

PROJECT NAME

KARKADANN



BASED ON

Way Huge Green Rhino Mk. II

BUILD DIFFICULTY

■■■■□ Intermediate

EFFECT TYPE

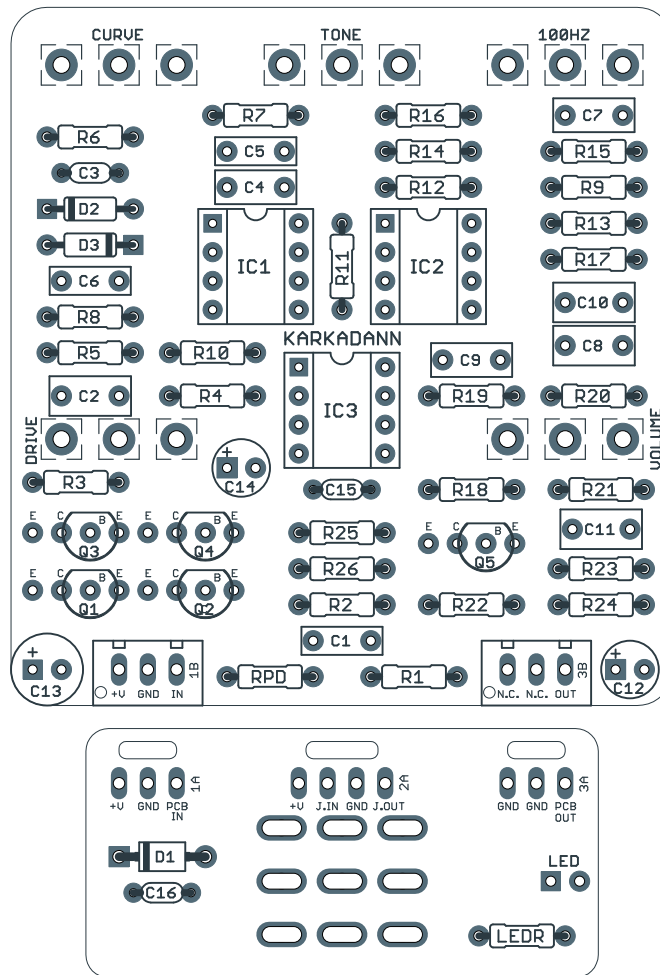
Overdrive

DOCUMENT VERSION

1.0.2 (2024-01-31)

PROJECT SUMMARY

A drive pedal based loosely on the classic Tube Screamer with a few extra tone-shaping controls added.



Actual size is 2.3" x 2.42" (main board) and 1.78" x 0.86" (bypass board).

TABLE OF CONTENTS

| | | | |
|-----|----------------------|----|--------------------|
| 1 | Project Overview | 8 | Drill Template |
| 2 | Introduction & Usage | 9 | Enclosure Layout |
| 3-5 | Parts List | 10 | Wiring Diagram |
| 6 | Build Notes | 11 | Licensing |
| 7 | Schematic | 11 | Document Revisions |

INTRODUCTION

The Karkadann Dynamic Overdrive is an adaptation of the Way Huge Green Rhino Mark II, an updated version of the original Green Rhino that was first released in 1996, based on the Tube Screamer. While it was technically their best-selling pedal, only 419 of them were produced while Way Huge was active between 1992 and 1999.

In 2008, Jeorge Tripps went to work for Dunlop, who was eager to resurrect the Way Huge brand with their support behind it. The Mark II version was designed by Jeorge and released in 2011.

The Mark IV followed in 2016. There is no record of a Mark III, so either it was an unreleased prototype or they just skipped a number. Regardless, the Mark IV drops the Curve control and adds a new 500 Hz control, along with a toggle switch to drop both the 100 Hz and 500 Hz EQ stages to return it to the sound of the original 1990s version.

Another confusing detail: the original Green Rhino was called the “Green Rhino Overdrive II” to distinguish it from the Red Llama, the company’s other overdrive. There was only one version of the Green Rhino during the 1990s and it was always called the Overdrive II. The Mark II that came fifteen years later is different!

The Karkadann is a direct adaptation of the Green Rhino Mark II circuit with no modifications.

USAGE

The Karkadann has the following controls:

- **Drive** controls the gain of the op-amp clipping stage.
- **Tone** is a Tube Screamer-style control that boosts or cuts highs.
- **Curve** affects both the low-frequency cutoff and the gain ratio of the clipping stage. It’s pretty subtle, but works best at higher Drive settings.
- **100 Hz** allows the 100 Hz bass frequency to be boosted or cut.
- **Volume** is the output volume at the end 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 (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 | 1k | Metal film resistor, 1/4W | |
| R2 | 560k | Metal film resistor, 1/4W | |
| R3 | 10k | Metal film resistor, 1/4W | |
| R4 | 10k | Metal film resistor, 1/4W | |
| R5 | 51k | Metal film resistor, 1/4W | |
| R6 | 3k3 | Metal film resistor, 1/4W | |
| R7 | 22k | Metal film resistor, 1/4W | |
| R8 | 1k | Metal film resistor, 1/4W | |
| R9 | 220R | Metal film resistor, 1/4W | |
| R10 | 22k | Metal film resistor, 1/4W | |
| R11 | 1k | Metal film resistor, 1/4W | |
| R12 | 1k | Metal film resistor, 1/4W | |
| R13 | 470k | Metal film resistor, 1/4W | |
| R14 | 10k | Metal film resistor, 1/4W | |
| R15 | 10k | Metal film resistor, 1/4W | |
| R16 | 10k | Metal film resistor, 1/4W | |
| R17 | 10k | Metal film resistor, 1/4W | |
| R18 | 24k | Metal film resistor, 1/4W | |
| R19 | 470R | Metal film resistor, 1/4W | |
| R20 | 10k | Metal film resistor, 1/4W | |
| R21 | 10k | Metal film resistor, 1/4W | |
| R22 | 10k | Metal film resistor, 1/4W | |
| R23 | 10k | Metal film resistor, 1/4W | |
| R24 | 1M | Metal film resistor, 1/4W | |
| R25 | 680k | Metal film resistor, 1/4W | |
| R26 | 1M | Metal film resistor, 1/4W | |
| RPD | 2M2 | Metal film resistor, 1/4W | |
| LEDR | 4k7 | Metal film resistor, 1/4W | |
| C1 | 22n | Film capacitor, 7.2 x 2.5mm | |
| C2 | 1uF | Film capacitor, 7.2 x 3.5mm | |

PARTS LIST, CONT.

| PART | VALUE | TYPE | NOTES |
|-------|--------------|--------------------------------|-------------------------------------|
| C3 | 56pF | MLCC capacitor, NP0/C0G | |
| C4 | 220n | Film capacitor, 7.2 x 3.0mm | |
| C5 | 47n | Film capacitor, 7.2 x 2.5mm | |
| C6 | 220n | Film capacitor, 7.2 x 3.0mm | |
| C7 | 220n | Film capacitor, 7.2 x 3.0mm | |
| C8 | 1uF | Film capacitor, 7.2 x 3.5mm | |
| C9 | 220n | Film capacitor, 7.2 x 3.0mm | |
| C10 | 1uF | Film capacitor, 7.2 x 3.5mm | |
| C11 | 1uF | Film capacitor, 7.2 x 3.5mm | |
| C12 | 10uF | Electrolytic capacitor, 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 | Reference voltage filter capacitor. |
| C16 | 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 | 2N5088 | BJT transistor, NPN, TO-92 | Substitute; original uses PN2484. |
| Q2 | 2N5088 | BJT transistor, NPN, TO-92 | Substitute; original uses PN2484. |
| Q3 | 2N5088 | BJT transistor, NPN, TO-92 | Substitute; original uses PN2484. |
| Q4 | 2N5088 | BJT transistor, NPN, TO-92 | Substitute; original uses PN2484. |
| Q5 | 2N5088 | BJT transistor, NPN, TO-92 | Substitute; original uses PN2484. |
| IC1 | LF353N | Operational amplifier, DIP8 | |
| IC1-S | DIP-8 socket | IC socket, DIP-8 | |
| IC2 | LF353N | Operational amplifier, DIP8 | |
| IC2-S | DIP-8 socket | IC socket, DIP-8 | |
| IC3 | LM833 | Operational amplifier, DIP8 | |
| IC3-S | DIP-8 socket | IC socket, DIP-8 | |
| 100HZ | 20kB | 16mm right-angle PCB mount pot | |
| CURVE | 5kB | 16mm right-angle PCB mount pot | |
| DRIVE | 500kB | 16mm right-angle PCB mount pot | |
| TONE | 20kC | 16mm right-angle PCB mount pot | |
| VOL. | 100kB | 16mm right-angle PCB mount pot | |

PARTS LIST, CONT.

| PART | VALUE | TYPE | NOTES |
|------|-----------|-------------------------------|----------------------------------|
| LED | 5mm | LED, 5mm, red diffused | |
| IN | 1/4" mono | 1/4" phone jack, closed frame | Switchcraft 111X 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

Input buffer (Q1-4)

The input buffer uses 4 transistors in full parallel, an unusual configuration that is designed to reduce noise. You can just use one and leave the others off and it will work fine. But transistors are pretty cheap.

Potentiometer values

The Green Rhino uses one 20kB and one 20kC potentiometer. These are uncommon values and are not available from the standard places such as Small Bear. However, Tayda Electronics carries both in the correct right-angle PCB mount format:

- 20kB: <https://aionelectronics.com/link/alpha-20kb-right-angle-16mm-potentiometer/>
- 20kC: <https://aionelectronics.com/link/alpha-20kc-right-angle-16mm-potentiometer/>

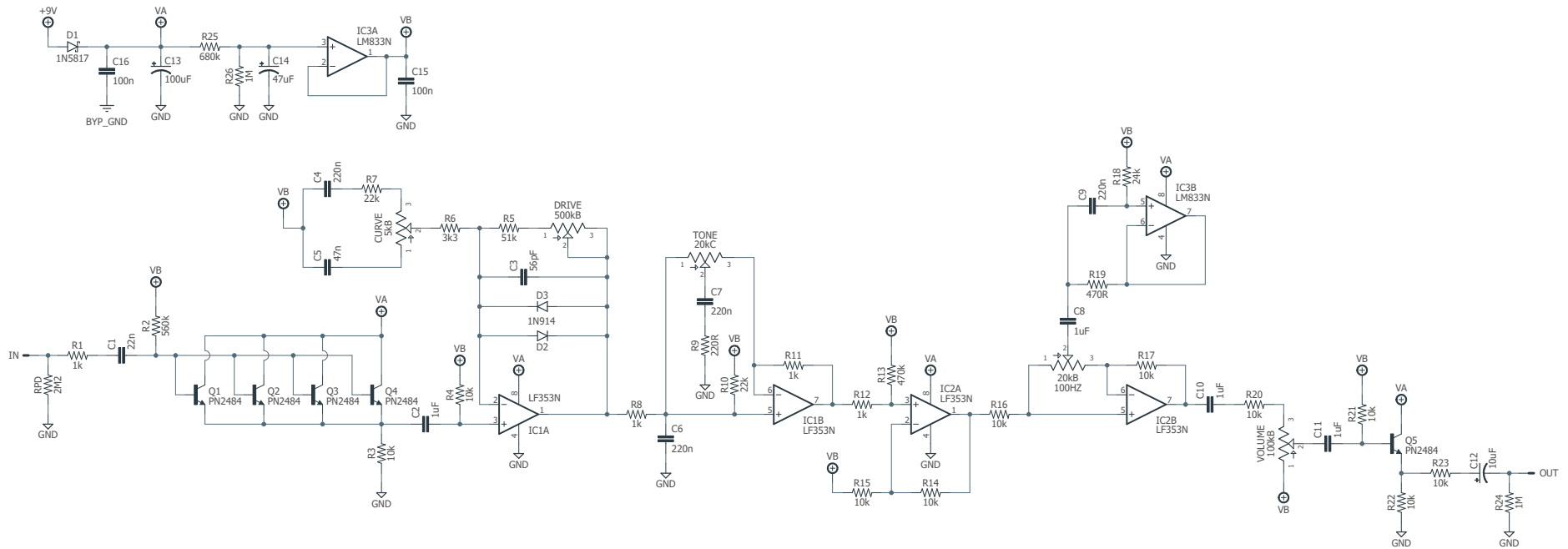
If you're unable to get them from Tayda, you can substitute 20kW for the Tone control (the standard Tube Screamer value) and 25kB for the 100 Hz control.

C6 value

The original trace of the Green Rhino Mk. II lists C6 as a 47n capacitor, and this is the value we originally included in this project. However, based on a review of the [photos accompanying the trace](#), pin 1 of the tone control definitely connects to a 220n capacitor, meaning they retained the original Tube Screamer value. There is only one 47n capacitor on the board which is part of the Curve control.

Using 47n for C6 will increase the brightness of the effect since the pre-tone hi-cut frequency is shifted up to 3.3k. This will diminish the classic Tube Screamer mid-hump which relies on cutting frequencies above 723 Hz. Therefore, it's recommended to use 220n in all builds, and to modify existing units to 220n if you built this project prior to 2024.

SCHEMATIC



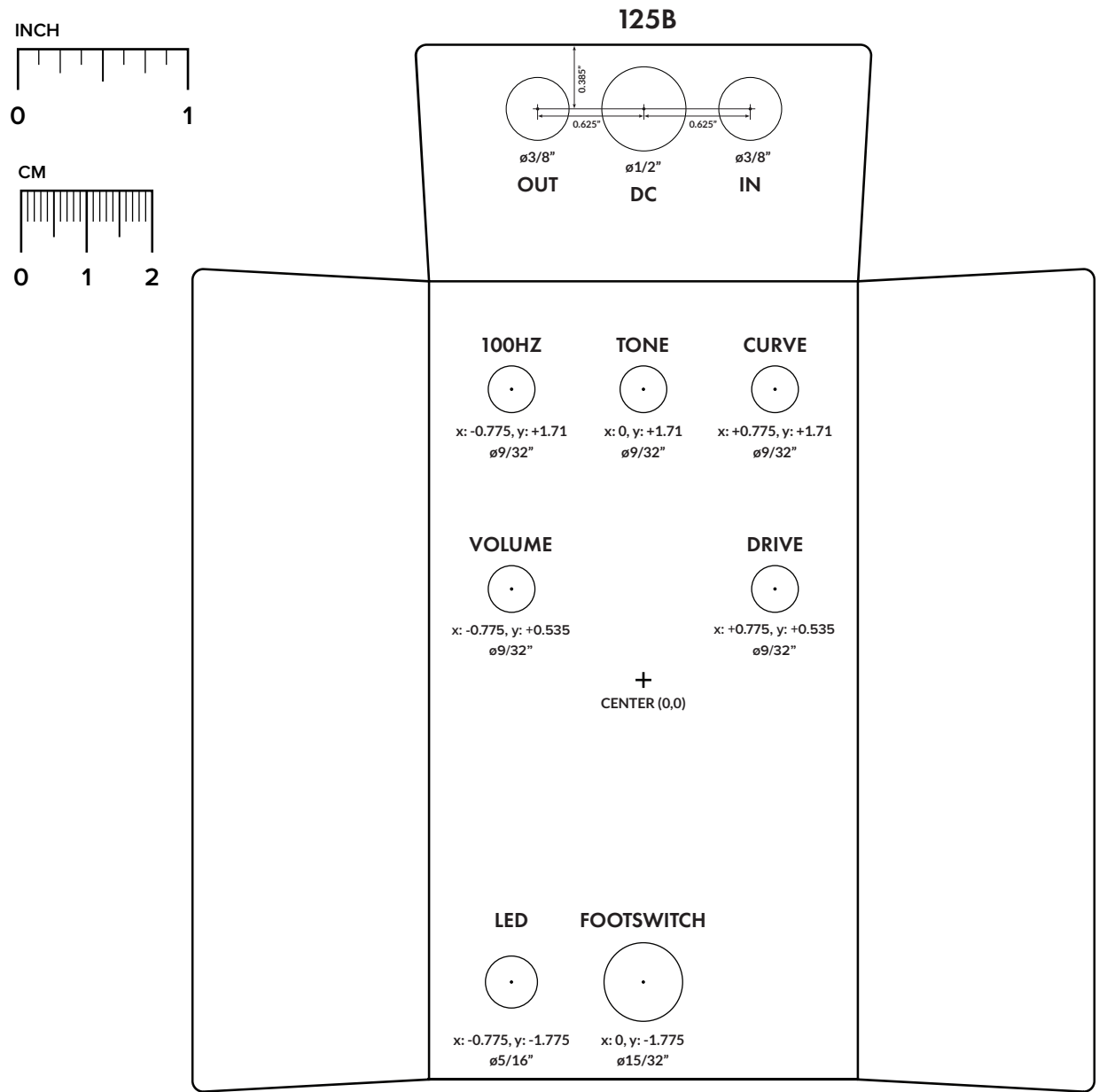
DRILL TEMPLATE

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.

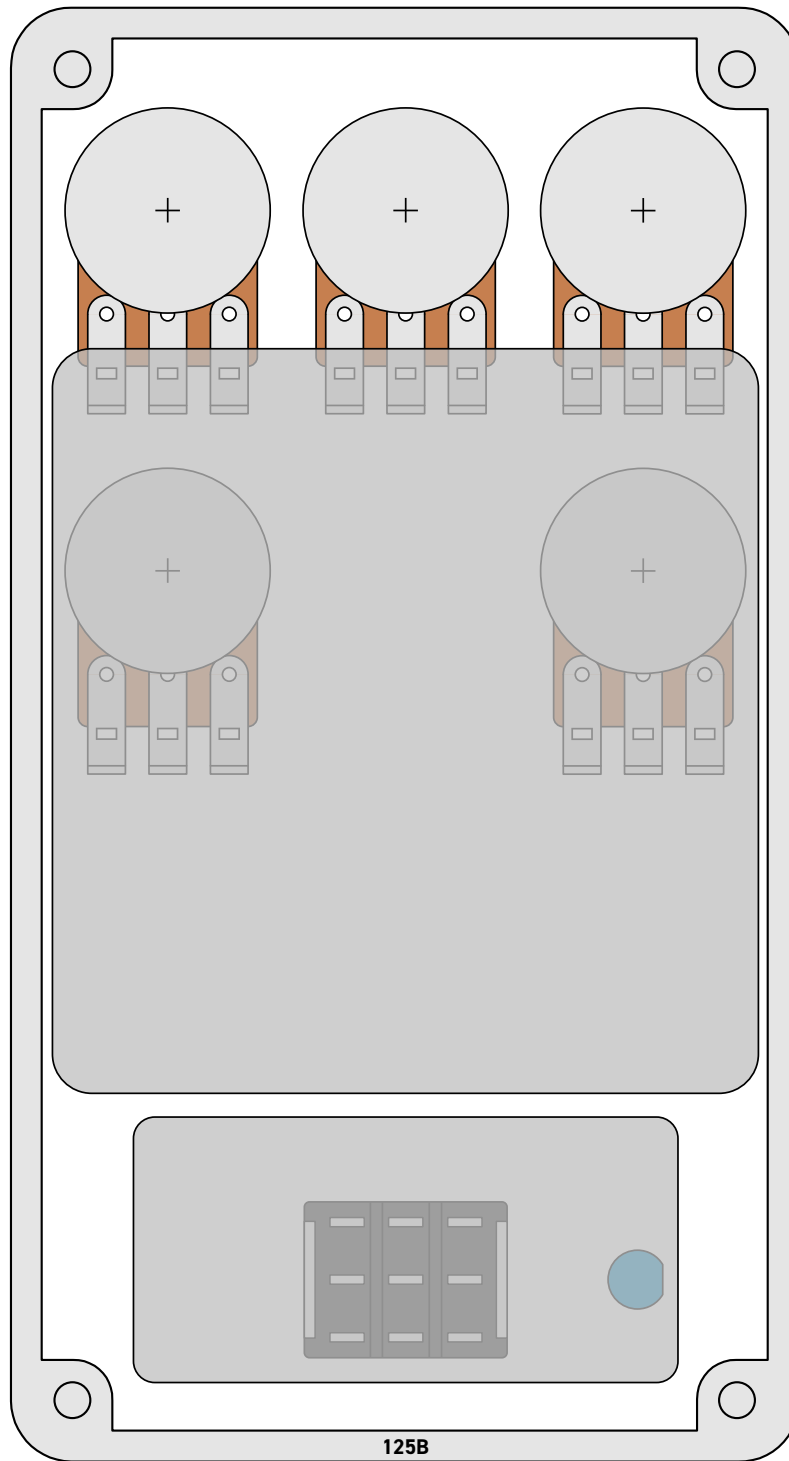
Top jack layout requires the use of closed-frame jacks like the [Switchcraft 111X](#). Open-frame jacks will not fit in layouts with 5 or more knobs due to the placement of the DC jack.

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.

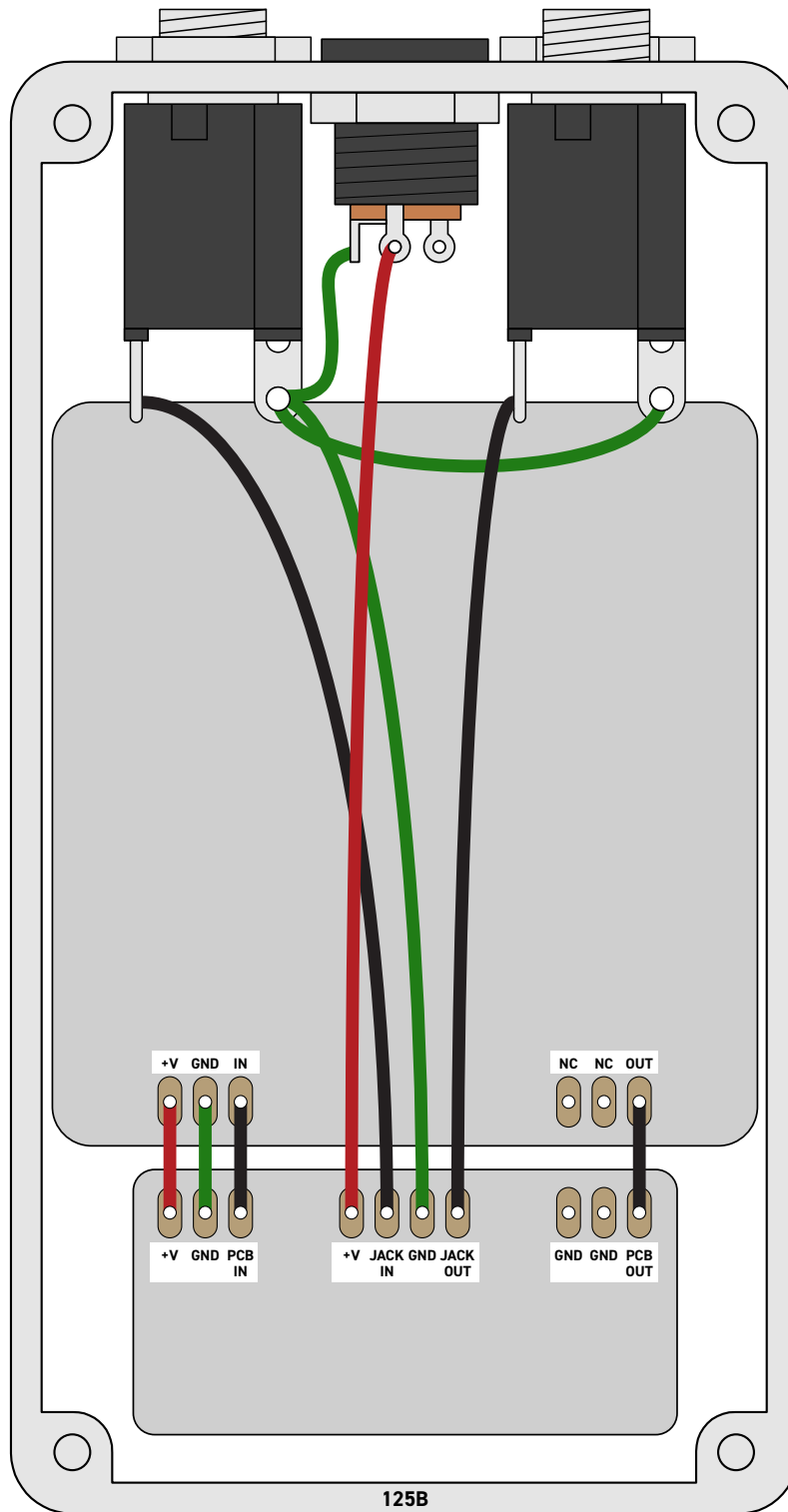


ENCLOSURE LAYOUT

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

1.0.2 (2024-01-31)

Changed C6 to 220n based on a review of the original trace.

1.0.1 (2020-06-15)

Corrected link to parts spreadsheet on page 3.

1.0.0 (2020-06-05)

Initial release.