



# 3-Band Rat

Rat with a Marshall-type  
3 band EQ



# Important notes

## If you're using any of our footswitch daughterboards, DOWNLOAD THE DAUGHTERBOARD DOCUMENT

- Download and read the appropriate build document for the daughterboard as well as this one BEFORE you start.
- DO NOT solder the supplied Current Limiting Resistor (CLR) to the main circuit board even if there is a place for it. This should be soldered to the footswitch daughterboard.

## POWER SUPPLY

Unless otherwise stated in this document this circuit is designed to be powered with 9V DC.

## COMPONENT SPECS

Unless otherwise stated in this document:

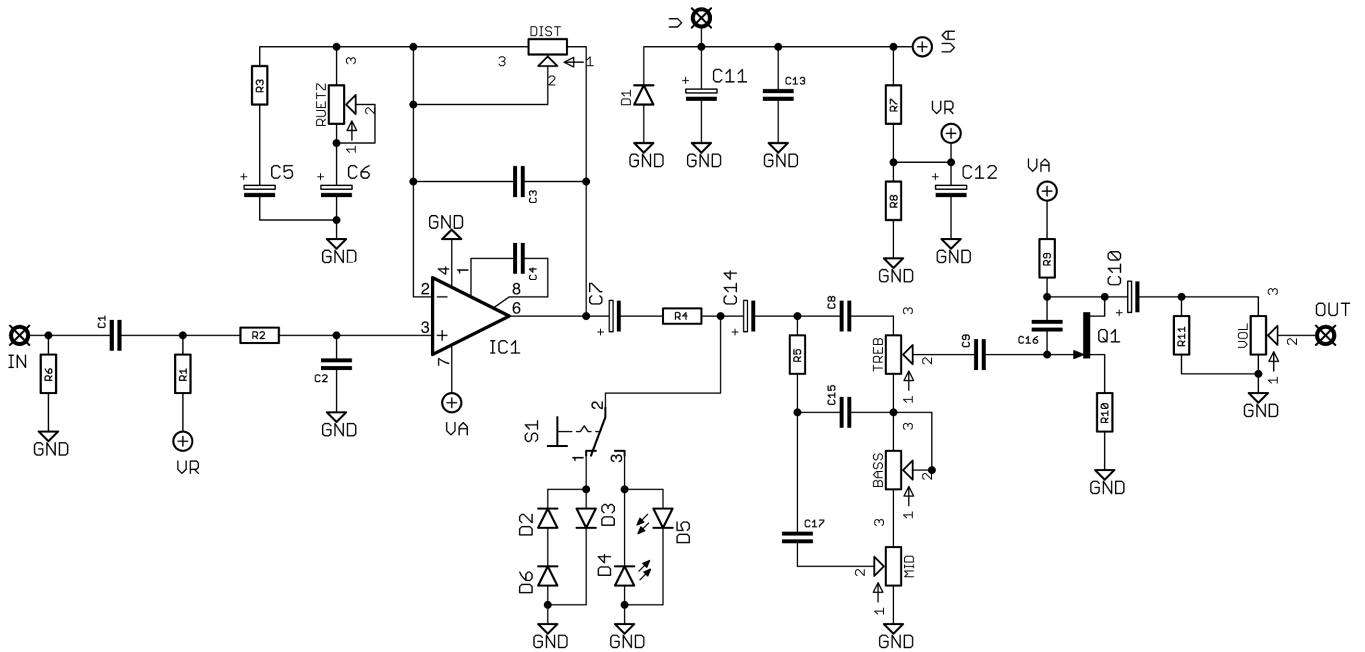
- Resistors should be 0.25W. You can use those with higher ratings but check the physical size of them.
- Electrolytics caps should be at least 25V for 9V circuits, 35V for 18V circuits. Again, check physical size if using higher ratings.

## LAYOUT CONVENTIONS

Unless otherwise stated in this document, the following are used:

- **Electrolytic capacitors:**  
Long leg (anode) to square pad.
- **Diodes/LEDs:**  
Striped leg (cathode) to square pad. Short leg to square pad for LEDs.
- **ICs:**  
Square pad indicates pin 1.

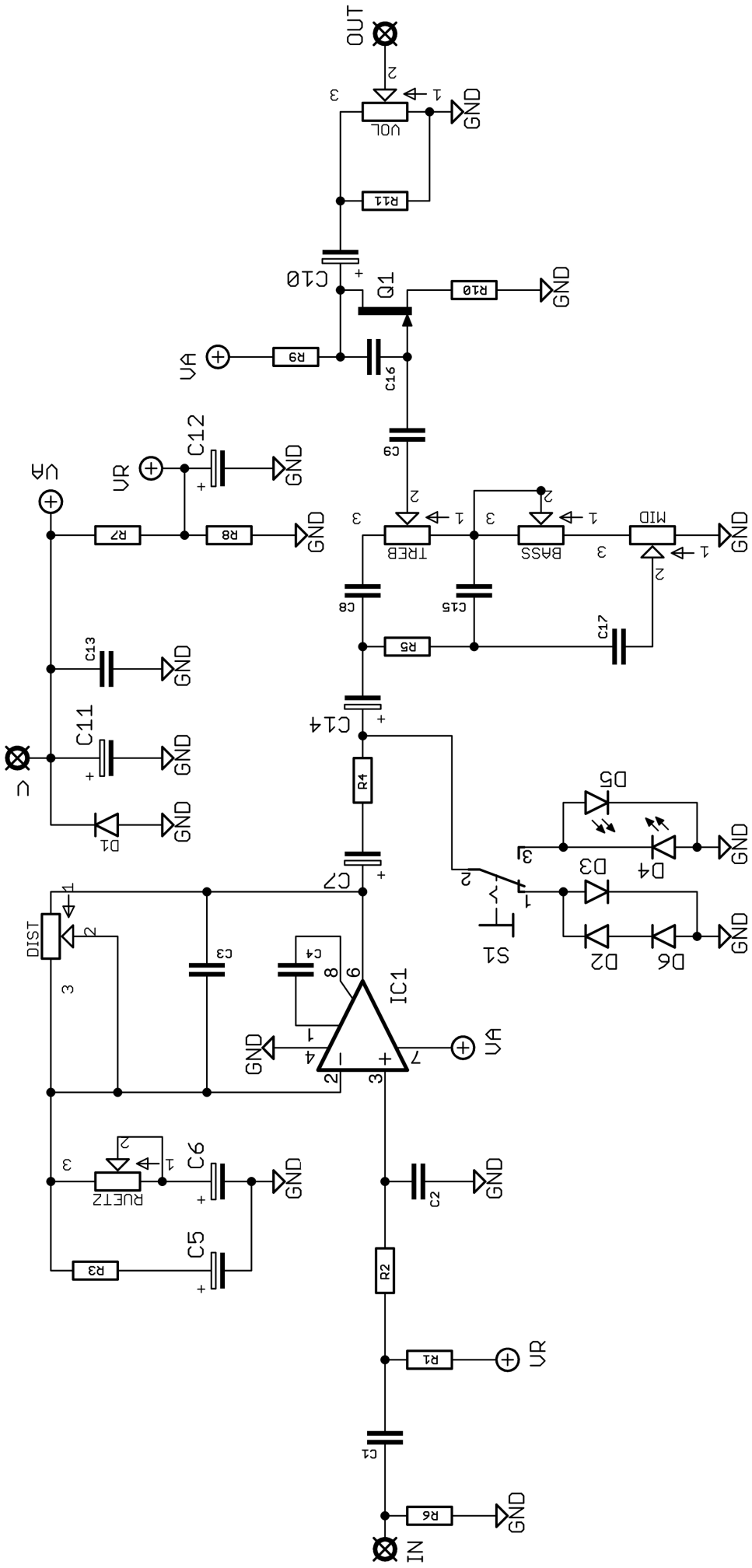
# Schematic + BOM

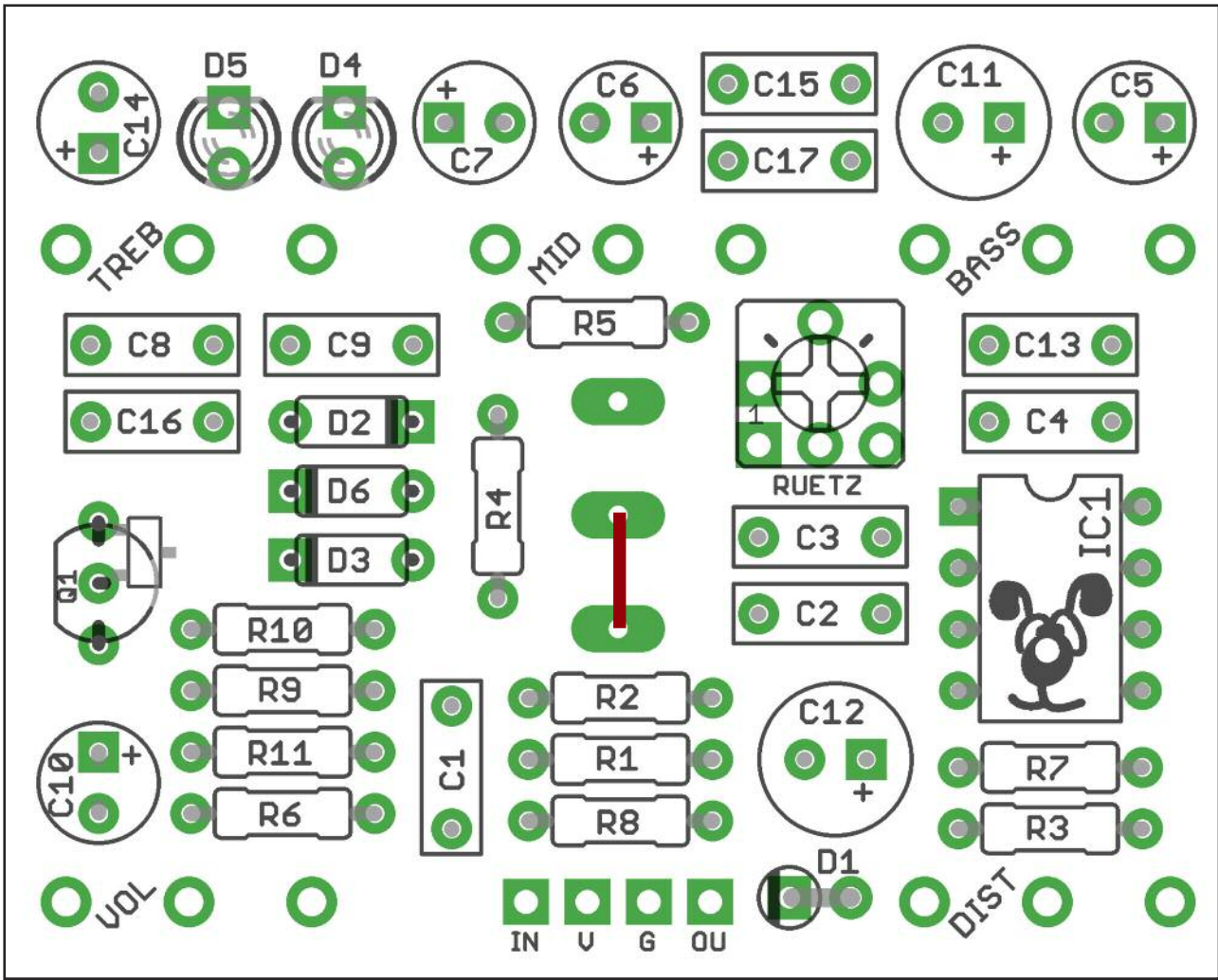


R1	1M	C1	22n	D1	1N4001
R2	1K	C2	1n	D2-3	1N4148
R3	560R	C3	100p	D4-5*	3mm Red LED
R4	1K	C4	33p	D6*	Jumper
R5	33K	C5	4u7 elec	IC1	LM308 / OP07
R6	1M	C6	2u2 elec	Q1**	2N5457
R7	10K	C7	4u7 elec	VOL	100KA
R8	10K	C8	470p	DIST	100KA
R9	10K	C9	22n	BASS	1MA
R10	1K5	C10	1u elec	MID	25KA
R11	1M	C11	100u elec	TREB	250KA
		C12	47u elec	RUEZ	1K TRIM
		C13	47n		
		C14	4u7 elec	S1*	SPDT ON-ON
		C15	22n		
		C16	100p		
		C17	22n		

\*S1 and D4-5 are optional alternative clipping. If you prefer to keep it standard just leave those out and add a jumper on S1 as shown on page 5. We've also added an extra spot, D6, so you can experiment with asymmetrical clipping if you like. Use 1N4148 in here if you want to try it.

\*\*You can use through-hole or SMT parts (MMBF5457) for Q1.





The power and signal pads on the PCB conform to the FuzzDog Direct Connection format, so can be paired with the appropriate daughterboard for quick and easy offboard wiring. Check the separate daughterboard document for details.

Be very careful when soldering the transistor, diodes and LED. They're very sensitive to heat. You should use some kind of heat sink (crocodile clip or reverse action tweezers) on each leg as you solder them. Keep exposure to heat to a minimum (under 2 seconds).

Snap the small metal tag off the pots so they can be mounted flush in the box.

You should solder all other board-mounted components before you solder the pots. Once they're in place you'll have no access to much of the board. Make sure your pots all line up nicely.

The best way to do that is to solder a single pin of each pot in place then melt and adjust if necessary before soldering in the other two pins. If your pots don't have protective plastic jackets ensure you leave a decent gap between the pot body and the PCB otherwise you risk shorting out the circuit.

If you're not adding the extra clipping in positions D4 and D5, add a jumper wire on S1 as shown in red above.

A jumper is required in D6 if you aren't adding an extra diode for asymmetrical clipping.

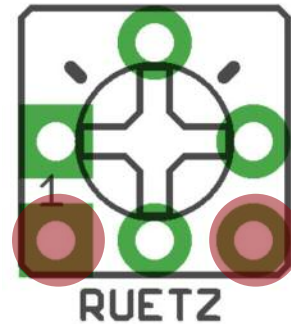


# Extra notes....

## No Ruez mod please

Replace the 1K Ruez trimmer with a 47R resistor if you want to keep things stock.

You'll need to place it vertically into these pads >>>>

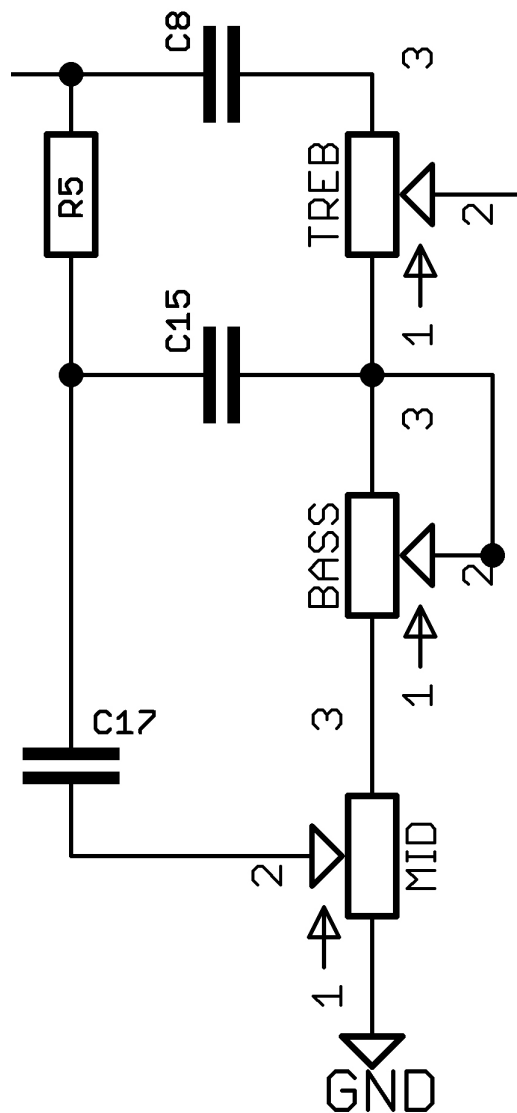


## Tone stack tweaking

No rules here. Google is your friend.

The values in the BOM are taken from the Krank Distortus Maximus and work very well. A boutique variation of that circuit, the ProTone Body Rot, uses the following values:

BASS	50KA
MID	2KB
TREB	25KB
R5	2K2
C8	4n7
C15	330n
C17	330n



# Test the board!

**Check the relevant daughterboard document for more info before you undertake this stage.**

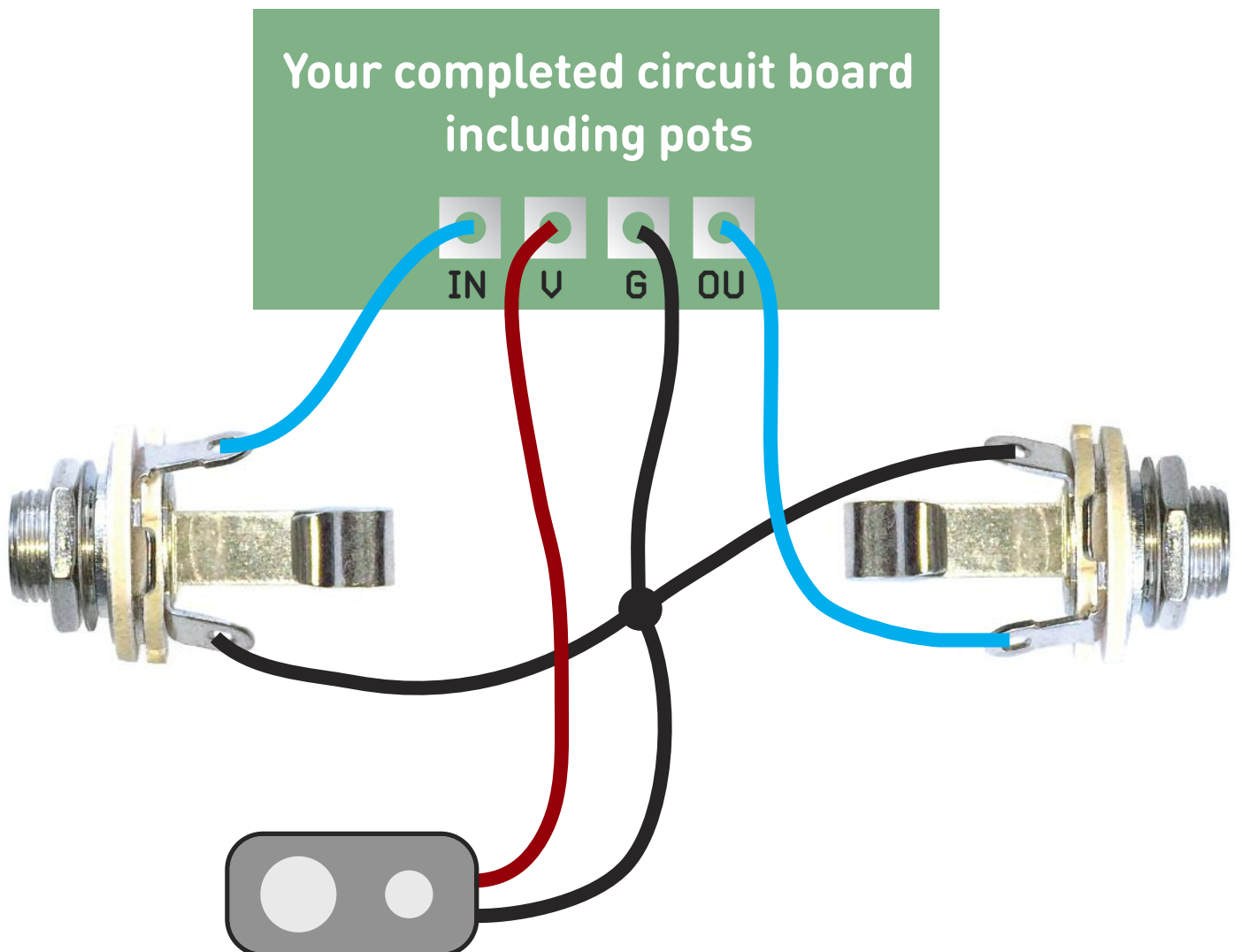
**UNDER NO CIRCUMSTANCES will troubleshooting help be offered if you have skipped this stage. No exceptions.**

Once you've finished the circuit it makes sense to test it before starting on the switch and LED wiring. It'll cut down troubleshooting time in the long run. If the circuit works at this stage, but it doesn't once you wire up the switch - guess what? You've probably made a mistake with the switch.

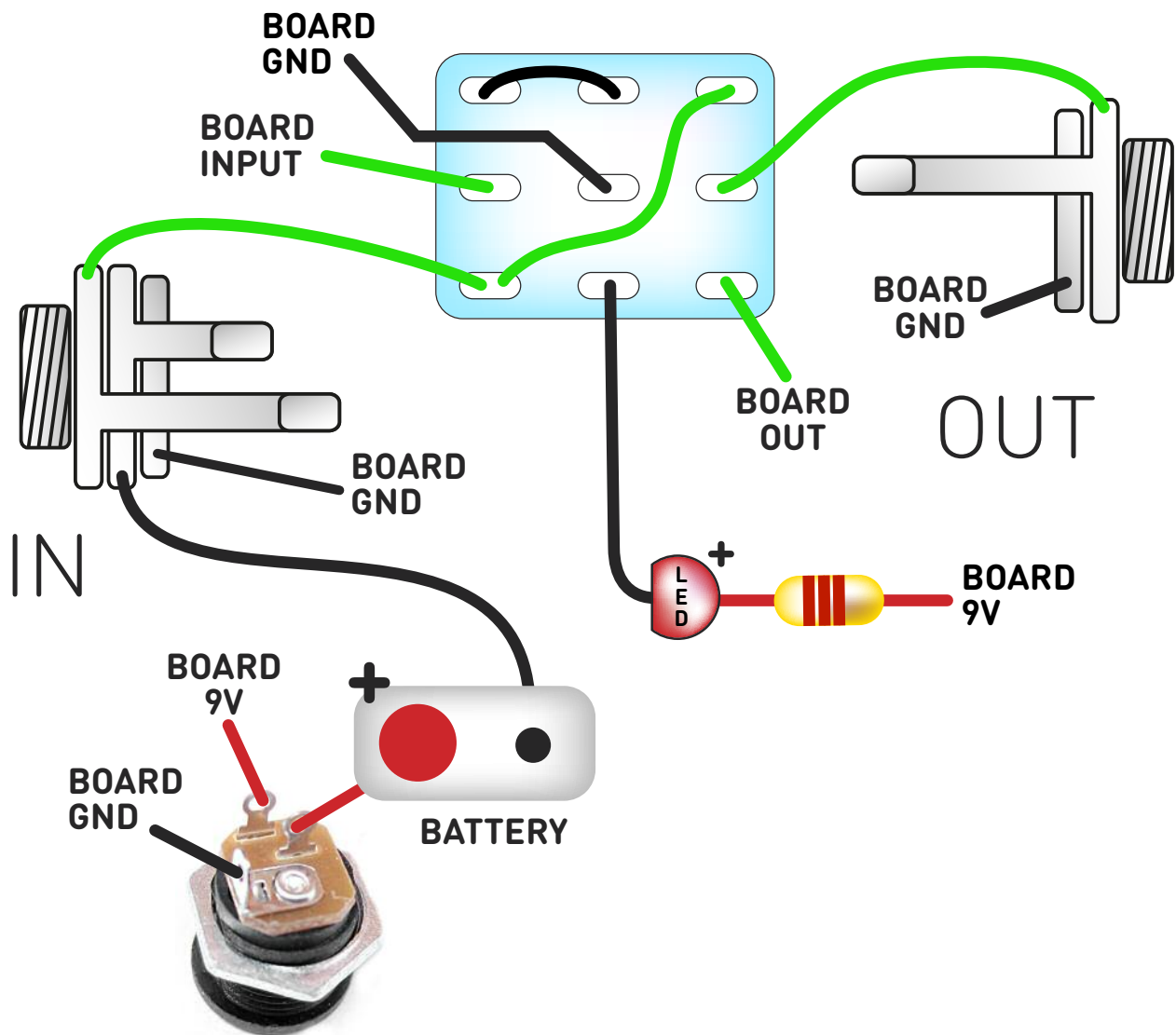
Solder some nice, long lengths of wire to the board connections for 9V, GND, IN and OUT. Connect IN and OUT to the jacks as shown. Connect all the GNDs together (twist them up and add a small amount of solder to tack it). Connect the battery + lead to the 9V wire, same method. Plug in. Go!

If you're using a ribbon cable you can tack the wires to the ends of that. It's a lot easier to take them off there than it is to desolder wires from the PCB pads.

If it works, carry on and do your switch wiring. If not... aw man. At least you know the problem is with the circuit. Find out why, get it working, THEN worry about the switch etc.



# Wire it up (if using a daughterboard please refer to the relevant document)



Wiring shown above will disconnect the battery when you remove the jack plug from the input, and also when a DC plug is inserted.

The Board GND connections don't all have to directly attach to the board. You can run a couple of wires from the DC connector, one to the board, another to the IN jack, then daisy chain that over to the OUT jack.

It doesn't matter how they all connect, as long as they do.

This circuit is standard, Negative GND. Your power supply should be Tip Negative / Sleeve Positive. That's the same as your standard pedals (Boss etc), and you can safely daisy-chain your supply to this pedal.



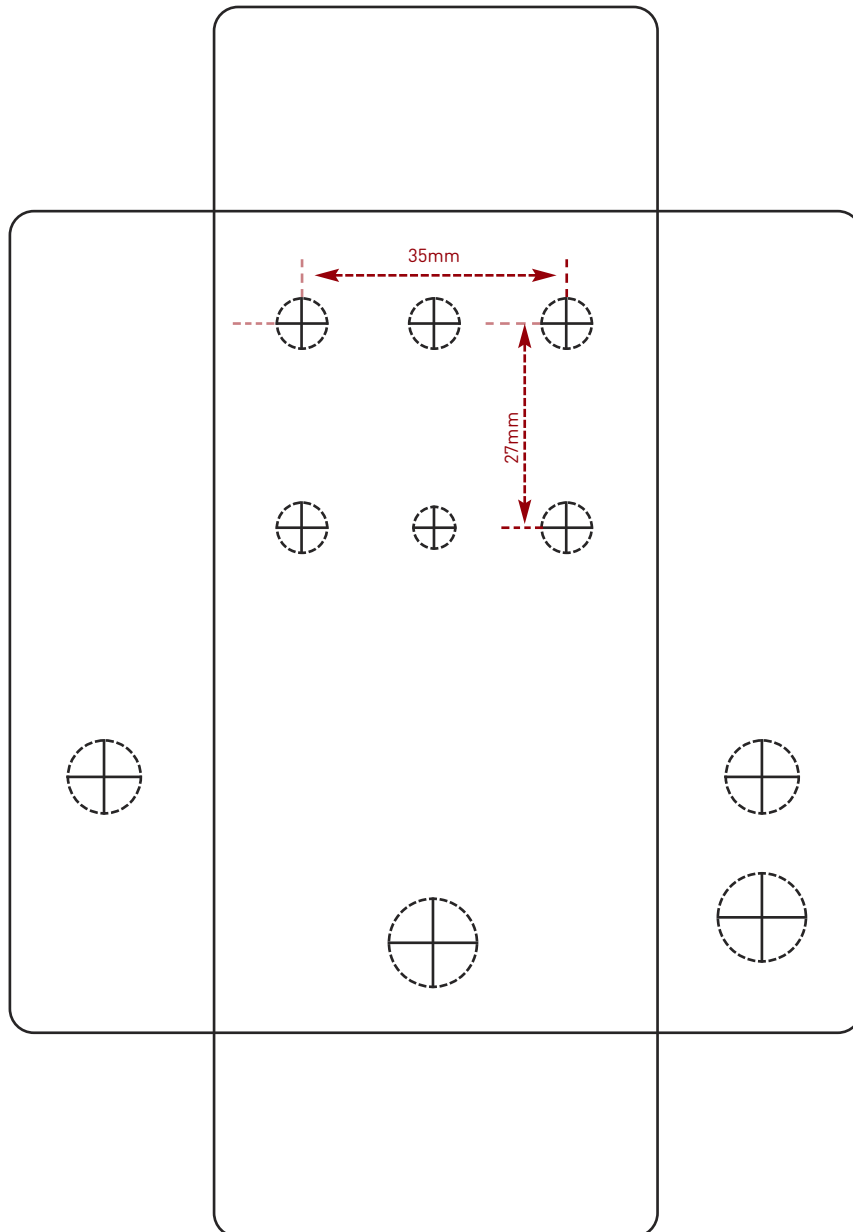
# Drilling template

Hammond 1590B  
60 x 111 x 31mm

Recommended drill sizes:

Pots	7mm
Jacks	10mm
Footswitch	12mm
DC Socket	12mm
Toggle switches	6mm

It's a good idea to drill the pot and toggle switch holes 1mm bigger if you're board-mounting them.  
Wiggle room = good!



This template is a rough guide only. You should ensure correct marking of your enclosure before drilling. You use this template at your own risk. Pedal Parts Ltd can accept no responsibility for incorrect drilling of enclosures.

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