

SANDSTORM

FX TYPE: Distortion

Based on the Ibanez® SD-9™

Enclosure Size: 1590B, 1590B2, 125B

"Softie" compatibility: Softie1&2

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Overview

Somehow, in 15 years of DIY, I never got around to building an SD-9 clone (it's even a project in the mbp "Etcher's Paradise" section!) I probably never would have had an mbp forum member not suggested it as a project. And, I'm glad I did because there is something cool in this circuit. It might look a bit like a Tube Screamer but it sounds nothing like it. And while it has hard clipping, it also sounds nothing like a Rat or OCD, for example. It's definitely its own thing. I often use the term "texture" to describe overdrives and this one exudes that quality. It is dry, and coarse (hence the name) but not overbearingly so. Maybe it could be a secret weapon. The only modern day commercial clone I know of is the Way Huge Geisha Drive and even that departs somewhat from the stock design. So, if you are an overdrive/distortion junkie this is a good "left turn" project to put in your roster.

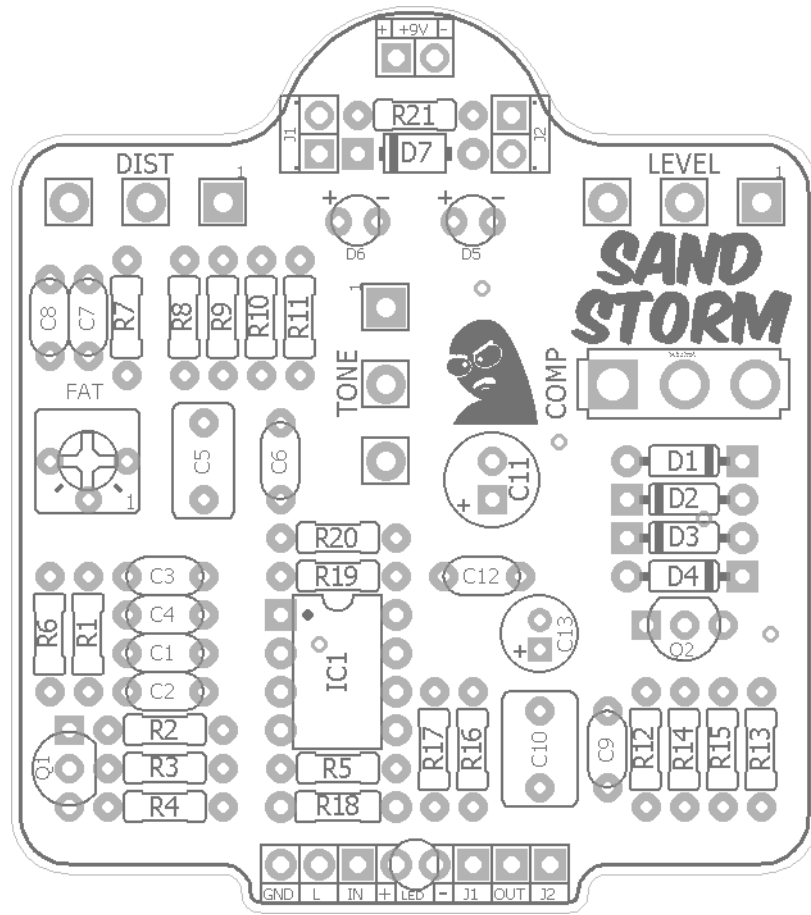
Controls

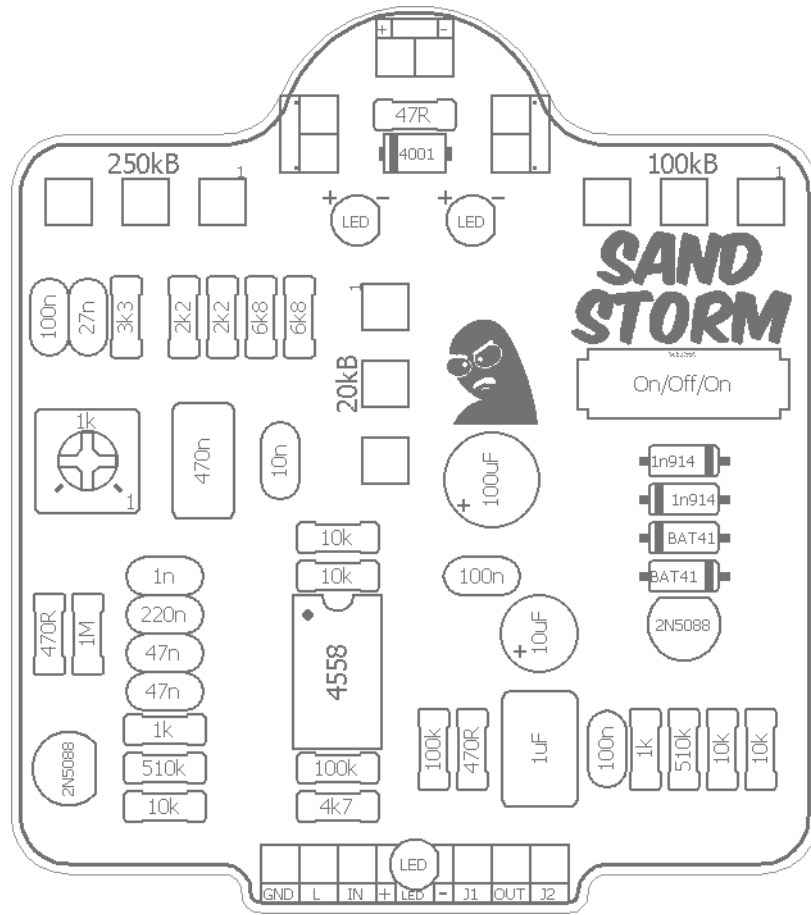
- **VOL:** Total output.
- **GAIN:** Total distortion.
- **tone:** A Big Muff style HP/LP tone control.
- **COMP :** Standard clipping options. The 1n914 is the stock SD-9 clipping. The BAT41 is much more compressed and the LEDs are loud and crunchy.
- **FAT:** This trimmer will let you dial in a little more bass. CCW is stock. As you turn it up the tone will thicken up. I included this option since I really liked some of the lower gain settings with a little more low end.

4.14 Update: R7 should be 33k, not 3k3.

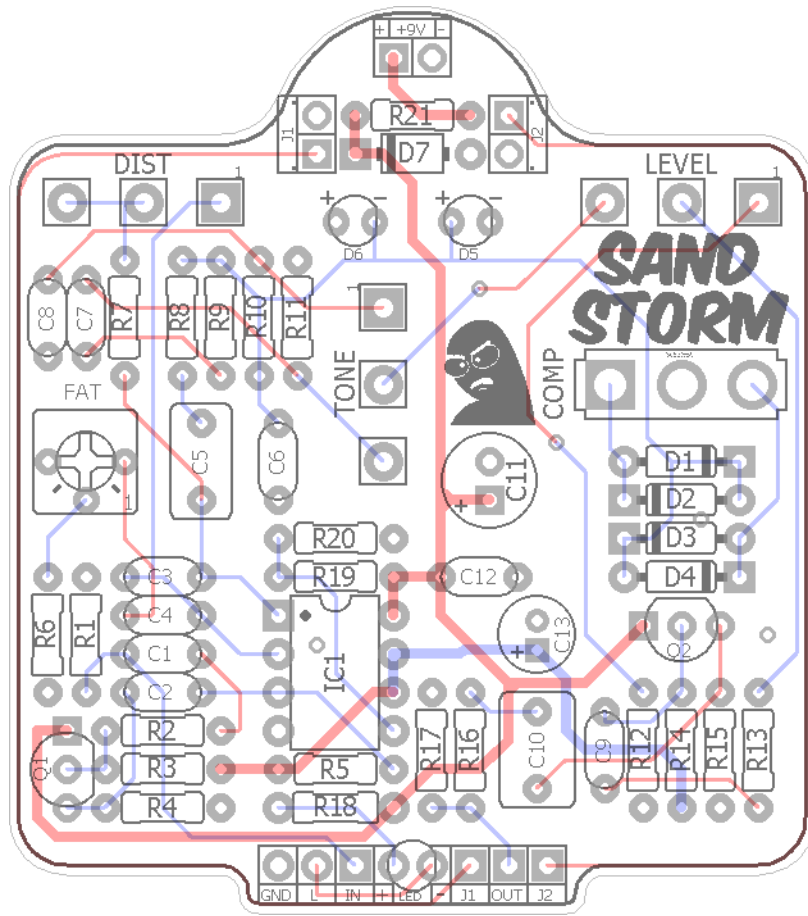
Terms of Use: You are free to use purchased **Sandstorm** circuit boards for both DIY and small commercial operations. You may not offer **Sandstorm** PCBs for resale or as part of a "kit" in a commercial fashion. Peer to peer re-sale is fine, though.

Technical assistance for your build(s) is available via the [madbeanpedals forum](http://madbeanpedals.com). 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.





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Resistors		Caps		Diodes	
R1	1M	C1	47n	D1, D2	1n914
R2	1k	C2	47n	D3, D4	BAT41
R3	510k	C3	1n	D5, D6	LED
R4	10k	C4	220n	D7	4001
R5	100k	C5	470n	Transistors	
R6	470R	C6	10n	Q1, Q2	2N5088
R7	33k	C7	27n	IC	
R8	2k2	C8	100n	IC1	4558
R9	2k2	C9	100n	Switch	
R10	6k8	C10	1uF	COMP	On/Off/On
R11	6k8	C11	100uF	Trimmer	
R12	1k	C12	100n	FAT	1k
R13	10k	C13	10uF	Pots	
R14	510k			TONE	20kB
R15	10k			LEVEL	100kB
R16	470R			DIST	250kB
R17	100k				
R18	4k7				
R19	10k				
R20	10k				
R21	47R				

Value	QTY	Type	Rating
47R	1	Metal / Carbon Film	1/4W
470R	2	Metal / Carbon Film	1/4W
1k	2	Metal / Carbon Film	1/4W
2k2	2	Metal / Carbon Film	1/4W
33k	1	Metal / Carbon Film	1/4W
4k7	1	Metal / Carbon Film	1/4W
6k8	2	Metal / Carbon Film	1/4W
10k	5	Metal / Carbon Film	1/4W
100k	2	Metal / Carbon Film	1/4W
510k	2	Metal / Carbon Film	1/4W
1M	1	Metal / Carbon Film	1/4W
1n	1	Film	16v min.
10n	1	Film	16v min.
27n	1	Film	16v min.
47n	2	Film	16v min.
100n	3	Film	16v min.
220n	1	Film	16v min.
470n	1	Film	16v min.
1uF	1	Film	16v min.
10uF	1	Electrolytic	16v min.
100uF	1	Electrolytic	16v min.
1n914	2		
BAT41	2		
LED	2	Red	3 or 5mm
4001	1		
2N5088	2		
4558	1		
SPDT	1	On/Off/On, Solder Lug or Pin	
1k	1	Bourns 3362p	
20kB	1	PCB Mount, Right Angle	16mm
100kB	1	PCB Mount, Right Angle	16mm
250kB	1	PCB Mount, Right Angle	16mm

BAT41:

<https://www.mouser.com/ProductDetail/511-BAT41>

<http://smallbear-electronics.mybigcommerce.com/diode-schottky-bat41/>

SPDT (On/Off/On):

<http://smallbear-electronics.mybigcommerce.com/spdt-short-lever-center-off/>

Bourns 3362p (1k):

<https://www.mouser.com/ProductDetail/652-3362P-1-102LF>

Here's an alternative that has a knob to adjust the trimmer!

<https://www.mouser.com/ProductDetail/652-3362P-1-102TLF>

16mm Right Angle Pots (20kB, 100kB, 250kB):

<http://smallbear-electronics.mybigcommerce.com/alpha-single-gang-16mm-right-angle-pc-mount/>

Thinline DC Jack:

<http://smallbear-electronics.mybigcommerce.com/dc-power-jack-all-plastic-unswitched-2-1-mm/>

Enclosed Mono:

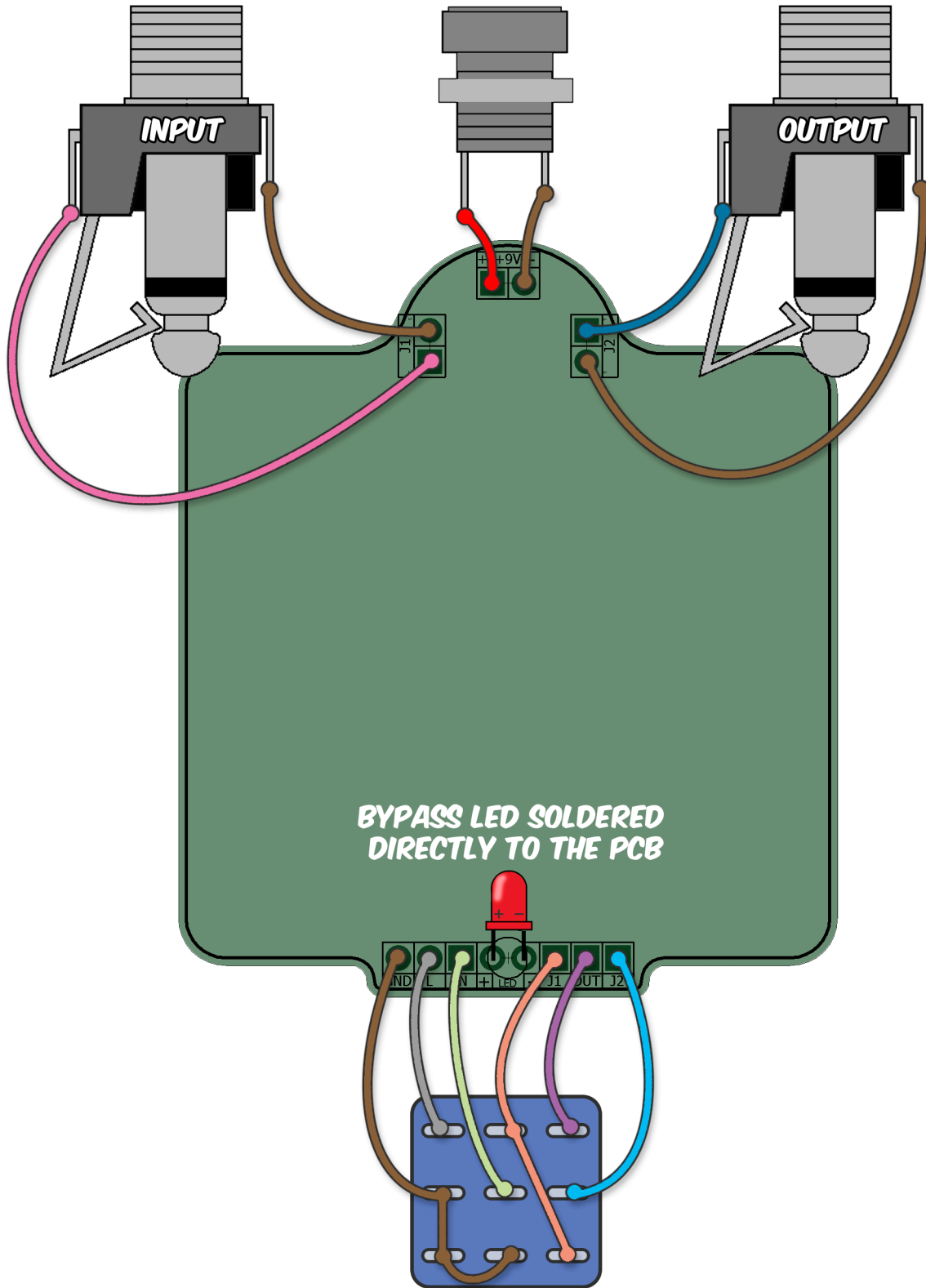
<http://smallbear-electronics.mybigcommerce.com/1-4-in-mono-enclosed-jack/>

<http://smallbear-electronics.mybigcommerce.com/1-4-in-mono-enclosed-switchcraft-111x/>

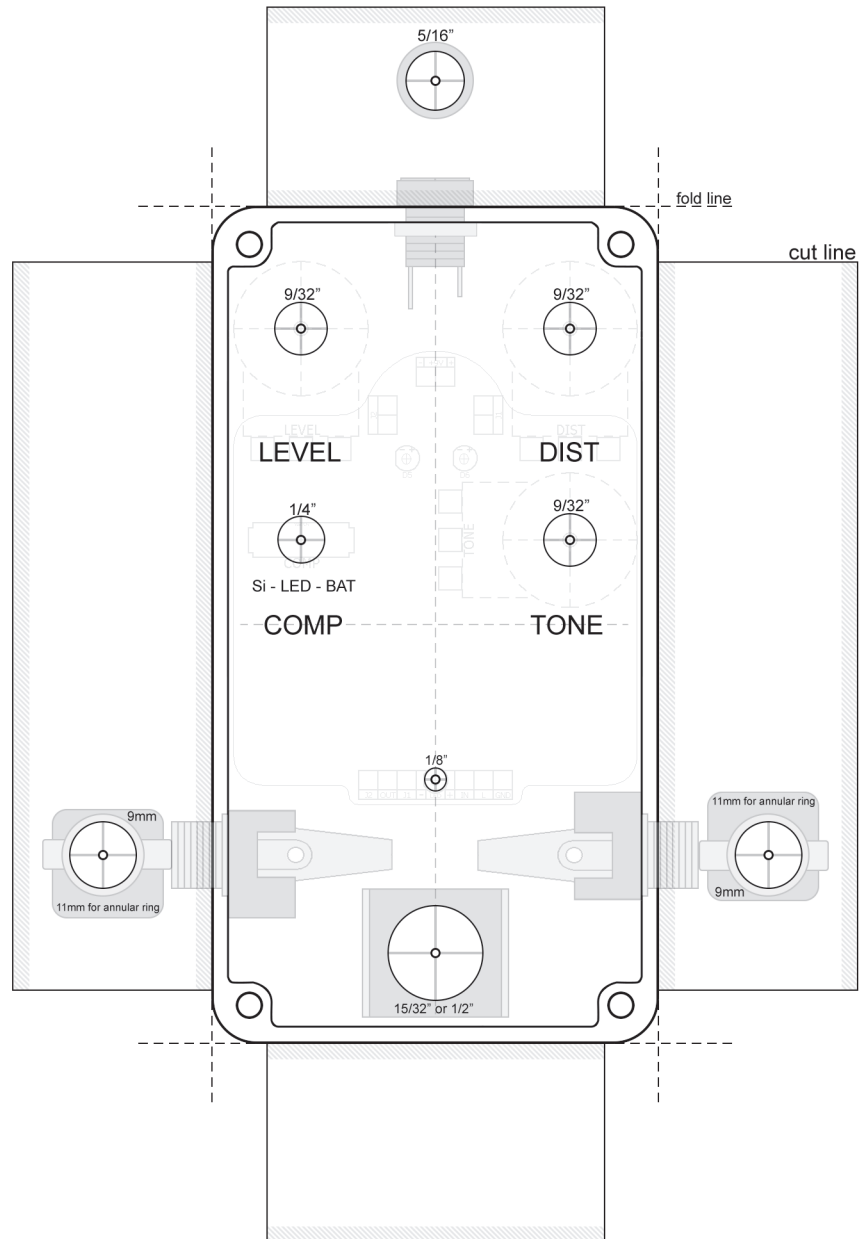
Lumberg Mono:

<http://smallbear-electronics.mybigcommerce.com/lumberg-1-4-compact-shrouded-mono-jack/>

- Not much to say here. On my prototype I used a 250kA instead of linear pot. I think I may prefer that for dialing in lower gain tones but on the production board I used 250kB. Of course, you can also try different op-amps. My go-to sub for a 4558 is the 4580DD which I like a lot. Not a game changing difference but it sometimes offers another flavor in overdrives/distortions.
- 4.14 Update: One thing I forgot to mention - the Sandstorm does not have a lot of output. Being that there is no active gain stage after the tone control (only a buffer) you will have some volume loss when the BAT41 clippers are selected. Expect to set the volume knob pretty much all the way up on this setting. If you want to experiment with a different type of clipping for that setting that has no volume loss, try either a 1n914 or two 1n194 in series on one side and 1N4001 on the other for asymmetrical clipping. The LEDs will be the opposite - the output for these will be quite loud!

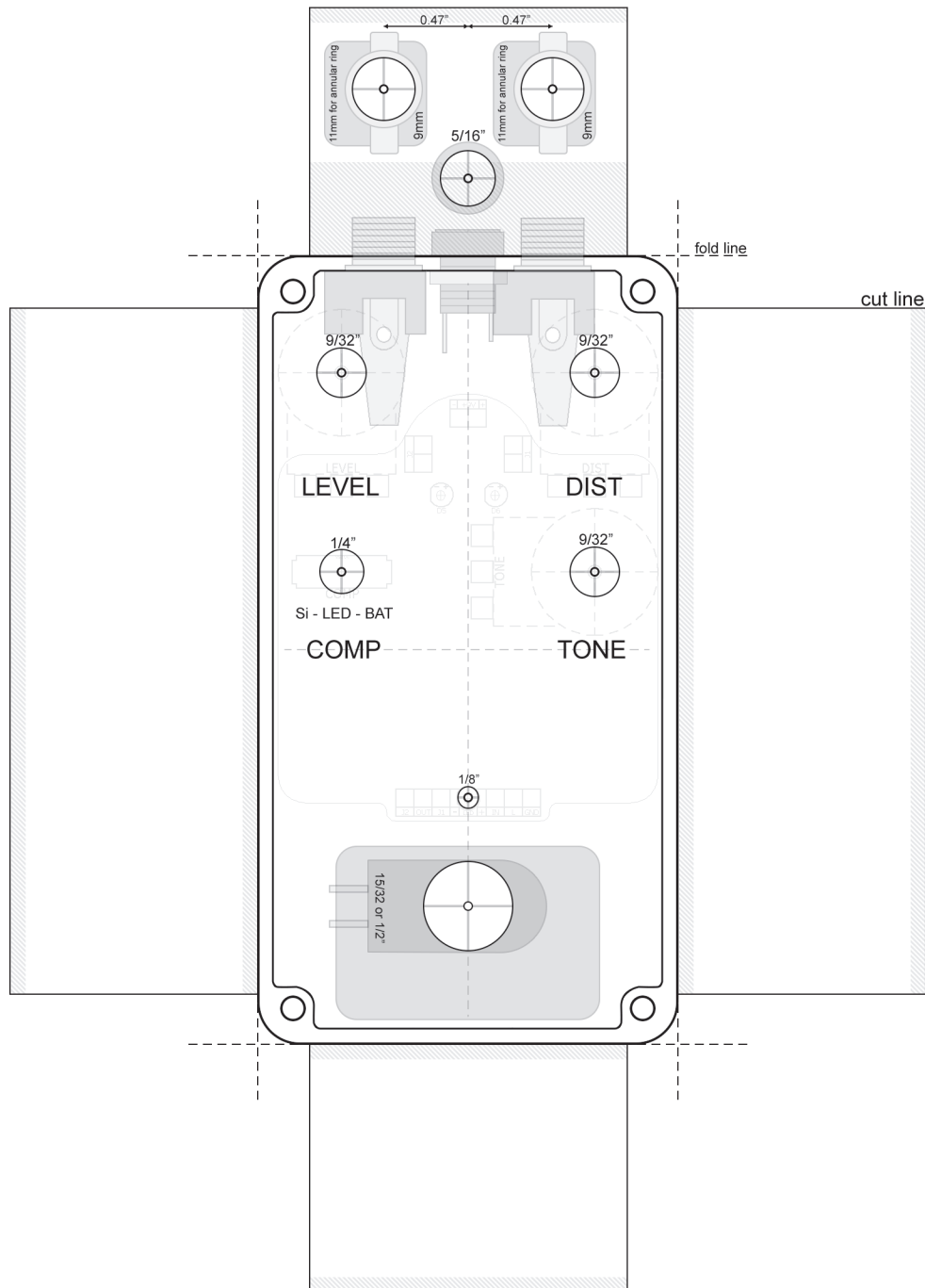


Note: Drill Guides are approximate and may require tweaking depending on the types of jacks, switches and pots you use.



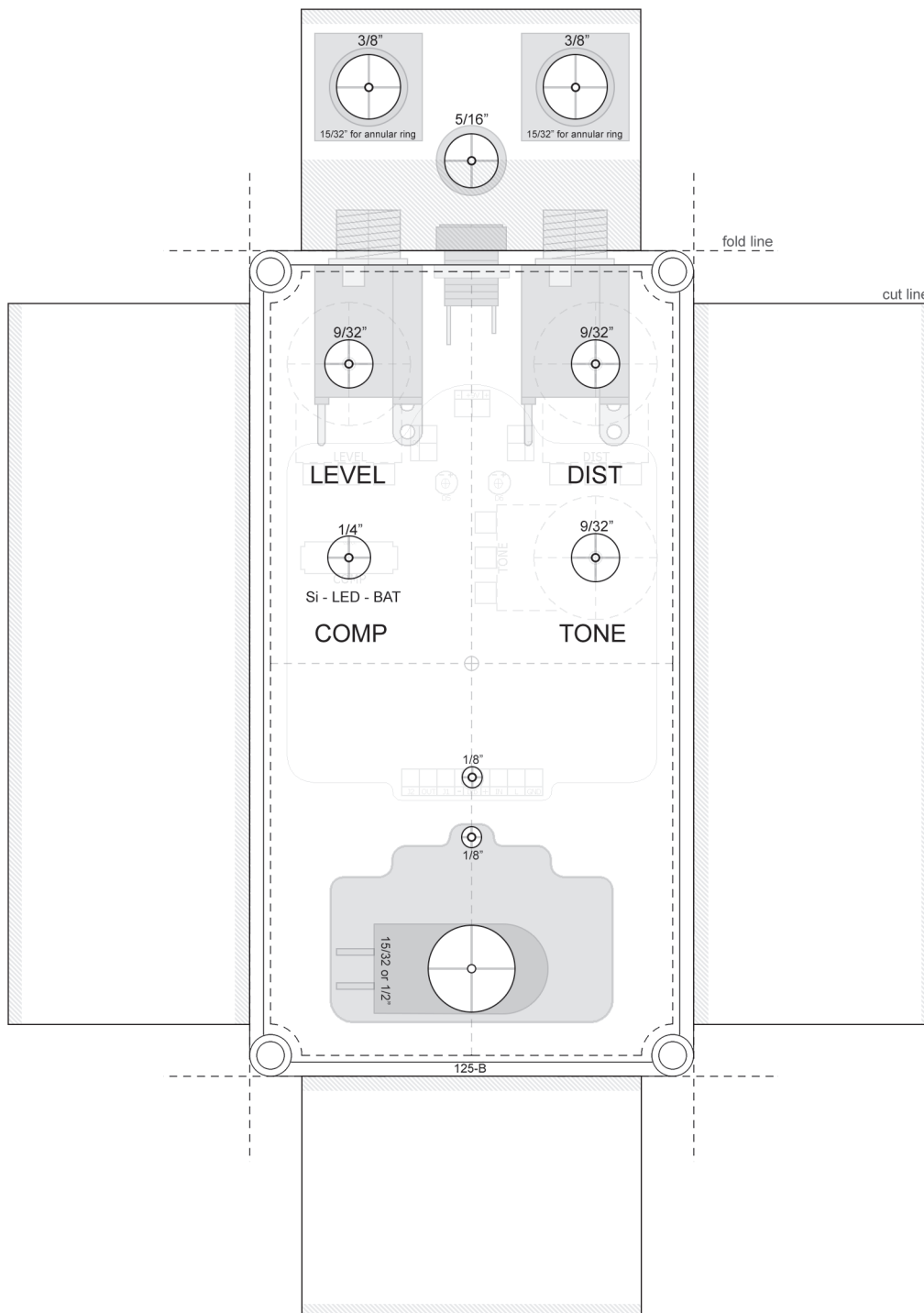
- This is a tight fit, but should work if you use the Lumberg style 1/4" jacks.
- I don't recommend using any of the mbp 3pdt boards for this enclosure.

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- Shown with Softie 2 relay bypass. If you are using one of the mbp 3pdt bypass boards, or just a 3pdt switch on its own, move the drill spot for the switch a bit lower so you can fit everything properly. Drill only one LED spot!
- Lumberg style jacks are used here but other styles may fit using the same drill locations.

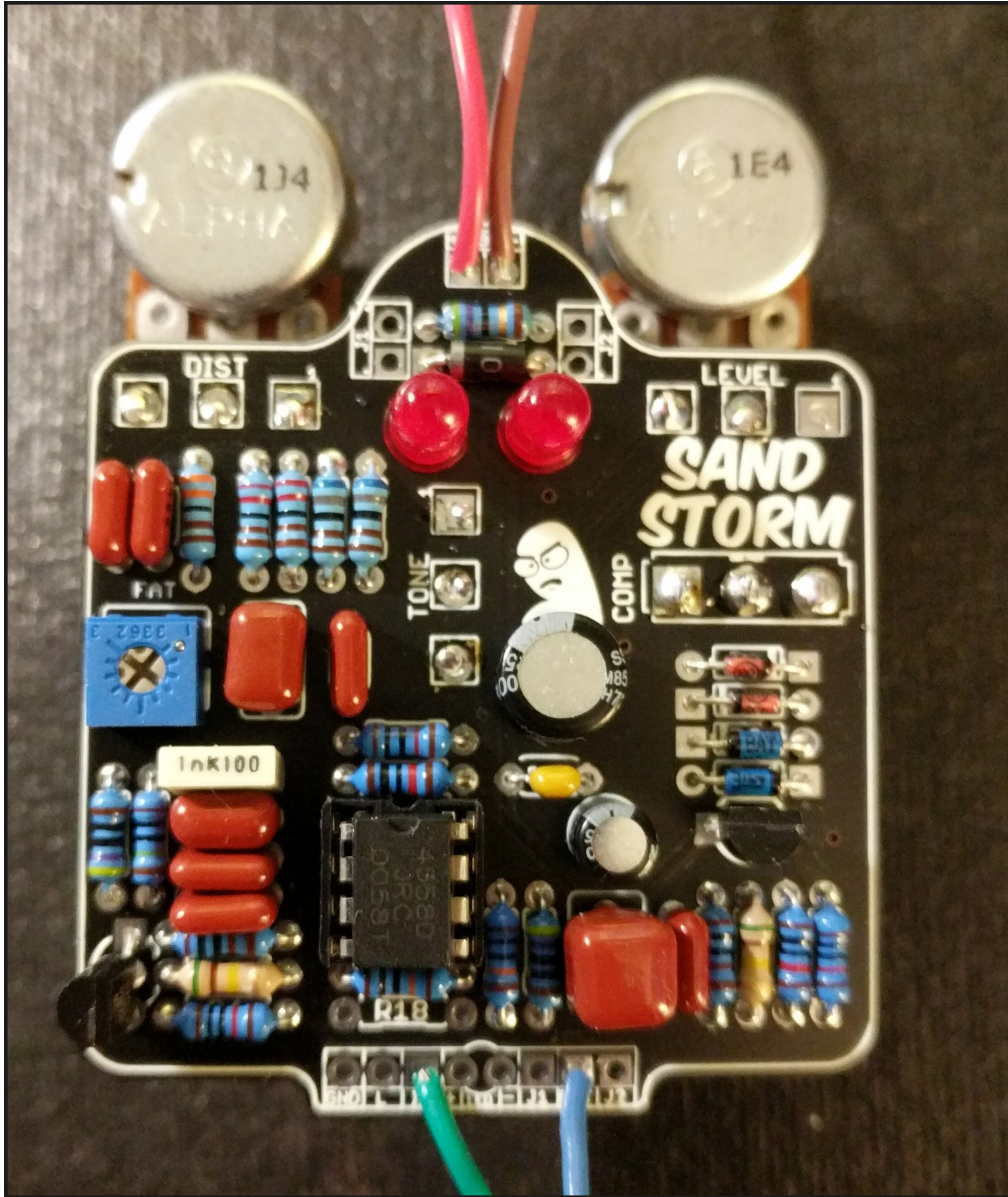
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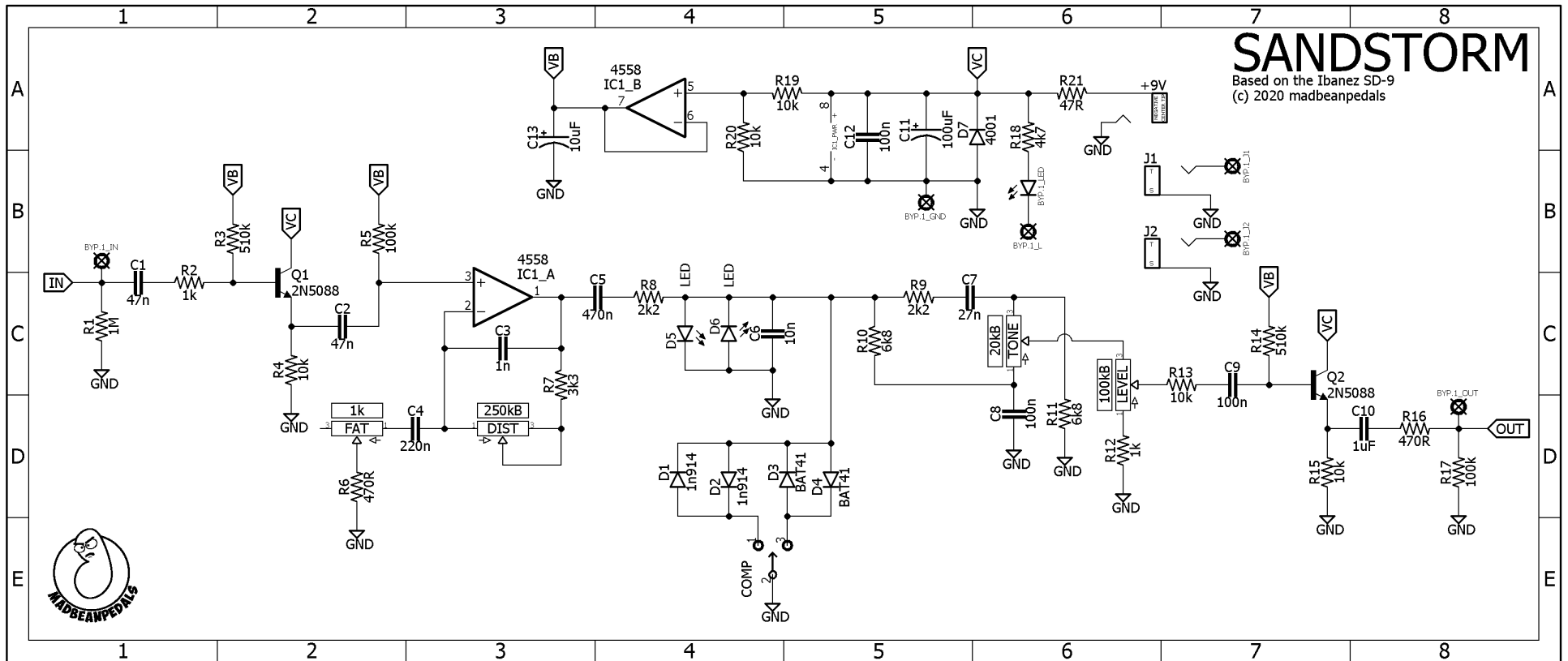


- Shown with Softie 1 relay bypass. Use the same drill spot for 3PDT switch or move to your desired location. Drill only one LED spot!
- Enclosed top jacks are used here, but you should also be able to fit open-frame metal jacks or the Lumberg style.
- You could also use side jacks but you'll need to move the Softie1 drill spot down. If you use side jacks with a regular 3pdt instead of the Softie simply pick your drill spots for the jacks.

IC1	4558	Q1	2N5088
1	4.63	C	9.25
2	4.63	B	4.05
3	4.58	E	3.65
4	0	Q2	2N5088
5	4.59	C	9.25
6	4.63	B	4.06
7	4.63	E	3.67
8	9.25		

- 9.42vDC One Spot
- Current Draw ~ 3mA





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