PROJECT NAME

CRESCENT

DIY GUITAR EFFECTS

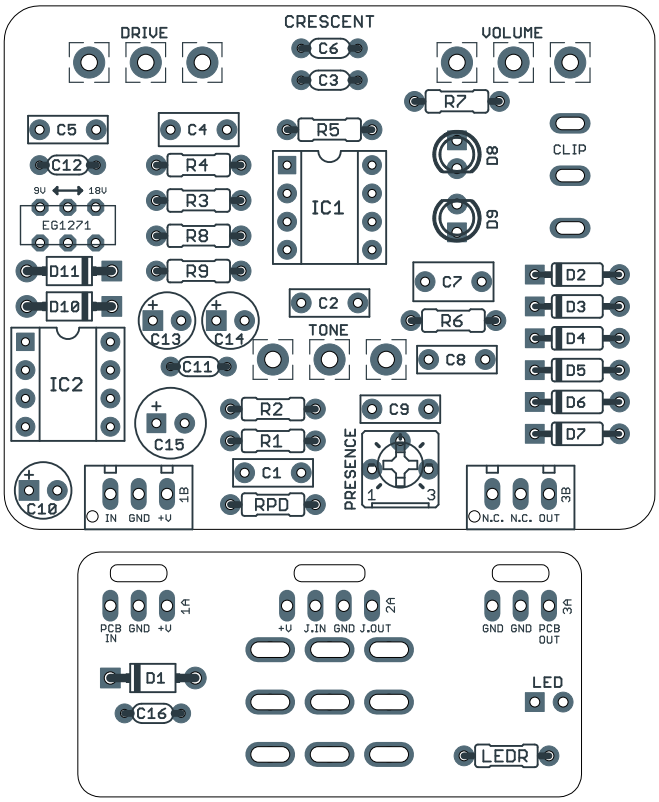
BASED ON
MI Audio Crunch Box

BUILD DIFFICULTY
Intermediate

EFFECT TYPE
Amp-Like Distortion

DOCUMENT VERSION
1.0.1 (2021-04-12)

PROJECT SUMMARY
A Marshall-like distortion pedal noted for its high-gain “stack of amps” tone.



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

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INTRODUCTION

The Crescent Amp Distortion is an adaptation of the MI Audio Crunch Box, a tweaked hybrid of the Marshall Guv'nor and Bluesbreaker first released in 2006.

It's solidly in the family of Marshall-like pedals and is lauded for its high-gain "stack of amps" tone. It has seen has seen at least five major versions since that time, with the fourth and fifth version being renamed to the Super Crunch Box.

The Crescent is not a direct clone or copy of any of these versions, but rather a hybrid of several of them. It's most similar to version 3, but with an added option for 18V operation using a charge pump as well as a clipping diode toggle switch (both features from V5, although our version had it long before V5 was released!).

The updated version of the Crescent is mostly the same as the earlier 1590B version, with two major changes. First, there is an internal slide switch allowing 9V or 18V operation to be selected. Second, the Presence control has been relocated back inside the enclosure as a trimmer, as on the original Crunch Box units. The presence control essentially just sets the range of the main tone control, so it doesn't need to be external.

The Crunch Box was the inspiration for another well-known high gain pedal, the Suhr Riot. An Aion FX adaptation of the Riot is available called the Fusion Distortion.

USAGE

The Crescent has the following controls:

- **Tone** controls the treble response of the effect.
- **Drive** controls the amount of gain in the op-amp feedback diode clipping stage.
- **Volume** controls the overall output.
- **Clipping** (toggle switch) selects between 3 sets of diodes: 1x silicon, 2x silicon, or LEDs (stock). This will directly affect the volume, which will need to be adjusted when changing this mode.
- An internal **Presence** control allows you to tweak the overall response of the tone knob.
- **Voltage** (internal slide switch) selects 9V or 18V operation.

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.

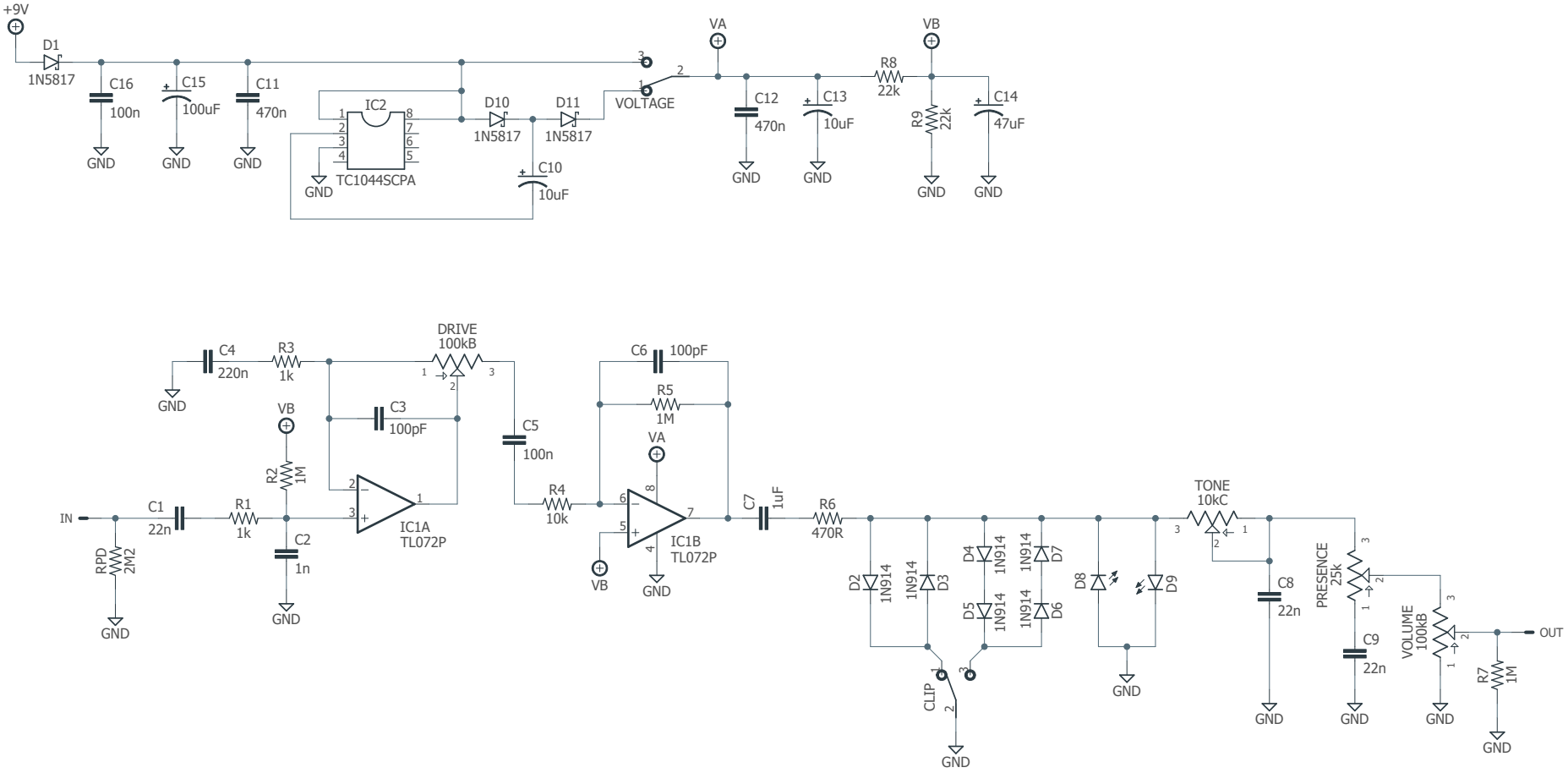
View parts list spreadsheet →

PART	VALUE	TYPE	NOTES
R1	1k	Metal film resistor, 1/4W	
R2	1M	Metal film resistor, 1/4W	
R3	1k	Metal film resistor, 1/4W	
R4	10k	Metal film resistor, 1/4W	
R5	1M	Metal film resistor, 1/4W	
R6	470R	Metal film resistor, 1/4W	
R7	1M	Metal film resistor, 1/4W	
R8	22k	Metal film resistor, 1/4W	
R9	22k	Metal film resistor, 1/4W	
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	1n	Film capacitor, 7.2 x 2.5mm	
C3	100pF	MLCC capacitor, NP0/C0G	
C4	220n	Film capacitor, 7.2 x 2.5mm	
C5	100n	Film capacitor, 7.2 x 2.5mm	
C6	100pF	MLCC capacitor, NP0/C0G	
C7	1uF	Film capacitor, 7.2 x 3.5mm	
C8	22n	Film capacitor, 7.2 x 2.5mm	
C9	22n	Film capacitor, 7.2 x 2.5mm	
C10	10uF	Electrolytic capacitor, 5mm	Charge pump filter capacitor.
C11	470n	MLCC capacitor, X7R	Charge pump filter capacitor.
C12	470n	MLCC capacitor, X7R	Charge pump filter capacitor.
C13	10uF	Electrolytic capacitor, 5mm	Power supply filter capacitor.
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	1N914	Fast-switching diode, DO-35	
D3	1N914	Fast-switching diode, DO-35	

PARTS LIST, CONT.

PART	VALUE	TYPE	NOTES
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	5mm	LED, 5mm, red diffused	Can also use 3mm LEDs.
D9	5mm	LED, 5mm, red diffused	Can also use 3mm LEDs.
D10	1N5817	Schottky diode, DO-41	
D11	1N5817	Schottky diode, DO-41	
IC1	TL072P	Operational amplifier, DIP-8	
IC1-S	DIP-8 socket	IC socket, DIP-8	
IC2	TC1044SCPA	Charge pump, DIP-8	
IC2-S	DIP-8 socket	IC socket, DIP-8	
DRIVE	100kB	16mm right-angle PCB mount pot	
TONE	10kC	16mm right-angle PCB mount pot	
VOL.	100kB	16mm right-angle PCB mount pot	
CLIP	SPDT cntr off	Toggle switch, SPDT on-off-on	
PRES.	25k trimmer	Trimmer, 10%, 1/4”	Bourns 3362P or similar.
VOLT.	SPDT slide	Slide switch, SPDT	E-Switch EG1271
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.

SCHEMATIC


+9V
D1
1N5817
C16
100n
C15
100uF
C11
470n
GND
IC2
TC1044SCPA
D10
1N5817
D11
1N5817
C10
10uF
VOLTAGE
VA
C12
470n
C13
10uF
R8
22k
VB
R9
22k
C14
47uF
DRIVE
100kB
C4
220n
R3
1k
C3
100pF
C5
100n
C6
100pF
R5
1M
R2
1M
IN
C1
22n
R1
1k
C2
1n
RPD
2M2
IC1A
TL072P
R4
10k
IC1B
TL072P
C7
1uF
R6
470R
D2
1N914
D3
1N914
D4
1N914
D5
1N914
D6
1N914
D7
1N914
D8
D9
CLIP
TONE
10kC
C8
22n
PRESENCE
25k
C9
22n
VOLUME
100kB
R7
1M
OUT

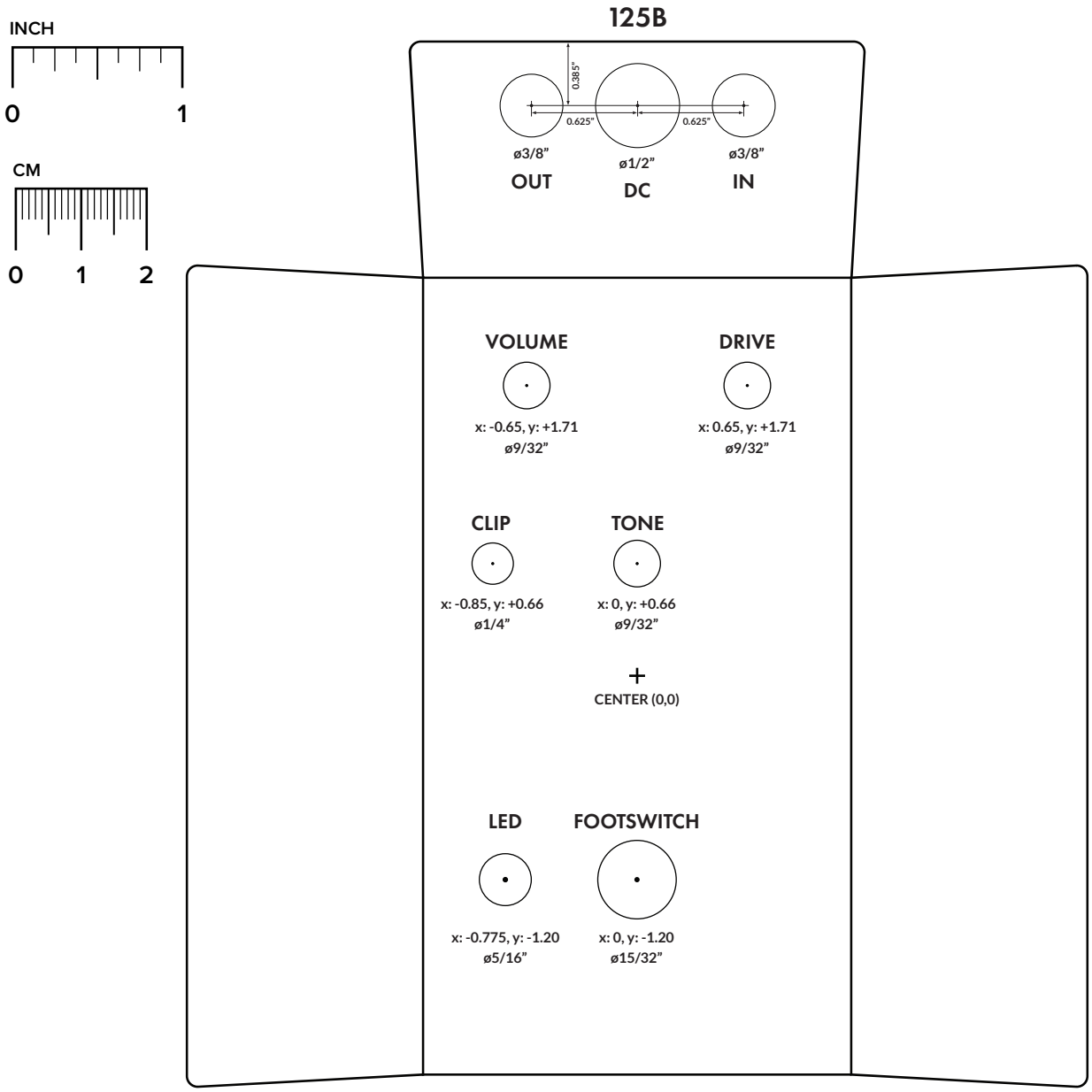
DRILL TEMPLATE

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.

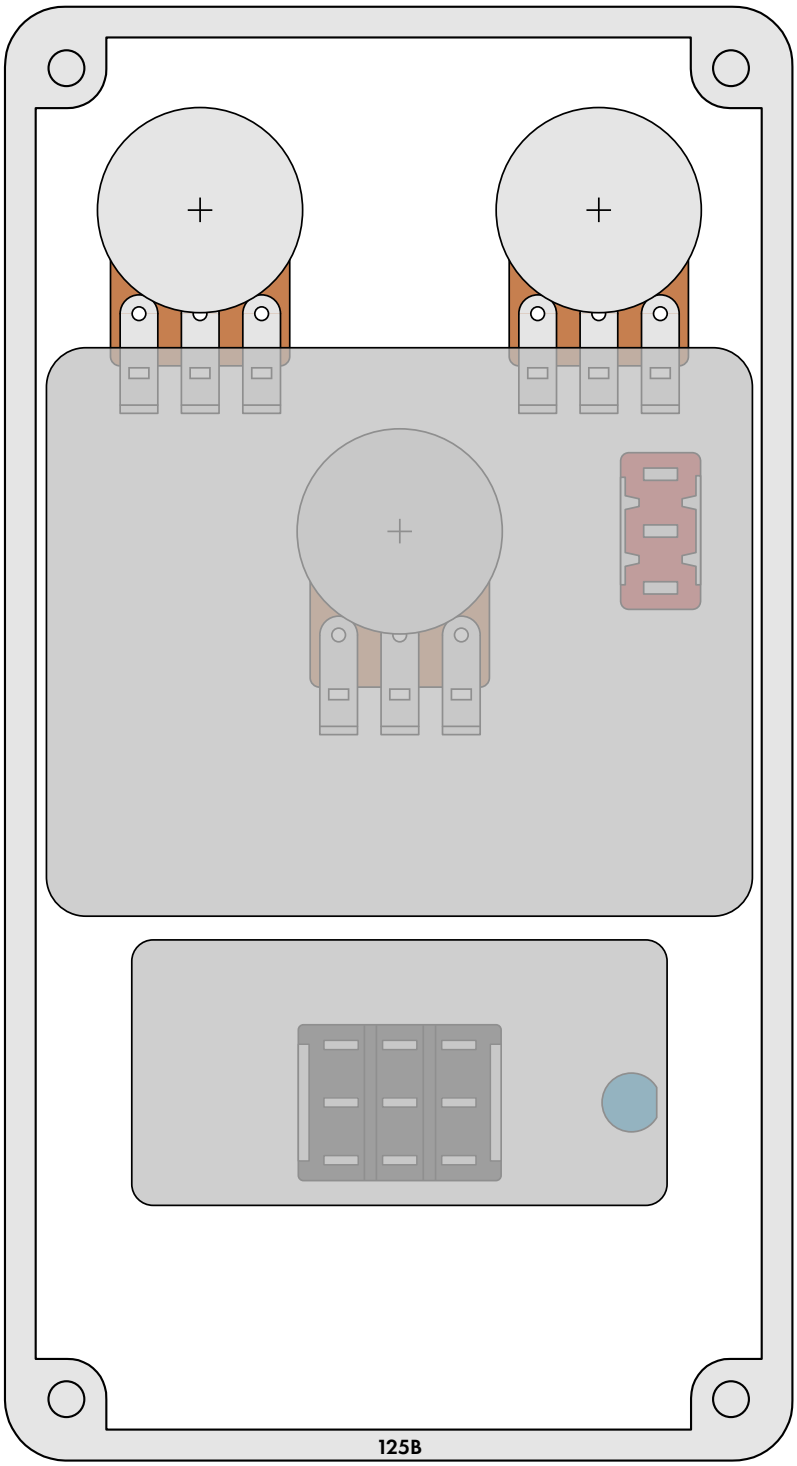
Top jack layout assumes the use of closed-frame jacks like the Switchcraft 111X. If you'd rather use open-frame jacks, please refer to the Open-Frame Jack Drill Template for the top side.

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.

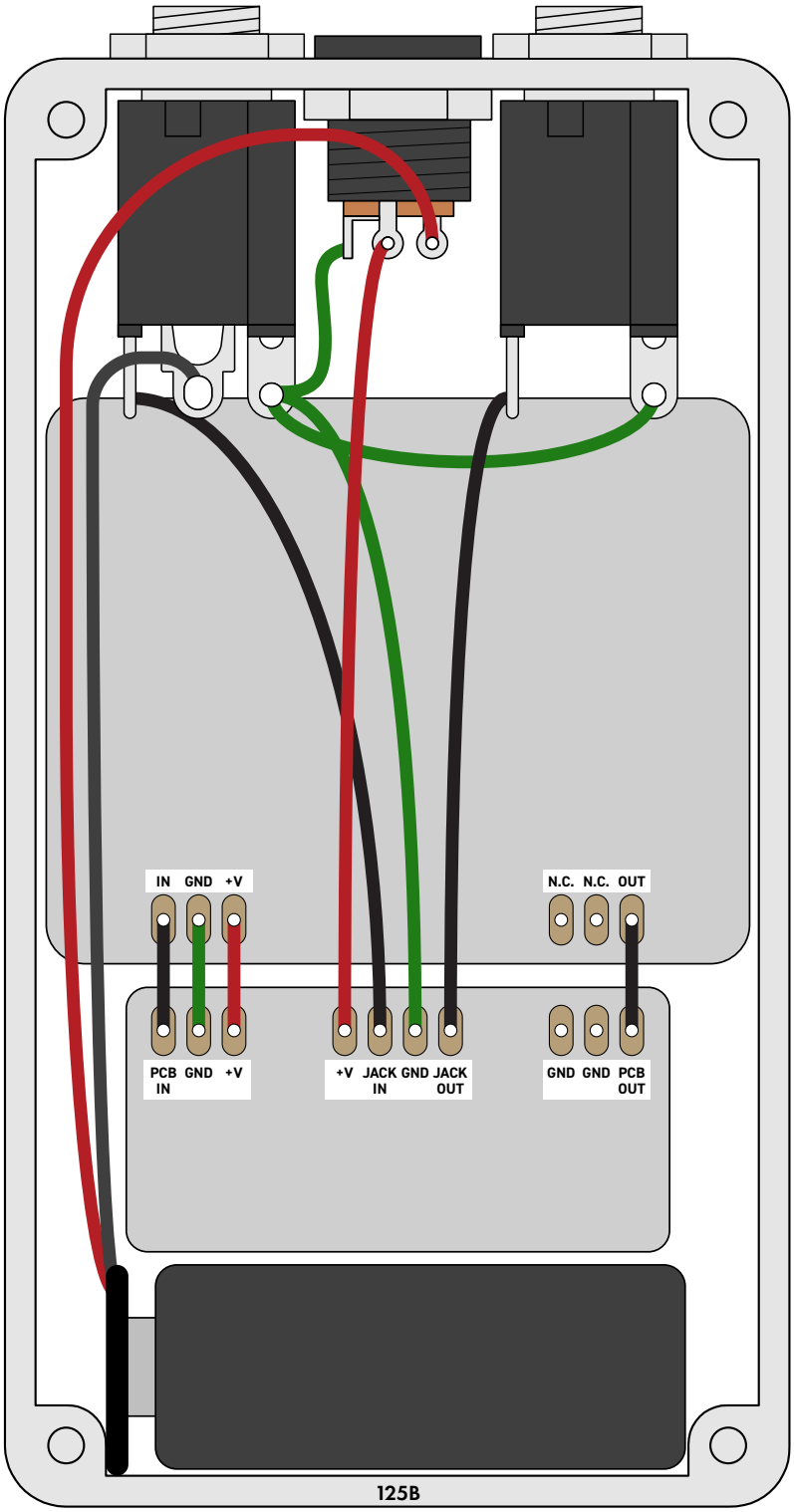


ENCLOSURE LAYOUT

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



WIRING DIAGRAM



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 (2021-04-12)
Corrected a few mixed-up capacitor values in the parts list. (The schematic and Mouser spreadsheet were correct.)

1.0.0 (2021-03-19)
Initial release.