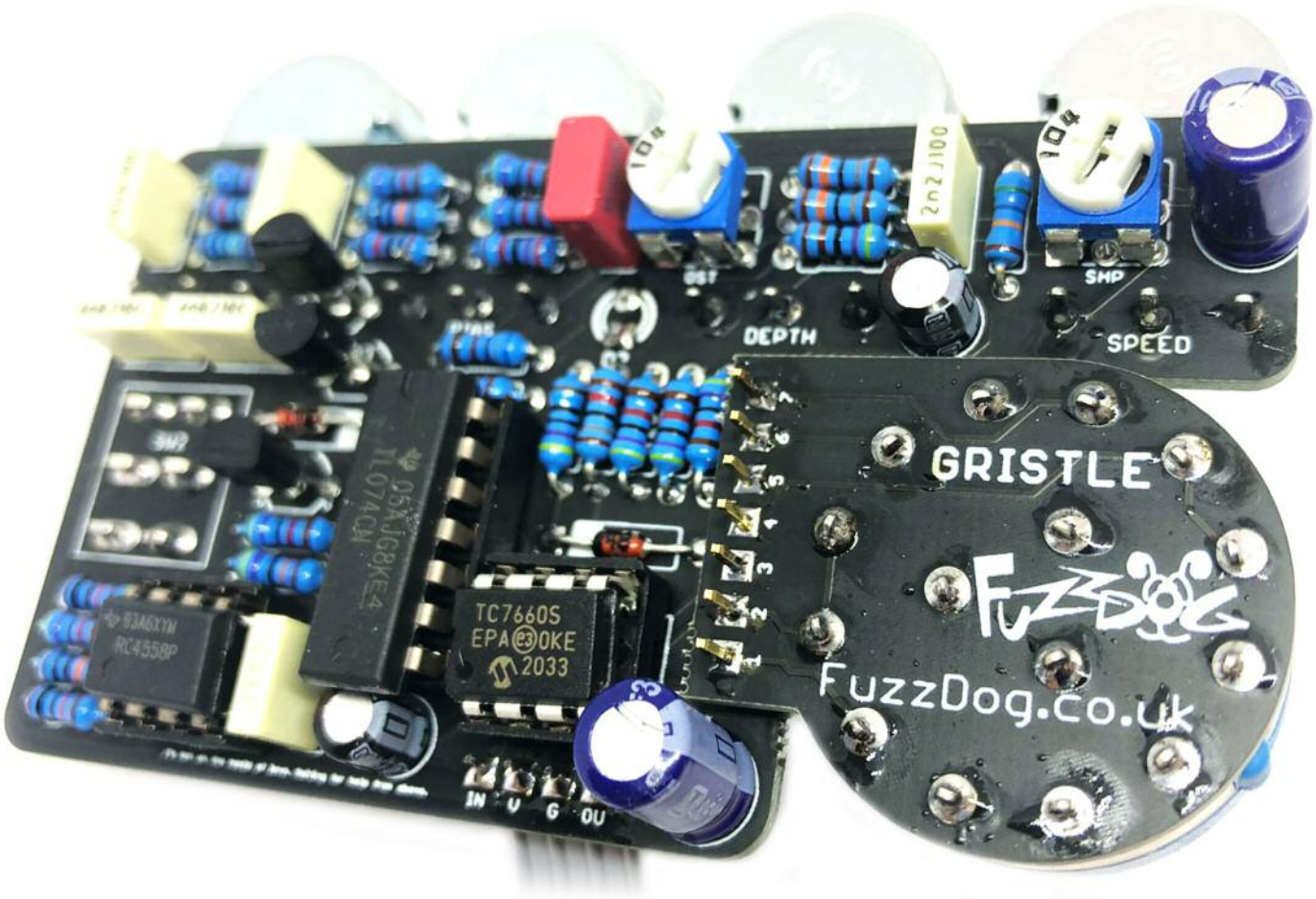


Gristleizer

Filthy, dirty modulation fun

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:

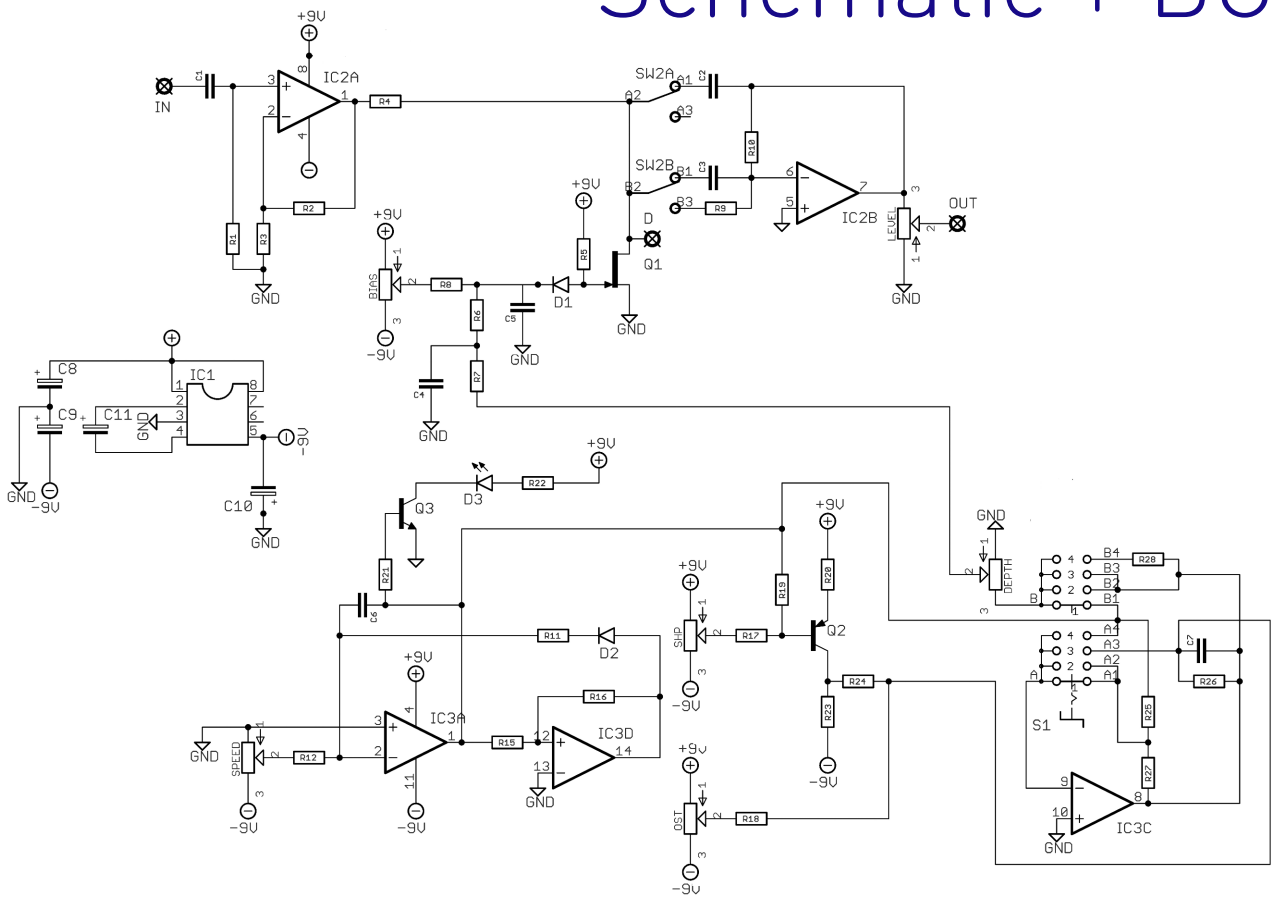
- Resistors should be 0.25W. You can use those with higher ratings but check the physical size of them.
- Electrolytics caps should be at least 25V for 9V circuits, 35V for 18V circuits. Again, check physical size if using higher ratings.

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	47K
R2	100K
R3	10K
R4	10K
R5	1M
R6	47K
R7	47K
R8	100K
R9	47K
R10	470K
R11	470R
R12	56K
R15	10K
R16	18K
R17	47K
R18	180K
R19	10K
R20	18K
R21	6K8
R22	4K7
R23	27K
R24	47K
R25	47K
R26	180K
R27	47K
R28	47K

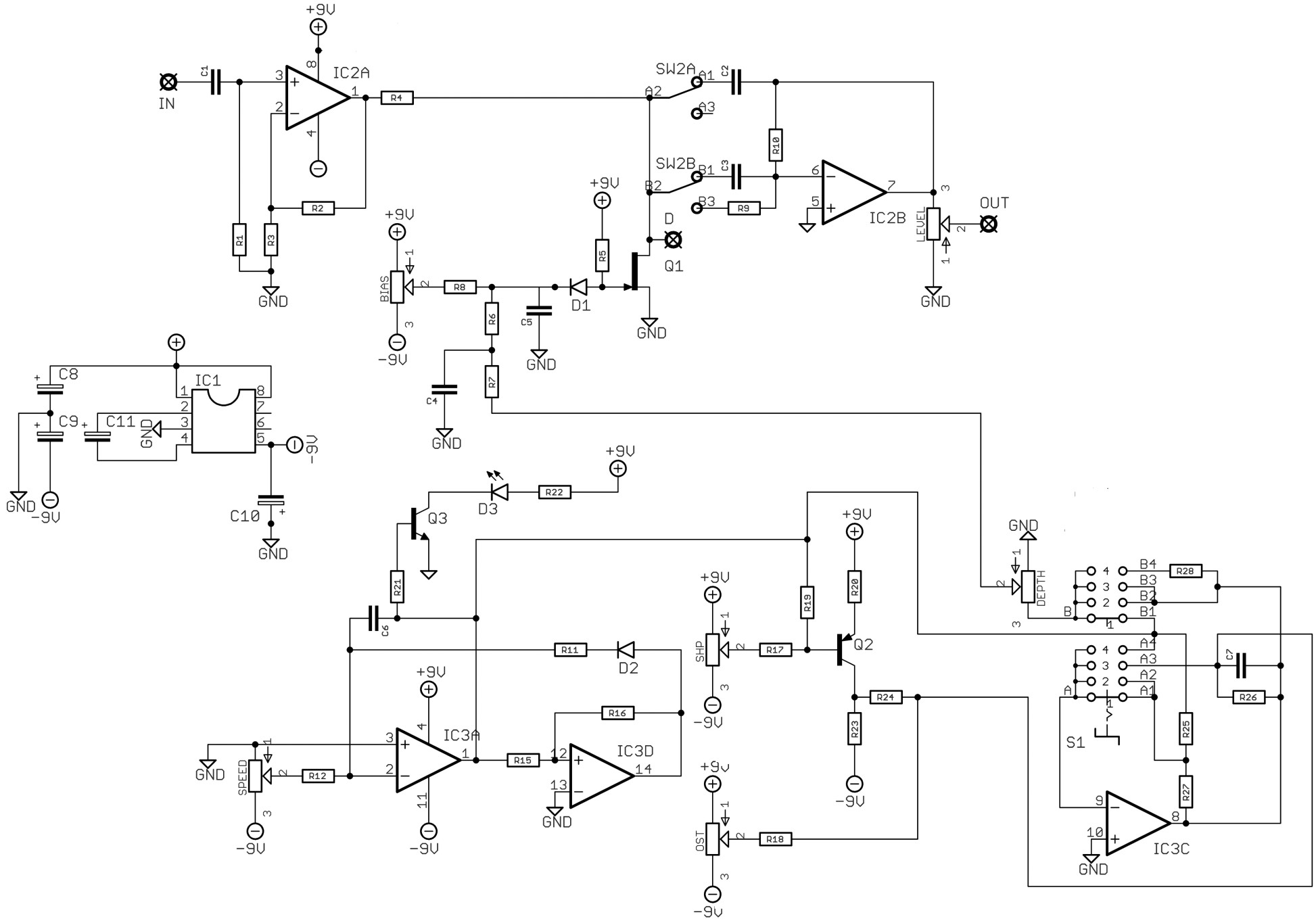
C1	100n
C2	6n8
C3	6n8
C4	10n
C5	100n
C6	470n
C7	2n2
C8	100u elec
C9	100u elec
C10	10u elec
C11	10u elec
Q1	2N3819*
Q2	2N3906
Q3	2N3904
IC1	7660SEPA**
IC2	4558
IC3	TL074
D1-2	1N4148***
D3	Rate Indicator LED

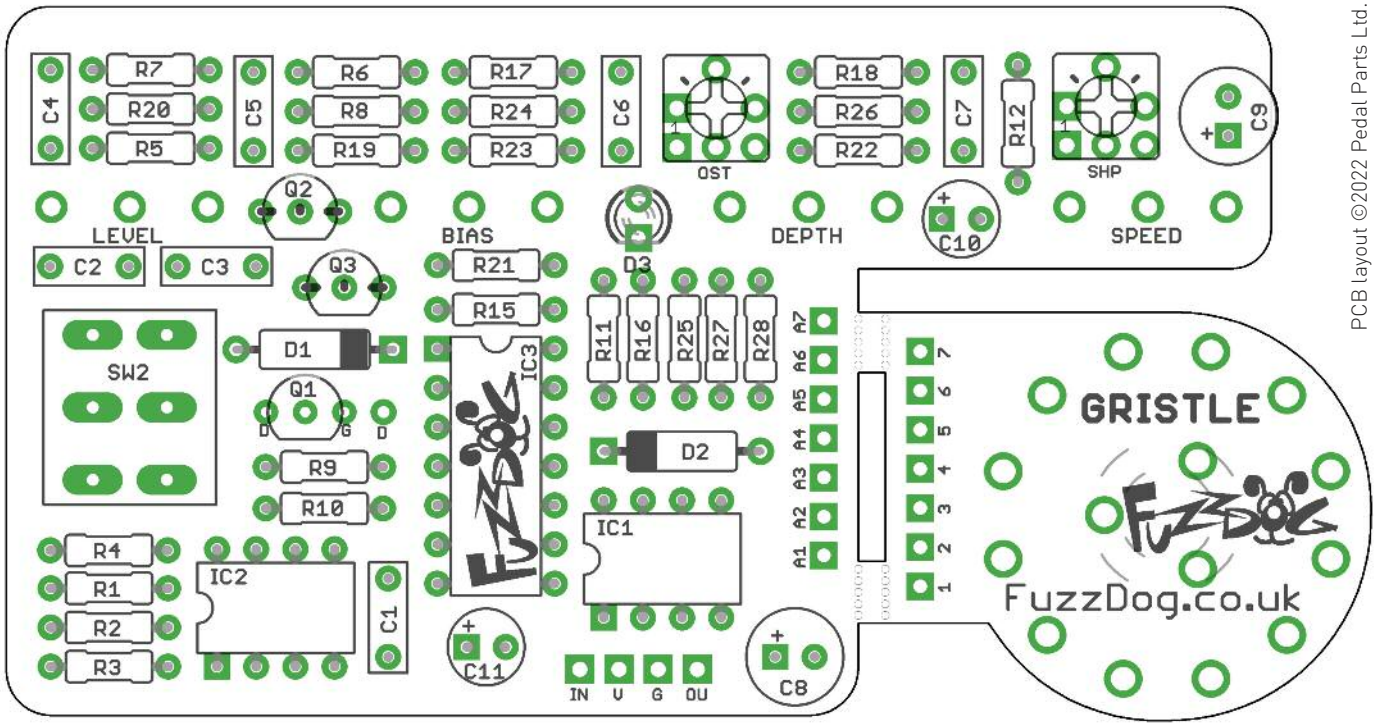
BIAS	100KB
DEPTH	10KB
LEVEL	100KB
SPEED	10KA
SHAPE	100K TRIM
OST	100K TRIM
SW1	3P4T ROTARY
SW2	DPDT ON-ON

*We've tried other FETs and they all worked absolutely fine - 2N5457, J201, J113. Check your pinout - see later in the document.

**Originally 1N34A but the circuit works much better with 1N4148.

***We exclusively use this model from MicroChip and have no issues at all with whine. Should also work fine with MAX1044.


+9V
IN
C1
IC2A
R4
SW2A
A1
A2
A3
C2
R10
SW2B
B1
B2
B3
C3
R9
IC2B
LEVEL
OUT
R1
R3
R2
GND
BIAS
R8
R6
C5
D1
R5
D
Q1
C4
R7
C8
C9
C11
IC1
C10
-9V
Q3
D3
R22
R21
C6
R11
D2
SPEED
R12
IC3A
R15
R16
IC3D
R19
R20
SHP
R17
Q2
R24
R23
OST
R18
DEPTH
B4
B3
B2
B1
R28
A4
A3
A2
A1
S1
C7
R26
R25
R27
IC3C



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.

Be very careful when soldering the transistors and diodes. 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).

You should get all the components in the top side of the board before soldering in the pots - once they're in place you'll have no access to some of the components without bending them out of the way - you can only do that so many times before the legs snap.

As the rotary is much deeper than the pots we've designed the PCB with a separate daughterboard to make it easier to match the height of this with the pots. There are mouse bites between the PCBs which makes it easy to snap them apart.

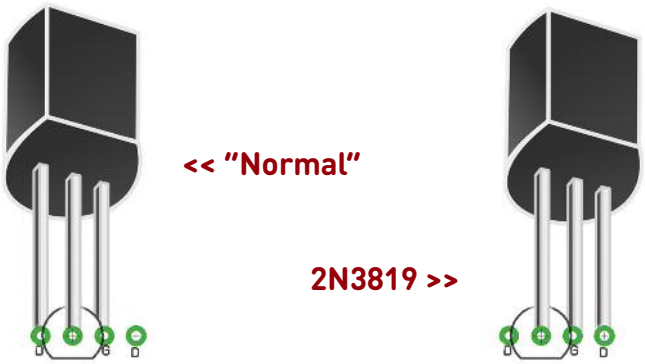
The rotary switch has a small plastic locator tab on the top side - line this up with the symbol on the pcb.

If your rotary switch has more than four positions (three clicks) when you turn it, you'll have to adjust it. Take off the nut and anti-vibration washer and you'll see another washer with a locator tab which is inserted into a hole in the switch body. Move that locator tab into the third hole from the left. You should now only have four positions on your turn.

See next page for how to mount the rotary.

FETS

The PCB has an extra pad next to Q1 to allow FETs with different pinouts to be used. If you're going for something with standard DSG pinout, such as J201 or 2N5457, they should be inserted exactly as indicated on the screen print. 2N3819 have a SGD pinout, so imagine you're inserting it into the normal pads, then move it across one pad so the right hand pin goes into the extra pad marked D.



Connecting the main PCB and daughterboard.

As can be seen in the image, the rotary switch daughterboard sits below the main PCB when viewed with the pots on top. This enables you to mount the pots fully into the main PCB but still get the rotary switch level with them for mounting in the enclosure.

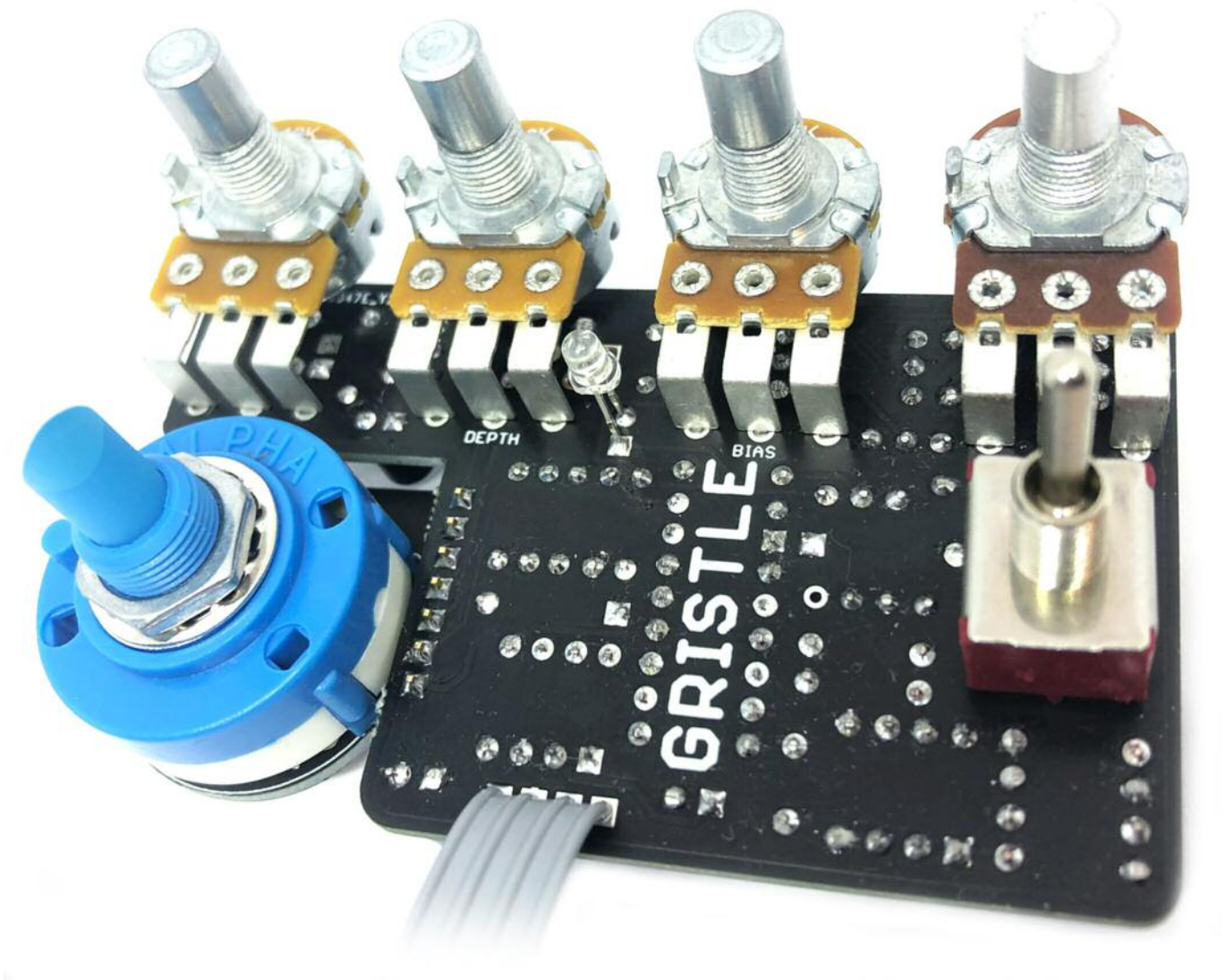
If you're using header pins to mount the daughterboard (a good idea), the plastic spacer on these will give you the correct distance between the boards. To be belt and braces about it, it's a good idea to use your enclosure as a guide before soldering the pins in.

Make sure you've snapped the locator tabs off the pots, and the large tab from the rotary.

Solder the switch onto thedaughterboard and your headers to the main PCB. Ensure the headers are at 90° to the board.

Now place your main pcb into the enclosure. Drop the switch onto the headers and let it rest on the enclosure. Now solder the pins to the daughterboard with this in position. Everything should line up.

Of course, you don't have to use header pins. You can connect the boards with wires if you want more flexibility with the positioning of the waveform selector switch.



Test the board!

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

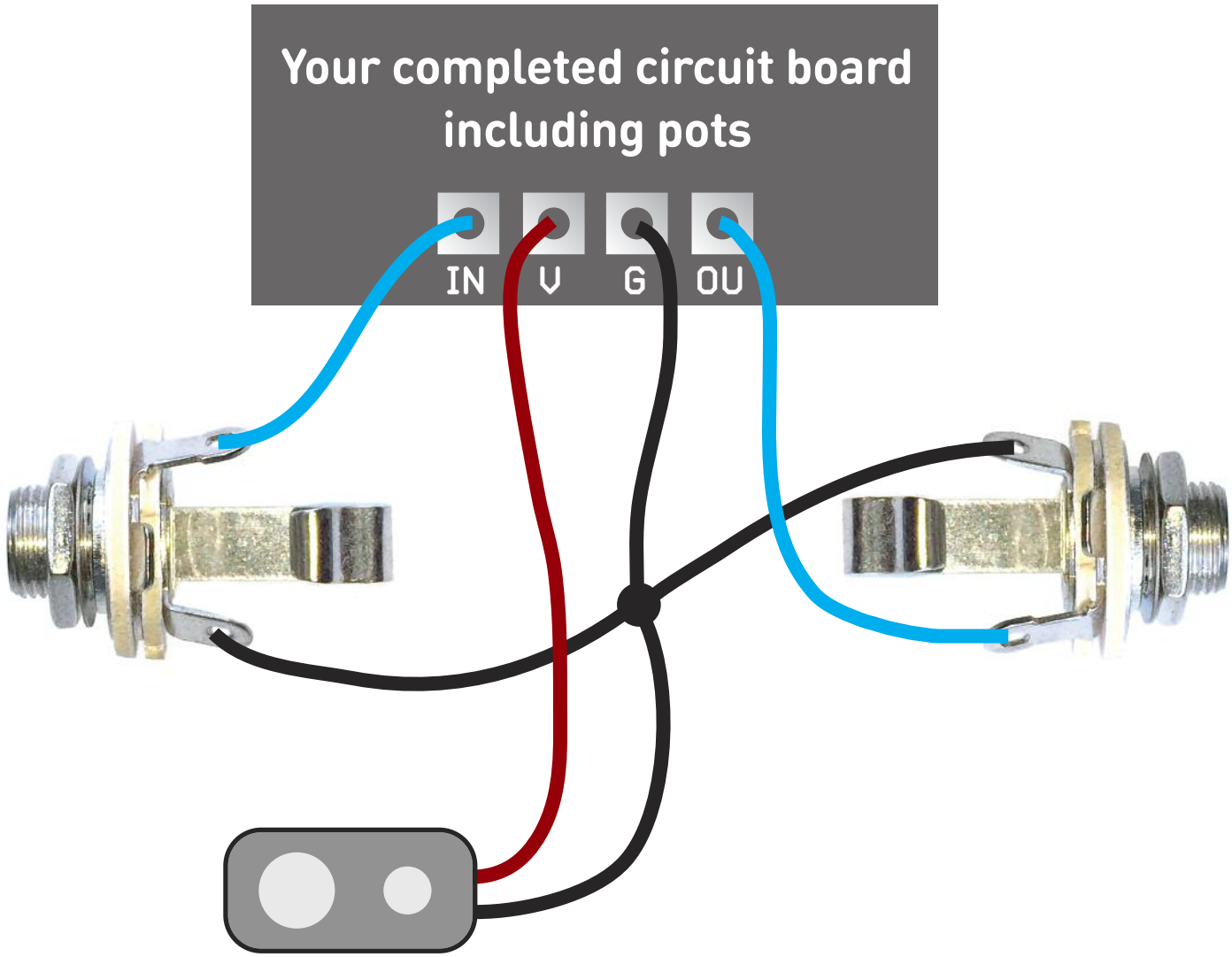
UNDER NO CIRCUMSTANCES will troubleshooting help be offered if you have skipped this stage. No exceptions.

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.

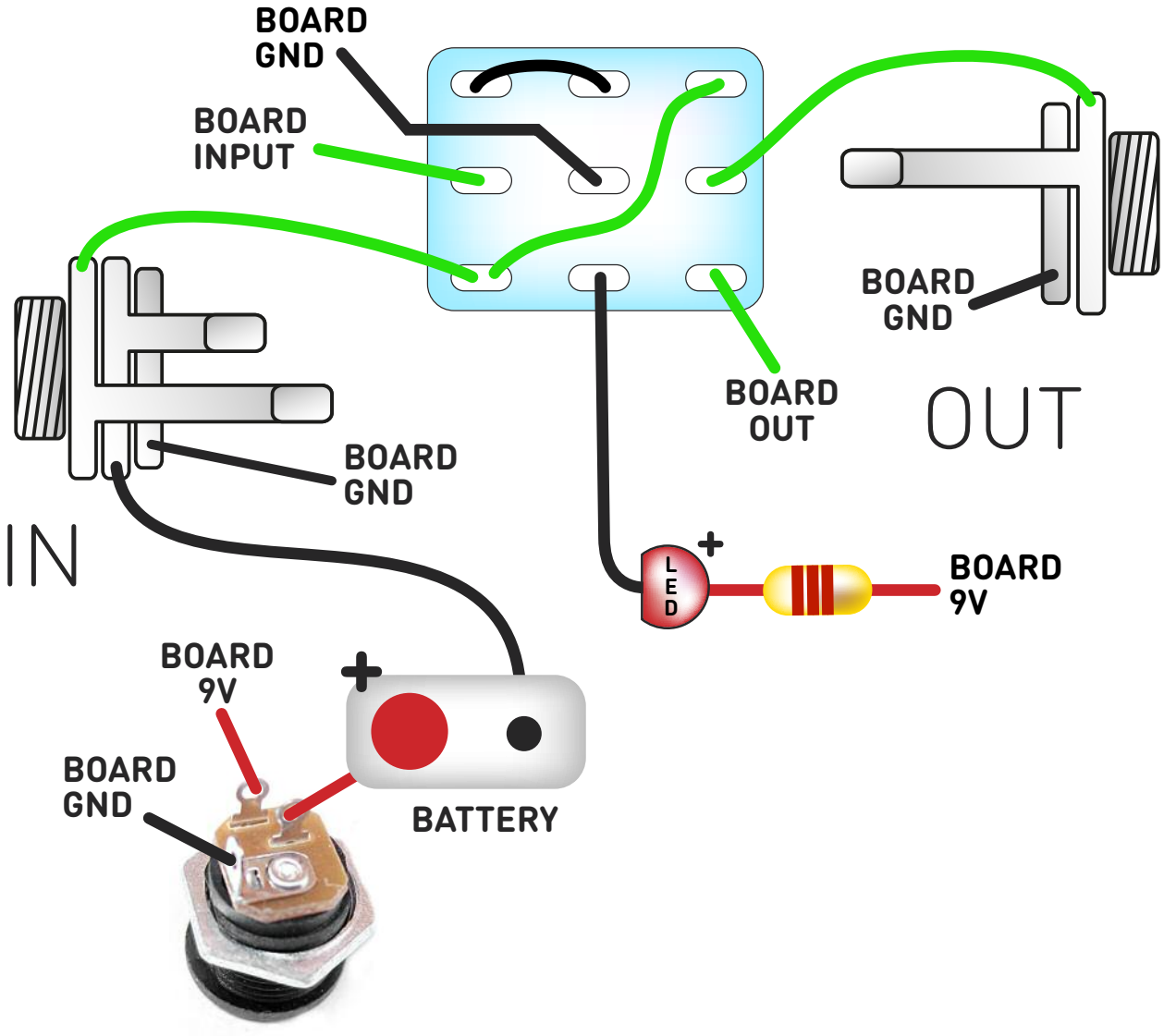
Solder some nice, long lengths of wire to the board connections for 9V, GND, IN and OUT. Connect IN and OUT to the jacks as shown. Connect all the GNDs together (twist them up and add a small amount of solder to tack it). Connect the battery + lead to the 9V wire, same method. Plug in. Go!

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.

SETTING UP

You have two trimmers to set. Pin 3 of the depth pot is the best place to attach your probe if you're using a scope.

SHAPE

This adjusts the shape of the triangle wave. If you have an oscilloscope now's the time to fire it up. Set the mode switch to triangle and adjust the trimmer until you get a nice triangular waveform. If you don't have a scope you're going to have to trust your ears. There are two methods. 1) Turn depth and rate up full and adjust until you have the smoothest tone. 2) Turn depth up full and rate right down - adjust until you have even up and down slopes.

OFFSET (OST)

This sets the centre of the LFO sweep. Again, a scope is your friend here - adjust this so the centre of the waveform is at 0V. No scope, adjust by ear for the fullest sweep you can hear.

MAKING SENSE OF IT ALL...

This isn't an exact-science effect. Everything is highly interactive so experimentation is the watchword. You'll find a sweet setting in one mode will do nothing in the next. Once you turn the rotary switch you'll find the Bias control will need tweaking to get the next mode working as you want.

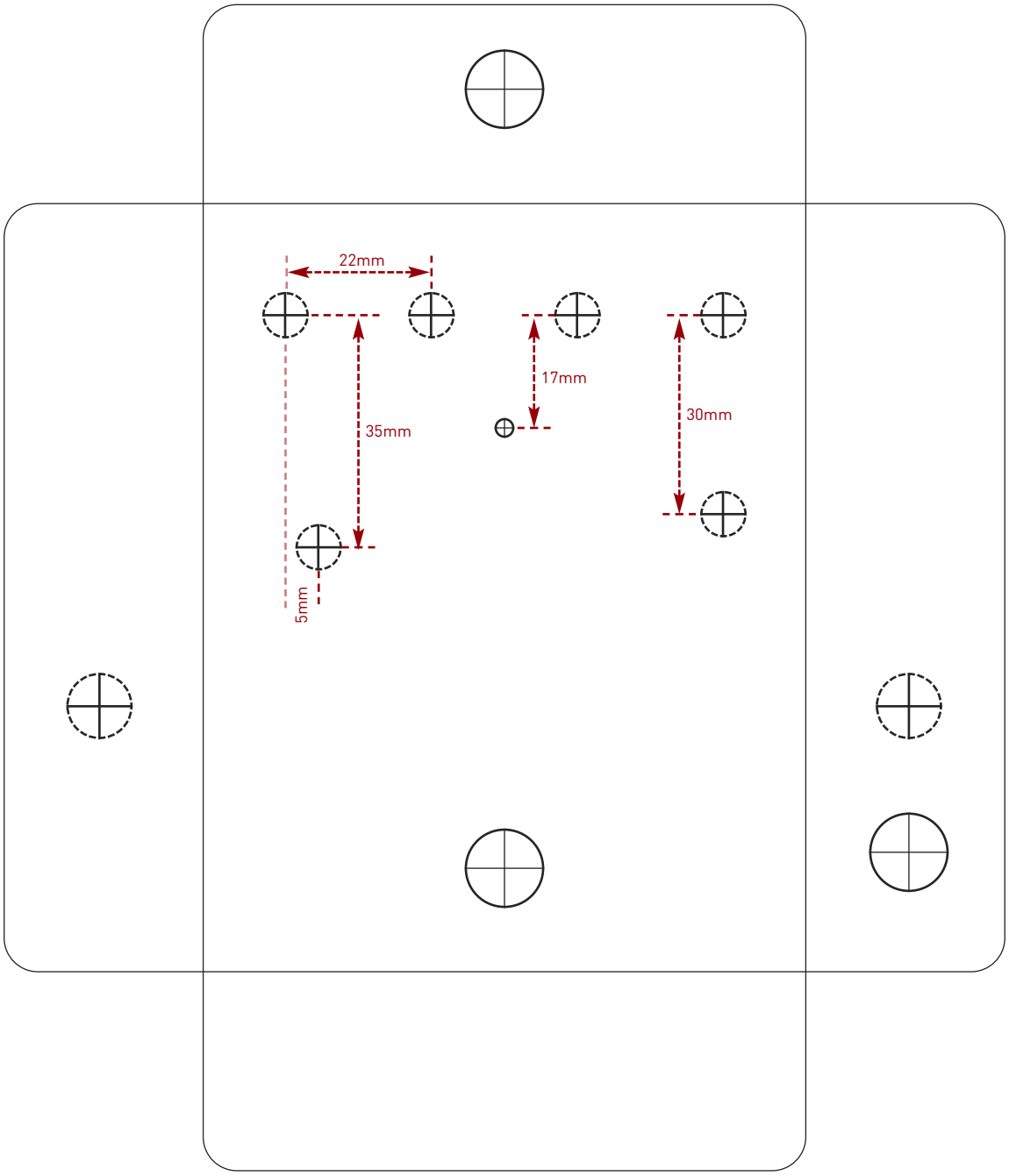
The toggle switch is to select VCA/VCF modes. If you're not sure what that is, just flip the switch.

Drilling template

Hammond 1590BB

Recommended drill sizes:

Pots	7mm
Jacks	10mm
Footswitch	12mm
DC Socket	12mm
Rotary Switch	10mm
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