

PROJECT NAME

IBEX

BASED ON

Roland AF-100 Bee Baa

EFFECT TYPE

Silicon fuzz



BUILD DIFFICULTY

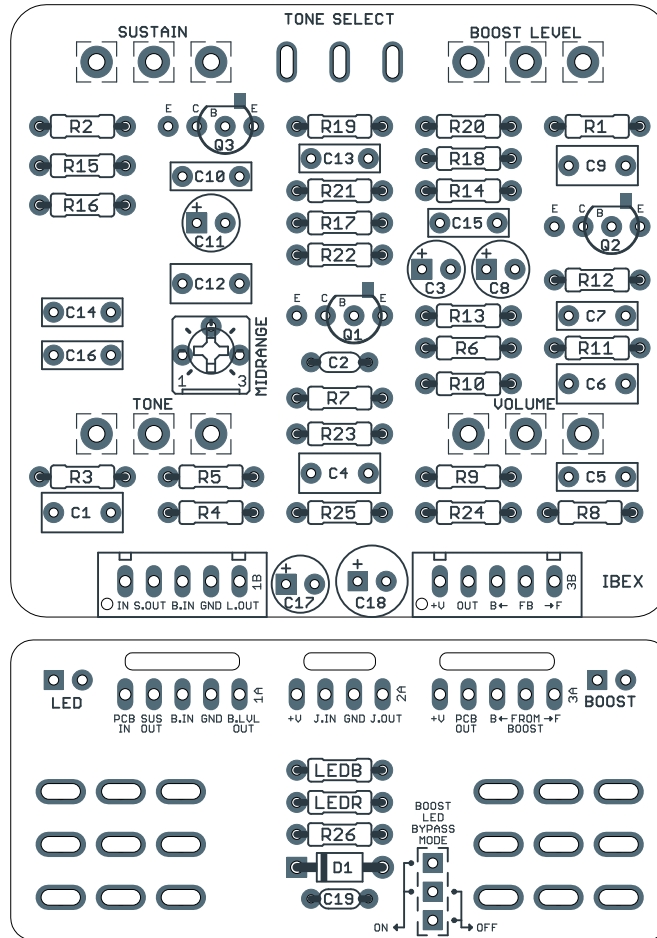
■■■■□ Intermediate

DOCUMENT VERSION

1.0.0 (2021-10-22)

PROJECT SUMMARY

An early silicon fuzz with a prominent mid-scoop and footswitchable clean boost mode.



Actual size is 2.3" x 2.14" (main board) and 2.3" x 1.05" (bypass board).

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INTRODUCTION

The Ibex Silicon Fuzz is based on the AF-100 Bee Baa, Roland's first fuzz pedal from 1972, the same year they were established as a company.

The "Bee Baa" name presumably comes from the two tone settings: a mid-scooped buzz that sounds like a swarm of bees, and a softer-edged tone that might evoke sheep, though you may need the help of some of the fashionable hallucinogenics of the decade in order to get there.

There were a lot of Japanese products in the 1970s that had poorly-chosen English names, but the Bee Baa stands tall as one of the worst. Along with along with "Funny Cat" and "Bee Gee", this likely contributed to Roland's failure to get a foothold in the United States during their first couple of years.

Regardless, the Bee Baa is a classic fuzz, and original units command high prices today. In addition to the searing fuzz tones, it also has a treble-emphasized boost mode with its own volume control, so it can be used as a two-channel effect. The boost mode is capable of some grit, but is nowhere near a dirty treble booster like the Rangemaster.

The Ibex is a direct clone of the Bee Baa, shrunk down to fit in a 125B enclosure but including a secondary footswitch to toggle between boost and fuzz modes. The Tone Select footswitch has been changed to a toggle since it's not a good application of a footswitch, but otherwise everything is exactly as it is in the original unit. An internal midrange trimmer has also been added to dial back the mid scoop.

USAGE

The Ibex has four controls, a toggle switch and a second footswitch:

- **Sustain** controls the input level of the effect in fuzz mode.
- **Boost Level** controls the input level of the effect in boost mode, and also acts as the volume control in this mode.
- **Tone** is a low-pass filter that cuts highs. It comes after the tone switch and impacts both modes.
- **Volume** is the overall output of the effect in fuzz mode.
- **Tone Select** (toggle) selects between two different tone modes. "Bee" mode is a steep mid-scoop while "Baa" mode is warmer and more balanced.
- **Boost** (footswitch) selects between boost mode and fuzz mode. In boost mode, the second and third transistor stages and the tone-shaping section are switched out, leaving only the first transistor stage which acts as a semi-clean boost with treble frequency emphasis.

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	1k	Metal film resistor, 1/4W	
R3	1k	Metal film resistor, 1/4W	
R4	100k	Metal film resistor, 1/4W	
R5	18k	Metal film resistor, 1/4W	
R6	1k8	Metal film resistor, 1/4W	
R7	10k	Metal film resistor, 1/4W	
R8	220k	Metal film resistor, 1/4W	
R9	10k	Metal film resistor, 1/4W	
R10	100k	Metal film resistor, 1/4W	
R11	15k	Metal film resistor, 1/4W	
R12	1k5	Metal film resistor, 1/4W	
R13	10k	Metal film resistor, 1/4W	
R14	100k	Metal film resistor, 1/4W	
R15	15k	Metal film resistor, 1/4W	
R16	1k5	Metal film resistor, 1/4W	
R17	10k	Metal film resistor, 1/4W	
R18	33k	Metal film resistor, 1/4W	
R19	47k	Metal film resistor, 1/4W	
R20	10k	Metal film resistor, 1/4W	
R21	47k	Metal film resistor, 1/4W	
R22	22k	Metal film resistor, 1/4W	
R23	68k	Metal film resistor, 1/4W	
R24	47k	Metal film resistor, 1/4W	
R25	1k	Metal film resistor, 1/4W	
R26	100R	Metal film resistor, 1/4W	
LEDB	4k7	Metal film resistor, 1/4W	LED current-limiting resistor. Adjust value to change LED brightness.
LEDR	2k2	Metal film resistor, 1/4W	LED current-limiting resistor. Adjust value to change LED brightness.
C1	1uF	Film capacitor, 7.2 x 3.5mm	
C2	100pF	MLCC capacitor, NP0/COG	
C3	10uF	Electrolytic capacitor, 5mm	
C4	1uF	Film capacitor, 7.2 x 3.5mm	

PARTS LIST, CONT.

PART	VALUE	TYPE	NOTES
C5	6n8	Film capacitor, 7.2 x 2.5mm	
C6	1uF	Film capacitor, 7.2 x 2.5mm	
C7	4n7	Film capacitor, 7.2 x 3.5mm	
C8	10uF	Film capacitor, 7.2 x 2.5mm	
C9	1uF	MLCC capacitor, NP0/COG	
C10	OMIT	Film capacitor, 7.2 x 2.5mm	4n7 in some vintage units, but usually omitted.
C11	10uF	Film capacitor, 7.2 x 2.5mm	
C12	1uF	Film capacitor, 7.2 x 2.5mm	
C13	2n2	Film capacitor, 7.2 x 2.5mm	4n7 in some vintage units.
C14	100n	Electrolytic capacitor, 5mm	
C15	2n2	Film capacitor, 7.2 x 2.5mm	
C16	22n	Electrolytic capacitor, 5mm	
C17	47uF	Electrolytic capacitor, 5mm	Power supply filter capacitor.
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	
Q1	2N5088	BJT transistor, NPN, TO-92	Substitute. Original uses 2SC644.
Q2	2N5088	BJT transistor, NPN, TO-92	Substitute. Original uses 2SC644.
Q3	2N5088	BJT transistor, NPN, TO-92	Substitute. Original uses 2SC644.
MID	25k trimmer	Trimmer, 10%, 1/4"	
SUS.	100kA	16mm right-angle PCB mount pot	
TONE	100kA	16mm right-angle PCB mount pot	
VOL.	100kA	16mm right-angle PCB mount pot	
B.LVL	100kA	16mm right-angle PCB mount pot	
TONE	SPDT on-on	Toggle switch, SPDT on-on	
LED	5mm red	LED, 5mm, red diffused	
B.LED	5mm green	LED, 5mm, green 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.
BOOST	3PDT	Stomp switch, 3PDT	
FSW	3PDT	Stomp switch, 3PDT	
ENC	125B	Enclosure, die-cast aluminum	Can also use a Hammond 1590N1.

BUILD NOTES

Midrange trimmer

The “Bee” mode has a very steep mid-scoop reminiscent of the Superfuzz or Hyper Fuzz. An internal trimmer has been added to dial back the amount of mid scoop (in other words, increase the mids) if it’s too much. Generally speaking, the “Bee” mode is more useful than the “Baa” mode, so this allows a little more fine-tuning to make this mode work across a wider variety of settings.

Setting the boost LED mode

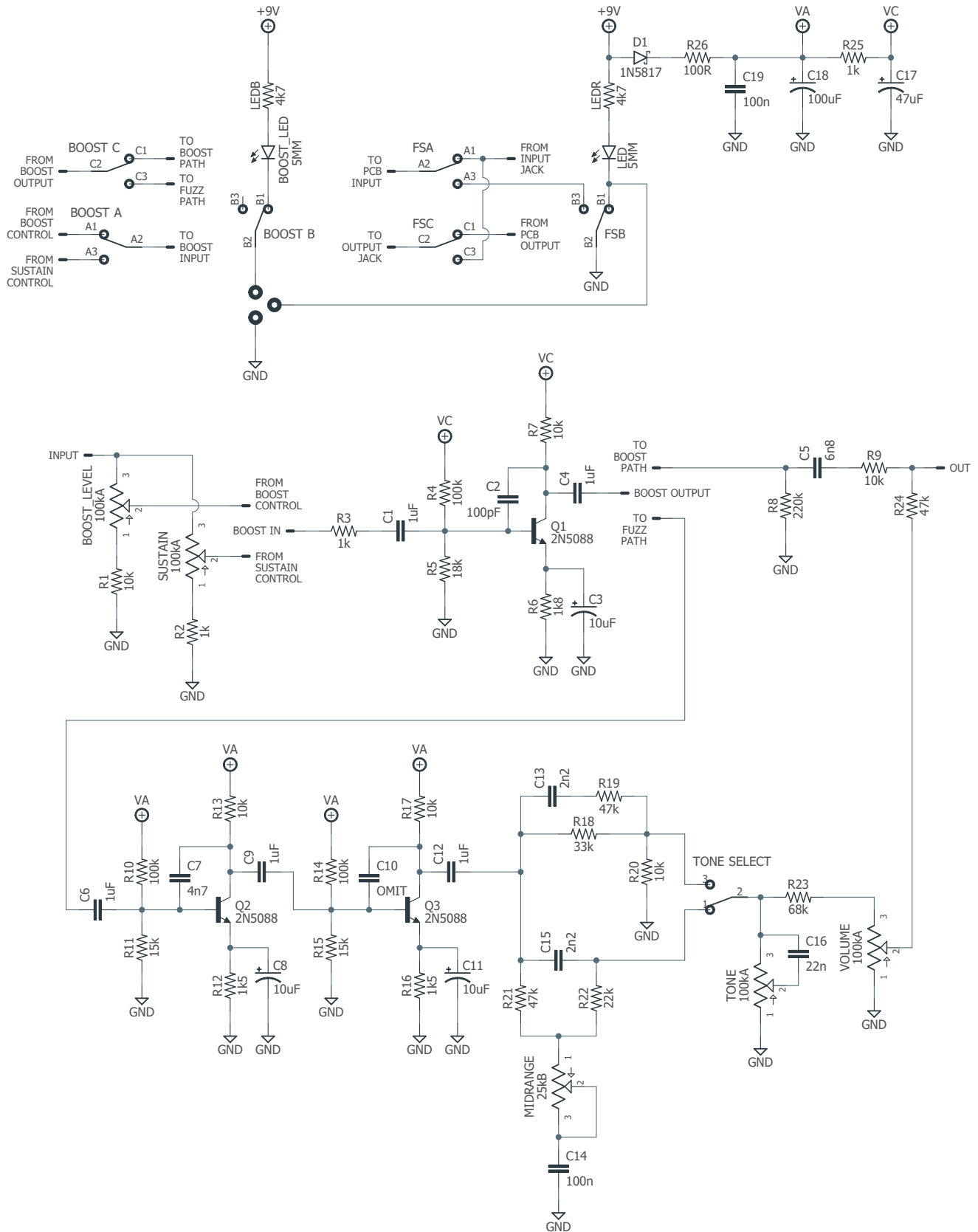
The boost sub-circuit in the Ibex is engaged with its own footswitch and has a LED to indicate that it’s engaged. The boost circuit is tied to the master footswitch, so the whole circuit is bypassed regardless of whether it is in boost or fuzz mode.

However, there are competing opinions on what should be done with the boost indicator LED when the whole unit is bypassed. Some players want to be able to know the boost status even when the unit is bypassed, while others would expect that none of the LEDs would be illuminated in bypass mode.

The footswitch PCB has jumpers to select which type of operation you want it to have:

- If you expect the boost LED to be **on** when the boost circuit is enabled, even if the whole effect is bypassed, then solder a jumper wire between the top and middle pads (marked “On”).
- If you expect the boost LED to be **off** when the effect is bypassed, even if the boost circuit is internally engaged, then solder a jumper wire between the middle and bottom pads (marked “Off”).

SCHEMATIC



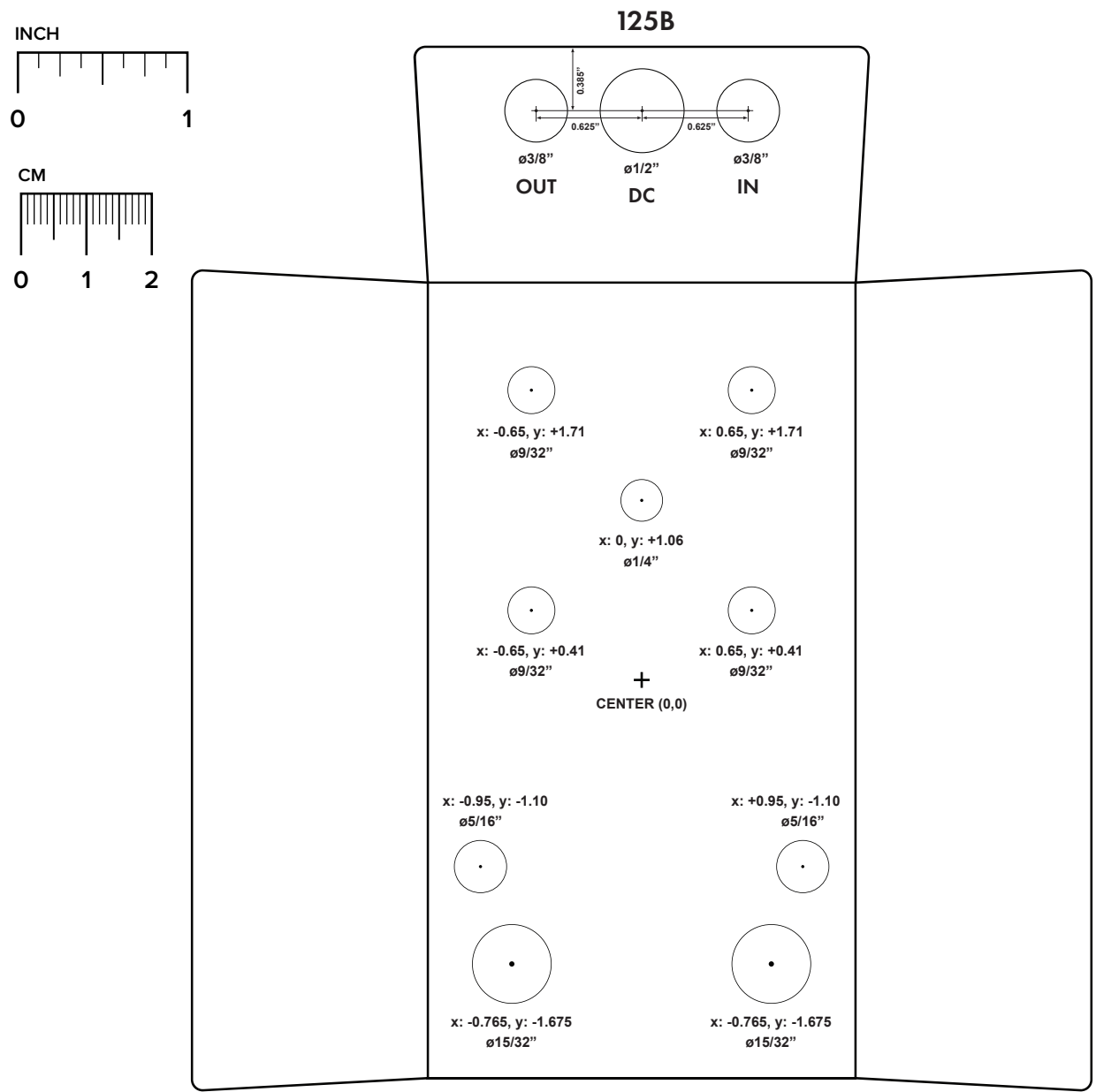
DRILL TEMPLATE

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.

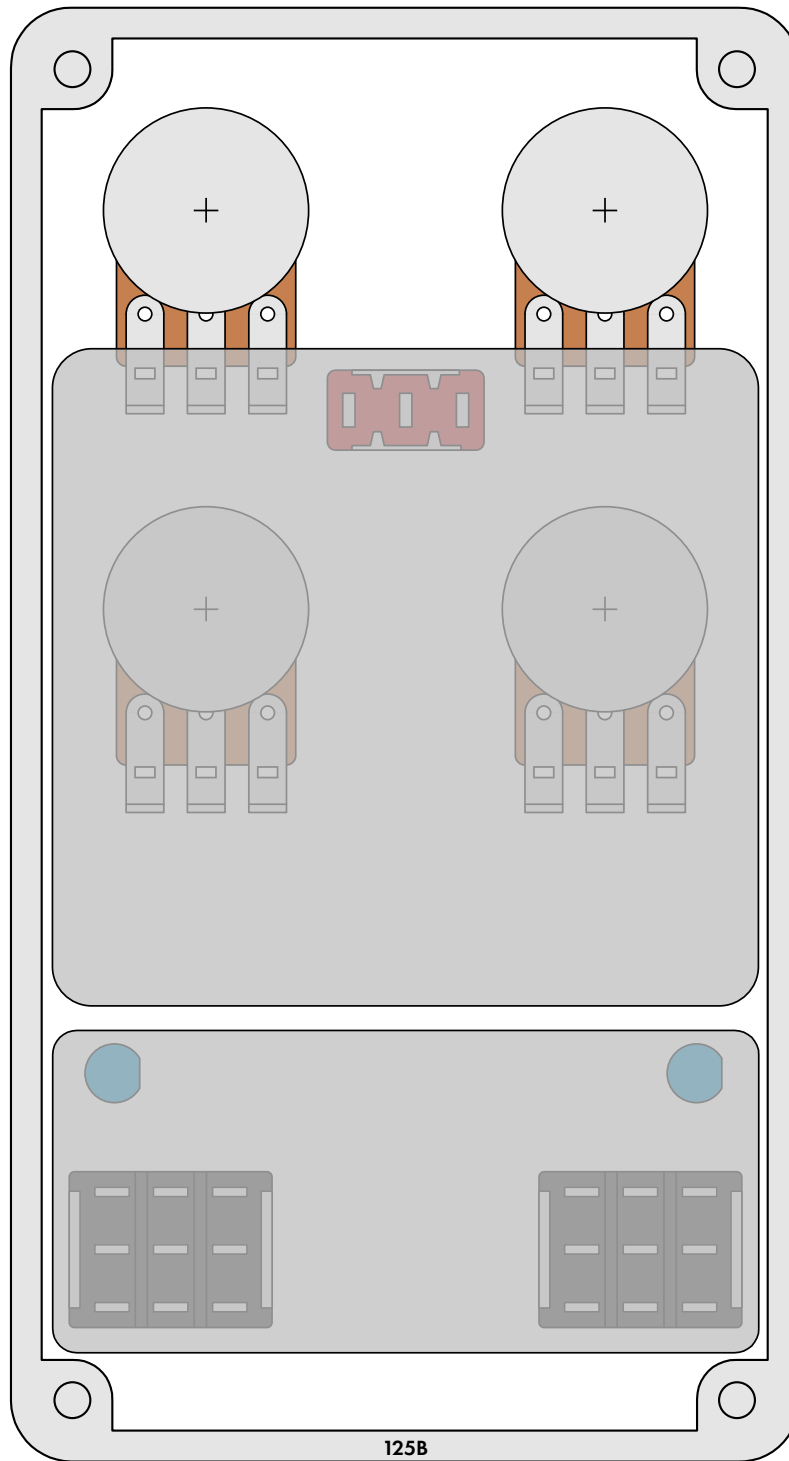
Top jack layout assumes the use of closed-frame jacks like the [Switchcraft 111X](#). If you'd rather use open-frame jacks, please refer to the Open-Frame Jack Drill Template for the top side.

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.

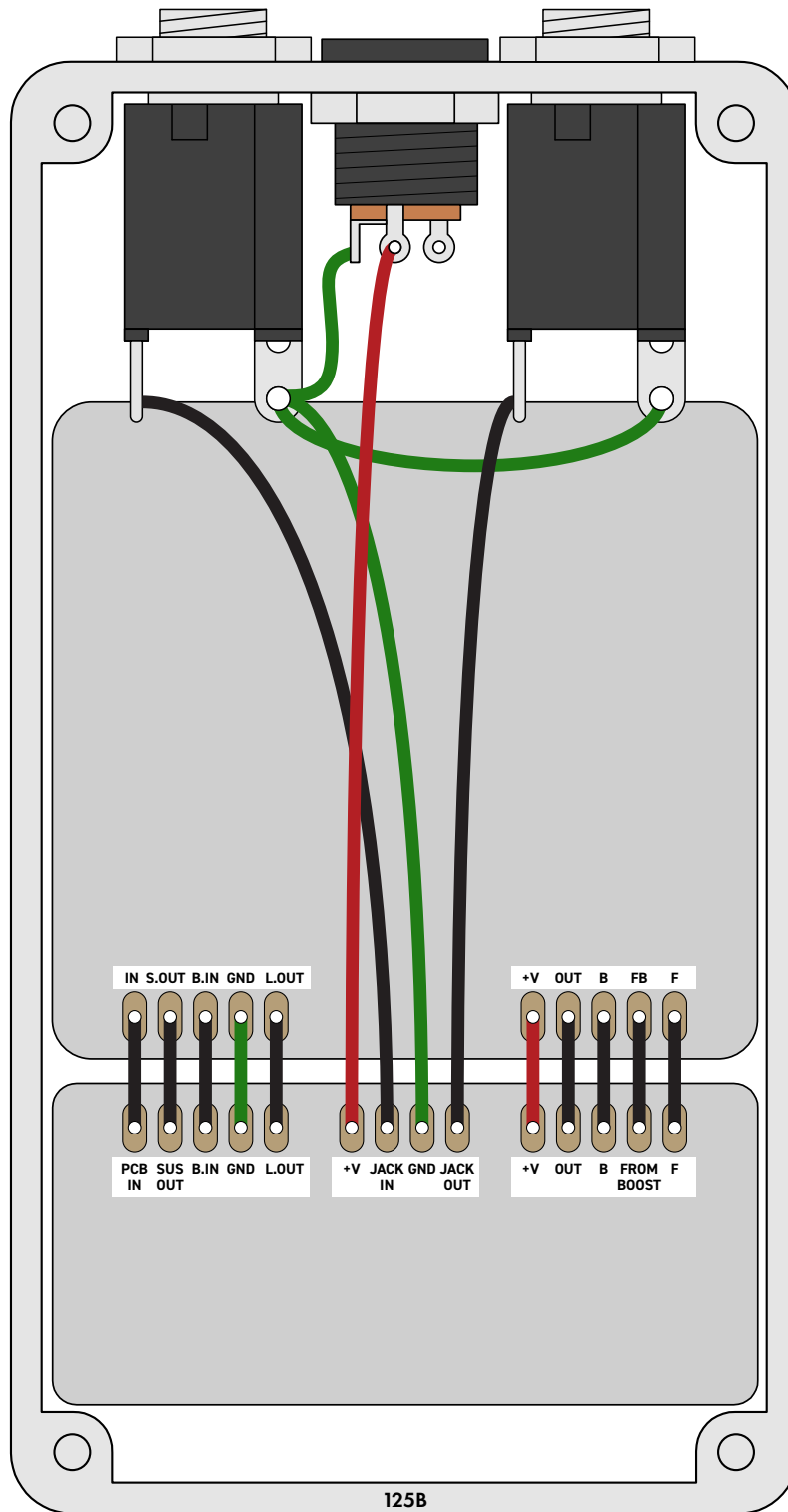


ENCLOSURE LAYOUT

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 (2021-10-22)

Initial release.