

PROJECT NAME

# MERIDIAN



BASED ON

PS-021 Guitar Exciter / Compressor

BUILD DIFFICULTY

■■■■□ Intermediate

EFFECT TYPE

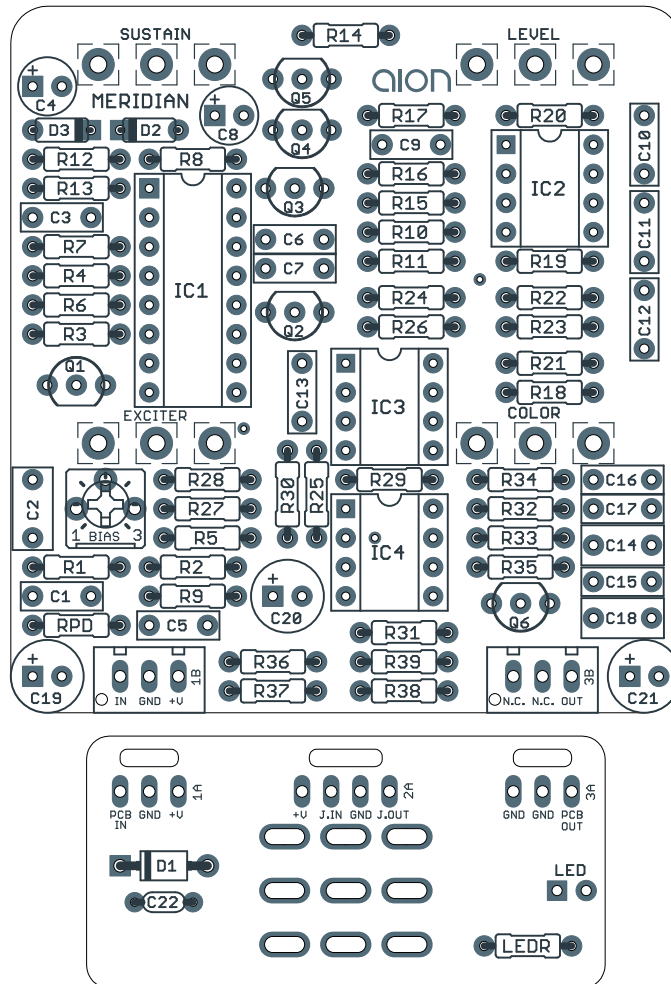
Compressor, frequency enhancer

DOCUMENT VERSION

1.0.0 (2019-08-31)

## PROJECT SUMMARY

A gem from the 1980s, this effect combines a Dyna-style compressor with an exciter that enables control over the even & odd harmonics.



Actual size is 2.3" x 2.43" (main board) and 1.78" x 0.86" (bypass board).

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## INTRODUCTION

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The Meridian Exciter/Compressor is a clone of the Guyatone (Nady in the USA) PS-021 Guitar Exciter / Compressor and its cousin, the PS-020 Bass Exciter / Compressor.

The PS-021 can be looked at as three distinct circuits chained together. First is the classic Dyna Comp, nearly a direct copy but with somewhat reduced sensitivity on the Sustain control, so its use is more as a limiter than a sustainer.

The following stage is an exciter, which is very similar to a circuit from a Japanese electronics book in the 1980s (and not unlike the BBE Sonic Stomp, but with no frequency-specific control).

The last stage is a Big Muff-style tone control that pans between a bass emphasis and treble emphasis. However, unlike the BMP's classic mid-scoop, there is a very slight mid hump throughout the rotation.

So while it's composed of familiar circuits, the end result is, as they say, more than the sum of its parts. This is a killer tone enhancer that still enjoys revered status with many, but flies under the radar since it doesn't have an association with any big-name artists or records.

The PS-020 is the bass version. The circuit is identical to the PS-021 except for five parts that have been changed in the exciter and tone control to make the frequencies more suitable for bass. It also changes the tone control to bring back the mid-scoop frequency curve, more similar to the Big Muff.

The Meridian is a direct clone of the original PS-021 and PS-020 except for two changes. First, it's been converted to true bypass and the JFET switching has been removed. Second, the obsolete CA3080 chip has been replaced by the current-production LM13700, which performs identically.

## USAGE

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The Meridian has the following controls:

- **Sustain** sets the compression threshold and amount of sustain, from subtle limiting to squish.
- **Exciter** increases the emphasis on harmonics. At 50%, there is no change. When turned to the left, even-order harmonics are increased. To the right, odd-order harmonics are increased.
- **Color** is a tone control that pans between bass boost and treble boost.
- **Level** is the output volume control.

## 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	10k	Metal film resistor, 1/4W	
R4	1M	Metal film resistor, 1/4W	
R5	470k	Metal film resistor, 1/4W	
R6	15k	Metal film resistor, 1/4W	
R7	1M	Metal film resistor, 1/4W	
R8	560k	Metal film resistor, 1/4W	PS-020 uses 470k here.
R9	150k	Metal film resistor, 1/4W	
R10	10k	Metal film resistor, 1/4W	
R11	10k	Metal film resistor, 1/4W	
R12	1M	Metal film resistor, 1/4W	
R13	1M	Metal film resistor, 1/4W	
R14	150k	Metal film resistor, 1/4W	
R15	10k	Metal film resistor, 1/4W	
R16	47k	Metal film resistor, 1/4W	
R17	39k	Metal film resistor, 1/4W	PS-020 uses 43k here.
R18	10k	Metal film resistor, 1/4W	
R19	10k	Metal film resistor, 1/4W	
R20	10k	Metal film resistor, 1/4W	
R21	4k7	Metal film resistor, 1/4W	
R22	10k	Metal film resistor, 1/4W	
R23	1k	Metal film resistor, 1/4W	
R24	10k	Metal film resistor, 1/4W	
R25	10k	Metal film resistor, 1/4W	
R26	22k	Metal film resistor, 1/4W	
R27	10k	Metal film resistor, 1/4W	
R28	10k	Metal film resistor, 1/4W	
R29	33k	Metal film resistor, 1/4W	
R30	33k	Metal film resistor, 1/4W	

## PARTS LIST, CONT.

PART	VALUE	TYPE	NOTES
R31	100k	Metal film resistor, 1/4W	
R32	10k	Metal film resistor, 1/4W	
R33	10k	Metal film resistor, 1/4W	
R34	1M	Metal film resistor, 1/4W	
R35	10k	Metal film resistor, 1/4W	
R36	10k	Metal film resistor, 1/4W	
R37	5k6	Metal film resistor, 1/4W	
R38	33k	Metal film resistor, 1/4W	
R39	33k	Metal film resistor, 1/4W	
RPD	2M2	Metal film resistor, 1/4W	
LEDR	4k7	Metal film resistor, 1/4W	
C1	10n	Film capacitor, 7.2 x 2.5mm	
C2	1uF	Film capacitor, 7.2 x 3.5mm	
C3	10n	Film capacitor, 7.2 x 2.5mm	
C4	1uF	Electrolytic capacitor, 4mm	
C5	1n	Film capacitor, 7.2 x 2.5mm	
C6	10n	Film capacitor, 7.2 x 2.5mm	
C7	10n	Film capacitor, 7.2 x 2.5mm	
C8	10uF	Electrolytic capacitor, 5mm	
C9	100n	Film capacitor, 7.2 x 2.5mm	
C10	33n	Film capacitor, 7.2 x 2.5mm	PS-020 uses 68n here.
C11	2n2	Film capacitor, 7.2 x 2.5mm	PS-021 uses 4n7 here.
C12	33n	Film capacitor, 7.2 x 2.5mm	
C13	22n	Film capacitor, 7.2 x 2.5mm	
C14	1uF	Film capacitor, 7.2 x 3.5mm	
C15	22n	Film capacitor, 7.2 x 2.5mm	
C16	10n	Film capacitor, 7.2 x 2.5mm	PS-020 uses 100n here.
C17	220n	Film capacitor, 7.2 x 2.5mm	
C18	1uF	Film capacitor, 7.2 x 3.5mm	
C19	100uF	Electrolytic capacitor, 6.3mm	Power supply filter capacitor.
C20	47uF	Electrolytic capacitor, 5mm	Reference voltage filter capacitor.
C21	47uF	Electrolytic capacitor, 5mm	Reference voltage filter capacitor.
C22	100n	MLCC capacitor, X7R	Power supply filter capacitor.

## PARTS LIST, CONT.

PART	VALUE	TYPE	NOTES
D1	1N5817	Schottky diode, DO-41	
D2	1N914	Fast-switching diode, DO-35	
D3	1N914	Fast-switching diode, DO-35	
Q1	2N5088	BJT transistor, NPN, TO-92	
Q2	2N5088	BJT transistor, NPN, TO-92	
Q3	2N5088	BJT transistor, NPN, TO-92	
Q4	2N5088	BJT transistor, NPN, TO-92	
Q5	2N5088	BJT transistor, NPN, TO-92	
Q6	2N5088	BJT transistor, NPN, TO-92	
IC1	LM13700N	Transconductance amplifier, DIP16	
IC1-S	DIP16 socket	IC socket, DIP-16	
IC2	JRC4558D	Operational amplifier, DIP8	
IC2-S	DIP-8 socket	IC socket, DIP-8	
IC3	JRC4558D	Operational amplifier, DIP8	
IC3-S	DIP-8 socket	IC socket, DIP-8	
IC4	JRC4558D	Operational amplifier, DIP8	
IC4-S	DIP-8 socket	IC socket, DIP-8	
SUST.	1MB	16mm right-angle PCB mount pot	
COLOR	100kB	16mm right-angle PCB mount pot	
EXC.	25kB	16mm right-angle PCB mount pot	
LEVEL	50kB	16mm right-angle PCB mount pot	
BIAS	2kB	Trimmer, 10%, 1/4" (Bourns 3362P)	
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

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### Bass version

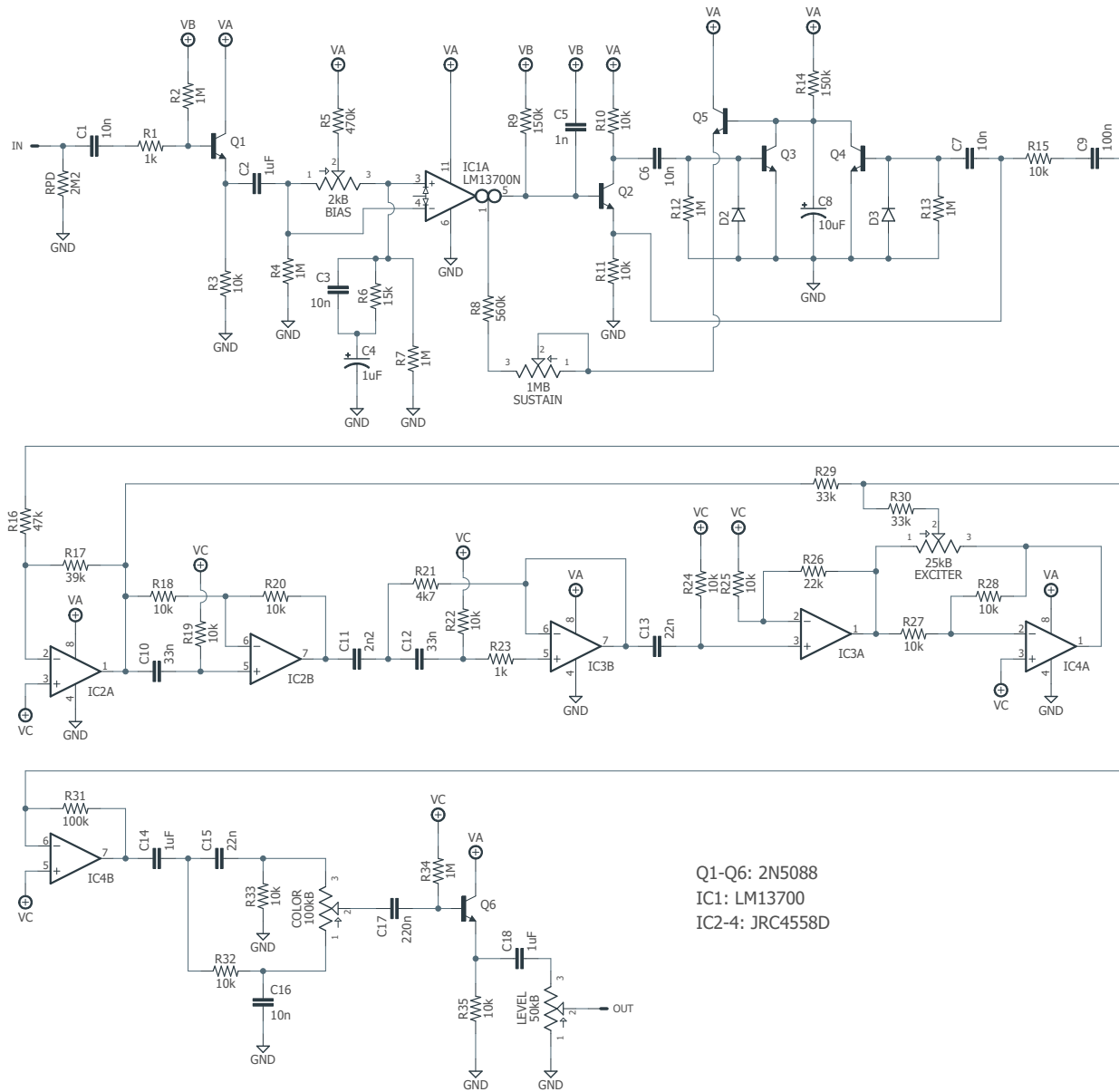
If you're building this for bass, the PS-020 version can be built by substituting the following five parts:

PART	PS-021 (GUITAR)	PS-020 (BASS)
R8	560k	470k
R17	39k	43k
C10	33n	68n
C11	2n2	4n7
C16	10n	100n

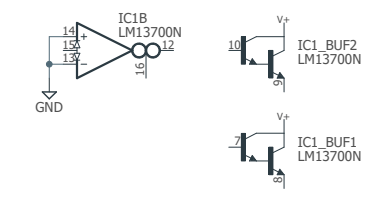
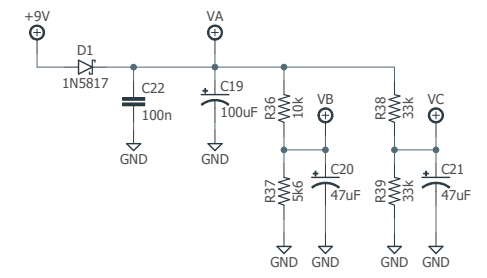
### Sustain modification

The compressor portion of the circuit is identical to the classic Ross / Dyna Comp circuit, except that the sustain control has more limited range in the PS-021. But, it can easily be modified to give a more Dyna-style effect. Change R8 to 27k and the Sustain pot to 500kC.

# SCHEMATIC



Q1-Q6: 2N5088  
 IC1: LM13700  
 IC2-4: JRC4558D



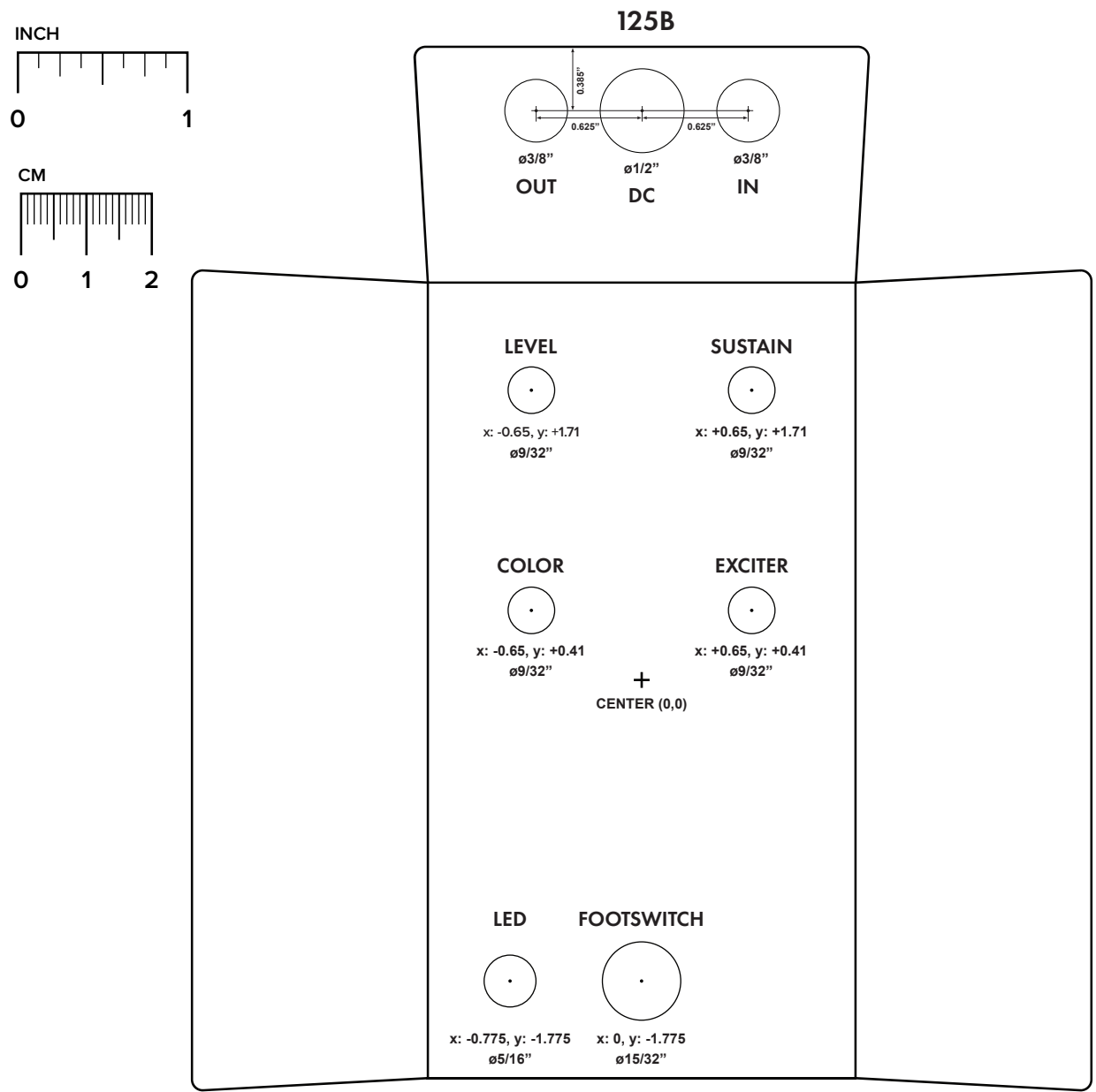
# DRILL TEMPLATE

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.

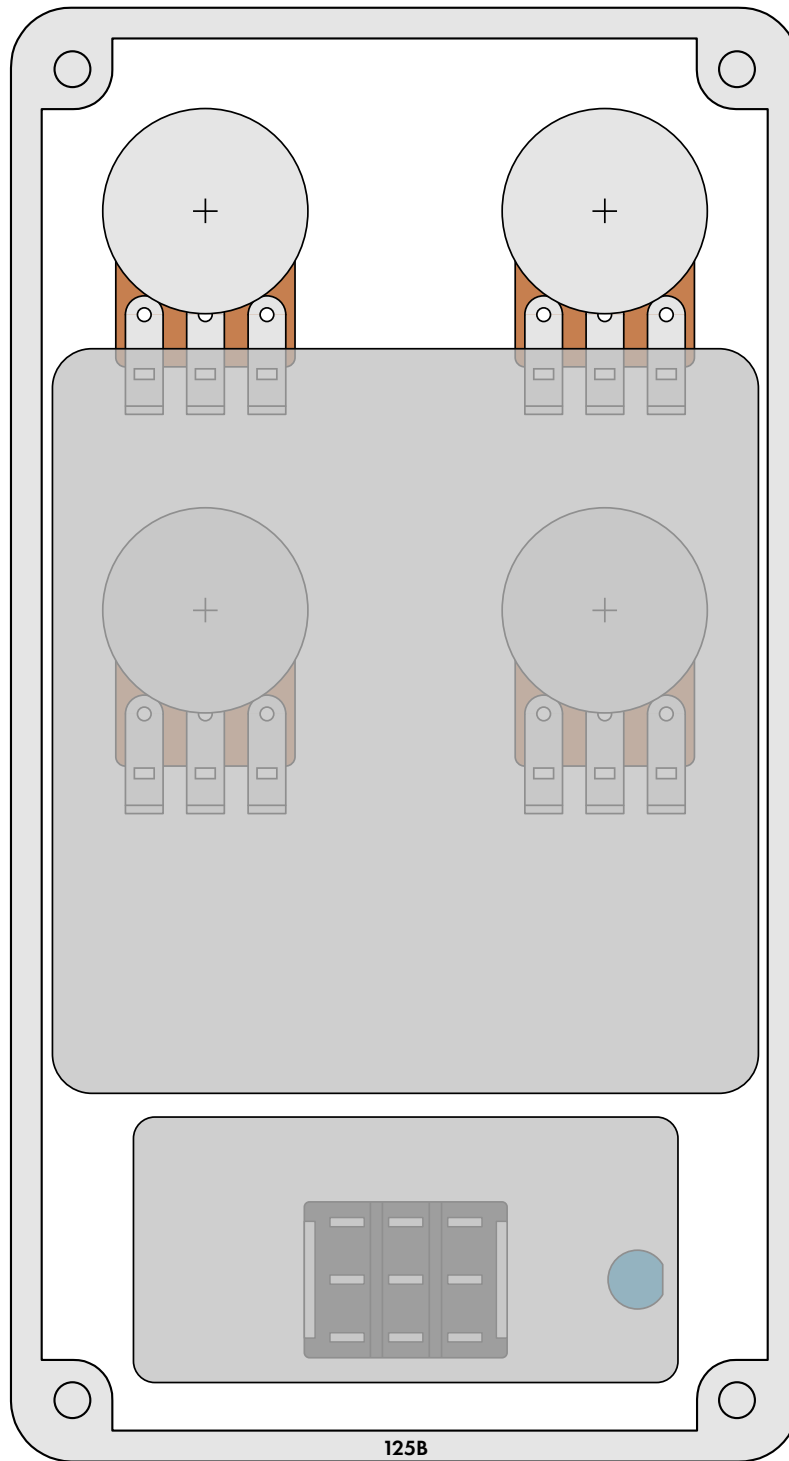




# ENCLOSURE LAYOUT

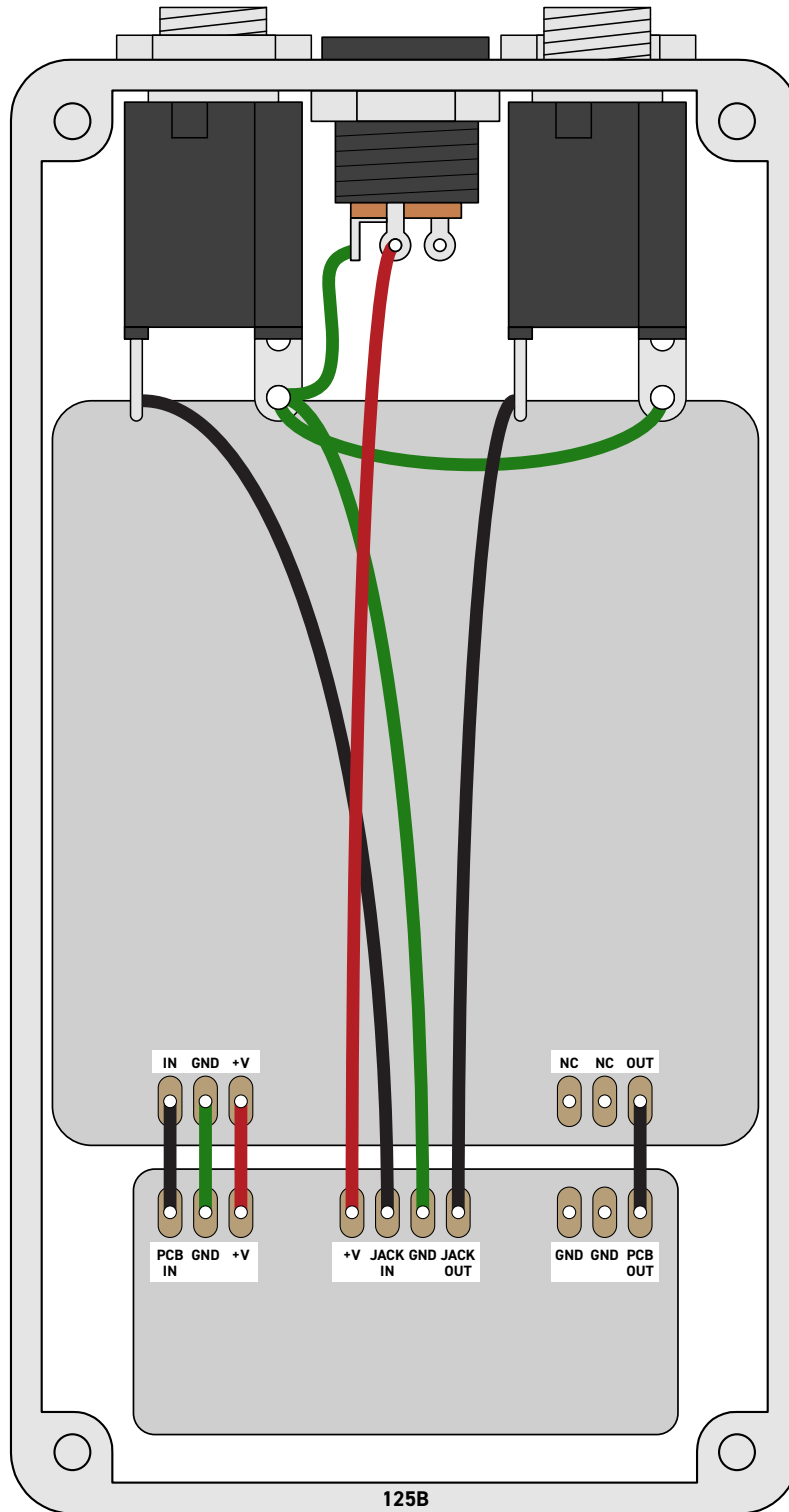
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Enclosure is shown without jacks. See next page for jack layout and wiring.



# WIRING DIAGRAM

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## LICENSE & USAGE

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**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

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### 1.0.0 (2019-08-31)

Initial release.