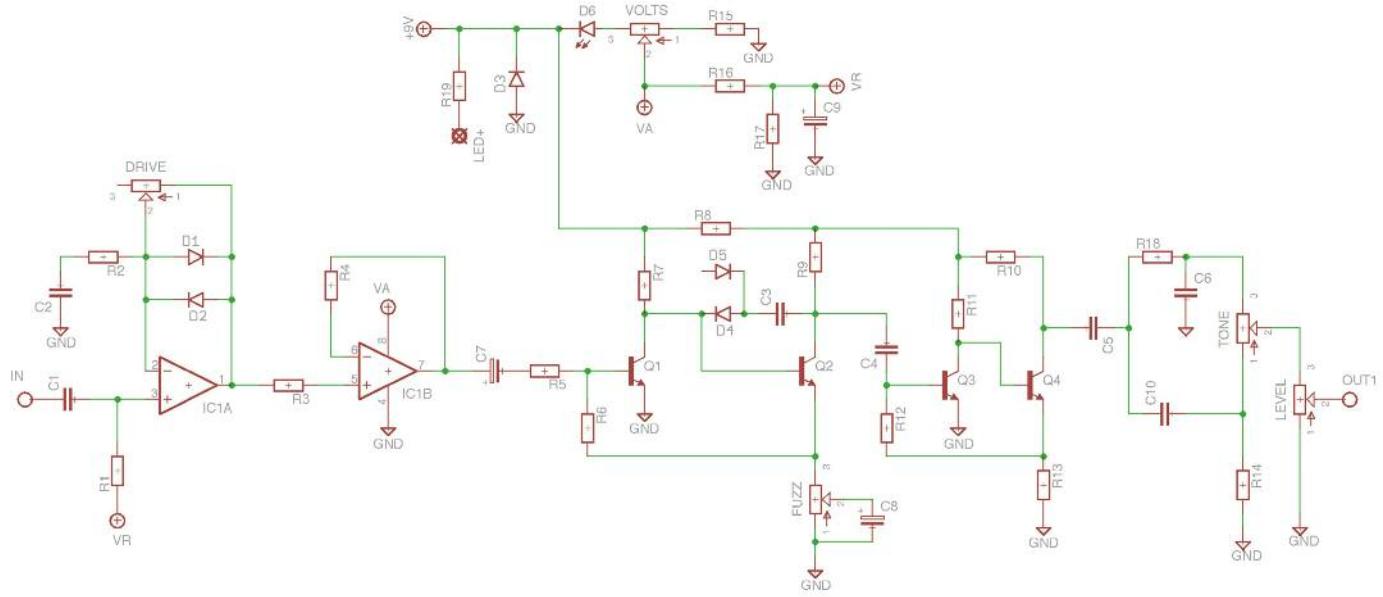


# Mad Mule

Neil Young's Crazy Horse  
tone in a box!

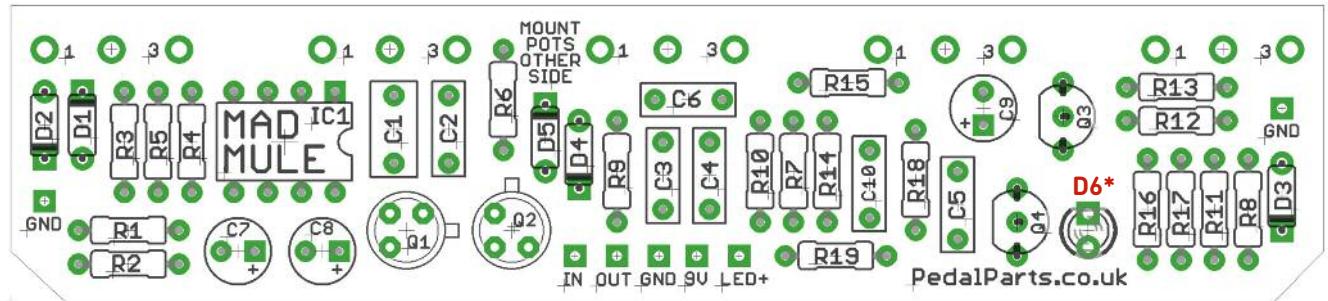
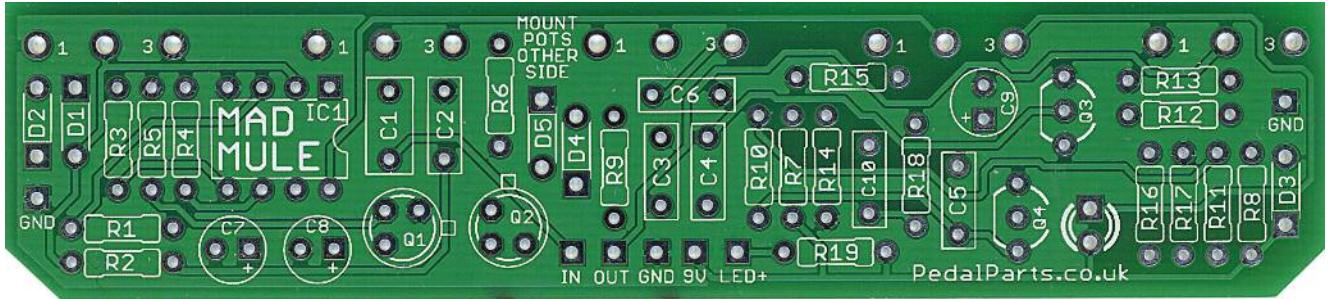
**PedalParts.co.uk**

# Schematic



# BOM

R1	1M	C1	1u	
R2	22K	C2	100n	
R3	1K	C3	100n	
R4	1K	C4	100n	DRIVE 250KB
R5	39K	C5	220n	VOLTS 1KB
R6	33K	C6	10n	TONE 20KB
R7	22K	C7	22u elec	FUZZ 1KB
R8	1K	C8	22u elec	VOL 500KB
R9	3K3	C9	22u elec	
R10	1K	C10	22n	
R11	1K5	D1-5	1N4148	
R12	100K	D6	3mm Green LED	
R13	1K5	IC	4558	
R14	22K	Q1-2	2N2222	
R15	560R	Q3-4	MPSA13	
R16	22K			
R17	22K			
R18	47K			
R19	2K2 (CLR)			



\*shown the wrong way round - reverse the orientation!  
Long leg to bottom (round) pad

The PCB is designed to have the pots mounted directly to it. You can use wire if you like - simply connect the board pads to the corresponding pins on the pots.

Pots mount on the back side of the PCB, opposite side to the components.

Snap the little metal tag off the pots to mount them flush in the box.



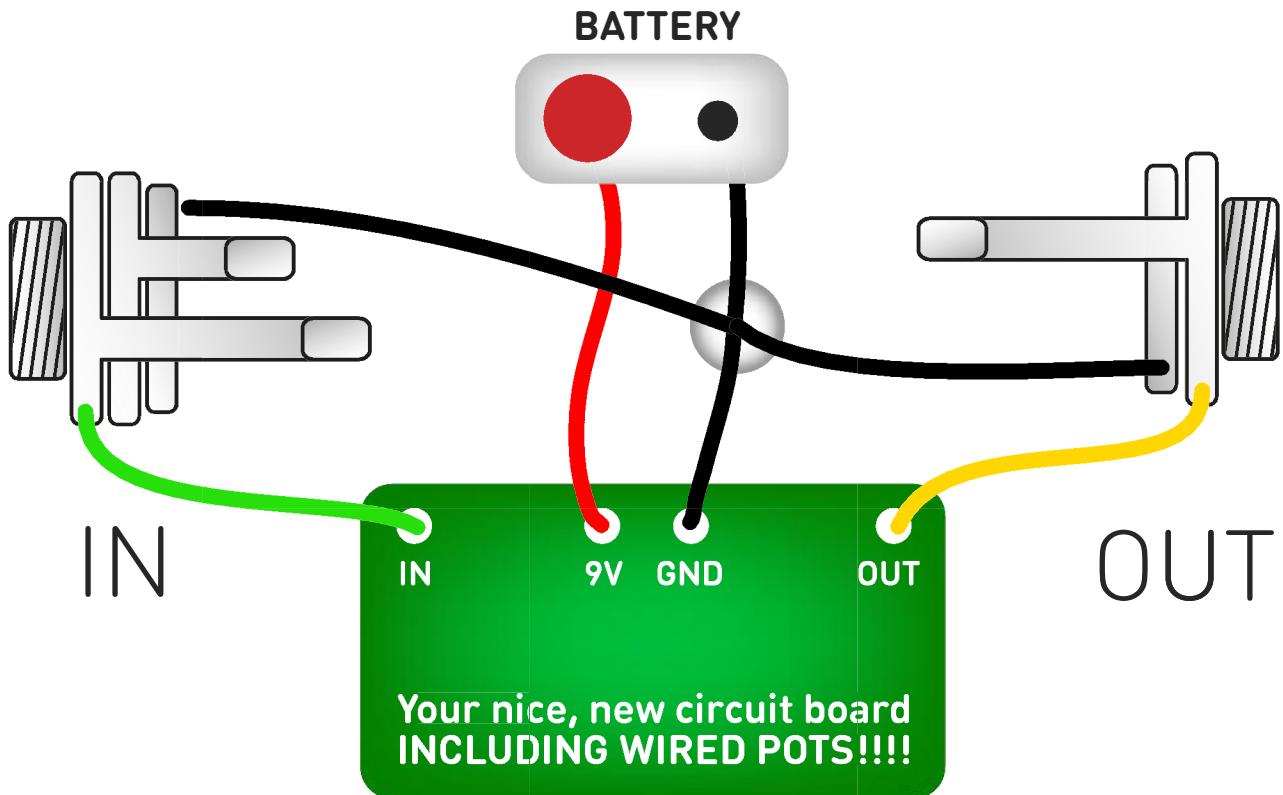
The polarity indication stripes for the diodes may not be visible on the PCB. The stripe indicates the Positive leg of the diode (counter-intuitive eh?). This leg goes into the square pad.

D6 (green 3mm LED) is missing its legend on the PCB. It is shown above in RED. The part is also the wrong way round. The longer leg of the LED should go into the round pad, whereas the square pad usually indicates positive.

The TONE control seems to work backwards compared to normal, i.e. more bass when turned clockwise. The PCB has been prepared with the Tone pot connections as shown in all schematics and layouts across the web, and no original unit was available to compare. Tone is neutral at 12 o'clock position.

Extra GND connection pads are placed at either side of the PCB. Use these for convenient connection to the jack sockets.

# Test the board!

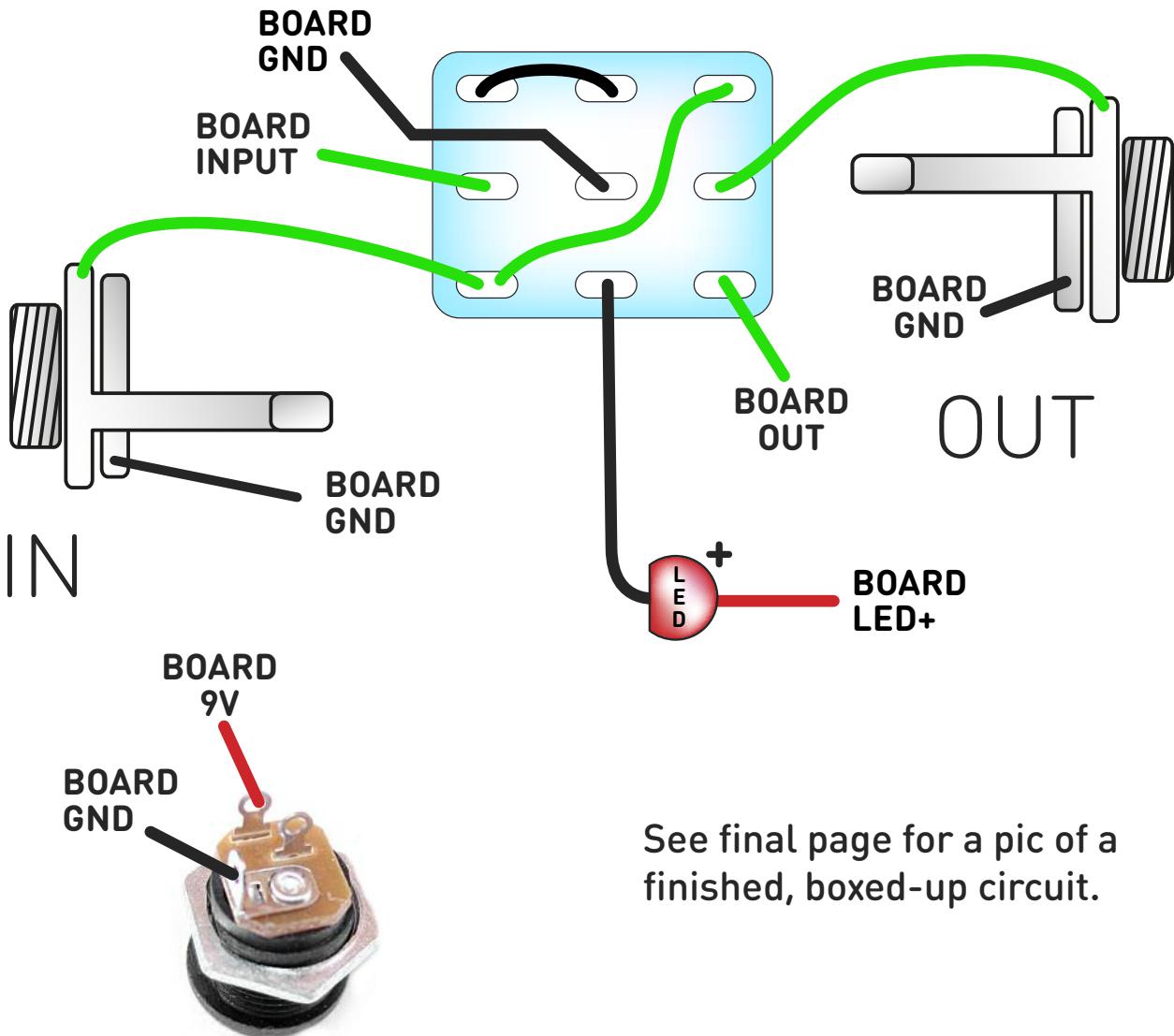


Once you've finished the circuit it makes sense to test it before starting on the switch and LED wiring. It'll cut down troubleshooting time in the long run. If the circuit works at this stage, but it doesn't once you wire up the switch - guess what? You've probably made a mistake with the switch.

Solder some nice, long lengths of wire to the board connections for 9V, GND (any of the GND pads will do for now), 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 it works, crack 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 - DC only version

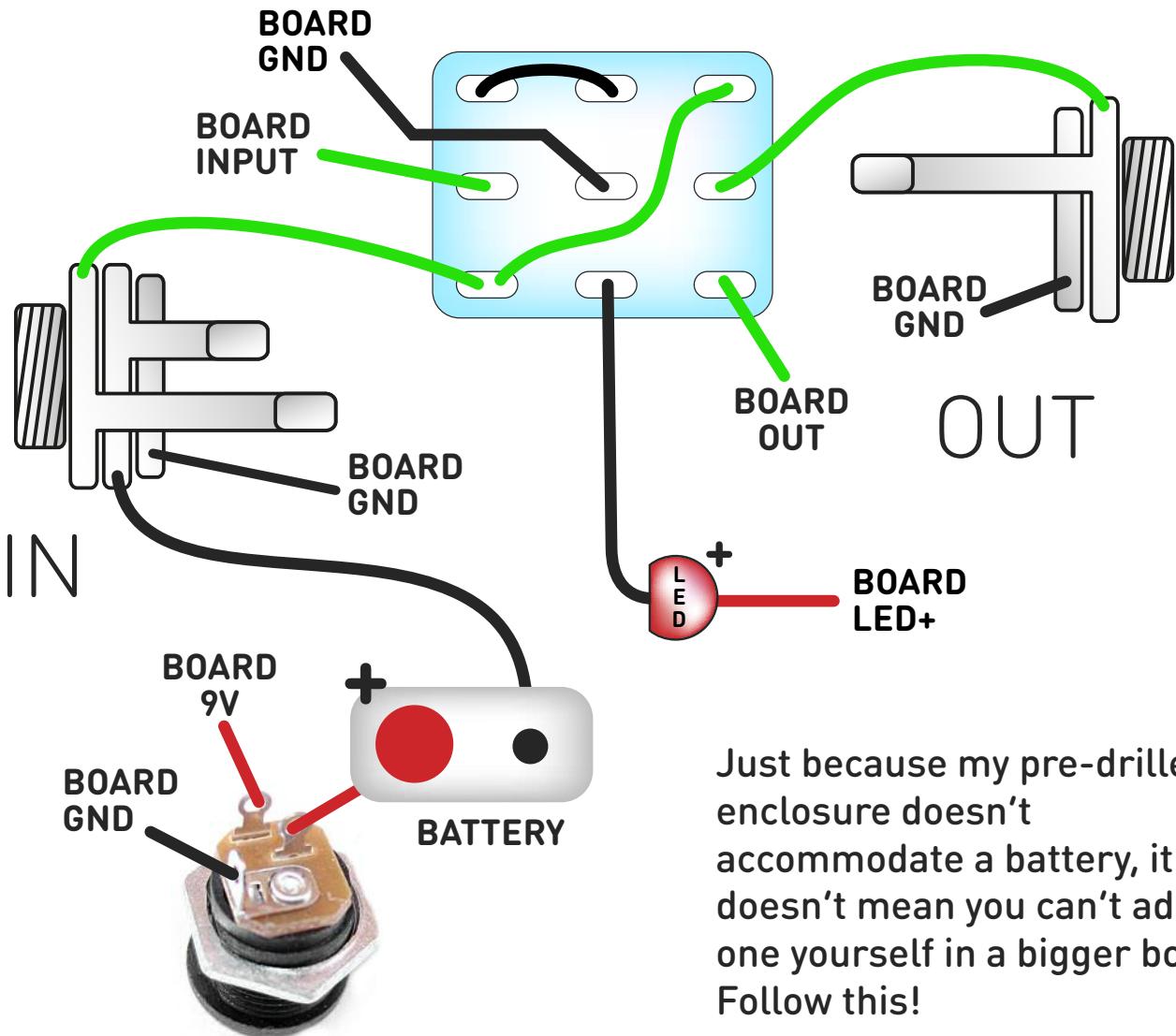


There are GND connections for both jacks at either end of the board.

I recommend stripping a longer-than-normal end on the wire that attached to the GND of the DC socket. Feed that through the pad, solder it, then attach another piece of wire to the bit sticking out. Run this to the footswitch. Alternatively, just run two wires from the DC socket or a jack socket. It doesn't matter how all the GNDs connect up, as long as they all 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. Now... start Rockin' the Free World!

# Wire it up - with battery



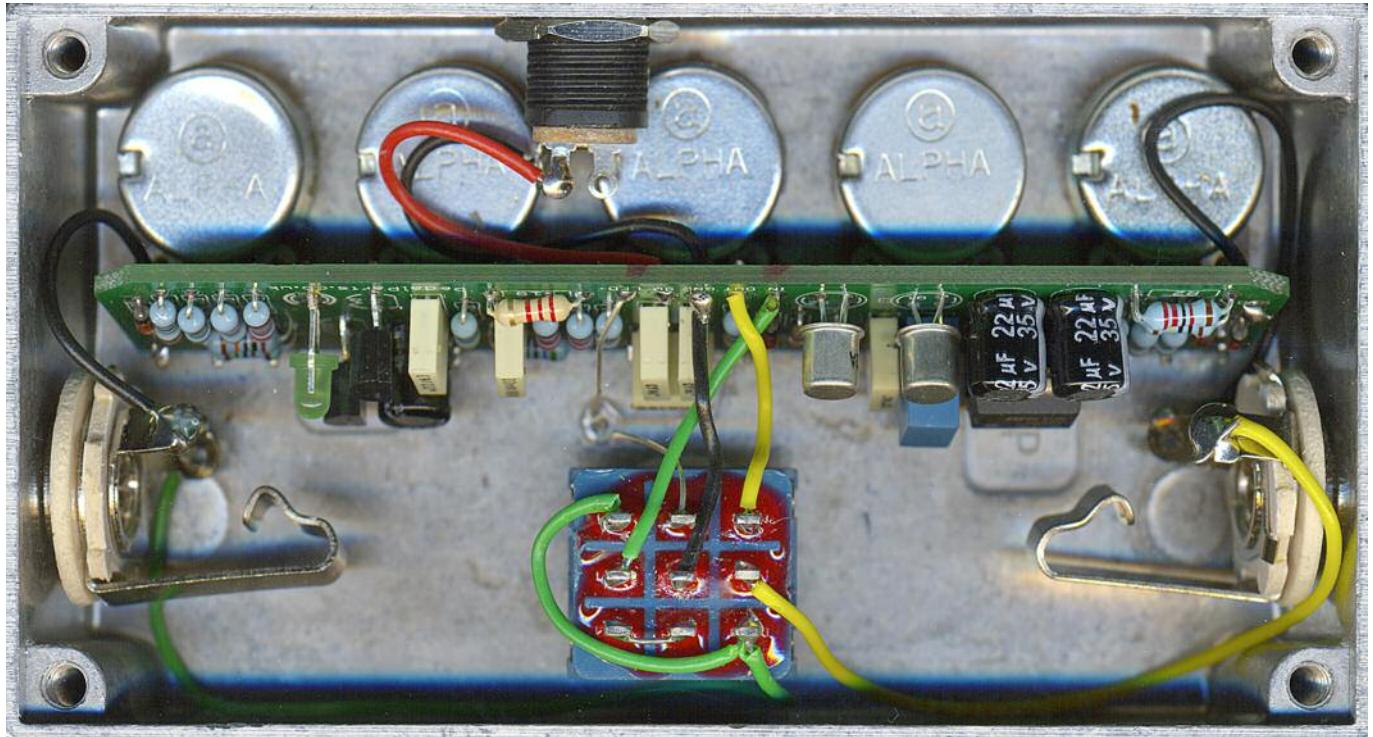
Just because my pre-drilled enclosure doesn't accommodate a battery, it doesn't mean you can't add one yourself in a bigger box. Follow this!

There are GND connections for both jacks at either end of the board.

I recommend stripping a longer-than-normal end on the wire that attached to the GND of the DC socket. Feed that through the pad, solder it, then attach another piece of wire to the bit sticking out. Run this to the footswitch. Alternatively, just run two wires from the DC socket or a jack socket. It doesn't matter how all the GNDs connect up, as long as they all 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. Now... start Rockin' the Free World!

# Finished article....



Not going to kid you - its a tight fit. I recommend having the board tipped back a bit on the pots, i.e. not at 90° to the box, as shown above. This gives a lot more clearance for the jack sockets, which would be very close to the diodes on the right hand side there. It also allows much more clearance when your jack plugs are inserted, otherwise you'll be scraping the top of the IC and the green LED.

If the lugs of the jack sockets are a bit too close to the enclosure for your liking, just gently bend them in a little.

You can either solder the pots pre-angled, or solder them at 90° and gently push the board back when in-situ in the box. Easy does it... only go as far as you need to. Insert a jack plug and judge it from there.

In the pic above I have the LED attached directly to the PCB, as I have the hole higher up than normal (I have my reasons!). You should use lengths of wire.