

# BURLYBEAR

## FX TYPE: FUZZ

Based on the Ibanez® FZ7™

Enclosure Size: 1590BB

Softie compatibility: Softie2

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## Overview

This is one of those “flew under my radar” type projects. I’ve borrowed from a couple of the Ibanez Tone Lok series in the past. I used a portion of the DE7™ for one of the Zero Point delay projects several years ago and most recently the SB7™ for the Edgelord project in the Bass Series. I had never heard the FZ7™ before that. Well, I’m glad I got around to it because this thing *slays*. It’s not at all a traditional type of fuzz but what it does, it does marvelously. If you like to play down-tuned guitars (DAGAD, etc) even better. It’s just got a great vibe. Granular and aggressive, but with a different feel than traditional fuzz.

The **Burly Bear** is 95% of the FZ7™. I’ve added two switchable mods and made a couple suggestions on alternate values (detailed in the Notes section). Another needed change was with the Damage control. On the FZ7™ it’s a 3-position slide switch. This is simply not practical for most DIY’ers. So, that has been converted to a pot. It has the same range as the switch, plus all the in-between values. The Damage control makes this circuit *awesome!*

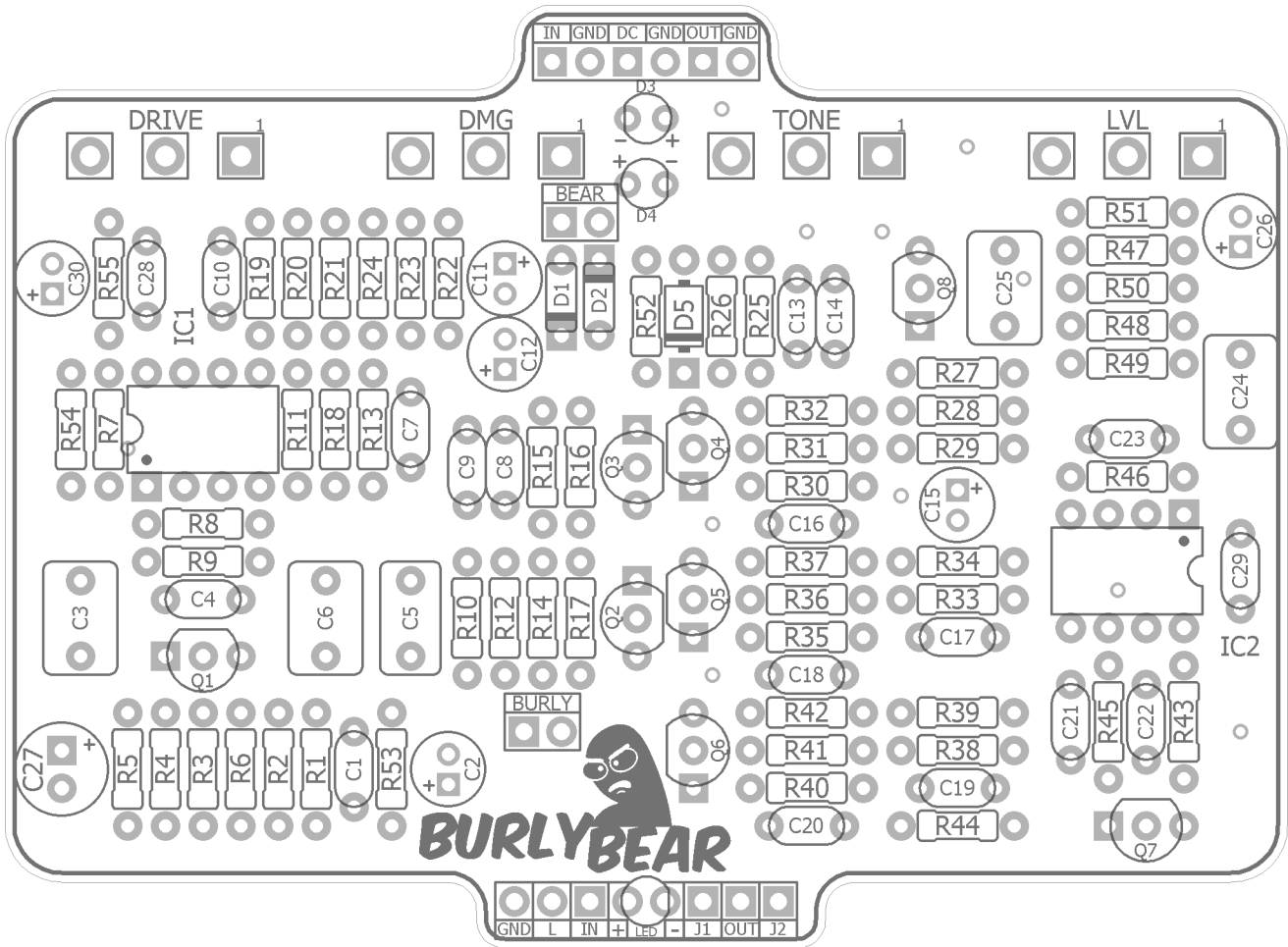
## Controls

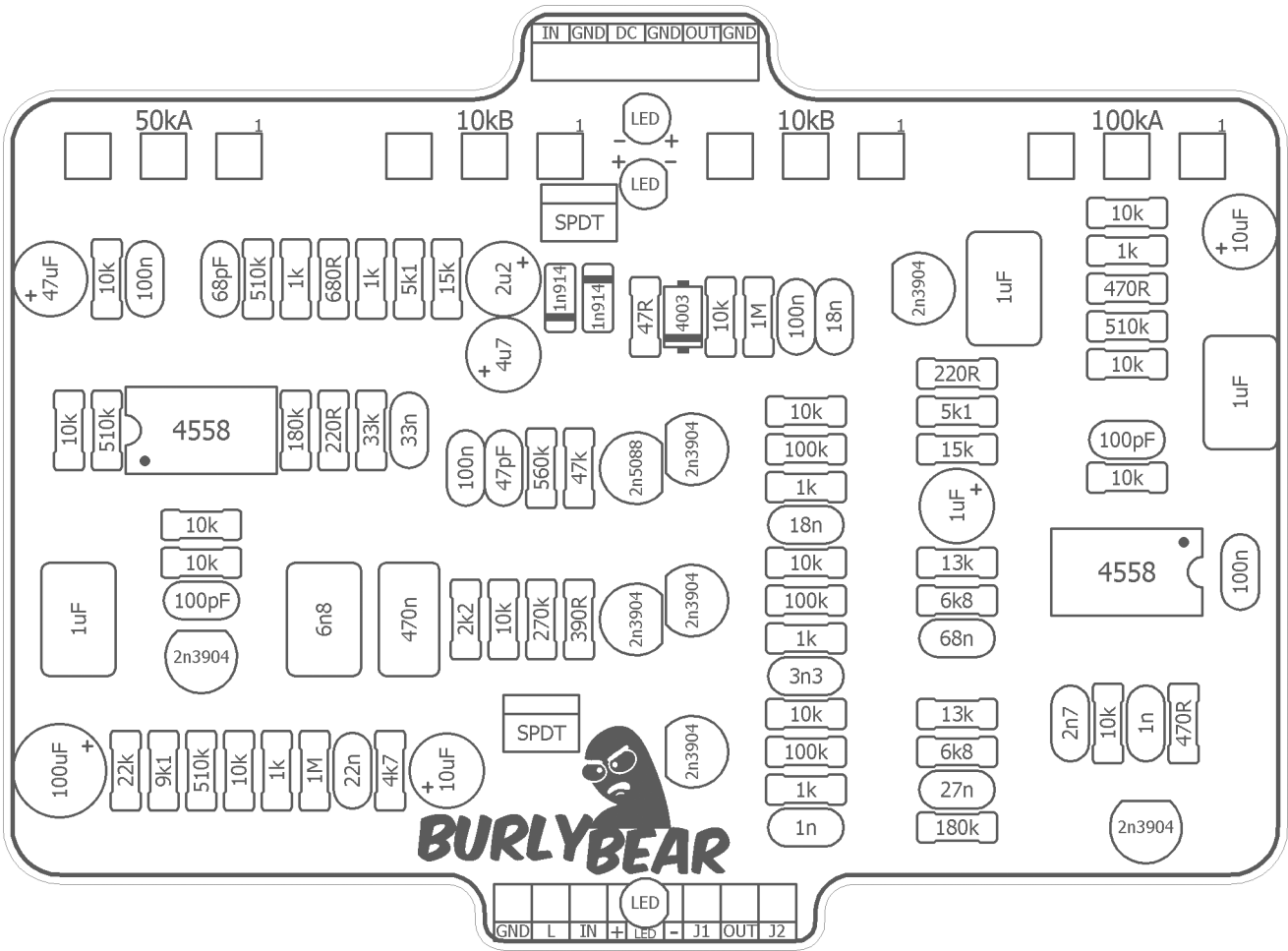
- **LVL, TONE, DRIVE** - As is typical with dirt pedals.
- **DMG** - The Damage control alters the voltage input bias to IC1. CCW: Normal, CW: “starved voltage” mode. At the highest settings the fuzz becomes sputtery and crushed sounding. This control was a 3-position slide switch in the FZ7™.
- **BURLY** - This lifts the 1st gyrator circuit. It gives the fuzz a different tonality - a bit more raw. It will increase the noise floor some.
- **BEAR** - Switches to LEDs as the primary clipping diodes. This mode will be louder and less compressed.

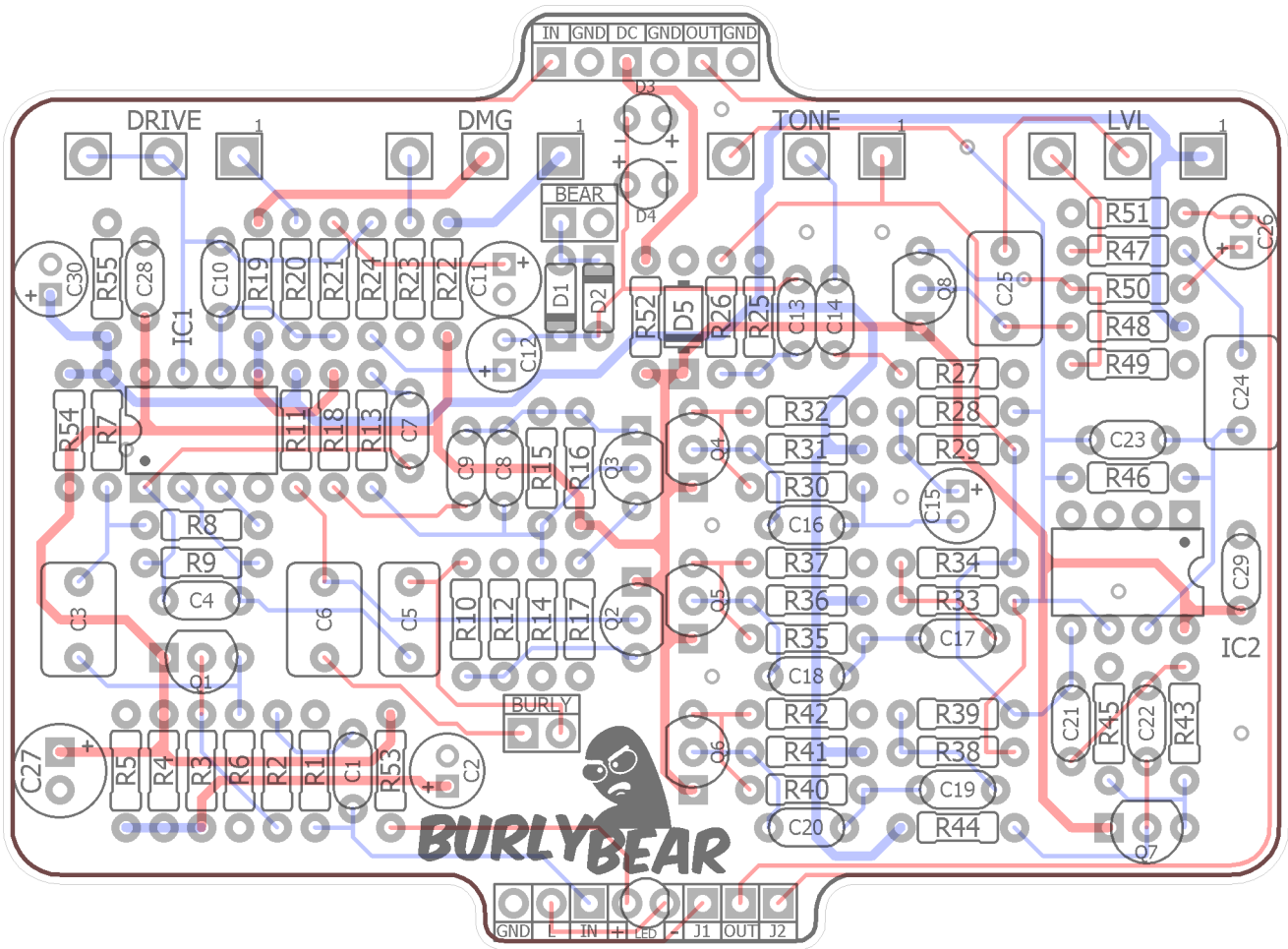
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**Technical assistance** for your build(s) is available via the [madbeanpedals forum](#). Please go there rather than emailing me for assistance on builds. This is because (1) I’m not always available to respond via email in a timely and continuous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







Resistors		Resistors		Caps		Diodes	
R1	1M	R31	100k	C1	22n	D1	1n914
R2	1k	R32	10k	C2	10uF	D2	1n914
R3	510k	R33	6k8	C3	1uF	D3	LED
R4	9k1	R34	13k	C4	100pF	D4	LED
R5	22k	R35	1k	C5	470n	D5	1n4003
R6	10k	R36	100k	C6	6n8	<b>Transistors</b>	
R7	510k	R37	10k	C7	33n	Q1	2n3904
R8	10k	R38	6k8	C8	47pF	Q2	2n3904
R9	10k	R39	13k	C9	100n	Q3	2n5088
R10	2k2	R40	1k	C10	68pF	Q4	2n3904
R11	180k	R41	100k	C11	2u2	Q5	2n3904
R12	10k	R42	10k	C12	4u7	Q6	2n3904
R13	33k	R43	470R	C13	100n	Q7	2n3904
R14	270k	R44	180k	C14	18n	Q8	2n3904
R15	560k	R45	10k	C15	1uF	<b>ICs</b>	
R16	47k	R46	10k	C16	18n	IC1	4558
R17	390R	R47	1k	C17	68n	IC2	4558
R18	220R	R48	510k	C18	3n3	<b>Switches</b>	
R19	510k	R49	10k	C19	27n	BEAR	SPDT
R20	1k	R50	470R	C20	1n	BURLY	SPDT
R21	680R	R51	10k	C21	2n7	<b>Pots</b>	
R22	15k	R52	47R	C22	1n	DMG	10kB
R23	5k1	R53	4k7	C23	100pF	TONE	10kB
R24	1k	R54	10k	C24	1uF	DRIVE	50kA
R25	1M	R55	10k	C25	1uF	LVL	100kA
R26	10k			C26	10uF		
R27	220R			C27	100uF		
R28	5k1			C28	100n		
R29	15k			C29	100n		
R30	1k			C30	47uF		

Values	QTY	Type	Rating	Values	QTY	Type	Rating
47R	1	Metal / Carbon Film	1/4W	1n	2	Film	16v min.
220R	2	Metal / Carbon Film	1/4W	2n7	1	Film	16v min.
390R	1	Metal / Carbon Film	1/4W	3n3	1	Film	16v min.
470R	2	Metal / Carbon Film	1/4W	6n8	1	Film	16v min.
680R	1	Metal / Carbon Film	1/4W	18n	2	Film	16v min.
1k	7	Metal / Carbon Film	1/4W	22n	1	Film	16v min.
2k2	1	Metal / Carbon Film	1/4W	27n	1	Film	16v min.
4k7	1	Metal / Carbon Film	1/4W	33n	1	Film	16v min.
5k1	2	Metal / Carbon Film	1/4W	68n	1	Film	16v min.
6k8	2	Metal / Carbon Film	1/4W	100n	4	Film	16v min.
9k1	1	Metal / Carbon Film	1/4W	470n	1	Film	16v min.
10k	14	Metal / Carbon Film	1/4W	1uF	3	Film	16v min.
13k	2	Metal / Carbon Film	1/4W	1uF	1	Electrolytic	16v min.
15k	2	Metal / Carbon Film	1/4W	2u2	1	Electrolytic	16v min.
22k	1	Metal / Carbon Film	1/4W	4u7	1	Electrolytic	16v min.
33k	1	Metal / Carbon Film	1/4W	10uF	2	Electrolytic	16v min.
47k	1	Metal / Carbon Film	1/4W	47uF	1	Electrolytic	16v min.
100k	3	Metal / Carbon Film	1/4W	100uF	1	Electrolytic	16v min.
180k	2	Metal / Carbon Film	1/4W	1n914	2		
270k	1	Metal / Carbon Film	1/4W	LED	2	Red, Diffused	3mm
510k	4	Metal / Carbon Film	1/4W	1n4003	1	or, 1N4001	
560k	1	Metal / Carbon Film	1/4W	2n3904	7		
1M	2	Metal / Carbon Film	1/4W	2n5088	1		
47pF	1	Ceramic / MLCC	16v min.	4558	2		
68pF	1	Ceramic / MLCC	16v min.	SPDT	2	Sub-Mini, On/On	
100pF	2	Ceramic / MLCC	16v min.	10kB	2	PCB Right Angle	16mm
				50kA	1	PCB Right Angle	16mm
				100kA	1	PCB Right Angle	16mm

**Mini SPDT (On/On):**

<https://lovemyswitches.com/taiway-sub-mini-spdt-on-on-switch-pcb-mount-long-shaft/>

**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:**

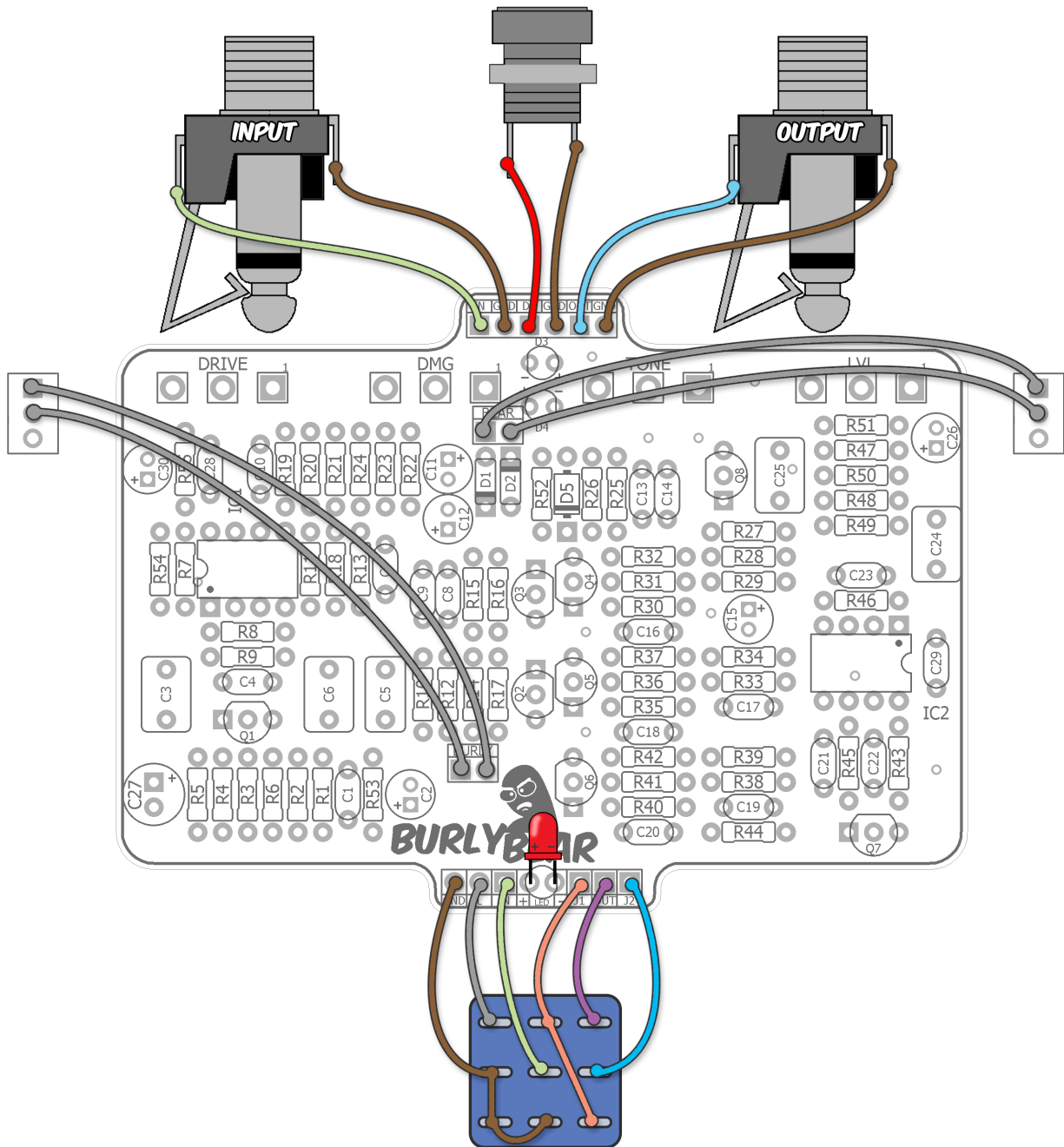
<https://stompboxparts.com/jacks/the-essentials-hardware-pack/>

- The two switch mods operate by lifting connections. IOW, when either switch is in the down position, it's the stock FZ7™. When the Burly switch is lifted, C6 is disconnected. When the Bear switch is lifted, the 1n914 diodes are lifted.
- You will need to use the sub-mini toggle switches instead of regular sized ones. If you wish to exclude either switch mod, simply solder in a jumper for the switch pads. For the Bear mod, you can omit the two LEDs if you are only using the 1n914 clipping diodes.

### Mod Ideas

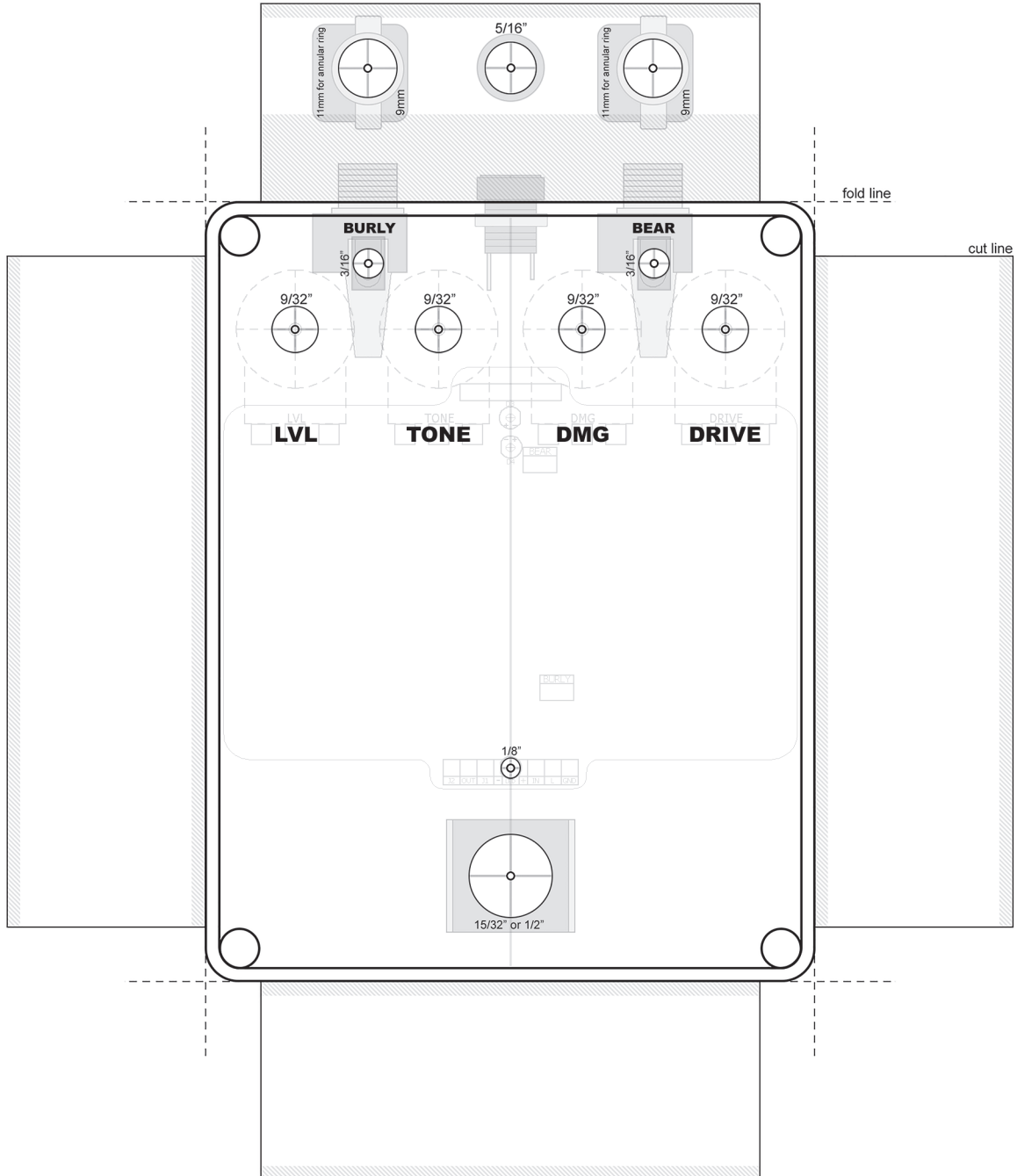
- The Tone control bunches up a bit at the highest settings (where it ends up making the most difference). You could try a 10kC instead of B to maybe get a bit more range at the top end.
- For bass guitar, try making C6 a 1uF film cap instead of 6n8. This thickens up the bottom. Also, it seems to make the Damage control even more crushed sounding at the highest setting. Pretty neat!
- The tone shaping is done mainly through gyrators with each one taking either a LO, MID, or HI band (notated on the schematic). So, this is kind of like a graphic EQ that's simply fixed. You could mess around with each "band" to alter the tone. But, that might get kinda labor intensive because of all the components involved. Overall, I like the way it's voiced. The one area that's easiest to mod is EQ1 (per the schematic). Altering C21 to higher values will *reduce* top end and also alter the Q of that gyrator. You can explore this more with the [gyrator calculator](#) on the Muzique site.





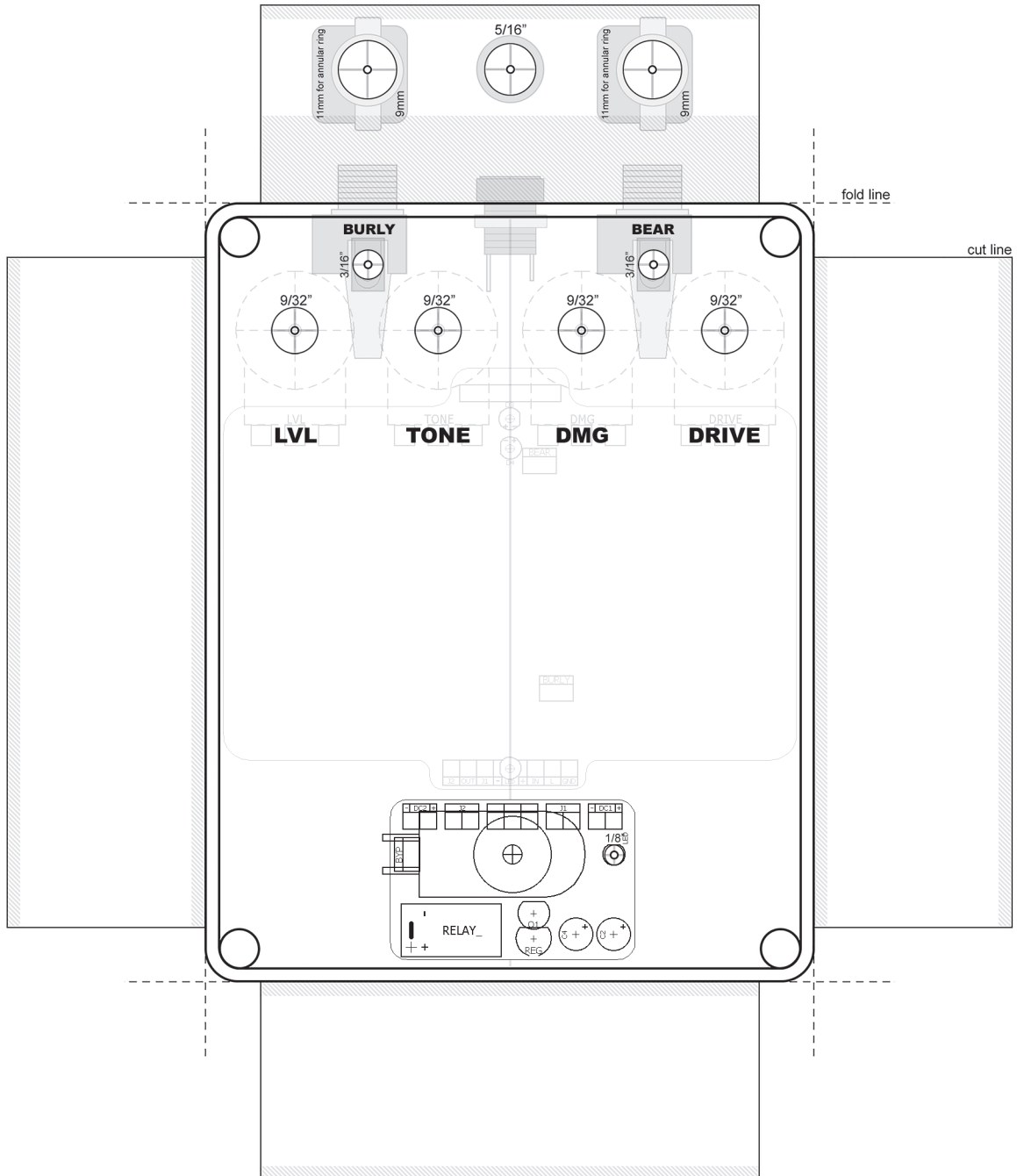
3PDT bypass wiring. If you want to use the Softie2 relay bypass instead (sold separately) please refer to that project documentation for wiring instructions.

**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 regular 3PDT bypass. The toggle switch is shown as sub-mini but a regular sized SPDT should also fit.

**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 Softie2 relay bypass (sold separately). Note the different LED location, too.

<b>Q1</b>	<b>2n3904</b>	<b>Q5</b>	<b>2n3904</b>	<b>IC1</b>	<b>4558</b>	<b>IC2</b>	<b>4558</b>
C	9.04	C	9.04	1	4.47	1	ignore
B	5	B	4.24	2	4.48	2	ignore
E	4.54	E	3.59	3	4.27	3	ignore
<b>Q2</b>	<b>2n3904</b>	<b>Q6</b>	<b>2n3904</b>	4	0	4	0
C	9.04	C	9.04	5	4.29	5	4.26
B	4.05	B	4.23	6	4.56	6	4.66
E	3.46	E	3.61	7	4.54	7	4.65
<b>Q3</b>	<b>2n5088</b>	<b>Q7</b>	<b>2n3904</b>	8	9.04	8	9.04
C	2.08	C	9.04				
B	0.62	B	4.04				
E	56mV	E	3.44				
<b>Q4</b>	<b>2n3904</b>	<b>Q8</b>	<b>2n3904</b>				
C	9.04	C	9.04				
B	4.21	B	3.49				
E	3.59	E	2.96				

- 9.5vDC One Spot
- Current Draw: 10mA
- Testing Conditions:
- DMG full CCW, all other knobs at 50%

