

## PROJECT NAME

# ANTIPODE

## BASED ON

Roland AF-60 Bee Gee

## EFFECT TYPE

Fuzz/Distortion

## BUILD DIFFICULTY

■■■■■ Easy

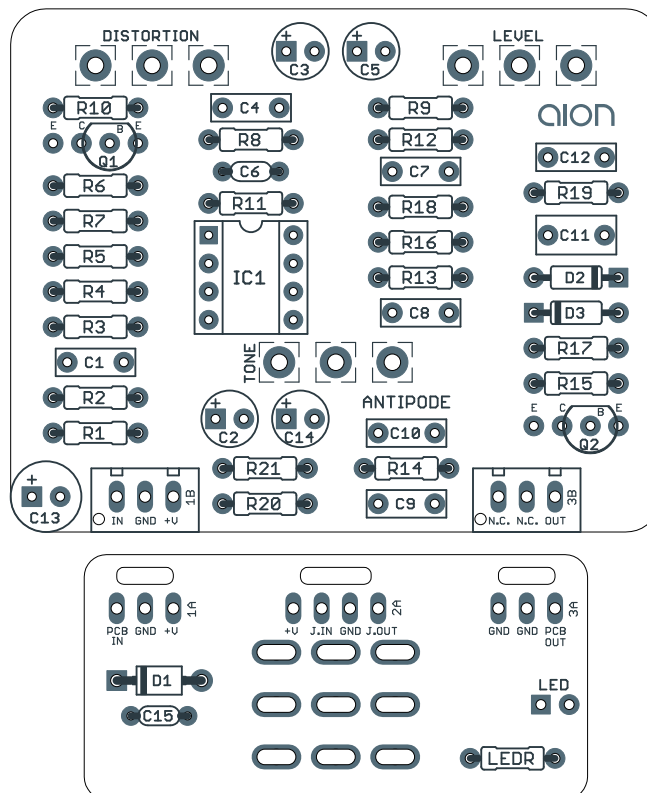
## DOCUMENT VERSION

1.0.0 (2019-11-28)



## PROJECT SUMMARY

While the circuit is best known as the “Jet” stage from the Roland AP-7 Jet Phaser, the standalone pedal version is much more flexible with a wider tonal palette to play with.



Actual size is 2.3" x 1.86" (main board) and 1.78" x 0.86" (bypass board).

# TABLE OF CONTENTS

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|     |                      |   |                    |
|-----|----------------------|---|--------------------|
| 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

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The Antipode Vintage Fuzz is an adaptation of the Roland AF-60 Bee Gee, a fuzz/distortion from 1975 that is best known as the standalone version of the “jet mode” of the legendary AP-7 Jet Phaser.

It features a combination of transistor gain, op-amp gain and diode-based hard clipping to get its character. The tone control is the classic Big Muff “balance” style, centered around 1.3Khz with a very slight mid-boost in the middle position.

The Jet Phaser’s adaptation is largely the same but with fewer controls. The output volume control is retained for the fuzz stage, but the tone control is simplified into a two-position switch with only “full bass” and “full treble” settings. The potentiometer on the AF-60 is much more usable.

The Antipode project has one modification, which is the addition of a gain control to allow the distortion level to be dialed back. In the original, the op-amp gain was fixed at 220, but with this control it can now get as low as 2, getting down into overdrive territory instead of full-on fuzz. With the gain control at maximum, the circuit is 100% identical to a vintage AF-60.

## USAGE

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The Antipode has the following controls:

- **Distortion** is a gain control. When set to maximum, it’s equivalent to the stock AF-60.
- **Tone** pans between a bass boost on one side and treble boost on the other, with a very slight mid-hump in the center position.
- **Volume** is the master output volume control.

## 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.

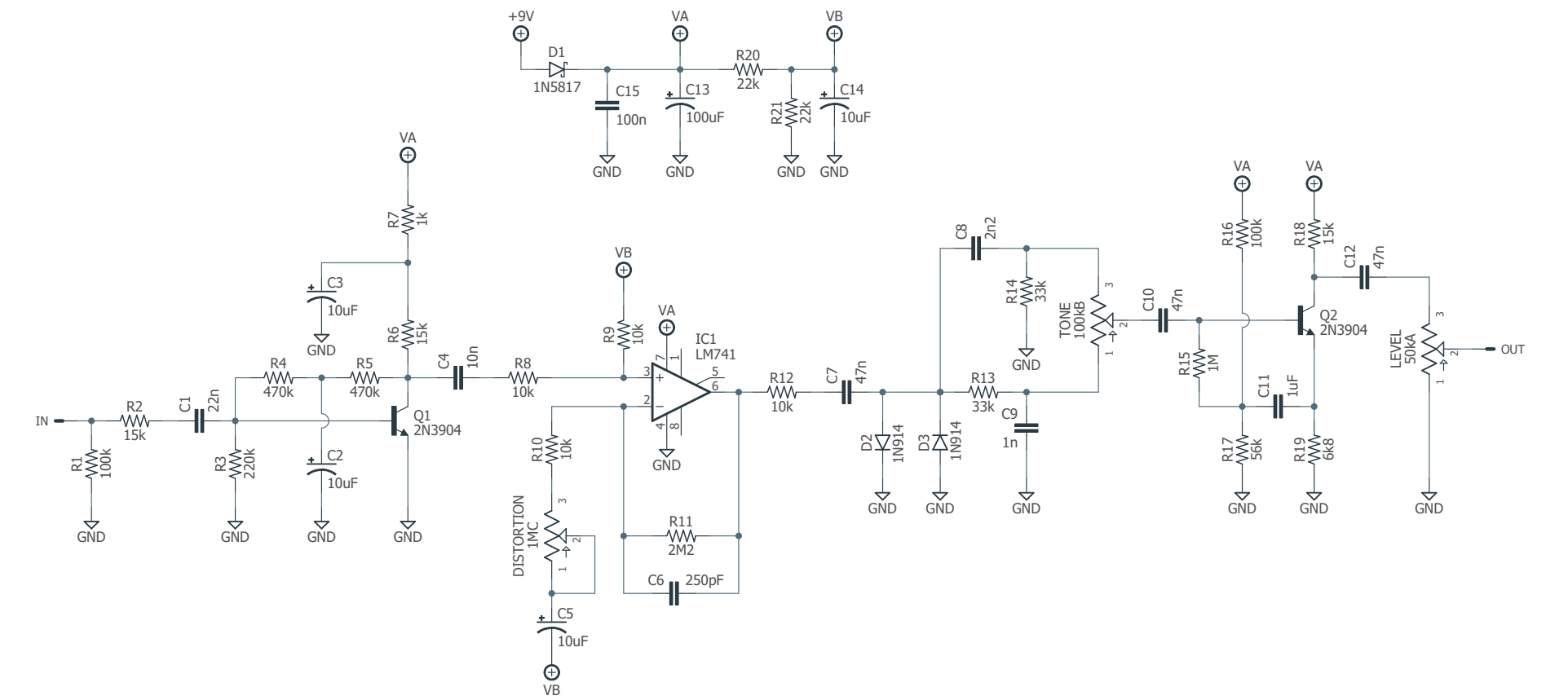
[View parts list spreadsheet](#) →

| PART  | VALUE | TYPE                        | NOTES                                                                 |
|-------|-------|-----------------------------|-----------------------------------------------------------------------|
| R1    | 100k  | Metal film resistor, 1/4W   |                                                                       |
| R2    | 15k   | Metal film resistor, 1/4W   |                                                                       |
| R3    | 220k  | Metal film resistor, 1/4W   |                                                                       |
| R4    | 470k  | Metal film resistor, 1/4W   |                                                                       |
| R5    | 470k  | Metal film resistor, 1/4W   |                                                                       |
| R6    | 15k   | Metal film resistor, 1/4W   |                                                                       |
| R7    | 1k    | Metal film resistor, 1/4W   |                                                                       |
| R8    | 10k   | Metal film resistor, 1/4W   |                                                                       |
| R9    | 10k   | Metal film resistor, 1/4W   |                                                                       |
| R10   | 10k   | Metal film resistor, 1/4W   |                                                                       |
| R11   | 2M2   | Metal film resistor, 1/4W   |                                                                       |
| R12   | 10k   | Metal film resistor, 1/4W   |                                                                       |
| R13   | 33k   | Metal film resistor, 1/4W   |                                                                       |
| R14   | 33k   | Metal film resistor, 1/4W   |                                                                       |
| R15   | 1M    | Metal film resistor, 1/4W   |                                                                       |
| R16   | 100k  | Metal film resistor, 1/4W   |                                                                       |
| R17   | 56k   | Metal film resistor, 1/4W   |                                                                       |
| R18   | 15k   | Metal film resistor, 1/4W   |                                                                       |
| R19   | 6k8   | Metal film resistor, 1/4W   |                                                                       |
| R20   | 22k   | Metal film resistor, 1/4W   |                                                                       |
| R21   | 22k   | Metal film resistor, 1/4W   |                                                                       |
| LED R | 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    | 10uF  | Electrolytic capacitor, 5mm |                                                                       |
| C3    | 10uF  | Electrolytic capacitor, 5mm |                                                                       |
| C4    | 10n   | Film capacitor, 7.2 x 2.5mm |                                                                       |
| C5    | 10uF  | Electrolytic capacitor, 5mm |                                                                       |
| C6    | 270pF | MLCC capacitor, NP0/COG     | Original is 250pF, but 220pf is the nearest readily-available value.  |
| C7    | 47n   | Film capacitor, 7.2 x 2.5mm |                                                                       |
| C8    | 2n2   | Film capacitor, 7.2 x 2.5mm |                                                                       |

## PARTS LIST, CONT.

| PART  | VALUE        | TYPE                           | NOTES                                                                 |
|-------|--------------|--------------------------------|-----------------------------------------------------------------------|
| C9    | 1n           | Film capacitor, 7.2 x 2.5mm    |                                                                       |
| C10   | 47n          | Film capacitor, 7.2 x 2.5mm    |                                                                       |
| C11   | 1uF          | Film capacitor, 7.2 x 3.5mm    |                                                                       |
| C12   | 47n          | Film capacitor, 7.2 x 2.5mm    |                                                                       |
| C13   | 100uF        | Electrolytic capacitor, 6.3mm  | Power supply filter capacitor.                                        |
| C14   | 47uF         | Electrolytic capacitor, 5mm    | Reference voltage filter capacitor.                                   |
| C15   | 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    |                                                                       |
| Q1    | 2N3904       | BJT transistor, NPN, TO-92     | Substitute. Original uses 2SC1000GR.                                  |
| Q2    | 2N3904       | BJT transistor, NPN, TO-92     | Substitute. Original uses 2SC1000GR.                                  |
| IC1   | LM741        | Operational amplifier, DIP8    | Original uses TA7504, but LM741 is an equivalent.                     |
| IC1-S | DIP-8 socket | IC socket, DIP-8               |                                                                       |
| DIST. | 1MC          | 16mm right-angle PCB mount pot |                                                                       |
| TONE  | 100kB        | 16mm right-angle PCB mount pot |                                                                       |
| LEVEL | 50kA         | 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     | <a href="#">Lumberg NEB/J 21 C</a> 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             | Available from <a href="#">Aion FX</a> .                              |
| ENC   | 125B         | Enclosure, die-cast aluminum   | Can also use a Hammond 1590N1.                                        |

# SCHEMATIC



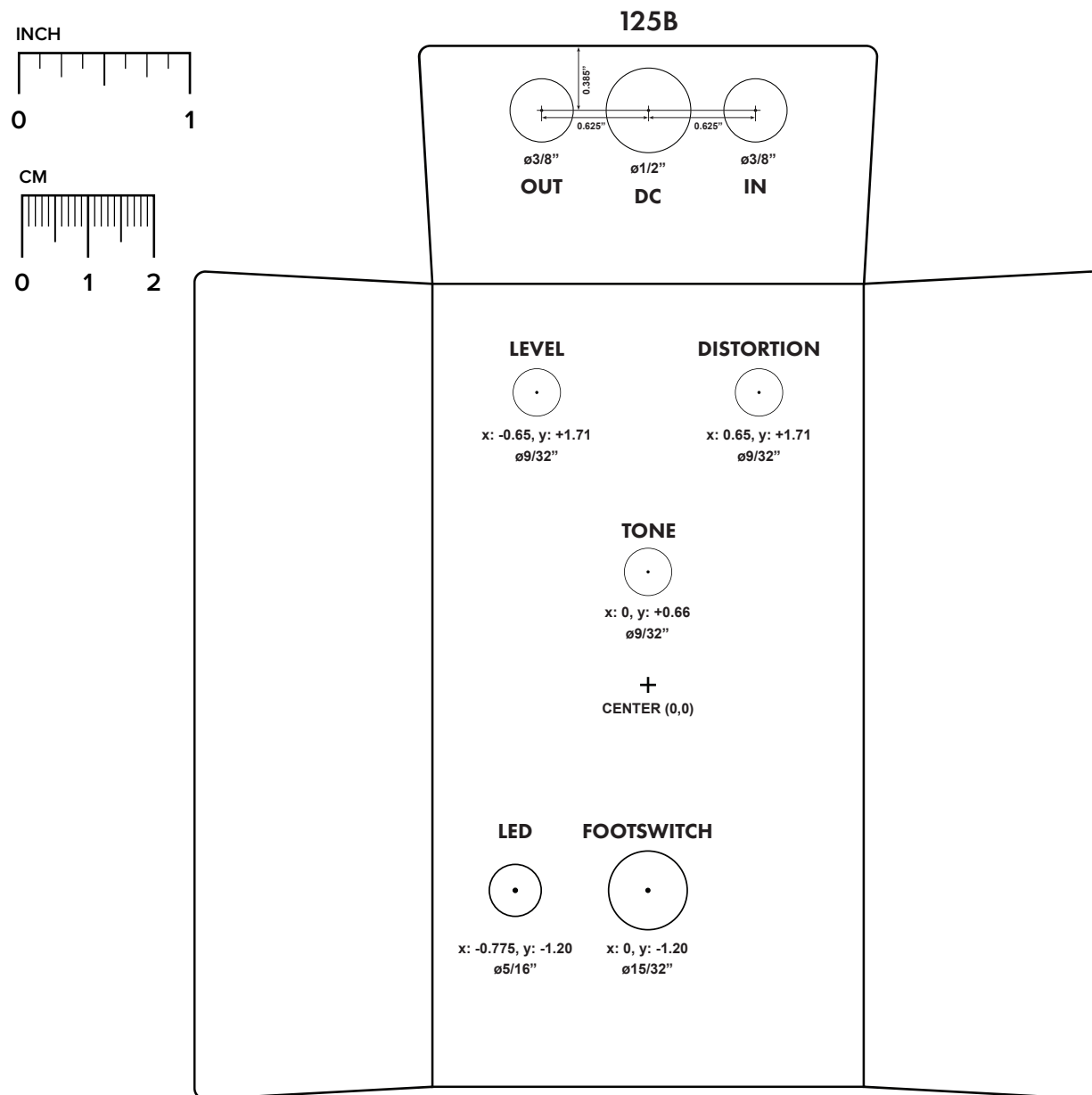
# DRILL TEMPLATE

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.

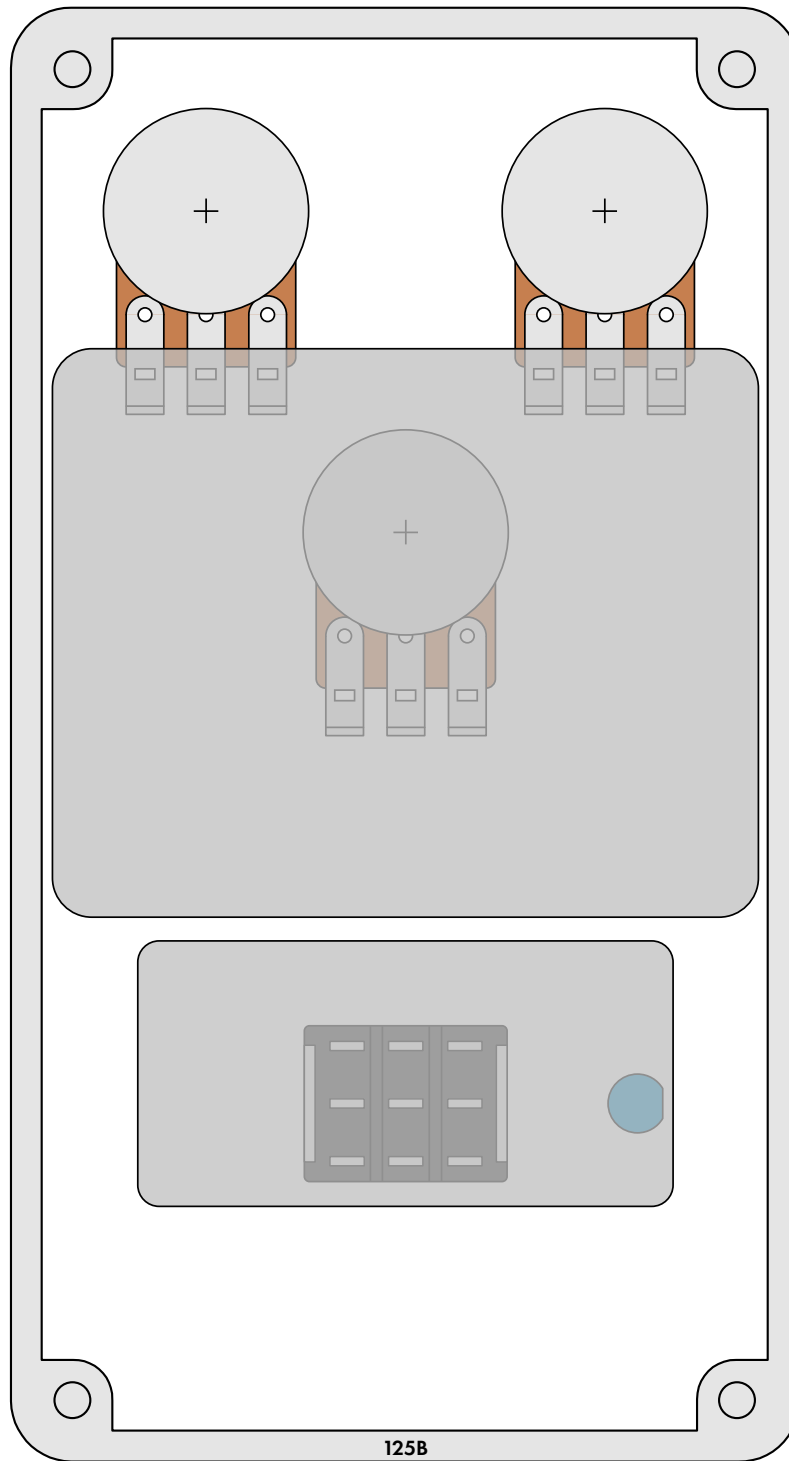
**LED hole drill size** assumes the use of a [5mm LED bezel](#), available from several parts suppliers. Adjust size accordingly if using something different, such as a 3mm bezel, a plastic bezel, or just a plain LED.



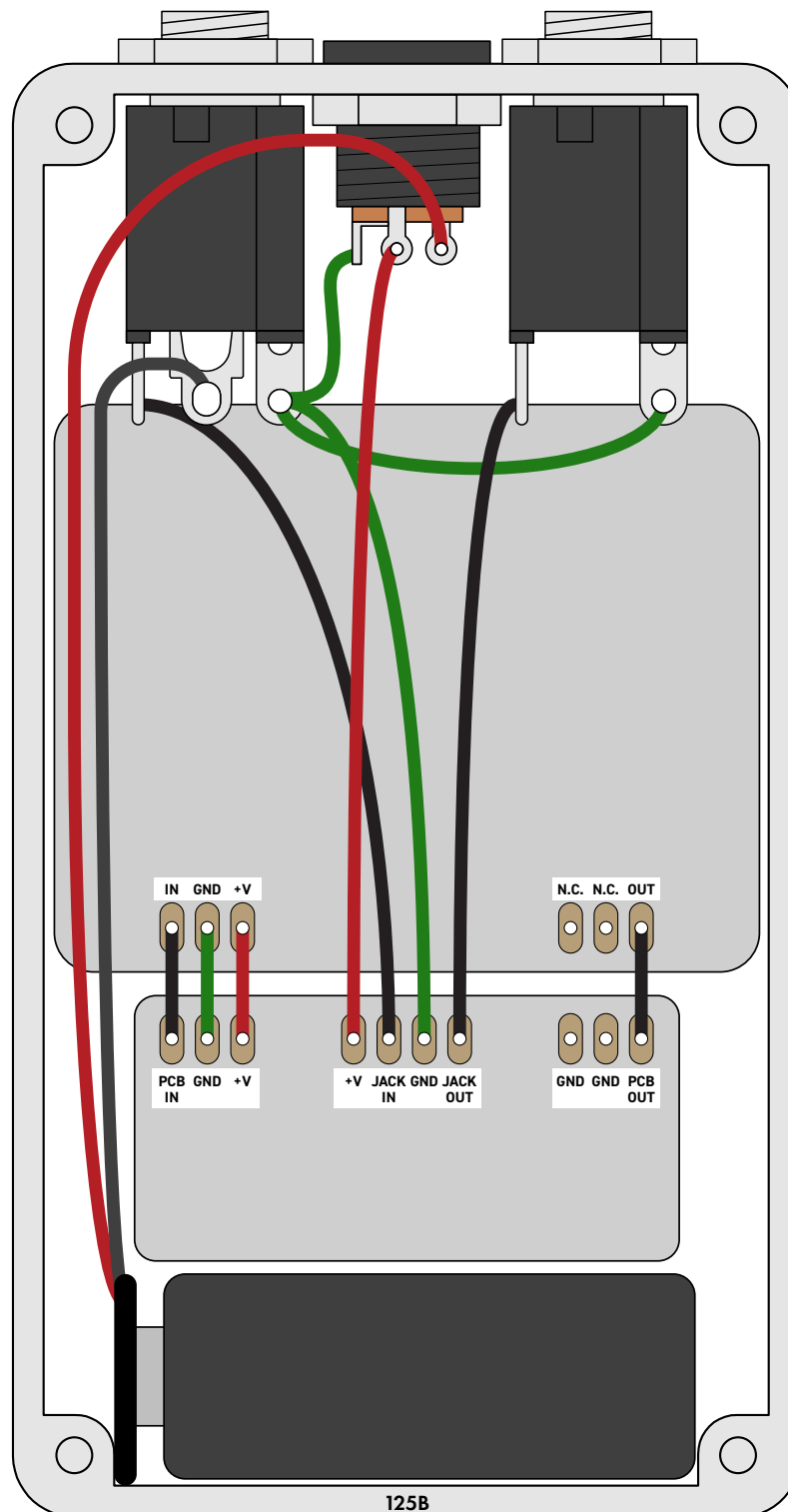
## ENCLOSURE LAYOUT

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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

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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 (2019-11-28)**

Initial release.