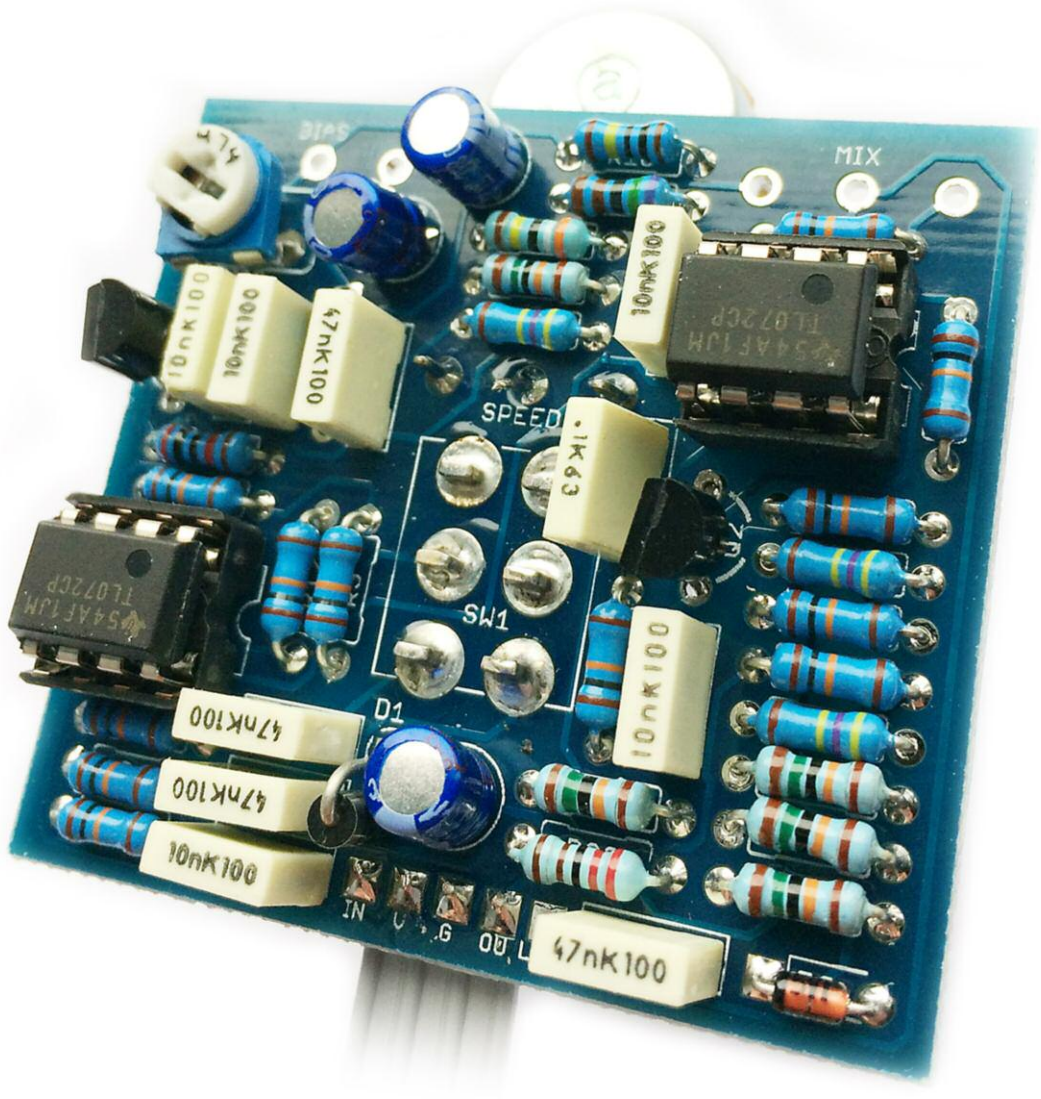
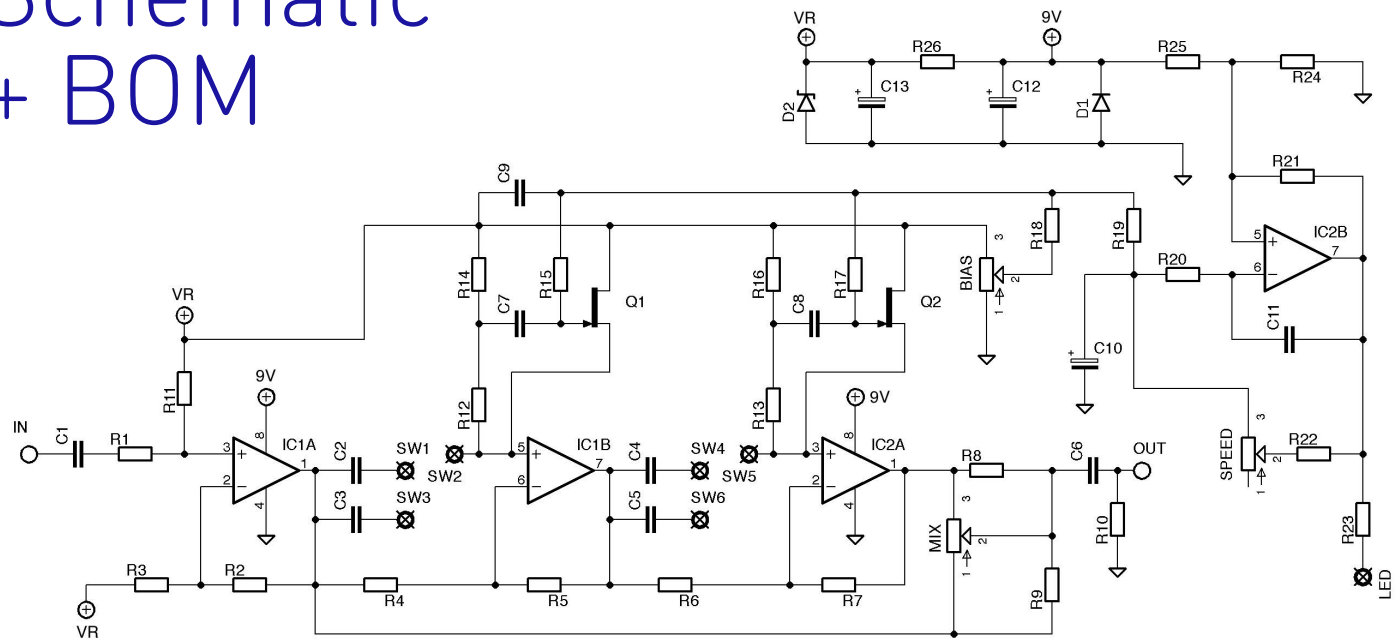


Phase 45

Swooshy goodness with some interesting mods

Schematic + BOM



R1	10K
R2	10K
R3	20K
R4	10K
R5	10K
R6	10K
R7	10K
R8	10K
R9	10K
R10	150K
R11	470K
R12	10K
R13	10K
R14	10K
R15	470K
R16	10K
R17	470K
R18	1M
R19	3M9
R20	150K
R21	150K
R22	7K5
R23	2K2
R24	150K
R25	150K
R26	10K

C1	10n
C2	47n
C3	10n
C4	47n
C5	100n
C6	47n
C7	10n
C8	10n
C9	47n
C10	10u
C11	10n
C12	10u
C13	10u

Q1,2	Matched FETS* (2N5457, 2N5952 etc)
D1	1N4001
D2	5.1v zener
IC1,2	TL072
MIX	20KB**
SPEED	500KC***
BIAS	220-500K Trim or pot‡
SW1	DPDT ON-ON‡‡

*Watch your pinouts. The PCB is designed for 2N5457 but other FETs may need rotating.

**Optional. If you're using a MIX pot then leave out R8-9.

***500KB will do but the sweep is better with reverse log.

‡ A 250KB pot is recommended if you want external bias.

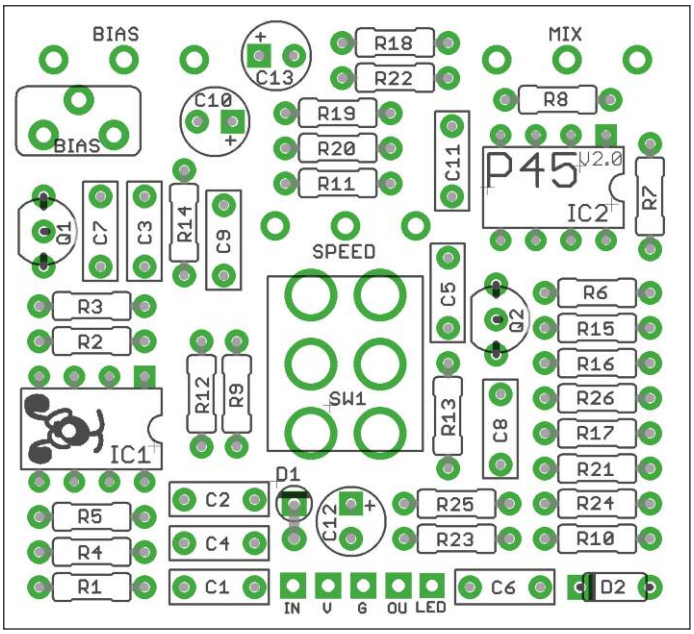
‡‡ Optional UniVibe mode switch. You need to place a couple of jumpers if not doing this mod. See later in doc.

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 diodes and transistors. 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). Sockets are recommended for the ICs.

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

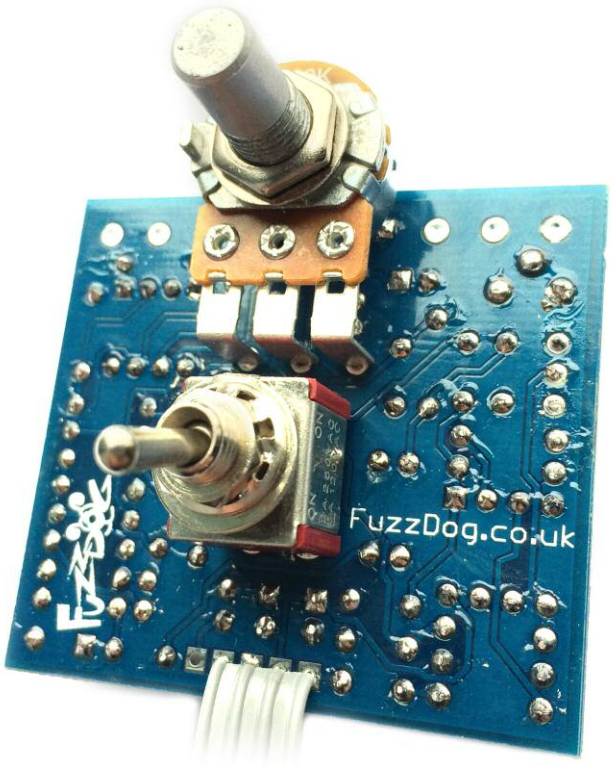
You should solder all other board-mounted components before you solder the pots. Once they're in place you'll have no access to much of the board. Make sure your pots all line up nicely. The best way to do that is to solder a single pin of each pot in place then melt and adjust if necessary before soldering 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.

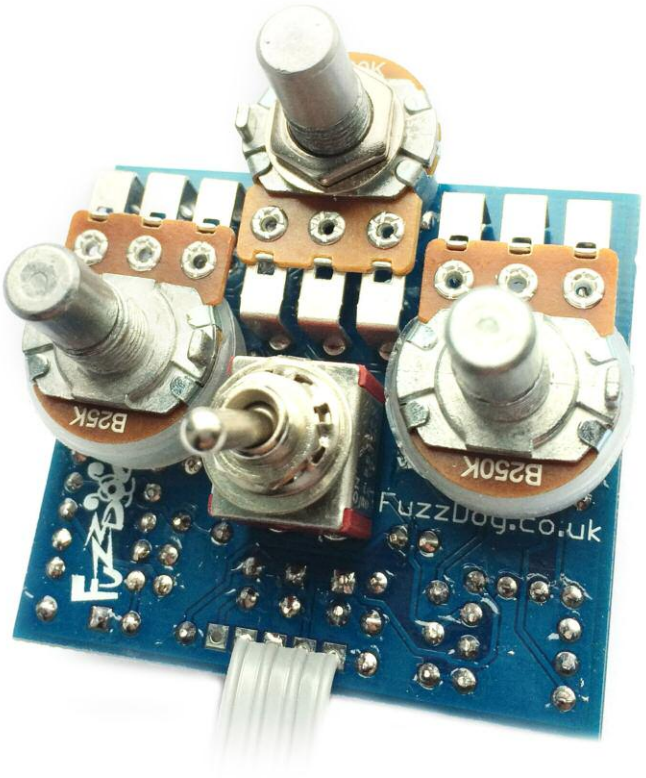


Same goes for the toggle switch. Use your enclosure as a guide for positioning them to ensure they line up properly. Solder one lug, then melt it and adjust to get it straight before soldering any others.

Positive (anode) legs of the electrolytic caps go to the square pads.

Negative (cathode) legs of the diodes go to the square pads.





MODS

External Bias

Simply use a pot instead of the trimmer for the BIAS control. 250KB is best.

Mix Control

By altering the amount of phased signal in the mix you can get a wide range of sounds, from phasing to a kind of pitch-shifted vibrato.

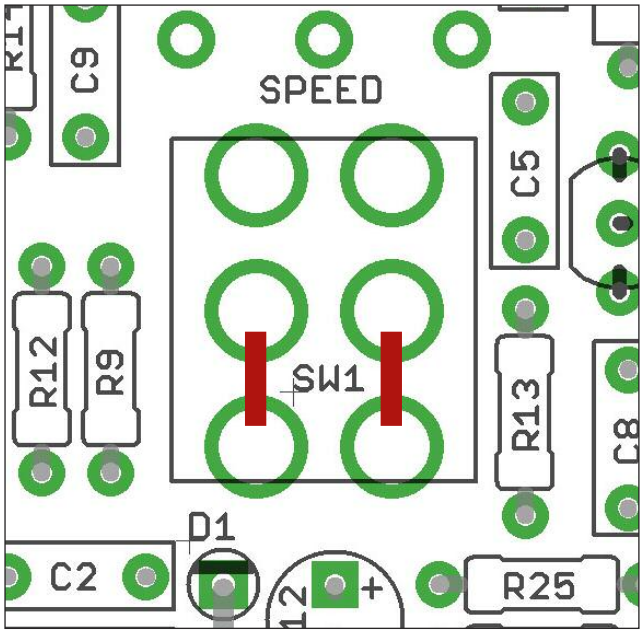
Use a 20KB pot and leave out R8 and R9.

UniVibe-ish Mode

By replacing a pair of matched caps with different values you can get a decent approximation of a UniVibe. It's no match for the real thing, but an interesting effect nonetheless.

C3 and C5 are the extra caps. If you aren't doing this mod, leave them out. If you've already put them in because you don't read the whole doc before building, no matter. They'll have no effect unless you add the switch.

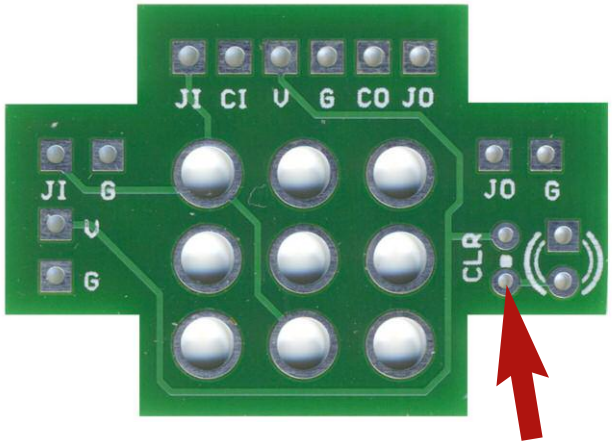
If you aren't adding this switch you should place jumpers across the switch pads shown.



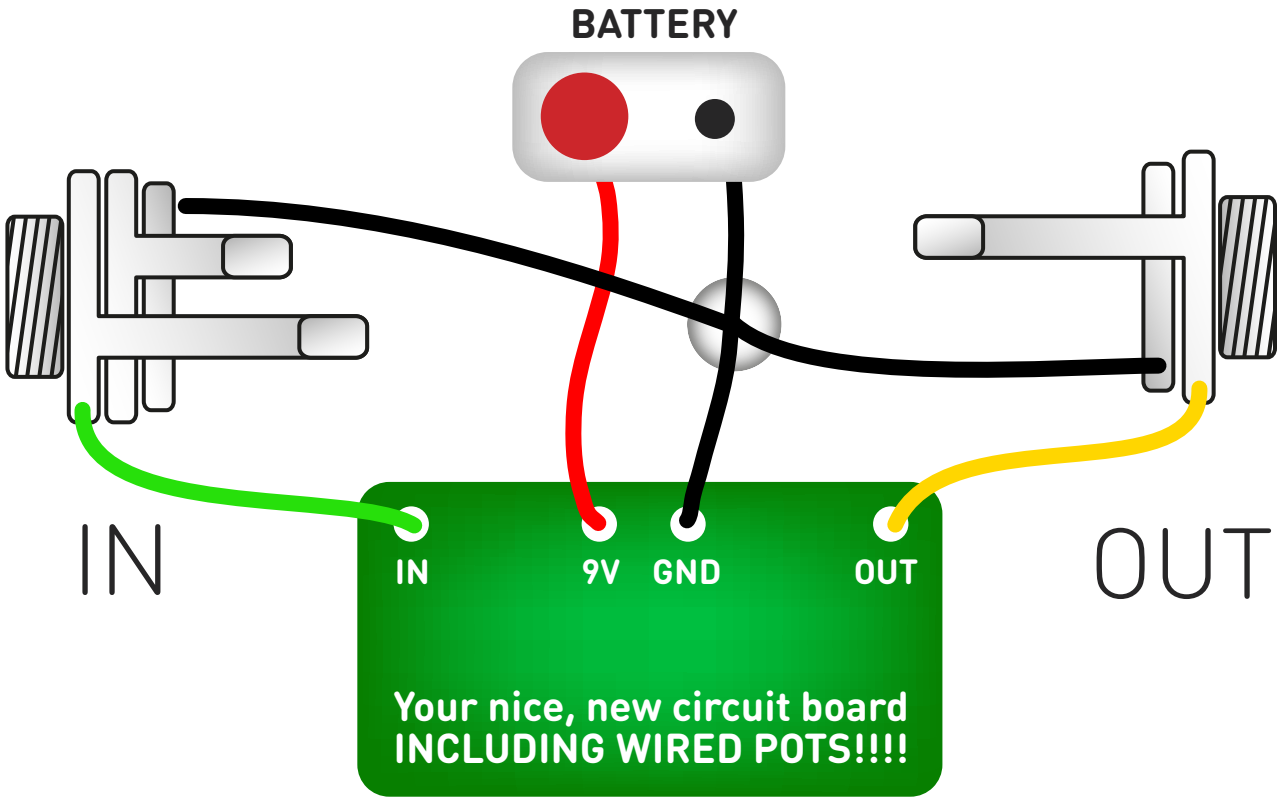
Flashing Rate LED

The LED pad on the main PCB will give you a voltage that matches the rate of the effect. You can add an always-on indicator by wiring up an LED to this pad and any ground point.

If you want your bypass indicator LED to flash you should use this pad to send power to the footswitch daughterboard. Leave the Current Limiting Resistor off the daughterboard and take a wire from the LED pad of the main PCB to the point shown.



Test the board!



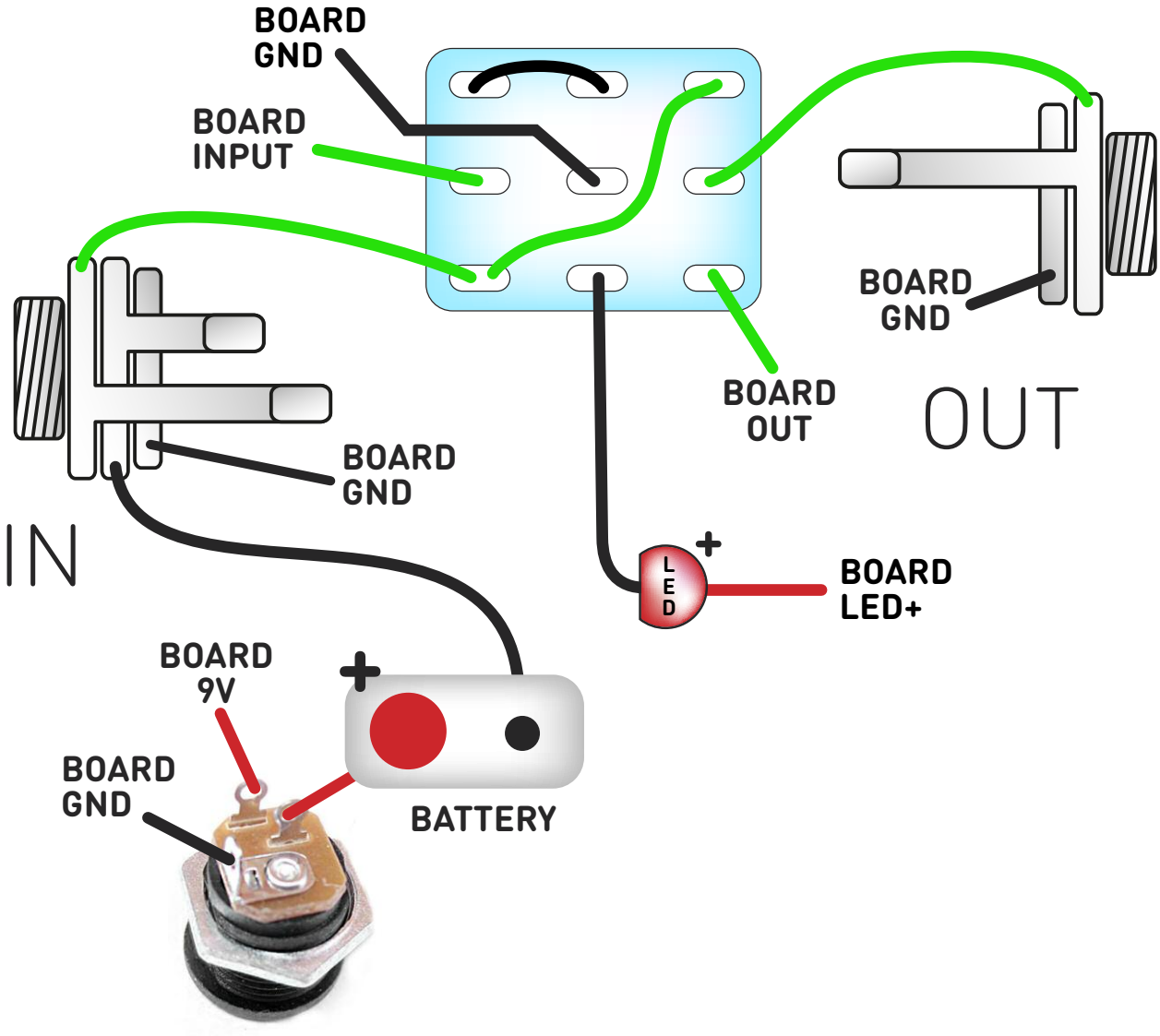
UNDER NO CIRCUMSTANCES will troubleshooting help be offered if you have skipped this stage. No exceptions.

Once you've finished the circuit it makes sense to test is 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 it works, crack 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

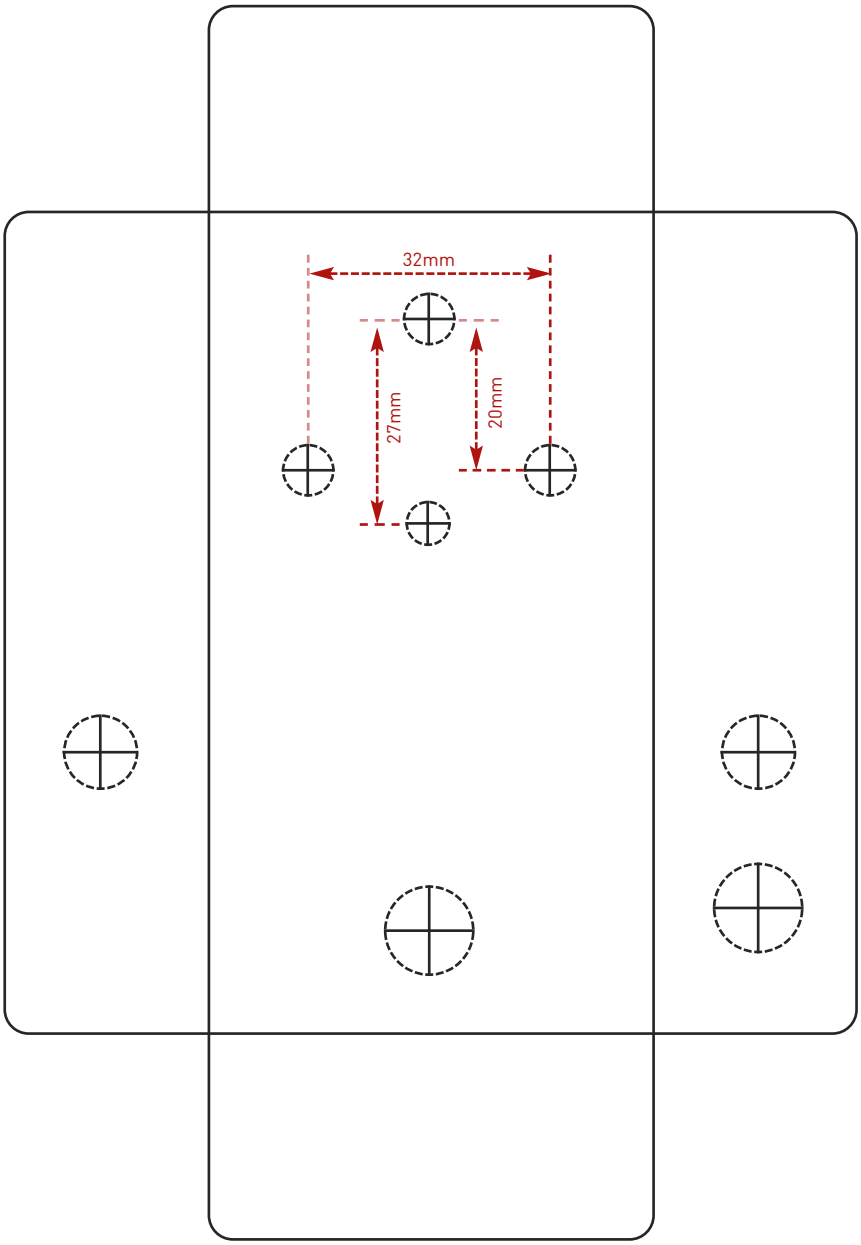
Hammond 1590B

60 x 111 x 31mm

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

Recommended drill sizes:

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



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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