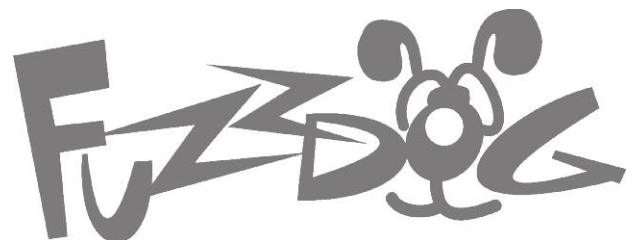


Signal Sloth

Based on the discontinued
Boss™ Slow Gear SG-1



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:

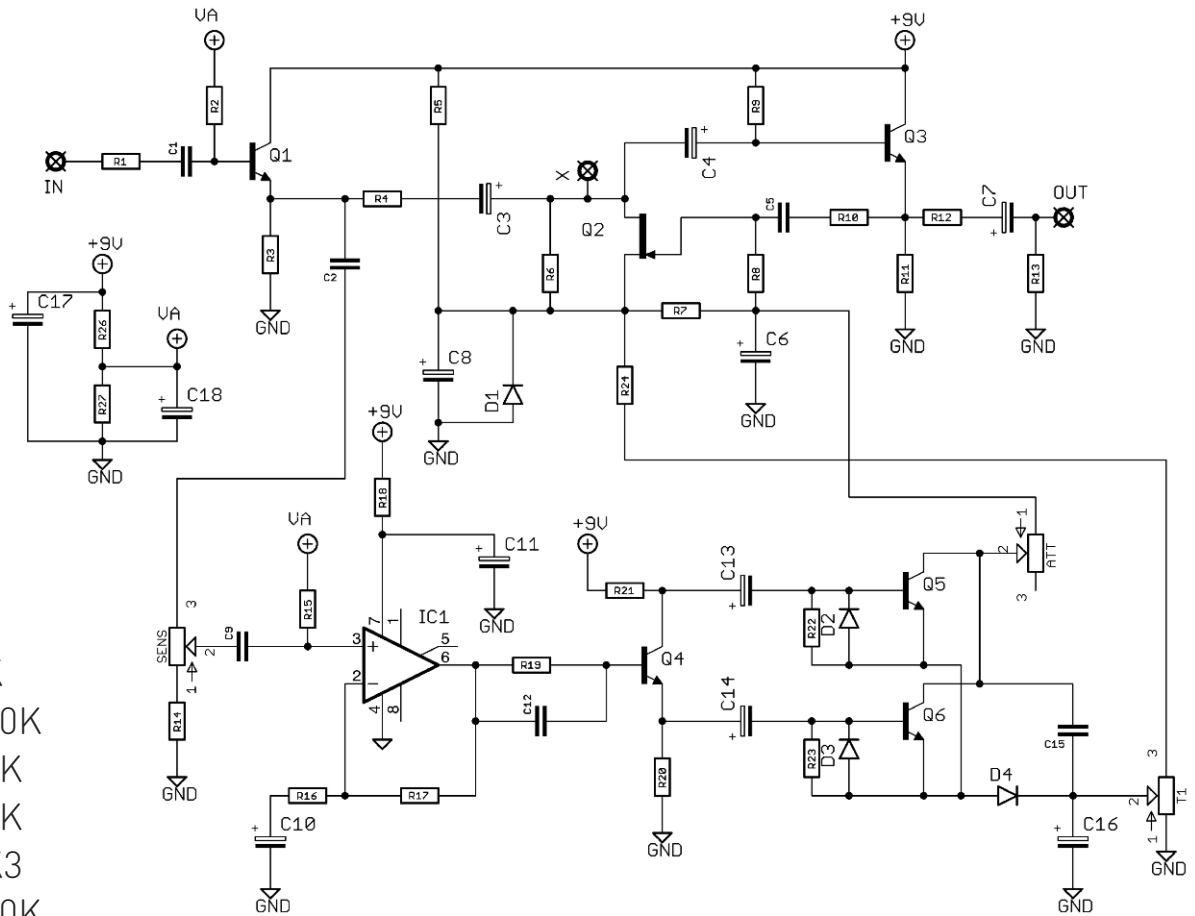
- Resistors should be 0.25W. You can use those with higher ratings but check the physical size of them.
- Electrolytics caps should be at least 25V for 9V circuits, 35V for 18V circuits. Again, check physical size if using higher ratings.

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

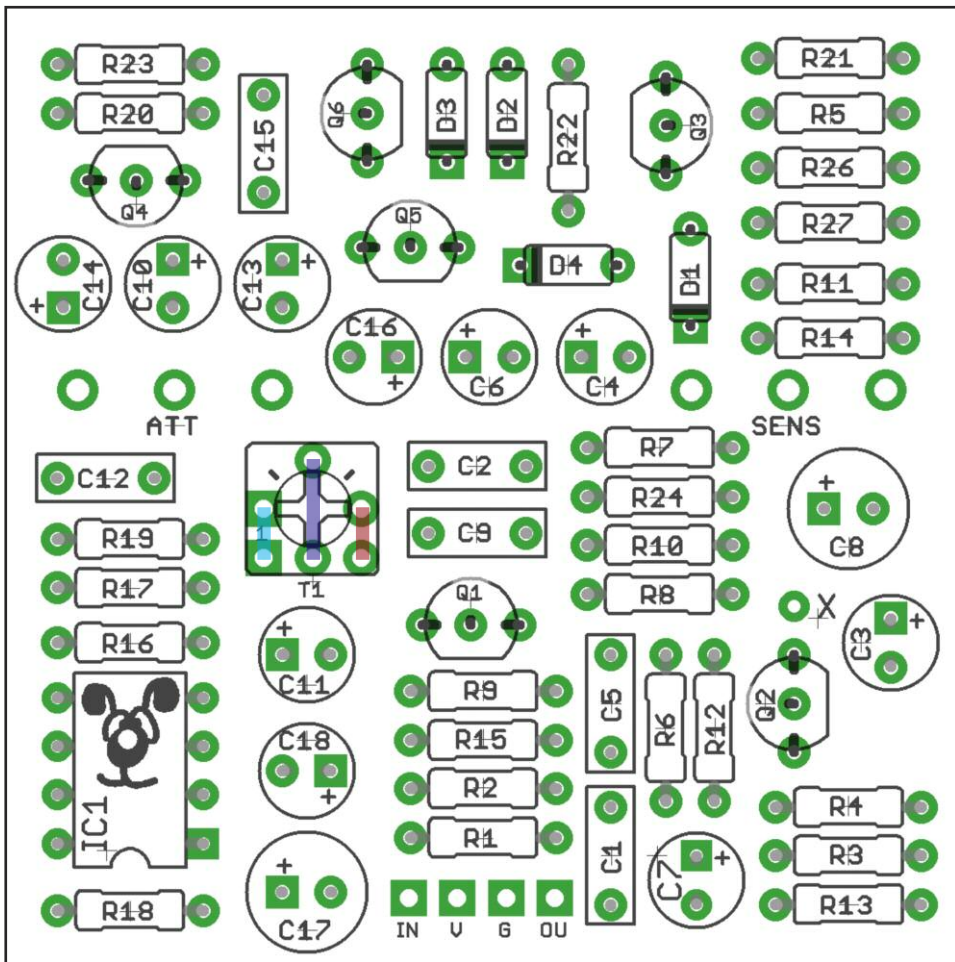


R1	1K
R2	470K
R3	10K
R4	22K
R5	3K3
R6	470K
R7	47K
R8	1M
R9	1M
R10	1M
R11	10K
R12	1K
R13	100K
R14	470R
R15	220K
R16	390R
R17	1M
R18	1K
R19	390K
R20	4K7
R21	4K7
R22	100K
R23	100K
R24	10K
R26	22K
R27	22K

C1	47n
C2	22n
C3	1u elec
C4	1u elec
C5	33n
C6	.47u elec
C7	1u elec
C8	47u elec
C9	22n
C10	1u elec
C11	10u elec
C12	1n
C13	1u elec
C14	1u elec
C15	47n
C16	10u elec
C17	47u elec
C18	10u elec

IC1	LM741
Q1	BC549
Q2	N-Channel FET*
Q3-6	BC549
D1	5v6 zener
D2-4	1N4148
ATT	25KB
SENS	100KA
T1	10KB trimmer

*Original uses a 2SK30A, but we got the same results with the more easy to obtain 2N5457. See later notes on pinouts.



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.

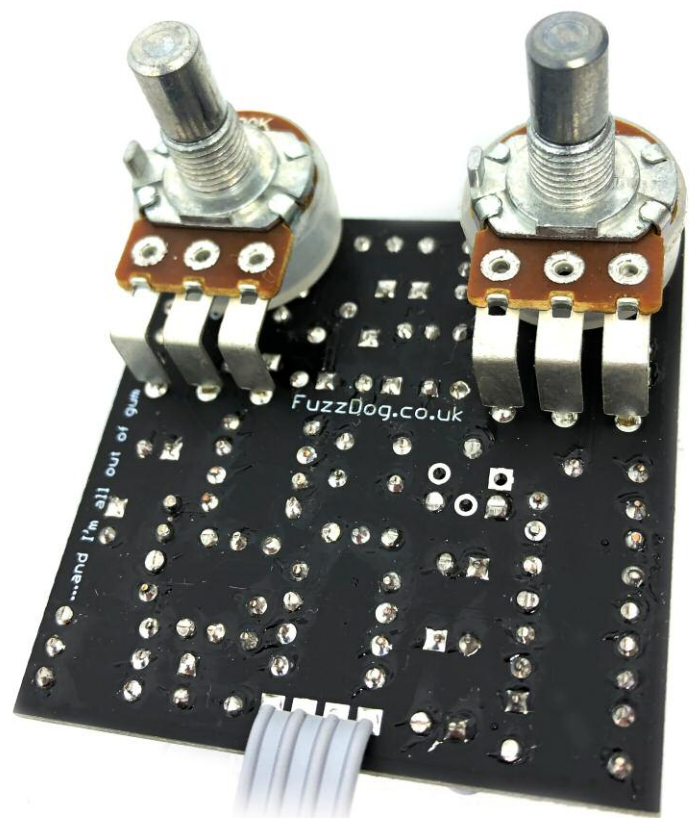
Be very careful when soldering the transistors and diodes. They're very sensitive to heat. Keep exposure to heat to a minimum (under 2 seconds) and leave a few seconds between soldering each leg. Same goes for the IC if you aren't using a socket.

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. Same for the toggle switch. 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.

There are extra pads on trimmers to allow different package formats to be used. Pads are connected via PCB traces as shown above, so just fit your trimmer into whichever holes it fits naturally into. As long as you have one pin each in the left, centre and right sections. No jumpers are required.



FET placement and biasing

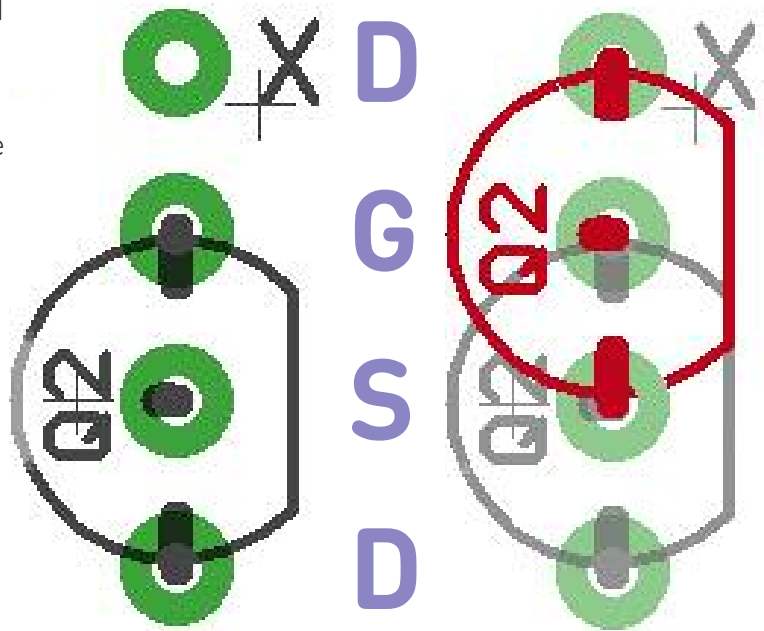
If you use a 2N5457 for Q2 it should be mounted in the pads following the orientation on the silk screen.

We've included an extra pad 'X' to accommodate FETs, in particular 2SK30A, with different pinouts. It's an extra Drain pad.

2N5457 have the pinout D S G

2SK30A are S G D

So, simply orientate a 2SK30A to fit Q2, then move the legs up one pad as shown in red in the right hand image.



You'll get no effect whatsoever until the FET is biased correctly.

To do this, set your Attack control all the way up, and Sensitivity no more than a quarter way up.

Now very slowly adjust the trimmer until you hear the desired slow note attack. There's a very small sweet spot. Use a multiturn trimmer to ensure best results.

Test the board!

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

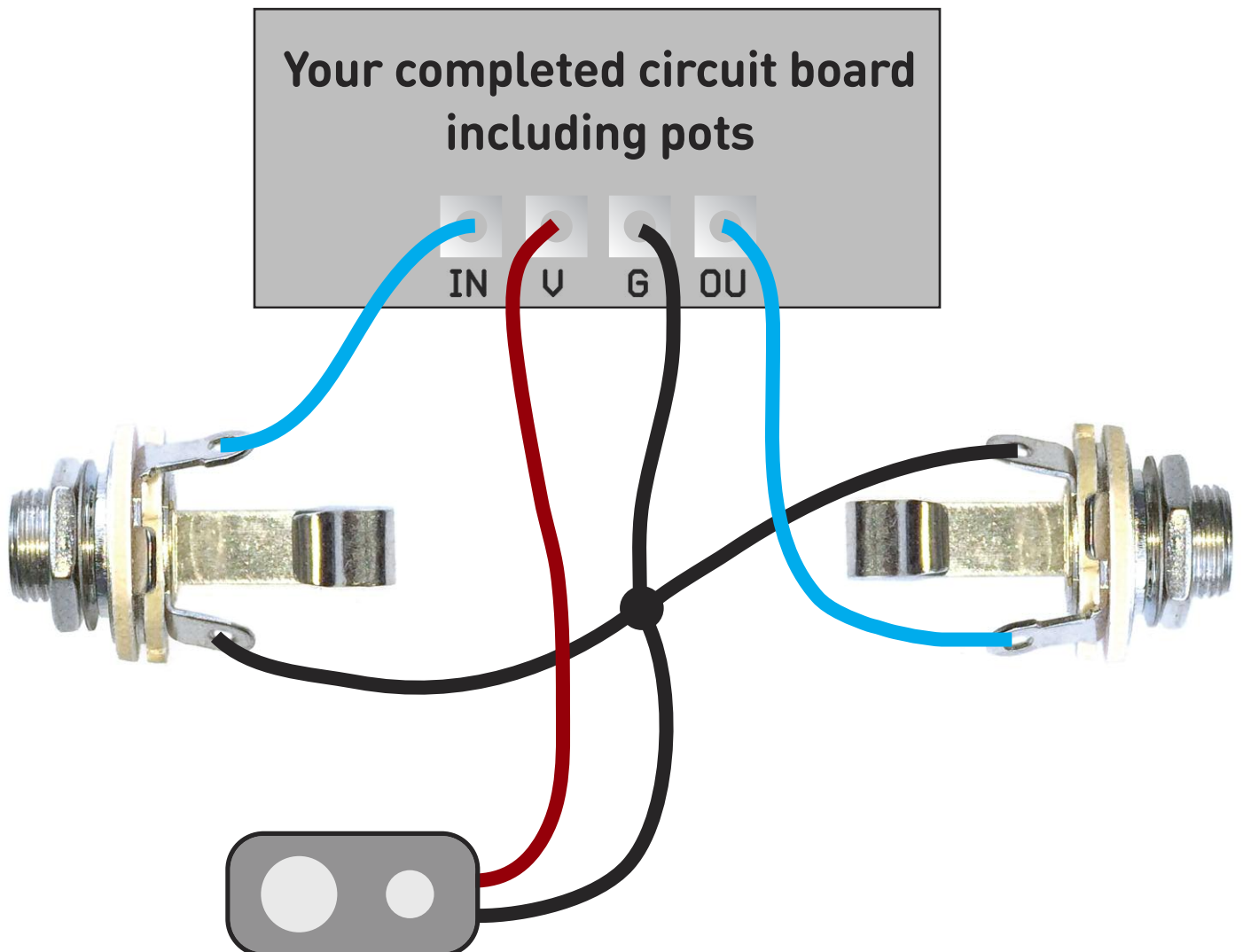
UNDER NO CIRCUMSTANCES will troubleshooting help be offered if you have skipped this stage. No exceptions.

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.

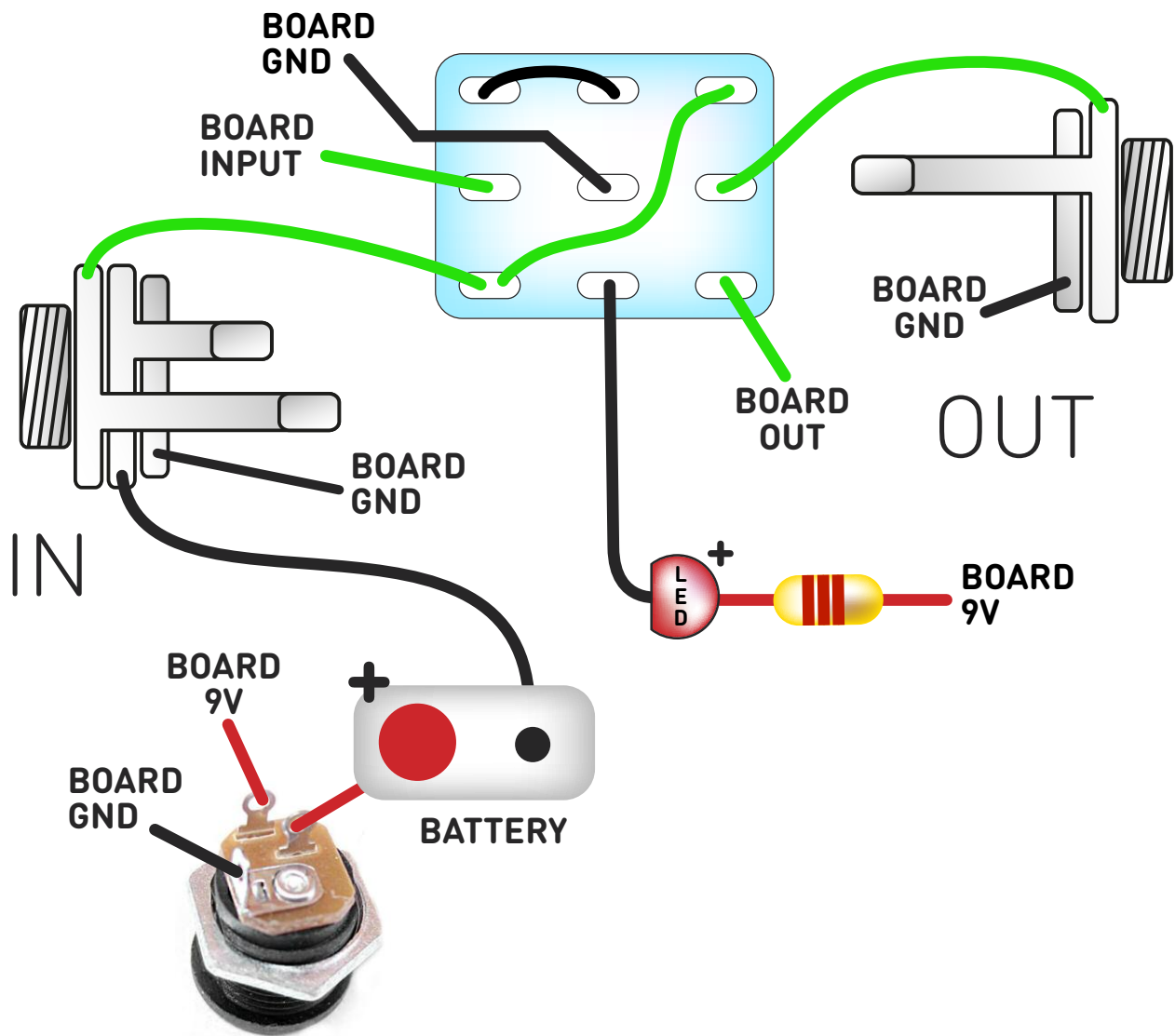
Solder some nice, long lengths of wire to the board connections for 9V, GND, IN and OUT. Connect IN and OUT to the jacks as shown. Connect all the GNDs together (twist them up and add a small amount of solder to tack it). Connect the battery + lead to the 9V wire, same method. Plug in. Go!

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.

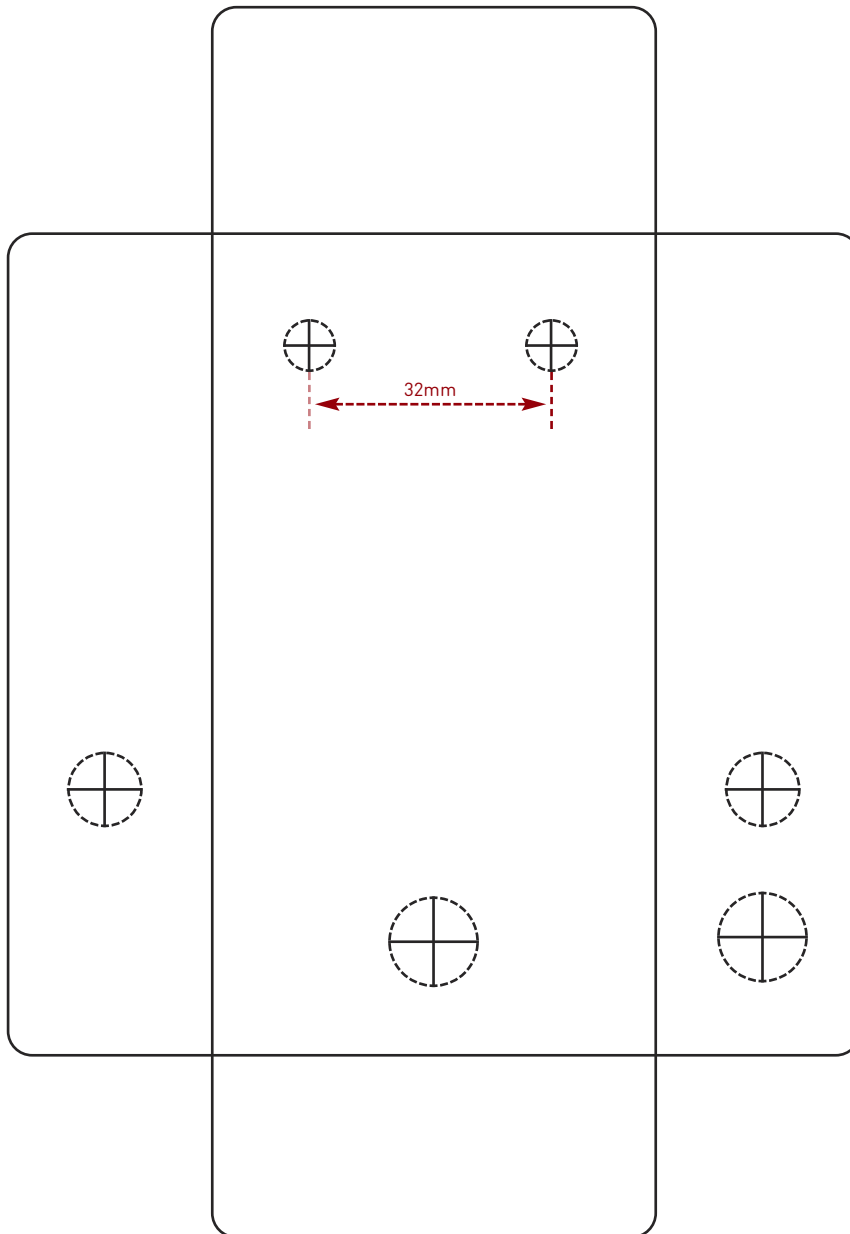
Drilling template

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.

FuzzDog.co.uk