

PROJECT NAME

# DURANDAL



BASED ON

King Tone Blues Power

BUILD DIFFICULTY



EFFECT TYPE

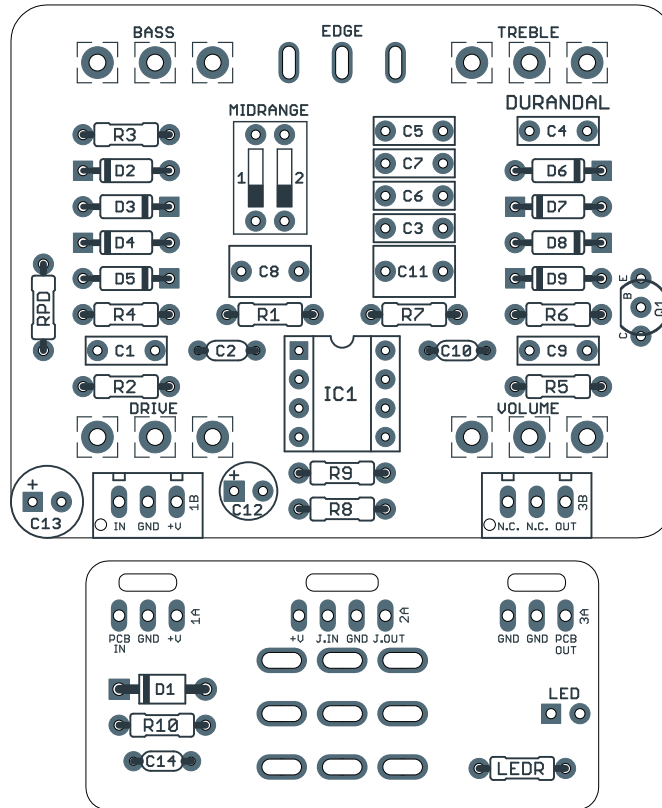
Transparent overdrive

DOCUMENT VERSION

1.0.0 (2022-05-13)

PROJECT SUMMARY

An adaptation of the legendary Timmy transparent drive pedal, with several modifications to add tonal flexibility. (And a few that definitely do not.)



Actual size is 2.3" x 1.86" (main board) and 1.78" x 0.87" (bypass board).

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## INTRODUCTION

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The Durandal Transparent Drive is based on the King Tone Blues Power, originally released in 2017.

Unlike the Duellist, there was no implication that it was based on any existing classic circuit. However, [we traced one](#) in 2022 and found that it's nearly identical to a Timmy, with a few minor tweaks and some added options. The treble response can be adjusted with the "Edge" switch (edge, stock, glass), and an internal DIP switch has four different midrange positions.

King Tone was a bit sneaky in concealing this one: the PCB has a transistor with all three legs connected to ground, meaning it's a decoy for people looking at gut shots trying to figure out what it's based on. (The earliest versions of the Blues Power didn't have this transistor.) There are also four diodes in the second op-amp stage that seem to be for clipping, but since this stage is unity gain, they have no effect. This could be another attempted decoy or just a design oversight.

The Durandal is a direct clone of the Blues Power... including the transistor and diodes, if you want to be in on the joke. However, these can be omitted entirely with no effect.

## USAGE

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The Durandal has five external controls:

- **Drive** controls the amount of gain in the op-amp feedback diode clipping stage.
- **Bass** controls the low-end response of the effect before the clipping.
- **Treble** is a passive treble cut after the clipping stage.
- **Volume** controls the overall output.
- **Edge** (toggle switch) selects between Edge, Stock and Glass modes, which set the pre-clipping treble response.

There is also an internal DIP switch with four different midrange settings. Here are the positions:

- **Both up** is "Punch" mode. This is the default setting.
- **Left down, right up** is "Transparent" mode.
- **Left up, right down** is "Clear" mode.
- **Both down** is "Scoop" mode.

## 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	1M	Metal film resistor, 1/4W	
R2	10k	Metal film resistor, 1/4W	
R3	1k2	Metal film resistor, 1/4W	
R4	3k3	Metal film resistor, 1/4W	
R5	680R	Metal film resistor, 1/4W	
R6	4k7	Metal film resistor, 1/4W	
R7	4k7	Metal film resistor, 1/4W	
R8	47k	Metal film resistor, 1/4W	
R9	47k	Metal film resistor, 1/4W	
R10	82R	Metal film resistor, 1/4W	Power supply filter resistor. Can also use 100R.
RPD	2M2	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	100n	Film capacitor, 7.2 x 2.5mm	
C2	47pF	MLCC capacitor, NP0/C0G	
C3	3n3	Film capacitor, 7.2 x 2.5mm	
C4	47n	Film capacitor, 7.2 x 2.5mm	
C5	15n	Film capacitor, 7.2 x 2.5mm	
C6	18n	Film capacitor, 7.2 x 2.5mm	
C7	22n	Film capacitor, 7.2 x 2.5mm	
C8	1.5uF	Film capacitor, 7.2 x 4.5mm	
C9	68n	Film capacitor, 7.2 x 2.5mm	
C10	100pF	MLCC capacitor, NP0/C0G	
C11	1.5uF	Film capacitor, 7.2 x 4.5mm	
C12	47uF	Electrolytic capacitor, 5mm	Reference voltage filter capacitor.
C13	100uF	Electrolytic capacitor, 6.3mm	Power supply filter capacitor.
C14	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	
D6	1N914	Fast-switching diode, DO-35	Likely unnecessary. See build notes.

## PARTS LIST, CONT.

PART	VALUE	TYPE	NOTES
D7	1N914	Fast-switching diode, DO-35	Likely unnecessary. See build notes.
D8	1N914	Fast-switching diode, DO-35	Likely unnecessary. See build notes.
D9	1N914	Fast-switching diode, DO-35	Likely unnecessary. See build notes.
Q1	2N4403	BJT transistor, PNP, TO-92	Not connected to anything. See build notes.
IC1	RC4558P	Operational amplifier, DIP8	
IC1-S	DIP-8 socket	IC socket, DIP-8	
MID	2-pos. DIP	DIP switch, 2-position	
DRIVE	1MA	16mm right-angle PCB mount pot	
BASS	50kC	16mm right-angle PCB mount pot	
TREBLE	10kC	16mm right-angle PCB mount pot	
LEVEL	10kA	16mm right-angle PCB mount pot	
STYLE	SPDT cntr. off	Toggle switch, SPDT on-off-on	
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.
FSW	3PDT	Stomp switch, 3PDT	
ENC	125B	Enclosure, die-cast aluminum	Can also use a Hammond 1590N1.

## BUILD NOTES

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### Decoy parts (Q1 and D5-D9)

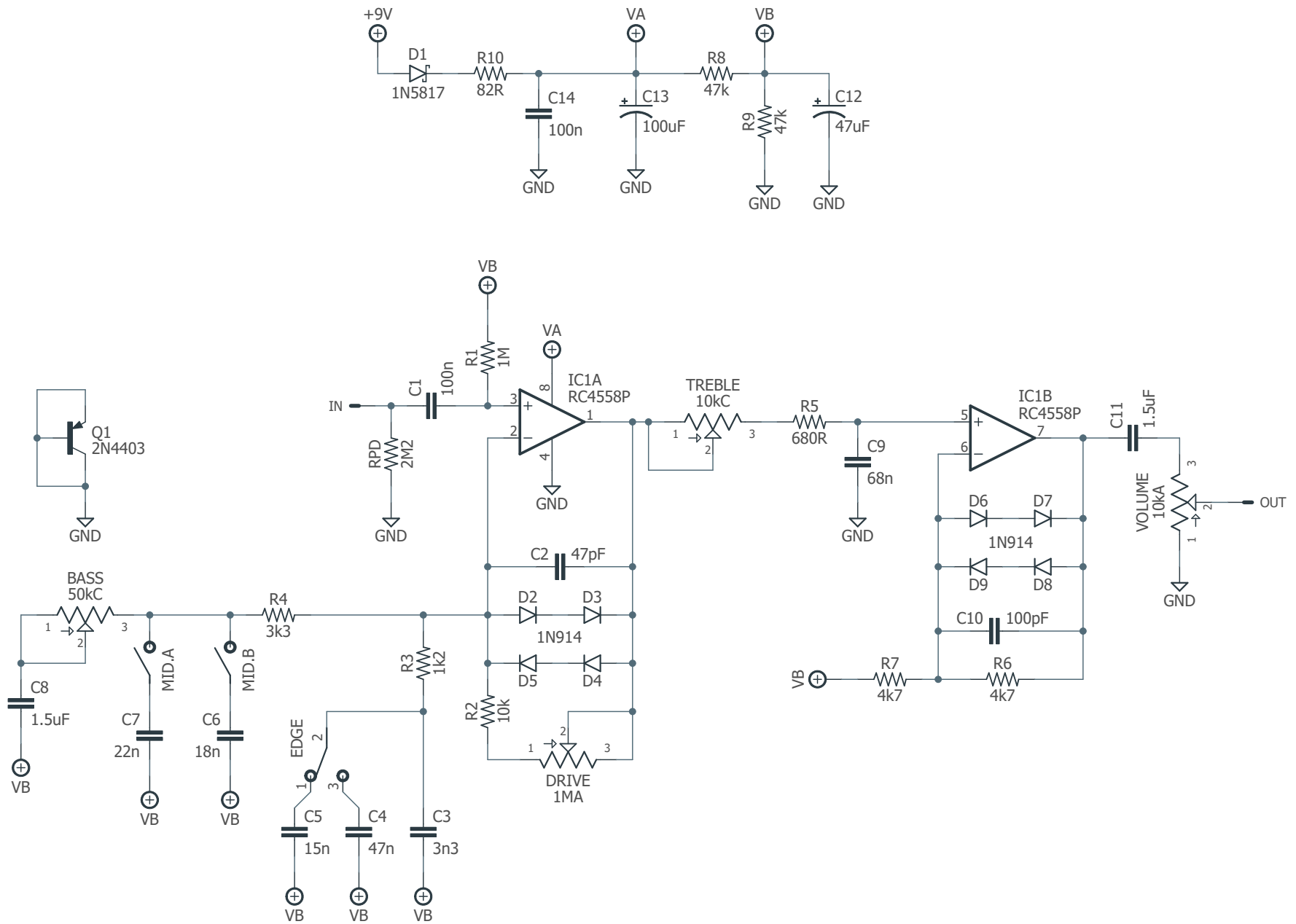
The original Blues Power has a transistor whose 3 legs are connected to ground. This is a decoy part meant to obscure the fact that it's essentially just a hot-rodded Timmy.

There are also four diodes that likely do nothing, added in the second stage. Since it's unity gain, there's no boosted signal to clip.

See the tracing journal for a more in-depth discussion of both of these.

We've included these parts on the PCB since there was extra space, but it's purely for the sake of irony and the circuit will sound the same if they are omitted.

# SCHEMATIC



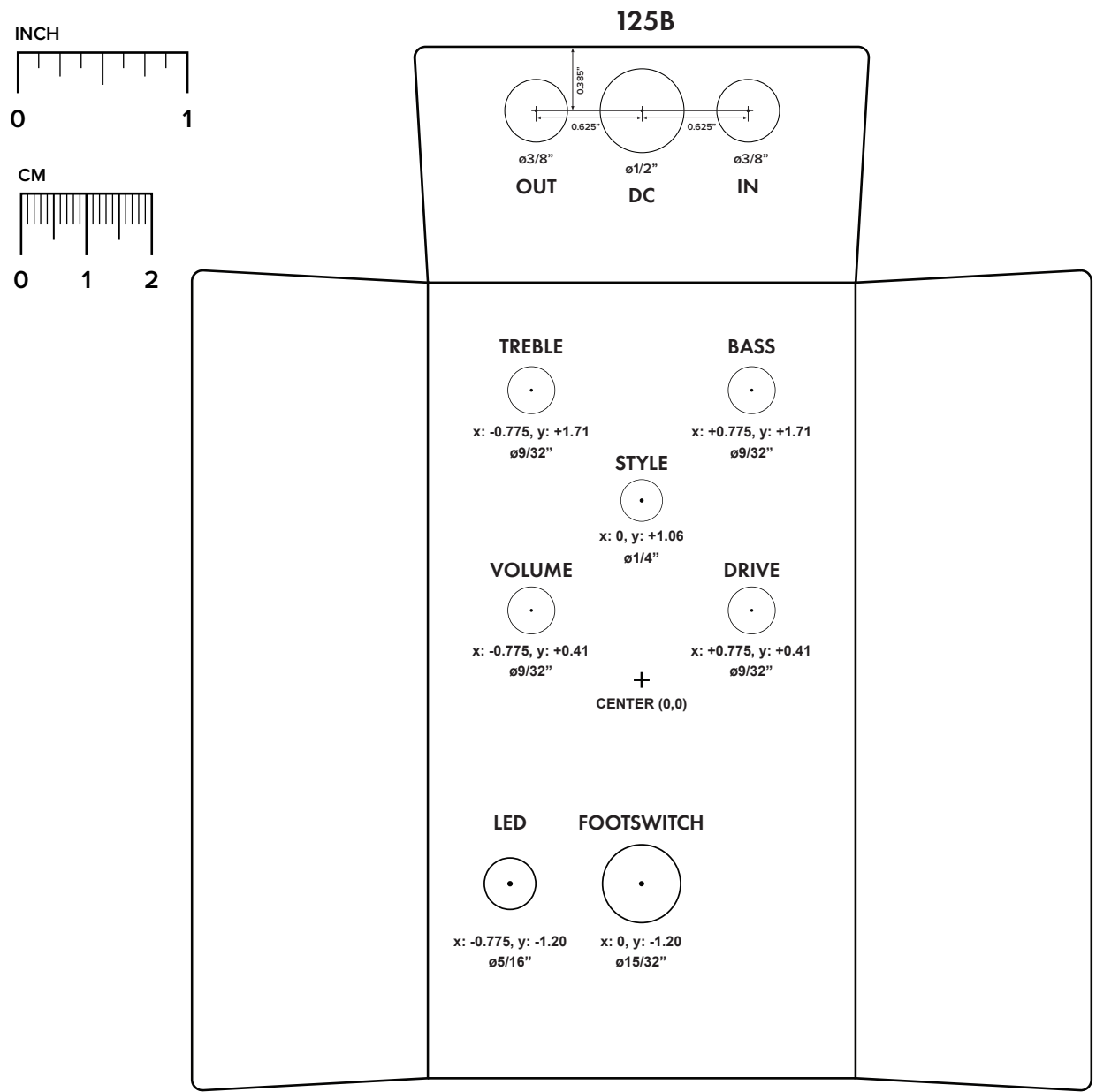
# DRILL TEMPLATE

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.

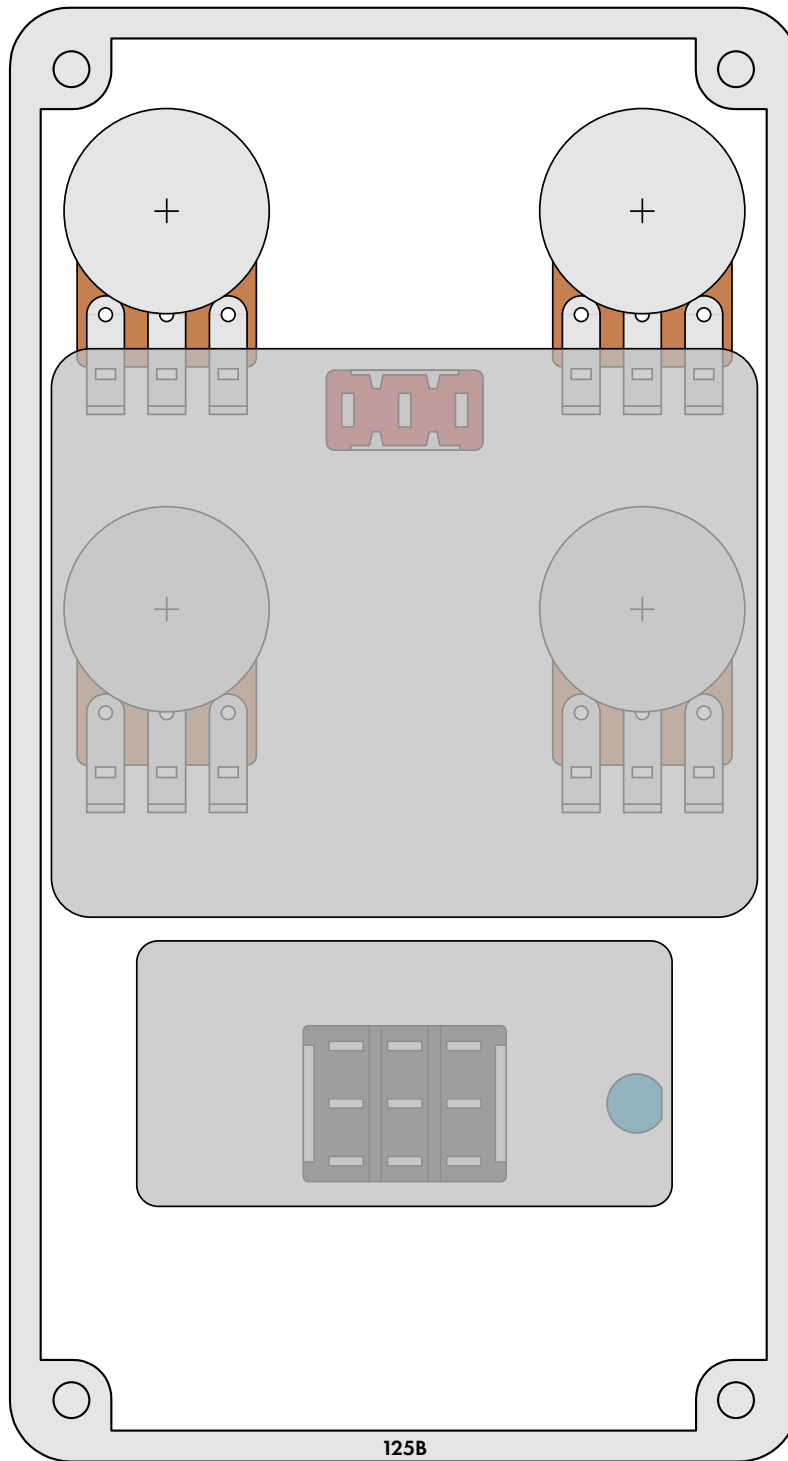
**LED hole drill size** assumes the use of a [5mm LED bezel](#), available from several parts suppliers. Adjust size accordingly if using something different, such as a 3mm bezel, a plastic bezel, or just a plain LED.



# ENCLOSURE LAYOUT

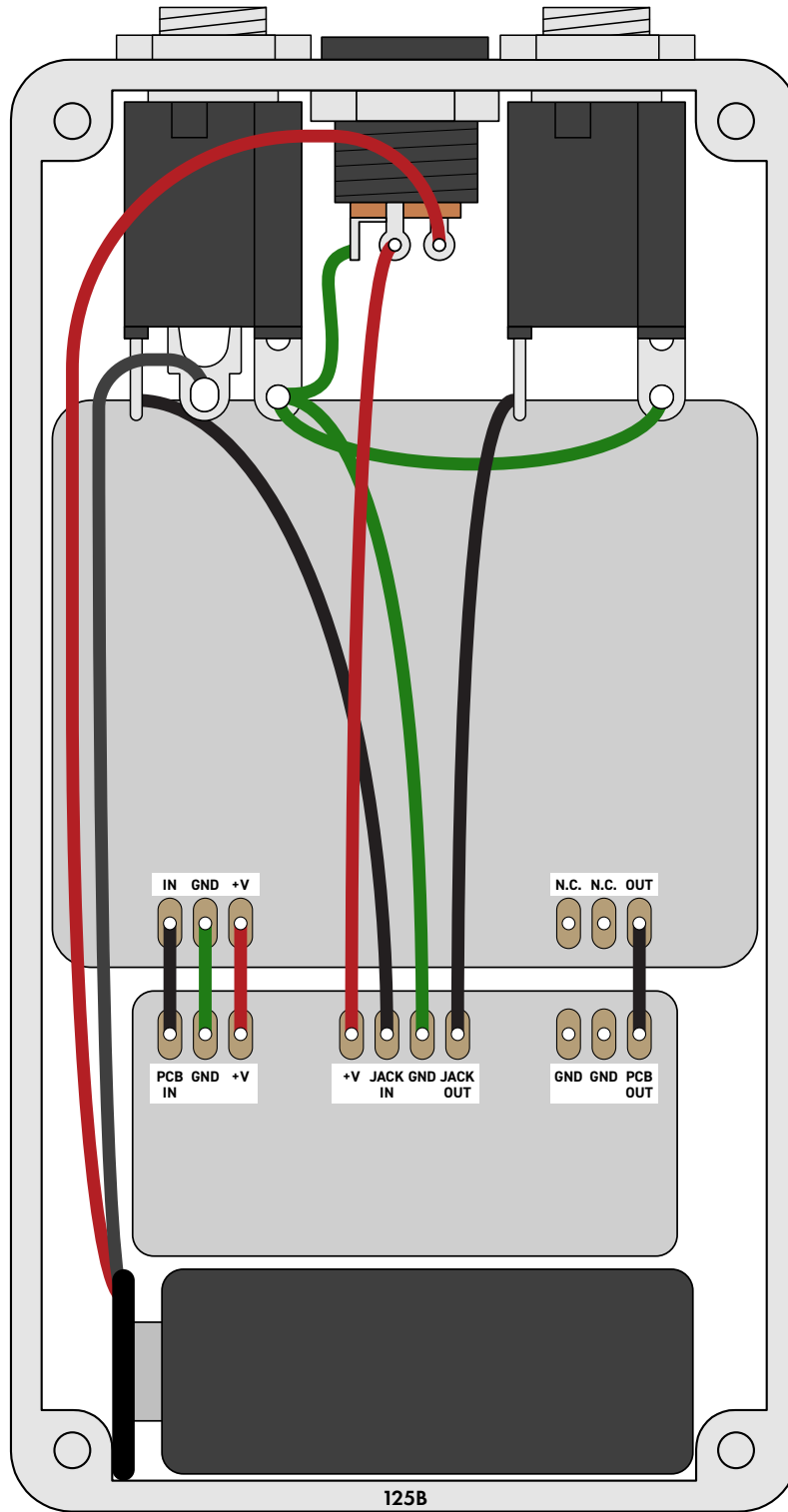
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Enclosure is shown without jacks. See next page for jack layout and wiring.





# WIRING DIAGRAM



## LICENSE & USAGE

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**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

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### 1.0.0 (2022-05-13)

Initial release.