

PROJECT NAME

EQUINOX

BASED ON

Marshall Guv'nor (Drivemaster)

EFFECT TYPE

Amp-Like Overdrive

BUILD DIFFICULTY

■■■■■ Easy

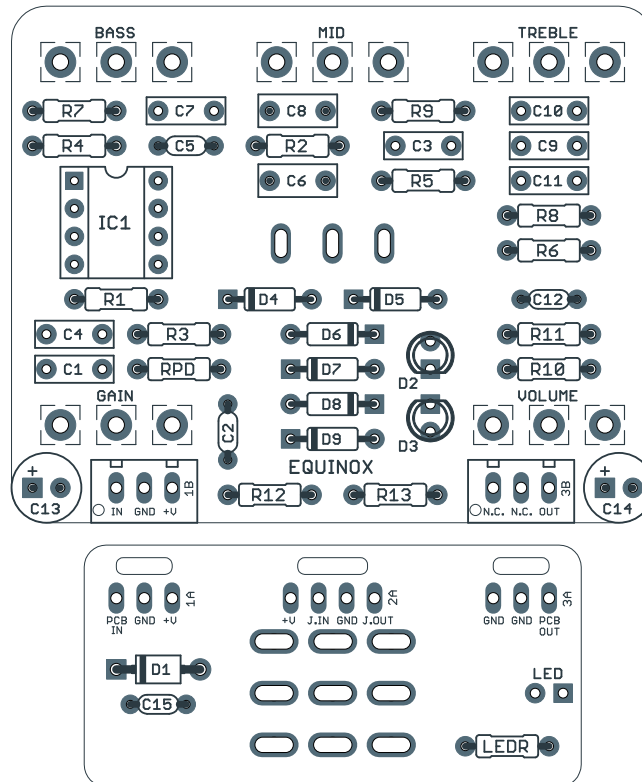
DOCUMENT VERSION

1.0.2(2021-04-27)



PROJECT SUMMARY

A great low-to-mid-gain amp-like overdrive with a 3-band EQ.



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

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INTRODUCTION

The Equinox Amp Overdrive project is a clone of the Marshall Guv'nor and Drivemaster. (The two pedals have different names, but they are identical circuits in every way except that the Guv'nor has an effects loop which has been excluded from this project).

First released in 1988, the Guv'nor was replaced in 1991 by the Drivemaster, the same time the Shredmaster and Bluesbreaker pedals were released. It was a very popular pedal at the time and remains well-regarded.

The Guv'nor was among the first overdrive pedals to use a 3-band tone control, allowing for more amp-like toneshaping via bass, midrange and treble knobs. Interestingly, while it looks like an amp tonestack on the surface, it's actually a little closer to a Big Muff tone control in its technology. All three controls are much more interactive than you'd usually see on an amp.

The Equinox is faithful to the original, but with one added modification: a switch that lets you go between different clipping diodes. The original has a high clipping threshold using LEDs, but with the clipping switch you can also select two 1N914s in each direction, as in the Bluesbreaker, or one 1N914 in each direction, as in the Shredmaster.

USAGE

The Equinox has the following controls:

- **Treble, Mid and Bass** form a passive 3-band tone control for flexible tone shaping.
- **Gain** controls the amount of gain in the op-amp gain stages that is fed into the clipping stage.
- **Volume** controls the overall output of the effect.
- **Clipping** (toggle switch) selects the clipping diodes which changes the character of the drive tone.

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	1M	Metal film resistor, 1/4W	
R2	2k2	Metal film resistor, 1/4W	
R3	10k	Metal film resistor, 1/4W	
R4	680k	Metal film resistor, 1/4W	
R5	1k	Metal film resistor, 1/4W	
R6	1k5	Metal film resistor, 1/4W	
R7	680R	Metal film resistor, 1/4W	
R8	680R	Metal film resistor, 1/4W	
R9	100R	Metal film resistor, 1/4W	
R10	22k	Metal film resistor, 1/4W	
R11	1M	Metal film resistor, 1/4W	
R12	47k	Metal film resistor, 1/4W	
R13	47k	Metal film resistor, 1/4W	
RPD	2M2	Metal film resistor, 1/4W	Input pulldown resistor. Can be as low as 1M.
LEDR	4k7	Metal film resistor, 1/4W	LED current-limiting resistor. Adjust value to change LED brightness.
C1	10n	Film capacitor, 7.2 x 2.5mm	
C2	100pF	MLCC capacitor, NP0/C0G	Some schematics show 120pF here, but the Marshall factory schematic shows 100pF.
C3	100n	Film capacitor, 7.2 x 2.5mm	
C4	68n	Film capacitor, 7.2 x 2.5mm	The original has 220n and 100n capacitors in series, which makes 68n.
C5	220pF	MLCC capacitor, NP0/C0G	
C6	220n	Film capacitor, 7.2 x 2.5mm	
C7	100n	Film capacitor, 7.2 x 2.5mm	
C8	220n	Film capacitor, 7.2 x 2.5mm	
C9	4n7	Film capacitor, 7.2 x 2.5mm	
C10	10n	Film capacitor, 7.2 x 2.5mm	
C11	68n	Film capacitor, 7.2 x 2.5mm	
C12	470pF	MLCC capacitor, NP0/C0G	
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.

PARTS LIST, CONT.

PART	VALUE	TYPE	NOTES
D1	1N5817	Schottky diode, DO-41	
D2	3mm	LED, 3mm, red diffused	
D3	3mm	LED, 3mm, red diffused	
D4	1N914	Fast-switching diode, DO-35	
D5	1N914	Fast-switching diode, DO-35	
D6	1N914	Fast-switching diode, DO-35	
D7	1N914	Fast-switching diode, DO-35	
D8	1N914	Fast-switching diode, DO-35	
D9	1N914	Fast-switching diode, DO-35	
IC1	TL072	Operational amplifier, DIP8	
IC1-S	DIP-8 socket	IC socket, DIP-8	
TREBLE	10k Ω	16mm right-angle PCB mount pot	
BASS	10k Ω	16mm right-angle PCB mount pot	
MID	10k Ω	16mm right-angle PCB mount pot	
GAIN	100k Ω	16mm right-angle PCB mount pot	
VOL	100k Ω	16mm right-angle PCB mount pot	
CLIP	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.
BATT	Battery snap	9V battery snap	Optional. Use the soft plastic type—the hard-shell type will not fit.
FSW	3PDT	Stomp switch, 3PDT	
ENC	125B	Enclosure, die-cast aluminum	Can also use a Hammond 1590N1.

BUILD NOTES

Clipping switch

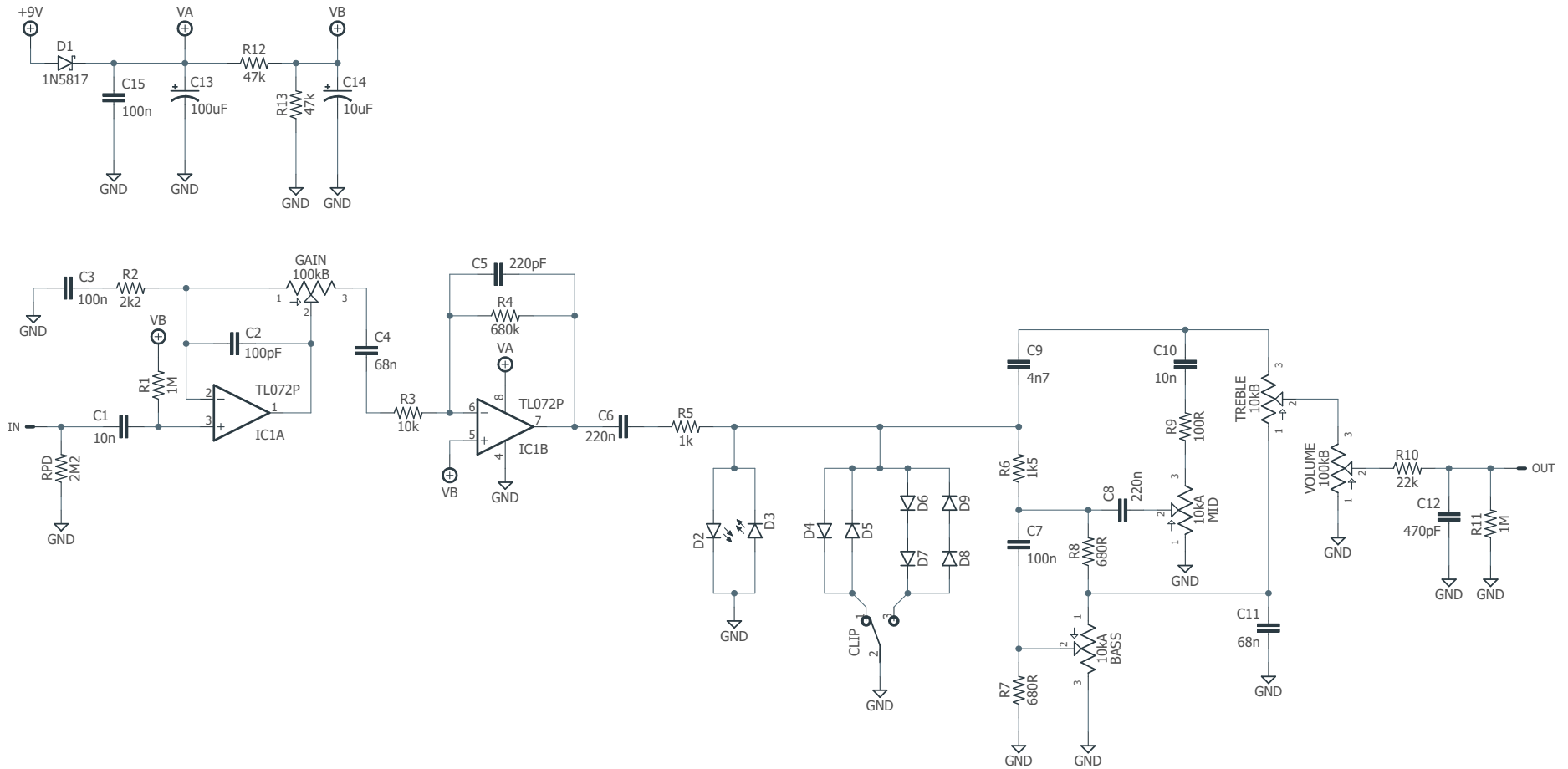
The clipping switch allows you select between different sets of diodes.

The center position of the toggle switch is the stock Guv'nor clipping arrangement, which has one LED in each direction. The upward position of the toggle is two diodes in each direction, a slightly lower clipping threshold, while the downward position is one diode in each direction like in the Shredmaster.

If you look at the schematic, you'll see that the LEDs, D2 and D3, are always connected. However, in either the up or down switch positions, the lower-threshold diodes are connected and so the LEDs have no effect—there's no signal remaining for them to clip.

The only thing to be aware of is that since the Guv'nor does not have a gain recovery stage after the clipping diodes & passive tone stack like the Shredmaster, the diodes will directly affect the maximum volume of the unit. Using the diodes with the lowest threshold (one 1N914 in each direction), you'll find that you have to crank the volume knob pretty high to get unity.

SCHEMATIC



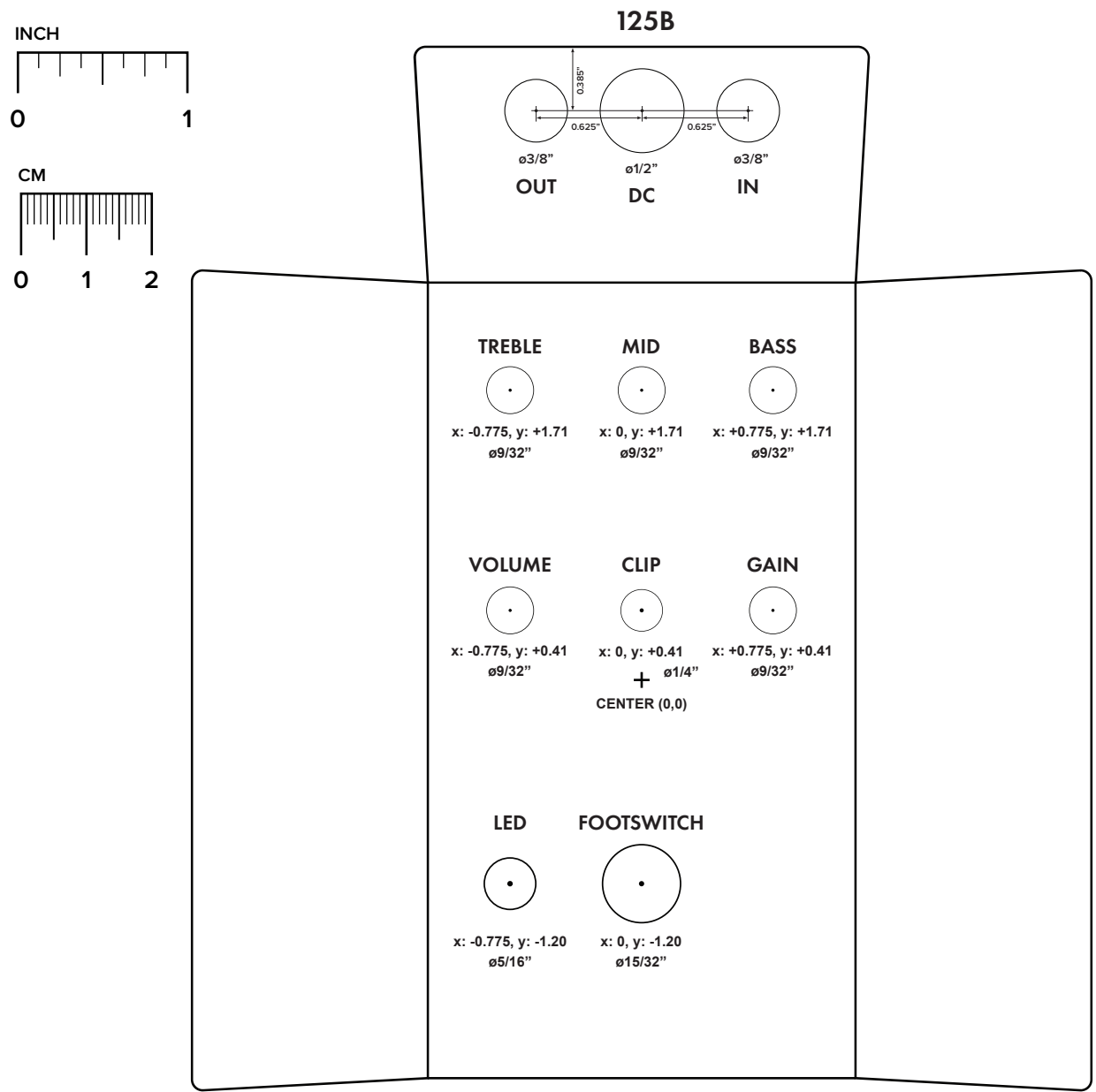
DRILL TEMPLATE

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.

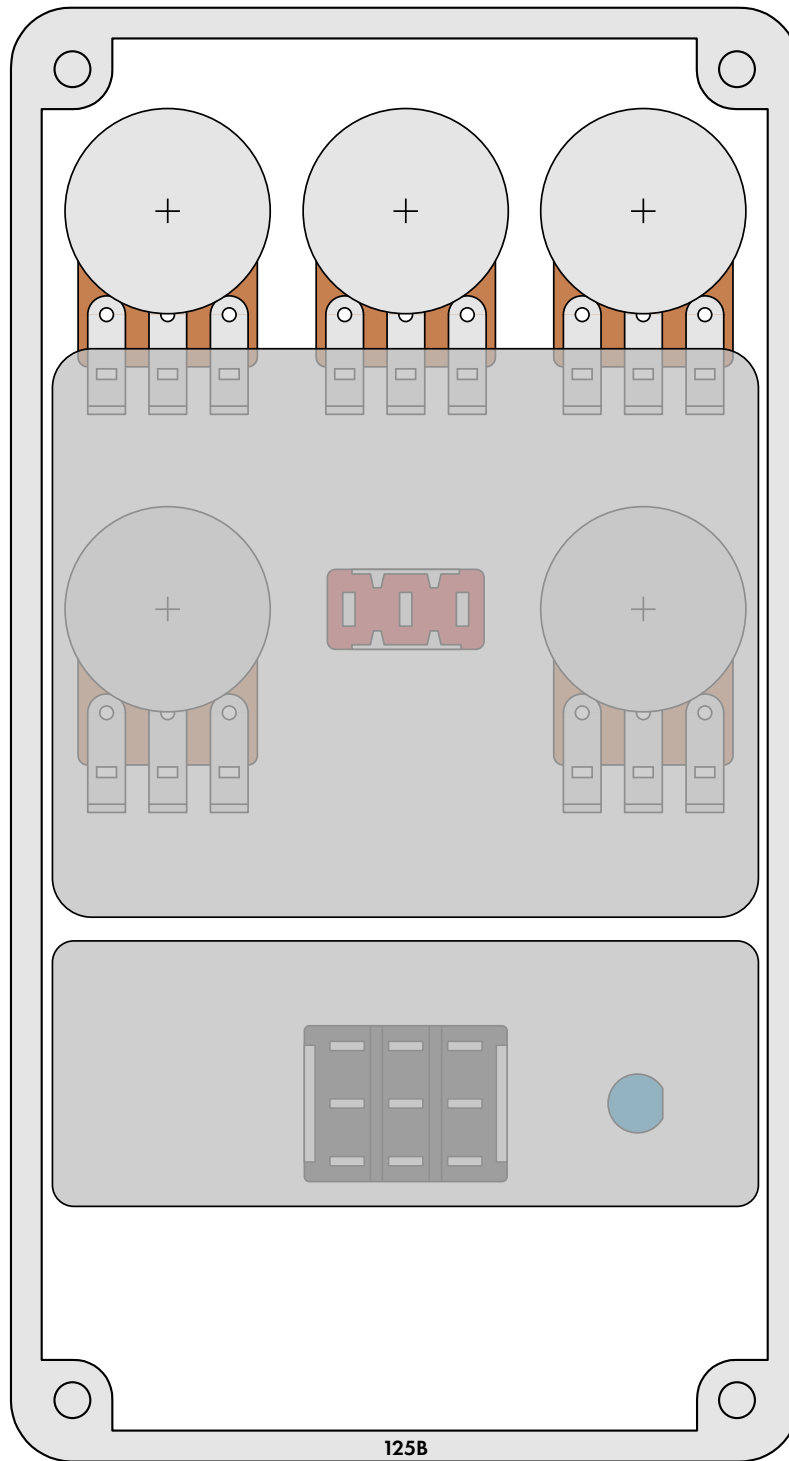
Top jack layout requires the use of closed-frame jacks like the [Switchcraft 111X](#). Open-frame jacks will not fit in layouts with 5 or more knobs due to the placement of the DC jack.

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.

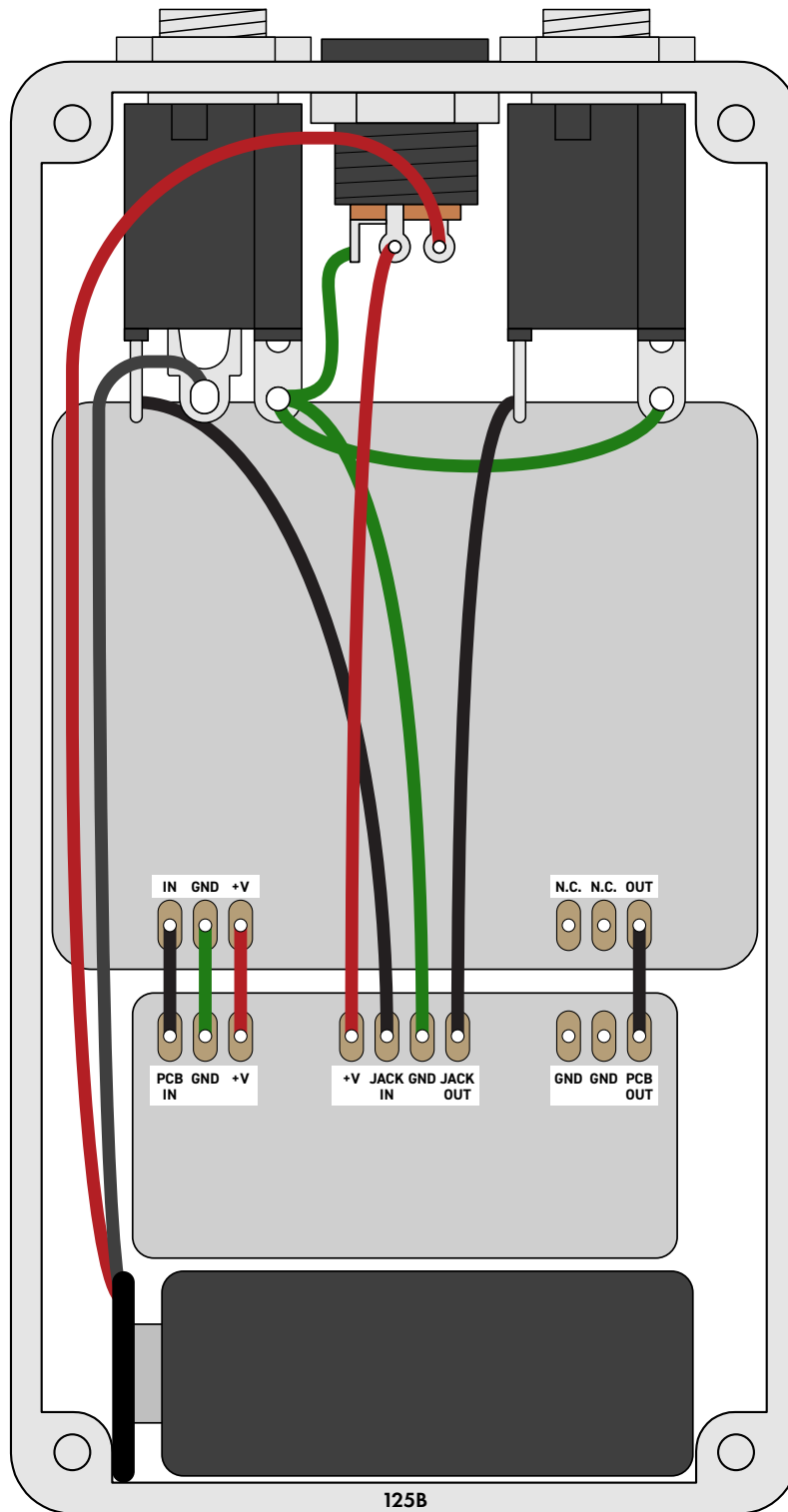


ENCLOSURE LAYOUT

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 (2021-04-27)

Changed Treble pot to 10kB (previously 10kA) based on review of an original Drivemaster.

1.0.1 (2019-07-28)

Corrected minor errors in PDF parts list. The spreadsheet & schematic were correct.

1.0.0 (2018-12-15)

Initial release.