PROJECT NAME

AURORA DELUXE

aion DIY GUITAR EFFECTS

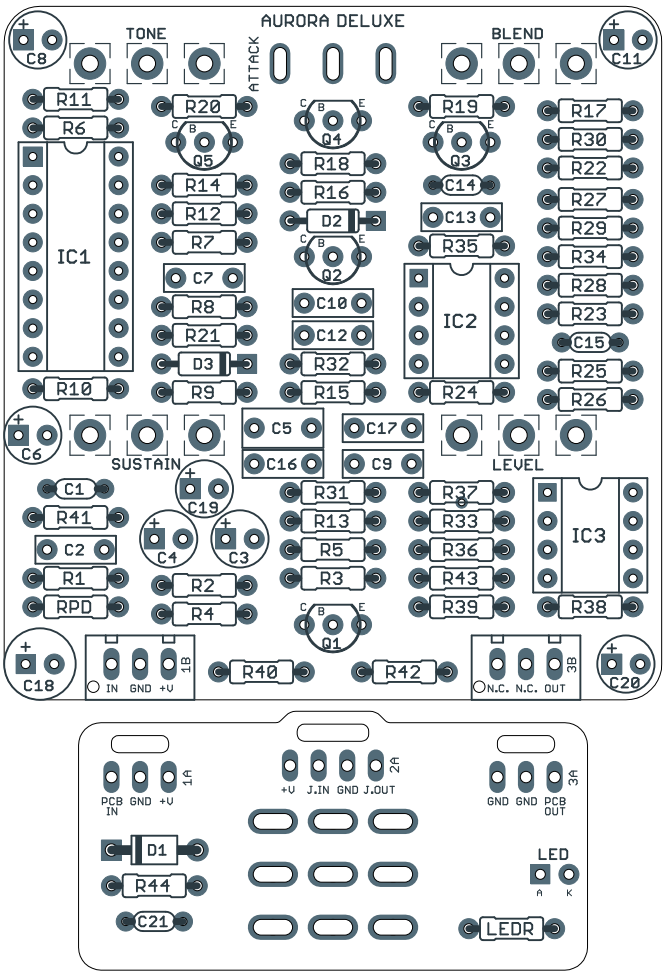
BASED ON
Keeley Compressor Plus

BUILD DIFFICULTY
Intermediate

EFFECT TYPE
Compressor with clean blend

DOCUMENT VERSION
1.0.2 (2024-01-19)

PROJECT SUMMARY
An expanded version of the classic Ross/Dyna Compressor with an added clean blend, treble control, and output buffer.



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

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INTRODUCTION

The Aurora Deluxe Compressor is based on the Keeley Compressor Plus, an updated version of their world-famous compressor. It was first released in 2017 and was traced by Aion FX in 2023.

Internally, it's a Ross/Dyna Comp as with the original compressor circuit. A clean blend has been added, as well as a subtle treble control that boosts very high frequencies and adds a touch of brightness or presence. To make room for the two new knobs, they omitted the Clipping knob (an input attenuator) as well as converting the Attack knob to a two-position switch. It's also been converted to use the LM13700, a current-production version of the obsolete CA3080.

The Compressor Plus fully replaced the previous Compressor. In fact, the standard version artwork omits the "Plus" and just labels it the "Keeley Compressor" in the same font as the original, though the product description does call it the Compressor Plus.

The Aurora Deluxe is a direct adaptation based on our trace of the Compressor Plus. The only difference is that we added a third position to the Attack (Release) switch that simulates the 12:00 position on the original control. We also combined two series capacitors that were clearly left over from the prototyping process.

USAGE

The Aurora Deluxe has four knobs and one toggle switch:

- **Sustain** controls the amount of compression. As you turn it up, it increases the sustain but also the noise level. If you keep it down below 12:00, it acts more like a limiter.
- **Blend** sets the ratio of clean to effected signal.
- **Tone** boosts the high-end response of the effect, with a corner frequency of 2.3kHz at maximum.
- **Level** is the overall output volume of the effect.
- **Attack** (toggle) allows you to set the amount of time after the input signal falls below the threshold before the compressor resets and is ready to compress again. It's technically a "Release" control, but "Attack" is a more common way of describing it in commercial circuits including the Boss CS-2.

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	10k	Metal film resistor, 1/4W	
R2	470k	Metal film resistor, 1/4W	
R3	470k	Metal film resistor, 1/4W	
R4	10k	Metal film resistor, 1/4W	
R5	10k	Metal film resistor, 1/4W	
R6	1M	Metal film resistor, 1/4W	
R7	1k	Metal film resistor, 1/4W	
R8	1k	Metal film resistor, 1/4W	
R9	220k	Metal film resistor, 1/4W	
R10	220k	Metal film resistor, 1/4W	
R11	1M	Metal film resistor, 1/4W	
R12	15k	Metal film resistor, 1/4W	
R13	150k	Metal film resistor, 1/4W	
R14	27k	Metal film resistor, 1/4W	
R15	10k	Metal film resistor, 1/4W	
R16	10k	Metal film resistor, 1/4W	
R17	1M	Metal film resistor, 1/4W	
R18	39k	Metal film resistor, 1/4W	
R19	150k	Metal film resistor, 1/4W	
R20	10k	Metal film resistor, 1/4W	
R21	1M	Metal film resistor, 1/4W	
R22	10k	Metal film resistor, 1/4W	
R23	47k	Metal film resistor, 1/4W	
R24	10k	Metal film resistor, 1/4W	
R25	47k	Metal film resistor, 1/4W	
R26	12k	Metal film resistor, 1/4W	
R27	15k	Metal film resistor, 1/4W	
R28	15k	Metal film resistor, 1/4W	
R29	15k	Metal film resistor, 1/4W	
R30	15k	Metal film resistor, 1/4W	
R31	10k	Metal film resistor, 1/4W	
R32	1M	Metal film resistor, 1/4W	

PARTS LIST, CONT.

PART	VALUE	TYPE	NOTES
R33	1M	Metal film resistor, 1/4W	
R34	27k	Metal film resistor, 1/4W	
R35	10k	Metal film resistor, 1/4W	
R36	100k	Metal film resistor, 1/4W	
R37	10k	Metal film resistor, 1/4W	
R38	10k	Metal film resistor, 1/4W	
R39	390R	Metal film resistor, 1/4W	
R40	56k	Metal film resistor, 1/4W	
R41	27k	Metal film resistor, 1/4W	
R42	10k	Metal film resistor, 1/4W	
R43	10k	Metal film resistor, 1/4W	
R44	47R	Metal film resistor, 1/4W	Power supply filter resistor.
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	150pF	MLCC capacitor, NP0/C0G	
C2	22n	Film capacitor, 7.2 x 2.5mm	
C3	1uF	Electrolytic capacitor, 4mm	
C4	1uF	Electrolytic capacitor, 4mm	
C5	1uF	Film capacitor, 7.2 x 3.5mm	
C6	1uF	Electrolytic capacitor, 4mm	
C7	10n	Film capacitor, 7.2 x 2.5mm	
C8	1uF	Electrolytic capacitor, 4mm	
C9	1n	Film capacitor, 7.2 x 2.5mm	
C10	10n	Film capacitor, 7.2 x 2.5mm	
C11	10uF	Electrolytic capacitor, 5mm	
C12	10n	Film capacitor, 7.2 x 2.5mm	
C13	47n	Film capacitor, 7.2 x 2.5mm	
C14	6n8	Film capacitor, 7.2 x 2.5mm	
C15	47pF	MLCC capacitor, NP0/C0G	
C16	22n	Film capacitor, 7.2 x 2.5mm	
C17	47n	Film capacitor, 7.2 x 2.5mm	
C18	220uF	Electrolytic capacitor, 6.3mm	Power supply filter capacitor.
C19	47uF	Electrolytic capacitor, 5mm	Reference voltage filter capacitor.
C20	47uF	Electrolytic capacitor, 5mm	Reference voltage filter capacitor.
C21	100n	MLCC capacitor, X7R	Power supply filter capacitor.
D1	1N5817	Schottky diode, DO-41	
D2	1N914	Fast-switching diode, DO-35	

PARTS LIST, CONT.

PART	VALUE	TYPE	NOTES
D3	1N914	Fast-switching diode, DO-35	
Q1	2N5088	BJT transistor, NPN, TO-92	Original uses MMBT6429 (SMD). 2N5088 is a close substitute. Can also use BC549C, but these will need to be rotated 180 degrees from the silkscreen.
Q2	2N5088	BJT transistor, NPN, TO-92	
Q3	2N5088	BJT transistor, NPN, TO-92	
Q4	2N5088	BJT transistor, NPN, TO-92	
Q5	2N5088	BJT transistor, NPN, TO-92	
IC1	LM13700N	Transconductance amplifier, dual, DIP16	Can also use NE5517N.
IC1-S	DIP-16 socket	IC socket, DIP-16	Can also use two DIP-8 sockets.
IC2	RC4558P	Operational amplifier, dual, DIP8	
IC2-S	DIP-8 socket	IC socket, DIP-8	
IC3	RC4558P	Operational amplifier, dual, DIP8	
IC3-S	DIP-8 socket	IC socket, DIP-8	
SUSTAIN	500KC	16mm right-angle PCB mount pot	Reverse audio (reverse log or antilog) taper.
TONE	100kB	16mm right-angle PCB mount pot	Linear taper.
BLEND	10kB	16mm right-angle PCB mount pot	Linear taper.
LEVEL	100kA	16mm right-angle PCB mount pot	Audio (log) taper.
ATTACK	SPDT on-off-on	Toggle switch, SPDT center off	
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

Transistor substitutions

The original Compressor Plus uses MMBT6429 transistors, which do not have a current-production through-hole equivalent. They are medium-gain low-noise transistors that are very close in specification to the 2N5088 or BC549C.

The Aurora Deluxe PCB uses the USA E-B-C convention for Q1-Q5, so the 2N5088 will be a direct fit. The BC549C or other European C-B-E convention transistors will need to be rotated 180 degrees from the PCB silkscreen.

IC substitutions

The very first version of the Compressor Plus used NE5532 for IC2 and IC3, the two dual op-amps. They soon switched to RC4558P, which are still used in current models. The NE5532 has lower noise and a better slew rate, but significantly higher current draw. The RC4558P is perfectly adequate for the application and is recommended to use in this project, but you can use either type, or whatever else you want such as a the TL072 or OPA2134.

The LM13700N was obsoleted recently in through-hole format, but is still readily available, including from major distributors like Mouser. The NE5517N is a second-source substitute that will perform identically, and is available from Aion FX.

Toggle switch positions

The Compressor Plus has a two-position toggle that controls the attack speed, with positions labeled “Single Coil” and “Humbucker”. This designation isn’t very useful since it has more to do with playing style than the type of pickups, but according to Keeley, single-coil mode corresponds to slow attack and humbucker mode is fast attack. On the Aurora Deluxe, the third setting is in between the two.

If you’re labeling your enclosure, we recommend using the speed designation rather than pickup type. The switch positions are shown in the drill tempate on page 8.

If you do want to keep a 2-position switch with just Single and Humbucker modes, you can omit R18 (leave empty, no jumper) and use a SPDT on-on switch instead of an on-off-on. In this case, single-coil or slow mode would be on the left and humbucker or fast mode would be on the right.


+9V
D1
1N5817
R44
47R
C21
100n
C18
220uF
VA
R40
56k
VB
R42
10k
VC
R41
27k
C19
47uF
R43
10k
C20
47uF
GND
IC1A
LM13700N
IC1_BUF2
LM13700N
IC1_BUF1
LM13700N
R3
470k
R2
470k
C3
1uF
R4
10k
C4
1uF
R10
220k
R9
220k
C6
1uF
IN
C2
22n
R1
10k
Q1
2N5088
C1
150pF
RPD
1M
C5
1uF
R7
1k
R8
1k
R5
10k
R6
1M
R11
1M
R12
15k
C7
10n
C8
1uF
IC1B
LM13700N
R13
150k
C9
1n
SUSTAIN
500KC
R14
27k
R15
10k
R16
10k
R17
1M
ATTACK
R20
10k
R18
39k
R19
150k
Q5
2N5088
Q2
2N5088
Q3
2N5088
Q4
2N5088
C10
10n
C11
10uF
C12
10n
D2
1N914
D3
1N914
R21
1M
C16
22n
R32
1M
R31
10k
R33
1M
IC2A
RC4558P
R34
27k
R35
10k
R30
15k
R29
15k
BLEND
10kB
R26
12k
IC2B
RC4558P
TONE
100kB
C14
6n8
R24
10k
R23
47k
C13
47n
R22
10k
R25
47k
C15
47pF
R27
15k
R28
15k
IC3A
RC4558P
R36
100k
R37
10k
IC3B
RC4558P
R38
10k
R39
390R
C17
47n
LEVEL
100kA
OUT

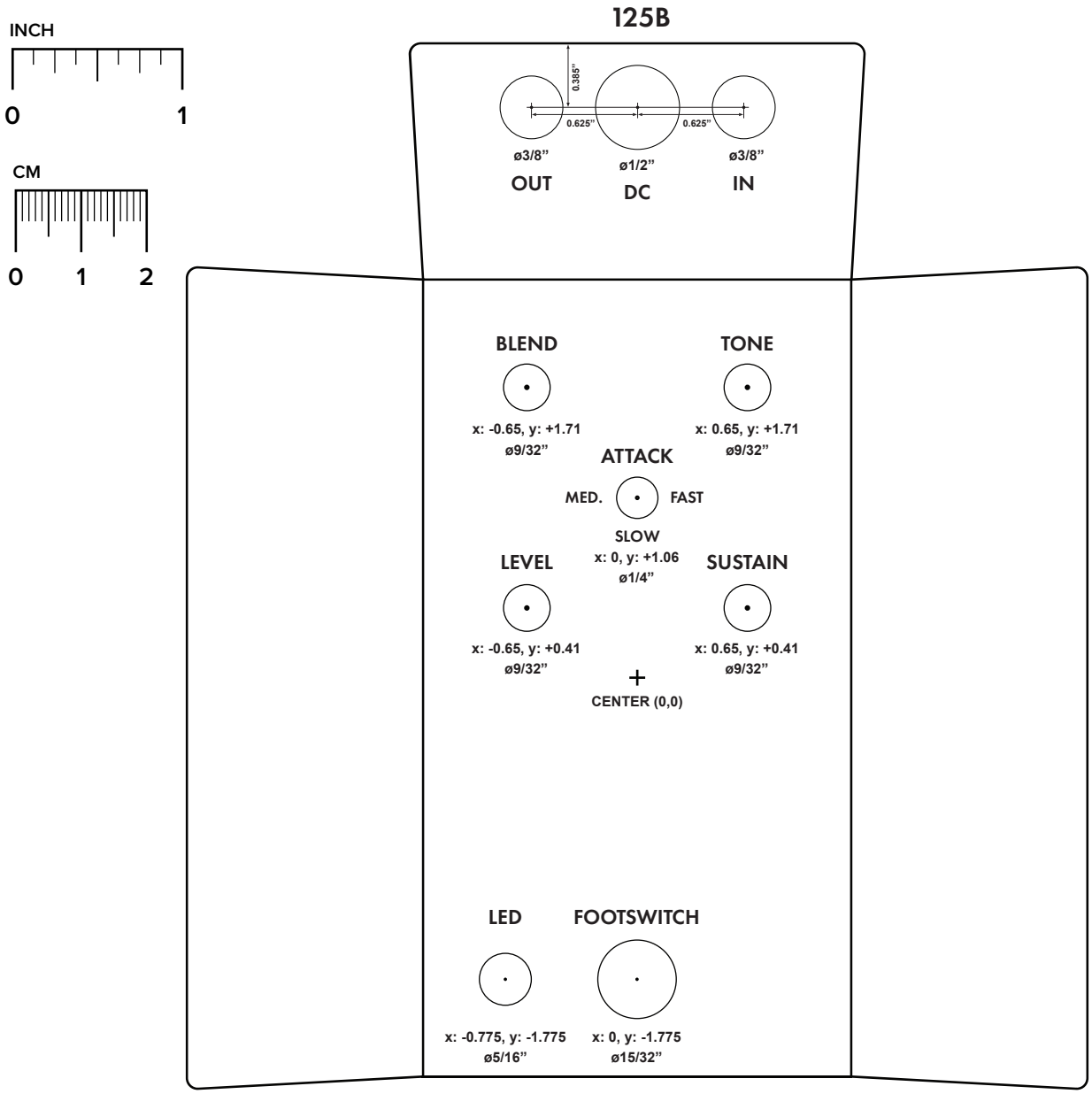
DRILL TEMPLATE

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.

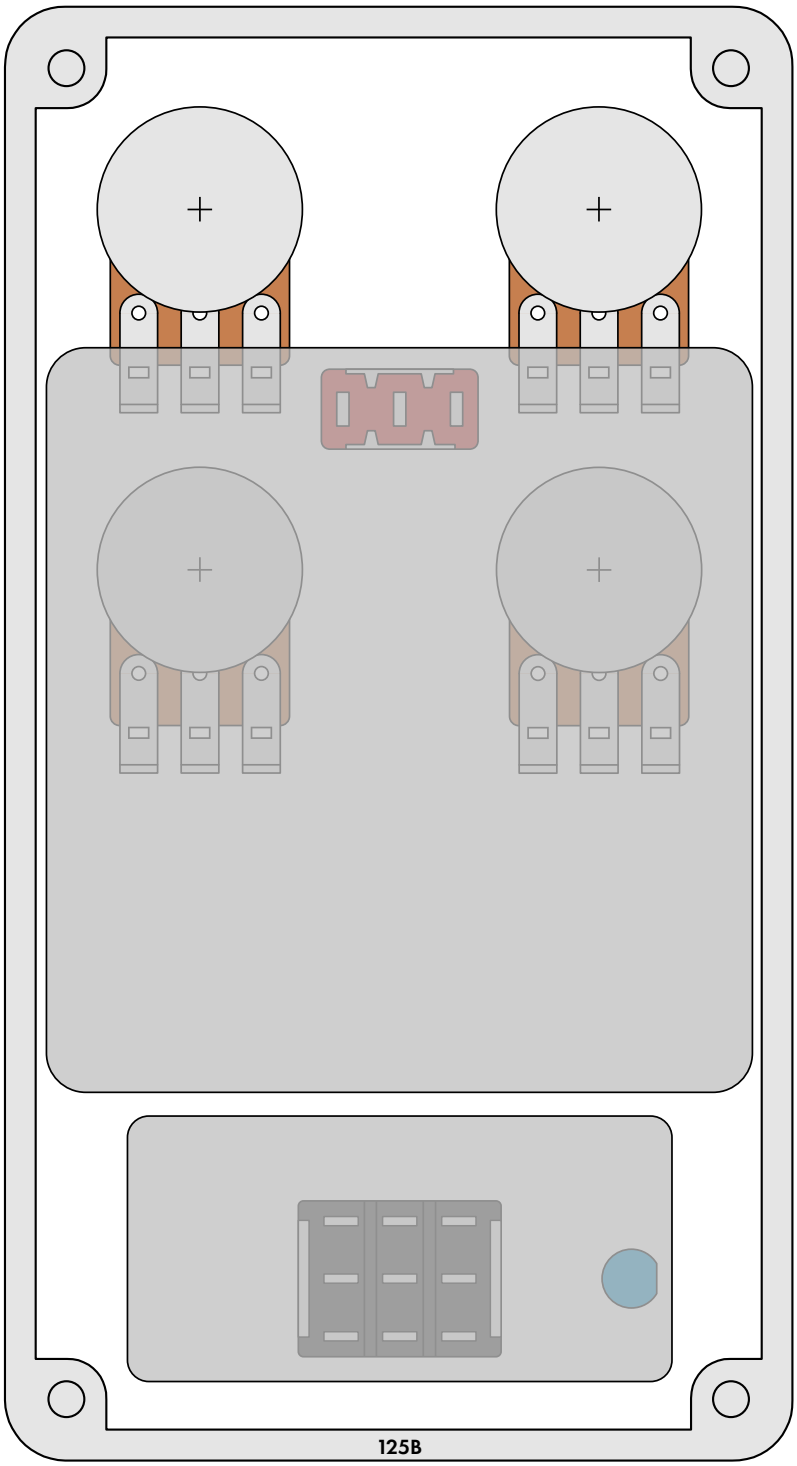
Top jack layout assumes the use of closed-frame jacks like the Switchcraft 111X. If you'd rather use open-frame jacks, please refer to the Open-Frame Jack Drill Template for the top side.

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.

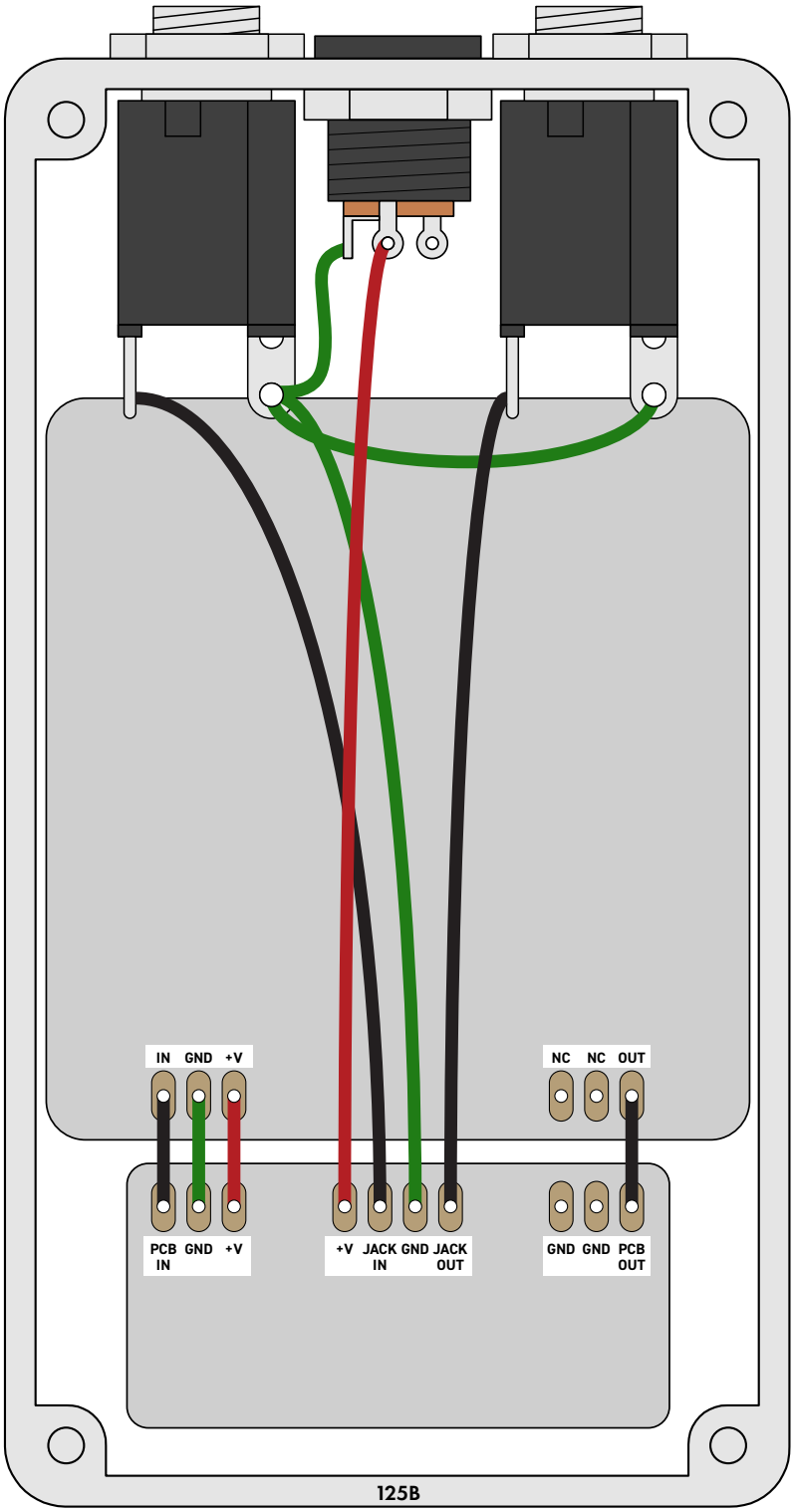


ENCLOSURE LAYOUT

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 cannotbe 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 (2024-01-19)
Added labels for each of the toggle switch positions to the drill template, and added a section about this switch to the build notes.

1.0.1 (2023-12-02)
Corrected the drill template labeling. All four knobs were mirrored.

1.0.0 (2023-11-24)
Initial release.