

# Protean - Green

Tweaked ODR-1 which is one half of a nice box of Nashville



# 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:

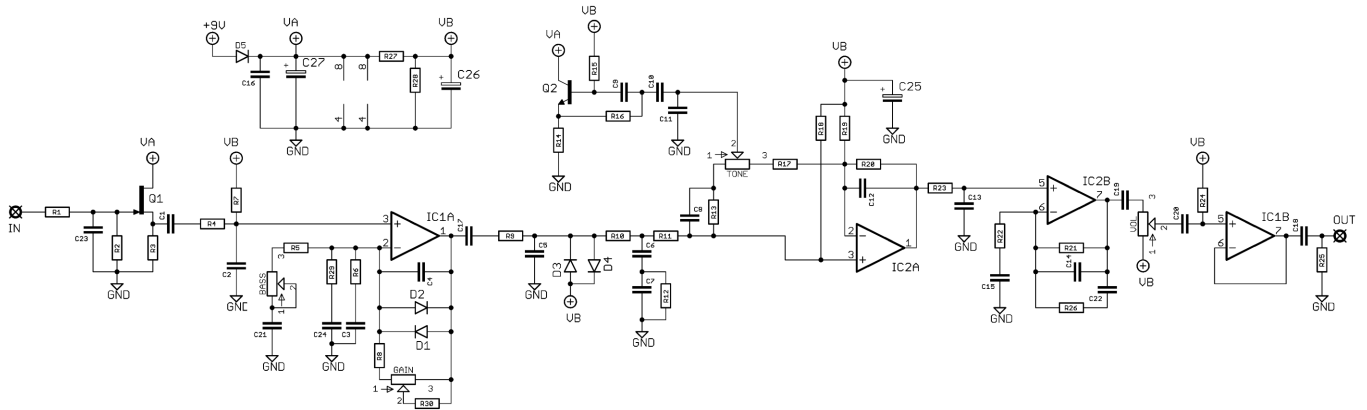
- Resistors should be 0.125W or 0.4W which are 3mm in length. You can use 6mm resistors if you stand them upright.
- Electrolytics caps should be at least 25V for 9V circuits, 35V for 18V circuits. Again, check physical size if using higher ratings.

## 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



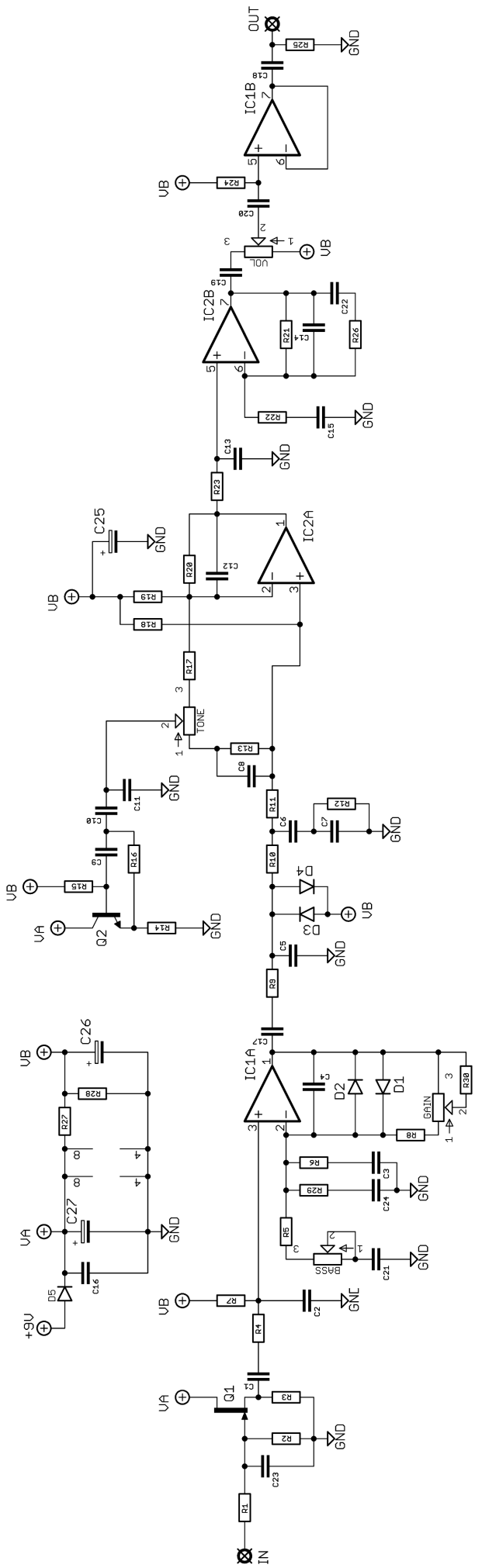
|     |             |     |                  |       |                   |
|-----|-------------|-----|------------------|-------|-------------------|
| R1  | 33K         | C1  | 100n (68n)       | D1-4  | 1N4148            |
| R2  | 1M          | C2  | 22n              | D5    | 1N5817            |
| R3  | 3K3         | C3  | 82n              | Q1    | 2N5457            |
| R4  | 2K7         | C4  | 120p             |       | (or MMBF5457 SMT) |
| R5  | 1K5         | C5  | 2n7              | Q2    | 2N5088            |
| R6  | 820R        | C6  | 82n              | IC1-2 | 4558              |
| R7  | 10K         | C7  | 1n               | BASS  | Jumper 2-3 (50KC) |
| R8  | 1K8         | C8  | 22n              | TONE  | 25KB              |
| R9  | 12K         | C9  | 8n2              | GAIN  | 100KA (250KA)     |
| R10 | 43K         | C10 | 100n             | VOL   | 50KA              |
| R11 | 10K         | C11 | 27n              |       |                   |
| R12 | 12K         | C12 | 560p             |       |                   |
| R13 | 5K1         | C13 | 8n2              |       |                   |
| R14 | 3K3         | C14 | 4n7              |       |                   |
| R15 | 150K        | C15 | 1u*              |       |                   |
| R16 | 2K2         | C16 | 100n             |       |                   |
| R17 | 1K2         | C17 | 2u2              |       |                   |
| R18 | Empty (43K) | C18 | 1u               |       |                   |
| R19 | 10K         | C19 | 2u2              |       |                   |
| R20 | 20K         | C20 | 1u               |       |                   |
| R21 | 22K         | C21 | 2u2              |       |                   |
| R22 | 1K2         | C22 | 82n              |       |                   |
| R23 | 4K7         | C23 | 100p (Empty)     |       |                   |
| R24 | 150K        | C24 | 470n             |       |                   |
| R25 | 150K        | C25 | Empty (47u elec) |       |                   |
| R26 | 5K1         | C26 | 100u elec        |       |                   |
| R27 | 15K         | C27 | 100u elec        |       |                   |
| R28 | 15K         |     |                  |       |                   |
| R29 | 470R        |     |                  |       |                   |
| R30 | Jumper      |     |                  |       |                   |

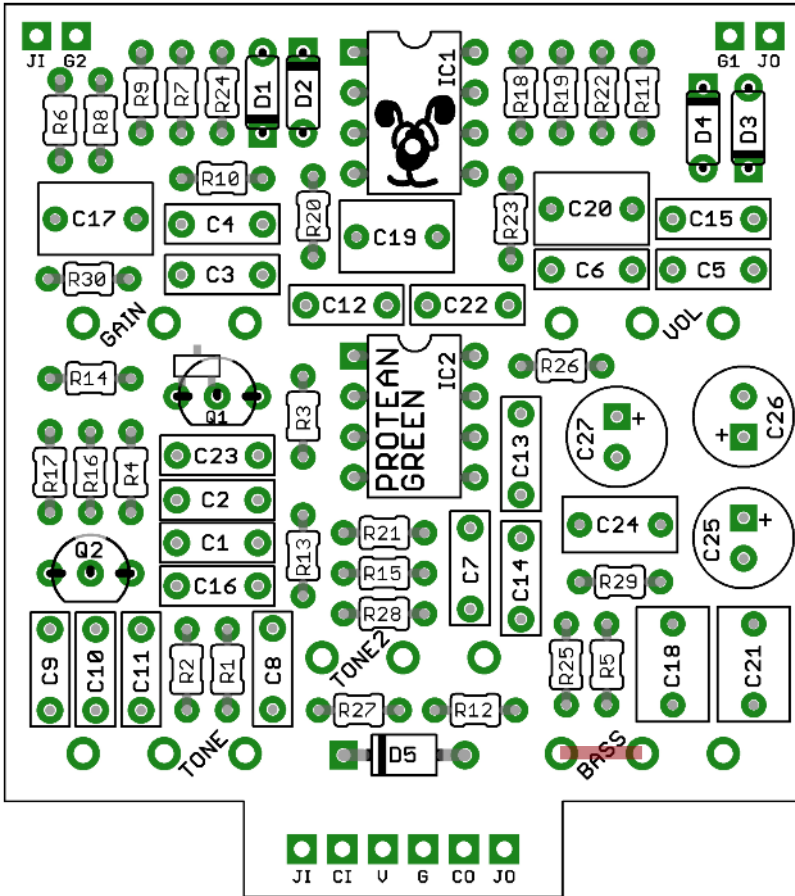
\*We didn't allow space for a large film cap for C15, so you'll need to use a MLCC to get one small enough..

The PCB has been designed for 3mm resistors. You can use 6mm if you stand them upright.

Substitution values in brackets are for a standard ODR-1 build, other than the BASS pot. This is an optional add on that AionFX included on their ODR-1. It's based on the bass-cut control of the Timmy, and is a worthwhile addition. The ODR-1 is notoriously bassy as standard.

There are two sets of pads for the Tone pot. Use the central set if you're not including the Bass pot. No jumpers are required on the unused set.





If you're building the dual version along with the Protean Blue, please see the separate document available for that.

We've designed the kit to use header pins to connect to the footswitch daughterboards for that build, but a stand-alone single build should connect as normal using just the CI V G CO pads.

If you aren't using the BASS pot place a jumper across pads 2-3 as shown in red.

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. Ignore all the J1, J0 and extra G pads unless you're building the dual version with the Protean Blue.

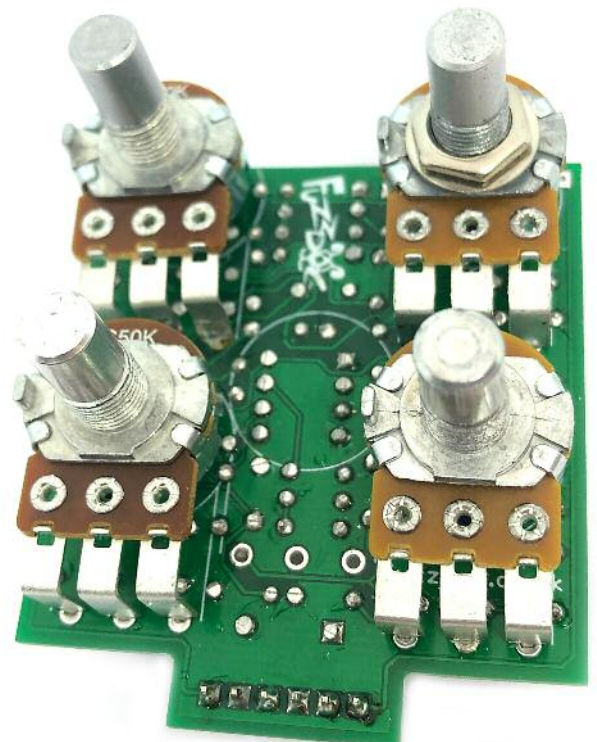
Be very careful when soldering the diodes and transistors. They're very sensitive to heat. You should use some kind of heat sink (crocodile clip or reverse action tweezers) on each leg as you solder them. Keep exposure to heat to a minimum (under 2 seconds). Same goes for the IC if you aren't using a 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. 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.

**R30?** In the trace of this circuit there's a resistor across pins 2-3 of the GAIN control. We assume this is an error and we're sticking with the standard ODR-1 configuration of having that in series with the pot, though we've included it for completeness. If you want to try it like that just put 1K8 in there and jumper R8.



# Test the board!

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

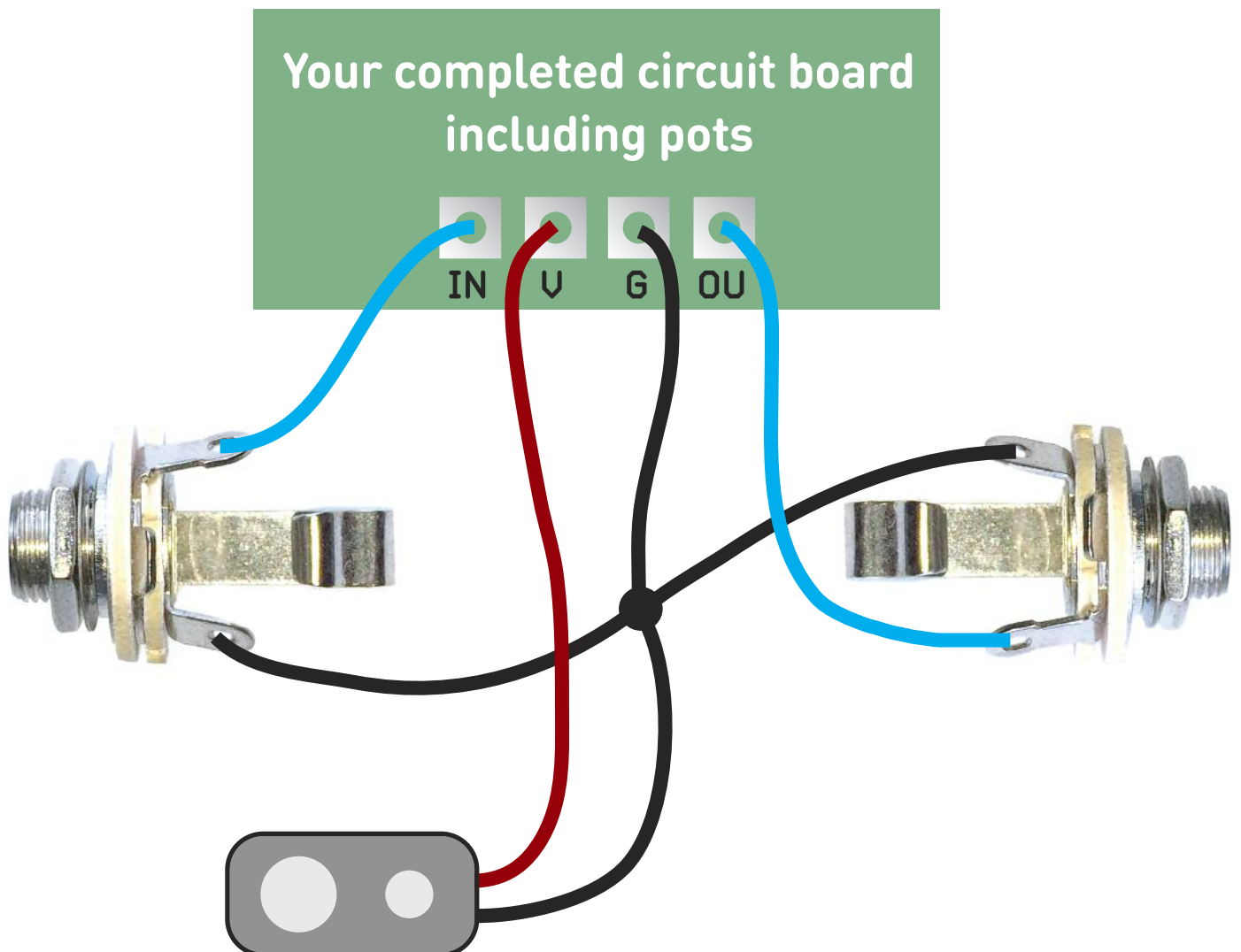
**UNDER NO CIRCUMSTANCES will troubleshooting help be offered if you have skipped this stage. No exceptions.**

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.

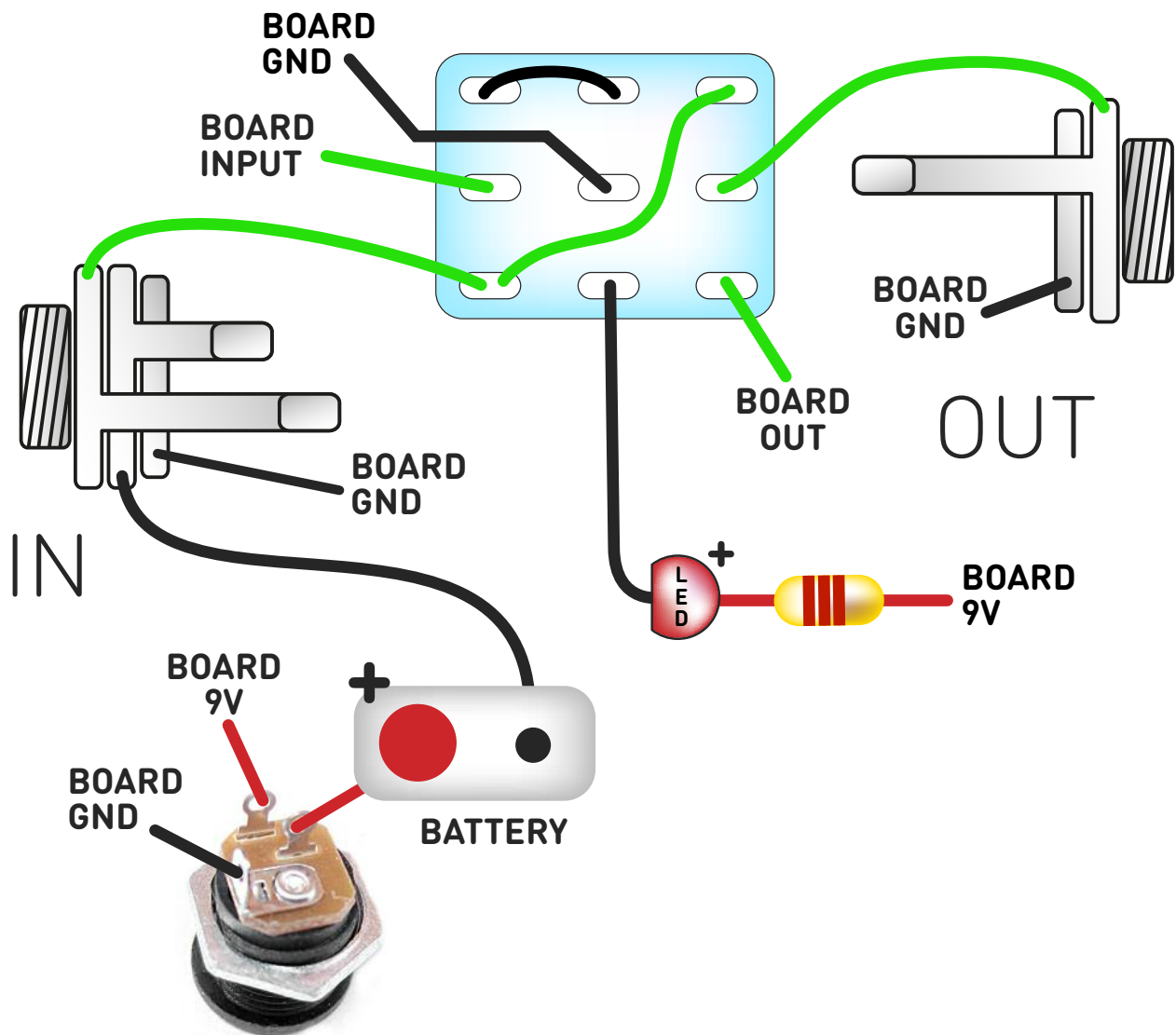
Solder some nice, long lengths of wire to the board connections for 9V, GND, IN and OUT. Connect IN and OUT to the jacks as shown. Connect all the GNDs together (twist them up and add a small amount of solder to tack it). Connect the battery + lead to the 9V wire, same method. Plug in. Go!

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

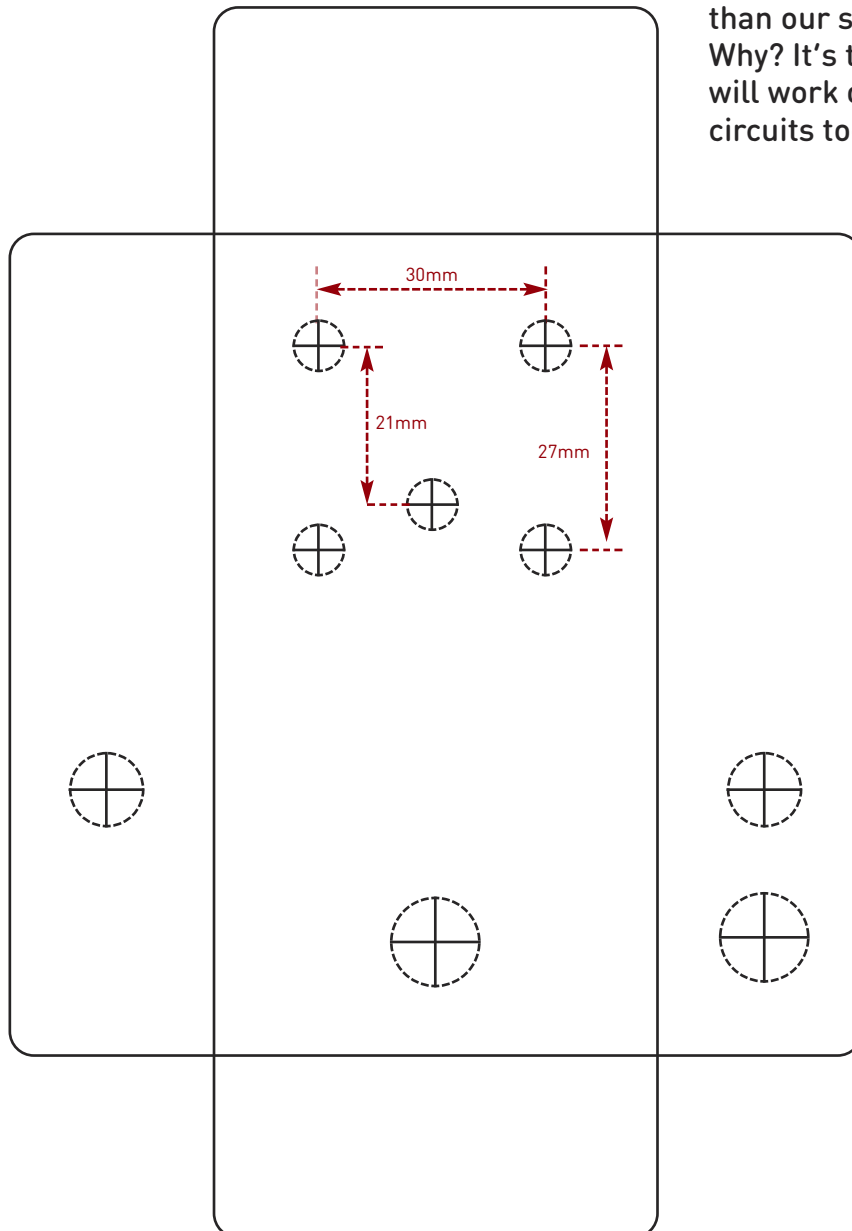
It's a good idea to drill the pot and toggle switch holes 1mm bigger if you're board-mounting them.  
Wiggle room = good!

Recommended drill sizes:

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

## IMPORTANT

Pot spacing is 30mm rather than our standard 32mm. Why? It's the max spacing that will work out evenly with two circuits together in a 1590BB.



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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