

PROJECT NAME

PERELANDRA



BASED ON

Xotic BB Preamp

BUILD DIFFICULTY

■■■■■ Easy

EFFECT TYPE

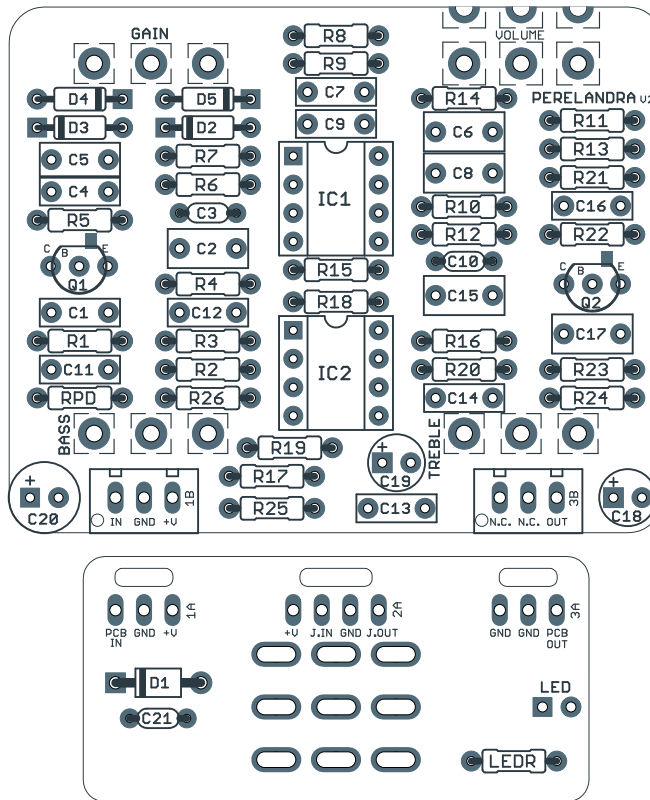
Boost / Overdrive

DOCUMENT VERSION

2.0.0 (2021-10-22)

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).

IMPORTANT NOTE

This documentation is for the standard (non-deluxe) version of the project. Early PCBs of the Deluxe version were labeled "Perelandra V2" rather than "Perelandra Deluxe". Please make sure your PCB matches the above image (four knobs and no toggles) before proceeding since the part numbering is different. The [Perelandra Deluxe](#) is available as a separate project.

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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. It was first released in 2005, a few years after the AC Booster and RC Booster, and the “BB” refers to the Marshall Bluesbreaker amplifier.

Despite the name, the BB Preamp has nothing to do with the Bluesbreaker pedal. In fact, like the AC/RC Booster, it’s 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 18k 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.

Version 2 of the Perelandra is a full redesign based on traces of several versions of the BB Preamp in 2021. The PCB supports the standard BB Preamp (called the “version 1.5”), the AT (Andy Timmons) model, and the Bass BB Preamp. Instructions have been provided for each variant. The default is version 1.5, the current production model.

The [Perelandra Deluxe](#) is hot-rodded version that incorporates modifications from the two Custom Shop models of the BB Preamp, the “MB” (mid boost) and “Comp” versions. Since it’s a lot more complex, we’ve split it off into a separate project. While the Deluxe version can emulate either the 1.5 or AT with the right control settings, the bass version is not supported and can only be built on this PCB.

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	Use 4k7 for bass version.
R6	4k7	Metal film resistor, 1/4W	Use 10k for bass version.
R7	1k	Metal film resistor, 1/4W	
R8	10k	Metal film resistor, 1/4W	
R9	1k	Metal film resistor, 1/4W	
R10	18k	Metal film resistor, 1/4W	
R11	220R	Metal film resistor, 1/4W	Jumper for bass version.
R12	1k	Metal film resistor, 1/4W	
R13	1k	Metal film resistor, 1/4W	
R14	47k	Metal film resistor, 1/4W	Use 22k for bass version.
R15	10k	Metal film resistor, 1/4W	
R16	47k	Metal film resistor, 1/4W	
R17	4k7	Metal film resistor, 1/4W	
R18	4k7	Metal film resistor, 1/4W	
R19	33k	Metal film resistor, 1/4W	
R20	10k	Metal film resistor, 1/4W	
R21	470k	Metal film resistor, 1/4W	
R22	10k	Metal film resistor, 1/4W	
R23	470R	Metal film resistor, 1/4W	
R24	100k	Metal film resistor, 1/4W	
R25	10k	Metal film resistor, 1/4W	
R26	10k	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	100n in bass version.
C3	47pF	MLCC capacitor, NP0/C0G	
C4	47n	Film capacitor, 7.2 x 2.5mm	Use 10uF for bass version. (positive leg to left pad)

PARTS LIST, CONT.

PART	VALUE	TYPE	NOTES
C5	220n	Film capacitor, 7.2 x 2.5mm	Omit (leave empty) for bass version.
C6	220n	Film capacitor, 7.2 x 2.5mm	Use 1uF for bass version.
C7	OMIT		Use 1n for bass version. Omit (leave empty) for standard circuit.
C8	1uF	Film capacitor, 7.2 x 3.5mm	
C9	100n	Film capacitor, 7.2 x 2.5mm	Use 10uF for bass version. (positive leg to left pad)
C10	150pF	MLCC capacitor, NP0/COG	
C11	33n	Film capacitor, 7.2 x 2.5mm	
C12	33n	Film capacitor, 7.2 x 2.5mm	
C13	4n7	Film capacitor, 7.2 x 2.5mm	Use 10n for bass version.
C14	4n7	Film capacitor, 7.2 x 2.5mm	Use 10n for bass version.
C15	1uF	Film capacitor, 7.2 x 3.5mm	Use 10uF for bass version. (positive leg to left pad)
C16	100n	Film capacitor, 7.2 x 2.5mm	
C17	1uF	Film capacitor, 7.2 x 3.5mm	Alternative to C18 for better-quality output capacitor.
C18	OMIT		Use 10uF for original output capacitor. Recommended to use C17 instead except for bass version.
C19	47uF	Electrolytic capacitor, 5mm	Power supply filter capacitor.
C20	100uF	Electrolytic capacitor, 6.3mm	Reference voltage filter capacitor.
C21	100n	MLCC capacitor, X7R	Power supply filter capacitor.
D1	1N5817	Schottky diode, DO-41	
D2	1N914	Fast-switching diode, DO-35	
D3	1N914	Fast-switching diode, DO-35	Jumper for AT version.
D4	1N914	Fast-switching diode, DO-35	Jumper for AT version.
D5	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	
IC1-S	DIP-8 socket	IC socket, DIP-8	
IC2	JRC4558D	Operational amplifier, DIP8	
IC2-S	DIP-8 socket	IC socket, DIP-8	

PARTS LIST, CONT.

PART	VALUE	TYPE	NOTES
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	100kB dual	16mm right-angle PCB mount pot	Linear taper, dual right-angle PCB mount.
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.

BUILD NOTES

“AT” (Andy Timmons) and “Version 1.5” models

In 2007, Xotic changed the BB Preamp to add an extra clipping diode in each direction (which they described as reducing compression). Andy Timmons was an early endorser of the BB Preamp and preferred the pre-2007 version. Because of this, Xotic re-released the pre-2007 version as the Andy Timmons signature model (sometimes called the “BB-AT”).

While there have been a few very minor circuit changes to the BB Preamp along its production run, the only thing distinguishing the AT from the non-AT version is the diodes. The AT version has one diode in each direction while the later version has two in each direction.

The post-2007 version is now referred to as the “v1.5” by Xotic and is still in production. There is no version 2, but presumably they didn’t feel the pre- and post-2007 versions were different enough to warrant a whole number change in version as with the V2 AC/RC Boosters.

The default parts list provided above is for version 1.5, the current production model. To build the AT version, just jumper one of the two diodes in each direction (i.e. D3 and D4).

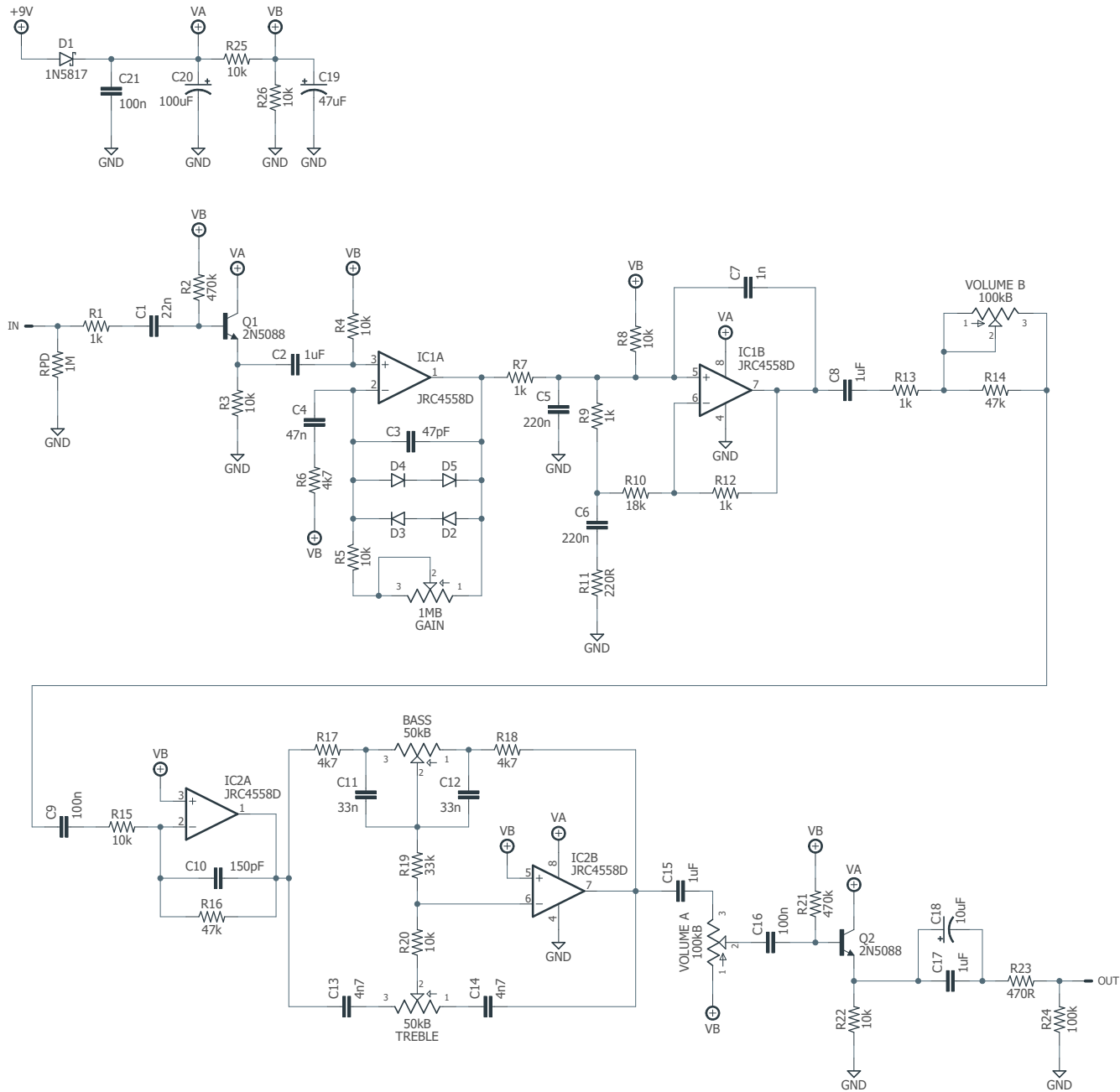
Bass version

The Bass BB Preamp was released in 2006. It’s mostly the basic circuit, but it has a single capacitor added and several part substitutions.

To build the bass version, change the following parts:

- **C2:** 1uF → 100n
- **C4:** 47n → 10uF (positive leg should go in left pad; will need to position it overlapping R5)
- **C5:** omit (leave empty)
- **C6:** 220n → 1uF
- **C7:** 1n (normally left empty on standard version)
- **C9:** 10uF (positive leg should go in left pad; easiest to solder it to the bottom side of the PCB)
- **C13:** 4n7 → 10n
- **C14:** 4n7 → 10n
- **C15:** 1uF → 10uF (positive leg should go in left pad; will need to position it overlapping R16)
- **R5:** 10k → 4k7
- **R6:** 4k7 → 10k
- **R11:** jumper
- **R14:** 47k → 22k

SCHEMATIC



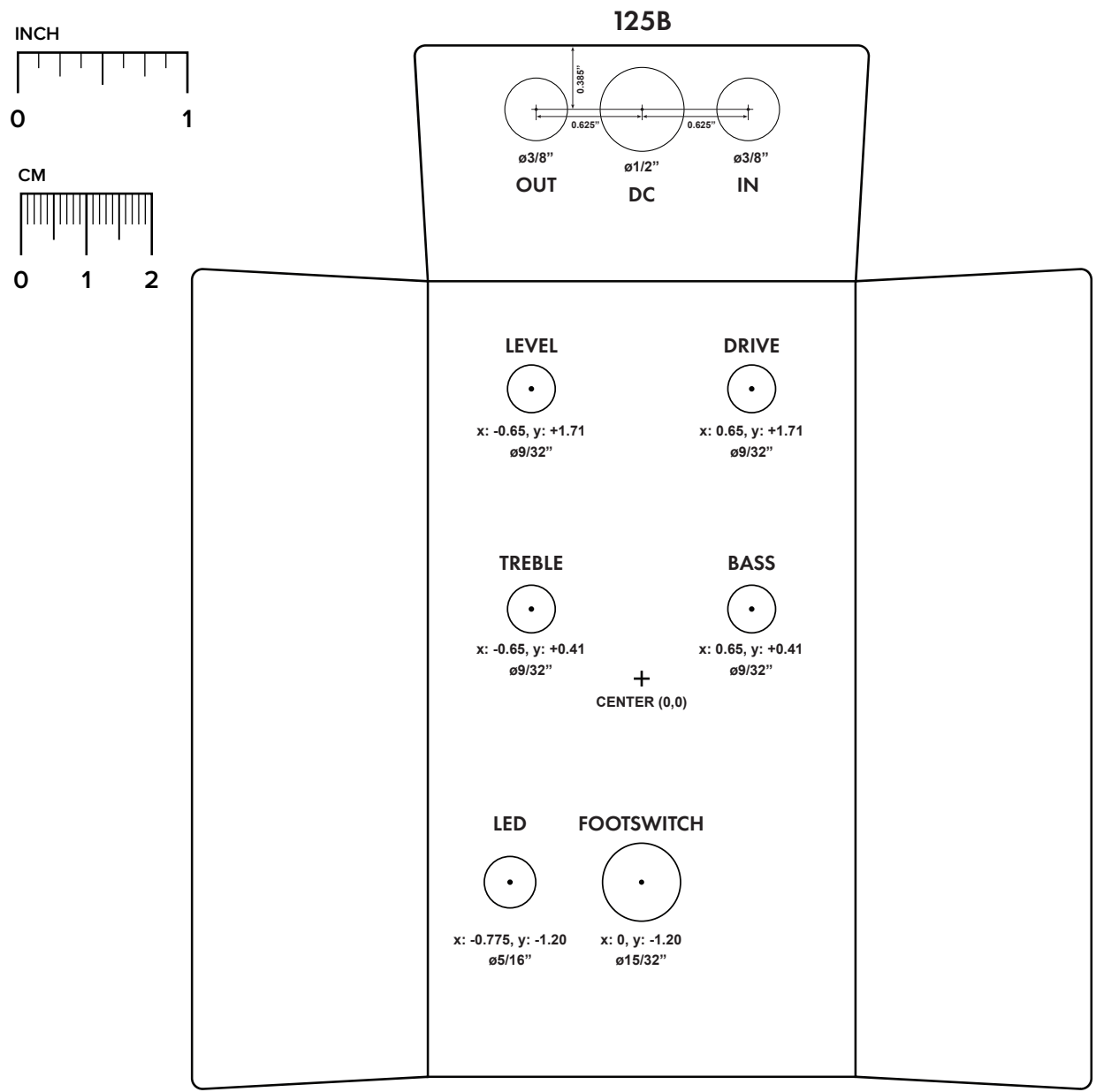
DRILL TEMPLATE

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.

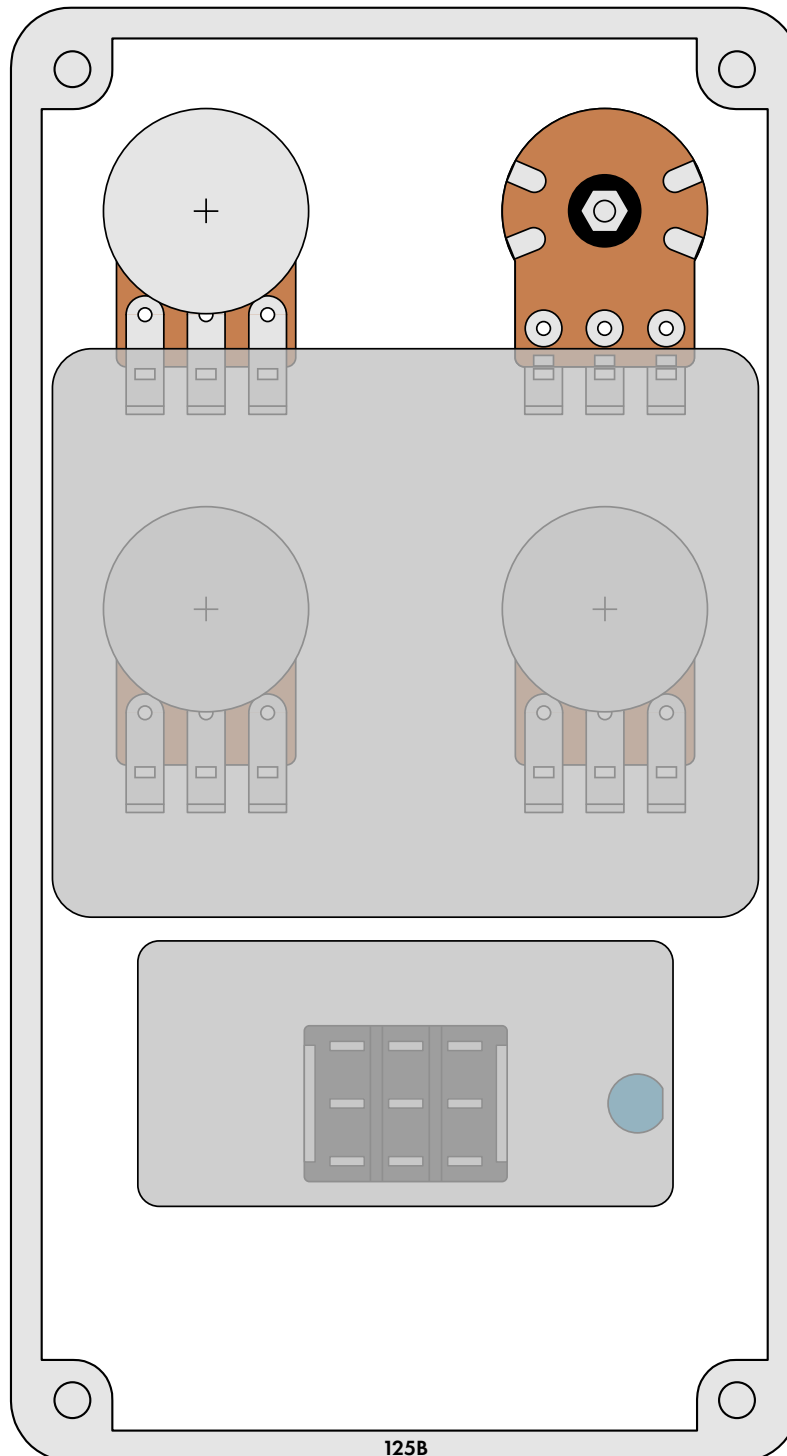
LED hole drill size assumes the use of a [5mm LED bezel](#), available from several parts suppliers. Adjust size accordingly if using something different, such as a 3mm bezel, a plastic bezel, or just a plain LED.



ENCLOSURE LAYOUT

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

Note: The upper pads for the dual-gang gain potentiometer appear to be cut in half. **This is intentional!** It's called a *plated half-hole* or *castellated hole*, and it's used so that the PCB can lay flat across the pots instead of angling upward for the dual pot. Solder it like you would if they were normal pads, but bend the top pins forward slightly so they make contact with the edge of the pads.



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

2.0.0 (2021-10-22)

Full redesign based on new traces of the BB Preamp 1.5, AT and Bass models.

1.0.0 (2018-09-22)

Initial release.