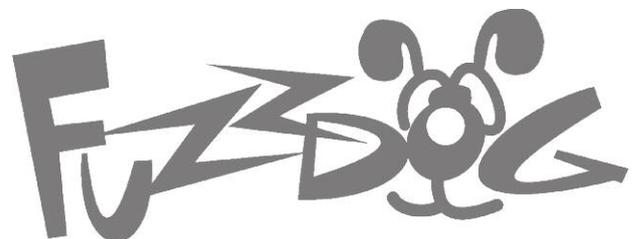


# Verb Engine

Spacey, noisy  
reverb madness



# 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:

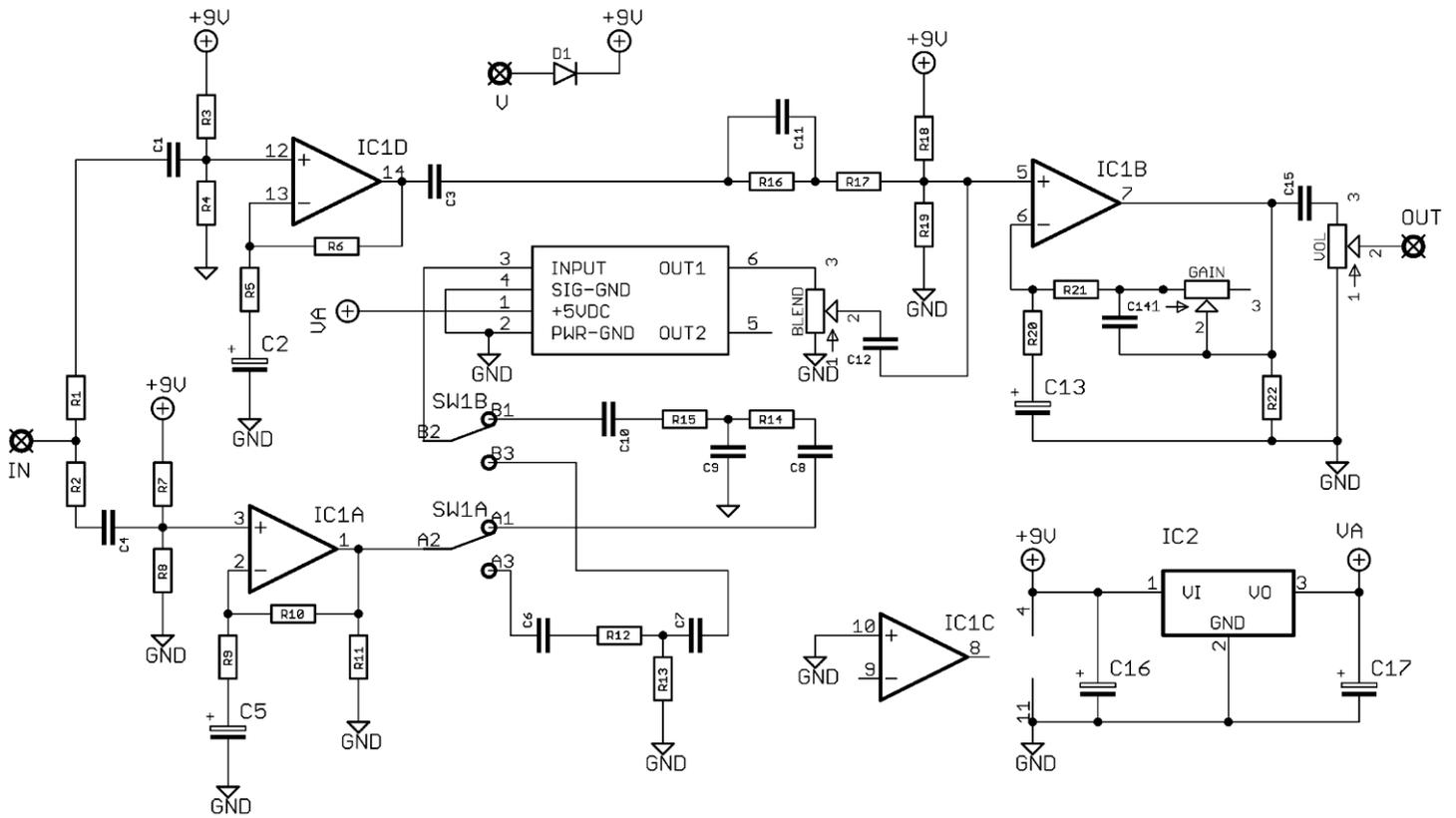
- Resistors should be 0.25W. You can use those with higher ratings but check the physical size of them.
- Electrolytics caps should be at least 25V for 9V circuits, 35V for 18V circuits. Again, check physical size if using higher ratings.

## 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	100K
R2	10K
R3	1M
R4	1M
R5	10K
R6	22K
R7	1M
R8	1M
R9	10K
R10	100K
R11	100K
R12	1-10K*
R13	1K
R14	39K
R15	39K
R16	1M
R17	6K8
R18	1M
R19	1M
R20	10K
R21	68K
R22	100K

C1	33n
C2	1u elec
C3	100n
C4	10n
C5	1u elec
C6	100n
C7	4n7
C8	220n
C9	33n
C10	220n
C11	470p
C12	10n
C13	1u elec
C14	470p
C15	220n
C16	100u elec
C17	100u elec

D1	1N4001
BLEND	10KA
GAIN	1MC
VOL***	100KA
SW1	DPDT ON-ON

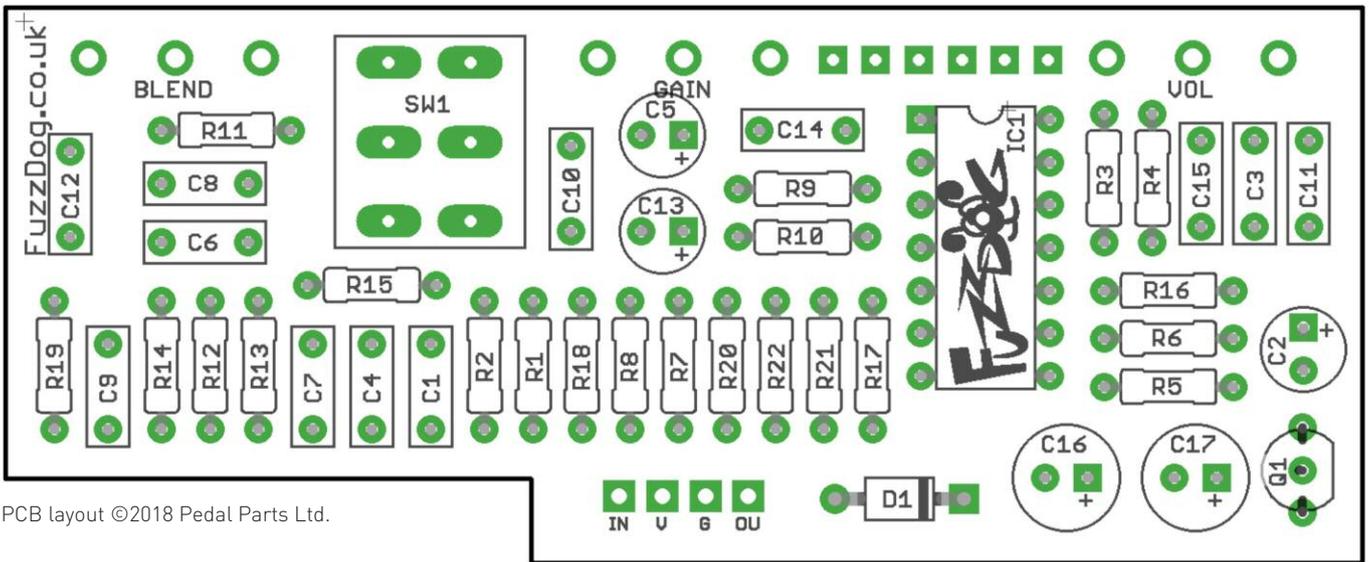
\*R12 is listed as 100K on the trace schematic. The Sunshine tone setting sounds wrong with this value. Something between 1-10K is best - we recommend 4K7. Smaller = brighter.

\*\*Other quad op-amps will work but will likely change the effect characteristics.

\*\*\*We've connected the volume in a more sensible way than the original.

IC1	TLC27M4AiN**
Q1	78L05 Regulator

Reverb brick is BTDR-2H Long



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 regulator Q1. They're very sensitive to heat.

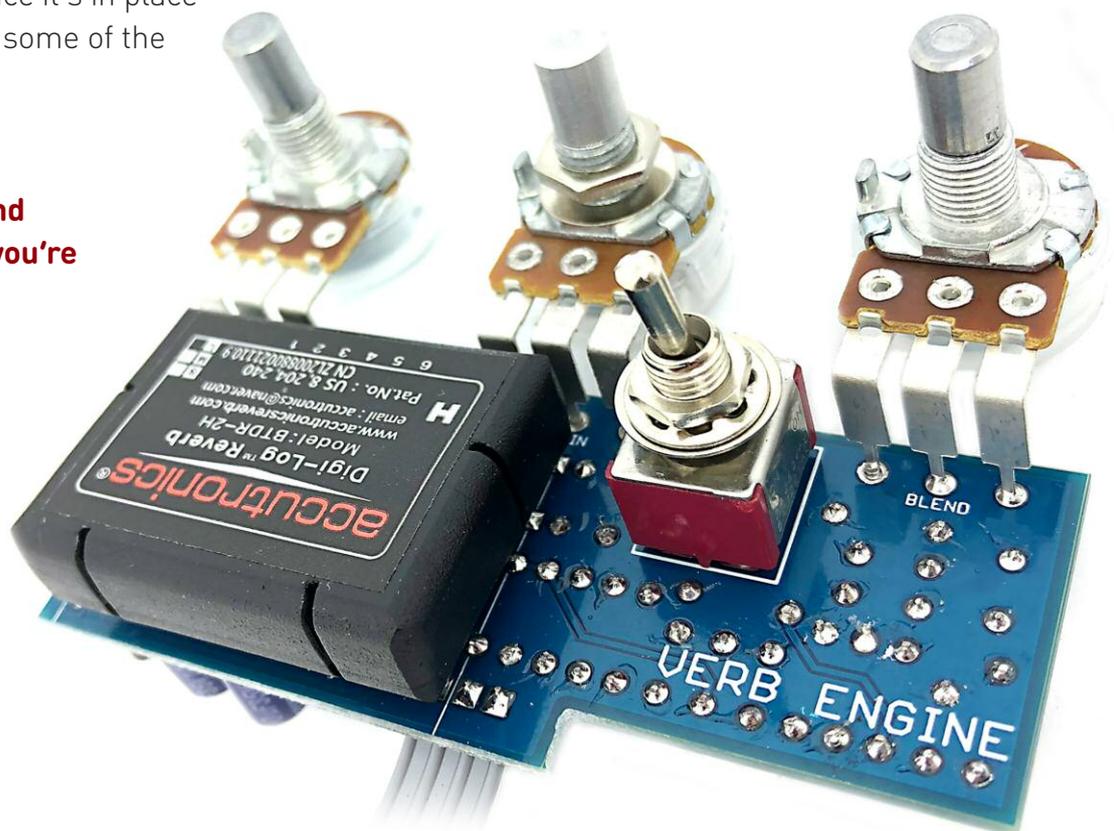
It's best to use a socket for the IC. If you're not, be very careful when soldering.

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

Mount the brick last. Once it's in place you'll have no access to some of the pads on the PCB.

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. You should mount the pots so the pins are only just showing on the top side of the PCB, otherwise there won't be enough space between the PCB and the enclosure for the BTDR-2H.

**You can hack in a fun and fruity feedback mod if you're feeling adventurous. See next page.**



# Feedback Fun

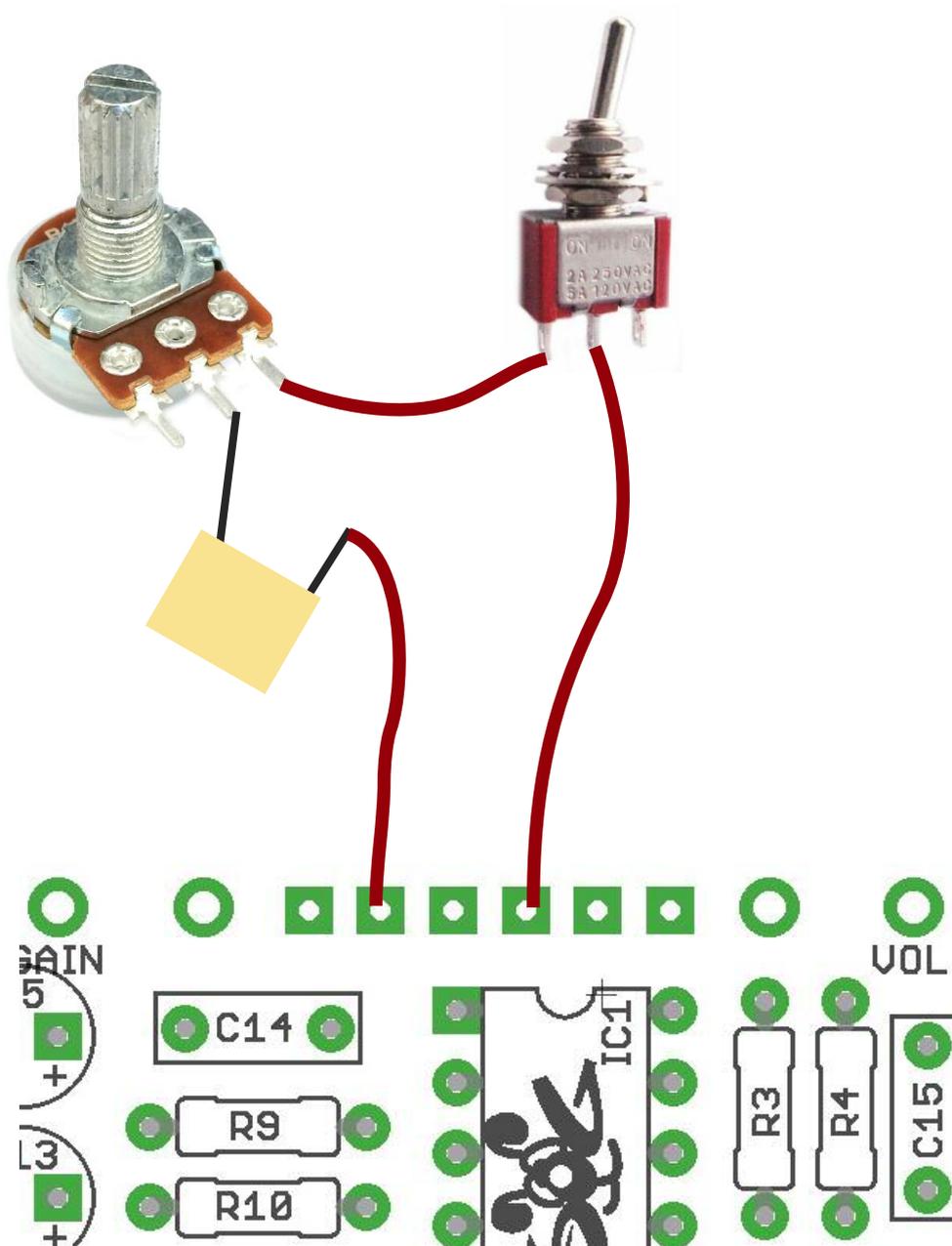
You can get some great modulated dwell or self oscillation by creating a feedback loop on the brick.

From pin 5 (currently unused reverb output), wire up a 47-100n cap to pin 2 of a C100K pot. The bigger the cap, the more bass you'll get in the loop.

Pin 3 of the pot goes back to pin 3, the input of the brick via whichever switch you want to use to make/break the connection.

Careful how you go when soldering direct to the pins of the brick. They don't like heat.

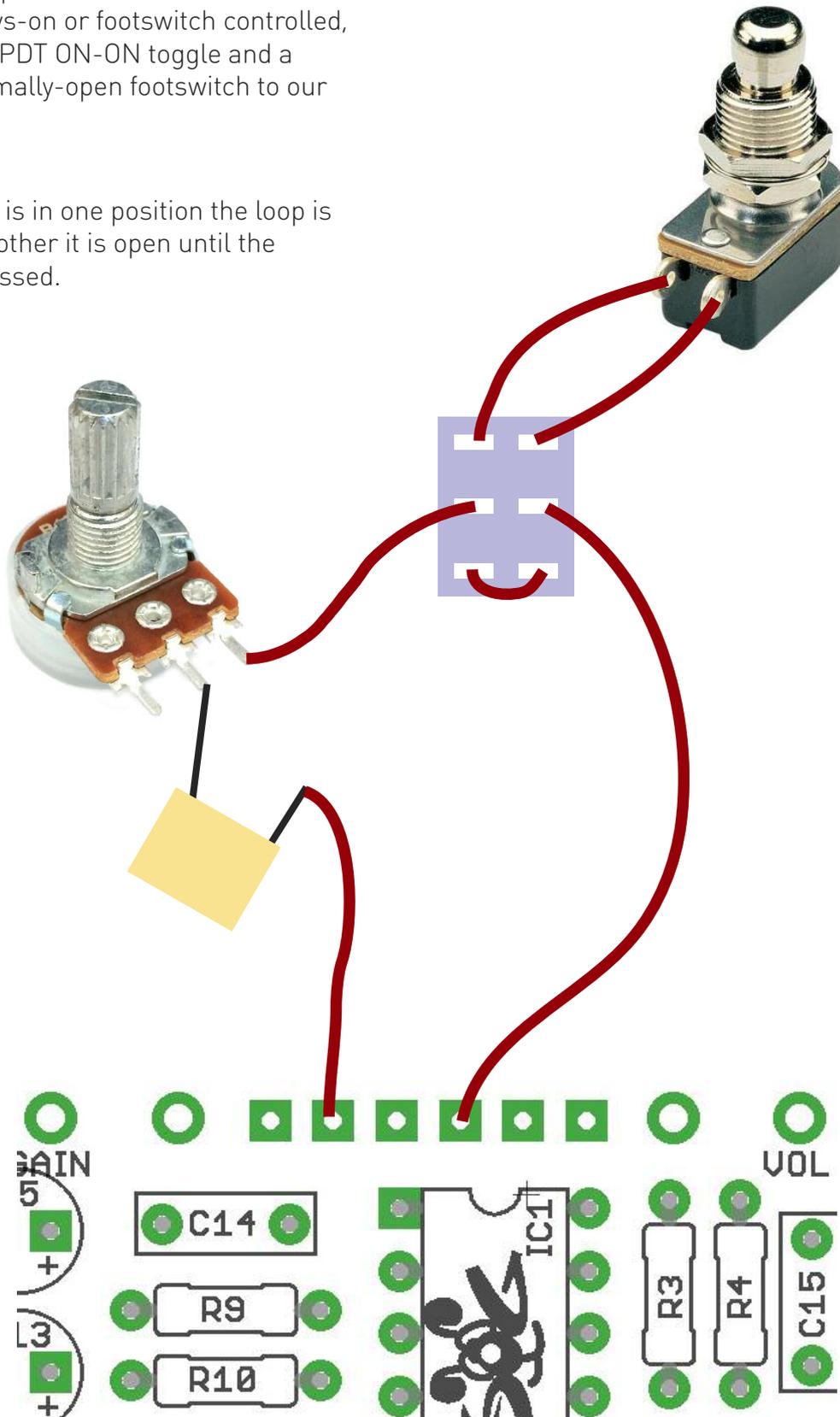
See the next page for the way we wired our workshop unit up with a footswitch >>>>



# Feedback Fun Part 2

We wanted the option of the feedback/dwell mod being always-on or footswitch controlled, so we added a DPDT ON-ON toggle and a momentary normally-open footswitch to our workshop build.

When the toggle is in one position the loop is engaged. In the other it is open until the footswitch is pressed.



# Test the board!

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

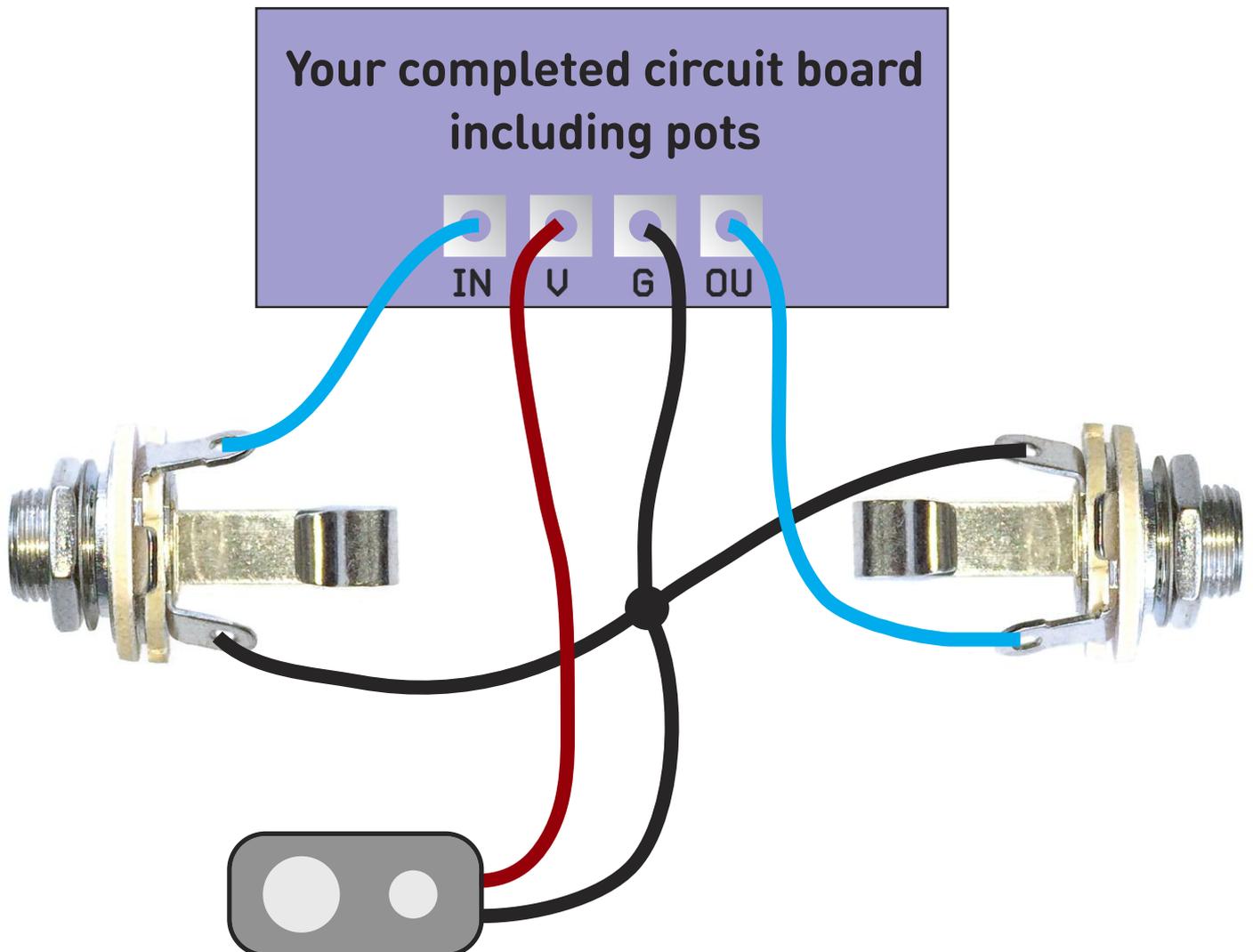
**UNDER NO CIRCUMSTANCES will troubleshooting help be offered if you have skipped this stage. No exceptions.**

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.

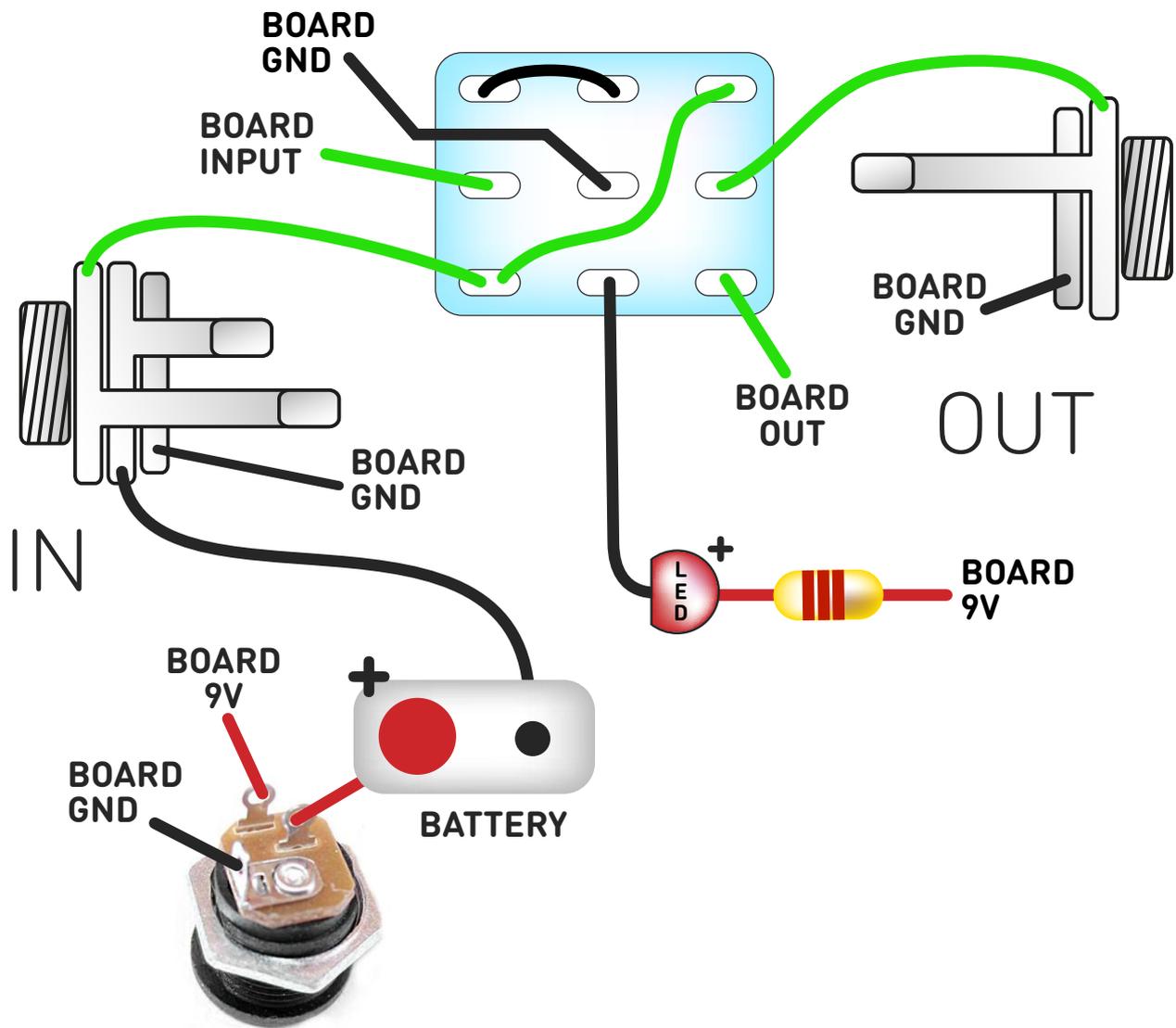
Solder some nice, long lengths of wire to the board connections for 9V, GND, IN and OUT. Connect IN and OUT to the jacks as shown. Connect all the GNDs together (twist them up and add a small amount of solder to tack it). Connect the battery + lead to the 9V wire, same method. Plug in. Go!

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.

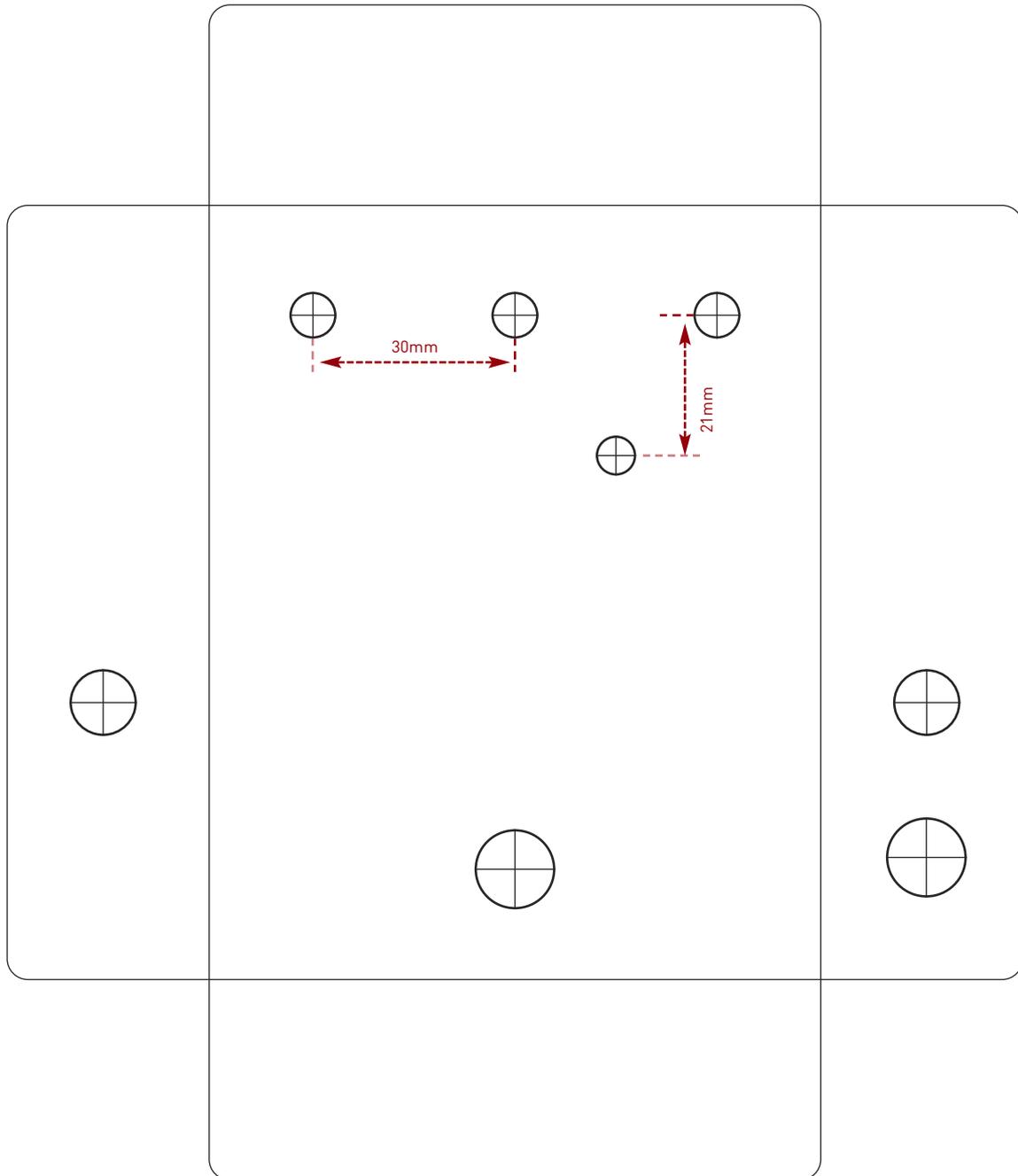
# Drilling template

Hammond 1590BB

It's a good idea to drill the pot 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.

FuzzDog.co.uk