

PROJECT NAME
IXORA

BASED ON
Dinosaural OPA-101

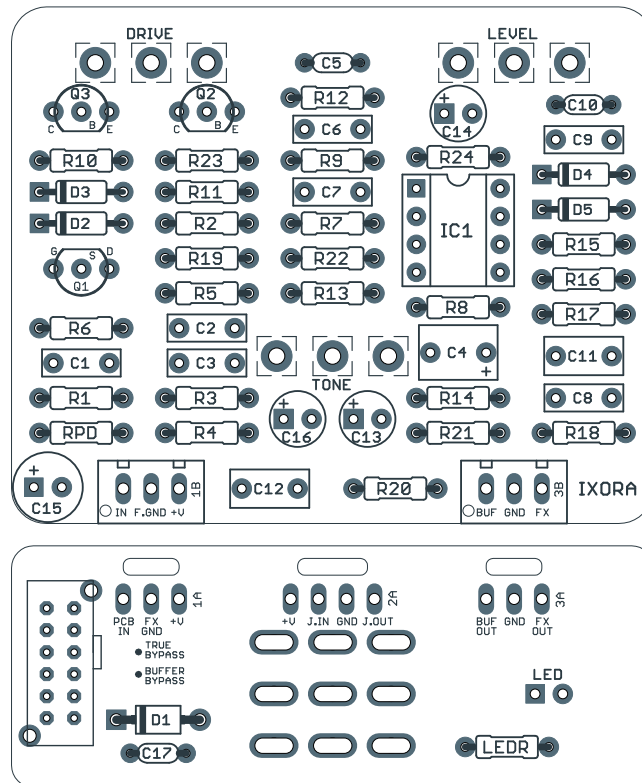
BUILD DIFFICULTY
■■■■□ Intermediate

EFFECT TYPE
Overdrive

DOCUMENT VERSION
1.0.1 (2020-11-30)

PROJECT SUMMARY

An adaptation of a rare overdrive pedal designed by Dan Coggins, formerly of Lovetone, hand-built in small quantities between 2012 and 2016.



Actual size is 2.3" x 1.86" (main board) and 2.3" x 0.87" (bypass board).

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INTRODUCTION

The Ixora Amp Overdrive is an adaptation of the Dinosaural OPA-101 Overdriven Preamp, an extremely rare overdrive pedal designed by Dan Coggins (formerly of Lovetone). The OPA-101 was [traced by Aion FX in 2020](#).

Dinosaural originally released the OPA-101 in November 2012. It was only available for direct sale, either via their website or Facebook page. It's estimated that only a few hundred were made.

It was developed as an updated version of the Tube Bender, another original Dinosaural design from 2003. (The Tube Bender was also [traced by Aion FX](#) and is available as the [Wyvern](#) project.) While the Tube Bender was an all-discrete transistor circuit that bore some resemblance to silicon Tone Bender variants, the OPA-101 substituted the input gain stage and output buffer for op-amp stages. The middle two-transistor amplifier stage, responsible for the unique clipping characteristics, is kept the same.

The other major change from the Tube Bender was the inclusion of a JFET-based buffered bypass mode, identical to the one from the OTC-201. The Ixora has an internal slide switch that allows the selection of either buffered or true bypass mode.

The original OPA-101 did not have a tone control, only a fixed treble cut after the clipping stage. The Ixora substitutes a potentiometer for the fixed resistor, allowing more or less treble cut than the stock unit and greatly improving the versatility.

USAGE

The Ixora has the following controls:

- **Drive** controls the amount of gain that is fed into the transistor clipping stage.
- **Tone** cuts treble frequencies after the clipping stage.
- **Level** is the overall output level.

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 (most 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	10k	Metal film resistor, 1/4W	
R2	1M	Metal film resistor, 1/4W	
R3	10k	Metal film resistor, 1/4W	
R4	180R	Metal film resistor, 1/4W	
R5	39k	Metal film resistor, 1/4W	
R6	330k	Metal film resistor, 1/4W	
R7	1M	Metal film resistor, 1/4W	
R8	2k2	Metal film resistor, 1/4W	
R9	10k	Metal film resistor, 1/4W	
R10	10k	Metal film resistor, 1/4W	
R11	10k	Metal film resistor, 1/4W	
R12	10k	Metal film resistor, 1/4W	
R13	470R	Metal film resistor, 1/4W	
R14	1M	Metal film resistor, 1/4W	
R15	OMIT		See build notes.
R16	JUMPER		See build notes.
R17	180R	Metal film resistor, 1/4W	
R18	39k	Metal film resistor, 1/4W	
R19	180R	Metal film resistor, 1/4W	
R20	39k	Metal film resistor, 1/4W	
R21	10k	Metal film resistor, 1/4W	
R22	1k8	Metal film resistor, 1/4W	
R23	8k2	Metal film resistor, 1/4W	
R24	1k	Metal film resistor, 1/4W	
RPD	2M2	Metal film resistor, 1/4W	
LEDR	4k7	Metal film resistor, 1/4W	LED current-limiting resistor. Adjust value to change LED brightness.
C1	33n	Film capacitor, 7.2 x 2.5mm	
C2	10n	Film capacitor, 7.2 x 2.5mm	
C3	100n	Film capacitor, 7.2 x 2.5mm	
C4	2.2uF	Film capacitor, 7.2 x 5mm	

PARTS LIST, CONT.

PART	VALUE	TYPE	NOTES
C5	470pF	MLCC capacitor, NP0/C0G	
C6	100n	Film capacitor, 7.2 x 2.5mm	
C7	22n	Film capacitor, 7.2 x 2.5mm	
C8	10n	Film capacitor, 7.2 x 2.5mm	
C9	OMIT		See build notes.
C10	OMIT		See build notes.
C11	1uF	Film capacitor, 7.2 x 3.5mm	
C12	1uF	Film capacitor, 7.2 x 3.5mm	
C13	10uF	Electrolytic capacitor, 5mm	Reference voltage filter capacitor.
C14	10uF	Electrolytic capacitor, 5mm	Reference voltage filter capacitor.
C15	100uF	Electrolytic capacitor, 6.3mm	Power supply filter capacitor.
C16	10uF	Electrolytic capacitor, 5mm	Reference voltage filter capacitor.
C17	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	
D4	1N914	Fast-switching diode, DO-35	
D5	1N914	Fast-switching diode, DO-35	
Q1	J113	JFET, N-channel	Can substitute any other general-purpose JFET (e.g. 2N5457).
Q2	BC549C	BJT transistor, NPN, TO-92	Can substitute 2N5088 (rotate 180 degrees on PCB).
Q3	BC549C	BJT transistor, NPN, TO-92	Can substitute 2N5088 (rotate 180 degrees on PCB).
IC1	TL072	Operational amplifier, DIP8	
IC1-S	DIP-8 socket	IC socket, DIP-8	
DRIVE	100kA	16mm right-angle PCB mount pot	
TONE	10kB	16mm right-angle PCB mount pot	
LEVEL	100kA	16mm right-angle PCB mount pot	
TB-BUF	4PDT slide	Slide switch, 4PDT	E-Switch EG4208 (4mm lever) or EG4208A (6mm lever)
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.
FSW	3PDT	Stomp switch, 3PDT	
ENC	125B	Enclosure, die-cast aluminum	Can also use a Hammond 1590N1.

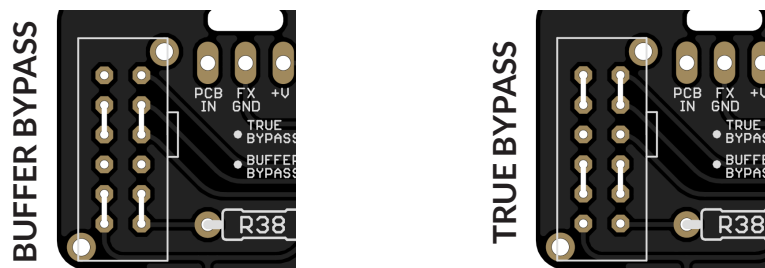
BUILD NOTES

Transistor selection

The original OPA-101 uses BC549C transistors. The pinout on the Ixora PCB follows this convention. However, the USA-equivalent 2N5088 will work the same here, so these can be substituted if they are easier to find. The 2N5088 should be rotated 180 degrees from the silkscreen since the pinout is mirrored from the BC549C.

Bypassing the true bypass / buffer switch

The E-Switch EG4208 slide switch used for the true bypass/buffer selector is available from Mouser Electronics but may not be accessible to everyone. If you are unable to obtain it, you can hard-wire the switch to either true bypass mode or buffered mode by soldering jumpers to the switch pads.



Tone control

The original OPA-101 does not have a tone control, instead having only a fixed treble cut, with R13 being either 4k7 or 2k2. The Ixora adds a tone control in place of the fixed resistor. The stock 4k7 setting is just under 12:00 on the tone knob, and the stock 2k2 setting is just under 9:00.

Output gain stage

The original OPA-101 has space for an output gain stage, but of 3 different units that were examined, all of them had this stage hard-wired as a unity-gain buffer. It appears that the circuit was originally designed with a gain recovery stage, but after production started, the decision was made to remove it.

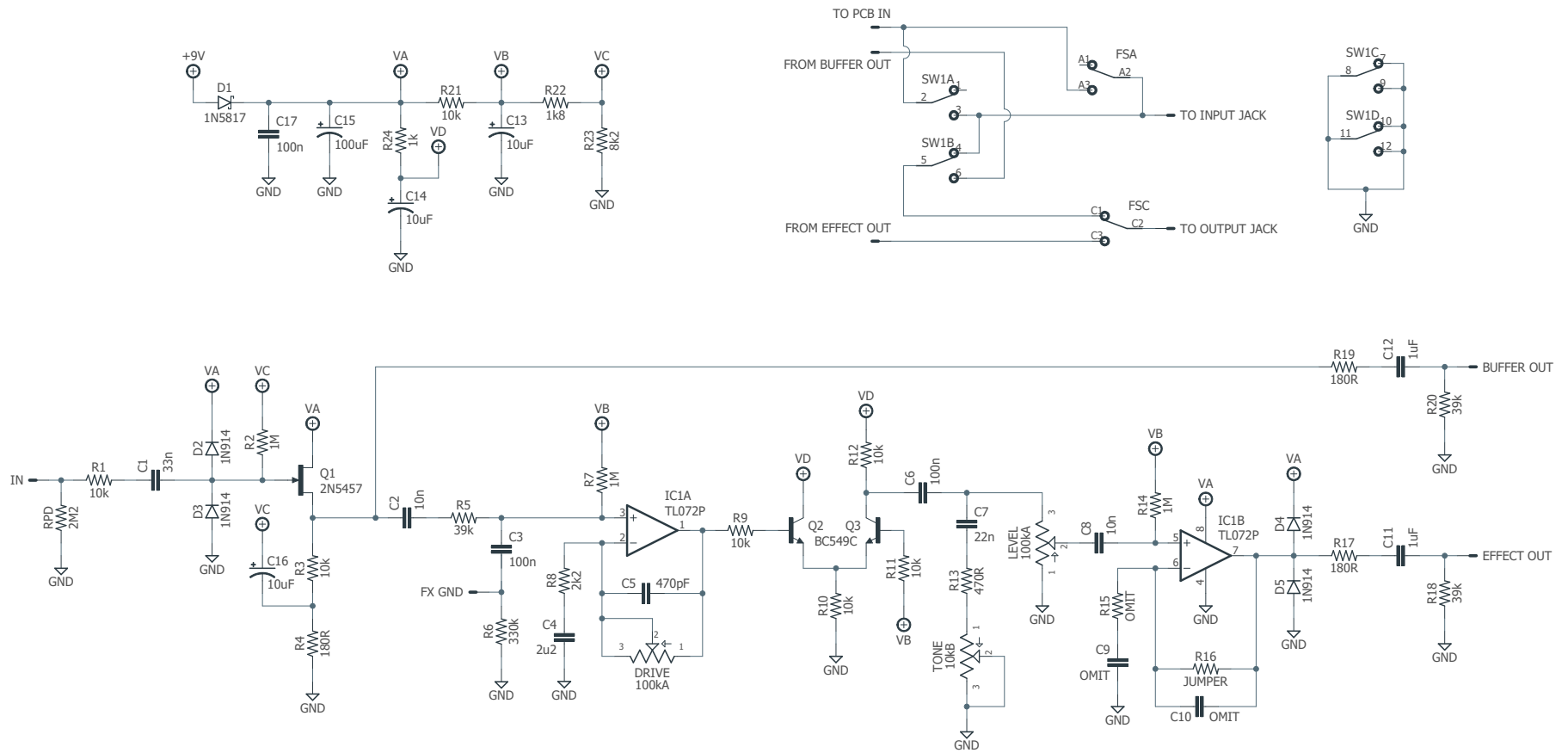
The Ixora has left these optional components (R15, R16, C9, C10) in place if you want to experiment with increasing the maximum volume or cutting the bass slightly. Try using the following values as a starting point:

- **R15:** 4k7
- **R16:** 10k
- **C9:** 100n
- **C10:** 47pF

This will double the available gain and cut the lows with a corner frequency of 339 Hz.

If building a stock unit, make sure R16 is jumpered. The other three components should be omitted.

SCHEMATIC



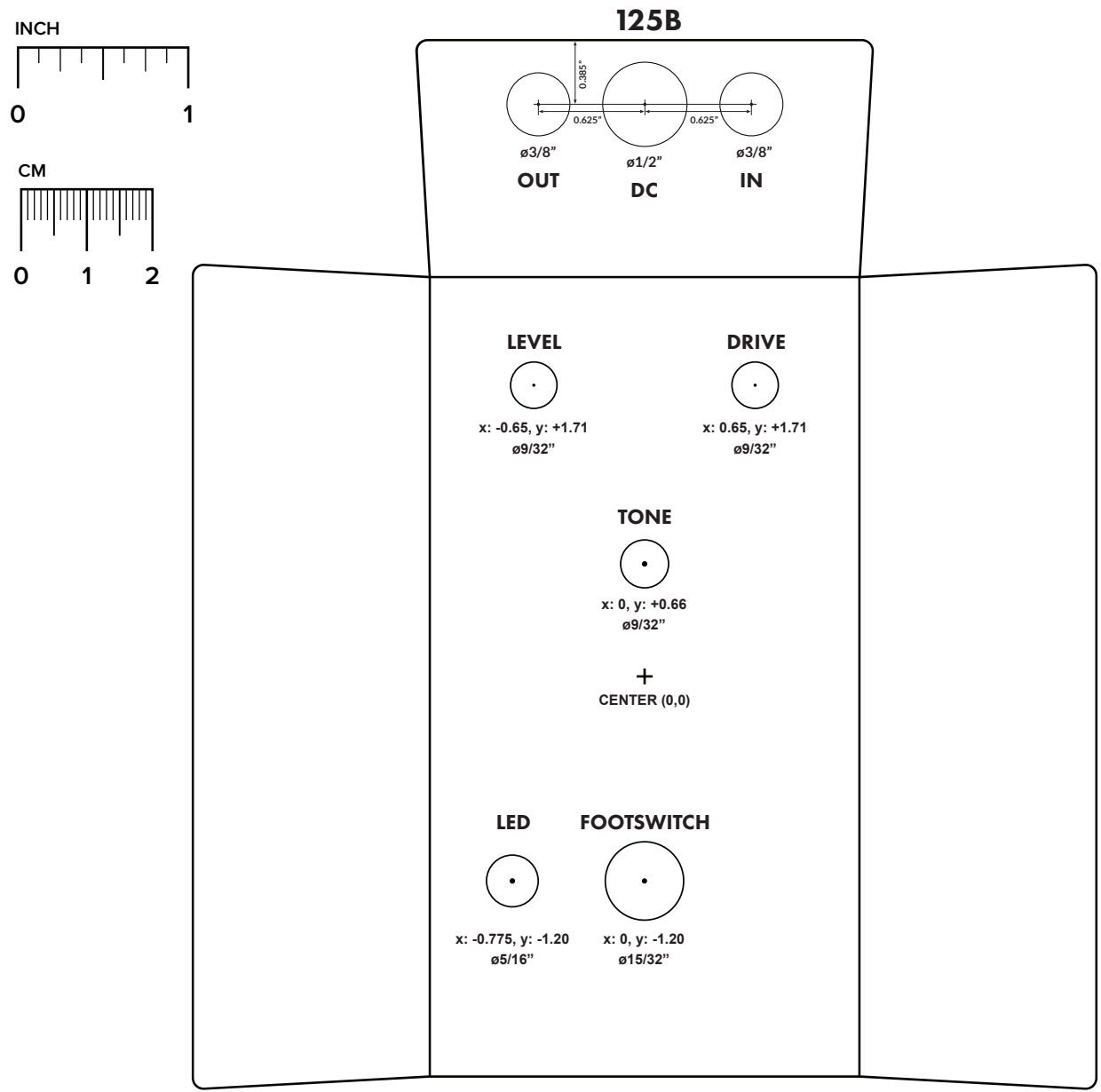
DRILL TEMPLATE

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.

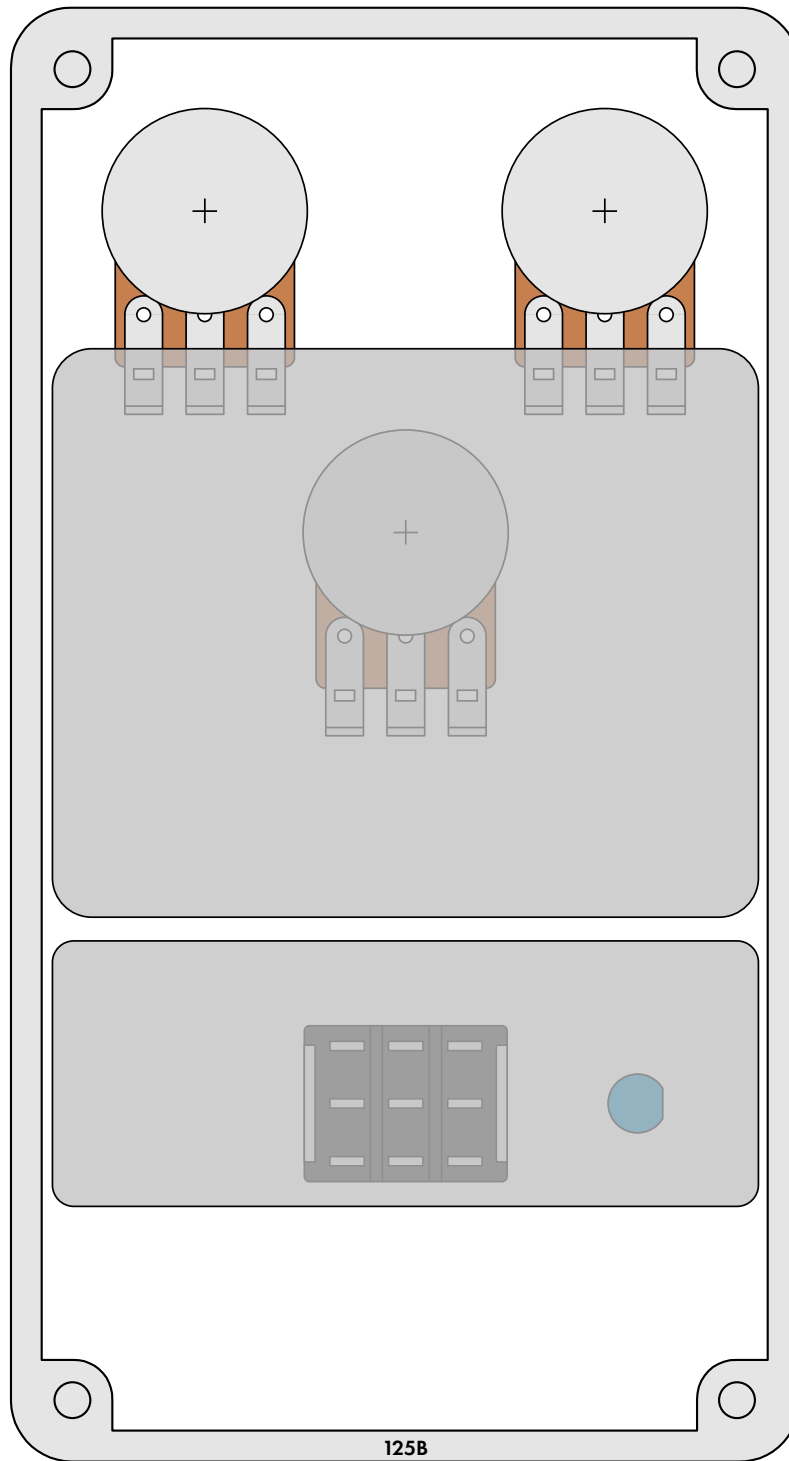
Top jack layout assumes the use of closed-frame jacks like the [Switchcraft 111X](#). If you'd rather use open-frame jacks, please refer to the [Open-Frame Jack Drill Template](#) for the top side.

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.

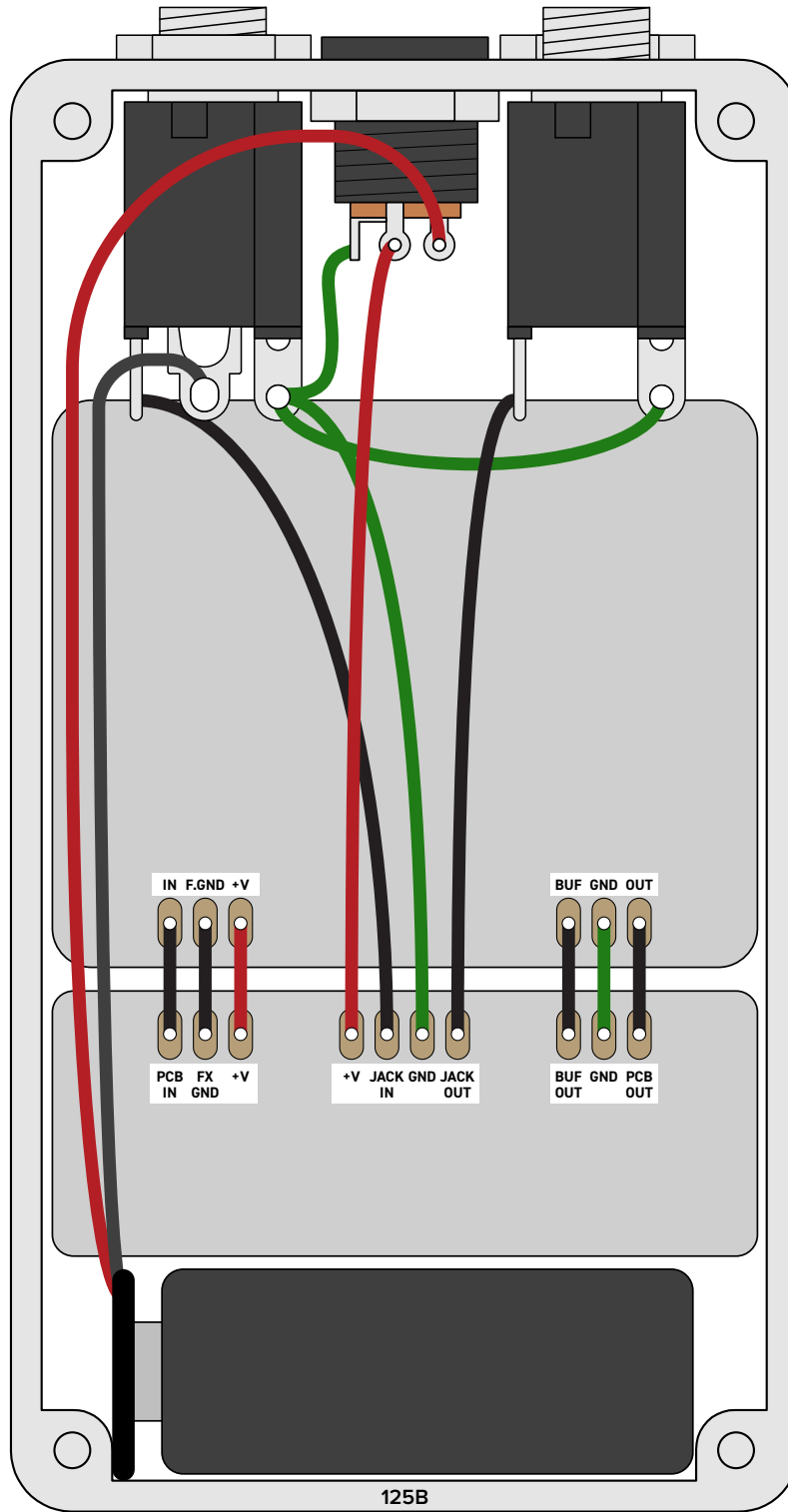


ENCLOSURE LAYOUT

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



WIRING DIAGRAM



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

1.0.1 (2020-11-30)

Removed extra Volume pot from the parts list which was inadvertently included.

1.0.0 (2020-11-16)

Initial release.