PROJECT NAME

DELUGE

aion
DIY GUITAR EFFECTS

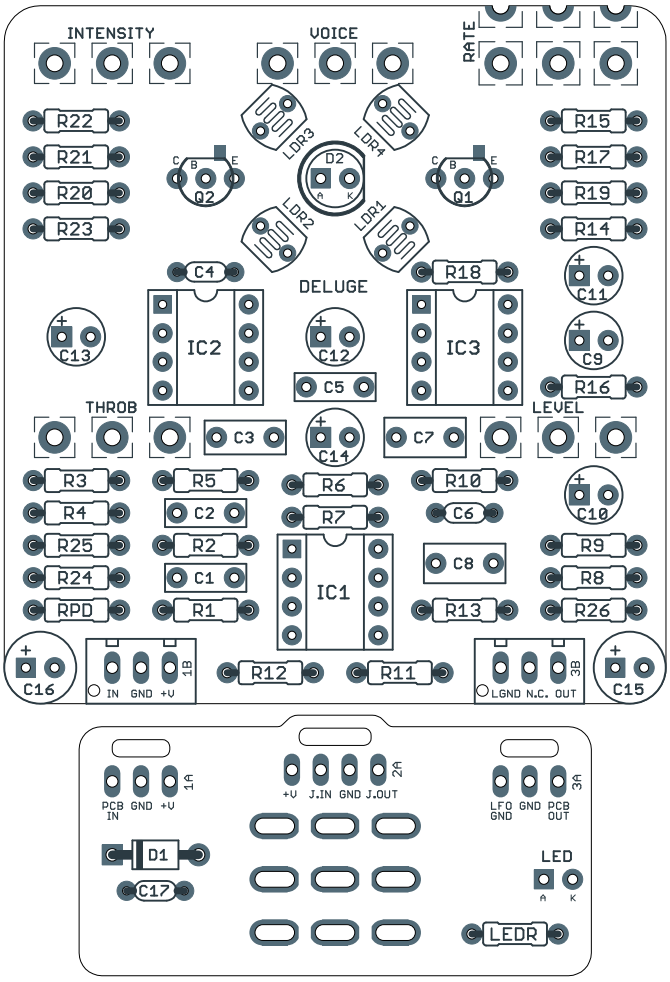
BASED ON
Earthquaker Devices Depths

BUILD DIFFICULTY
Easy

EFFECT TYPE
Phaser/vibrato

DOCUMENT VERSION
1.0.0 (2026-07-03)

PROJECT SUMMARY
A four-stage optical phaser/vibrato inspired by the Uni-Vibe, delivering classic vibe tones with some modern updates.



Actual size is 2.3” x 2.42” (main board) and 1.78” x 0.91” (bypass board).

TABLE OF CONTENTS

INTRODUCTION

The Deluge Optical Vibe is an adaptation of the Earthquaker Devices Depths, a four-stage optical vibrato based on the Uni-Vibe.

The Depths was originally released in 2012 and discontinued in early 2026. Compared to the Uni-Vibe, it's been modernized and both simplified and expanded. It uses the same photocell-based phase-shift topology but with op-amps instead of transistors. It adds controls for "Throb", which reduces the bass level of the lowest-frequency phase stage, and "Voice", which is an external bias control for the LED.

The end result doesn't sound exactly like a classic Uni-Vibe, but it covers similar territory. It's significantly easier to build with zero calibration needed.

The Deluge is a direct adaptation of the V1 Depths, prior to the V2's addition of the relay bypass system. The only change is that the LFO's power supply and ground have been isolated from the audio signal path to reduce the chances of ticking or added noise.

USAGE

The Deluge has five controls:

- **Rate** is the speed of the modulation effect.
- **Intensity** is a depth control that sets the overall sweep range of the LFO.
- **Voice** is an external bias that controls the brightness of the LED in response to the LFO signal. This shifts the frequency of the phaser effect, going lower as you turn it up.
- **Throb** controls the bass level of the lowest phase stage. Since it affects very low bass frequencies, its effect is more noticeable on synthesizers or bass guitar or with overdrive.
- **Level** is the output level 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—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	47k	Metal film resistor, 1/4W	
R3	47k	Metal film resistor, 1/4W	
R4	22k	Metal film resistor, 1/4W	
R5	47k	Metal film resistor, 1/4W	
R6	47k	Metal film resistor, 1/4W	
R7	47k	Metal film resistor, 1/4W	
R8	47k	Metal film resistor, 1/4W	
R9	47k	Metal film resistor, 1/4W	
R10	100k	Metal film resistor, 1/4W	
R11	100k	Metal film resistor, 1/4W	
R12	10k	Metal film resistor, 1/4W	
R13	56k	Metal film resistor, 1/4W	
R14	3k3	Metal film resistor, 1/4W	
R15	220k	Metal film resistor, 1/4W	
R16	3k3	Metal film resistor, 1/4W	
R17	220k	Metal film resistor, 1/4W	
R18	2M2	Metal film resistor, 1/4W	
R19	15k	Metal film resistor, 1/4W	
R20	4k7	Metal film resistor, 1/4W	
R21	100k	Metal film resistor, 1/4W	
R22	47k	Metal film resistor, 1/4W	
R23	100R	Metal film resistor, 1/4W	
R24	10k	Metal film resistor, 1/4W	
R25	10k	Metal film resistor, 1/4W	
R26	47R	Metal film resistor, 1/4W	
RPD	2M2	Metal film resistor, 1/4W	Input pull-down resistor.
LEDR	10k	Metal film resistor, 1/4W	LED current-limiting resistor. Adjust value to change LED brightness.
C1	100n	Film capacitor, 7.2 x 2.5mm	
C2	15n	Film capacitor, 7.2 x 2.5mm	
C3	220n	Film capacitor, 7.2 x 3mm	
C4	100pF	MLCC capacitor, NP0/C0G	

PARTS LIST, CONT.

PART	VALUE	TYPE	NOTES
C5	4n7	Film capacitor, 7.2 x 2.5mm	
C6	470pF	MLCC capacitor, NP0/C0G	
C7	1uF	Film capacitor, 7.2 x 5mm	
C8	1uF	Film capacitor, 7.2 x 5mm	
C9	1uF	Electrolytic capacitor, 4mm	
C10	1uF	Electrolytic capacitor, 4mm	
C11	1uF	Electrolytic capacitor, 4mm	
C12	47uF	Electrolytic capacitor, 5mm	
C13	47uF	Electrolytic capacitor, 5mm	
C14	47uF	Electrolytic capacitor, 5mm	Reference voltage filter capacitor.
C15	100uF	Electrolytic capacitor, 6.3mm	Power supply filter capacitor.
C16	100uF	Electrolytic capacitor, 6.3mm	Power supply filter capacitor.
C17	100n	MLCC capacitor, X7R	Power supply filter capacitor.
D1	1N5817	Schottky diode, DO-41	
D2	5mm white	LED, 5mm, white water-clear	See build notes for LED selection.
LDR1-4	PDV-P9203	LDR, 10-30k light, 5M dark	4 needed. See build notes for LDR selection.
Q1	MPSA18	BJT transistor, NPN, TO-92	
Q2	MPSA18	BJT transistor, NPN, TO-92	
IC1	TL072	Operational amplifier, dual, DIP8	
IC1-S	DIP-8 socket	IC socket, DIP-8	
IC2	TL072	Operational amplifier, dual, DIP8	
IC2-S	DIP-8 socket	IC socket, DIP-8	
IC3	TL072	Operational amplifier, dual, DIP8	
IC3-S	DIP-8 socket	IC socket, DIP-8	
RATE	100kB	16mm right-angle PCB mount pot	
THROB	25kB	16mm right-angle PCB mount pot	
VOICE	10kB	16mm right-angle PCB mount pot	
INTENSITY	25kB	16mm right-angle PCB mount pot	
LEVEL	100kA	16mm right-angle PCB mount pot	
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	Lumberg NEB/J 21 C or equivalent.
FSW	3PDT	Stomp switch, 3PDT	Available from Aion FX.
ENC	125B	Enclosure, die-cast aluminum	Can also use a Hammond 1590N1.

BUILD NOTES

LED selection

The Depths uses a water-clear, super-bright white LED for the phase stages. This is rare among LDR circuits. It's much more common to use red, yellow or green since LDRs respond better to those wavelengths of light. Vintage-style diffused LEDs also tend to have a smoother illumination curve in this application.

If you want to build an exact clone of the Depths, use a white LED as in the original. But if you want to experiment, many builders have used yellow or red LEDs in this circuit. You may be able to get sounds more to your liking with different LEDs.

LDR selection

Since LDRs are not labeled, it's not known what exact part number EQD used in the original unit. Visually, they look similar to the PDV-9203 used in most Uni-Vibe clones. But so do many other LDRs, so we can't know for sure.

Most DIY Depths builds have used the PDV-9203 and by all accounts they sound great in this circuit. Feel free to experiment, but start with these if you're not sure. As with the Uni-Vibe, you'll want something with a high dynamic range (10-100k resistance under illumination, 5M to 20M dark resistance).

LDR orientation

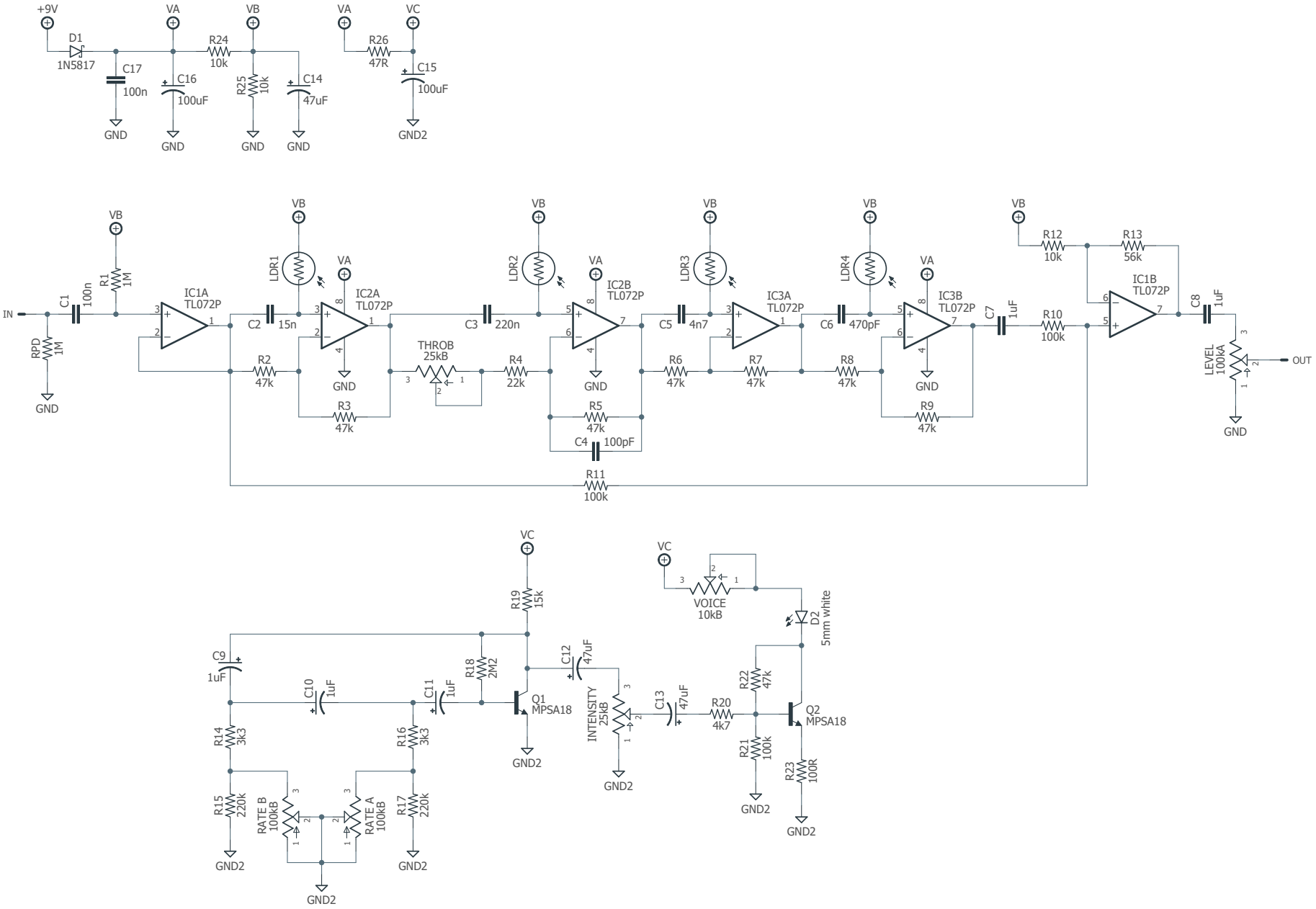
The LDRs should be bent 90 degrees so that they are facing inward, positioned near the top of the LED but a little lower.

Light shield

The Depths does not utilize any sort of light shield, so we have opted not to include space for one in this build either. As in the original, the LDRs will pick up a tiny bit of ambient light from the status LED, but this can be considered part of the sound of the circuit.

Just make sure you test it with the enclosure lid on because it will sound very different if the LDRs are exposed to any outside light. Fortunately this circuit does not require any biasing, so as long as it works, you shouldn't need to tweak anything.

SCHEMATIC


+9V
D1
1N5817
C17
100n
C16
100uF
R24
10k
R25
10k
C14
47uF
R26
47R
C15
100uF
VA
VB
VC
GND
GND2
IN
C1
100n
R1
1M
RPD
1M
IC1A
TL072P
LDR1
C2
15n
IC2A
TL072P
R2
47k
R3
47k
THROB
25kB
R4
22k
LDR2
C3
220n
IC2B
TL072P
R5
47k
C4
100pF
LDR3
C5
4n7
IC3A
TL072P
R6
47k
R7
47k
LDR4
C6
470pF
IC3B
TL072P
R8
47k
R9
47k
C7
1uF
R10
100k
R11
100k
R12
10k
R13
56k
IC1B
TL072P
C8
1uF
LEVEL
100kA
OUT
R19
15k
VOICE
10kB
D2
5mm white
C9
1uF
C10
1uF
C11
1uF
R18
2M2
C12
47uF
Q1
MPSA18
INTENSITY
25kB
C13
47uF
R20
4k7
R22
47k
Q2
MPSA18
R21
100k
R23
100R
R14
3k3
R16
3k3
R15
220k
RATE B
100kB
RATE A
100kB
R17
220k

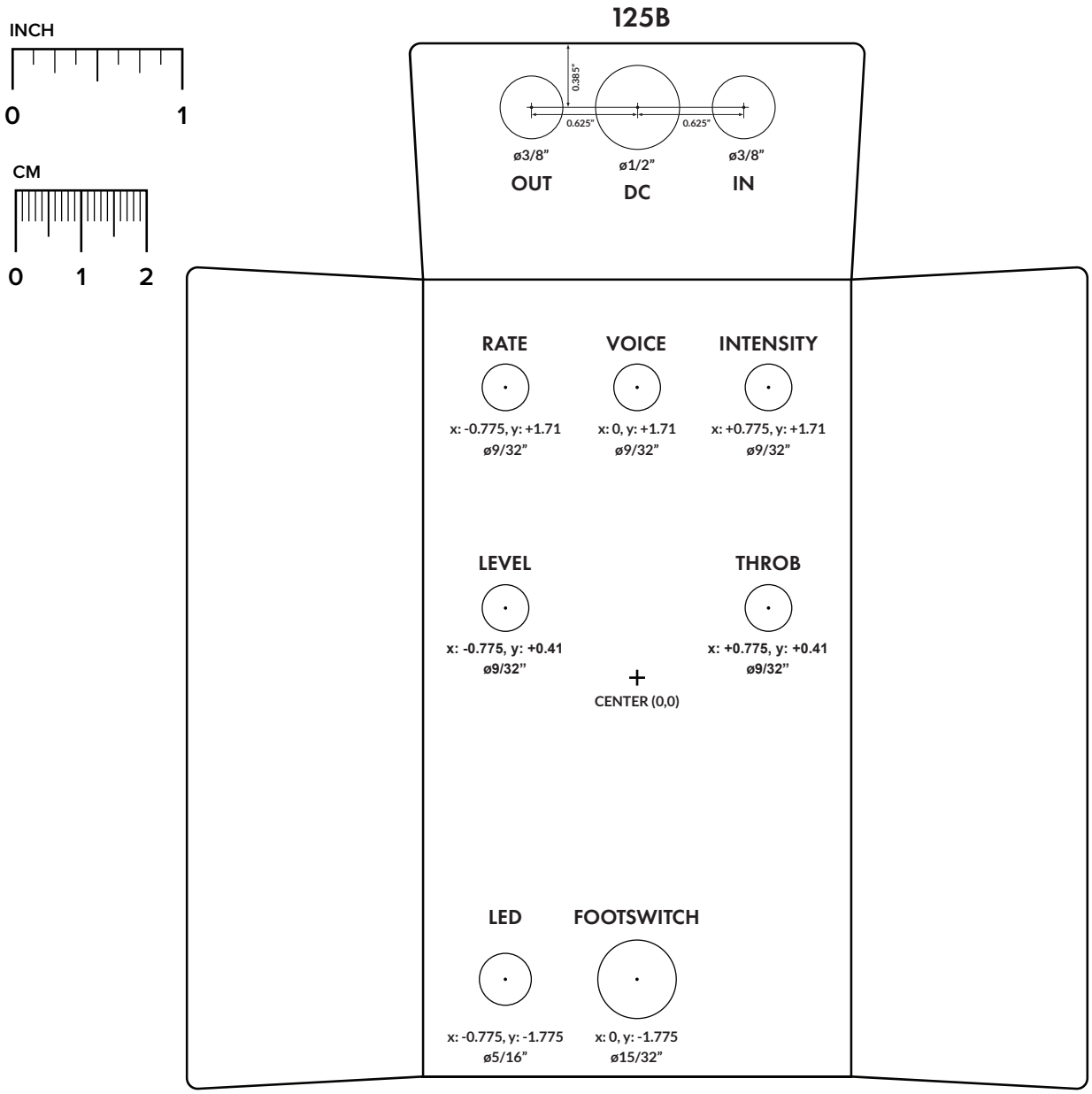
DRILL TEMPLATE

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.

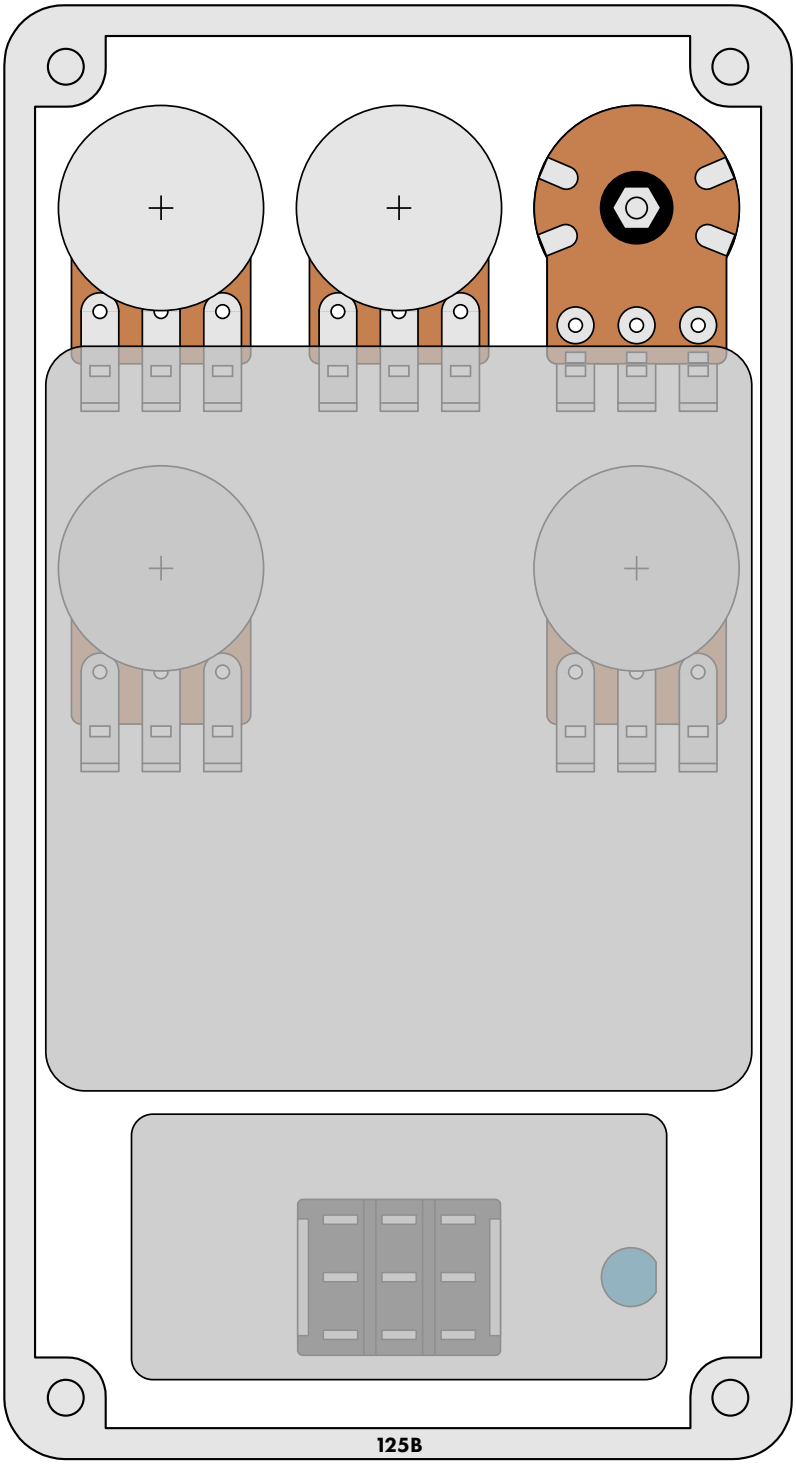
Top jack layout assumes the use of closed-frame jacks like the Switchcraft 111X. Open-frame jacks will not fit in layouts with 5 or more knobs due to the placement of the DC jack.

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

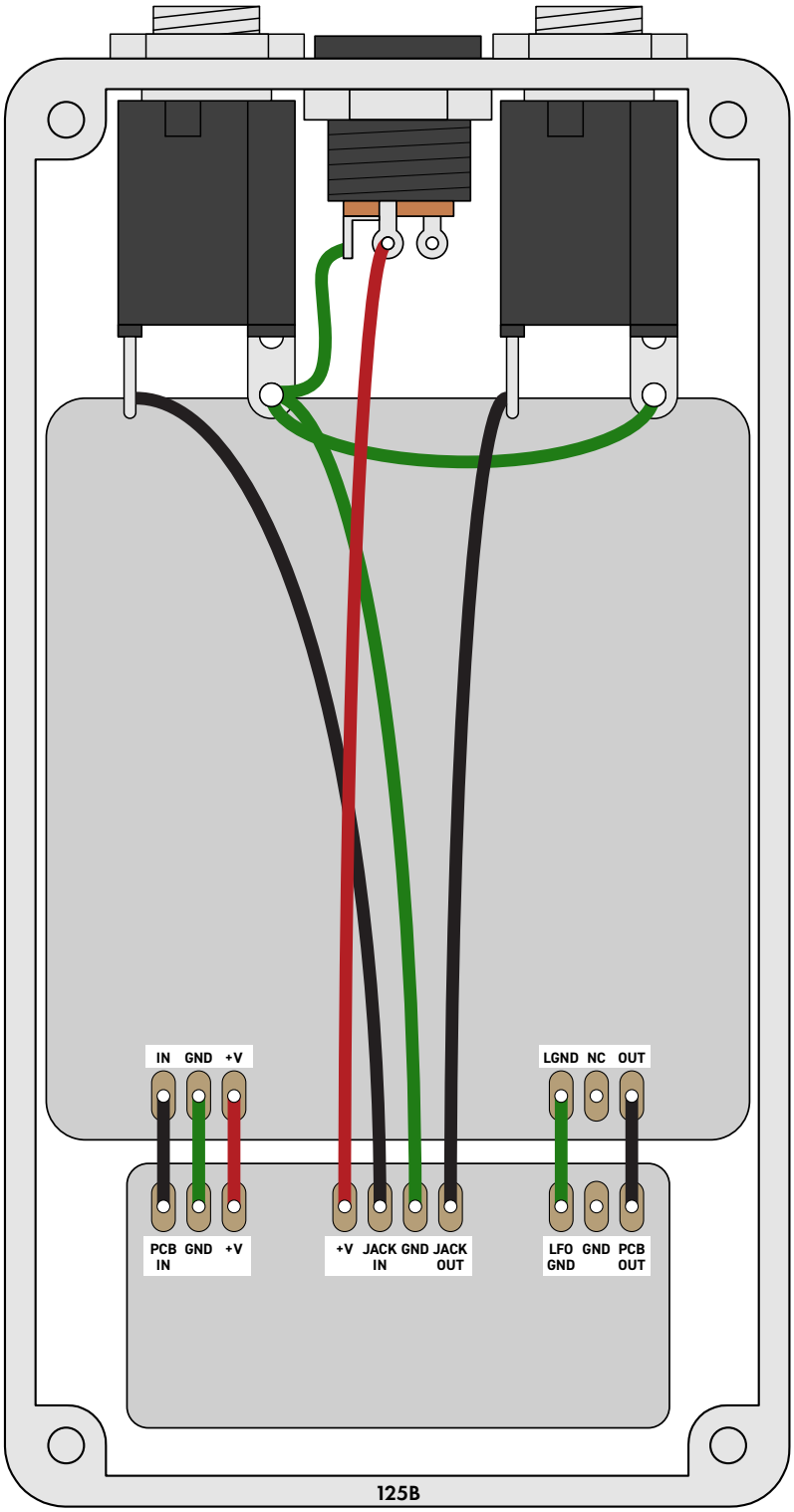
Enclosure is shown without jacks. See next page for jack layout and wiring.



Note: The upper pads for the dual-gang gain potentiometer appear to be cut in half. **This is intentional!** It's called a *plated half-hole* or *castellated hole*, and they're used so that the PCB can lay flat across the pots instead of angling upward for the dual pot.

Solder the pot like you would if they were normal pads, but bend the top pins forward slightly so they make contact with the edge of the pads.

WIRING DIAGRAM



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

1.0.0 (2026-07-03)
Initial release.