

PROJECT NAME

ECLIPSE

BASED ON

Korg® SDD-3000 Preamp

EFFECT TYPE

Boost, preamp

BUILD DIFFICULTY

■■■■□ Intermediate

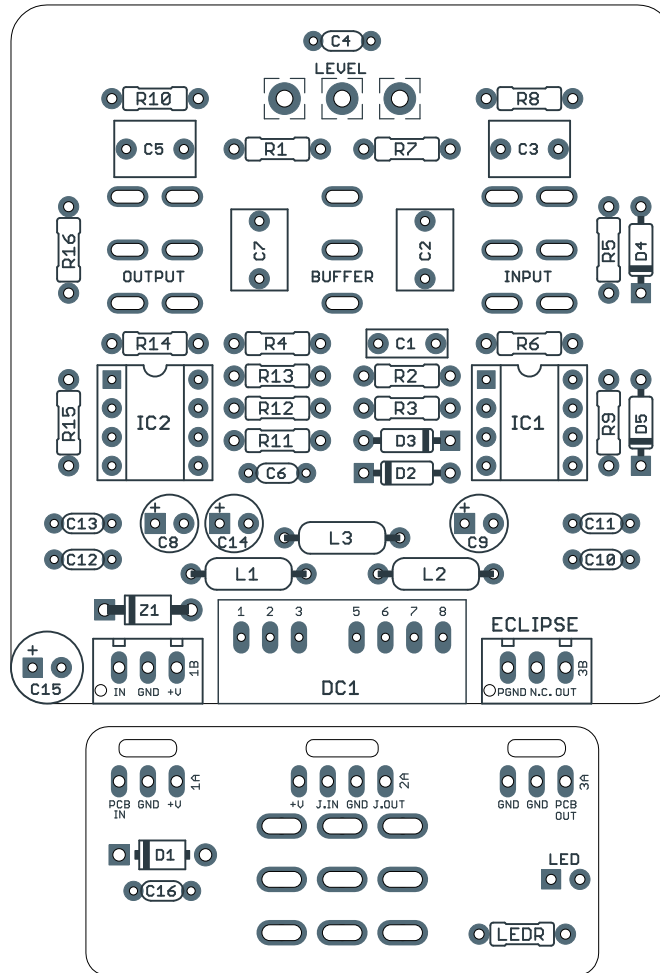
DOCUMENT VERSION

1.0.0 (2022-04-08)



PROJECT SUMMARY

An adaptation of the bypass preamp section of the Korg SDD-3000 digital delay, notably used by The Edge, Daniel Lanois and others.



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

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INTRODUCTION

The Eclipse Boost / Preamp is an adaptation of the preamp section of the Korg SDD-3000 digital delay, famously used by The Edge, Daniel Lanois and William Orbit among others. While the SDD-3000 is a digital delay unit, the preamp (input & output stages) is fully analog, and they would use the unit in bypass mode as a building block for their guitar tones.

The 125B-format update of the Eclipse has a few improvements. First, the attenuation controls have been changed into 3-way toggle switches to perfectly emulate the original unit's functionality. (On the earlier version of the Eclipse, you'd have to approximate the position on the knobs, which was inexact.)

Second, the input buffer (which was only engaged in the -30dB position of the original SDD unit) has been added, but made independently switchable so it can be used with any attenuation setting.

Last, while the first version of the Eclipse supported either +/-15V or +/-9V power, the updated version uses a more advanced voltage converter to get a clean and quiet +/-15V from a normal 9V supply. The +/-9V operation has been removed.

The end result is that the build is both more straightforward and more accurate to the original SDD-3000, and now an even-more-exact replica of the original unit's bypass mode.

USAGE

The Eclipse has one control and three switches:

- **Level** controls the amount of gain from the op-amp.
- **Input Attenuator** (toggle switch) selects between -30dB, -10dB or +4dB input levels.
- **Input Buffer** (toggle switch) enables or disables the input buffer, which on the original unit was only engaged in -30dB mode.
- **Output Attenuator** (toggle switch) selects between -20dB, -10dB or +4dB output levels.

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	5k6	Metal film resistor, 1/4W	
R2	2M	Metal film resistor, 1/4W	
R3	560k	Metal film resistor, 1/4W	
R4	22k	Metal film resistor, 1/4W	
R5	130k	Metal film resistor, 1/4W	
R6	30k	Metal film resistor, 1/4W	
R7	10k	Metal film resistor, 1/4W	
R8	3k3	Metal film resistor, 1/4W	
R9	3k3	Metal film resistor, 1/4W	
R10	110k	Metal film resistor, 1/4W	
R11	360k	Metal film resistor, 1/4W	
R12	22k	Metal film resistor, 1/4W	
R13	220R	Metal film resistor, 1/4W	
R14	6k2	Metal film resistor, 1/4W	
R15	1k	Metal film resistor, 1/4W	
R16	470R	Metal film resistor, 1/4W	
LEDR	4k7	Metal film resistor, 1/4W	LED current-limiting resistor. Adjust value to change LED brightness.
C1	100n	Film capacitor, 7.2 x 2.5mm	
C2	2.2uF	Film capacitor, 7.2 x 5mm	
C3	2.2uF	Film capacitor, 7.2 x 5mm	
C4	10pF	MLCC capacitor, NP0/C0G	
C5	2.2uF	Film capacitor, 7.2 x 5mm	
C6	5pF	MLCC capacitor, NP0/C0G	
C7	2.2uF	Film capacitor, 7.2 x 5mm	
C8	10uF	Electrolytic capacitor, 5mm	
C9	10uF	Electrolytic capacitor, 5mm	
C10	100n	MLCC capacitor, X7R	
C11	100n	MLCC capacitor, X7R	
C12	100n	MLCC capacitor, X7R	Needs an additional jumper in v1.0 (fixed in v1.1). See build notes.
C13	100n	MLCC capacitor, X7R	
C14	47uF	Electrolytic capacitor, 5mm	
C15	100uF	Electrolytic capacitor, 6.3mm	

PARTS LIST, CONT.

PART	VALUE	TYPE	NOTES
C16	100n	MLCC capacitor, X7R	
D1	1N5817	Schottky diode, DO-41	
D2	1N914	Fast-switching diode, DO-35	
D3	1N914	Fast-switching diode, DO-35	
D4	1N914	Fast-switching diode, DO-35	
D5	1N914	Fast-switching diode, DO-35	
Z1	1N4743A	Zener diode, 13V, DO-41	
L1	10uH	Inductor, 10uH	
L2	10uH	Inductor, 10uH	
L3	10uH	Inductor, 10uH	
IC1	TL072	Operational amplifier, DIP8	
IC1-S	DIP-8 socket	IC socket, DIP-8	
IC2	JRC4558D	Operational amplifier, DIP8	
IC2-S	DIP-8 socket	IC socket, DIP-8	
DC1	TEC 2-0923	DC-DC converter, +9V to +/-15V	See build notes for alternatives.
LEVEL	100kB	16mm right-angle PCB mount pot	
BUFFER	SPDT	Toggle switch, SPDT on-on	
INPUT	DPDT on-on-on	Toggle switch, DPDT on-on-on	
OUT.	DPDT on-on-on	Toggle switch, DPDT on-on-on	
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

DC converter selection

There are several brands and models available, all with the same pinout and similar specifications. Here are the DC converters we've found that will work in this circuit.

BRAND	PART #	MOUSER #	SUPPLY	NOTES
Traco	TEC 2-0923	495-TEC2-0923	4.5-13.2V	Preferred option. More sources on Octopart.
CUI	PQMC3-D12-D15-S	490-PQMC3-D12-D15-S	9-18V	
XP Power	IZ1215S	209-IZ1215S	9-18V	
Recom	RS3-1215D	919-RS3-1215D	9-18V	
Mornsun	WRA1215S-3WR2	N/A	9-18V	NAC Semi: https://aionfx.com/link/mornsun/

The Traco TEC 2-0923 is preferred for this circuit because its supply voltage range (4.5V to 13.2V) is perfectly suited for any type of pedal power supply.

The other models all have a minimum supply voltage of 9V. Most nominally 9VDC adapters put out around 9.6V, which is more than enough—but one very notable exception is the Voodoo Labs Pedal Power series (and likely other similar pedalboard supplies) which regulate to exactly 9.00V.

These DC converter modules are usually specced very conservatively, so it's very unlikely that there would be any issues even if the supply voltage was slightly lower than 9V. However, operating on the extreme lower end of a spec is not ideal from an engineering standpoint, so if we're going to point you to a specific module, it's going to be the one that works reliably in all use cases.

If you are using a standard wall-wart supply that puts out more than 9V, then all this is immaterial and any of the five units listed above will work the same. All significant specifications are the same aside from this input voltage range. We haven't tried all of them directly, but their datasheets indicate they will perform identically and they have the same pinout and physical dimensions.

This is fortunate, because most suppliers don't stock more than 20 or 30 of each type at a time. So while we recommend the Traco TEC 2-0923 as the best overall, it will likely not always be in stock, especially as we release more preamp projects with converters and more people are using them.

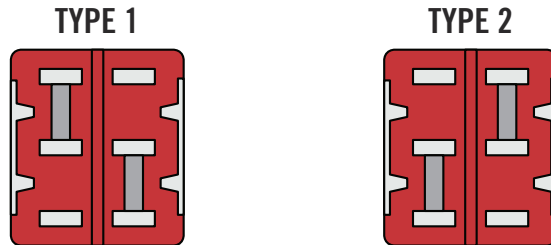
If you're having a hard time finding any that will work, try searching Octopart for the part number shown in the Part # column. Most of these brands are also carried by Digi-Key, Newark, and several other suppliers, and this engine will search all of the major distributors at once for easier sourcing.

The Mornsun unit is not available from Mouser, but it's included here because it's less than half the price of the others (USD\$5.87 as of the time of this writing) with the exact same specs. So if you need more than one, it quickly becomes much more cost-effective than the other options.

BUILD NOTES, CONT.

DPDT switch selection

The input and output attenuation switches are DPDT on-on-on toggles. For this type of switch, depending on the manufacturer, there are two different types of configurations for the center position, which are as follows:



The Eclipse requires the **Type 2** configuration, which is used by most major manufacturers such as Taiway. If you're considering a different brand, make sure to check the configuration of the center position. Many of the on-on-on switches sold by Tayda or Love My Switches are Type 1 and will not work.

C12 jumper

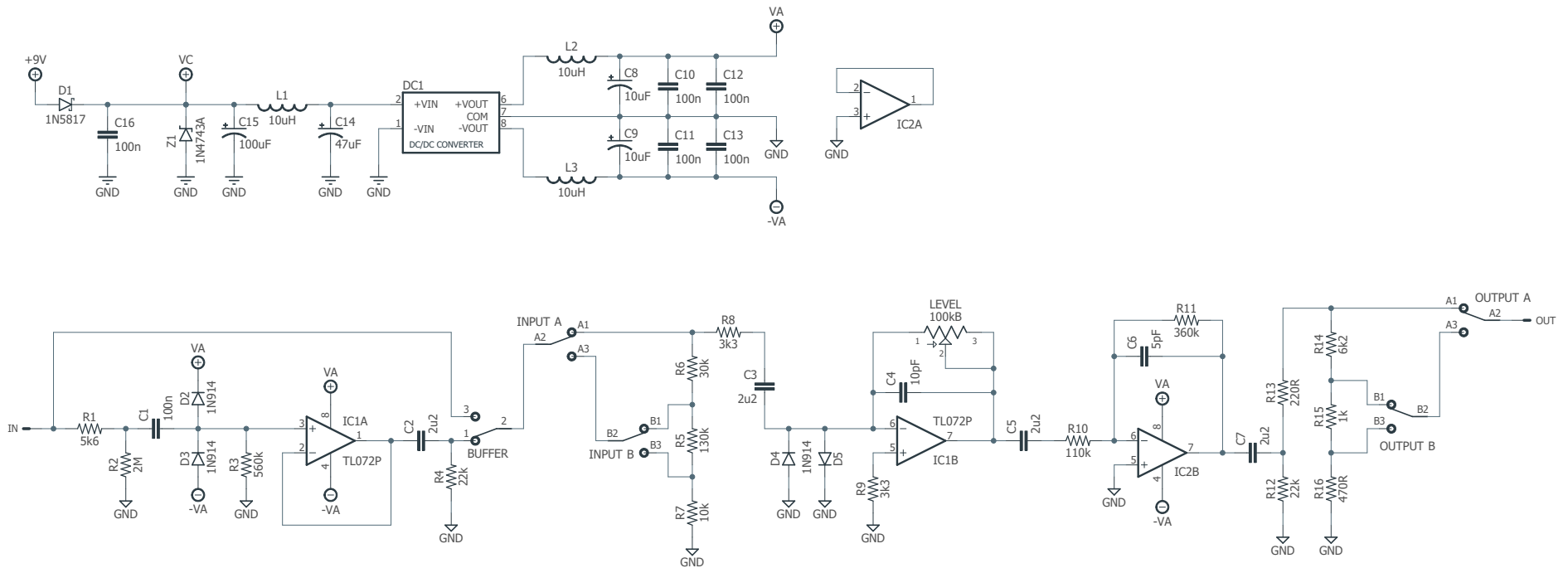
The first run of Eclipse PCBs has a very minor error: the left leg of C12 (relative to the top of the PCB) should be connected to ground, but doesn't connect to anything. To fix this error, just run a jumper wire from the left pad of C12 to the left pad of C13, immediately above it, which is grounded.

It's easiest to do this on the underside of the PCB after the components have been soldered, in which case it would be the right leg instead of the left (the one closest to the edge).

If your PCB says "Eclipse v1.1" then this fix is not necessary.

This capacitor is not critical to the operation of the circuit and was just added for some additional power filtering for IC2, so if it's not corrected nothing bad will happen. But if it's there, you may as well ensure it's connected properly.

SCHEMATIC



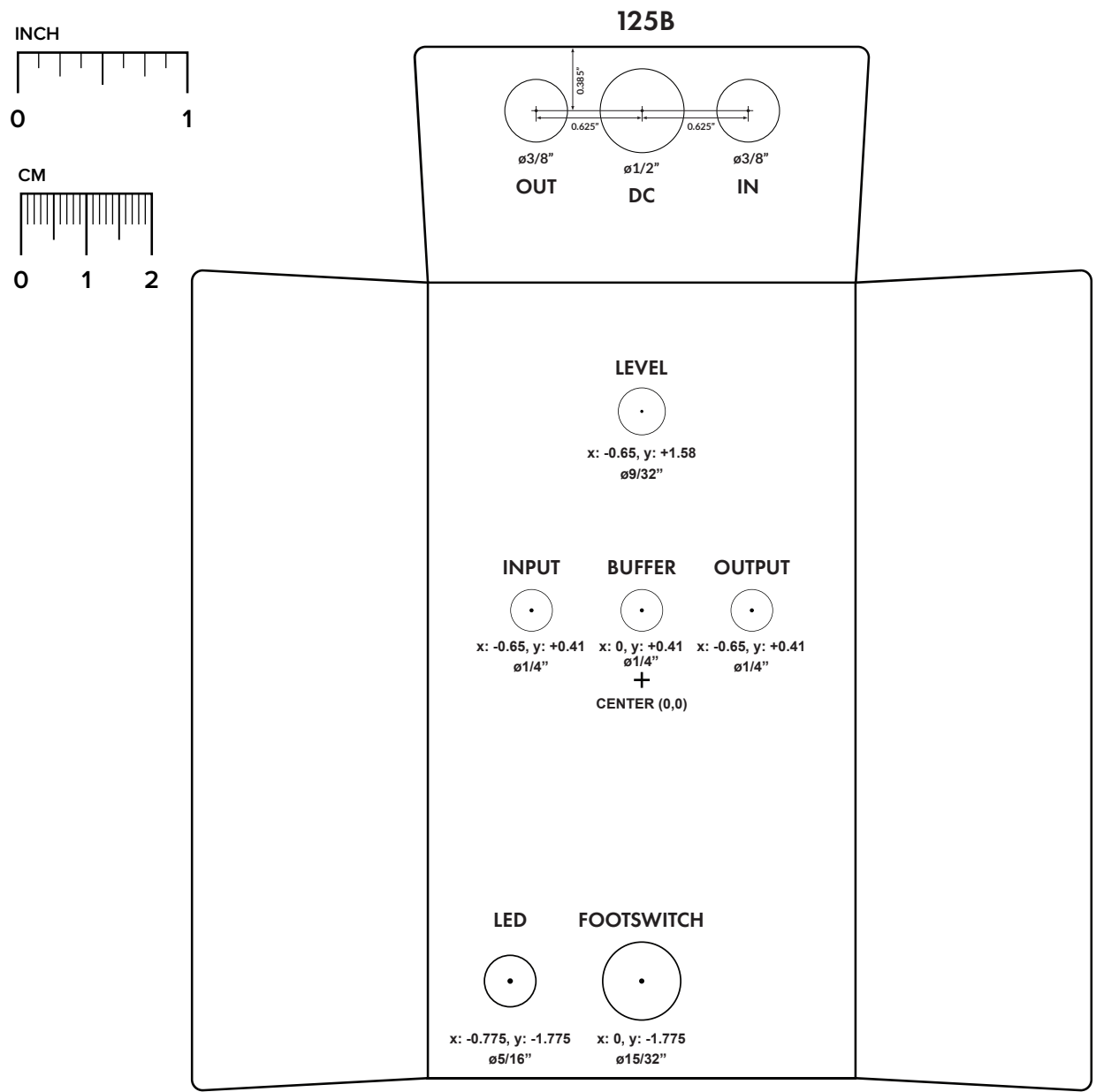
DRILL TEMPLATE

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.

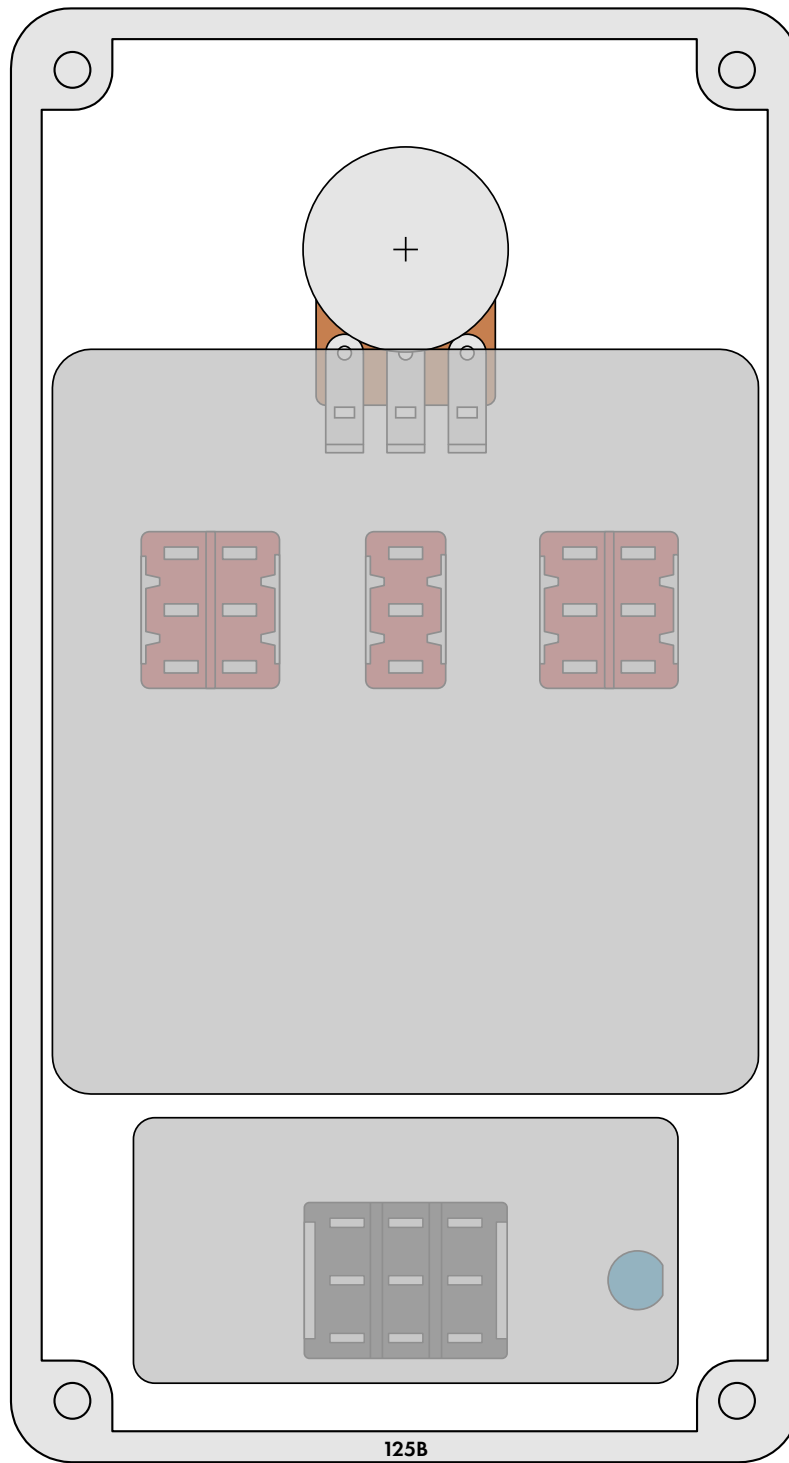
Top jack layout assumes the use of closed-frame jacks like the [Switchcraft 111X](#). If you'd rather use open-frame jacks, please refer to the Open-Frame Jack Drill Template for the top side.

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.

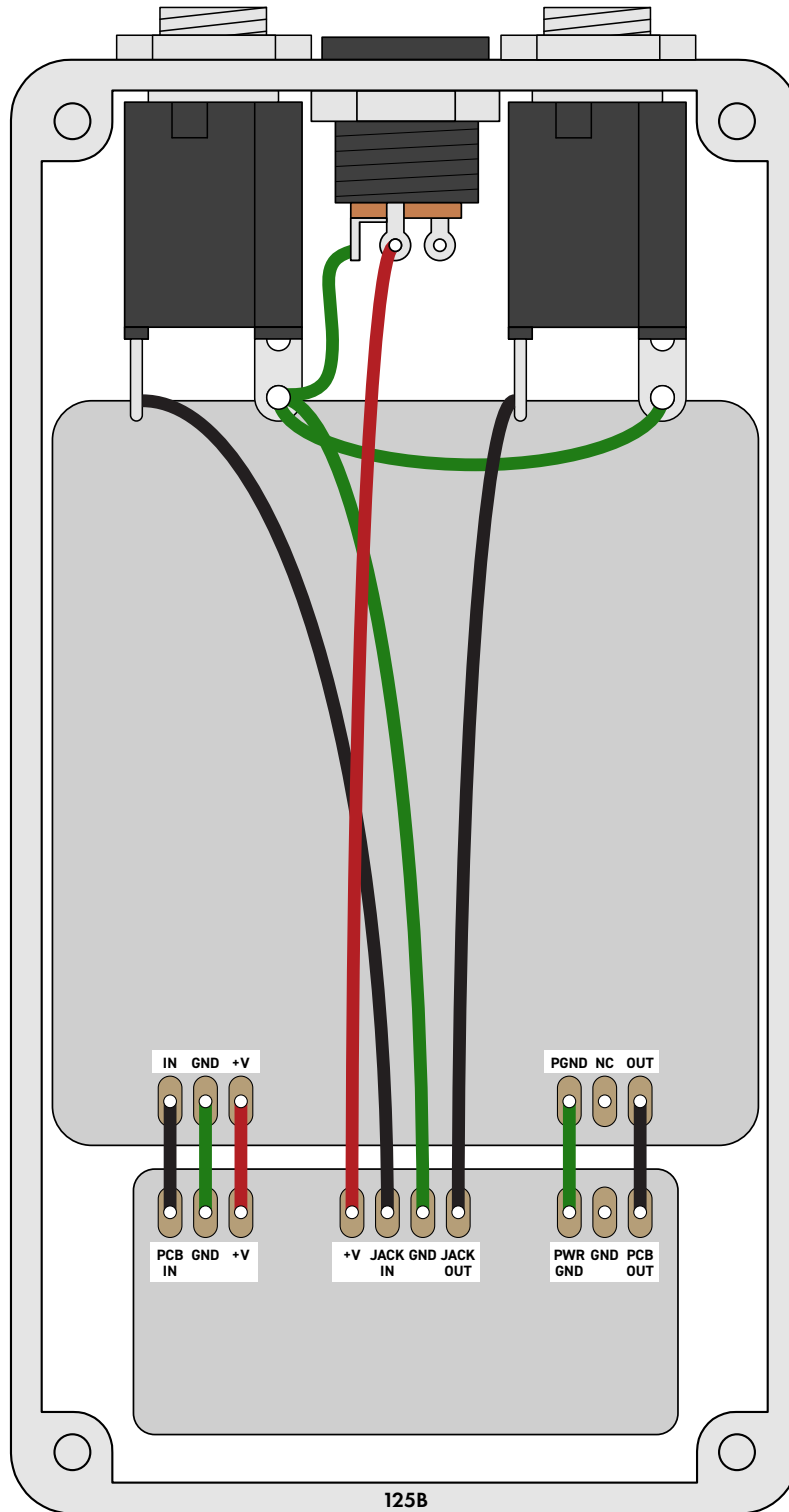


ENCLOSURE LAYOUT

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 (2022-04-08)

Initial release.