PROJECT NAME

ASCALON

DIY GUITAR EFFECTS

BASED ON
King Tone Octaland

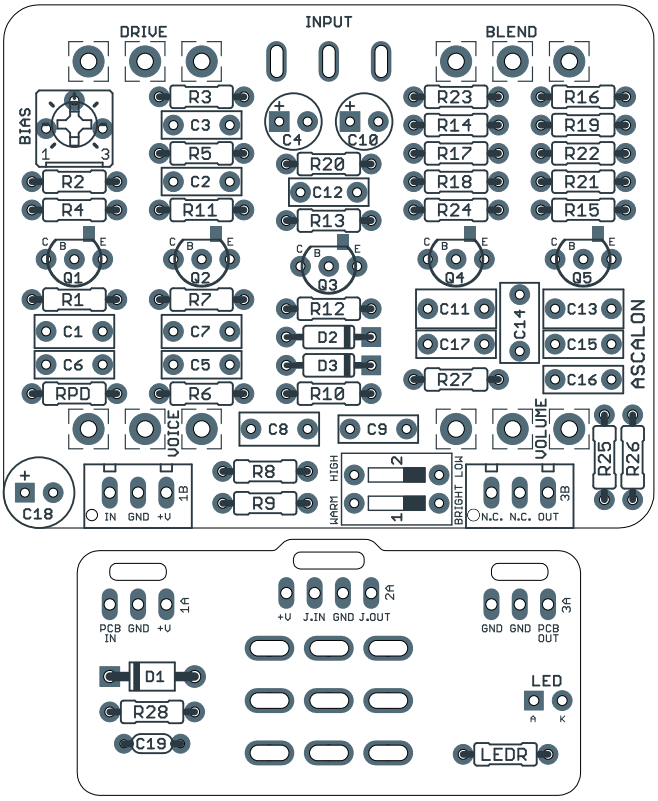
BUILD DIFFICULTY
Easy

EFFECT TYPE
Octave fuzz with clean blend

DOCUMENT VERSION
1.0.0 (2024-11-29)

PROJECT SUMMARY

A vintage-flavored octave fuzz based on the Roger Mayer Octavia with an added clean blend and dual-stage tone control.



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

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INTRODUCTION

The Ascalon Octave Fuzz is based on the King Tone Octaland Mini, first released in 2019 as an updated version of the original Octaland. It was traced by Aion FX in 2024.

At its core, the octave section is adapted from the Roger Mayer Octavia, which also served as the inspiration for the Catalinbread Octapussy. But it expands a lot on the classic circuit with the addition of a clean blend (useful for retaining low end) and an innovative two-stage tone control, along with an input capacitor selection and more circuit tweaks by way of internal DIP switches.

King Tone released an updated version of the Octaland Mini in 2022, moving the DIP switches to the outside and adding some extra options. Our trace was from a 2020 unit, so we do not know what changes were made in this version.

The Ascalon is a direct adaptation of the Octaland Mini with no modifications or changes other than some minor tweaks to the power supply to standardize it with our other projects.

USAGE

The Ascalon has four controls, one toggle switch and two internal DIP switches:

- **Drive** controls the gain of the input stage, which drives both the clean and octave paths.
- **Voice** is a dual-function treble cut tone control. At the center 12:00 position, the treble is at maximum. To the right (from 12:00 to maximum), treble is gradually cut after the first stage, before the clean and octave paths are split. To the left (from 12:00 to zero), treble is gradually cut at the end of the circuit, after the blend and drive paths are rejoined.
- **Blend** sets the ratio of clean signal to octave signal.
- **Volume** controls the overall volume of the effect.
- **Input** (toggle switch) is a 3-way selector for the input capacitor. To the left, it's "Full Fat" mode, which passes the full input frequency. In the center position is "Glass" mode, which has the most bass cut. To the right is "Vintage" mode, which is balanced between the two.
- **Gain Low/High** (internal DIP switch) affects the octave path only. In high gain mode, gain and bass are increased.
- **Warm/Bright** (internal DIP switch) affects the clean path only. In Warm mode, a passive filter is engaged that cuts treble above 723 Hz.

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	2M	Metal film resistor, 1/4W	
R2	750k	Metal film resistor, 1/4W	
R3	1k	Metal film resistor, 1/4W	
R4	1k	Metal film resistor, 1/4W	
R5	10k	Metal film resistor, 1/4W	
R6	10k	Metal film resistor, 1/4W	
R7	1M	Metal film resistor, 1/4W	
R8	487k	Metal film resistor, 1/4W	
R9	100k	Metal film resistor, 1/4W	
R10	10k	Metal film resistor, 1/4W	
R11	3M	Metal film resistor, 1/4W	
R12	360k	Metal film resistor, 1/4W	
R13	20k	Metal film resistor, 1/4W	
R14	510R	Metal film resistor, 1/4W	
R15	51k	Metal film resistor, 1/4W	
R16	100k	Metal film resistor, 1/4W	
R17	220k	Metal film resistor, 1/4W	
R18	3M	Metal film resistor, 1/4W	
R19	360k	Metal film resistor, 1/4W	
R20	20k	Metal film resistor, 1/4W	
R21	510R	Metal film resistor, 1/4W	
R22	10k	Metal film resistor, 1/4W	
R23	100k	Metal film resistor, 1/4W	
R24	1M	Metal film resistor, 1/4W	
R25	1M	Metal film resistor, 1/4W	
R26	10k	Metal film resistor, 1/4W	
R27	15k	Metal film resistor, 1/4W	
R28	100R	Metal film resistor, 1/4W	Power supply filter resistor.
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.

PARTS LIST, CONT.

PART	VALUE	TYPE	NOTES
C1	220n	Film capacitor, 7.2 x 2.5mm	
C2	5n1	MLCC capacitor, NP0/C0G	See build notes for capacitor selection.
C3	5n6	Film capacitor, 7.2 x 2.5mm	
C4	22uF	Electrolytic capacitor, 5mm	
C5	2n2	Film capacitor, 7.2 x 2.5mm	
C6	100n	Film capacitor, 7.2 x 2.5mm	
C7	220n	Film capacitor, 7.2 x 2.5mm	
C8	220n	Film capacitor, 7.2 x 2.5mm	
C9	15n	Film capacitor, 7.2 x 2.5mm	
C10	4.7uF	Electrolytic capacitor, 4mm	
C11	1uF	Film capacitor, 7.2 x 3.5mm	
C12	100n	Film capacitor, 7.2 x 2.5mm	
C13	1uF	Film capacitor, 7.2 x 3.5mm	
C14	1uF	Film capacitor, 7.2 x 3.5mm	
C15	22n	Film capacitor, 7.2 x 2.5mm	
C16	100n	Film capacitor, 7.2 x 2.5mm	
C17	33n	Film capacitor, 7.2 x 2.5mm	
C18	100uF	Electrolytic capacitor, 6.3mm	Power supply filter capacitor.
C19	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	
Q1	2N5089	BJT transistor, NPN, TO-92	Can substitute BC549C (rotate 180 degrees)
Q2	2N3904	BJT transistor, NPN, TO-92	
Q3	2N3904	BJT transistor, NPN, TO-92	
Q4	2N3904	BJT transistor, NPN, TO-92	
Q5	2N3904	BJT transistor, NPN, TO-92	
BLEND	50kB	16mm right-angle PCB mount pot	
DRIVE	1kC	16mm right-angle PCB mount pot	
VOICE	50kB	16mm right-angle PCB mount pot	50kW in original. See build notes.
VOLUME	100kB	16mm right-angle PCB mount pot	
INPUT	SPDT center off	Toggle switch, SPDT on-off-on	
BIAS	10k trimmer	Trimmer, 10%, 1/4"	Bourns 3362P or similar.
SW1	DIP switch, 2-pos.	DIP switch, 2-position	

PARTS LIST, CONT.

PART	VALUE	TYPE	NOTES
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

Voice pot value

The Octaland uses a 50k W-taper pot for the Voice control. W-taper pots act as a reverse audio taper from 0 to 50%, linear at 50%, and standard audio taper from 50% to 100%. Most suppliers carry 20kW, which is used for the Tube Screamer tone control, but other values are rare.

The only 50kW potentiometer we are aware of is this one from Tayda Electronics. It's a standard 16mm pot, but the legs are an odd format and spacing. You can either cut the legs off and solder wires to the base of the pins or else try to form the pins into the correct shape—though note that the ends of the pins will be too large for the holes on the PCB so they will need to be trimmed or filed down.

The other solution, which is far more straightforward, is just to use a 50kB pot. The 0, 50% and 100% positions will be the same, it's just the settings in between that will be more difficult to dial in.

Transistor selection

The Octaland Mini is all SMD. Q2-5 are standard 2N3904 types, but Q1 is a 2SD2656, which is much higher gain. This type is only available in SMD, so we recommend using the 2N5089 as a substitute, which has similar specifications. You can also use the BC549C, but note that it will need to be rotated 180 degrees from the silkscreen since the pinout is mirrored.

C2 input capacitor

The input switch of the Octaland is designed to give three different values for the input capacitor: 5n (Glass), 10n (Vintage) and 220n (Full Fat). These settings are created by switching a combination of series and parallel capacitors, so the values are only approximate.

We've replicated the same switching arrangement in the Ascalon, but the 5n1 value is not readily available in standard through-hole film, only SMD, so depending on availability you will have to make a choice on what to use. There are three possible solutions:

1. Use a MLCC capacitor. Mouser has two high-quality options available, part numbers 80-C318C512K1G5TA and 80-C322C512JAG5TA. Either of them should fit the space, but it's recommended to install the resistors first since the capacitors are slightly wider than the PCB outline.

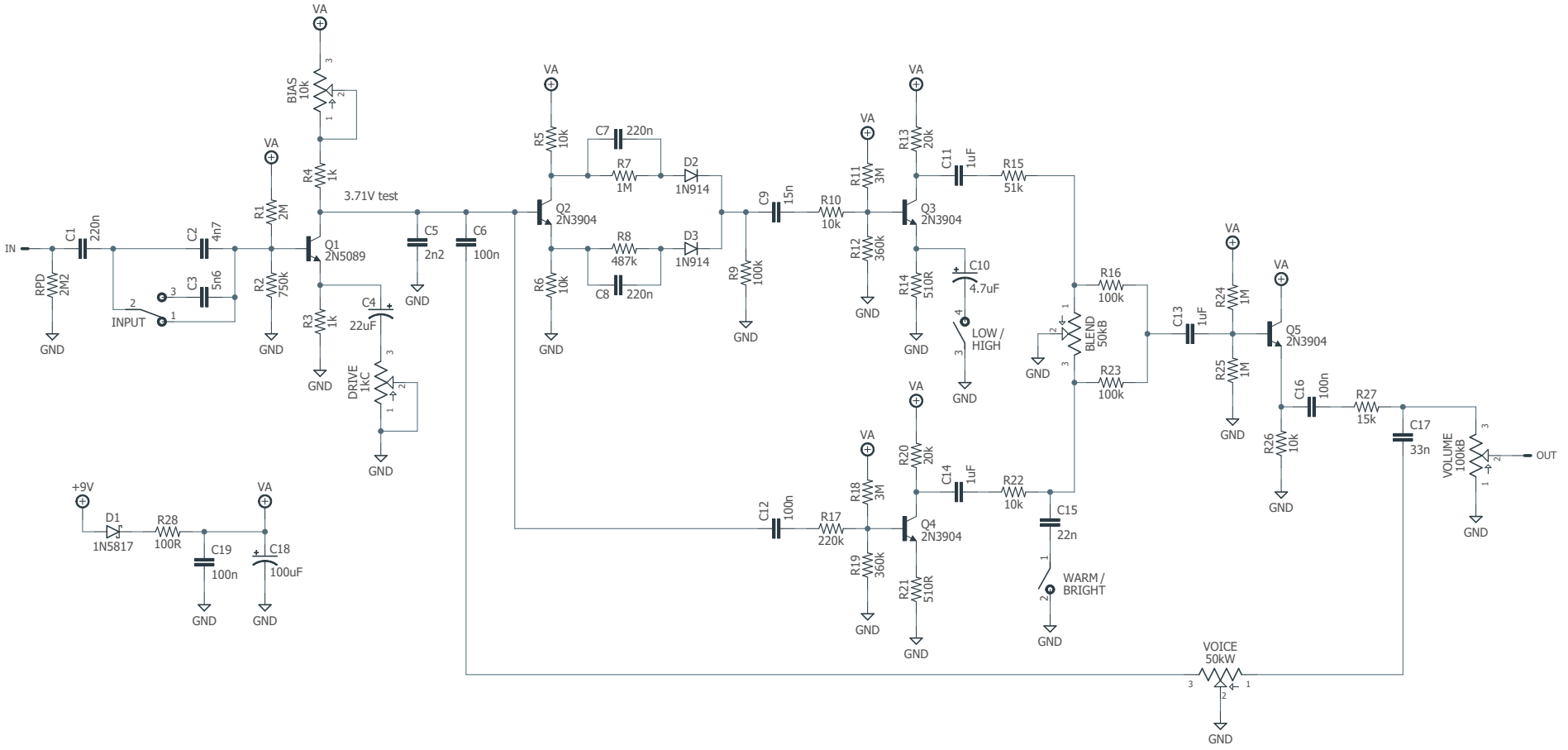
2. Substitute a 4n7 for C2. This will have very little change in tone, though the bass cutoff frequency will be slightly higher, meaning less bass in both Glass and Vintage modes.

3. Use 4n7 for C2 and add a 390pF MLCC capacitor in parallel. This will give almost exactly 5.1nF. There's not a lot of space for the capacitor near to C2, but you can solder it to the left and center pins of the toggle switch which have the same connections.

Setting the bias

We are not sure of the procedure that King Tone uses for setting the bias trimmer. On our unit, the pad marked "TEST" measured 3.71VDC and the trimmer was set to around 45-47% rotation (e.g. 4.5k to 4.7k). It's recommended to use this as a starting point. From there, you can adjust it further and try to improve the sound, but the bias of this input stage isn't going to make a huge difference to the tone.

SCHEMATIC


VA
BIAS 10k
R4 1k
R1 2M
R2 750k
R3 1k
C4 22uF
DRIVE 1kC
IN
C1 220n
C2 4n7
C3 5n6
RPD 2M2
INPUT
Q1 2N5089
3.71V test
C5 2n2
C6 100n
GND
R5 10k
C7 220n
R7 1M
D2 1N914
Q2 2N3904
R8 487k
C8 220n
D3 1N914
R6 10k
C9 15n
R9 100k
R10 10k
R11 3M
R12 360k
Q3 2N3904
R13 20k
C11 1uF
R15 51k
R14 510R
C10 4.7uF
LOW / HIGH
R16 100k
BLEND 50kB
R23 100k
C13 1uF
R24 1M
R25 1M
Q5 2N3904
C16 100n
R26 10k
R27 15k
C17 33n
VOLUME 100kB
OUT
R18 3M
R17 220k
C12 100n
R20 20k
C14 1uF
R22 10k
C15 22n
WARM / BRIGHT
R19 360k
R21 510R
Q4 2N3904
+9V
D1 1N5817
R28 100R
C19 100n
C18 100uF
VOICE 50kW

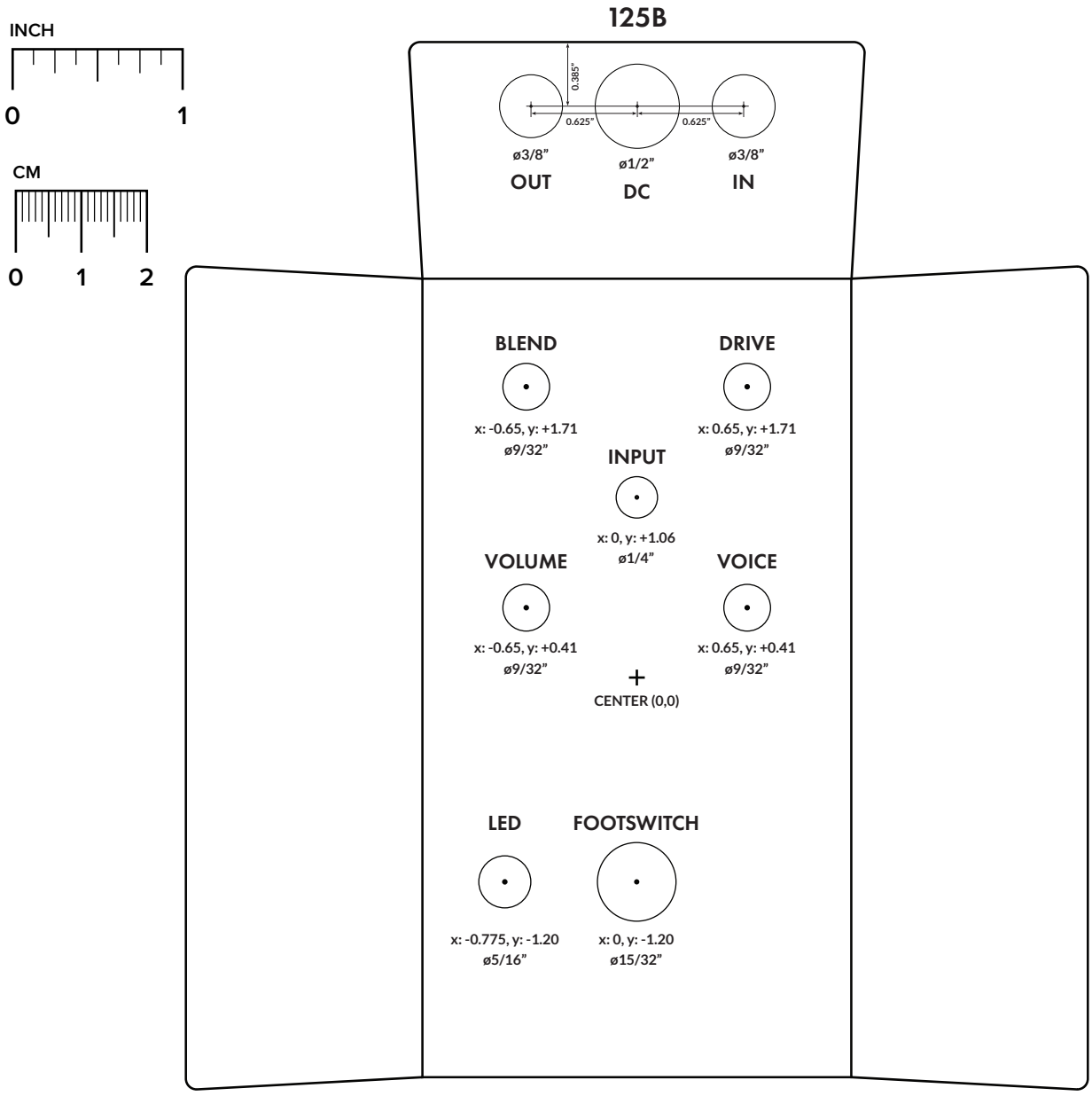
DRILL TEMPLATE

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.

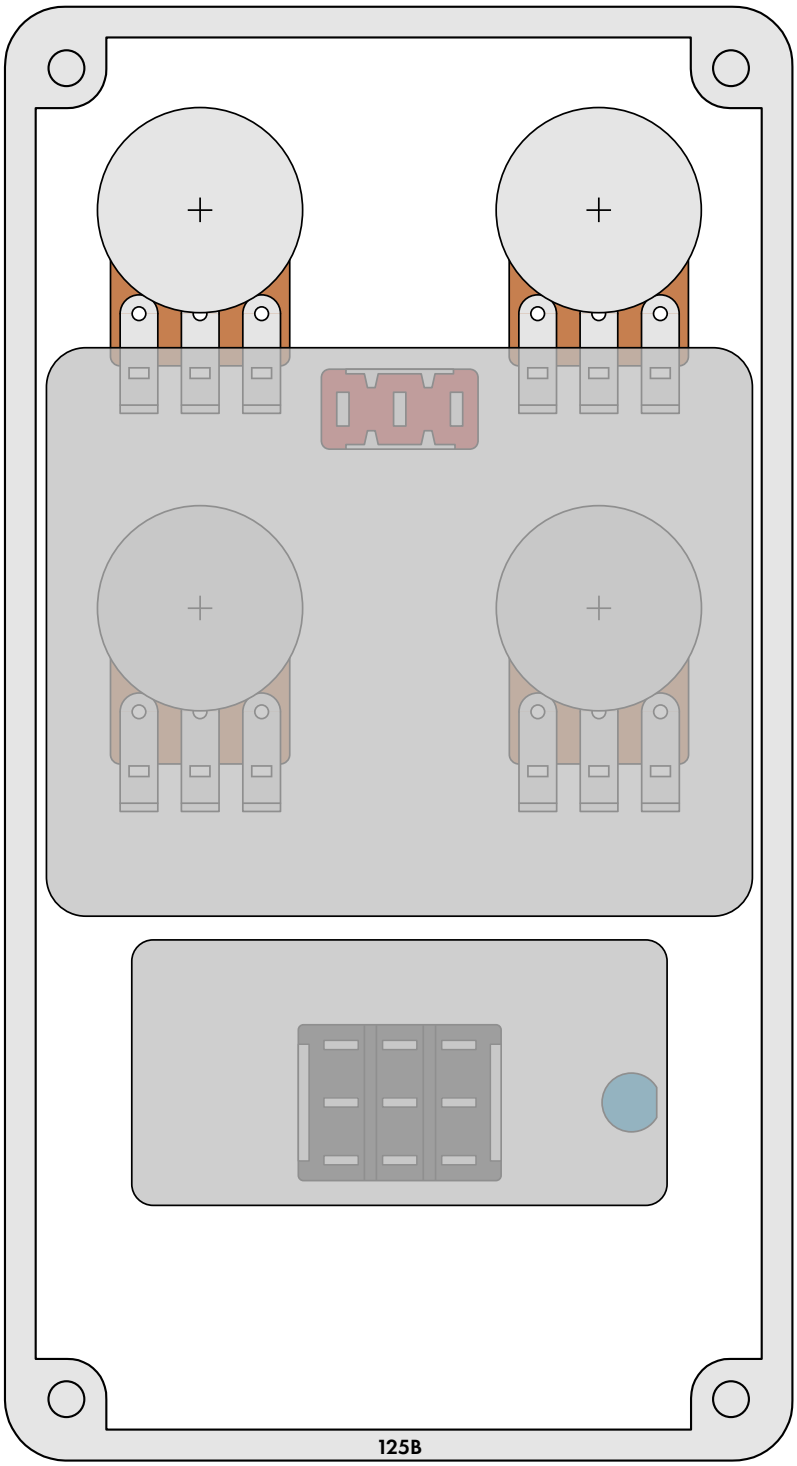
Top jack layout assumes the use of closed-frame jacks like the Switchcraft 111X. If you'd rather use open-frame jacks, please refer to the Open-Frame Jack Drill Template for the top side.

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.

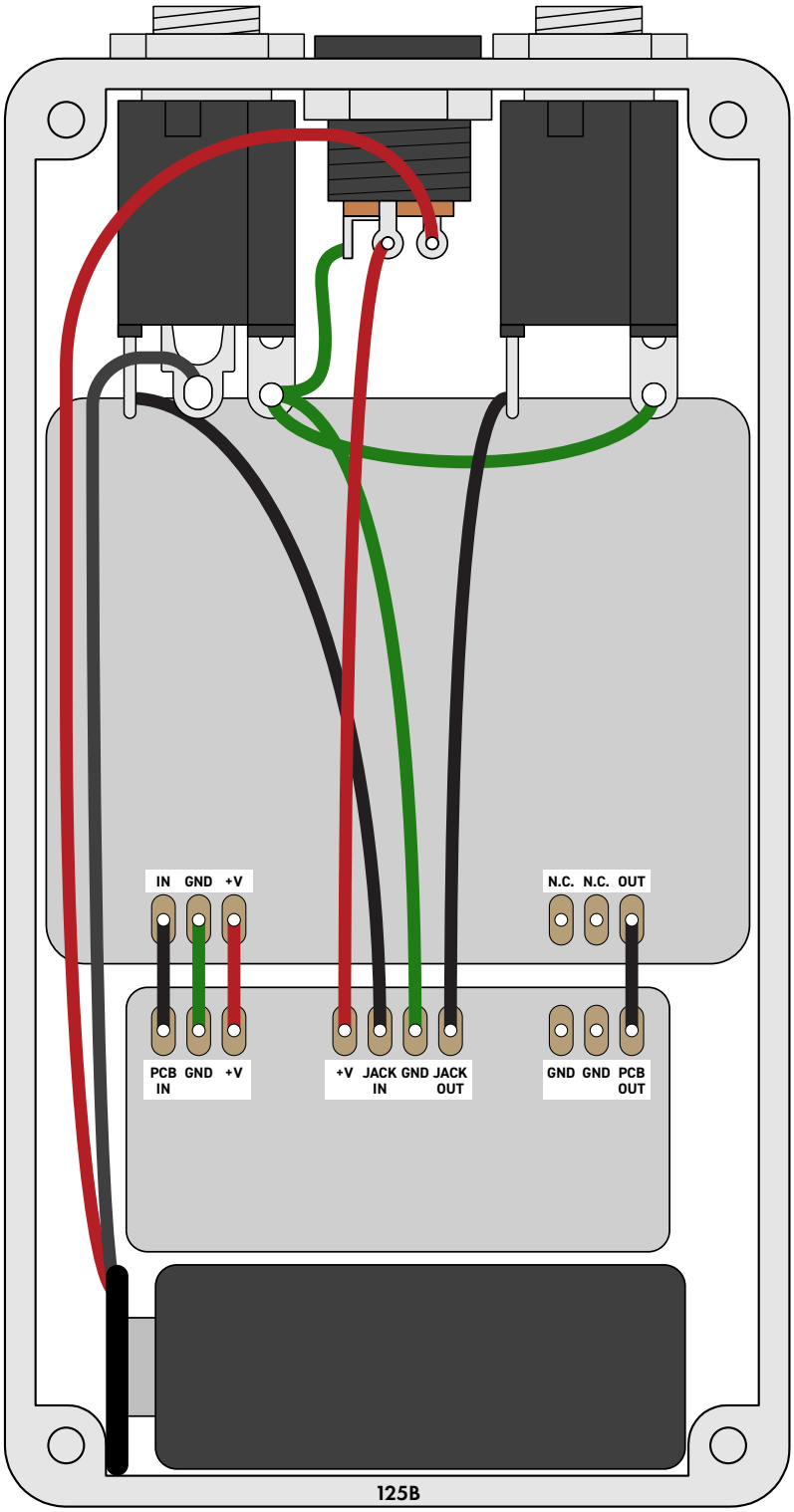


ENCLOSURE LAYOUT

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 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

1.0.0 (2024-11-29)

Initial release.