

BurlyBear24

FX Type: **FUZZ**
Build Level: Intermediate
Based On: Ibanez® FZ7™

Last Updated: July 20, 2024 4:30 PM

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Overview

The 2024 version of the Burly Bear in a new layout and has a couple minor circuit changes (how the Burly switch operates, buffered Vb).

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: Self-explanatory.

DMG: The Damage control alters the voltage 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 switches from the stock gyrator used in the gain stage (switch down) to a brighter sounding one (switch up). It also creates a more aggressive pick attack.

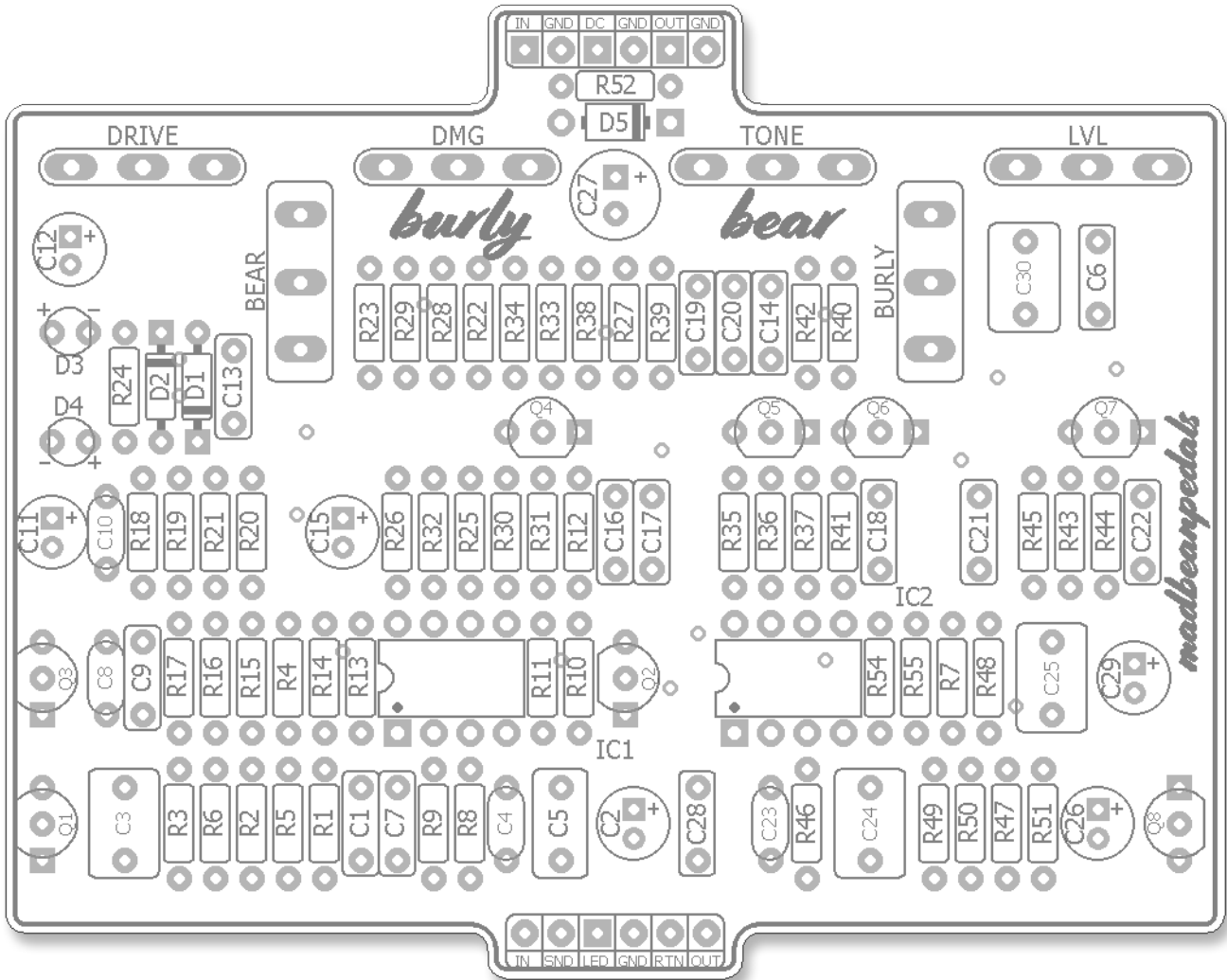
BEAR: Switches to LEDs as the primary clipping diodes. This mode will be louder and less compressed.

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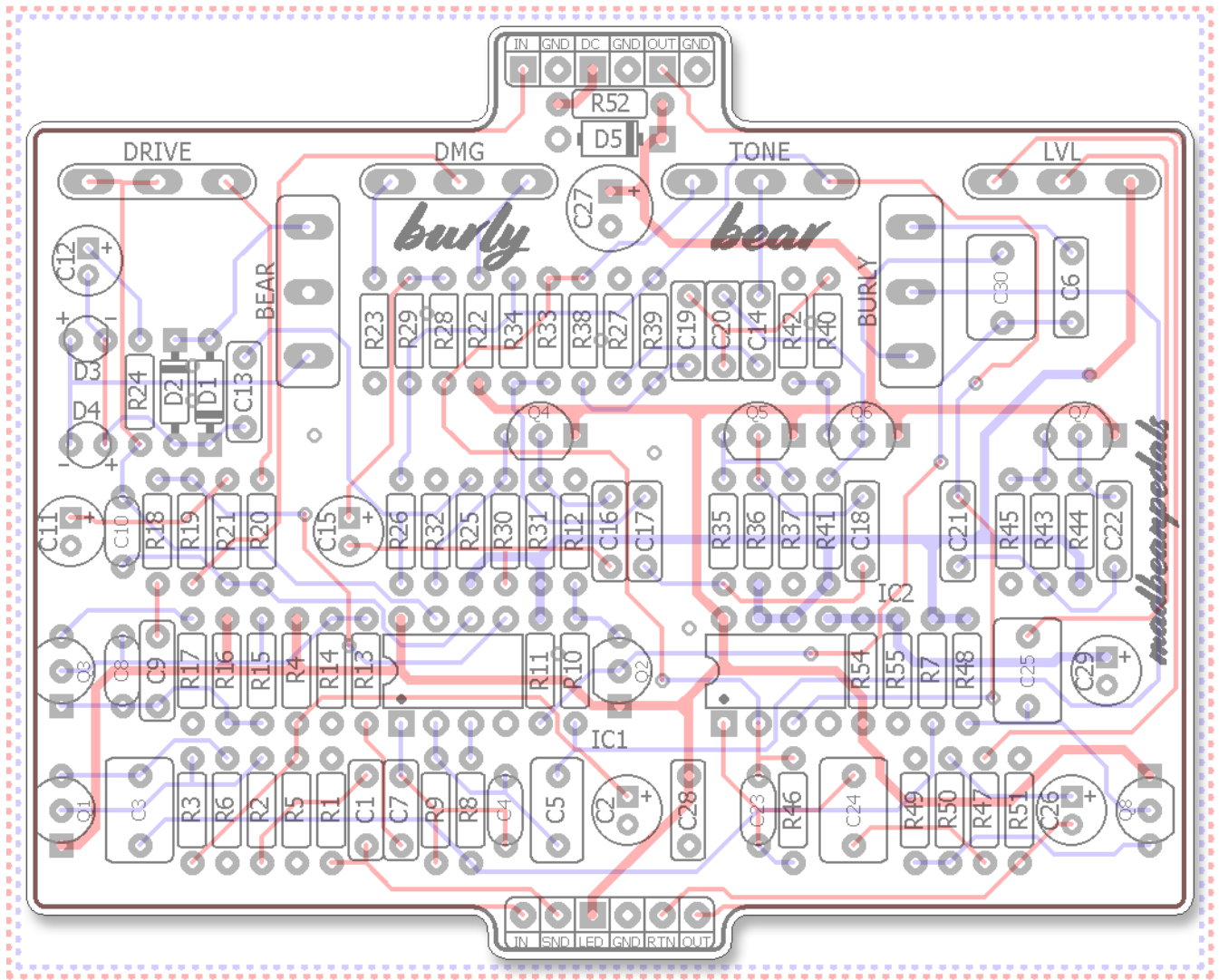
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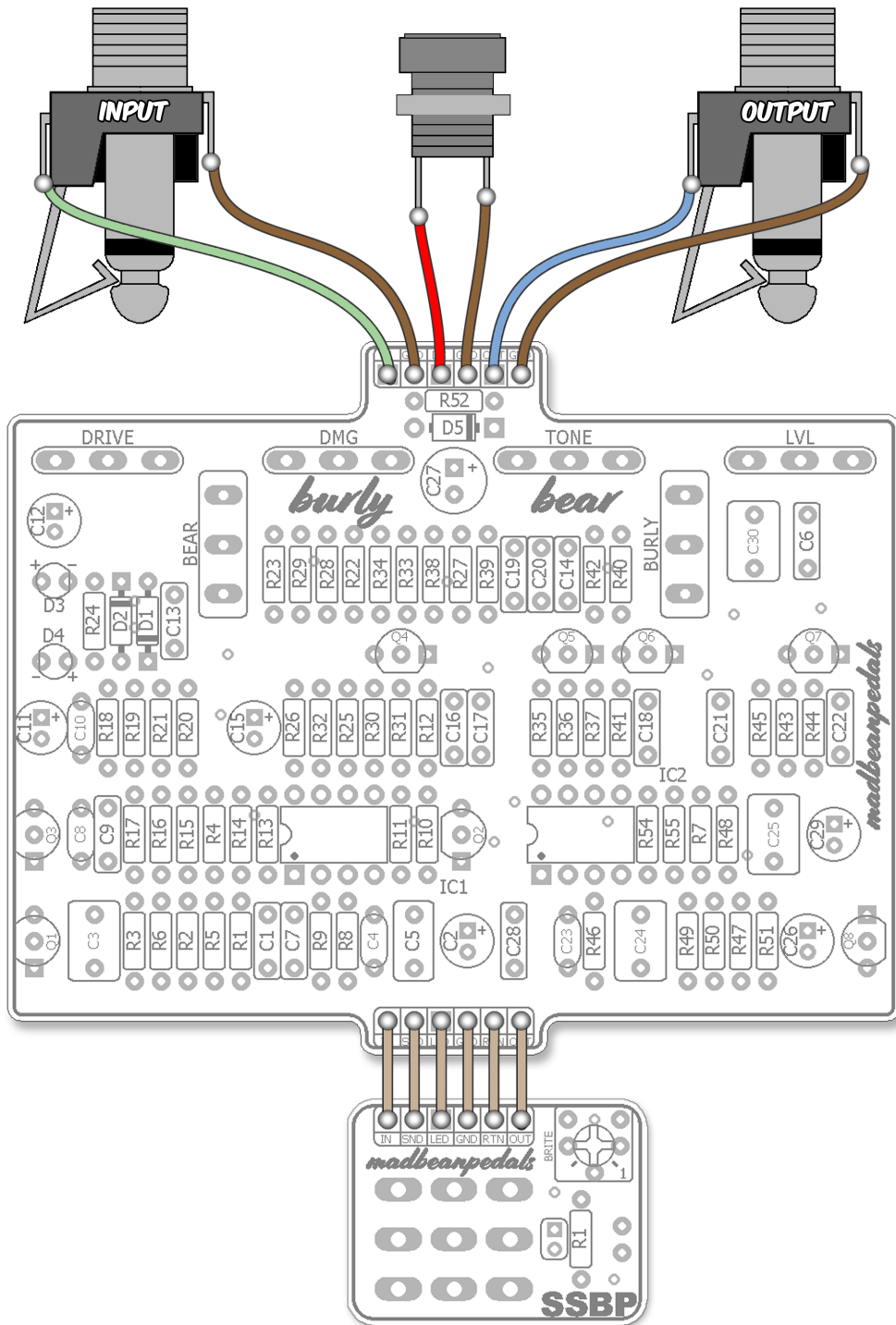
Parts Layout



Trace Layout



Wiring



The BurlyBear24 is compatible with both the **SSBP** and **SSABP** bypass boards available at madbeanpedals.

B.O.M.

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	Transistors	
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	ICs	
R16	47k	R46	10k	C16	18n	IC1	4558
R17	390R	R47	1k	C17	68n	IC2	4558
R18	220R	R48	510k	C18	3n3	Switches	
R19	510k	R49	10k	C19	27n	BEAR	SPDT
R20	1k	R50	470R	C20	1n	BURLY	SPDT
R21	680R	R51	10k	C21	2n7	Pots	
R22	15k	R52	47R	C22	1n	DMG	10kB
R23	5k1	R54	10k	C23	100pF	TONE	10kB
R24	1k	R55	10k	C24	1uF	DRIVE	50kA
R25	1M			C25	1uF	LVL	100kA
R26	10k			C26	10uF		
R27	220R			C27	100uF		
R28	5k1			C28	100n		
R29	15k			C29	47uF		
R30	1k			C30	1n5		

Shopping List

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	1n5	1	Film	16v min.
390R	1	Metal / Carbon Film	1/4W	2n7	1	Film	16v min.
470R	2	Metal / Carbon Film	1/4W	3n3	1	Film	16v min.
680R	1	Metal / Carbon Film	1/4W	6n8	1	Film	16v min.
1k	7	Metal / Carbon Film	1/4W	18n	2	Film	16v min.
2k2	1	Metal / Carbon Film	1/4W	22n	1	Film	16v min.
5k1	2	Metal / Carbon Film	1/4W	27n	1	Film	16v min.
6k8	2	Metal / Carbon Film	1/4W	33n	1	Film	16v min.
9k1	1	Metal / Carbon Film	1/4W	68n	1	Film	16v min.
10k	14	Metal / Carbon Film	1/4W	100n	3	Film	16v min.
13k	2	Metal / Carbon Film	1/4W	470n	1	Film	16v min.
15k	2	Metal / Carbon Film	1/4W	1uF	2	Film	16v min.
22k	1	Metal / Carbon Film	1/4W	1uF	1	Electrolytic	16v min.
33k	1	Metal / Carbon Film	1/4W	2u2	1	Electrolytic	16v min.
47k	1	Metal / Carbon Film	1/4W	4u7	1	Electrolytic	16v min.
100k	3	Metal / Carbon Film	1/4W	10uF	2	Electrolytic	16v min.
180k	2	Metal / Carbon Film	1/4W	47uF	1	Electrolytic	16v min.
270k	1	Metal / Carbon Film	1/4W	100uF	1	Electrolytic	16v min.
510k	4	Metal / Carbon Film	1/4W	1n914	2		
560k	1	Metal / Carbon Film	1/4W	LED	2	Red, Diffused	5mm
1M	2	Metal / Carbon Film	1/4W	1n4003	1	or, 1N4001	
47pF	1	Ceramic / MLCC	16v min.	2n3904	7		
68pF	1	Ceramic / MLCC	16v min.	2n5088	1		
100pF	2	Ceramic / MLCC	16v min.	4558	2		
				SPDT	2	On/On	
				10kB	2	PCB Right Angle	16mm
				50kA	1	PCB Right Angle	16mm
				100kA	1	PCB Right Angle	16mm

Additional Hardware

- (1) 1590BB enclosure
- (2) 1/4" mono jacks
- (1) Slim 2.1mm DC jack
- (1) Standard 3PDT footswitch
- (1) 5mm LED

Build Notes

- The previous version of the BurlyBear required off-board wiring for the added switch mods. The new layout makes them board mounted.
- The Burly switch on the previous version lifted the first gyrator. For the 2024 version, it instead switches to a different cap in the gyrator circuit for a brighter and slightly more aggressive tone. If you want the gyrator lift option, use an On/Off/On switch instead of On/On. The center position will be the lifted option. Warning: at the highest Drive settings this option may produce some squeal, so watch out. If you play a lot of down-tuned sludge guitar, try 1uF @ C30 instead of 1n5. That can produce some nice thick tones.
- The tone shaping of this circuit 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 fixed in place. 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. You can explore this more with the [gyrator calculator](#) on the Muzique site.
- **MOD:** If you use 10kC in place of 10kB for the DAMAGE and TONE pots you will get a little more fine control over each.

Circuit Voltages

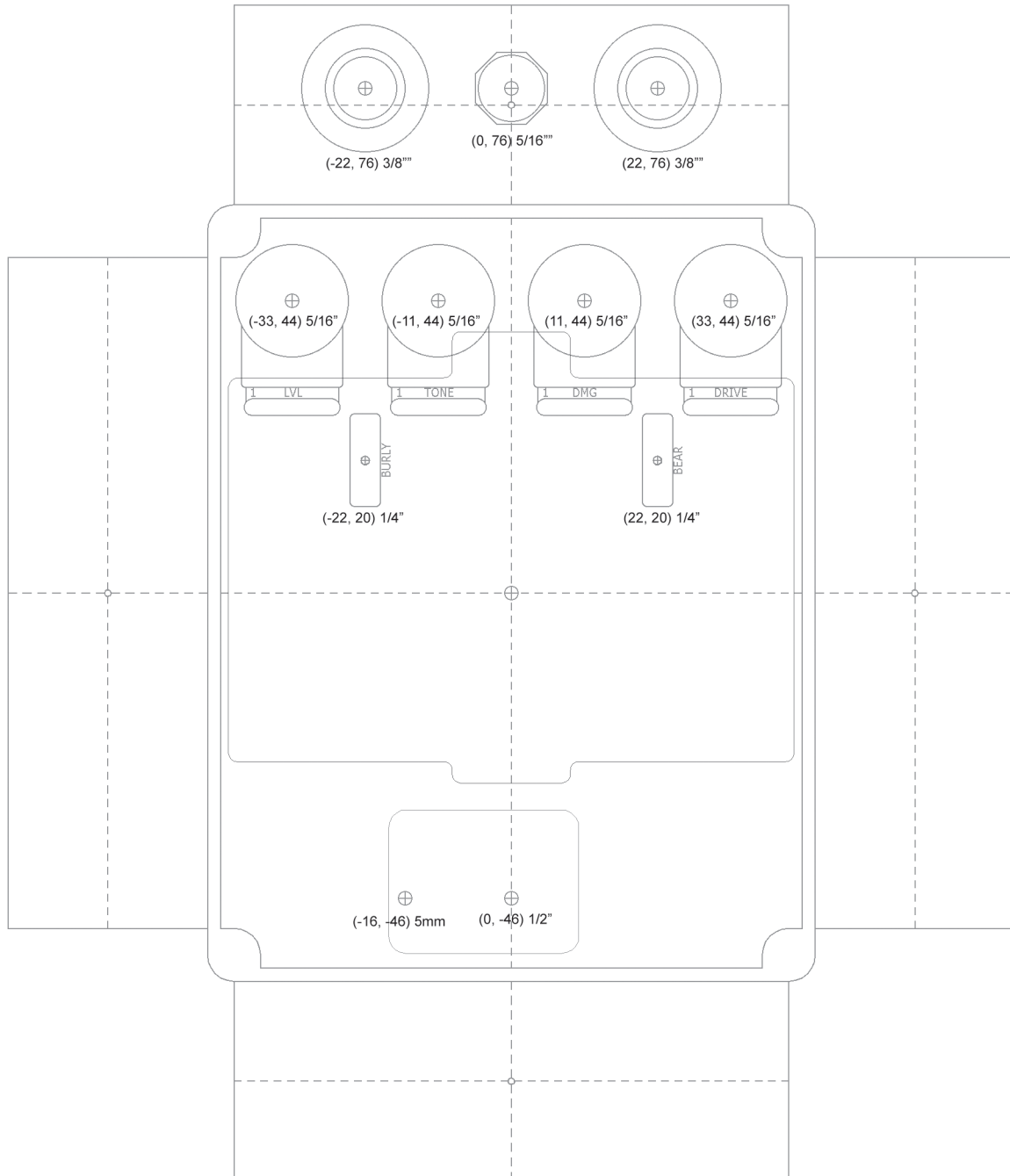
Q1	2n3904	Q5	2n3904	IC1	4558	IC2	4558
C	8.92	C	8.92	1	4.46	1	4.42
B	4.79	B	4.21	2	4.46	2	4.42
E	4.31	E	3.61	3	4.26	3	4.1
Q2	2n3904	Q6	2n3904	4	0	4	0
C	8.92	C	8.93	5	4.19	5	4.45
B	4.11	B	4.43	6	4.38	6	4.46
E	3.53	E	3.88	7	4.38	7	4.46
Q3	2n5088	Q7	2n3904	8	8.92	8	8.92
C	1.42	C	8.93				
B	0.62	B	4.02				
E	62mV	E	3.45				
Q4	2n3904	Q8	2n3904				
C	8.93	C	8.92				
B	4.19	B	3.5				
E	3.61	E	2.98				

- 9.42vDC One Spot
- Current Draw: 11MA
- Testing Conditions: Pots @ 0, switches down.

Drill Template

Coordinates are denoted in (X,Y), drill size format starting from the center (0,0) location of the enclosure.

Tayda drill link: https://drill.taydakits.com/box-designs/new?public_key=dkNrQWc4NmJ5OVNTc0MybFlsSIaAwUT09Cg==



Hardware

1590BB enclosure

1/4" mono jacks

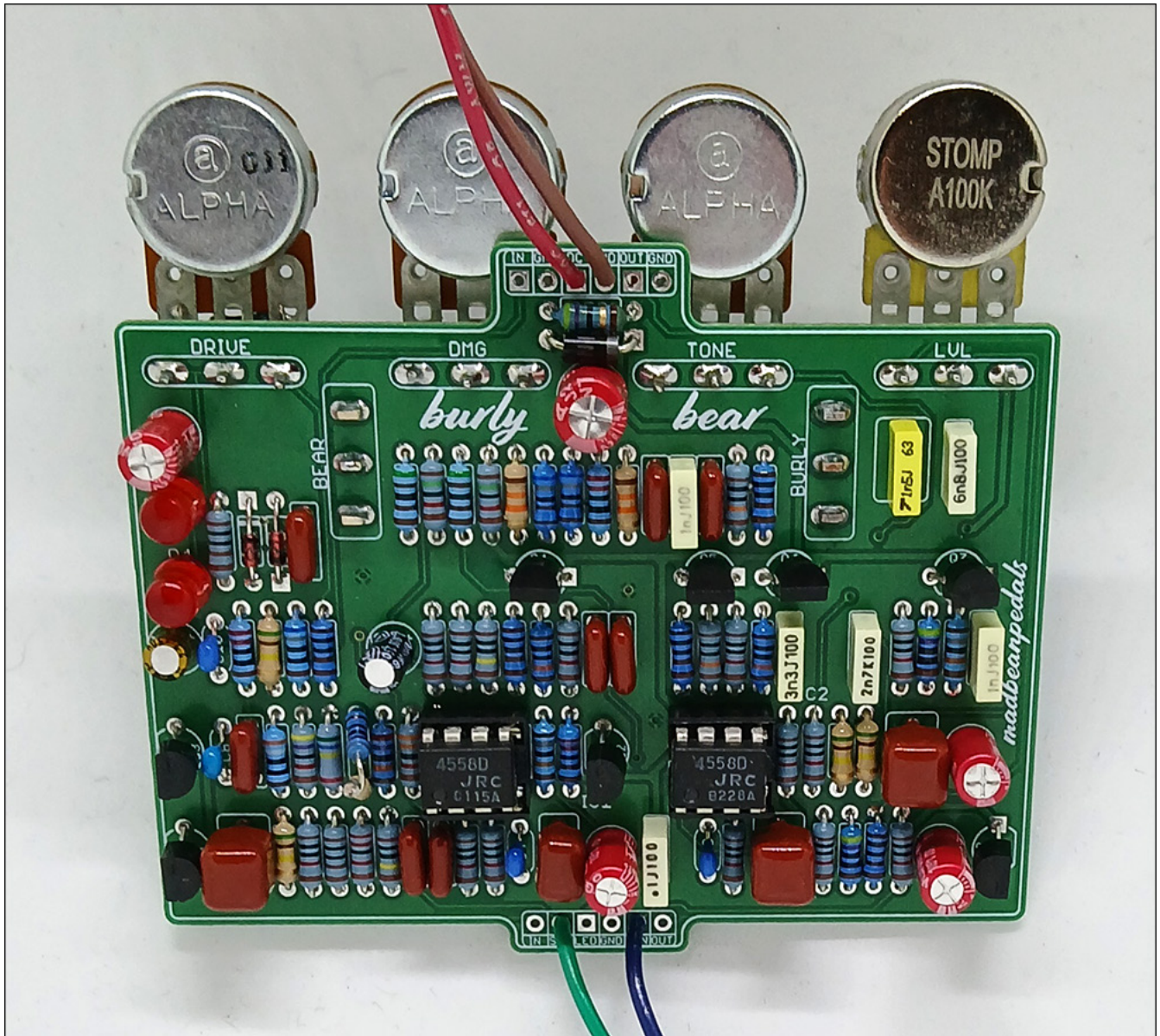
Slim 2.1mm DC jack

Standard 3PDT footswitch

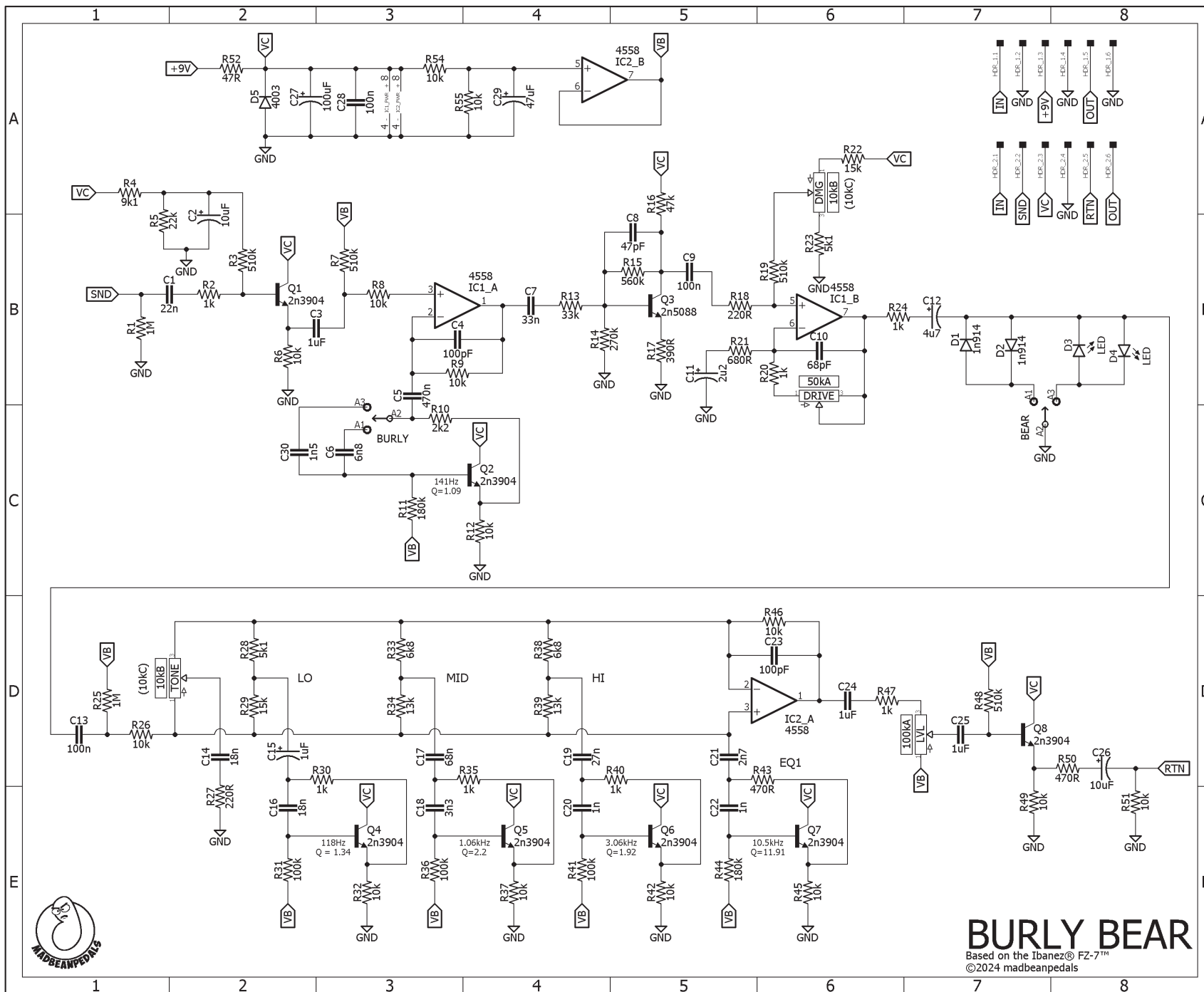
5mm LED

NOTE: Different 1/4" and DC jack styles may require different sized drill holes.

Build Pic



Schematic



BURLY BEAR
 Based on the Ibanez® FZ-7™
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