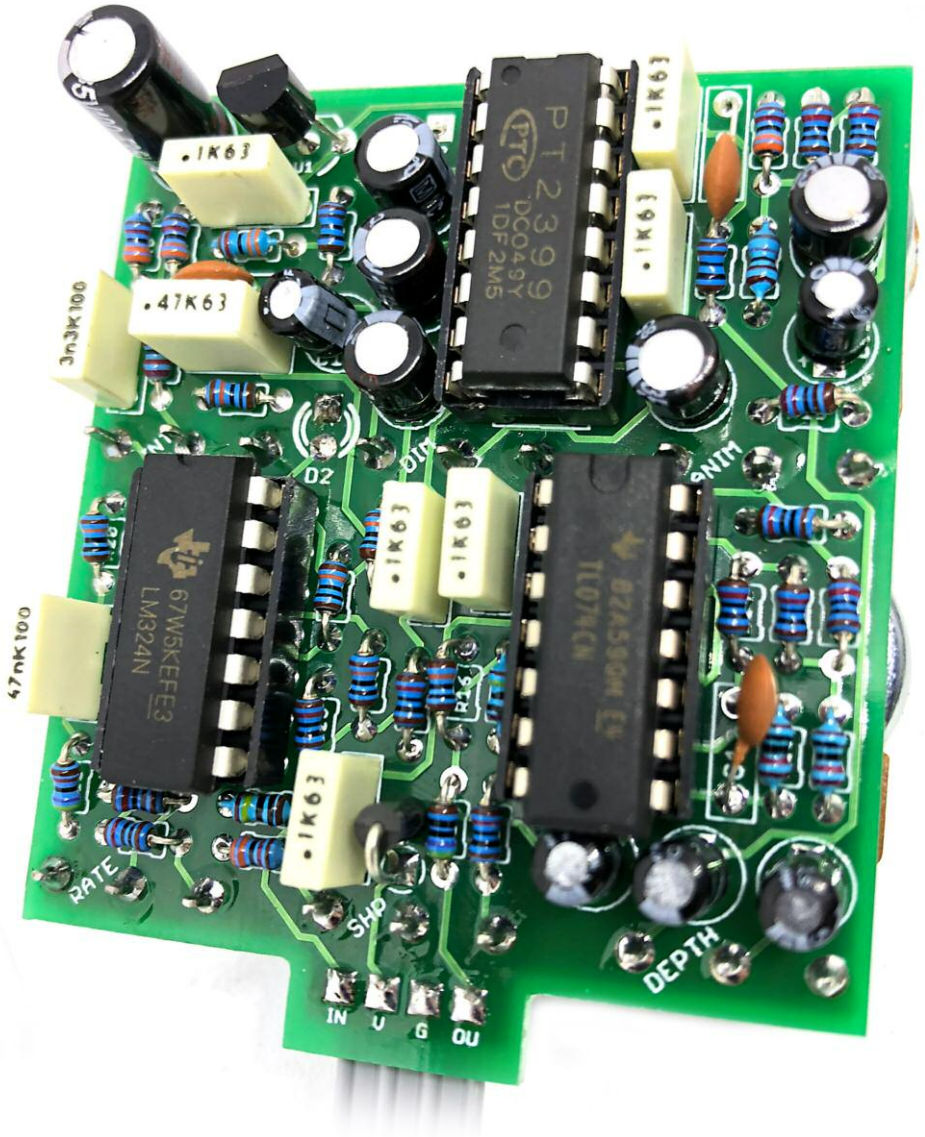


Ocean Engine

Highly tweakable chorus

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:

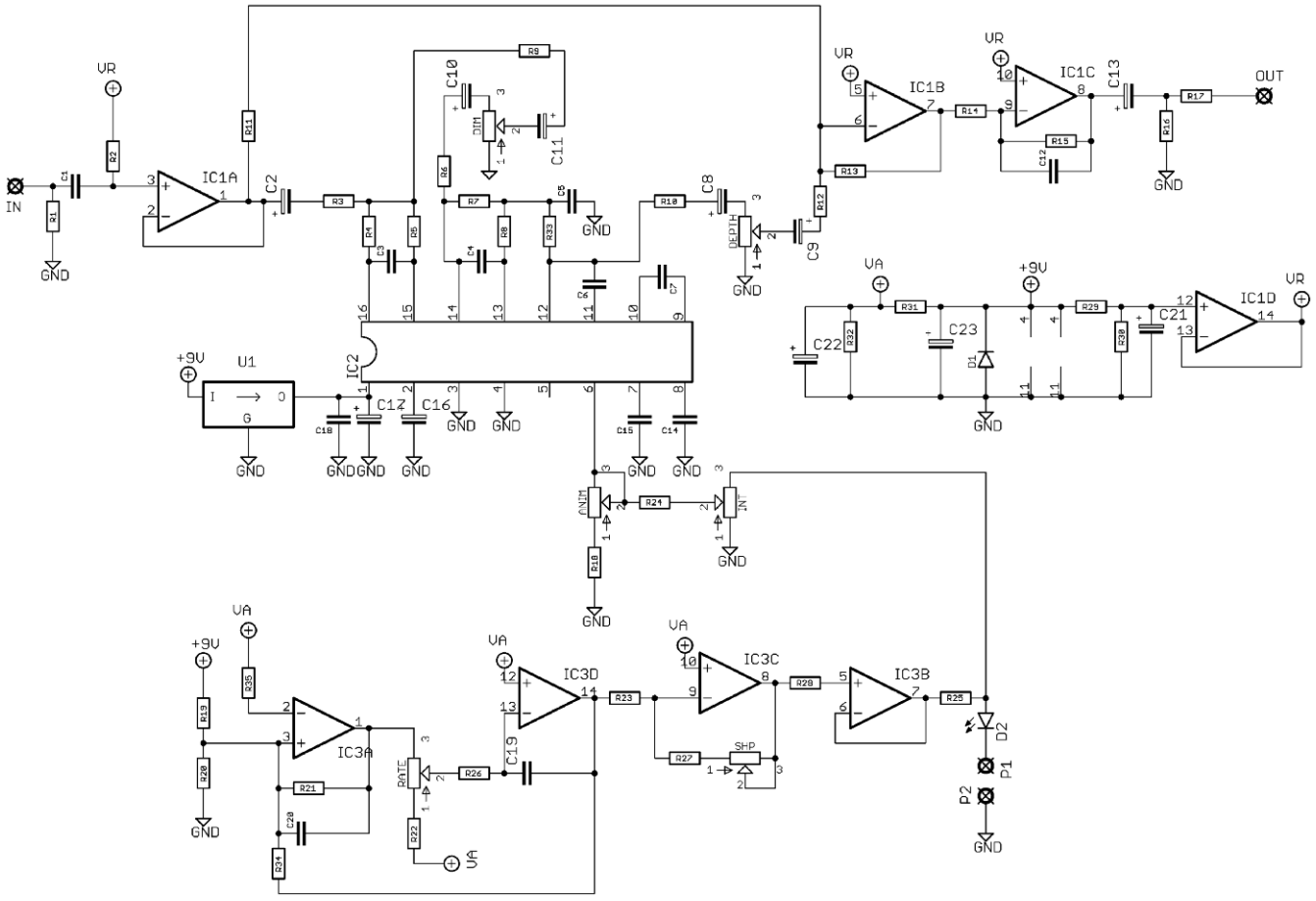
- Resistors should be 0.25W. You can use those with higher ratings but check the physical size of them.
- Electrolytics caps should be at least 25V for 9V circuits, 35V for 18V circuits. Again, check physical size if using higher ratings.

LAYOUT CONVENTIONS

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

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

Schematic + BOM



R1	1M
R2	1M
R3	10K
R4	33K
R5	10K
R6	1K
R7	33K
R8	33K
R9	8K2
R10	1K
R11	10K
R12	10K
R13	10K
R14	10K
R15	10K
R16	100K
R17	470R
R18	2K2

R19	100K
R20	100K
R21	47K
R22	10K
R23	10K
R24	22K
R25	Jumper
R26	10K
R27	10K
R28	33K
R29	10K
R30	10K
R31	100K
R32	100K
R33	33K
R34	10K
R35	100K

C1	100n
C2	1u elec
C3	470p
C4	470p
C5	3n3
C6	100n
C7	100n
C8	1u elec
C9	1u elec
C10	1u elec
C11	10u elec
C12	100p
C13	1u elec
C14	100n
C15	100n
C16	10u elec
C17	10u elec
C18	100n
C19	470n
C20	47n
C21	10u elec
C22	10u elec
C23	100u elec

D1	1n4001
D2	LED*
IC1	TL074
IC2	PT2399
IC3	LM324
U1	78L05 Regulator
ANIM	2KB
DIM	5KB
DEP	25KB**
INT	50KB**
RATE	1MC
SHP	100KA

The PCB has been designed for 3mm resistors, but you could use 6mm and stand them upright.

*D2 is an optional rate indicator LED. See next page for details.

**see next page

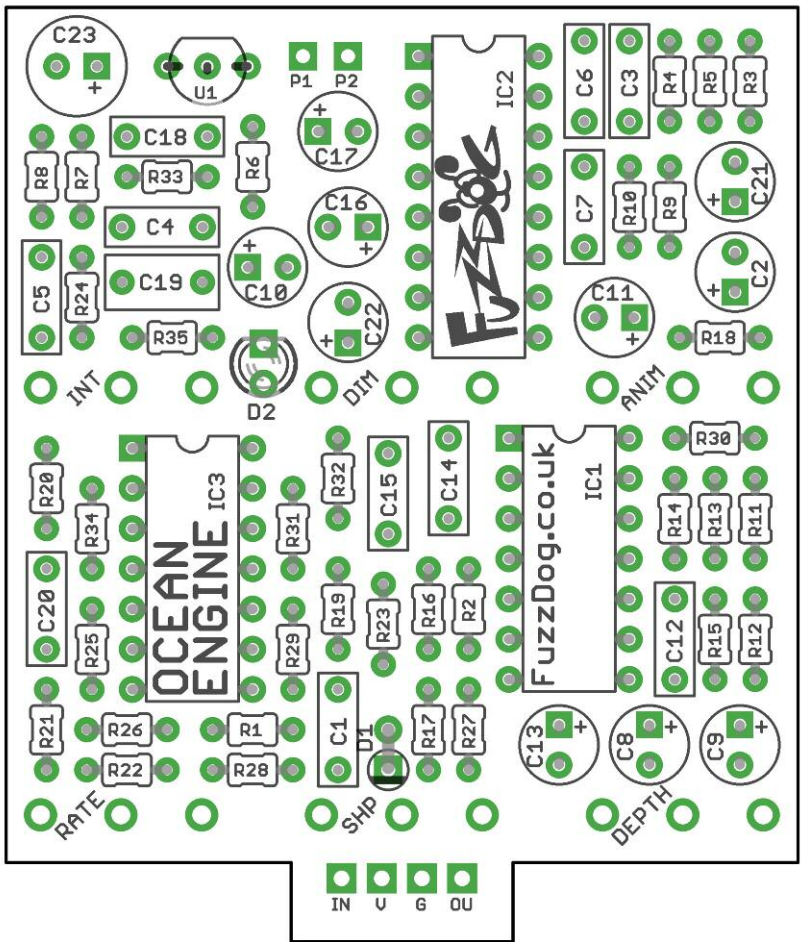
The power and signal pads on the PCB conform to the FuzzDog Direct Connection format, so can be paired with the appropriate daughterboard for quick and easy offboard wiring. Check the separate daughterboard document for details.

Be very careful when soldering the LED 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). Same goes for ICs if you aren't using sockets.

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.

To get the pots level it's best to use the enclosure as a guide.



Flashing Rate LED

This is entirely optional. If you want it then populate D2 and put a 1K resistor across pads P1 and P2. It'll have to mount vertically.

Control Labels Oops**

Seems the original trace of this circuit had a couple of controls incorrect. Reading the description of the orignal pedal, the DEPTH and INTENSITY controls are switched, so the same is true on our PCB. The pot values are correct in the BOM, so place as marked, but on your controls mark the INT pot as Depth, and the DEPTH pot as Intensity.

Test the board!

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

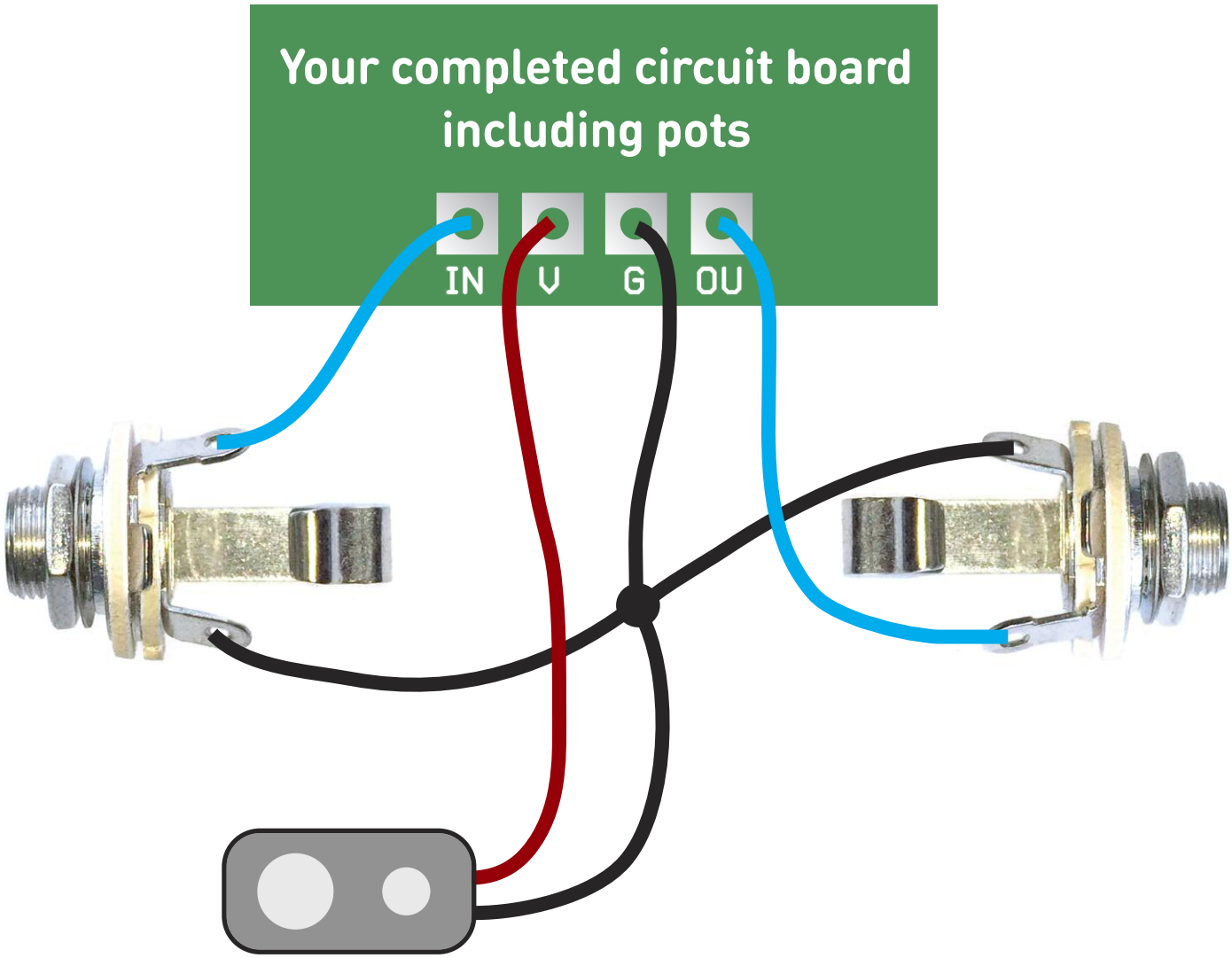
UNDER NO CIRCUMSTANCES will troubleshooting help be offered if you have skipped this stage. No exceptions.

Once you've finished the circuit it makes sense to test 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.

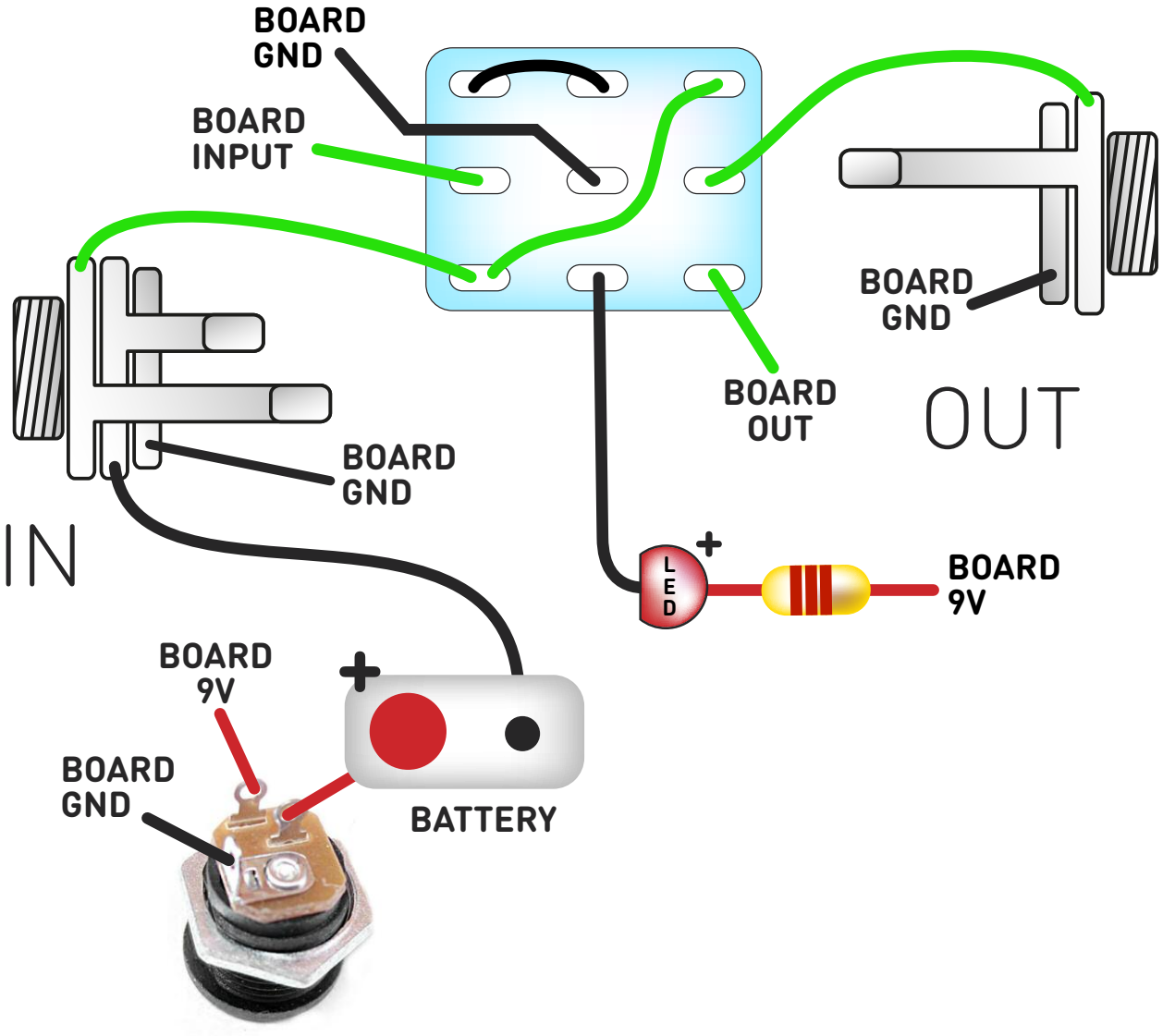
Solder some nice, long lengths of wire to the board connections for 9V, GND, IN and OUT. Connect IN and OUT to the jacks as shown. Connect all the GNDs together (twist them up and add a small amount of solder to tack it). Connect the battery + lead to the 9V wire, same method. Plug in. Go!

If 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 do 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

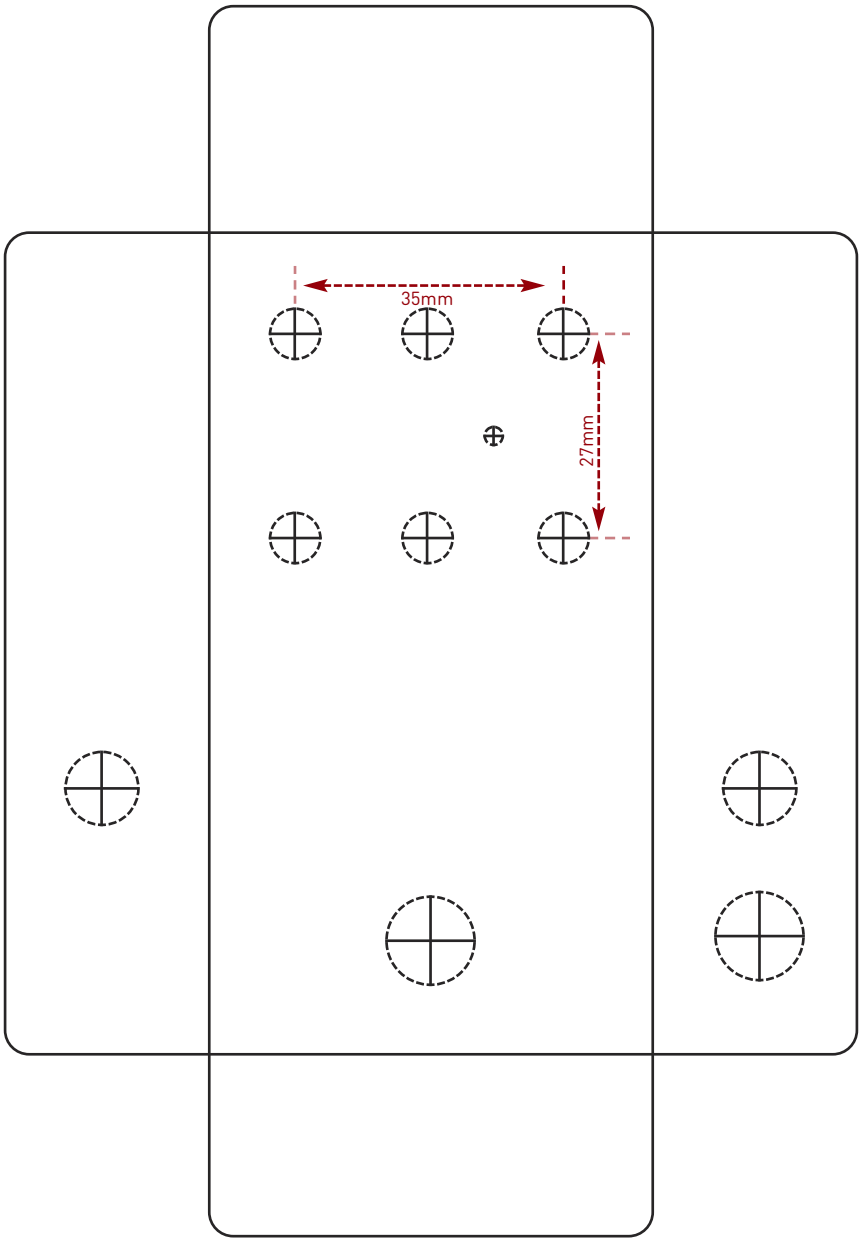
Hammond 1590B

60 x 111 x 31mm

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



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