

PROJECT NAME

CINDER

BASED ON

Amptweaker Tight Fuzz

EFFECT TYPE

Transistor fuzz

BUILD DIFFICULTY

■■■■■ Intermediate

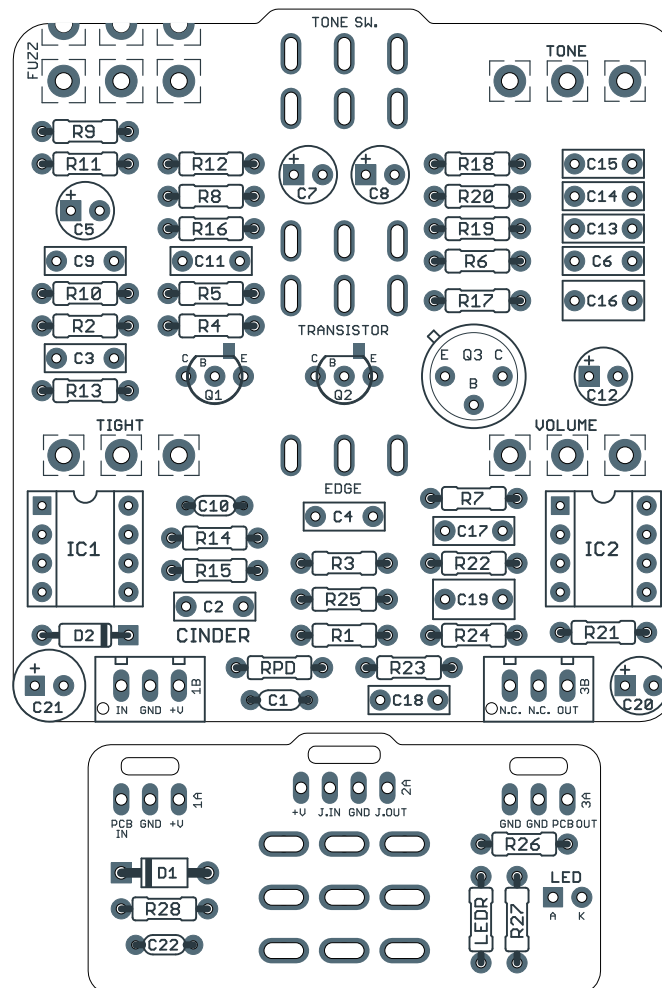
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1.0.0 (2023-11-24)

aion
DIY GUITAR EFFECTS

PROJECT SUMMARY

A vintage-inspired fuzz/booster with several tone options, most notably a switch to select between germanium and silicon transistors.



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

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INTRODUCTION

The Cinder Hybrid Fuzz is based on the Amptweaker Tight Fuzz, a combination silicon/germanium fuzz first released in 2012 and traced by Aion FX in 2023.

The Tight Fuzz shares several concepts with the other drive pedals in the Amptweaker lineup like the [Tight Metal](#) and [Tight Drive](#), wrapping the vintage-inspired fuzz with James Brown's signature pre-gain bass cut control as well as a heavily modified Big Muff-style tone control.

As with the Tight Metal, there are several toggle switch options, changing between silicon and germanium transistors, '60s/'70s EQ, and a sharp or smooth fuzz tone. All in all, it's a great modernized take on the classic fuzz topologies.

The Cinder is based on our trace of the Tight Fuzz, which you can read about in our tracing journal. The only difference is the omission of the "SideTrak" effects loop that is engaged along with the pedal.

USAGE

The Cinder has four knobs and three switches:

- **Tight** is a pre-gain bass cut that helps to eliminate flabbiness with quick riffing.
- **Fuzz** is a dual-gang pot that simultaneously controls the gain and bias of the second transistor. At zero, it acts as a clean boost with almost no clipping. Around noon, it's a light fuzz, and once you get past 2:00 or 3:00 it becomes a more traditional fuzz tone.
- **Tone** pans between a high-pass and low-pass filter after the fuzz section, similar to the Big Muff tone control.
- **Volume** is the overall output volume of the effect.
- **Ge/Si** (toggle) selects between a germanium and silicon transistor for the second position in the fuzz section of the circuit.
- **Edge** (toggle) enables "smooth" mode, which softens the highs on the way into the fuzz stage.
- **'60s/'70s** (toggle) selects between two eras. '60s has more top end and '70s has more body.

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	475k	Metal film resistor, 1/4W	Can substitute 470k.
R2	1k5	Metal film resistor, 1/4W	
R3	22k1	Metal film resistor, 1/4W	Can substitute 22k.
R4	1k5	Metal film resistor, 1/4W	
R5	1k5	Metal film resistor, 1/4W	
R6	22k1	Metal film resistor, 1/4W	Can substitute 22k.
R7	47k5	Metal film resistor, 1/4W	Can substitute 47k.
R8	100k	Metal film resistor, 1/4W	
R9	1k	Metal film resistor, 1/4W	
R10	475R	Metal film resistor, 1/4W	Can substitute 470R.
R11	1k5	Metal film resistor, 1/4W	
R12	6k81	Metal film resistor, 1/4W	Can substitute 6.8k.
R13	150k	Metal film resistor, 1/4W	
R14	150k	Metal film resistor, 1/4W	
R15	150k	Metal film resistor, 1/4W	
R16	10k	Metal film resistor, 1/4W	
R17	4k75	Metal film resistor, 1/4W	Can substitute 4.7k.
R18	1k5	Metal film resistor, 1/4W	
R19	2k74	Metal film resistor, 1/4W	Can substitute 2.7k.
R20	4k75	Metal film resistor, 1/4W	Can substitute 4.7k.
R21	220k	Metal film resistor, 1/4W	
R22	330k	Metal film resistor, 1/4W	
R23	47k5	Metal film resistor, 1/4W	Can substitute 47k.
R24	47k5	Metal film resistor, 1/4W	Can substitute 47k.
R25	47k5	Metal film resistor, 1/4W	Can substitute 47k.
R26	1k	Metal film resistor, 1/4W	
R27	47k5	Metal film resistor, 1/4W	Can substitute 47k.
R28	47R	Metal film resistor, 1/4W	
RPD	1M	Metal film resistor, 1/4W	Input pulldown resistor.
LEDR	10k	Metal film resistor, 1/4W	LED current-limiting resistor. Adjust value to change LED brightness.
C1	47pF	MLCC capacitor, NP0/C0G	
C2	100n	Film capacitor, 7.2 x 2.5mm	

PARTS LIST, CONT.

PART	VALUE	TYPE	NOTES
C3	100n	Film capacitor, 7.2 x 2.5mm	
C4	100n	Film capacitor, 7.2 x 2.5mm	
C5	22uF	Electrolytic capacitor, 5mm	
C6	1n2	Film capacitor, 7.2 x 2.5mm	
C7	4.7uF	Electrolytic capacitor, 4mm	
C8	22uF	Electrolytic capacitor, 5mm	
C9	100n	Film capacitor, 7.2 x 2.5mm	
C10	47pF	MLCC capacitor, NP0/C0G	
C11	47n	Film capacitor, 7.2 x 2.5mm	
C12	22uF	Electrolytic capacitor, 5mm	
C13	100n	Film capacitor, 7.2 x 2.5mm	
C14	33n	Film capacitor, 7.2 x 2.5mm	
C15	47n	Film capacitor, 7.2 x 2.5mm	
C16	220n	Film capacitor, 7.2 x 2.5mm	
C17	1n2	Film capacitor, 7.2 x 2.5mm	
C18	100n	Film capacitor, 7.2 x 2.5mm	
C19	220n	Film capacitor, 7.2 x 2.5mm	
C20	47uF	Electrolytic capacitor, 5mm	Reference voltage filter capacitor.
C21	100uF	Electrolytic capacitor, 6.3mm	Power supply filter capacitor.
C22	100n	MLCC capacitor, X7R	Power supply filter capacitor.
D1	1N5817	Schottky diode, DO-41	
D2	1N914	Fast-switching diode, DO-35	
Q1	2N5088	BJT transistor, NPN, TO-92	
Q2	2N5088	BJT transistor, NPN, TO-92	
Q3	AC127	Germanium transistor, NPN	Any NPN above 80-100 hFE will work, i.e. 2N1304 from SBE.
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	
TIGHT	100kC	16mm right-angle PCB mount pot	Reverse audio (reverse log or antilog) taper.
FUZZ	10kC dual	16mm right-angle PCB mount pot, dual	Reverse audio (reverse log or antilog) taper, dual-ganged.
TONE	10kB	16mm right-angle PCB mount pot	Linear taper.
VOLUME	100kA	16mm right-angle PCB mount pot	Audio (log) taper.
EDGE	SPDT on-on	Toggle switch, SPDT on-on	
TRANS.	DPDT on-on	Toggle switch, DPDT on-on	
TONE SW.	DPDT on-on	Toggle switch, DPDT on-on	
LED	5mm	LED, 5mm, red diffused	

PARTS LIST, CONT.

PART	VALUE	TYPE	NOTES
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

Silicon transistor substitutions

The original Tight Fuzz used old-stock NEC 2SD1616 silicon transistors for Q1 and Q2. These transistors are not necessarily unique, and the 2N5088 or any other comparable medium-gain type will be a close substitute.

You can also use the BC549C, but note the inverted pinout for the European convention, so it will need to be rotated 180 degrees from the PCB silkscreen.

Germanium transistor substitutions

Q3 is an old-stock AC127 in the original. In the unit we traced, it measured 146 h_{FE} and 175 μ A leakage. It's likely that any transistor with an h_{FE} above ~80 should work about the same, so you probably don't need to be too rigid about the specs here.

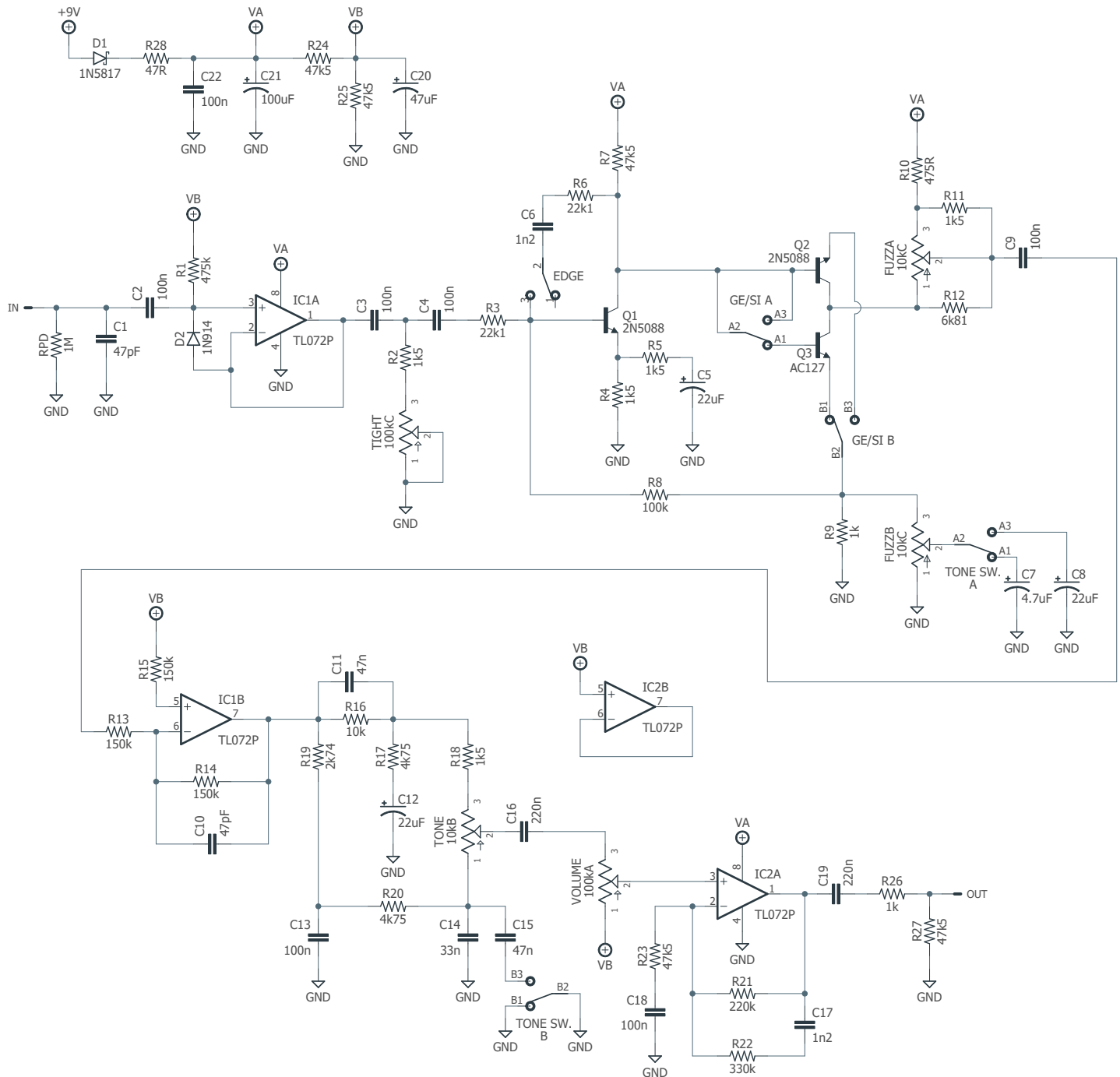
Note that this is an **NPN** transistor. Germanium NPNs are a bit more obscure than PNP, but usually easy to find and fairly cheap since the classic fuzz circuits all used PNP types. If you inadvertently use a PNP here, it will barely pass signal in germanium mode, so be careful!

Odd resistor values

About half the resistor values used in this circuit are high-precision values such as 47.5k or 6.81k. None of them are critical to the circuit's operation, so if you have a nearby value such as 47k or 6.8k, you can substitute them with no change in sound. We've included the nearest substitutes in the Notes column of the parts list.

However, if you're just using the Mouser spreadsheet to order, they're the same price as standard types, so we recommend just using the original values.

SCHEMATIC



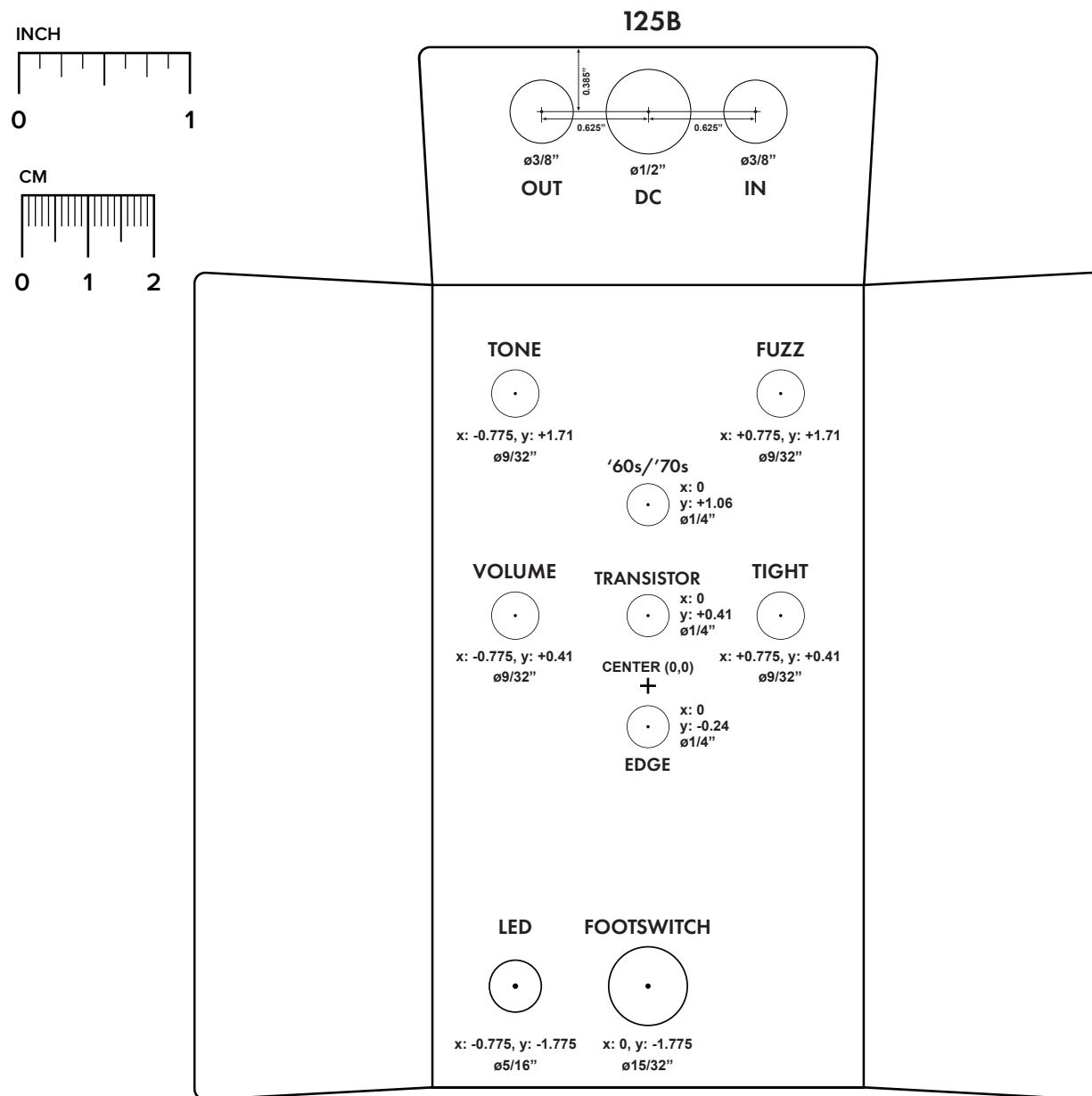
DRILL TEMPLATE

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.

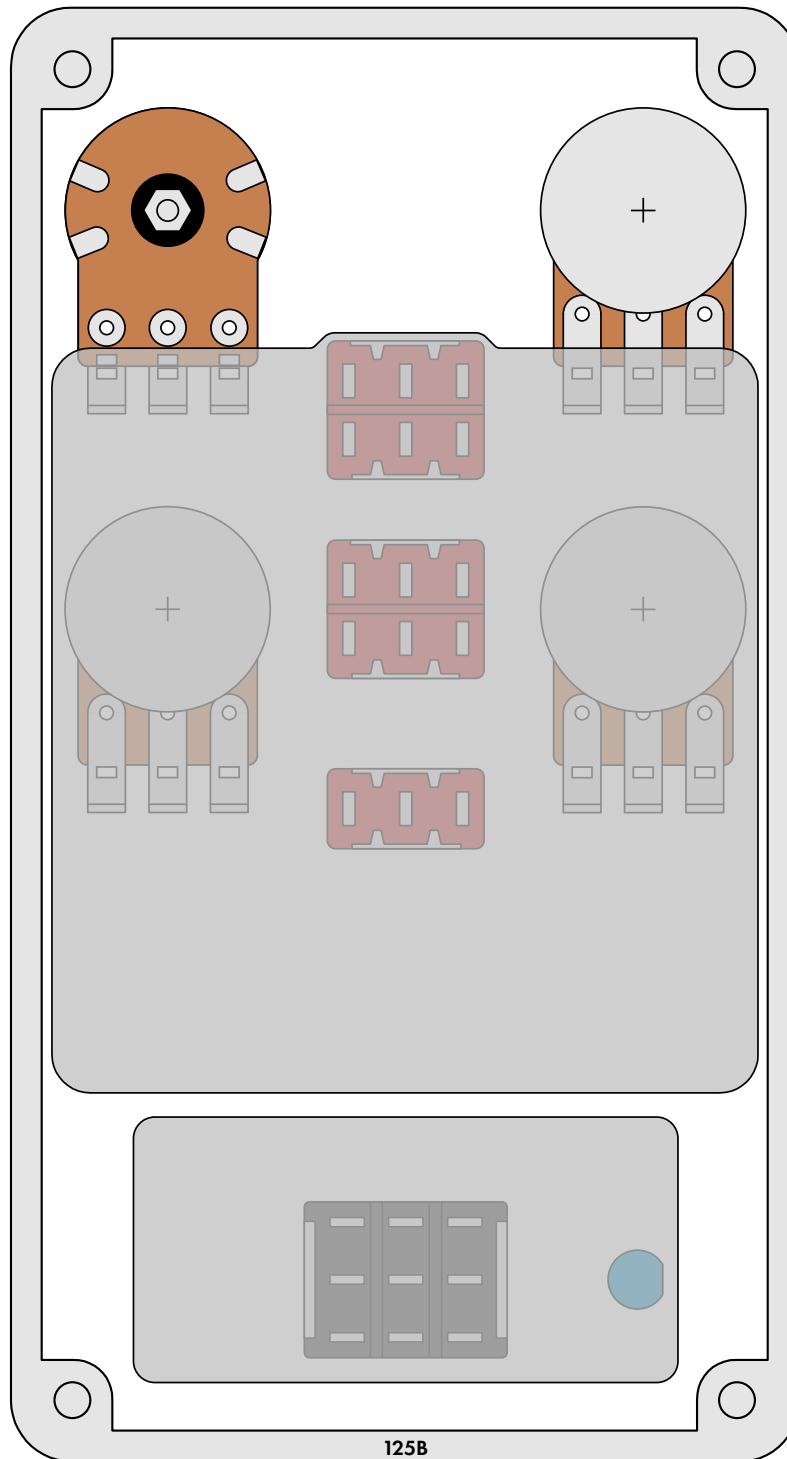
Top jack layout assumes the use of closed-frame jacks like the [Switchcraft 111X](#). If you'd rather use open-frame jacks, please refer to the [Open-Frame Jack Drill Template](#) for the top side.

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.

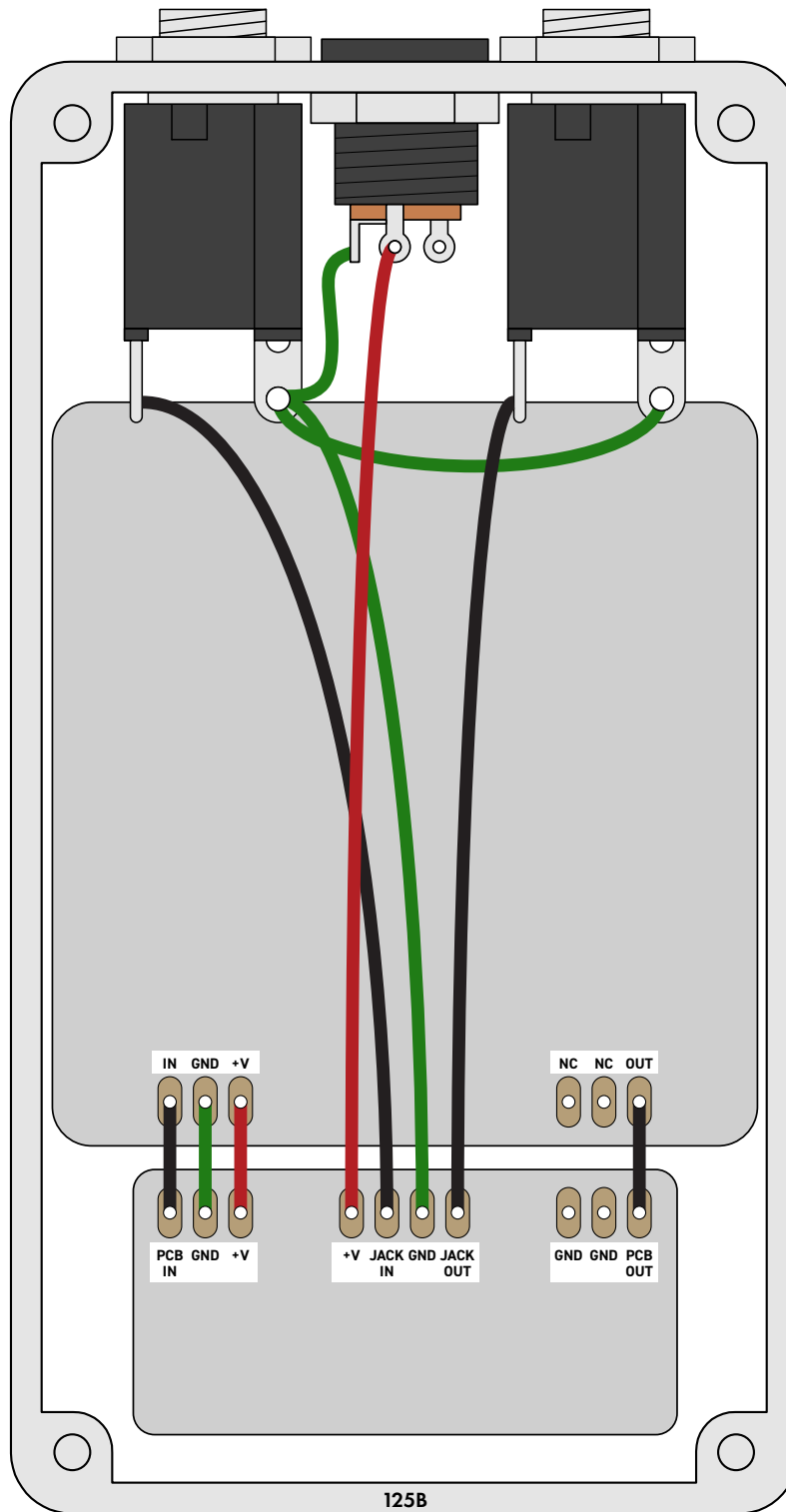


ENCLOSURE LAYOUT

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



WIRING DIAGRAM



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 (2023-11-24)

Initial release.