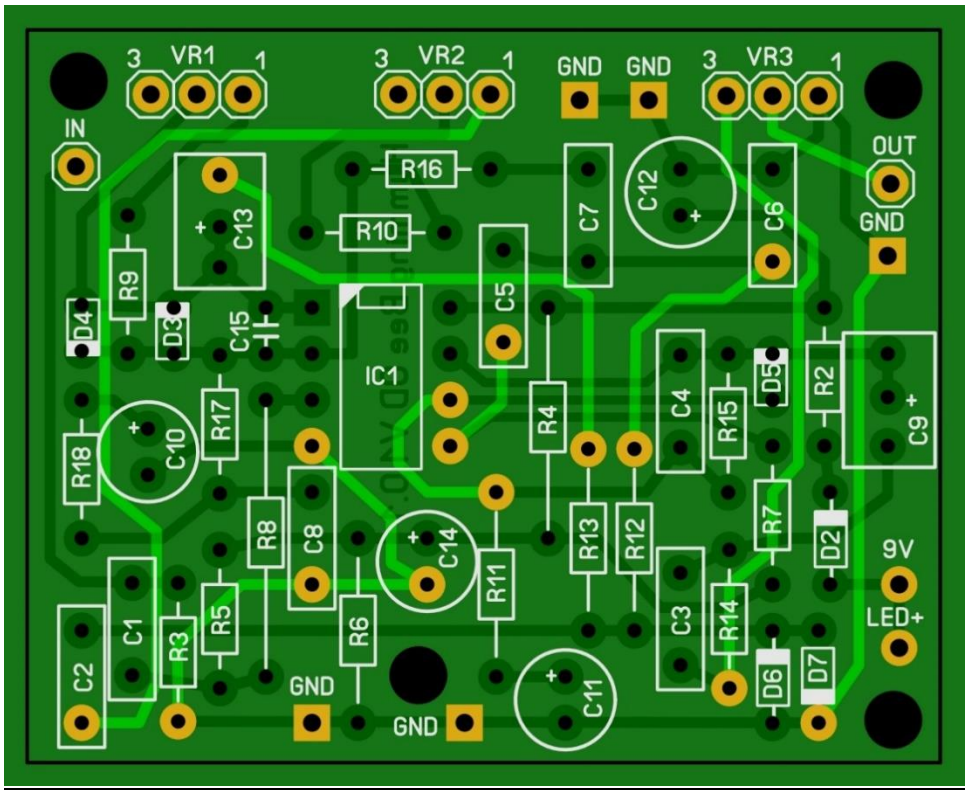
Components

Part	Value	Comment	Part	Value	Comment
C1	4n7	MKT	**IC1**	**OP275**	Socket
C2	22n	MKT	**R2**	51R or 47R	
C3	4n7	MKT	**R3**	1M	
C4	1n	MKT	**R4**	47k	
C5	22n	MKT	**R5**	**360k**	
C6	22n	MKT	**R6**	47k	
C7	4n7	MKT	**R7**	1M	
C8	220n	MKT	**R8**	6k8	
C9	1u	MKT	**R9**	3k	
C10	22u	Electrolyte	**R10**	**13k7**	
C11	22u	Electrolyte	**R11**	**2k61**	
C12	100u	Electrolyte	**R12**	10k	
C13	1u	MKT	**R13**	2k	
C14	22u	Electrolyte	**R14**	47k	
C15	100p	Ceramic	**R15**	5k6	
D2	1N5817		**R16**	150k	
D3	Red 3mm LED	Socket	**R17**	1k	
D4	Red 3mm LED	Socket	**R18**	5k6	
D5	Red 3mm LED	Socket	**VR1**	A500k	Drive
D6	1N4007		**VR2**	B50k	Focus
D7	1N4007		**VR3**	B50k	Volume

* Parts marked in red are specialty parts



General guideline for components

- Capacitors: All values under 1nF should be ceramic disks. From 1nF up to 1uF should be MKT (foil/metalfilm capacitors) and over 1uF use electrolyte caps (or tantalum) 16V+ rated and watch out for polarity!
- Resistors: use 1% metalfilm for the best results.
- Socket all IC's and 3mm LED's. This way you can easily mod them or replace them if they break.

General building tips

Soldering this board can be complicated for some people since the solder pads can be very close together. Use a magnifying glass to make the job easier.
Start by soldering the resistors. It is best to solder diodes D2, D6 and D7 in an upright position (remember the polarity) so do not solder them yet. Next, solder the sockets for the IC's and LED's. For the LED's you can buy a 20 pin SIL socket and cut of the pins you need. IC1 requires a 8 pin DIL socket. Now solder the ceramic capacitors, the Diodes D2,6 and 7, then you can solder the MKT capacitors (not the 1u ones!) and the electrolyte capacitors. Now finish by soldering the 1u MKT capacitors. Place the IC's and transistors and you are almost ready to rock. The white triangle on the IC's point to where pin 1 of the IC should be inserted.

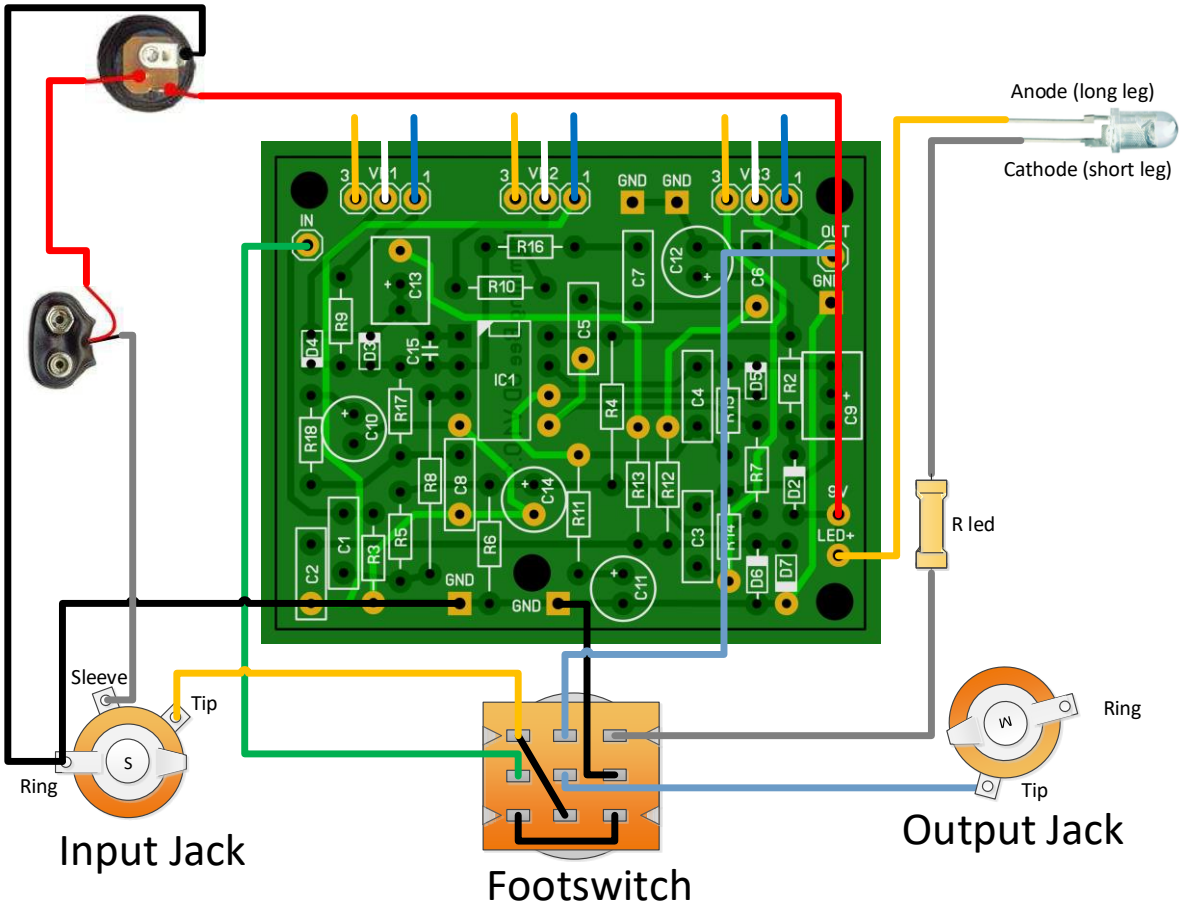
Besides the components mentioned in the table on the first page, you will need:

- **2 input jacks**. 2 mono jacks if you are not going to use a battery but only the 9V adapter. 1 mono (for output) and 1 stereo jack (for input) if you will be using both a 9V battery and the 9V adapter.
- **3PDT footswitch** (9 pins). I also carry an easy off board circuit for this.
- **2,1mm DC jack** (isolated).
- **9v battery clip** (optional).
- **22 gage stranded hook-up wire.**
- **Hammond 1590B** case (or similar) in your favourite colour. A 1590BB will give you more room to experiment with.

Modifications

You can experiment with different types of 3 mm LED's. It is reported that green LED's are very suitable as replacements.

Offboard wiring



Blue = pin 1
White = pin 2
Yellow = pin 3

Notice that in the “off” position the effect input is connected to ground to prevent possible oscillation.

The LED requires a resistor (R led in the diagram) depending on the type of LED you are using. An ultra-bright red or blue LED requires a 3k3 resistor.

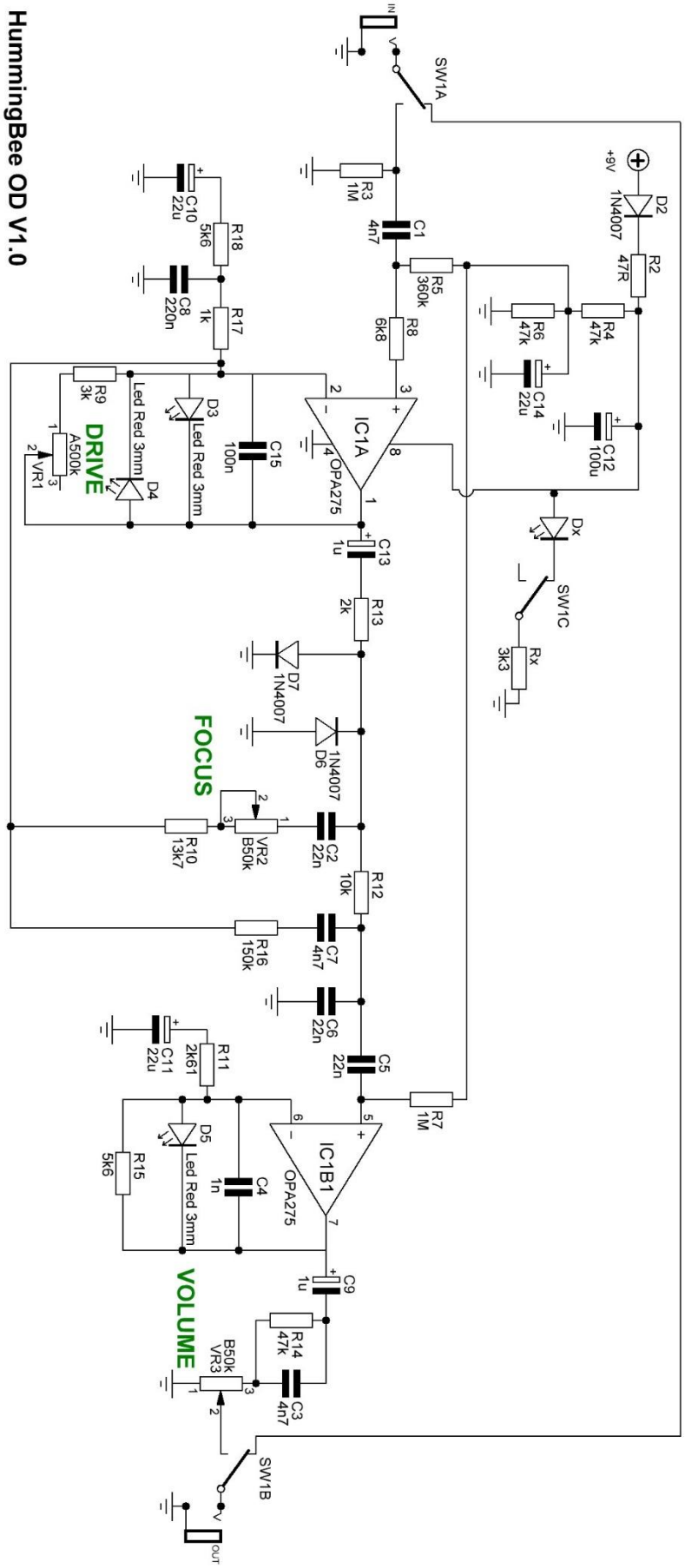
Troubleshooting

All PCB's have been e-tested 100% in the factory, so there should not be a connection problem on the PCB itself.

The board is not working (at all), what now?

- Check if your 9V is plugged in correctly (and/or soldered correctly on the board).
- Check that you oriented the capacitors, IC's ,transistors and diodes the right way. MKT capacitors and resistors do not need to be oriented.
- Check if you used the correct values of the components. For resistors you can look here: http://www.diyaudioandvideo.com/Electronics/Color/
- Double and triple check your soldering! A lose or cold solder can be really bad for your board.
- Replace the IC's and transistors, one might be defective. Before doing that first unplug the 9V and wait 5 seconds.
- Check that you have good/high grade components. A lot of Chinese sourced parts are fakes (especially high end opamps) so be careful that you source your parts from reliable suppliers.

Schematic


HummingBee OD V1.0
IN
OUT
SW1A
SW1B
SW1C
+9V
D2
1N4007
R2
47R
R3
1M
C1
4n7
R5
360k
R8
6k8
R4
47k
R6
47k
C14
22u
C12
100u
C10
22u
R18
5k6
C8
220n
R17
1k
R9
3k
D3
Led Red 3mm
C15
100n
IC1A
OPA275
DRIVE
A500k
VR1
D4
Led Red 3mm
C13
1u
R13
2k
Dx
Rx
3k3
D7
1N4007
D6
1N4007
FOCUS
R10
13k7
VR2
B50k
C2
22n
R12
10k
R16
150k
C7
4n7
C6
22n
C5
22n
R7
1M
C11
22u
R11
2k61
D5
Led Red 3mm
R15
5k6
C4
1n
IC1B1
OPA275
C9
1u
VOLUME
B50k
VR3
R14
47k
C3
4n7