PROJECT NAME

SUPREAUX DEUX

DIY GUITAR EFFECTS

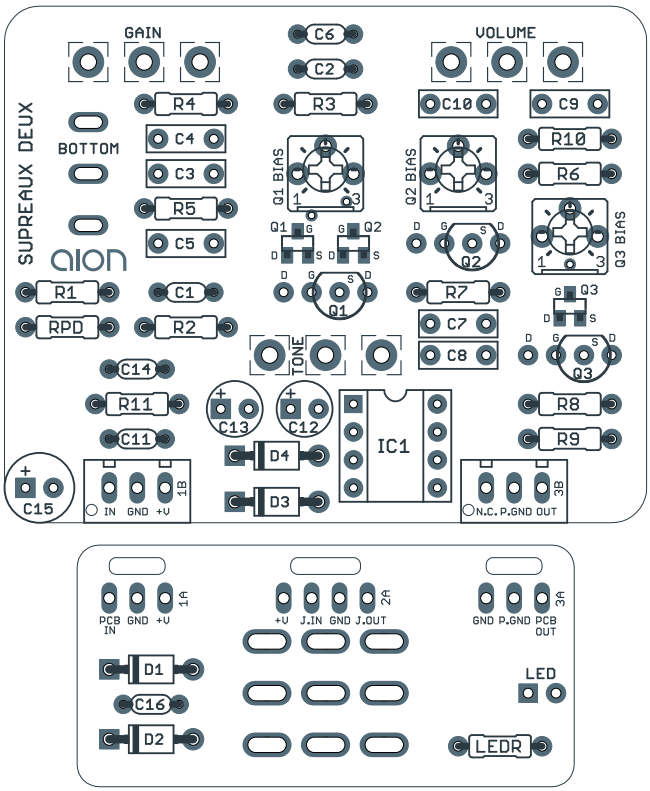
BASED ON
ROG Supreaux Deux

BUILD DIFFICULTY
Intermediate

EFFECT TYPE
JFET overdrive / amp simulator

DOCUMENT VERSION
1.0.0 (2020-06-05)

PROJECT SUMMARY
An updated version of the original Runoffgroove Supreaux, an adaptation of the Supro 16T amplifier with JFETs replacing the tube stages.



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

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INTRODUCTION

The Runoffgroove Supreaux Deux is an updated version of the Supreaux circuit, a JFET adaptation of the Supro 16T amplifier. The original Supreaux circuit, originally designed in 2004, is well-known as the source circuit for the JHS Superbolt and is also available as a PCB from Aion FX.

The Supreaux Deux was designed in 2008 in order to be more accurate to the sound of the Supro amp. As the original circuit had grown in popularity, the Runoffgroove team decided that they could do better, and the end result is something that they felt was even closer to the original amp's character.

The Aion FX version of the Supreaux Deux is a direct adaptation of the original circuit, but with two modifications. First, since the original circuit needs 18V power to sound right, a charge pump has been added to get 18V from a standard 9V input. In addition, another position has been added to the Bottom switch allowing for three settings instead of two.

Since the J201 is very difficult to find in TO-92 through-hole format, and many DIY hobbyists are intimidated by SMD parts, Aion FX offers J201s in SMD format that have been pre-soldered to adapters so they can be used as through-hole parts.

USAGE

The Supreaux has the following controls:

- **Drive** controls the volume going into the JFET clipping stage. At higher drive levels, the second JFET will overload and clip the signal.
- **Tone** is a simple passive high-pass filter that can be dampened, retaining more treble as the knob is turned up.
- **Volume** controls the overall output of the effect.
- **Bottom** is a toggle switch that reduces the amount of bass cut before the clipping stage.

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	100k	Metal film resistor, 1/4W	
R2	390R	Metal film resistor, 1/4W	
R3	56k	Metal film resistor, 1/4W	
R4	1M	Metal film resistor, 1/4W	
R5	1M	Metal film resistor, 1/4W	
R6	1k	Metal film resistor, 1/4W	
R7	100k	Metal film resistor, 1/4W	
R8	1M	Metal film resistor, 1/4W	
R9	390R	Metal film resistor, 1/4W	
R10	22k	Metal film resistor, 1/4W	
R11	100R	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	270pF	MLCC capacitor, NP0/C0G	
C2	470pF	MLCC capacitor, NP0/C0G	
C3	2n2	Film capacitor, 7.2 x 2.5mm	
C4	2n2	Film capacitor, 7.2 x 2.5mm	
C5	10n	Film capacitor, 7.2 x 2.5mm	
C6	470pF	MLCC capacitor, NP0/C0G	
C7	1n5	Film capacitor, 7.2 x 2.5mm	
C8	4n7	Film capacitor, 7.2 x 2.5mm	
C9	1n5	Film capacitor, 7.2 x 2.5mm	
C10	68n	Film capacitor, 7.2 x 2.5mm	
C11	470n	MLCC capacitor, X7R	Power supply filter capacitor.
C12	10uF	Electrolytic capacitor, 5mm	Power supply filter capacitor.
C13	47uF	Electrolytic capacitor, 5mm	Power supply filter capacitor.
C14	470n	MLCC capacitor, X7R	Power supply filter capacitor.
C15	100uF	Electrolytic capacitor, 6.3mm	Power supply filter capacitor.
C16	100n	MLCC capacitor, X7R	Power supply filter capacitor.

PARTS LIST, CONT.

PART	VALUE	TYPE	NOTES
D1	1N5817	Schottky diode, DO-41	
D2	1N4742A	Zener diode, 12V, DO-41	
D3	1N5817	Schottky diode, DO-41	
D4	1N5817	Schottky diode, DO-41	
Q1	2N5457	JFET, N-channel, TO-92 or SOT-23	Can use either 2N5457 (through-hole) or MMBF5457 (SMD).
Q2	J201	JFET, N-channel, TO-92 or SOT-23	Can use either J201 (through-hole) or MMBFJ201 (SMD).
Q3	2N5457	JFET, N-channel, TO-92 or SOT-23	Can use either 2N5457 (through-hole) or MMBF5457 (SMD).
Q1_TR	10k trimmer	Trimmer, 10%, 1/4"	
Q2_TR	50k trimmer	Trimmer, 10%, 1/4"	
Q3_TR	10k trimmer	Trimmer, 10%, 1/4"	
IC1	TC1044SCPA	Charge pump, DIP8	
IC1-S	DIP-8 socket	IC socket, DIP-8	
TONE	500kA	16mm right-angle PCB mount pot	
GAIN	500kA	16mm right-angle PCB mount pot	
VOL.	100kA	16mm right-angle PCB mount pot	
BTM	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

Setting bias trimmers

Turn the trimmers so that the drain (“D” pad) of the JFETs measure 12V, measured with a multimeter (red probe to “D” pad and black probe to ground).

This is just a guideline, though. You can tweak the trimmers to fine-tune the circuit to your liking. The bias affects the total gain of the circuit, so you can make it a little cleaner or a little dirtier than stock.

J201 usage

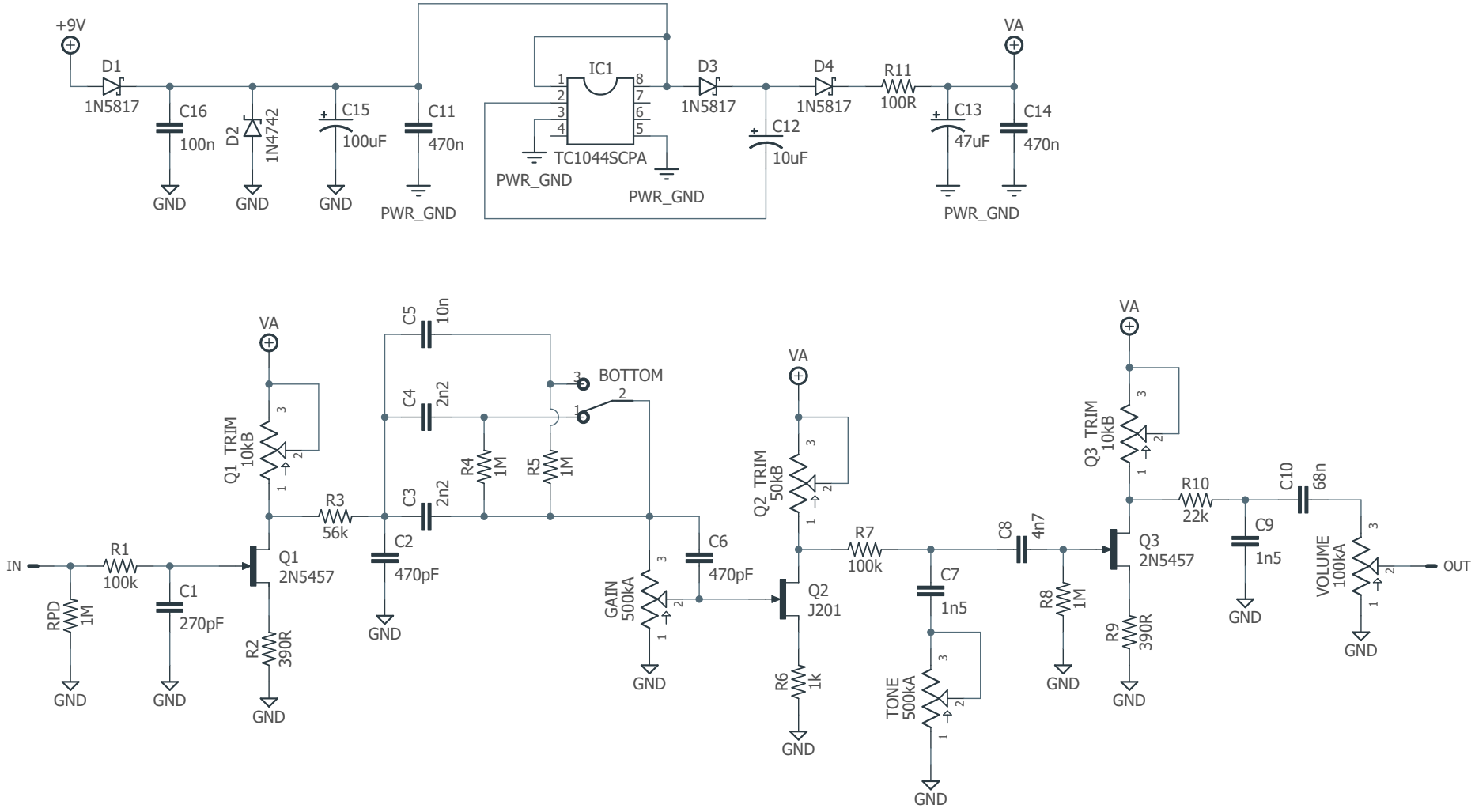
The J201 transistor is very popular in DIY pedal designs, but was discontinued in TO-92 through-hole format several years ago and is becoming very scarce. Genuine parts are getting expensive and many counterfeits have entered the market.

The MMBFJ201 is a SMD version that is still in production. On the PCB, two outlines have been included for each individual JFET, one for TO-92 and one for SMD (called SOT-23) right next to it. Make sure you only use one or the other—don’t put both a through-hole and surface mount part in the two Q1 spots.

J201 adapters

Many DIY builders are intimidated by the small size of surface-mount parts. Aion FX offers pre-soldered J201s on adapters so they can easily be used as through-hole parts.

SCHEMATIC


+9V
D1
1N5817
C16
100n
D2
1N4742
C15
100uF
C11
470n
GND
GND
GND
PWR_GND
IC1
TC1044SCPA
PWR_GND
PWR_GND
D3
1N5817
D4
1N5817
C12
10uF
R11
100R
C13
47uF
C14
470n
PWR_GND
VA
VA
C5
10n
C4
2n2
C3
2n2
C2
470pF
BOTTOM
Q1 TRIM
10kB
R3
56k
R4
1M
R5
1M
Q1
2N5457
IN
R1
100k
C1
270pF
RPD
1M
R2
390R
GND
GND
GND
GND
VA
Q2 TRIM
50kB
R7
100k
C6
470pF
GAIN
500kA
Q2
J201
R6
1k
GND
GND
VA
Q3 TRIM
10kB
C8
4n7
R8
1M
Q3
2N5457
R9
390R
R10
22k
C9
1n5
C10
68n
VOLUME
100kA
OUT
GND
GND
GND
C7
1n5
TONE
500kA
GND
GND

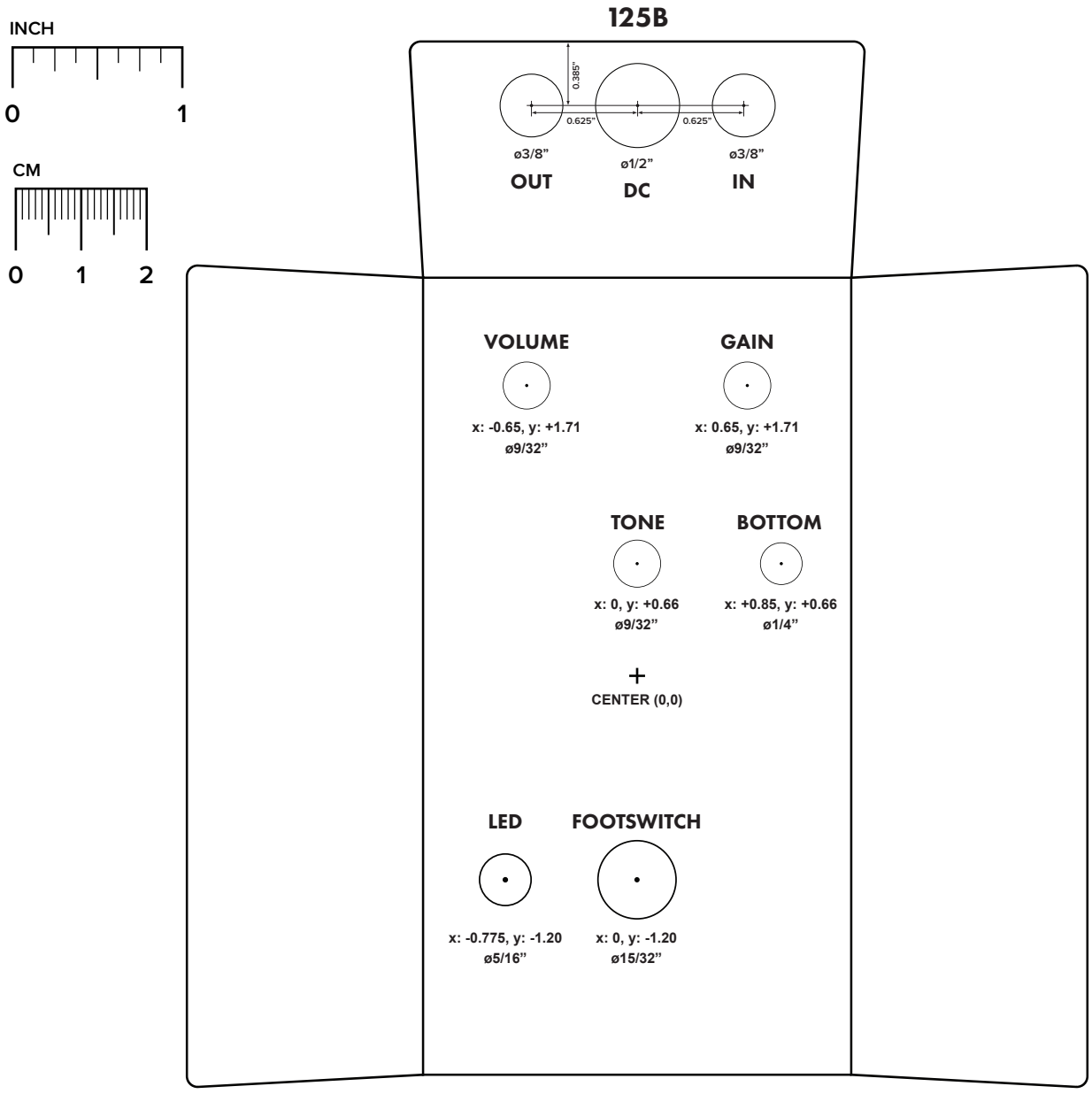
DRILL TEMPLATE

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.

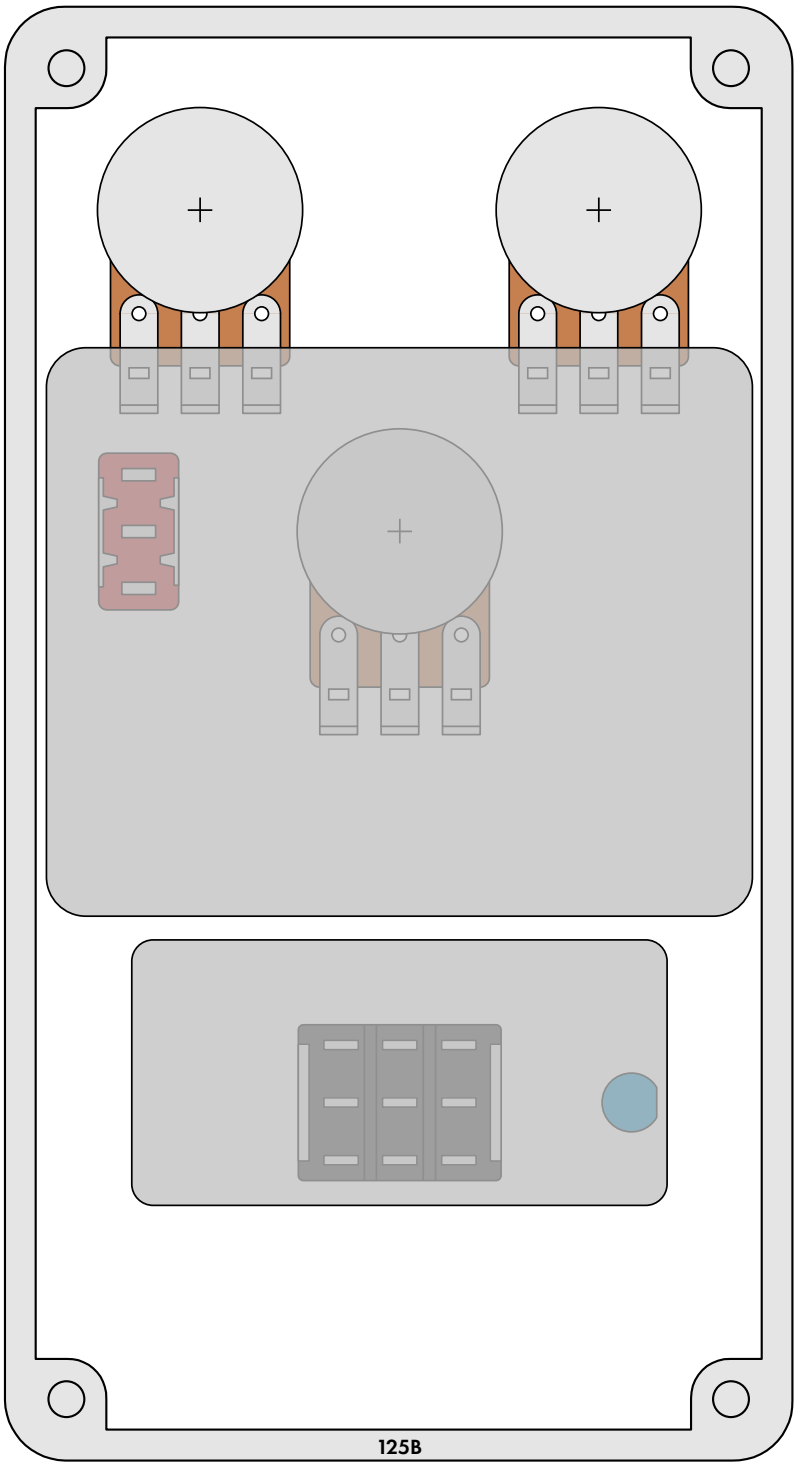
Top jack layout assumes the use of closed-frame jacks like the Switchcraft 111X. If you'd rather use open-frame jacks, please refer to the Open-Frame Jack Drill Template for the top side.

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.

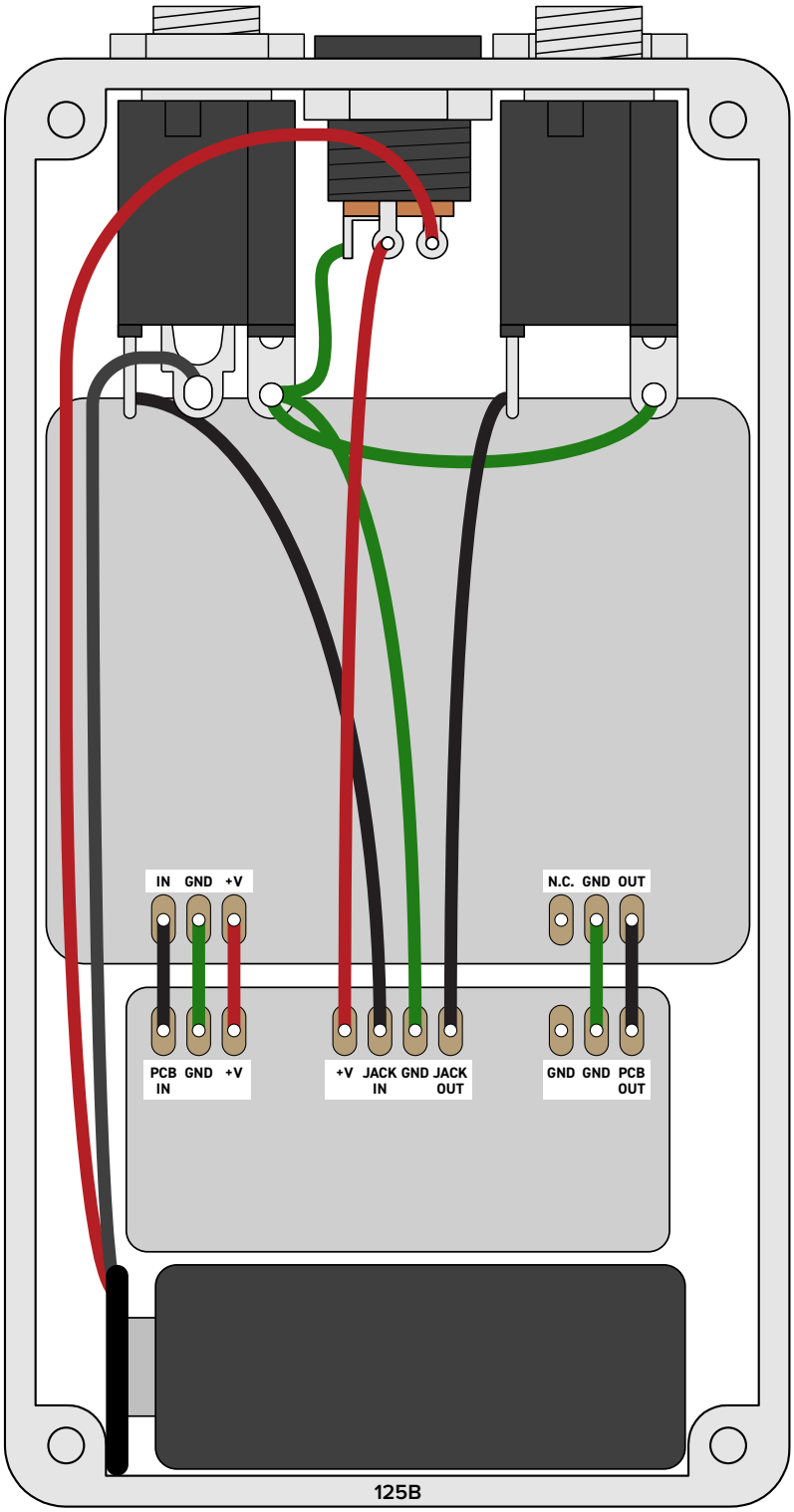


ENCLOSURE LAYOUT

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.

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DOCUMENT REVISIONS

1.0.0 (2020-06-05)
Initial release.