

PROJECT NAME

TRITON MK. III



BASED ON

Catalinbread® Dirty Little Secret V3

BUILD DIFFICULTY

■■■■□ Intermediate

EFFECT TYPE

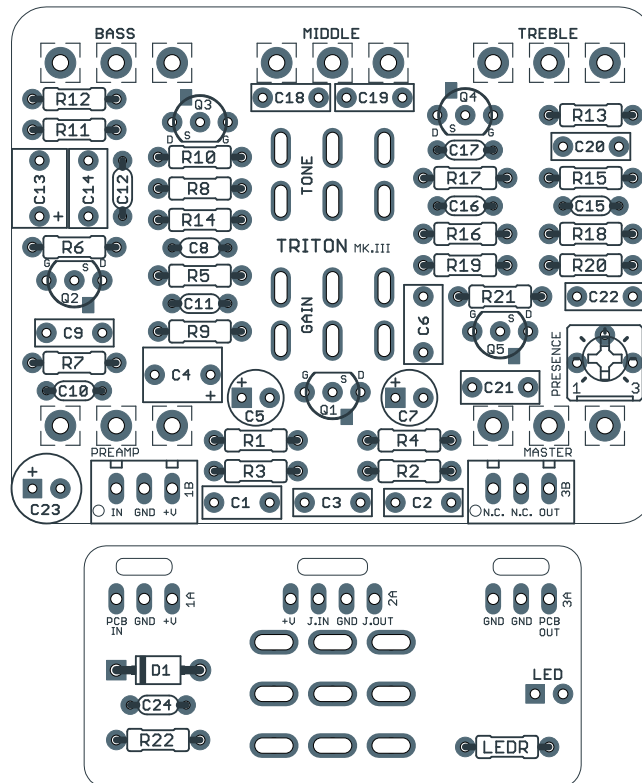
Overdrive / Amp Emulation

DOCUMENT VERSION

1.0.1 (2021-02-19)

PROJECT SUMMARY

An adaptation of the classic Marshall® amplifiers from the 1960s. It uses cascaded mu-amp stages in place of tubes for amp-like tone in a small box.



Actual size is 2.3" x 1.86" (main board) and 1.78" x 0.87" (bypass board).

IMPORTANT NOTE

This documentation is for the **Mk. III** version of the project. There is also a [Mk. II](#) version, based on the Dirty Little Secret Mk. II. While the name is similar, the circuit and part numbering are different. Please be sure your PCB is labeled "Triton Mk. III" before proceeding with this build document.

TABLE OF CONTENTS

1	Project Overview	7	Drill Template
2	Introduction & Usage	8	Enclosure Layout
3-4	Parts List	9	Wiring Diagram
5	Build Notes	10	Licensing
6	Schematic	10	Document Revisions

INTRODUCTION

The Triton Preamp Drive Mk. III is an adaptation of the Catalinbread Dirty Little Secret Mk. III, their “amp in a box” voiced with a Marshall amplifier in mind. This third version was released in early 2013.

The Formula 5F6, released a few months later in the summer of 2013, is the same circuit with several tweaks in part values to make it more like Fender’s tweed Bassman amplifier from the late 1950s (which was Jim Marshall’s source for the first Marshall amps). With the Triton PCB, you can build either the DLS or 5F6, as well as the hotter “Red” special edition of the DLS from 2019.

The production version of the DLS includes an internal slide switch to go between “Super Lead” and “Super Bass” modes. This slide switch has four poles, with two poles controlling the gain and two poles controlling the tone stack. The Triton splits this into two discrete toggle switches so you can switch the gain and tone stacks independently, e.g. the gain of the Super Bass but the tonestack of the Super Lead.

Like several other Catalinbread pedals, this circuit blurs the line between a preamp and an overdrive. Like a true preamplifier, it’s very reactive to what comes before it, so it’s best placed after other drive pedals but before modulation. However, it also generates more than enough drive on its own and can be used as a standalone overdrive pedal just like any other.

The original DLS Mk. III used MPF4393 JFETs, which are no longer produced. Aion FX sells the [original MPF4393](#) in sets of 5. The PCB also has an extra pad so that surface-mount JFETs can be used (part number MMBF4393), which are still in production and perform identically to those used in Catalinbread pedals. See build notes for more details.

The Triton Mk. III is compatible with the [18V Voltage Doubler / Bypass module](#) if you want to run the circuit at 18V without an external adapter. The higher voltage provides increased volume and clarity.

USAGE

The Triton Mk. III has the following controls:

- **Preamp** controls the amount of gain in the first amplifier stage.
- **Bass, Middle** and **Treble** form a 3-band Fender/Marshall-style tone stack.
- **Master** is the overall output level.
- **Presence** (internal trimmer) is a treble-cut control at the end of the circuit.
- **Gain** (toggle switch) selects between Super Lead and Super Bass gain stages.
- **Tone** (toggle switch) selects between Super Lead and Super Bass tone stack capacitor values.

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	470k	Metal film resistor, 1/4W	Formula 5F6: 680k
R2	33k	Metal film resistor, 1/4W	
R3	1M	Metal film resistor, 1/4W	Formula 5F6: 470k
R4	1k	Metal film resistor, 1/4W	Carbon comp in original, measured value 711R
R5	1k	Metal film resistor, 1/4W	DLS Red: 270R
R6	1M	Metal film resistor, 1/4W	
R7	1M	Metal film resistor, 1/4W	
R8	47k	Metal film resistor, 1/4W	
R9	470k	Metal film resistor, 1/4W	
R10	470k	Metal film resistor, 1/4W	
R11	680R	Metal film resistor, 1/4W	Carbon comp in original, measured value 560R Formula 5F6: 1k8 DLS Red: 1k
R12	1k	Metal film resistor, 1/4W	DLS Red: 270R
R13	1M	Metal film resistor, 1/4W	
R14	1M	Metal film resistor, 1/4W	
R15	100k	Metal film resistor, 1/4W	Formula 5F6: 33k DLS Red: 91k
R16	56k	Metal film resistor, 1/4W	
R17	33k	Metal film resistor, 1/4W	Formula 5F6: 100k
R18	1k	Metal film resistor, 1/4W	
R19	2M2	Metal film resistor, 1/4W	
R20	2M2	Metal film resistor, 1/4W	
R21	4k7	Metal film resistor, 1/4W	
R22	100R	Metal film resistor, 1/4W	
LEDR	4k7	Metal film resistor, 1/4W	LED current-limiting resistor. Adjust value to change LED brightness.
C1	220n	Film capacitor, 7.2 x 2.5mm	
C2	1n	Film capacitor, 7.2 x 2.5mm	
C3	2n2	Film capacitor, 7.2 x 2.5mm	Formula 5F6: 4n7 DLS Red: 100n
C4	2.2uF	Film capacitor, 7.2 x 5mm	Formula 5F6: 1uF Can also substitute electrolytic (polarity marked on PCB)
C5	22uF	Electrolytic capacitor, 5mm	DLS Red: 27uF
C6	680n	Film capacitor, 7.2 x 4.5mm	Formula 5F6: omit (C7 is used instead) DLS Red: 1uF

PARTS LIST, CONT.

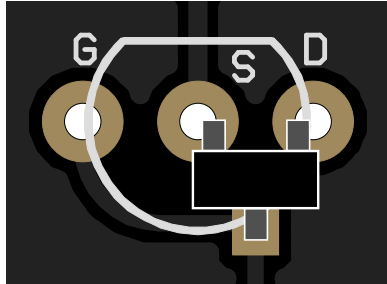
PART	VALUE	TYPE	NOTES
C7	(omit)		Formula 5F6: 4.7uF electrolytic
C8	220pF	MLCC capacitor, NP0/COG	
C9	22n	Film capacitor, 7.2 x 2.5mm	
C10	47pF	MLCC capacitor, NP0/COG	Formula 5F6: 100pF
C11	470pF	MLCC capacitor, NP0/COG	Formula 5F6: (omit)
C12	470pF	MLCC capacitor, NP0/COG	Formula 5F6: (omit)
C13	2.2uF	Film capacitor, 7.2 x 5mm	Formula 5F6: 1uF Can also substitute electrolytic (polarity marked on PCB)
C14	680n	Film capacitor, 7.2 x 4.5mm	Formula 5F6: 1uF DLS Red: 1uF
C15	470pF	MLCC capacitor, NP0/COG	Formula 5F6: 220pF
C16	270pF	MLCC capacitor, NP0/COG	Formula 5F6: 220pF
C17	470pF	MLCC capacitor, NP0/COG	
C18	22n	Film capacitor, 7.2 x 2.5mm	
C19	22n	Film capacitor, 7.2 x 2.5mm	
C20	22n	Film capacitor, 7.2 x 2.5mm	
C21	220n	Film capacitor, 7.2 x 2.5mm	
C22	10n	Film capacitor, 7.2 x 2.5mm	
C23	100uF	Electrolytic capacitor, 6.3mm	Power supply filter capacitor.
C24	100n	MLCC capacitor, X7R	Power supply filter capacitor.
D1	1N5817	Schottky diode, DO-41	
Q1	MMBF4393	JFET, N-channel, SOT-23	Substitute for MPF4393 (TO-92). See build notes.
Q2	MMBF4393	JFET, N-channel, SOT-23	Substitute for MPF4393 (TO-92). See build notes.
Q3	MMBF4393	JFET, N-channel, SOT-23	Substitute for MPF4393 (TO-92). See build notes.
Q4	MMBF4393	JFET, N-channel, SOT-23	Substitute for MPF4393 (TO-92). See build notes.
Q5	MMBF4393	JFET, N-channel, SOT-23	Substitute for MPF4393 (TO-92). See build notes.
PRE.	1MA	16mm right-angle PCB mount pot	
TREBLE	250kB	16mm right-angle PCB mount pot	
MID	25kB	16mm right-angle PCB mount pot	
BASS	1MA	16mm right-angle PCB mount pot	
MAST.	250kB	16mm right-angle PCB mount pot	
PRES.	10k trimmer	Trimmer, 10%, 1/4"	
GAIN	DPDT on-on	Toggle switch, DPDT on-on	
TONE	DPDT on-on	Toggle switch, DPDT on-on	
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.
FSW	3PDT	Stomp switch, 3PDT	
ENC	125B	Enclosure, die-cast aluminum	Can also use a Hammond 1590N1.

BUILD NOTES

Using SMD JFETs

The MPF4393 JFET is no longer available from the original manufacturer in through-hole format. This PCB uses a hybrid through-hole/SMD outline for each JFET. An extra “G” (gate) pad is included to accommodate the MMBF4393 surface-mount version without the need for adapters.

SMD JFETs should be oriented as follows:



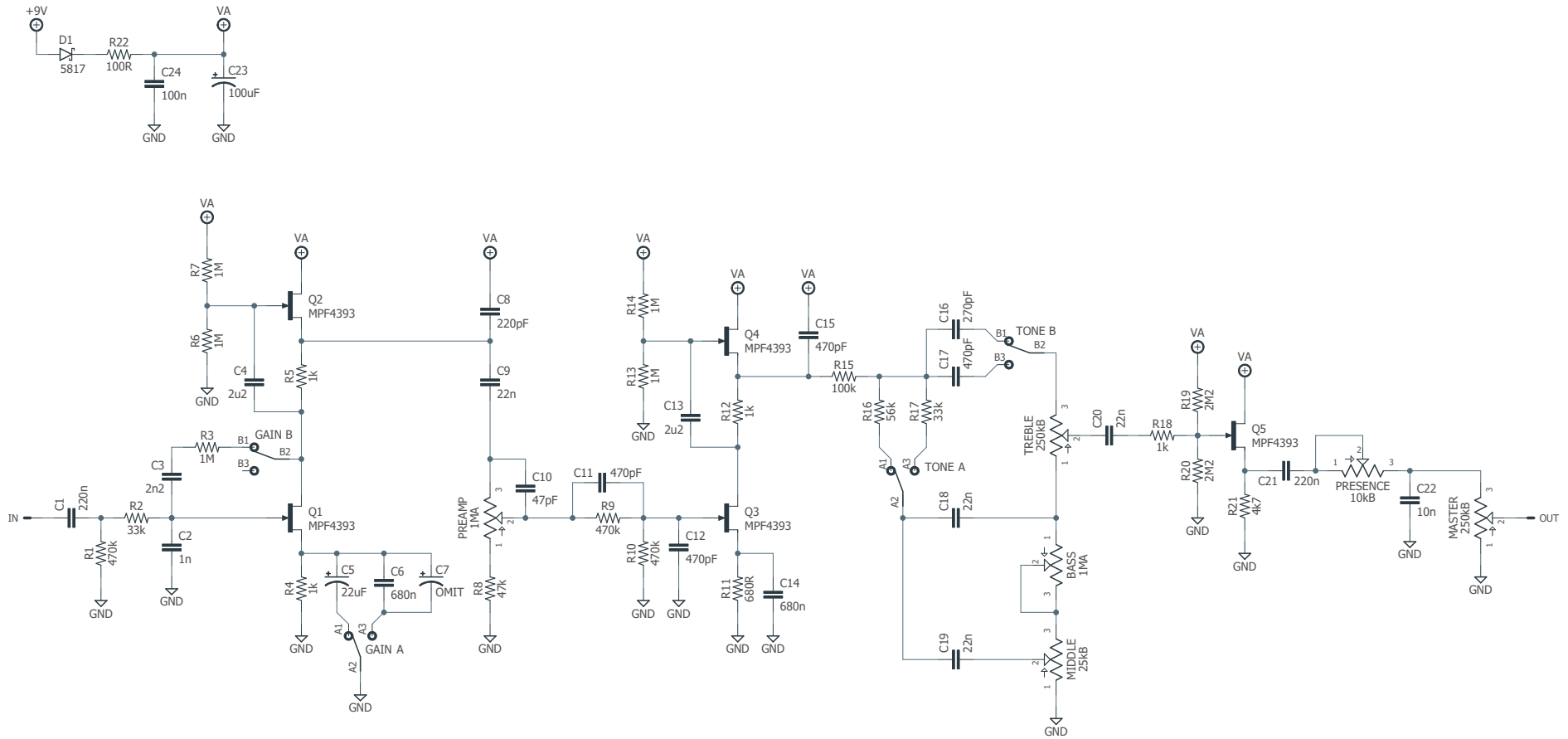
All surface-mount JFETs use the same pinout, so this configuration will fit any type that we're aware of. However, always check the datasheet if you're uncertain—they're difficult to desolder if you make a mistake.

MPF4393s from Aion FX

We have a large quantity of [through-hole MPF4393](#) and should be able to provide them in hobbyist quantities for the foreseeable future. They are available in sets of 5. They are manufactured by ON Semiconductor, the same as those used in the original Catalinbread pedal. They test in the same range and will perform identically.

SCHEMATIC

Schematic shown with original Dirty Little Secret Mk. III values.
Alternate values for DLS Red and Formula 5F6 can be found in the parts list.



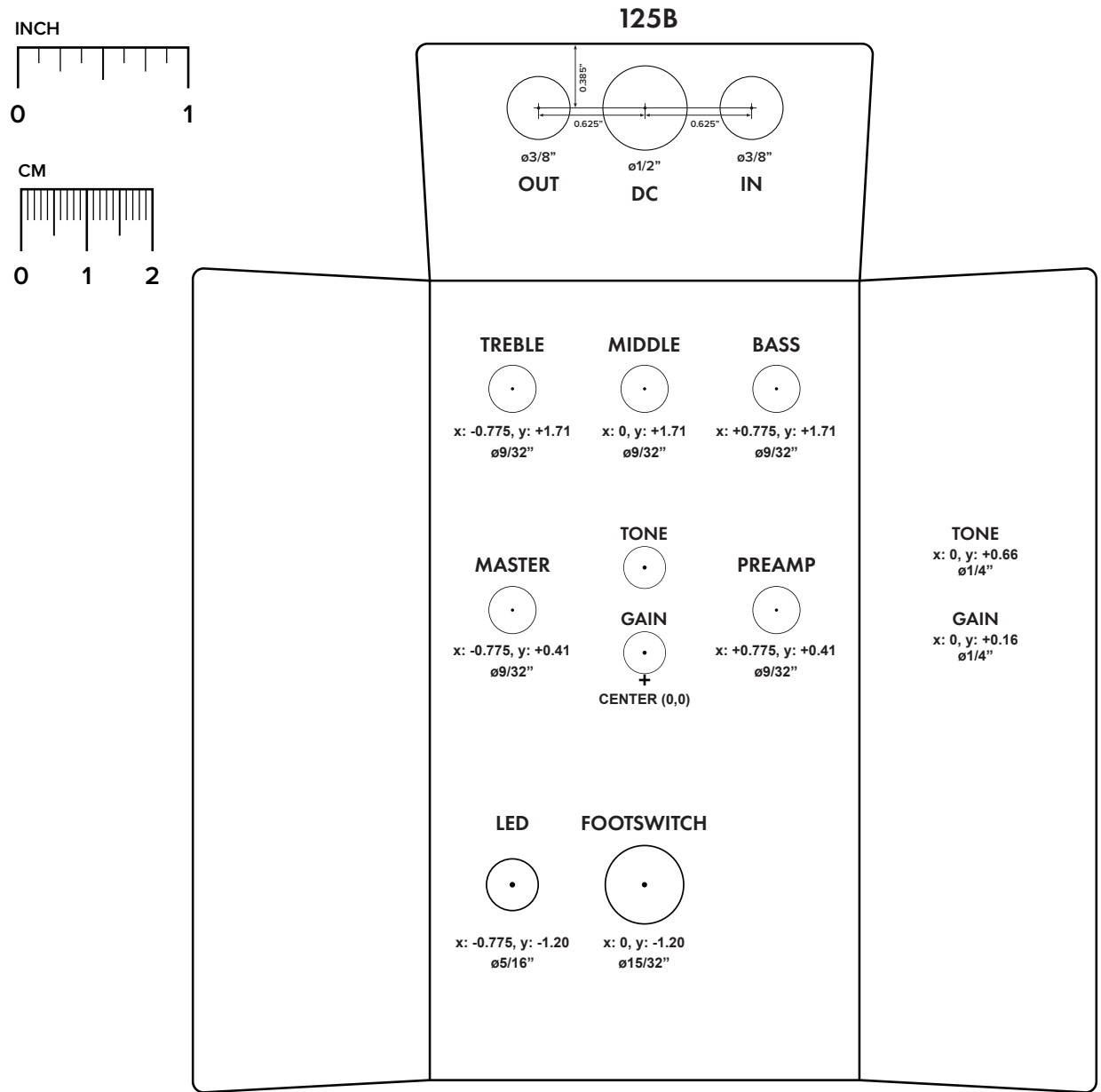
DRILL TEMPLATE

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.

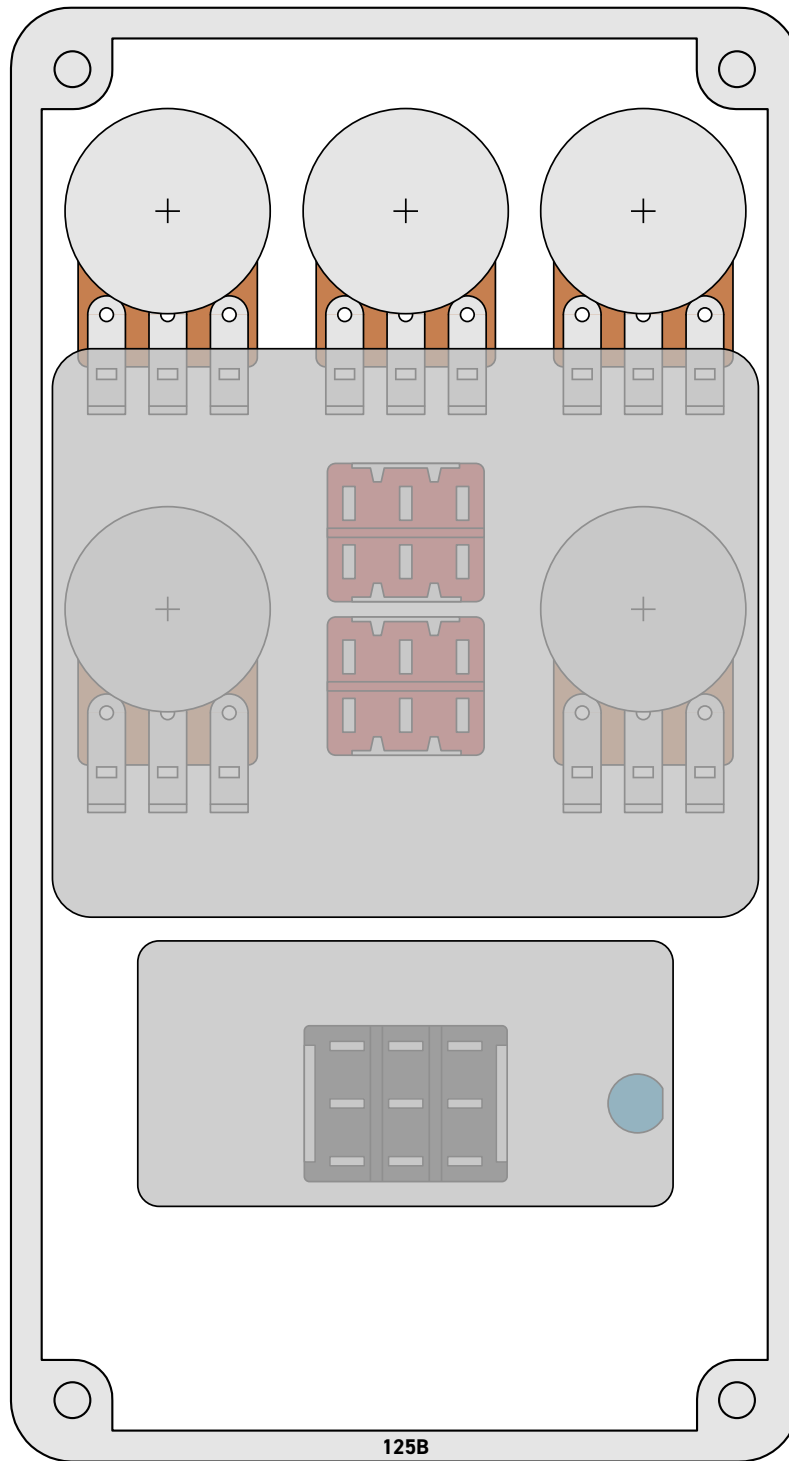
Top jack layout assumes the use of closed-frame jacks like the [Switchcraft 111X](#). Open-frame jacks will not fit in layouts with 5 or more knobs due to the placement of the DC jack.

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

1.0.1 (2021-02-19)

Corrected note about open-frame jacks (these are not compatible with 5-knob pedals).

1.0.0 (2020-11-27)

Initial release.