

PROJECT NAME

# KARKADANN

BASED ON

Way Huge Green Rhino Mk. II

EFFECT TYPE

Overdrive

BUILD DIFFICULTY

■■■■□ Intermediate

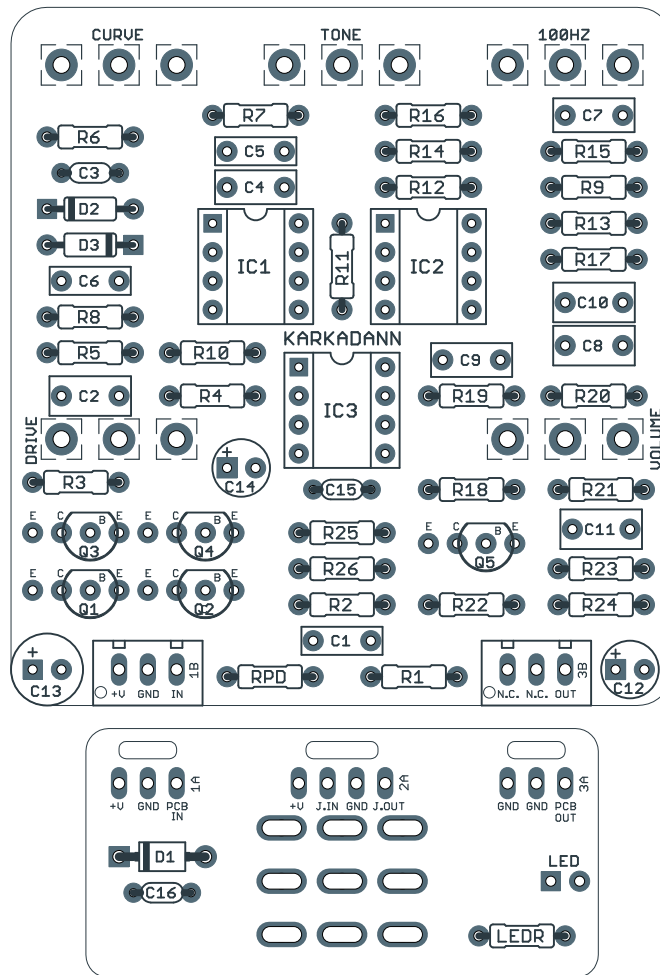
DOCUMENT VERSION

1.0.1 (2020-06-15)



## 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).

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## INTRODUCTION

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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

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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 2.5mm	
C5	47n	Film capacitor, 7.2 x 2.5mm	
C6	47n	Film capacitor, 7.2 x 2.5mm	
C7	220n	Film capacitor, 7.2 x 2.5mm	
C8	1uF	Film capacitor, 7.2 x 3.5mm	
C9	220n	Film capacitor, 7.2 x 2.5mm	
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

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### 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.

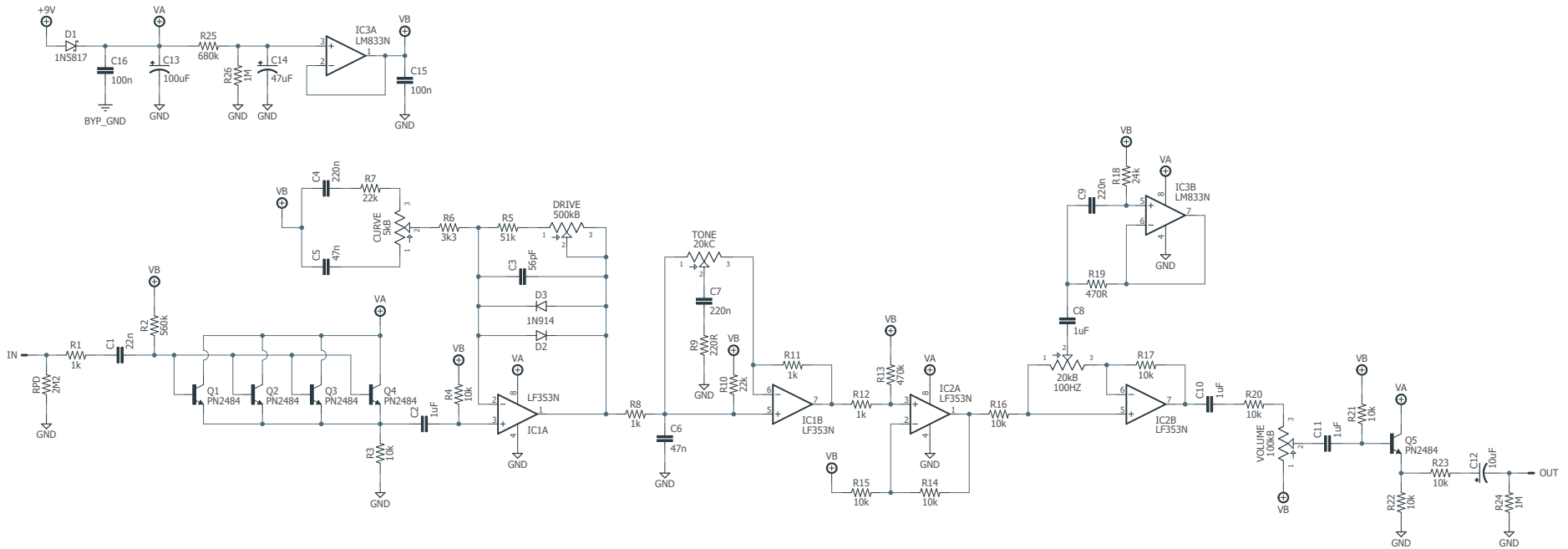
### Potentiometer values

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.

# SCHEMATIC



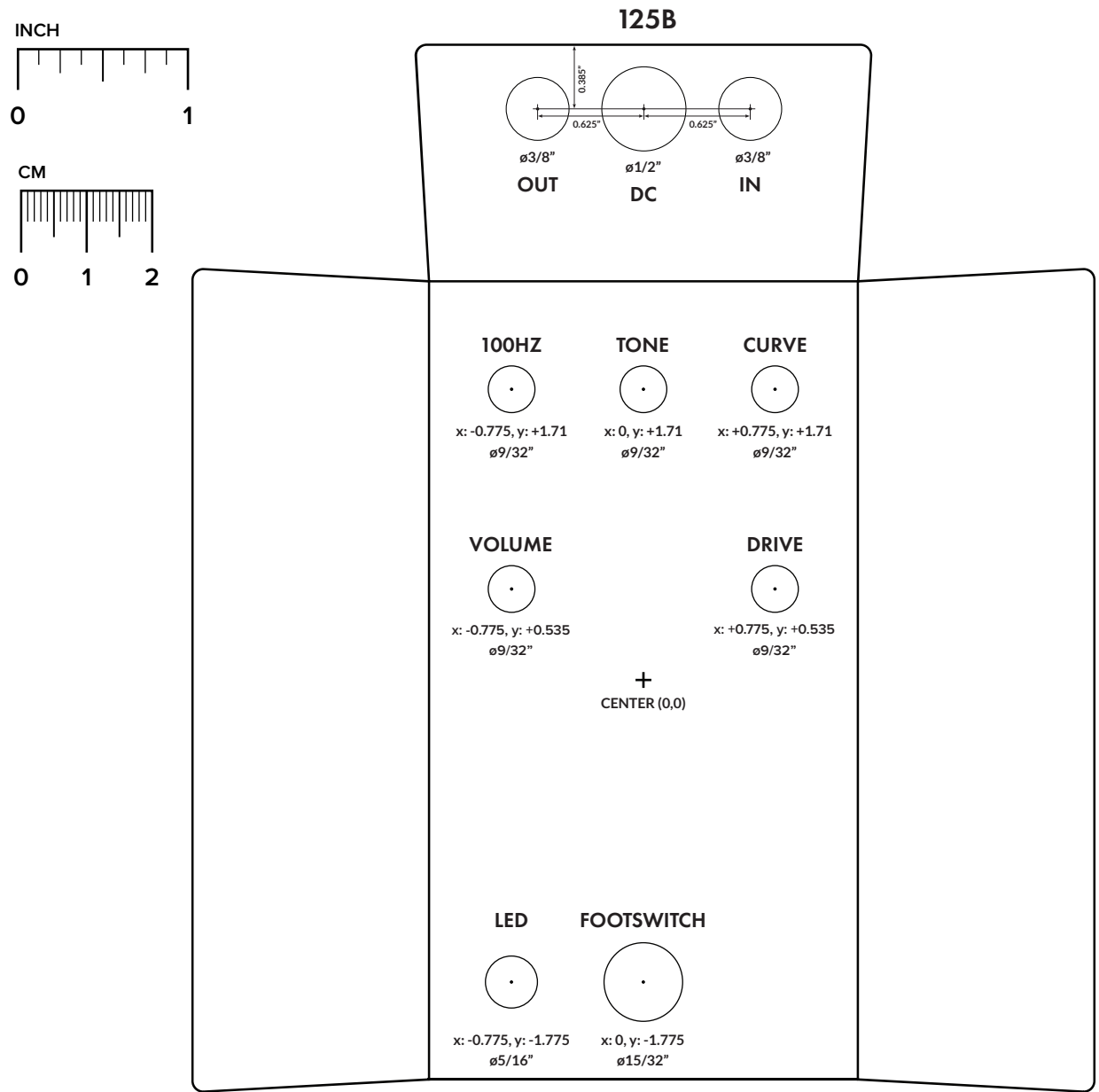
# DRILL TEMPLATE

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.

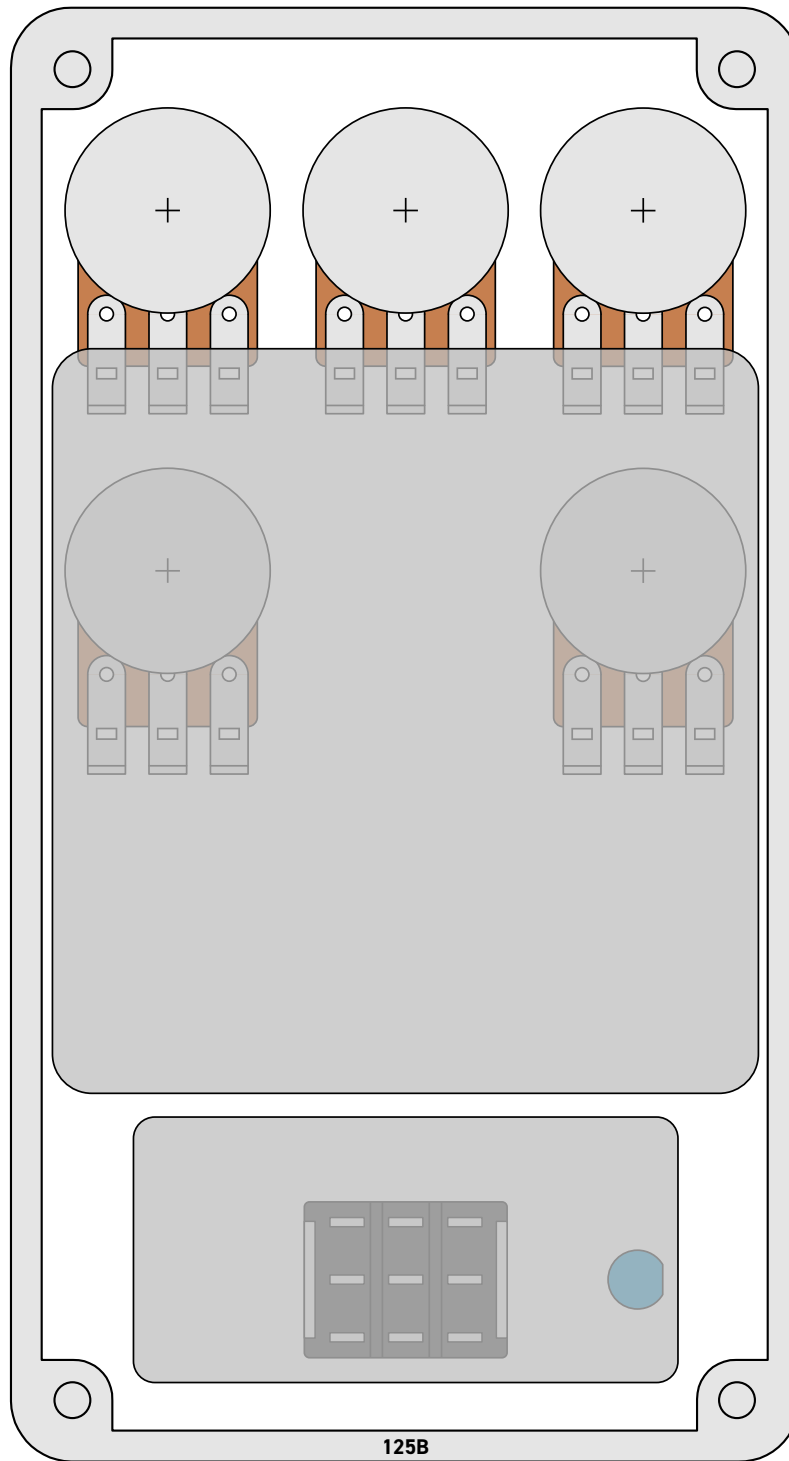




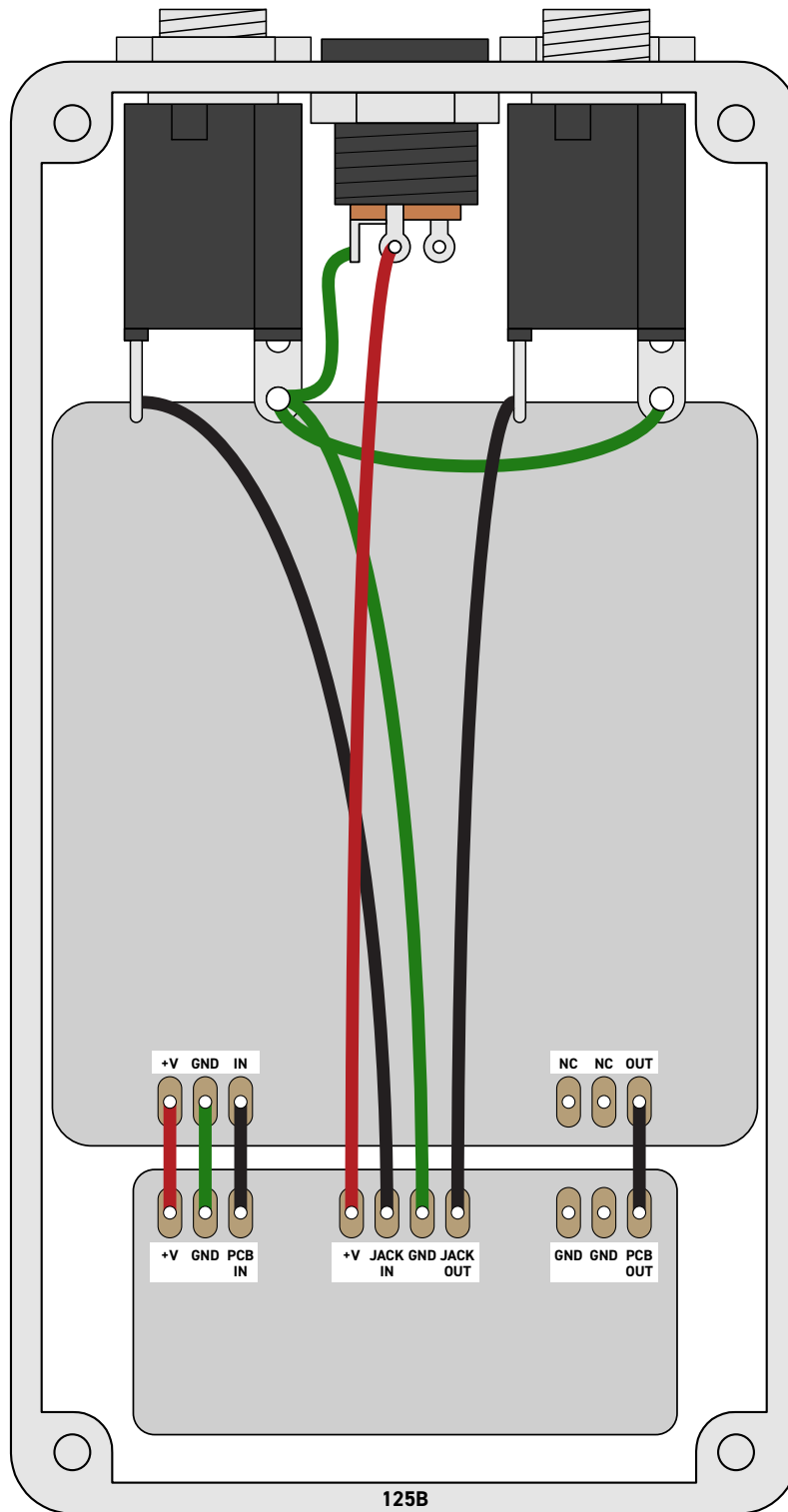
# ENCLOSURE LAYOUT

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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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### 1.0.1 (2020-06-15)

Corrected link to parts spreadsheet on page 3.

### 1.0.0 (2020-06-05)

Initial release.