

# BLUESTEEL

## FX TYPE: Overdrive

Based on the Boss® BD-2™

Enclosure Size: 125B

Softie compatibility: Softie3

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## Overview

The **Blue Steel** is a faithful adaption of the Boss BD-2 overdrive. The BD-2 very much stands apart from its contemporaries by the use of differential pairs, dual-gang drive control and a gyrator for tone shaping. It produces a very unique timbre as compared to the same old IC-based overdrives that are a dime a dozen these days.

Unlike some other BD-2 projects, the Blue Steel incorporates all the original circuit elements including the input and output buffers and even the power supply filtering. Obviously, the flip-flop bypass circuitry has been left out for true bypass operation. It also adds a switch to select different amounts of low end (being that a lack of lows is a frequent complaint with the BD-2). Lastly, I have noted the changes needed to mod it to the Keeley specs. I recommend giving these a try. I liked how mine turned out!

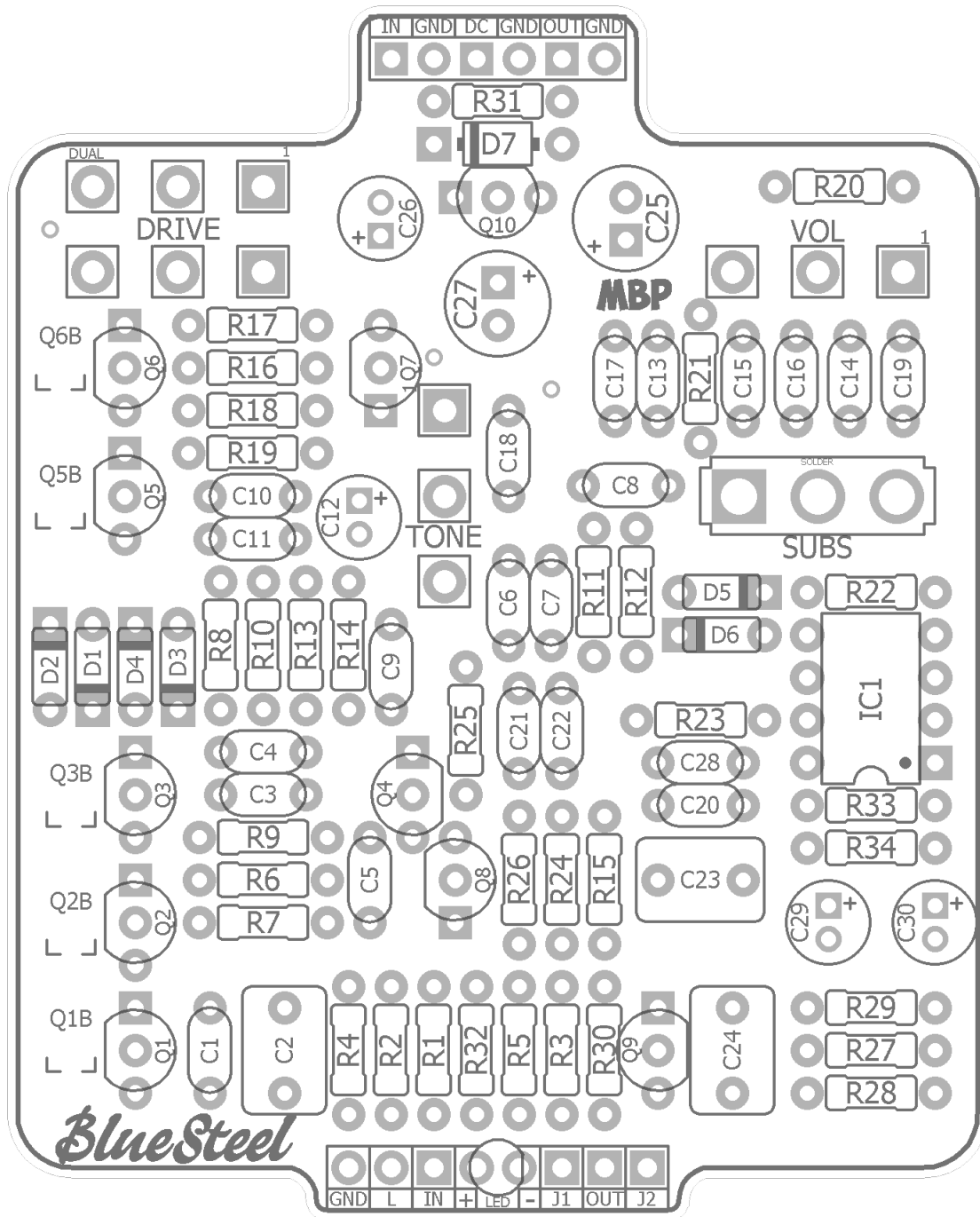
## Controls

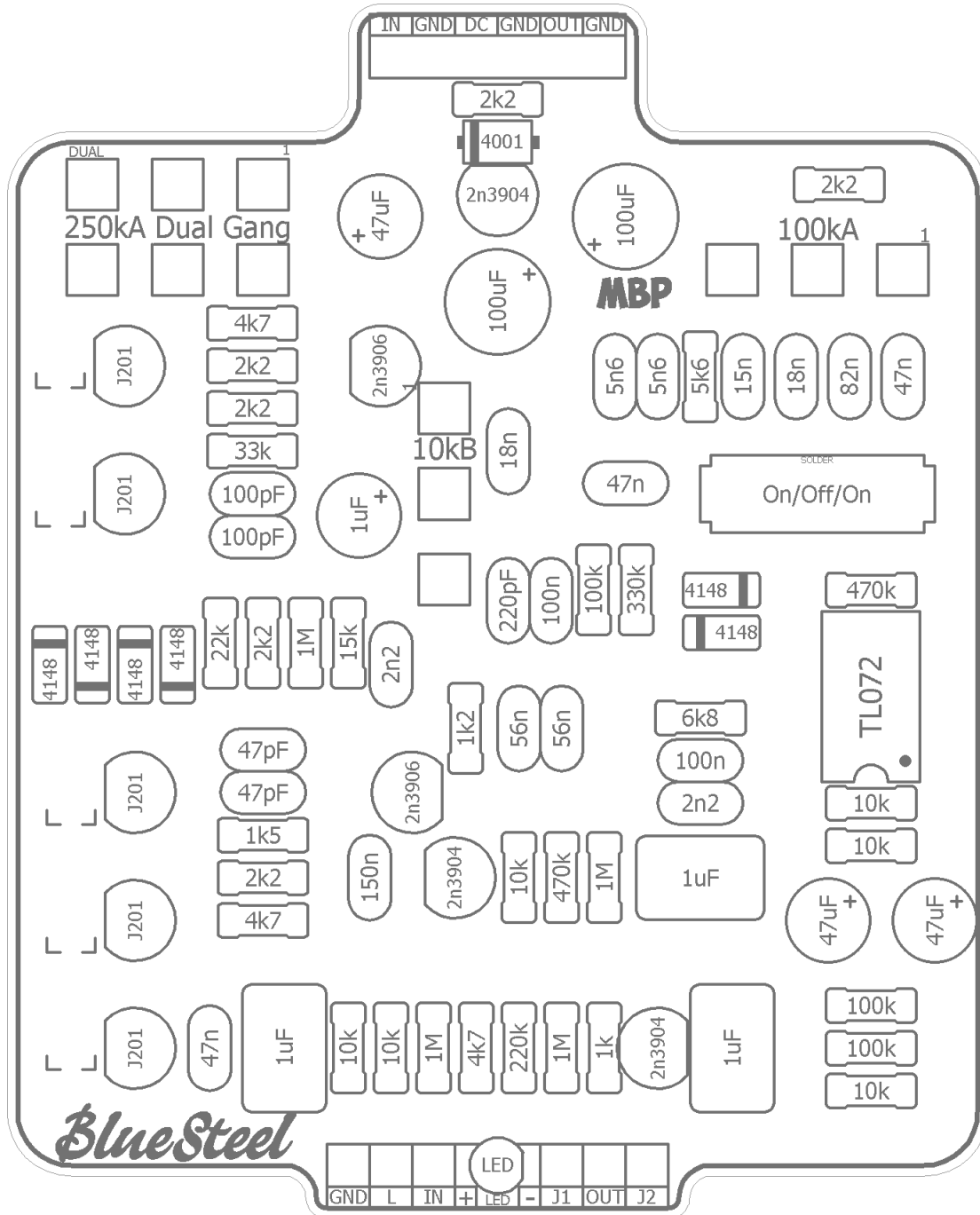
- **VOL, TONE, DRIVE** - As is typical with overdrives (in terms of function).
- **SUBS** - Selects between three preset low frequency ranges. The Middle position is the stock BD-2™ setting. Left is about twice as much bass and right is very sub heavy.

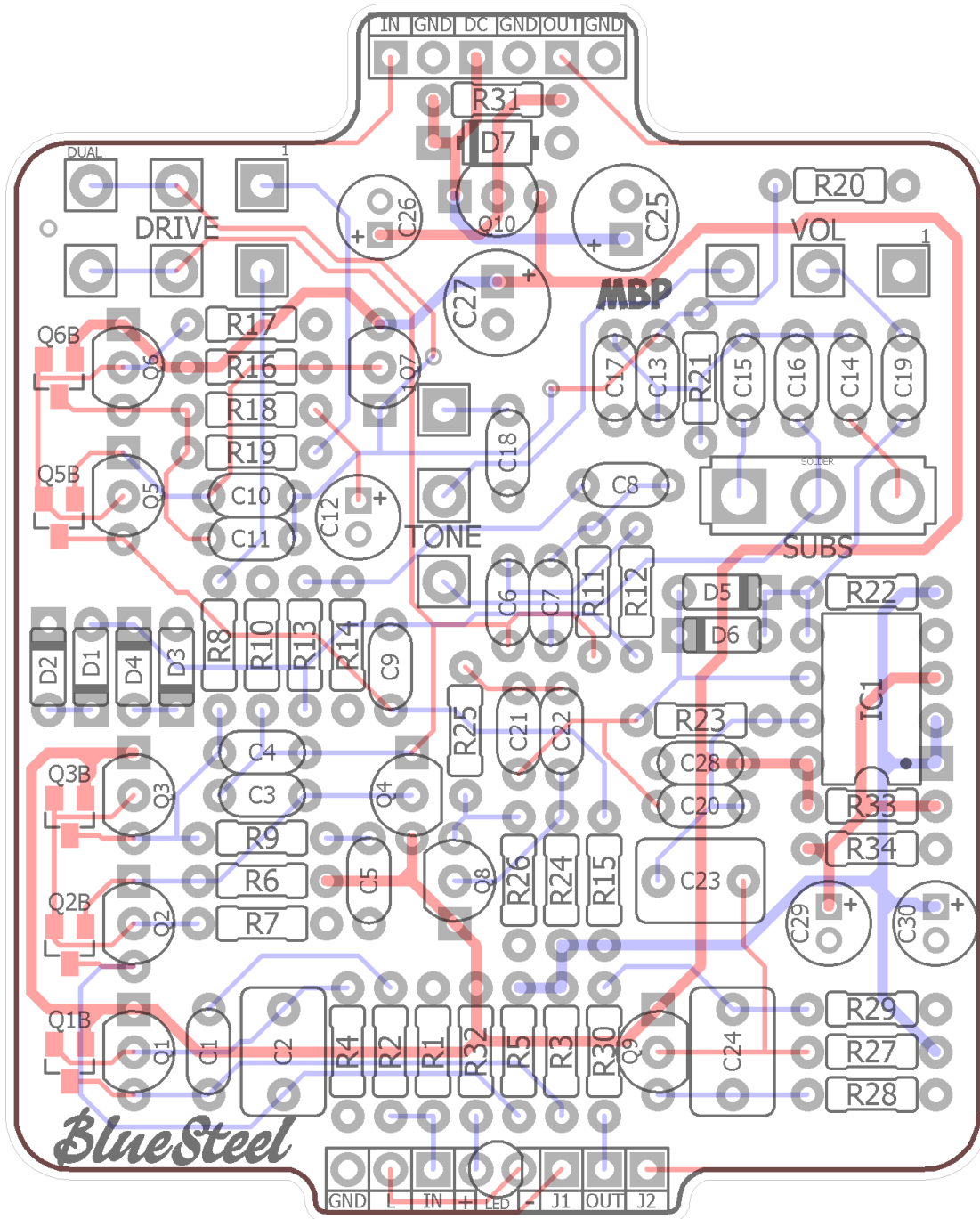
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**Terms of Use:** You are free to use purchased **BlueSteel** circuit boards for both DIY and small commercial operations. You may not offer **BlueSteel** PCBs for resale or as part of a "kit" in a commercial fashion. Peer to peer re-sale is fine, though.

**Technical assistance** for your build(s) is available via the [madbeanpedals forum](#). Please go there rather than emailing me for assistance on builds. This is because (1) I'm not always available to respond via email in a timely and continuous manner, and (2) posting technical problems and solutions in the forum creates a record from which other members may benefit.







Resistors		Caps		Diodes	
R1	1M	C1	47n	D1 - D6	1n4148
R2	10k	C2	1uF	D7	1N4001
R3	1M	C3	47pF	Transistors	
R4	10k	C4	47pF	Q1	J201
R5	220k	C5	150n	Q2	J201
R6	2k2	C6	220pF	Q3	J201
R7	4k7	C7	100n	Q4	2n3906
R8	22k	C8	47n	Q5	J201
R9	1k5	C9	2n2	Q6	J201
R10	2k2	C10	100pF	Q7	2n3906
R11	100k	C11	100pF	Q8	2n3904
R12	330k	C12	1uF	Q9	2n3904
R13	1M	C13	5n6	Q10	2n3904
R14	15k	C14	82n	ICs	
R15	1M	C15	15n	IC1	TL072
R16	2k2	C16	18n	Switches	
R17	4k7	C17	5n6	SUBS	On/Off/On
R18	2k2	C18	18n	Pots	
R19	33k	C19	47n	TONE	10kB
R20	2k2	C20	2n2	VOL	100kA
R21	5k6	C21	56n	DRIVE	250kA Dual-Gang
R22	470k	C22	56n		
R23	6k8	C23	1uF		
R24	470k	C24	1uF		
R25	1k2	C25	100uF		
R26	10k	C26	47uF		
R27	100k	C27	100uF		
R28	10k	C28	100n		
R29	100k	C29	47uF		
R30	1k	C30	47uF		
R31	2k2				
R32	4k7				
R33	10k				
R34	10k				

Values	QTY	Type	Rating
1k	1	Metal / Carbon Film	1/4W
1k2	1	Metal / Carbon Film	1/4W
1k5	1	Metal / Carbon Film	1/4W
2k2	6	Metal / Carbon Film	1/4W
4k7	3	Metal / Carbon Film	1/4W
5k6	1	Metal / Carbon Film	1/4W
6k8	1	Metal / Carbon Film	1/4W
10k	6	Metal / Carbon Film	1/4W
15k	1	Metal / Carbon Film	1/4W
22k	1	Metal / Carbon Film	1/4W
33k	1	Metal / Carbon Film	1/4W
100k	3	Metal / Carbon Film	1/4W
220k	1	Metal / Carbon Film	1/4W
330k	1	Metal / Carbon Film	1/4W
470k	2	Metal / Carbon Film	1/4W
1M	4	Metal / Carbon Film	1/4W
47pF	2	Ceramic / MLCC	16v min.
100pF	2	Ceramic / MLCC	16v min.
220pF	1	Ceramic / MLCC	16v min.
2n2	2	Film	16v min.
5n6	2	Film	16v min.
15n	1	Film	16v min.
18n	2	Film	16v min.
47n	3	Film	16v min.
56n	2	Film	16v min.
82n	1	Film	16v min.
100n	2	Film	16v min.
150n	1	Film	16v min.
1uF	3	Film	16v min.
1uF	1	Electrolytic	16v min.
47uF	3	Electrolytic	16v min.
100uF	2	Electrolytic	16v min.
1n4148	6	or, 1n914	
1N4001	1		
J201	5	through-hole or surface mount	
2n3906	2		
2n3904	3		
TL072	1		
SPDT	1	On/Off/On, Solder Lug	
10kB	1	PCB Right Angle	16mm
100kA	1	PCB Right Angle	16mm
250kA	1	PCB Right Angle, Dual-Gang	16mm

**MPF102 (Sub for J201):**

<https://stompboxparts.com/semiconductors/mpf102-jfet-nos-fairchild/>

**MMBFJ201 (surface mount version):**

<https://www.mouser.com/ProductDetail/512-MMBFJ201>

**SPDT (On/Off/On):**

<https://stompboxparts.com/switches/spdt-toggle-switch-on-off-on-solder-lug-short-bat/>

<https://lovemyswitches.com/taiway-spdt-on-off-on-switch-solder-lug-short-shaft/>

<https://www.taydaelectronics.com/mini-toggle-switch-1m-series-spdt-on-off-on-short-lever.html>

**250kA Dual-Gang pot:**

<https://stompboxparts.com/pots/16mm-dual-gang-potentiometer-smooth-shaft-short-pcb-leg/>

**Other 16mm Pots:**

<https://stompboxparts.com/pots/16mm-potentiometer-smooth-shaft-short-pcb-leg/>

<https://lovemyswitches.com/16mm-potentiometers-1-4-smooth-shaft-right-angle-pcb-mount/>

**Low Profile DC Jack:**

<https://stompboxparts.com/power-connections/dc-power-jack-2-1mm-low-profile/>

<https://lovemyswitches.com/thinline-lumberg-dc-power-jack-2-1mm/>

**Mono 1/4" jacks:**

<https://stompboxparts.com/audio-jacks/>

<https://lovemyswitches.com/categories/1-4-jacks-and-cables/mono-jacks.html>

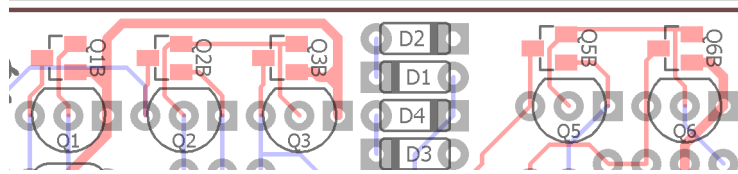
**My preferred 3PDT switch:**

<https://lovemyswitches.com/pro-3pdt-latched-foot-switch-solder-lugs-feather-soft-click/>

**Stompboxparts "Essentials" kit:**

<https://stompboxparts.com/jacks/the-essentials-hardware-pack/>

- The Blue Steel offers space for either through-hole or surface mount JFET. Obviously, you do not want to use both types on the same transistor. But, you knew that!

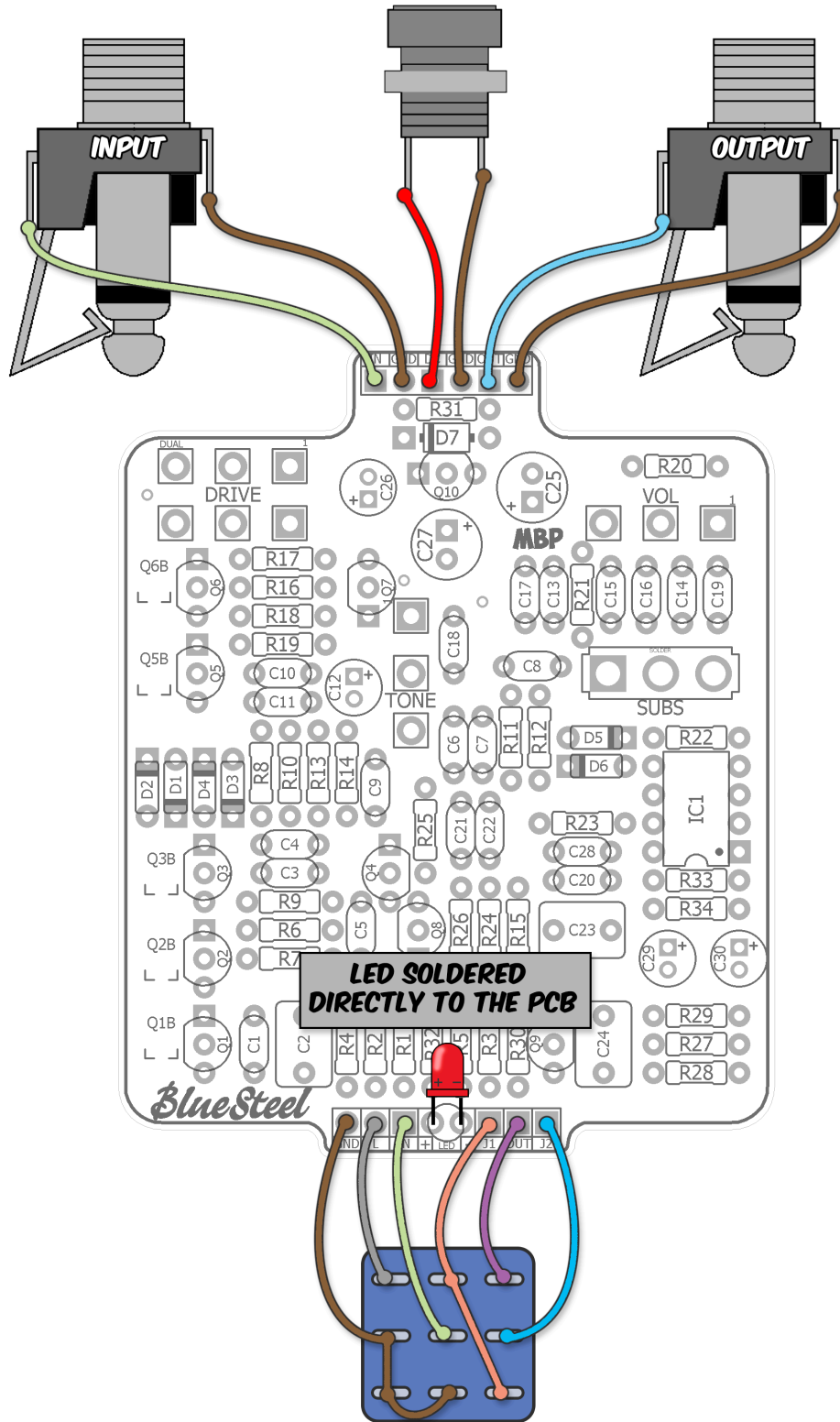


- The right position of the subs switch has a lot of...subs. The idea there was that setting would be great for very low gain settings. But, if it's not to your taste then I suggest using a 47n in place of 82 for C14.
- The drive control really needs an audio taper to get the most out of it. If you cannot get the 250kA Dual-Gang it's okay to use a 250kB instead. It will just bunch up more in the last 1/3rd of the turn. Alternatively, if you have a 500kA Dual-Gang, put a 500k resistor (or 470k) across pins 1 and 3 of each gang. This will reduce the total value down to about 250k. You could do the same with a 1MA Dual-Gang by using 330k resistors.

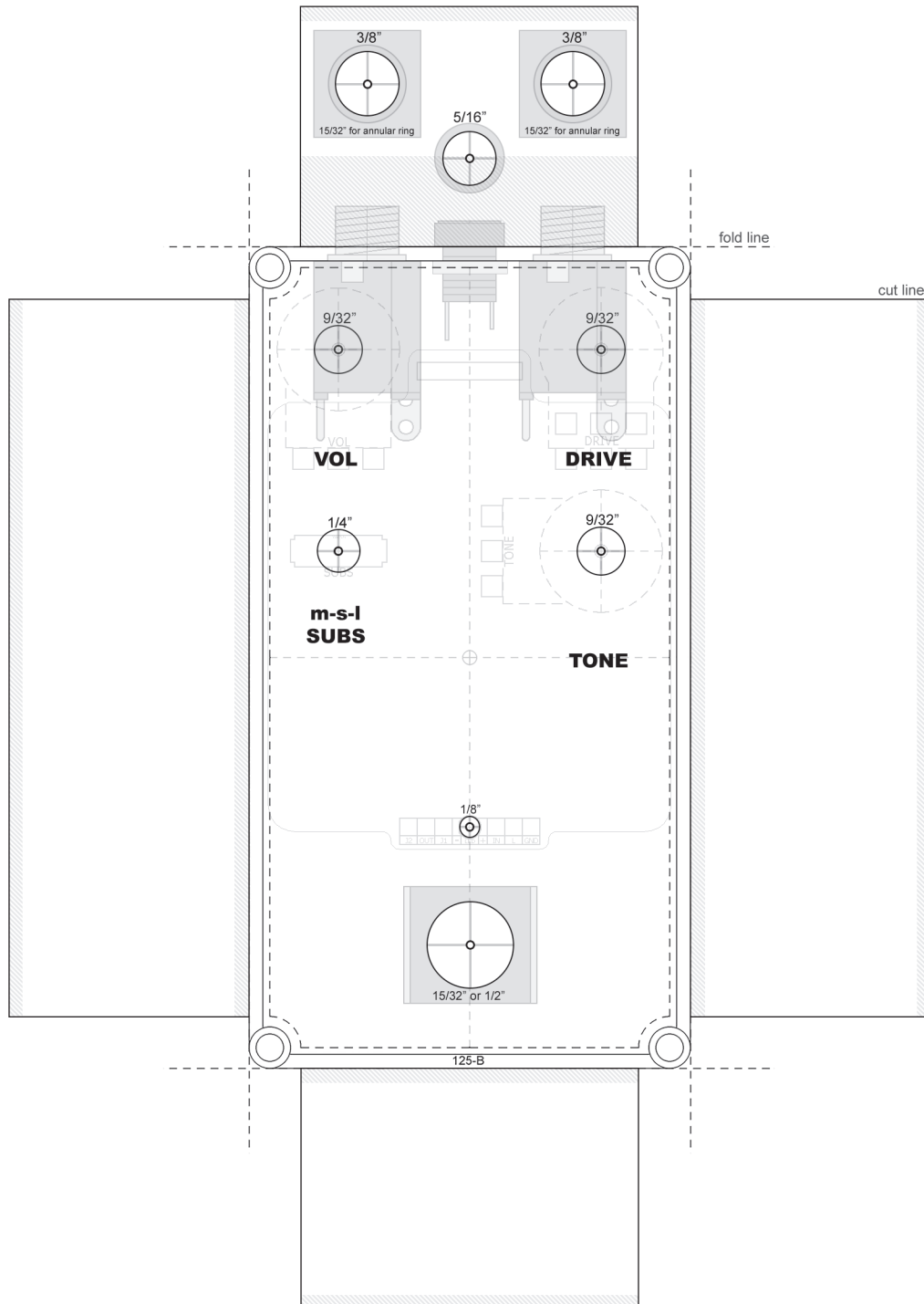
### Keeley Mods

- Make C1 100n
- Use 1N4002 for D1-D3 and jumper D4
- Use 1N4002 for D5, D6.
- I believe Keeley uses a 33n for C16 but since I've got three choices on a switch you don't need to do this.



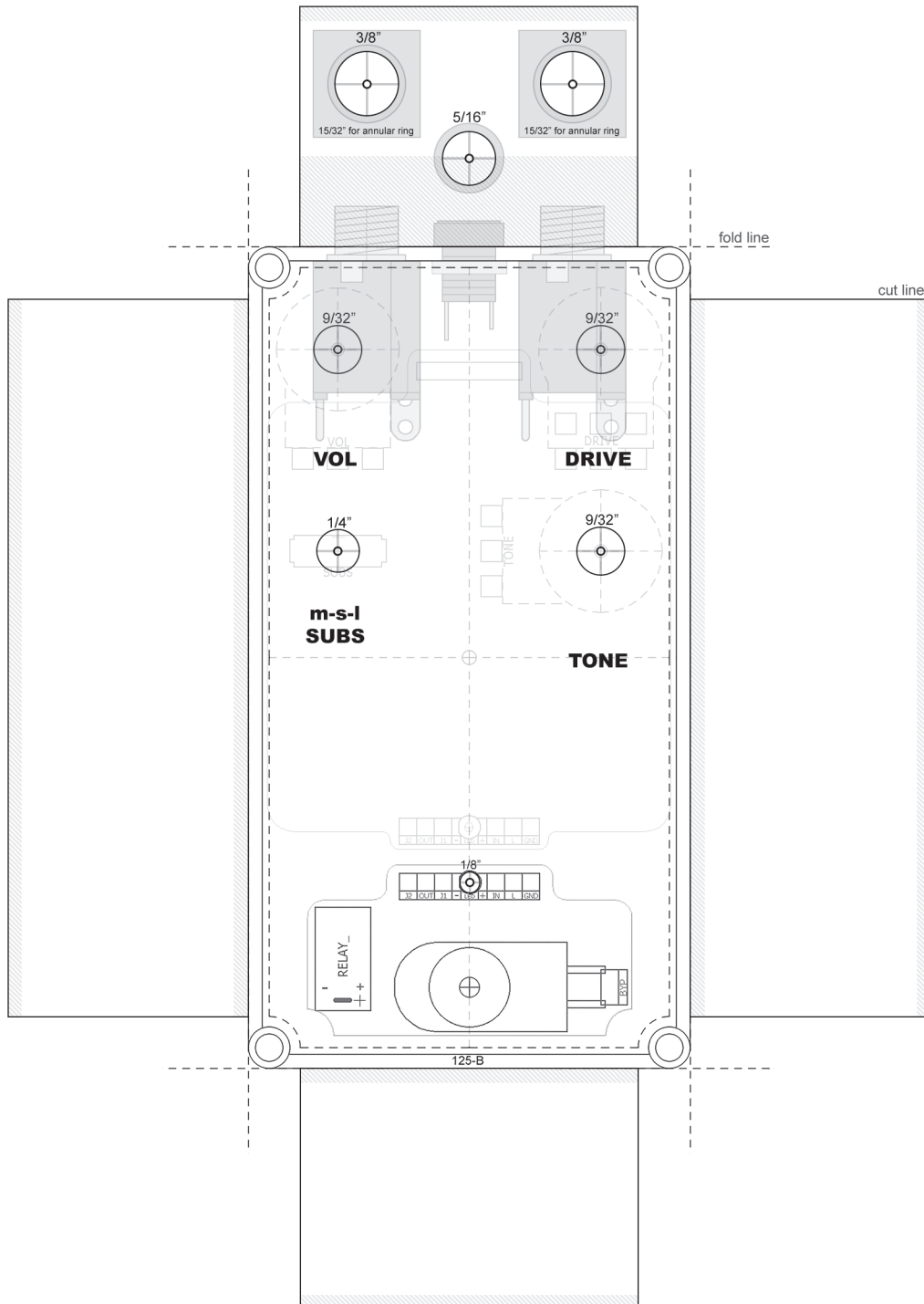


**Note:** Drill Guides are approximate and may require tweaking depending on the types of jacks, switches and pots you use.



Use this drill template for 3PDT bypass wiring.

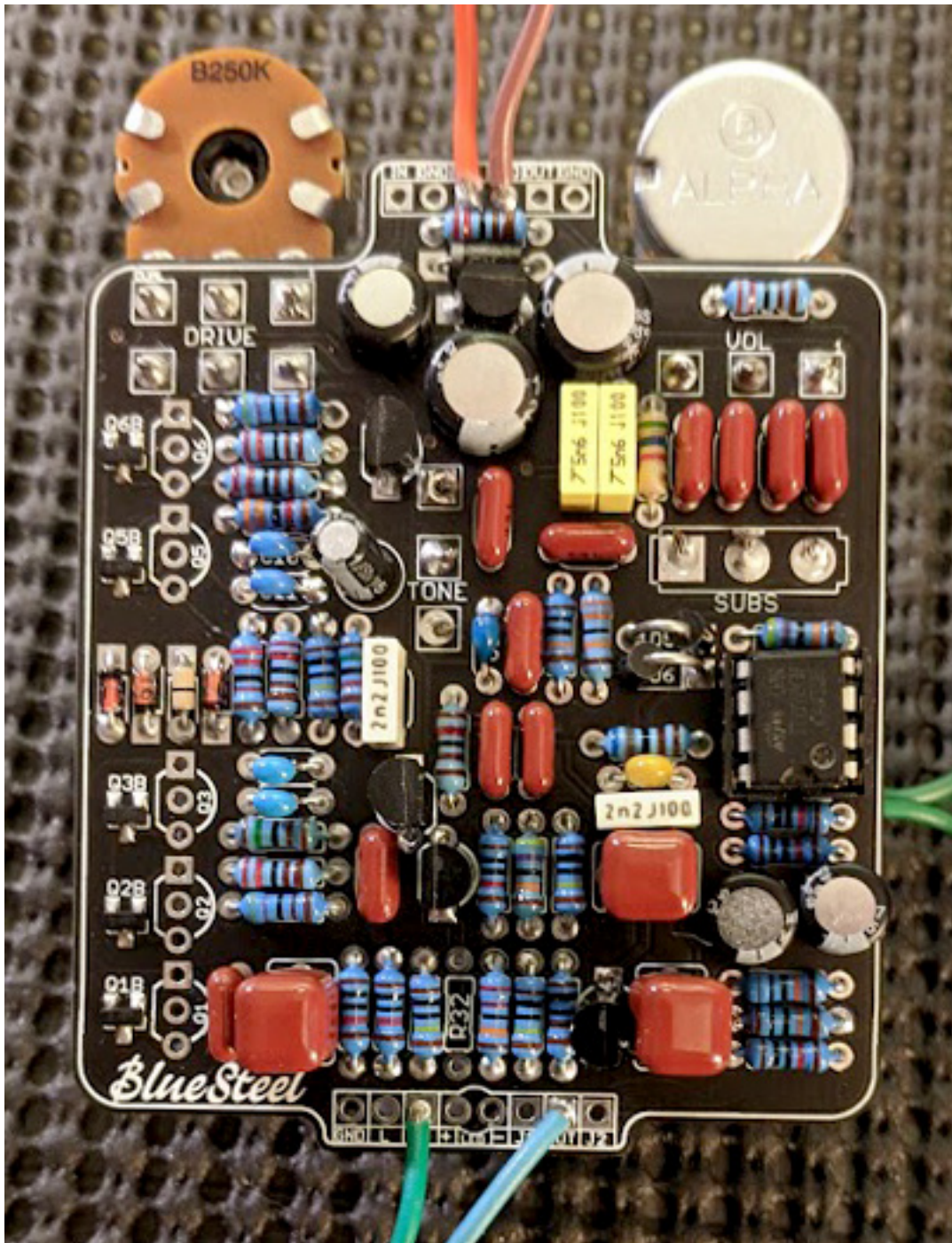
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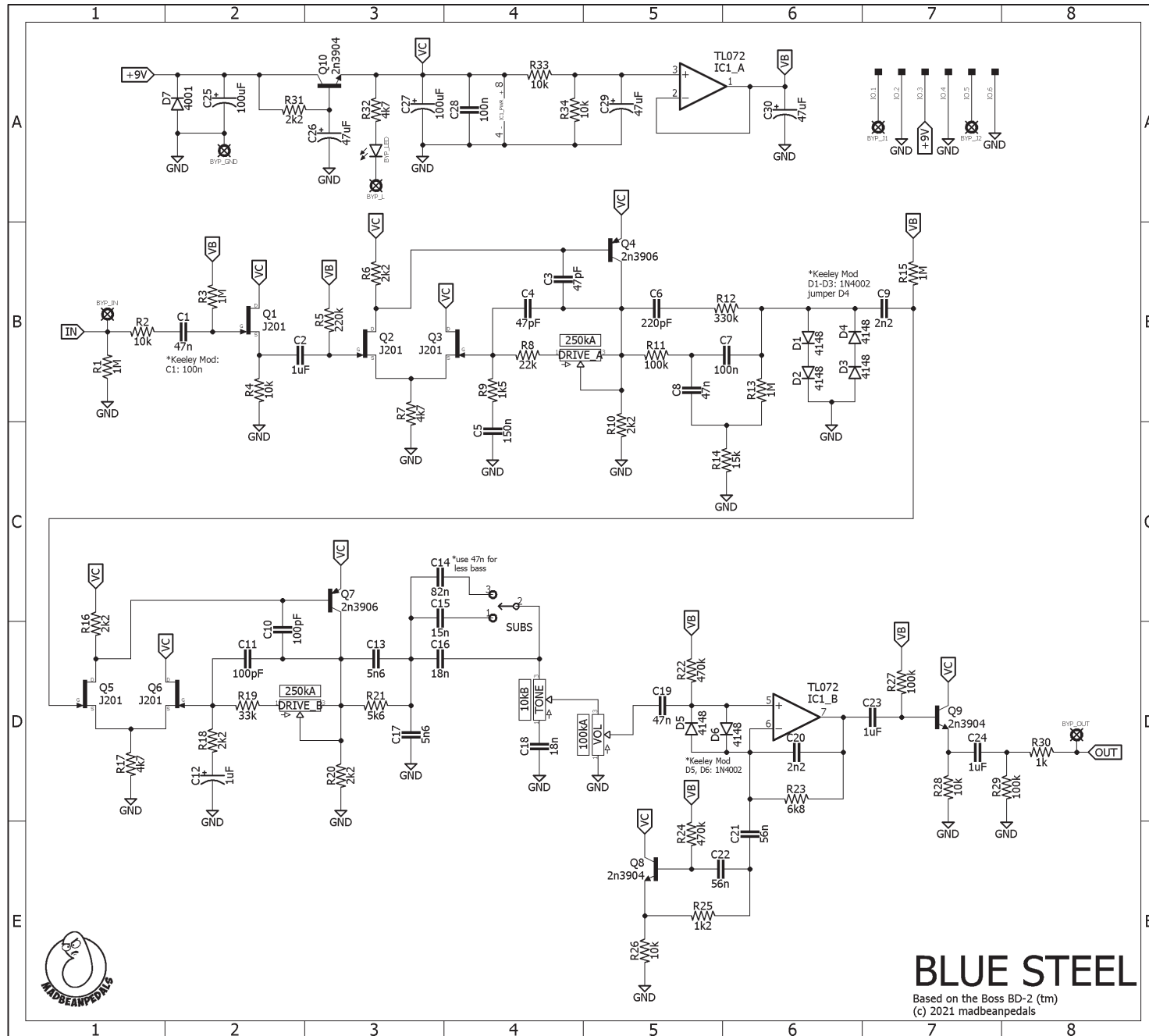


Use this drill template for Softie3 relay bypass (sold separately).

<b>Q1</b>	<b>J201</b>	<b>Q6</b>	<b>J201</b>	<b>IC1</b>	<b>TL072</b>
D	8.61	D	8.61	1	4.31
S	4.36	S	4.65	2	4.31
G	3.95	G	4.91	3	4.31
<b>Q2</b>	<b>J201</b>	<b>Q7</b>	<b>2n3906</b>	4	0
D	7.93	C	4.91	5	4.13
S	4.51	B	8.04	6	4.31
G	4.23	E	8.61	7	4.31
<b>Q3</b>	<b>J201</b>	<b>Q8</b>	<b>2n3904</b>	8	8.61
D	8.61	C	8.61		
S	4.51	B	3.55		
G	4.58	E	3.02		
<b>Q4</b>	<b>2n3906</b>	<b>Q9</b>	<b>2n3904</b>		
C	4.58	C	8.61		
B	7.93	B	4.09		
E	8.61	E	3.48		
<b>Q5</b>	<b>J201</b>	<b>Q10</b>	<b>2n3904</b>		
D	8.03	C	9.5		
S	4.62	B	9.35		
G	3.96	E	8.61		

- 9.5vDC One Spot
- Current Draw: 11mA





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