

ScareBear

FX Type: **DISTORTION**

Build Level: Beginner

Based On: EHX® Big Muff™

Last Updated: June 7, 2024 11:43 AM

© 2024 [madbeanpedals](http://madbeanpedals.com)



Overview

The **ScareBear** (based on the Big Muff™) is the successor to the Mudbunny project which was offered at madbeanpedals from 2010-2023. This version has all the stock tones available with the many Muff™ variations you can build, plus cool extra features.

The ScareBear retains the Tone Bypass switch from the Mudbunny. This removes the tone circuit and takes it to a more mids-focused distortion which many players will enjoy. The voltage divider after it reduces the tone bypass volume so it more closely matches the tone circuit when engaged.

A new clipping switch has been added to choose between two full sets of diode clippers. These can be germanium, LED, or even Mosfets. This expands the range of the circuit further so that all the classic Muff™ sounds are on tap, plus more.

The Ram's Head is the "default" B.O.M. for this version, as it is very popular and a good representative of what the Muff™ sounds like. However, there are many varieties you can build. I suggest you check out the Kitrae Big Muff pages for a complete history of the effect and for additional B.O.M.s.

Controls

- **VOL:** Total output.
- **TONE:** Blends between a low pass filter (CCW) and high pass filter (CW).
- **SUS:** Total distortion amount.
- **BYP:** Removes the tone circuit and makes it more mids-focused (up position).
- **CLIP:** Selects between silicon (down position) and another set of diodes of your choosing (up position).

Further Study:

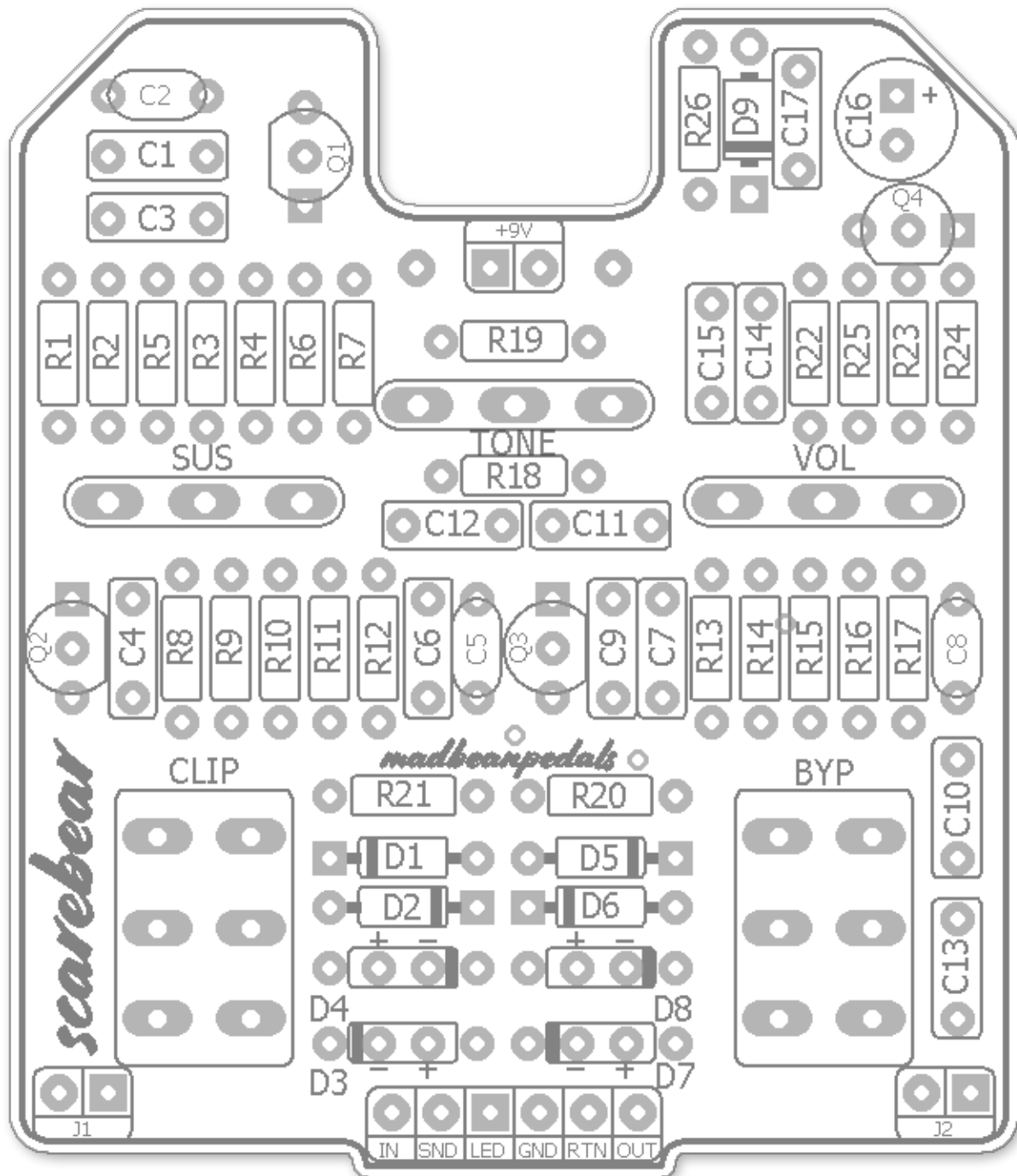
http://www.kitrae.net/music/music_big_muff.html

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

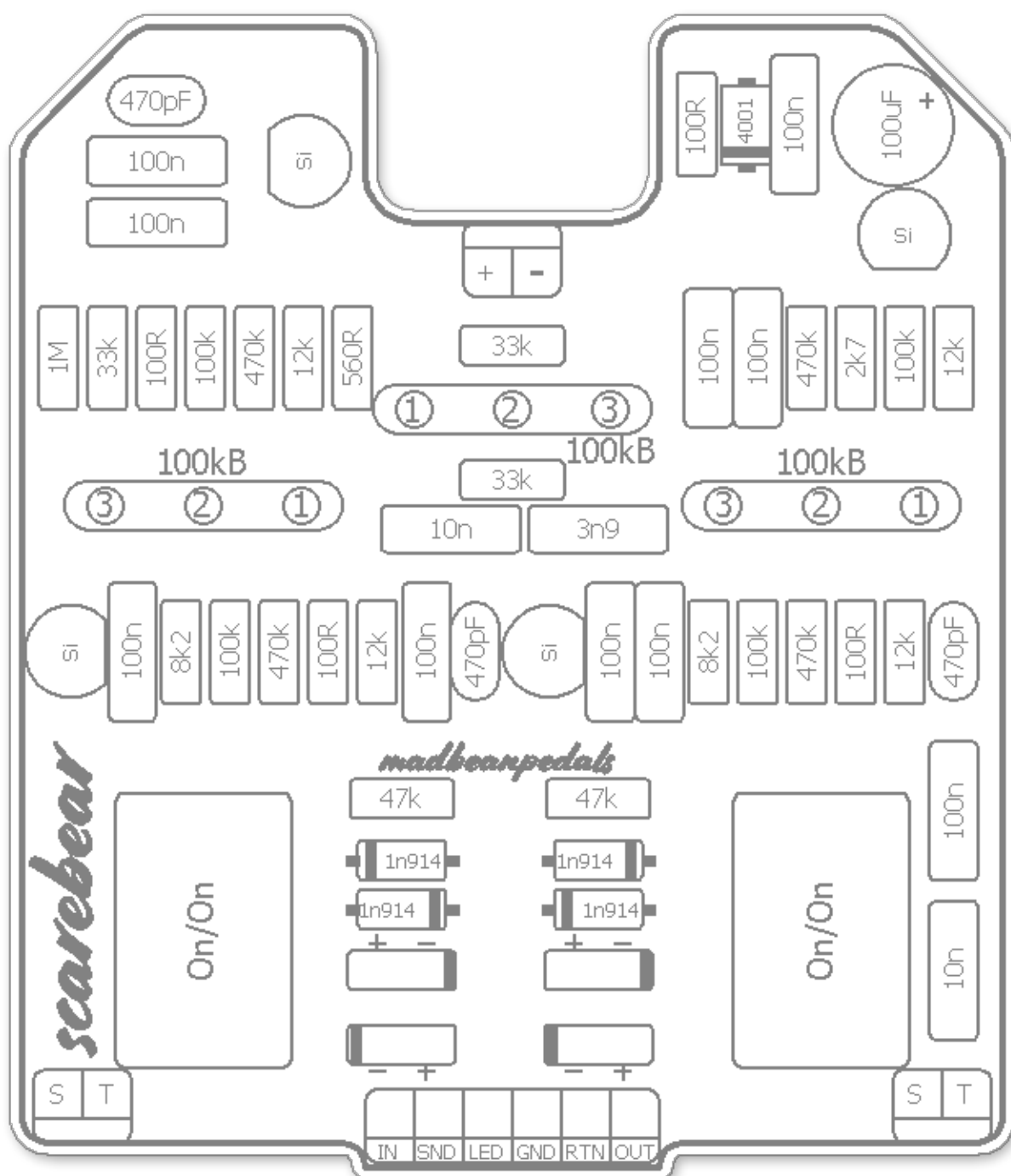
Technical assistance for is available via the [madbeanpedals](http://madbeanpedals.com) forum. Please go there rather than emailing me for personal assistance. This is because (1) I'm not always available to respond via email in a timely and continuous manner, and (2) posting technical problems and solutions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

All copyrights and registered trademarks are property of their original owners. Any mention of trademarked or intellectual properties in this documents is purely for comparative purposes.

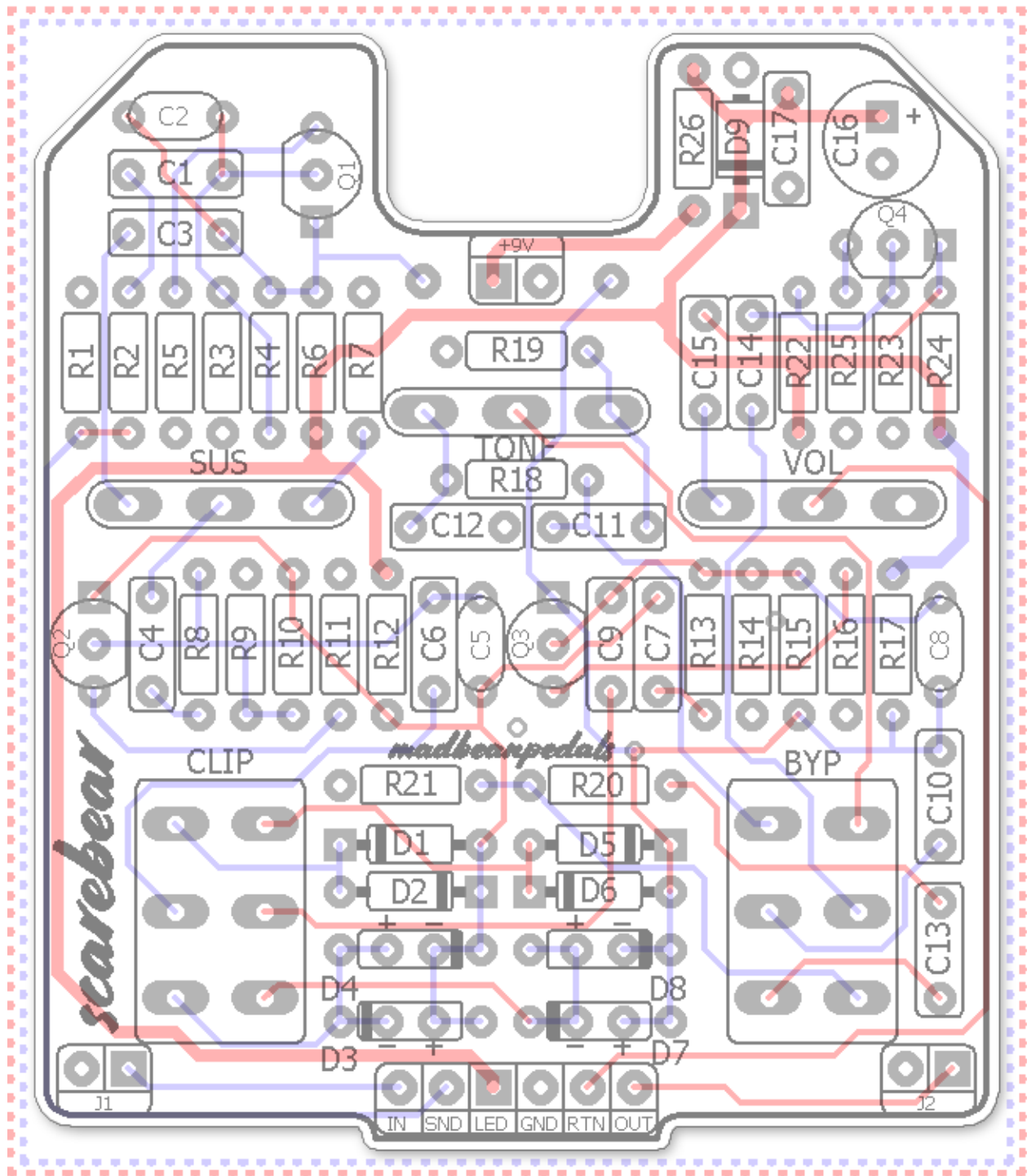
Parts Layout



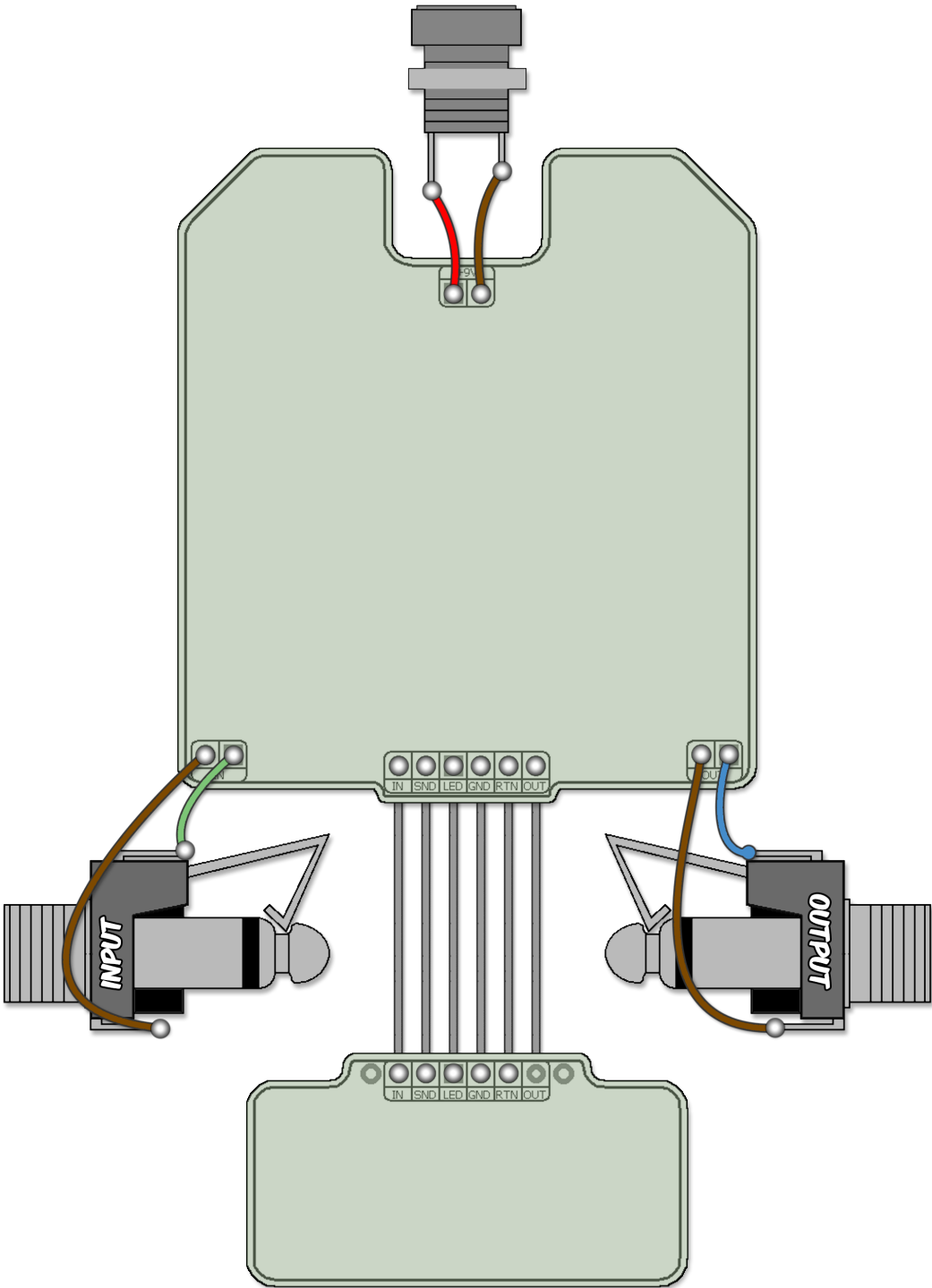
Component Values



Trace Layout



Wiring



Unless otherwise noted, all Standard Series projects have the same wiring regardless of which 3PDT bypass board is used. A 6-pin, 2" ribbon cable is recommended for soldering the connections between the two PCBs.

B.O.M.

Resistors		Caps		Diodes	
R1	1M	C1	100n	D1	1n914
R2	33k	C2	470pF	D2	1n914
R3	100k	C3	100n	D3	your choice
R4	470k	C4	100n	D4	your choice
R5	100R	C5	470pF	D5	1n914
R6	12k	C6	100n	D6	1n914
R7	560R	C7	100n	D7	your choice
R8	8k2	C8	470pF	D8	your choice
R9	100k	C9	100n	D9	1n4001
R10	470k	C10	100n	Transistors	
R11	100R	C11	3n9	Q1-Q4	Si
R12	12k	C12	10n	Switches	
R13	8k2	C13	10n	BYP	On/On
R14	100k	C14	100n	CLIP	On/On
R15	470k	C15	100n	Pots	
R16	100R	C16	100uF	SUS	100kB
R17	12k	C17	100n	TONE	100kB
R18	33k			VOL	100kB
R19	33k				
R20	47k				
R21	47k				
R22	470k				
R23	100k				
R24	12k				
R25	2k7				
R26	100R				

Shopping List

Values	QTY	Type	Rating
100R	4	Carbon / Metal Film	1/4W
560R	1	Carbon / Metal Film	1/4W
2k7	1	Carbon / Metal Film	1/4W
8k2	2	Carbon / Metal Film	1/4W
12k	4	Carbon / Metal Film	1/4W
33k	3	Carbon / Metal Film	1/4W
47k	2	Carbon / Metal Film	1/4W
100k	4	Carbon / Metal Film	1/4W
470k	4	Carbon / Metal Film	1/4W
1M	1	Carbon / Metal Film	1/4W
470pF	3	Ceramic / MLCC	16v min.
3n9	1	Film	16v min.
10n	2	Film	16v min.
100n	10	Film	16v min.
100uF	1	Electrolytic	16v min.
1n914	4		
1n4001	1		
diodes	4	*see notes	
Si	4	2n5088, etc.	
DPDT	2	On/On, Solder Lug or Pin Mount	
100kB	3	PCB Right Angle	16mm

Additional Hardware

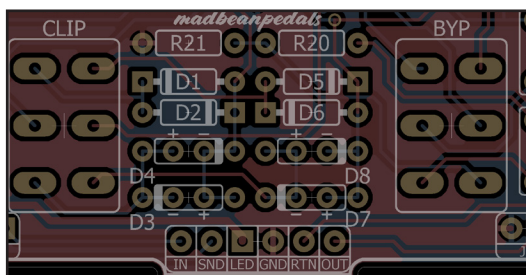
- (1) 1590B enclosure
- (2) Lumberg 1/4" Compact mono jacks
- (1) Slim 2.1mm DC jack
- (1) Standard 3PDT footswitch
- (1) 5mm LED

Build Notes

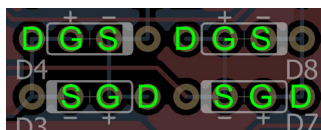
Transistors

- There are many transistors you can use in the ScareBear. Alternatives to the 2n5088 include BC549C, BC550, BC182L, 2n5089, and MPSA18, as well as many more. Using different transistors *can* create unique variations in tone but some may not be very distinguishable. Be careful to use the correct pin-outs, however. Some transistors, such as the BC549C will need to be rotated 180° from the silk screen drawing on the PCB due to its reversed pin-out. Always check the appropriate datasheet for your transistor BEFORE soldering.
- For my build, I used [BC4078](#) with matched HFE of around 260 using my DCA Atlas. I really like these - kinda grainy and textured (I mean more-so than usual) in the Muff™. For a period correct Ram's Head, you can use [2n5133](#) or [SE4010](#), (check pinouts).

Diodes



- For the extra clipping diodes, I've used a new library part that has multiple pins. It shows the anode and cathode orientation for regular diodes and LEDs. Here the "+" is the LED anode and "-" is cathode (short leg). Use 3mm LEDs as 5mm will not fit side by side.
- Diodes such as germanium, LED, and Mosfets (wired as diodes) offer the opportunity to customize the ScareBar to your taste via the Clip switch. Typical alternatives include 1n34a, 1n270, BAT41, red or green diffused 3mm LEDs, and 2n7000 Mosfets.
- Using germanium diodes in the D3/D4 position will sometimes create a very light octave effect. If you use them for both D3/D4 and D7/D8 you may get a slight "bloom" in the note decay (a VERY COOL effect). However, one caveat I've found with germanium diodes in the Muff™ is it sometimes does not fully clip the lowest frequencies. So, perhaps one of the other types in D3/D4 and germs or Schottky for D7/D8.
- For Mosfet for clipping, solder the transistors in so that the Drain and Gate are connected at one end and the Source on the other and do them back to back for D3/D4 and/or D7/D8. Example below on how 2n7000 would be connected.



- Note: If you use an On/On/On (type2 switch) you get one extra clipping setting. In the middle position, you will have D3/D4 as the first set of clippers and D5/D6 as the second! I liked this setting with LEDs since it does LED clipping first the 1n914 second.

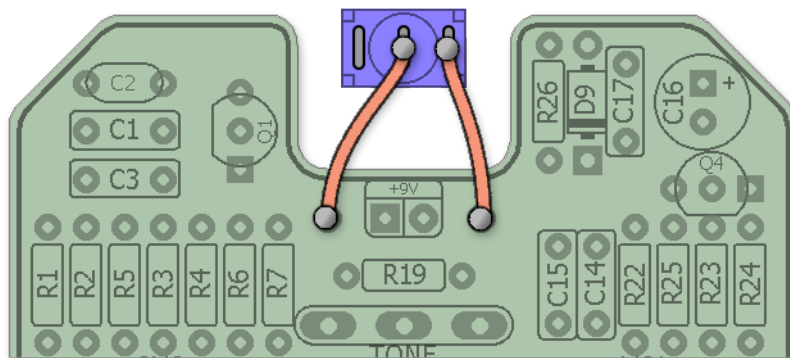
Build Notes

Tone Bypass

- C13 determines the center frequency of the Tone Bypass switch. I've suggested 10n as that creates a very sweet mid-focused sound. If that's not to your taste, I suggest socketing that cap and trying higher values like 22n, 33n, 47n, etc.

ScareBear Dare

- There is one additional mod for all the noisemakers out there. The ScareBear Dare shorts the collectors of Q1 and Q3. This creates an oscillator that changes pitch with the SUS control. And, the fundamental changes when you toggle the CLIP switch! Try this with some delay and you will be making headlines.
- The mod is simple to do: use an [SPDT sub-mini switch](#) and wire the two pads to it as shown below. When the switch is flipped to the right, you will be ScareBearing all your band-mates. The Drill Template shows where the sub-mini switch should be placed.



Circuit Voltages

Q1	Si	Q3	Si
C	4.57	C	4.41
B	0.62	B	0.65
E	38mV	E	40mV
Q2	Si	Q4	Si
C	4.52	C	5.2
B	0.65	B	1.52
E	39mV	E	0.92

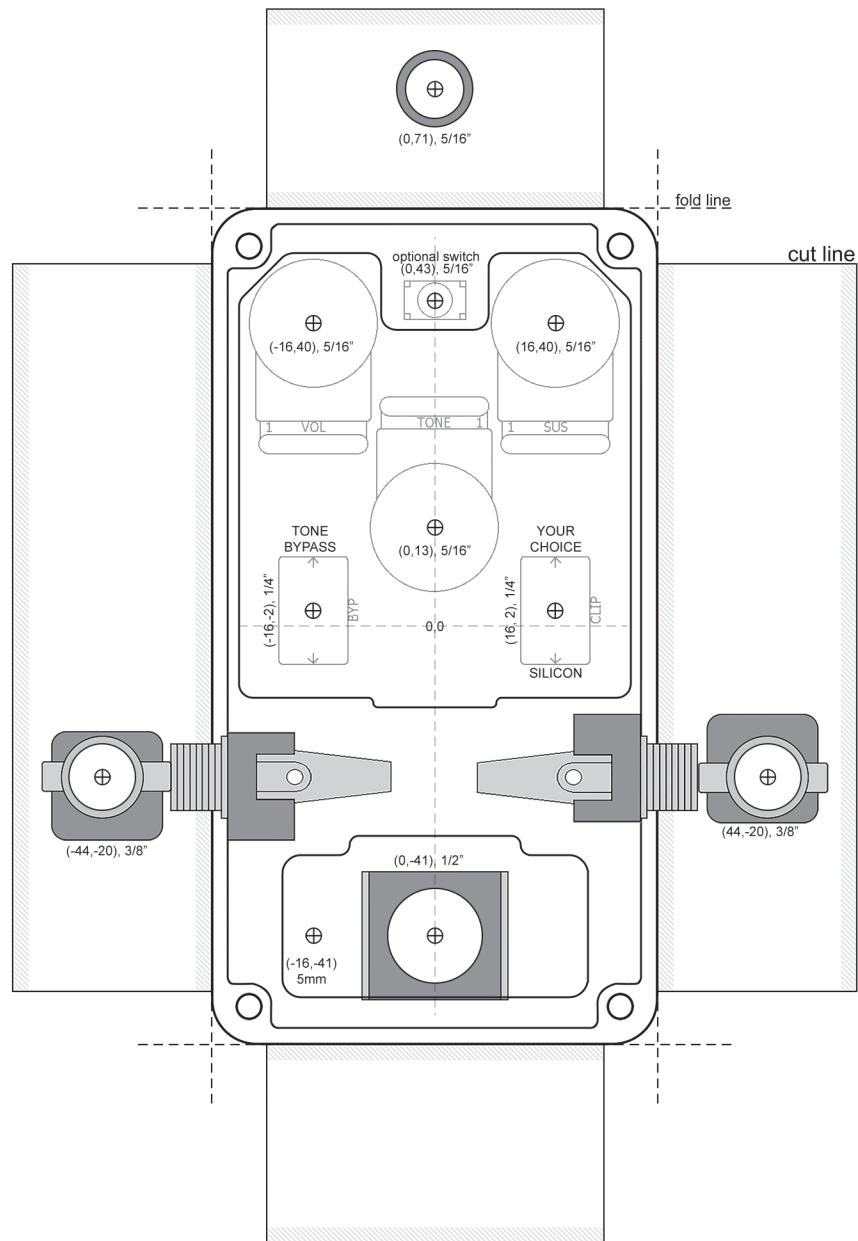
9.44vDC One Spot supply
Current Draw: ~2mA

- Knobs @ 50%
- Switches down

1590B Drill Template

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

[ScareBear Tayda Drill Template](#)

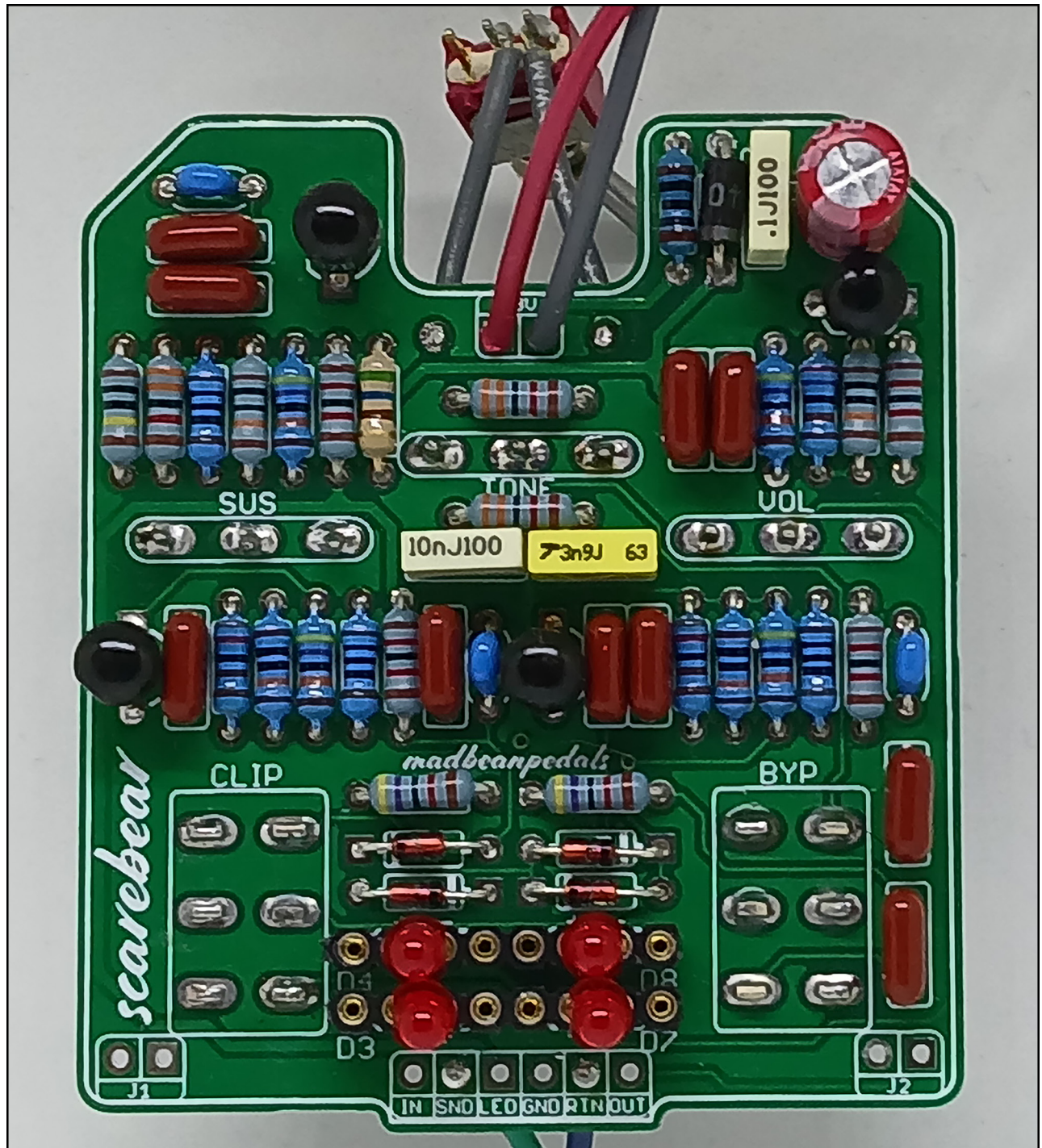


Hardware

1590B enclosure
Lumberg 1/4" Compact 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

