PROJECT NAME

TELLURION

aion
DIY GUITAR EFFECTS

BASED ON
Fulltone® Full-Drive® 1

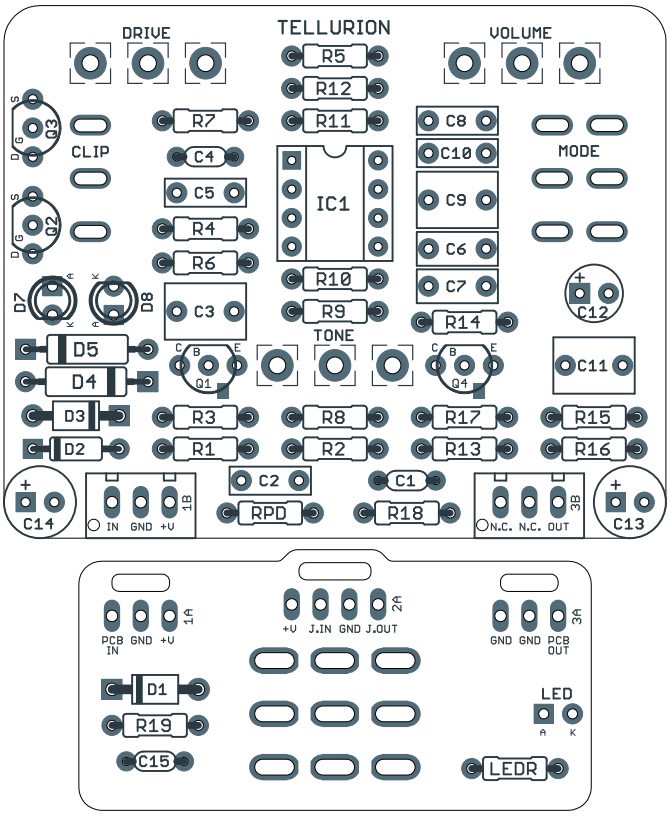
BUILD DIFFICULTY
Easy

EFFECT TYPE
Overdrive

DOCUMENT VERSION
1.0.0 (2026-07-03)

PROJECT SUMMARY

An adaptation of one of the original boutique pedals dating back to 1995, based on the classic Tube Screamer but with several hot-rodded additions.



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

TRADEMARK USAGE

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INTRODUCTION

The Tellurion Dynamic Drive is an adaptation of the Fulltone® Full-Drive 1, often abbreviated as the FD1. It was released in 2018 and traced by Aion FX in 2026.

The original Full-Drive was one of the first hand-made boutique pedals, dating all the way back to 1995. It was based on the classic Tube Screamer circuit, but with modified clipping diodes and a footswitch that engages a fixed gain boost.

The Full-Drive 1 is not actually a reissue of the original Full-Drive, but instead a new product that is essentially a single-channel FD2 with some tweaks to make it sound more like the late '90s units. It leaves off the Boost footswitch, but incorporates the 3-way Mode switch to get two extra settings in addition to the vintage Tube Screamer circuit.

The Tellurion project is an adaptation of the traced Full-Drive 1 with a few additions. The Mode switch is the same as the original, but we've added a Clipping switch to select between three different sets of clipping diodes. See build notes for options.

Note that while the initial product announcement makes reference to "Enhanced Bypass", the JFET bypass system first used in the OCD V2, the unit we traced was standard true bypass via a 3PDT switch. The user manual only mentions to true bypass, so it seems there was a last-minute change between the announcement and when it went into production.

USAGE

The Tellurion has the typical controls of a 3-knob overdrive:

- **Drive** controls the amount of gain.
- **Tone** controls the treble response by way of an active filter, boosting high frequencies to the right and cutting them to the left.
- **Volume** controls the overall output.

There are also two toggle switches:

- **Clip** (toggle switch) selects between three different clipping modes. Two of them are based on the Fulldrive 2 and can be tweaked for different variants of the Fulldrive 1, 2 and 3. The third position is LED clipping.
- **Mode** (toggle switch) selects between Vintage, Flat Mids and Comp Cut modes.

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	1k	Metal film resistor, 1/4W	
R2	510k	Metal film resistor, 1/4W	
R3	10k	Metal film resistor, 1/4W	
R4	10k	Metal film resistor, 1/4W	
R5	18k	Metal film resistor, 1/4W	
R6	4k7	Metal film resistor, 1/4W	
R7	1k	Metal film resistor, 1/4W	
R8	10k	Metal film resistor, 1/4W	
R9	220R	Metal film resistor, 1/4W	
R10	1k	Metal film resistor, 1/4W	
R11	150k	Metal film resistor, 1/4W	
R12	1k	Metal film resistor, 1/4W	
R13	510k	Metal film resistor, 1/4W	
R14	10k	Metal film resistor, 1/4W	
R15	100R	Metal film resistor, 1/4W	
R16	10k	Metal film resistor, 1/4W	
R17	10k	Metal film resistor, 1/4W	
R18	10k	Metal film resistor, 1/4W	
R19	47R	Metal film resistor, 1/4W	Power supply filter resistor.
RPD	1M	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.
C1	OMIT		10pF in FD2, empty in FD1. See build notes.
C2	22n	Film capacitor, 7.2 x 2.5mm	
C3	1uF	Film capacitor, 7.2 x 5mm	
C4	47pF	MLCC capacitor, NP0/C0G	
C5	68n	Film capacitor, 7.2 x 2.5mm	
C6	220n	Film capacitor, 7.2 x 3mm	
C7	220n	Film capacitor, 7.2 x 3mm	
C8	10n	Film capacitor, 7.2 x 2.5mm	
C9	1uF	Film capacitor, 7.2 x 5mm	
C10	100n	Film capacitor, 7.2 x 2.5mm	
C11	1uF	Film capacitor, 7.2 x 5mm	

PARTS LIST, CONT.

PART	VALUE	TYPE	NOTES
C12	10uF	Electrolytic capacitor, 5mm	
C13	47uF	Electrolytic capacitor, 5mm	Reference voltage filter resistor.
C14	100uF	Electrolytic capacitor, 6.3mm	Power supply filter resistor.
C15	100n	MLCC capacitor, X7R	Power supply filter resistor.
D1	1N5817	Schottky diode, DO-41	
D2	1N914	Fast-switching diode, DO-35	
D3	1N4007	Rectifier diode, DO-41	
D4	1N34A	Germanium diode, DO-7	Any germanium diode should work the same in this circuit, so use whatever you can find. See build notes for precautions about polarity.
D5	1N34A	Germanium diode, DO-7	
D7	3mm red	LED, 3mm, red diffused	
D8	3mm red	LED, 3mm, red diffused	
Q1	2N5088	BJT transistor, NPN, TO-92	Can also use BC549C (rotate 180 degrees from silkscreen).
Q2	2N7000	MOSFET, N-channel, TO-92	Can also use BS170 (rotate 180 degrees from silkscreen).
Q3	2N7000	MOSFET, N-channel, TO-92	Can also use BS170 (rotate 180 degrees from silkscreen).
Q4	2N5088	BJT transistor, NPN, TO-92	Can also use BC549C (rotate 180 degrees from silkscreen).
IC1	JRC4558D	Operational amplifier, DIP8	
IC1-S	DIP-8 socket	IC socket, DIP-8	
DRIVE	500kA	16mm right-angle PCB mount pot	
TONE	20kW	16mm right-angle PCB mount pot	Original uses 25kW, which is not available in small quantities from DIY suppliers. 20kW will perform the same.
VOL.	100kA	16mm right-angle PCB mount pot	
CLIP	SPDT cntr off	Toggle switch, SPDT on-off-on	
MODE	DPDT on-on-on	Toggle switch, DPDT on-on-on	Must be Type 2 configuration See build notes for a diagram.
LED	5mm	LED, 5mm, red diffused	
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	
BATT.	9V	9V battery snap	Soft vinyl type. The hard-shell type will not fit.
ENC	125B	Enclosure, die-cast aluminum	Can also use a Hammond 1590N1.

BUILD NOTES

Clipping options

The clipping switch selects between three combinations of clipping diodes. We've included space on the PCB for some of the combinations used in various Full-Drive units throughout the years.

The **first position** (toggle switch down) is based on the stock FD1 clipping, which is the same as the original Fulldrive. It has one 1N914 or 1N4148 in one direction and one rectifier diode (1N4001, 1N4004, 1N4007, etc.) in the other.

- **Variations:** Some versions of the FD2 have an additional rectifier diode in series with the D2 diode for more asymmetric clipping. One 2008 model had rectifier diodes for D2 and D4 and a germanium diode for D3.

The **second position** (toggle switch up) is based on the MOSFET clipping mode of the Full-Drive 2 MOSFET, which is the most well-known version of the circuit. Each side has one 2N7000 with another diode in series, either germanium or Schottky.

- **Variations:** Earlier units (e.g. 2008) used germanium for D5 and D6. Later units (e.g. 2014) used 1N5818 Schottky diodes, which test around the same as germaniums and should sound very similar. The FD2v2 (2018) used B130 diodes, which are SMD but nearly identical to the 1N5818.

The **third position** (toggle switch center) is LED clipping. This is not based on any Full-Drive unit, but is a common addition to Tube Screamer-based circuits. It gives a more open and transparent clipping tone, but retaining more crunch than the "Comp Cut" mode.

Germanium diodes

The Tellurion has space for two germanium diodes as part of the second clipping position. These days, the Russian D9 series are probably the most readily-available NOS germaniums, and will sound great in this circuit. But be aware that these Russian diodes have the stripe on the anode rather than the cathode, meaning they should be inserted backwards according to the PCB silkscreen.

This isn't an issue for circuits like the Klon or Distortion+ that just use two germanium diodes, since it's electronically identical whether they're both the right way or both backwards. However, since this circuit puts them in series with the MOSFETs, then if the germaniums are reversed in relation to the MOSFET polarity, the path to ground will be blocked and only half the waveform will be clipped.

If you're not sure what type of diode you have, it's always best to check the polarity using a multimeter to avoid a time-consuming mistake.

C1 capacitor

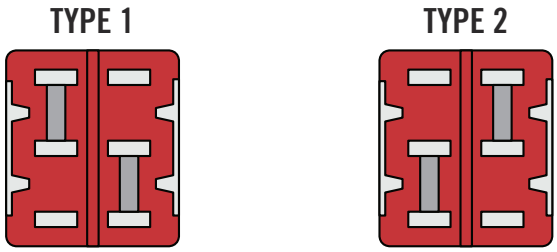
C1 is not present in the FD1, but it's in most versions of the FD2. It's a 10pF capacitor that is meant to prevent radio frequency interference that could be brought down to the audible range. It's not necessary in normal usage, but if you ever notice any issues with oscillation, particularly on high gain or treble levels, then you can see if this capacitor helps at all.

Mode switch operation

The Full-Drive 1 retains the Mode switch from the FD2. But, there is one crucial difference from the later MOSFET version: in the FD1, as in the earlier FD2s, the Comp Cut mode does not flatten the mids, whereas in the MOSFET version, Comp Cut also engages Flat Mids at the same time. (This is mentioned in the FD1 product copy from Fulltone, and we've confirmed that our traced unit is wired this way.)

Mode switch type

The Mode switch is a DPDT **on-on-on**, selecting between three different mode settings. For this type of on-on-on switch, there are two different configurations for the center position depending on the manufacturer, which are as follows:



The Tellurion requires the **Type 2** configuration, which is used by most major manufacturers such as Taiway. If you're considering a different brand, make sure you know the configuration of the center position. Many of the off-brand on-on-on switches such as the ones sold by Tayda Electronics are Type 1 and will not work in this circuit.

Tone pot value

The Tone pot is 25kW (W-taper) in the FD1 and in some later versions of the FD2. In earlier FD2 units, it was 25kB. The tone control is a direct copy of the one in the Tube Screamer, which uses 20kW potentiometers. This value is readily available from all DIY suppliers, but we've never seen a 25kW pot outside of this pedal.

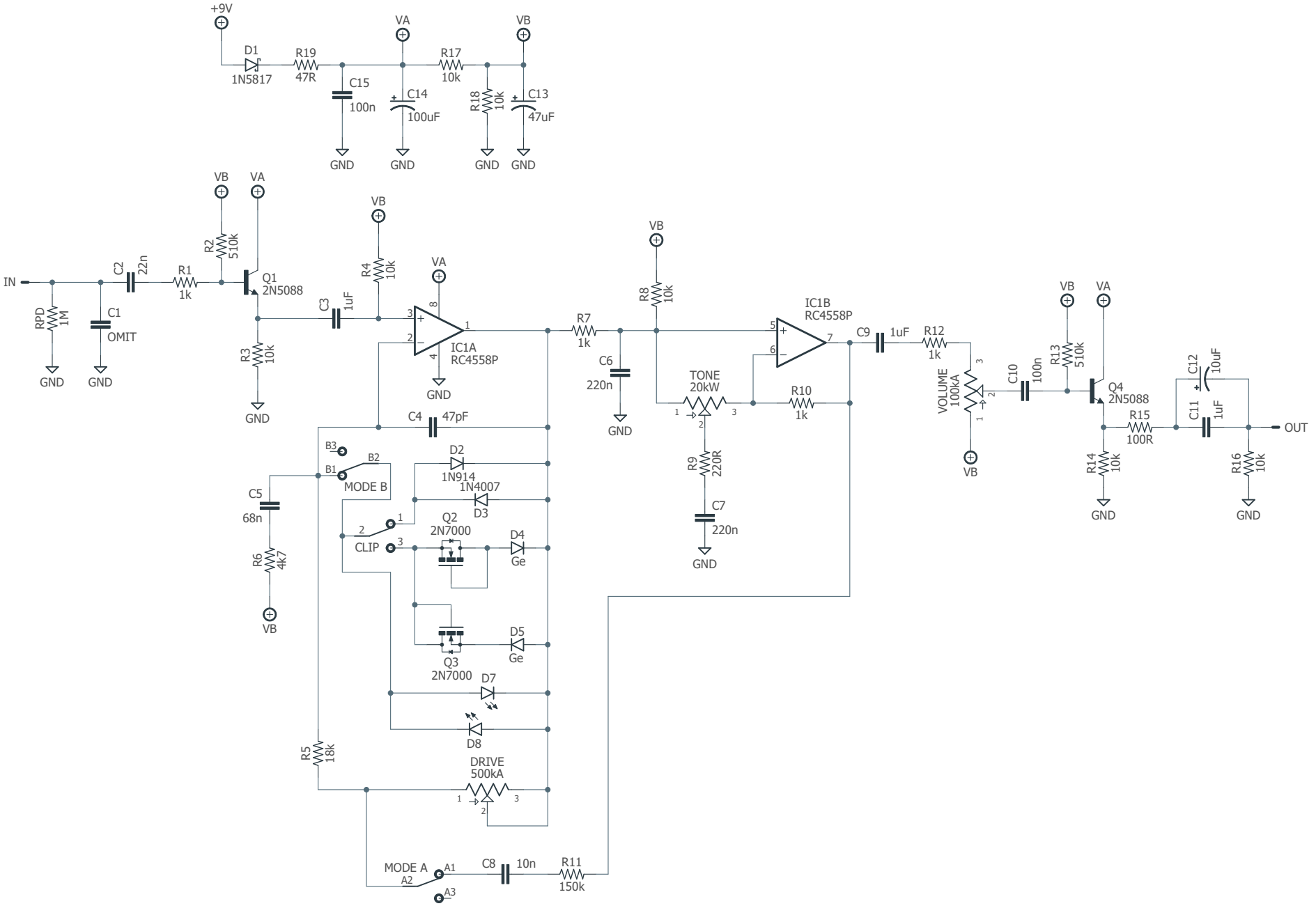
It is strongly recommended to use a 20kW pot for the tone control. The only difference is that it will have a tiny bit less range at either extreme of the rotation. If you do want the full range of the tone control, you can use a 25kB pot, but be aware that with linear taper, the adjustability will be much less smooth and a significant portion of the tonal change will happen between 11:00 and 1:00 on the control.

Drive pot value

The FD2 has two gain pots, one 500k and one 1M. They're in series, meaning the first gain control still affects the gain level in boost mode. With both controls all the way up, the total pot value is 1.5M.

The FD1 uses a single 500k potentiometer for the drive control, the same as the Tube Screamer and the non-boost mode of the FD2. If you want to have more gain available, you could increase this value to 1M. However, note that the higher pot value doesn't actually provide very much more audible gain since it's perceived logarithmically. The 1M pot also makes the lower end of the range harder to dial in. It's recommended to stick with 500k.

SCHEMATIC


+9V
D1
1N5817
R19
47R
C15
100n
VA
C14
100uF
R17
10k
R18
10k
VB
C13
47uF
GND
IN
C2
22n
R1
1k
RPD
1M
C1
OMIT
R2
510k
Q1
2N5088
R3
10k
C3
1uF
R4
10k
IC1A
RC4558P
R7
1k
C6
220n
R8
10k
TONE
20kW
R10
1k
R9
220R
C7
220n
IC1B
RC4558P
C9
1uF
R12
1k
VOLUME
100kA
C10
100n
R13
510k
Q4
2N5088
R15
100R
R14
10k
C12
10uF
C11
1uF
R16
10k
OUT
C4
47pF
B3
B2
B1
MODE B
D2
1N914
1N4007
D3
C5
68n
R6
4k7
Q2
2N7000
CLIP
D4
Ge
Q3
2N7000
D5
Ge
D7
D8
R5
18k
DRIVE
500kA
MODE A
A1
A2
A3
C8
10n
R11
150k

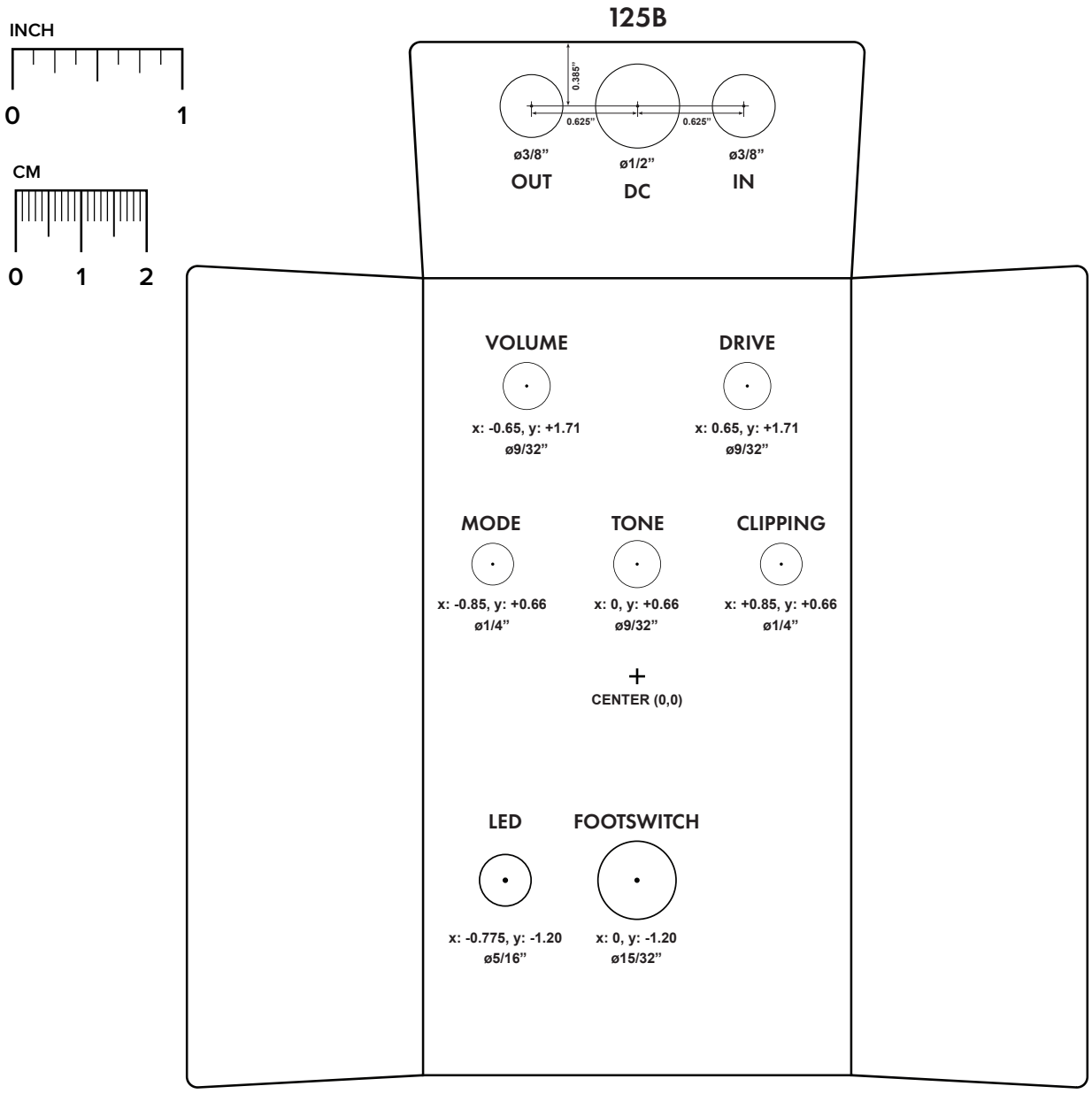
DRILL TEMPLATE

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.

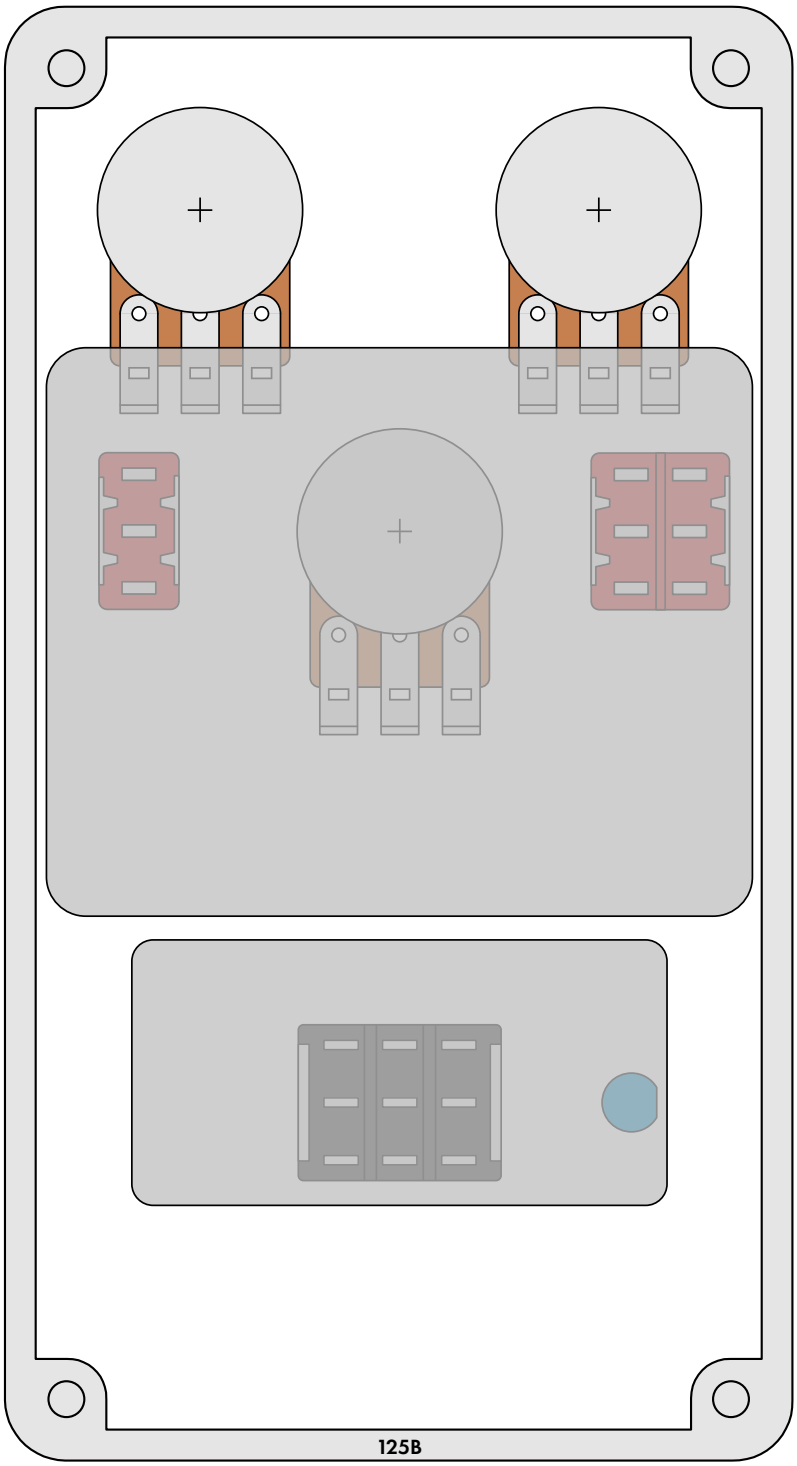
Top jack layout assumes the use of closed-frame jacks like the Switchcraft 111X. If you'd rather use open-frame jacks, please refer to the Open-Frame Jack Drill Template for the top side.

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.

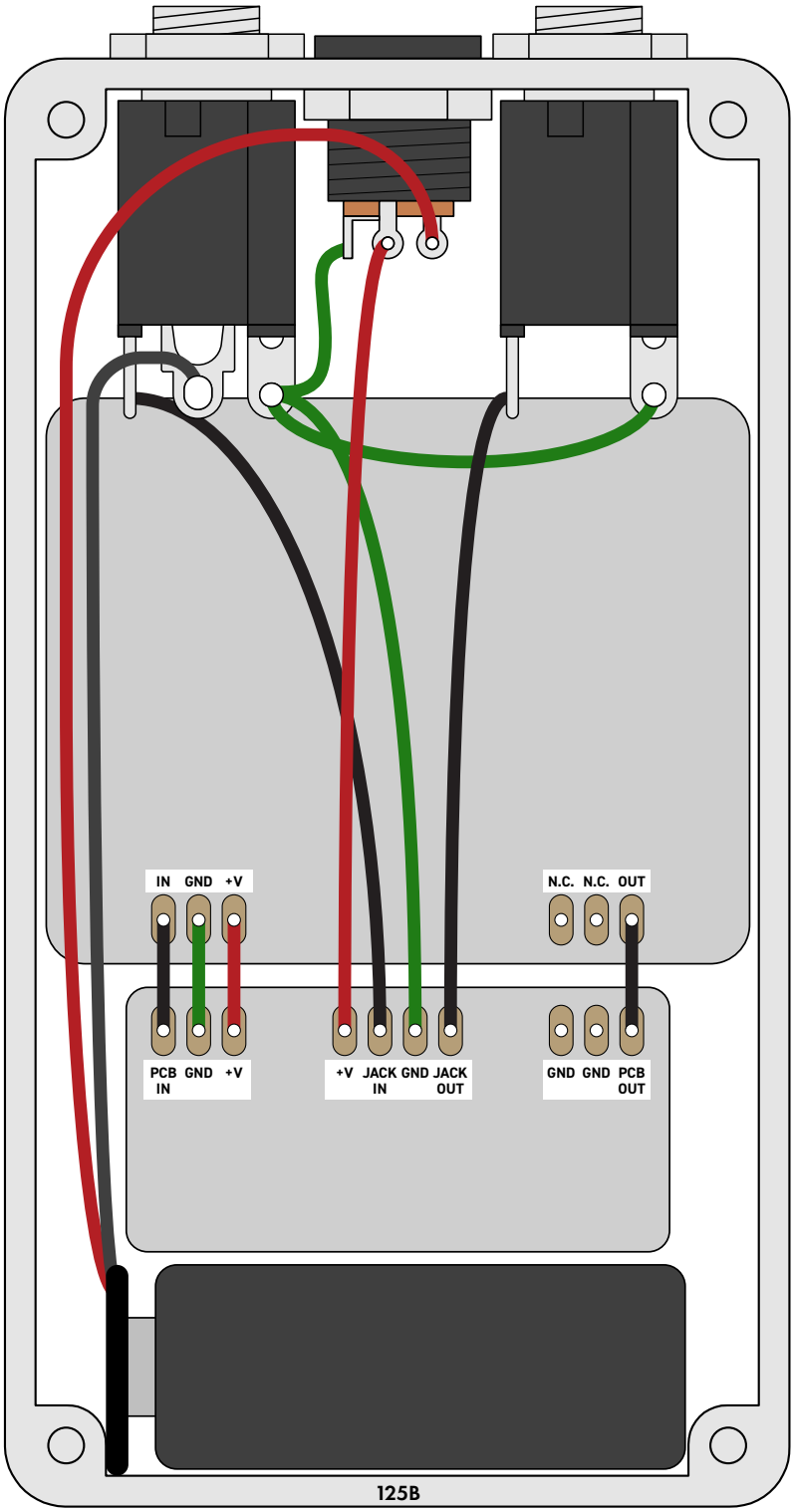


ENCLOSURE LAYOUT

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 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 (2026-07-03)
Initial release.