

PROJECT NAME

CUMULUS

BASED ON

Ibanez® OD-855 Overdrive II

EFFECT TYPE

Overdrive

BUILD DIFFICULTY

■■■■■ Easy

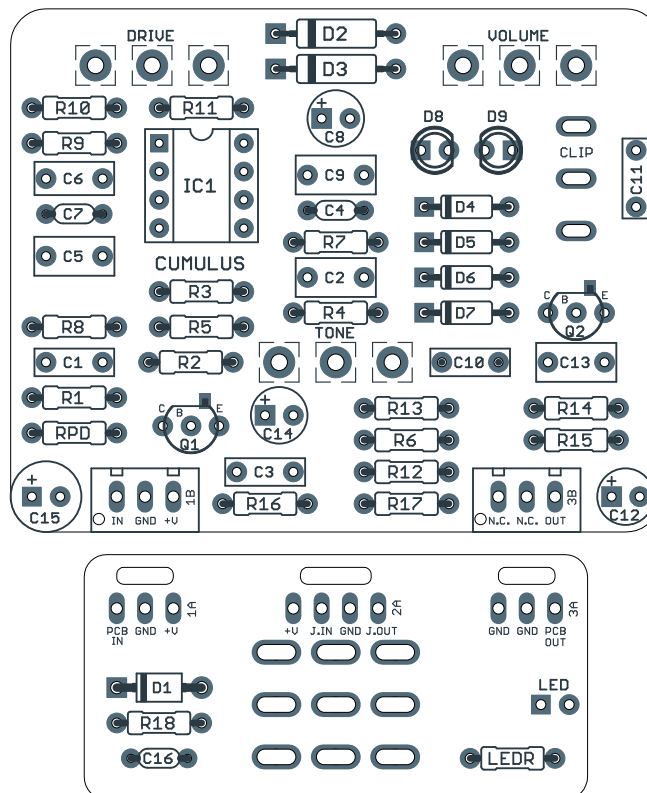
DOCUMENT VERSION

1.0.1 (2021-06-07)



PROJECT SUMMARY

An early overdrive circuit inspired by the Distortion+, but with the first appearance of the tone control that would later be used for the Tube Screamer.



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

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INTRODUCTION

The Cumulus Vintage Overdrive is based on the Ibanez® OD-855 Overdrive II, a precursor to the Tube Screamer originally released in 1977. Like other Ibanez pedals, this one was designed by Maxon, whose name is on the original PCB and inside the enclosure, but this one was exclusively released under the Ibanez name.

With its diodes-to-ground clipping setup, the OD-855 actually has a little more in common with an MXR Distortion+ than with a Tube Screamer. It's notable for being the first appearance of the classic Tube Screamer tone control— although in this case it appears before the clipping stage rather than after, and several values are changed so it doesn't impact the same frequencies.

The Cumulus is a direct adaptation of the original OD-855, but with the JFET switching removed to convert it to true bypass. A clipping switch has also been added, so you can select between the stock clipping diodes and two other options.

The updated version of the Cumulus is the same as the earlier 1590B version except that the clipping switch has been modified to allow LEDs to be used in the center position as the third diode option.

USAGE

The Cumulus has the following controls:

- **Drive** controls the amount of gain in the op-amp feedback diode clipping stage.
- **Tone** controls the treble response of the effect. The center point (12:00) is flat. When turned to the left, it cuts treble, and when turned to the right, it boosts treble.
- **Volume** controls the overall output of the effect.
- **Clip** (toggle switch) selects between three sets of diodes: 1x silicon (stock), 2x silicon, and LEDs.

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	10k	Metal film resistor, 1/4W	
R2	510k	Metal film resistor, 1/4W	
R3	3k	Metal film resistor, 1/4W	
R4	3k	Metal film resistor, 1/4W	
R5	100k	Metal film resistor, 1/4W	
R6	680R	Metal film resistor, 1/4W	
R7	3k	Metal film resistor, 1/4W	
R8	10k	Metal film resistor, 1/4W	
R9	100k	Metal film resistor, 1/4W	
R10	470R	Metal film resistor, 1/4W	
R11	10k	Metal film resistor, 1/4W	
R12	510k	Metal film resistor, 1/4W	
R13	10k	Metal film resistor, 1/4W	
R14	100R	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	100R	Metal film resistor, 1/4W	Power supply filter resistor.
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	22n	Film capacitor, 7.2 x 2.5mm	
C2	1uF	Film capacitor, 7.2 x 3.5mm	
C3	100n	Film capacitor, 7.2 x 2.5mm	
C4	470pF	MLCC capacitor, NP0/COG	
C5	1uF	Film capacitor, 7.2 x 3.5mm	
C6	470n	Film capacitor, 7.2 x 3mm	
C7	22pF	MLCC capacitor, NP0/COG	
C8	OMIT		4.7uF electrolytic in original. See build notes.
C9	1uF	Film capacitor, 7.2 x 3.5mm	
C10	2n2	Film capacitor, 7.2 x 2.5mm	

PARTS LIST, CONT.

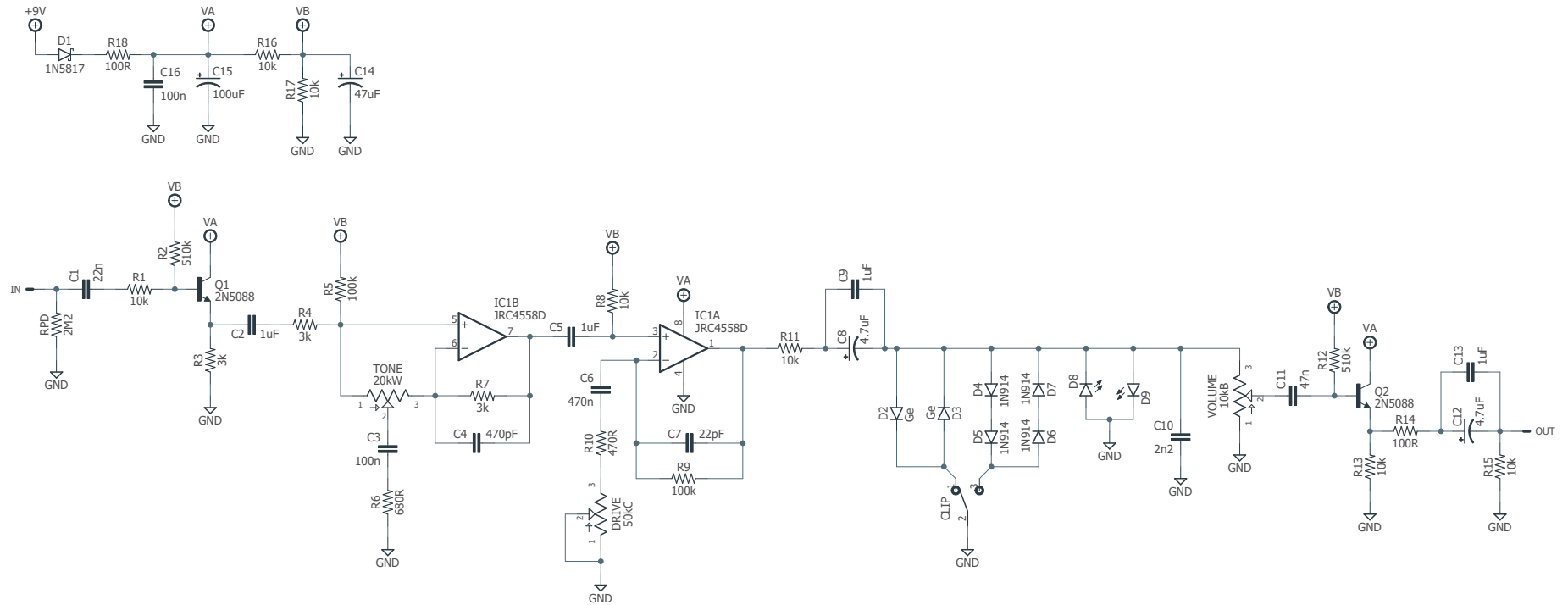
PART	VALUE	TYPE	NOTES
C11	47n	Film capacitor, 7.2 x 2.5mm	
C12	OMIT		4.7uF electrolytic in original. See build notes.
C13	1uF	Film capacitor, 7.2 x 3.5mm	
C14	47uF	Electrolytic capacitor, 5mm	Reference voltage filter capacitor.
C15	100uF	Electrolytic capacitor, 6.3mm	Power supply filter capacitor.
C16	100n	MLCC capacitor, X7R	Power supply filter capacitor.
D1	1N5817	Schottky diode, DO-41	
D2	Germanium	Germanium diode, DO-7	Any NOS germanium diode will work here. Can also substitute BAT41, a Schottky diode with similar forward voltage.
D3	Germanium	Germanium diode, DO-7	
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	3mm LED	LED, 3mm, red diffused	
D9	3mm LED	LED, 3mm, red diffused	
Q1	2N5088	BJT transistor, NPN, TO-92	Original uses 2SC1815.
Q2	2N5088	BJT transistor, NPN, TO-92	Original uses 2SC1815.
IC1	JRC4558D	Operational amplifier, DIP-8	
IC1-S	DIP-8 socket	IC socket, DIP-8	
DRIVE	50kC	16mm right-angle PCB mount pot	
TONE	20kW	16mm right-angle PCB mount pot	
VOL.	10kB	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

Electrolytic capacitors

The original OD-855 used 4.7uF electrolytic capacitors for C8 and C12. Since film is much better than electrolytic in quality and reliability for coupling audio signals, this project replaces them with 1uF film (C9 and C13 respectively). It's recommended to omit C8 and C12 entirely and use only C9 and C13, but you can use electrolytics instead if you prefer.

SCHEMATIC



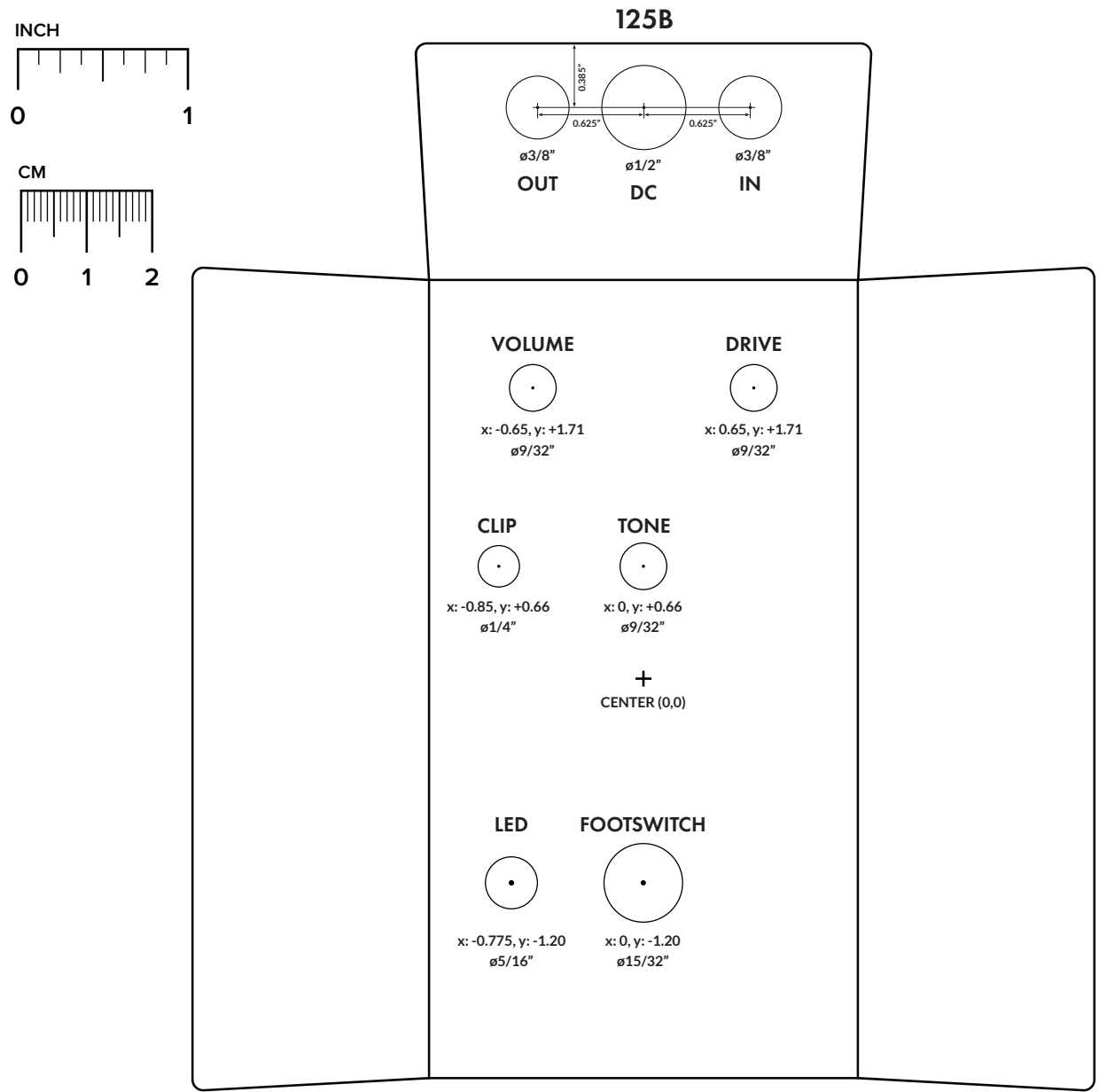
DRILL TEMPLATE

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.

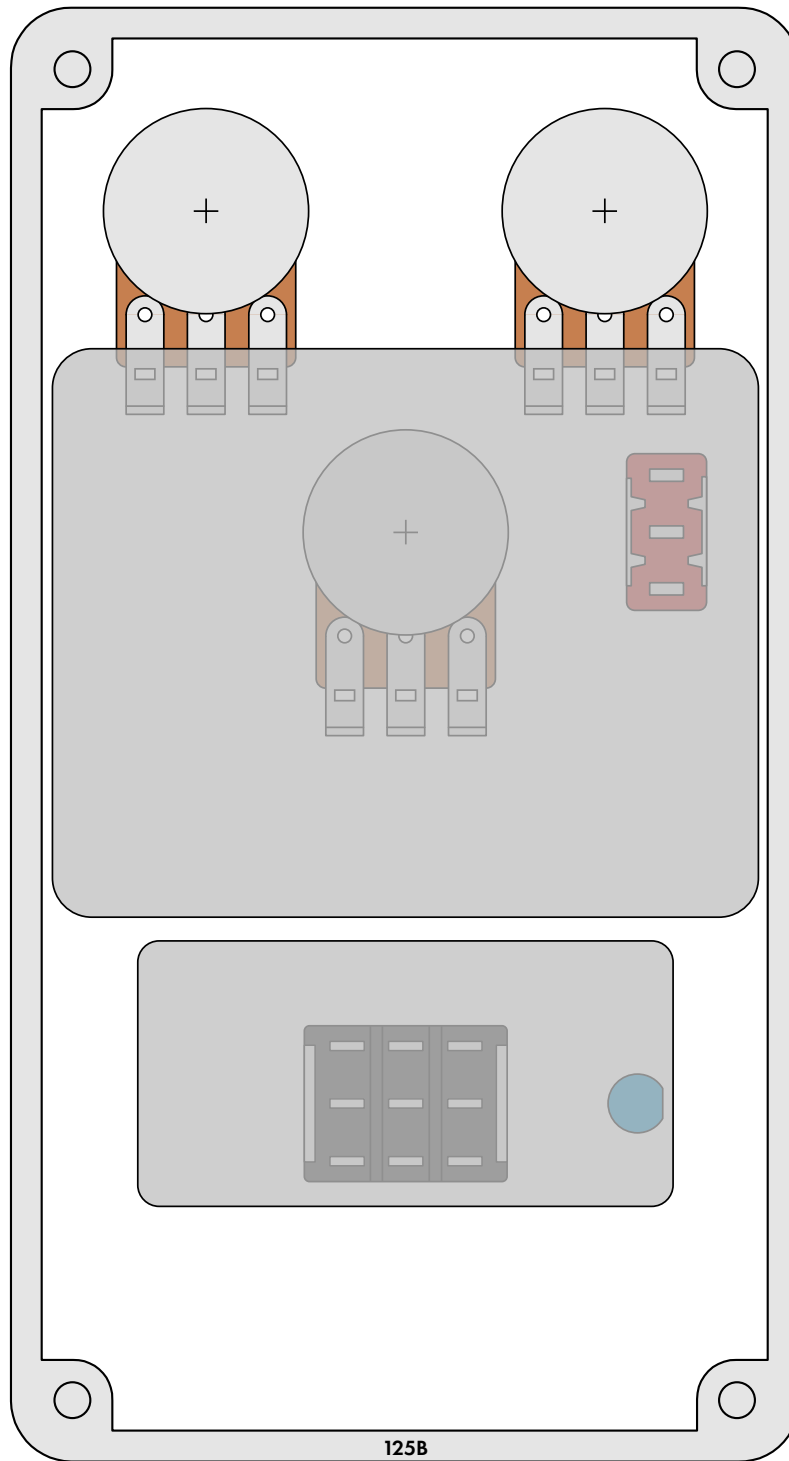
Top jack layout assumes the use of closed-frame jacks like the [Switchcraft 111X](#). If you'd rather use open-frame jacks, please refer to the [Open-Frame Jack Drill Template](#) for the top side.

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.

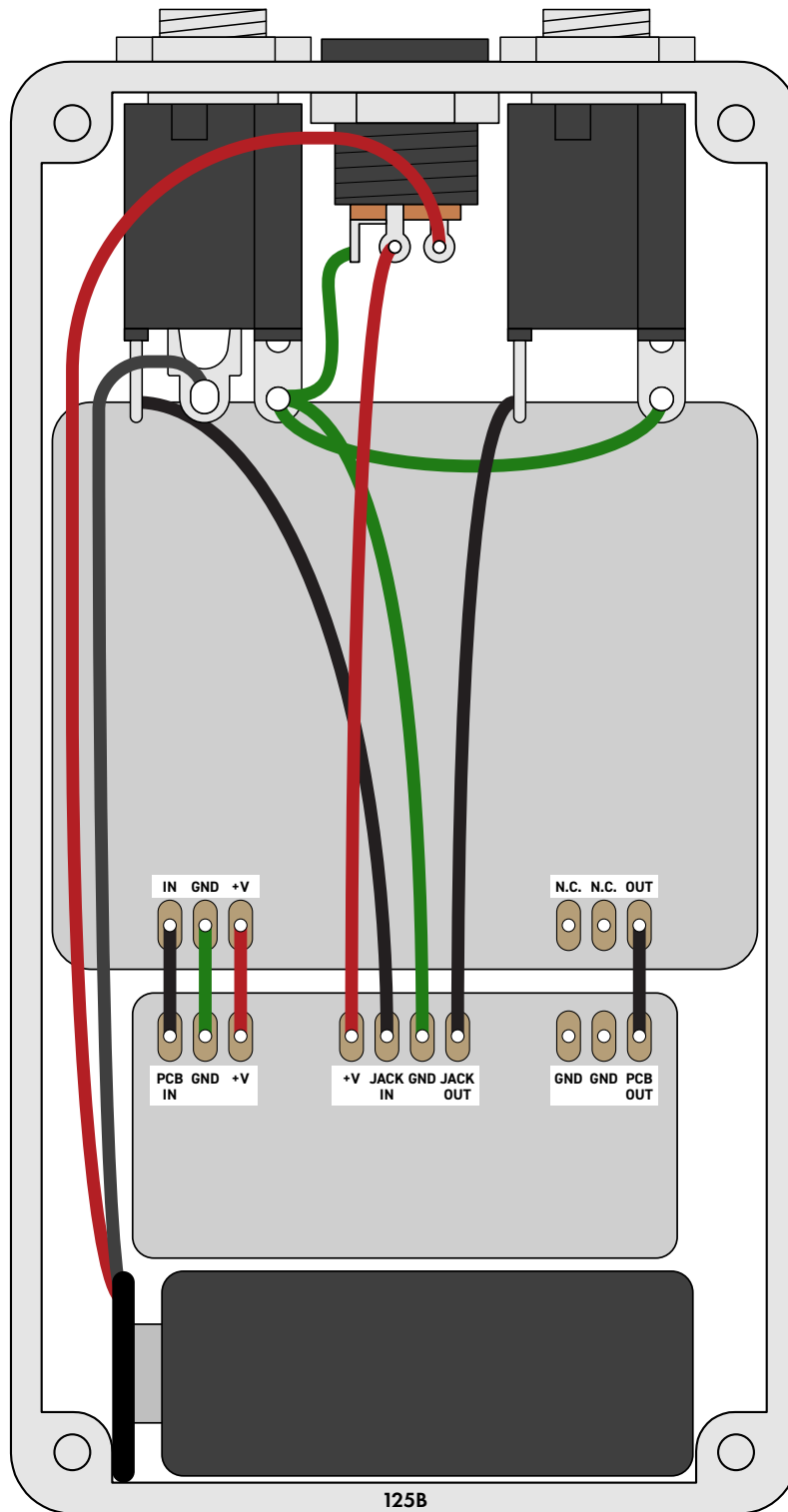


ENCLOSURE LAYOUT

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

1.0.1 (2021-06-07)

Corrected IC1 in the parts list, mistakenly listed as a LM741 (single) but should be JRC4558D (dual). The schematic and Mouser spreadsheet were correct.

1.0.0 (2021-03-19)

Initial release.