

PROJECT NAME

PERELANDRA

BASED ON

Xotic BB Preamp

BUILD DIFFICULTY

■■■■■ Easy

EFFECT TYPE

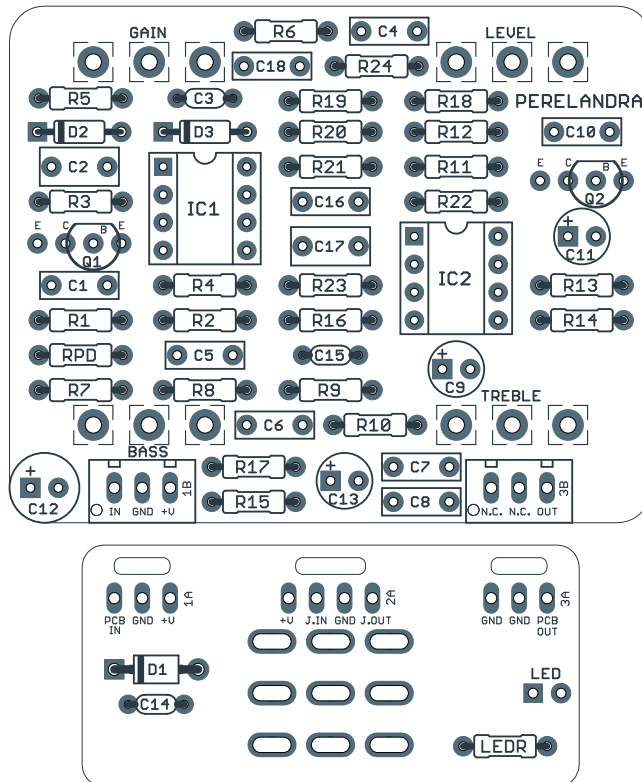
Boost / Overdrive

DOCUMENT VERSION

1.0.0 (2018-09-22)

PROJECT SUMMARY

A flexible drive pedal that can go from clean volume boost to smooth overdrive. Includes a 2-band tone stack for treble & bass.



Actual size is 2.3" x 1.86" (main board) and 2.3" x 0.86" (bypass board).

TABLE OF CONTENTS

1	Project Overview	7	Enclosure Layout
2	Introduction & Usage	8	Wiring Diagram
3-4	Parts List	9	Licensing
5	Schematic	9	Document Revisions
6	Drill Template		

INTRODUCTION

The Perelandra Boost / Overdrive is a recreation of the Xotic BB Preamp, a flexible tone machine that lets you go from a clean volume boost to a nice smooth overdrive with a 2-band EQ to shape the tone.

The BB Preamp is very similar to the Ibanez Tube Screamer, but with an active Baxandall tone control added before the output buffer so that the treble and bass can be independently boosted or cut.

In fact, if you look at the schematic for the BB Preamp, you can see that the original Tube Screamer tone control stage is left intact, but with the tone knob is fixed at 5% rotation (i.e. almost fully to the dark side of the control) by using a 1k and a 19k resistor. The main difference between the BB Preamp and the AC or RC Booster is the presence of this Tube Screamer tone control stage to shape the tone going into the Baxandall EQ.

USAGE

The Perelandra has four controls:

- **Gain** controls the amount of gain from the op amp that is fed through the feedback clipping diodes.
- **Treble** is one half of the Baxandall tone control, allowing you to boost or cut high frequencies.
- **Bass** is the other half of the Baxandall tone control, allowing you to boost or cut low frequencies.
- **Level** sets the overall output of the effect.

PARTS LIST

This parts list is also available in a spreadsheet format which can be imported directly into Mouser for easy parts ordering. Mouser doesn't carry all the parts—notably potentiometers—so the second tab lists all the non-Mouser parts as well as sources for each.

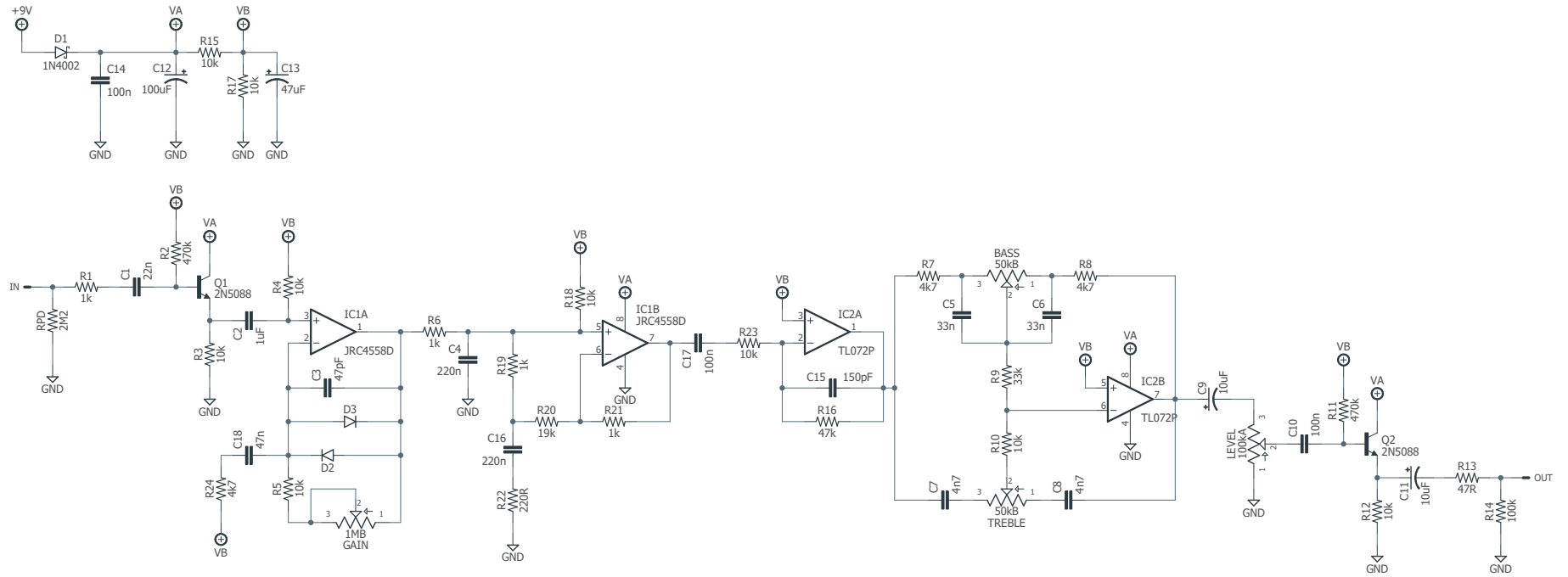
[View parts list spreadsheet](#) →

PART	VALUE	TYPE	NOTES
R1	1k	Metal film resistor, 1/4W	
R2	470k	Metal film resistor, 1/4W	
R3	10k	Metal film resistor, 1/4W	
R4	10k	Metal film resistor, 1/4W	
R5	10k	Metal film resistor, 1/4W	
R6	1k	Metal film resistor, 1/4W	
R7	4k7	Metal film resistor, 1/4W	
R8	4k7	Metal film resistor, 1/4W	
R9	33k	Metal film resistor, 1/4W	
R10	10k	Metal film resistor, 1/4W	
R11	470k	Metal film resistor, 1/4W	
R12	10k	Metal film resistor, 1/4W	
R13	47R	Metal film resistor, 1/4W	
R14	100k	Metal film resistor, 1/4W	
R15	10k	Metal film resistor, 1/4W	
R16	47k	Metal film resistor, 1/4W	
R17	10k	Metal film resistor, 1/4W	
R18	10k	Metal film resistor, 1/4W	
R19	1k	Metal film resistor, 1/4W	
R20	19.1k	Metal film resistor, 1/4W	Substitute. Original uses 19k.
R21	1k	Metal film resistor, 1/4W	
R22	220R	Metal film resistor, 1/4W	
R23	10k	Metal film resistor, 1/4W	
R24	4k7	Metal film resistor, 1/4W	
RPD	1M	Metal film resistor, 1/4W	Input pulldown resistor.
LEDR	4k7	Metal film resistor, 1/4W	LED current-limiting resistor. Adjust value to change LED brightness.
C1	22n	Film capacitor, 7.2 x 2.5mm	
C2	1uF	Film capacitor, 7.2 x 3.5mm	
C3	47pF	MLCC capacitor, NP0/COG	Substitute. Original uses 51pF.
C4	220n	Film capacitor, 7.2 x 2.5mm	

PARTS LIST, CONT.

PART	VALUE	TYPE	NOTES
C5	33n	Film capacitor, 7.2 x 2.5mm	
C6	33n	Film capacitor, 7.2 x 2.5mm	
C7	4n7	Film capacitor, 7.2 x 2.5mm	
C8	4n7	Film capacitor, 7.2 x 2.5mm	
C9	47u	Electrolytic capacitor, 5mm	
C10	100n	Film capacitor, 7.2 x 2.5mm	
C11	10uF	Electrolytic capacitor, 5mm	
C12	100uF	Electrolytic capacitor, 6.3mm	Power supply filter capacitor.
C13	47uF	Electrolytic capacitor, 5mm	Reference voltage filter capacitor.
C14	100n	MLCC capacitor, X7R	Power supply filter capacitor.
C15	150pF	MLCC capacitor, NP0/COG	
C16	220n	Film capacitor, 7.2 x 2.5mm	
C17	100n	Film capacitor, 7.2 x 2.5mm	
C18	47n	Film capacitor, 7.2 x 2.5mm	
D1	1N5817	Schottky diode, DO-41	
D2	1N914	Fast-switching diode, DO-35	
D3	1N914	Fast-switching diode, DO-35	
Q1	2N5088	BJT transistor, NPN, TO-92	Substitute. Original uses 2SC1815.
Q2	2N5088	BJT transistor, NPN, TO-92	Substitute. Original uses 2SC1815.
IC1	JRC4558D	Operational amplifier, DIP8	Original IC is unknown.
IC1-S	DIP-8 socket	IC socket, DIP-8	
IC2	TL072	Operational amplifier, DIP8	Original IC is unknown.
IC2-S	DIP-8 socket	IC socket, DIP-8	
GAIN	1MB	16mm right-angle PCB mount pot	
BASS	50kB	16mm right-angle PCB mount pot	
TREBLE	50kB	16mm right-angle PCB mount pot	
LEVEL	100kA	16mm right-angle PCB mount pot	
LED	5mm	LED, 5mm, red diffused	
IN	1/4" stereo	1/4" phone jack, closed frame	Switchcraft 112BX or equivalent.
OUT	1/4" mono	1/4" phone jack, closed frame	Switchcraft 111X or equivalent.
DC	2.1mm	DC jack, 2.1mm panel mount	Mouser 163-4302-E or equivalent.
BATT	Battery snap	9V battery snap	Optional. Use the soft plastic type—the hard-shell type will not fit.
FSW	3PDT	Stomp switch, 3PDT	
ENC	125B	Enclosure, die-cast aluminum	Can also use a Hammond 1590N1.

SCHEMATIC



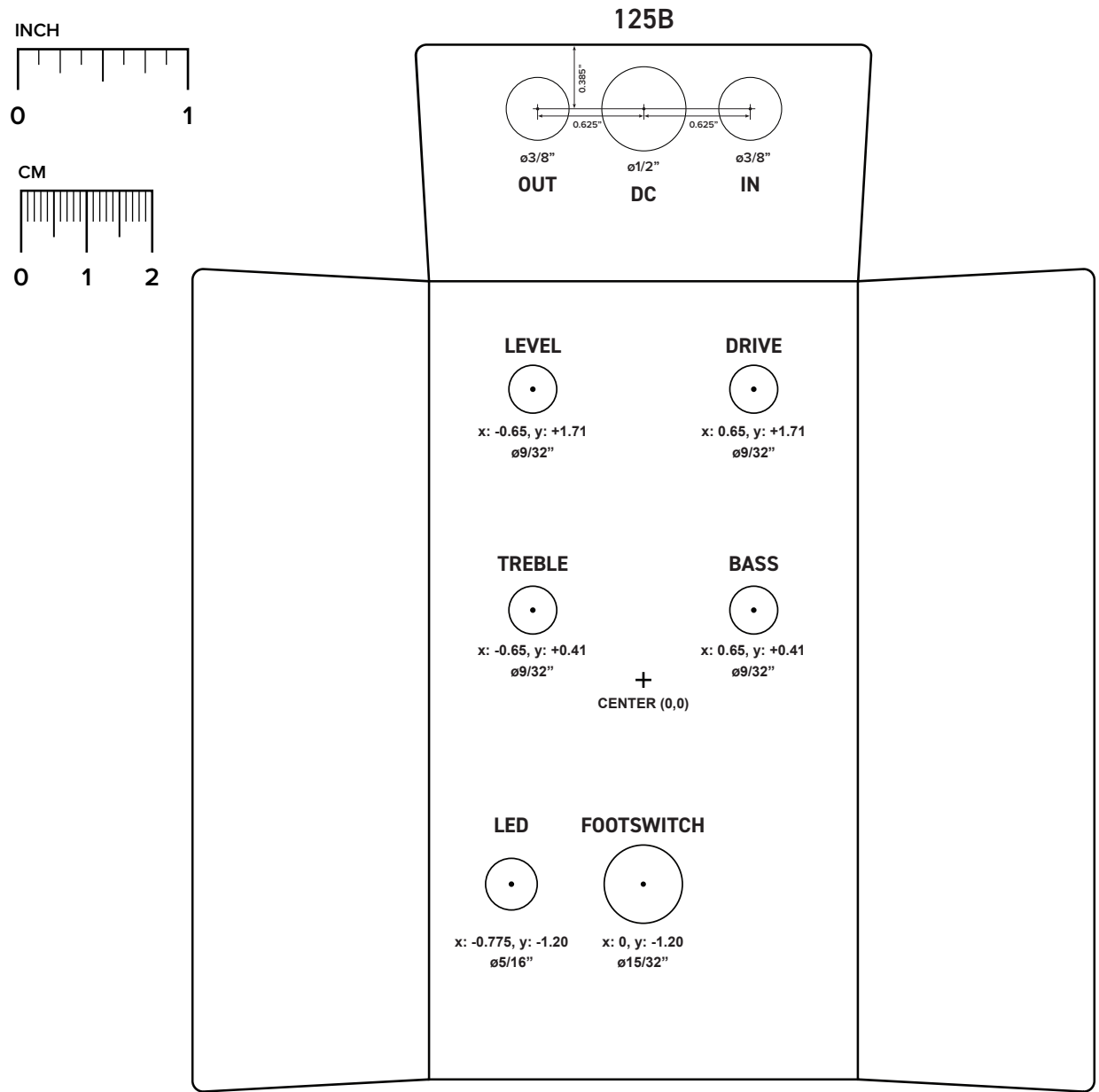
DRILL TEMPLATE

Cut out this drill template, fold the edges and tape it to the enclosure. Before drilling, it's recommended to first use a center punch for each of the holes to help guide the drill bit.

Ensure that this template is printed at 100% or "Actual Size". You can double-check this by measuring the scale on the printed page.

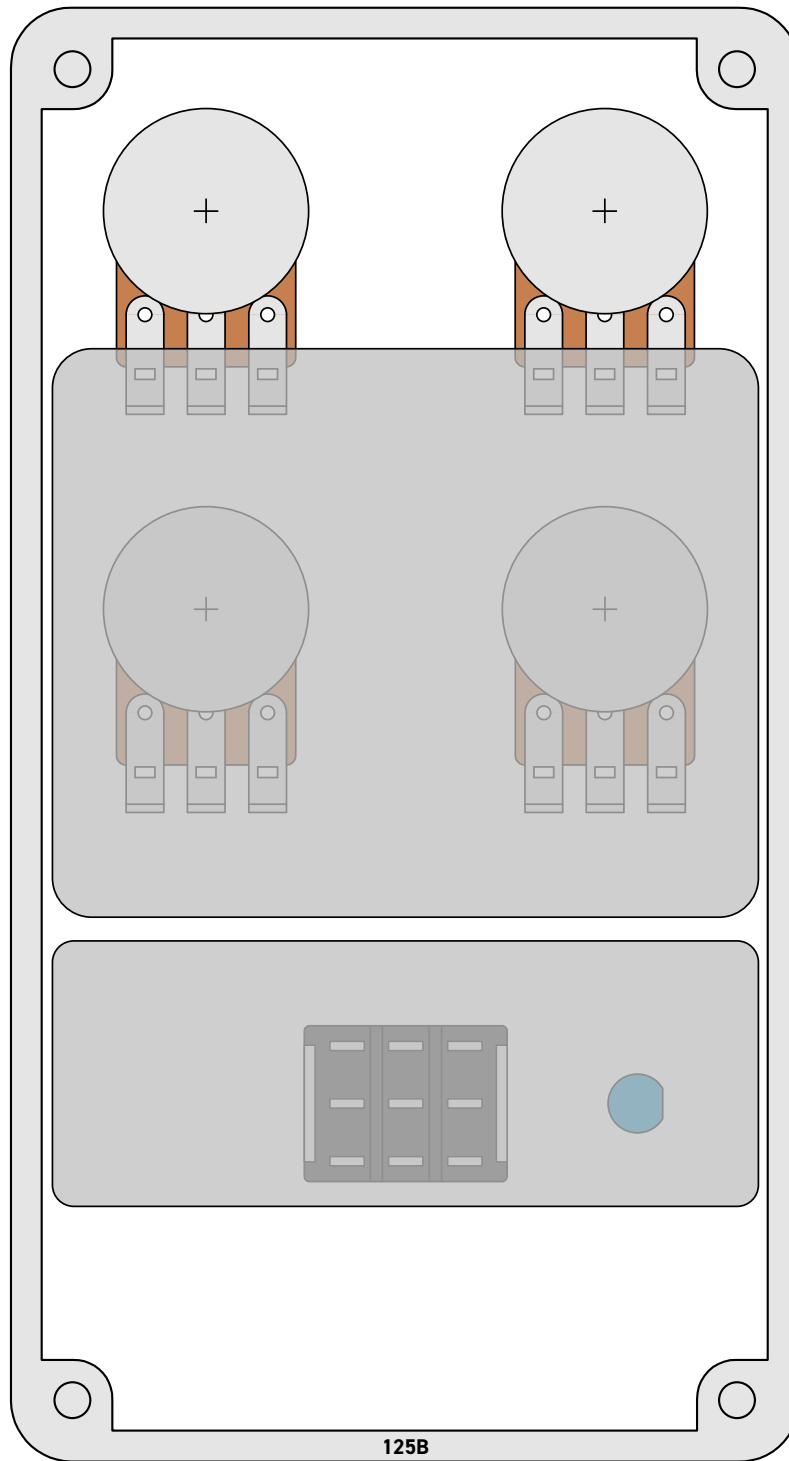
Top jack layout assumes the use of closed-frame jacks like the [Switchcraft 111X](#). If you'd rather use open-frame jacks, please refer to the Open-Frame Jack Drill Template for the top side.

LED hole drill size assumes the use of a [5mm LED bezel](#), available from several parts suppliers. Adjust size accordingly if using something different, such as a 3mm bezel, a plastic bezel, or just a plain LED.

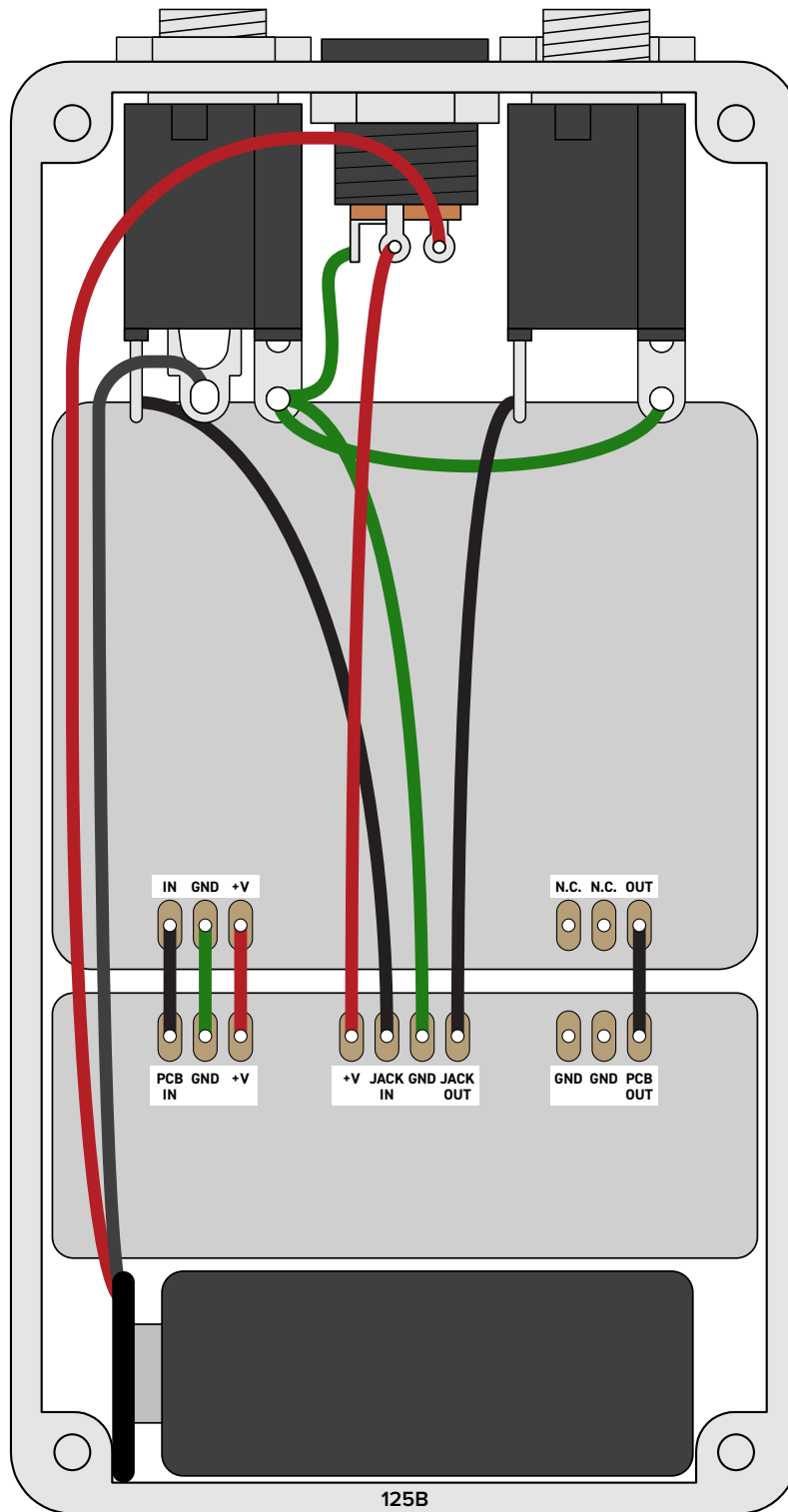


ENCLOSURE LAYOUT

Enclosure is shown without jacks. See next page for jack layout and wiring.



WIRING DIAGRAM



*Shown with optional 9V battery. If battery is omitted, both jacks can be mono rather than one being stereo.
Leave the far-right lug of the DC jack unconnected.*

LICENSE & USAGE

No direct support is offered for these projects beyond the provided documentation. It's assumed that you have at least some experience building pedals before starting one of these. Replacements and refunds cannot be offered unless it can be shown that the circuit or documentation are in error.

All of these circuits have been tested in good faith in their base configurations. However, not all the modifications or variations have necessarily been tested. These are offered only as suggestions based on the experience and opinions of others.

Projects may be used for commercial endeavors in any quantity unless specifically noted. No attribution is necessary, though a link back is always greatly appreciated. The only usage restrictions are that **(1) you cannot resell the PCB as part of a kit without prior arrangement, and (2) you cannot "goop" the circuit, scratch off the screenprint, or otherwise obfuscate the circuit to disguise its source.** (In other words: you don't have to go out of your way to advertise the fact that you use these PCBs, but please don't go out of your way to hide it. The guitar effects industry needs more transparency, not less!)

DOCUMENT REVISIONS

1.0.0 (2018-09-22)

Initial release.