

Boneyard

FX Type: **DISTORTION**

Build Level: Beginner

Based On: Carl Martin® Plexitone™

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Overview

From the [Carl Martin website](#):

“The Plexitone falls into the category of a distortion/gain pedal, but is actually so much more. When we think back to the guitar heroes from the 60’s, 70’s and 80’s, they all cut their teeth and developed their sound on single channel amps....ok, sometimes they daisy-chained a few together, but they were still single channel amps! With the Plexitone, we are now able to take our sound to three different levels of boost/gain/distortion at the touch of a toe.”

The **Boneyard** is only a piece of the original Plexitone™, namely the “crunch” channel. Additionally, the Boneyard utilizes a simple voltage inverter so that all the typical pedal power supplies can be used. It can be operated at 9v, but 12v operation is recommended if you have that option available.

Two mods were implemented: an input buffer and DIP switch. The input buffer was added to an issue with self-oscillation at high gain settings (a frequent problem with the Boneyard project offered a number of years ago). The DIP switch operation is explained below.

Controls

- **VOL, TONE, GAIN:** Self-explanatory.
- **DIP:** The left switch shorts one of the LEDs for asymmetrical clipping. The right switch adds a cap in parallel to C10 to shift the overall tone of the stock circuit darker.

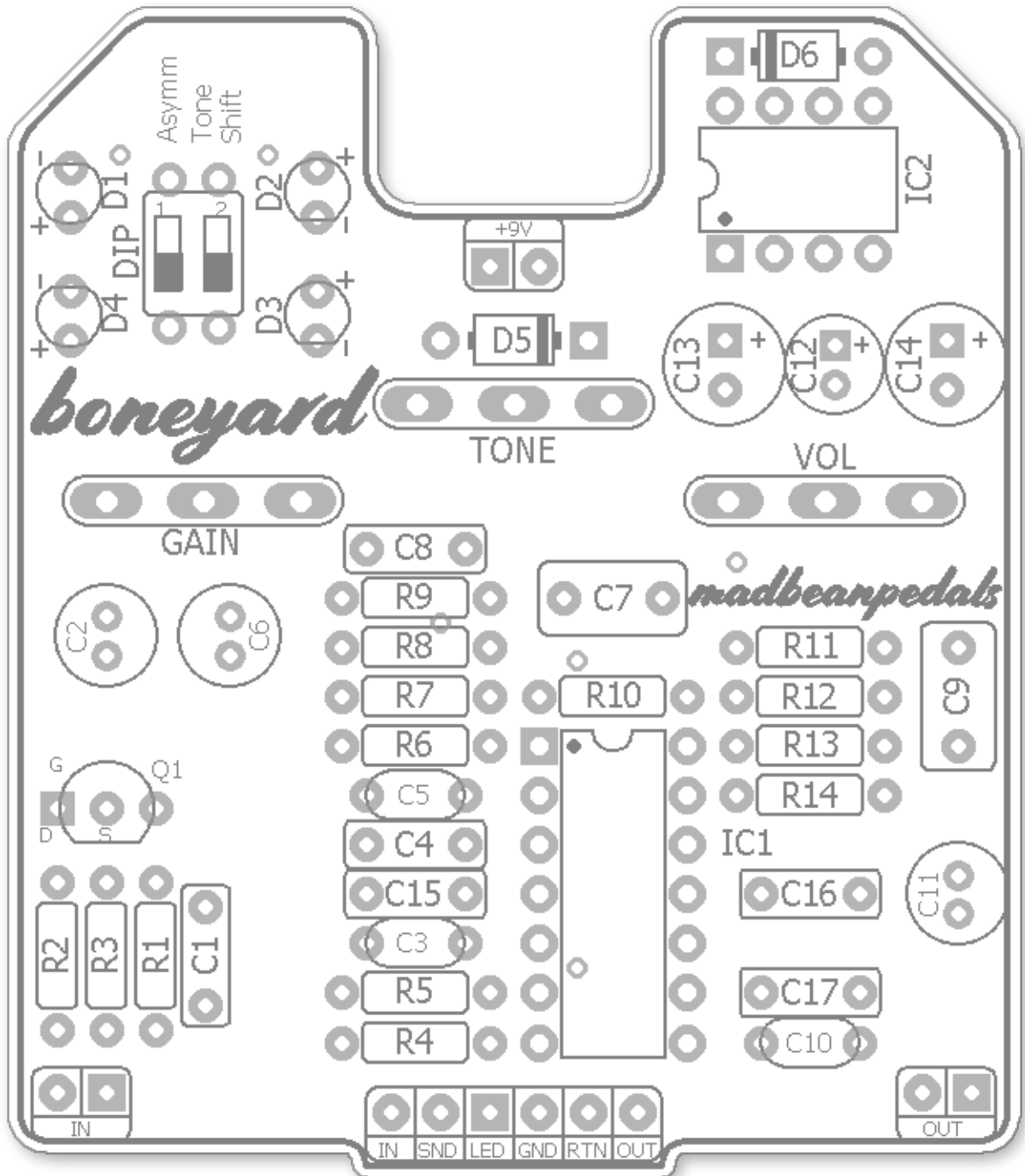
Further study: <https://www.youtube.com/watch?v=Ng4peS3MjrY>

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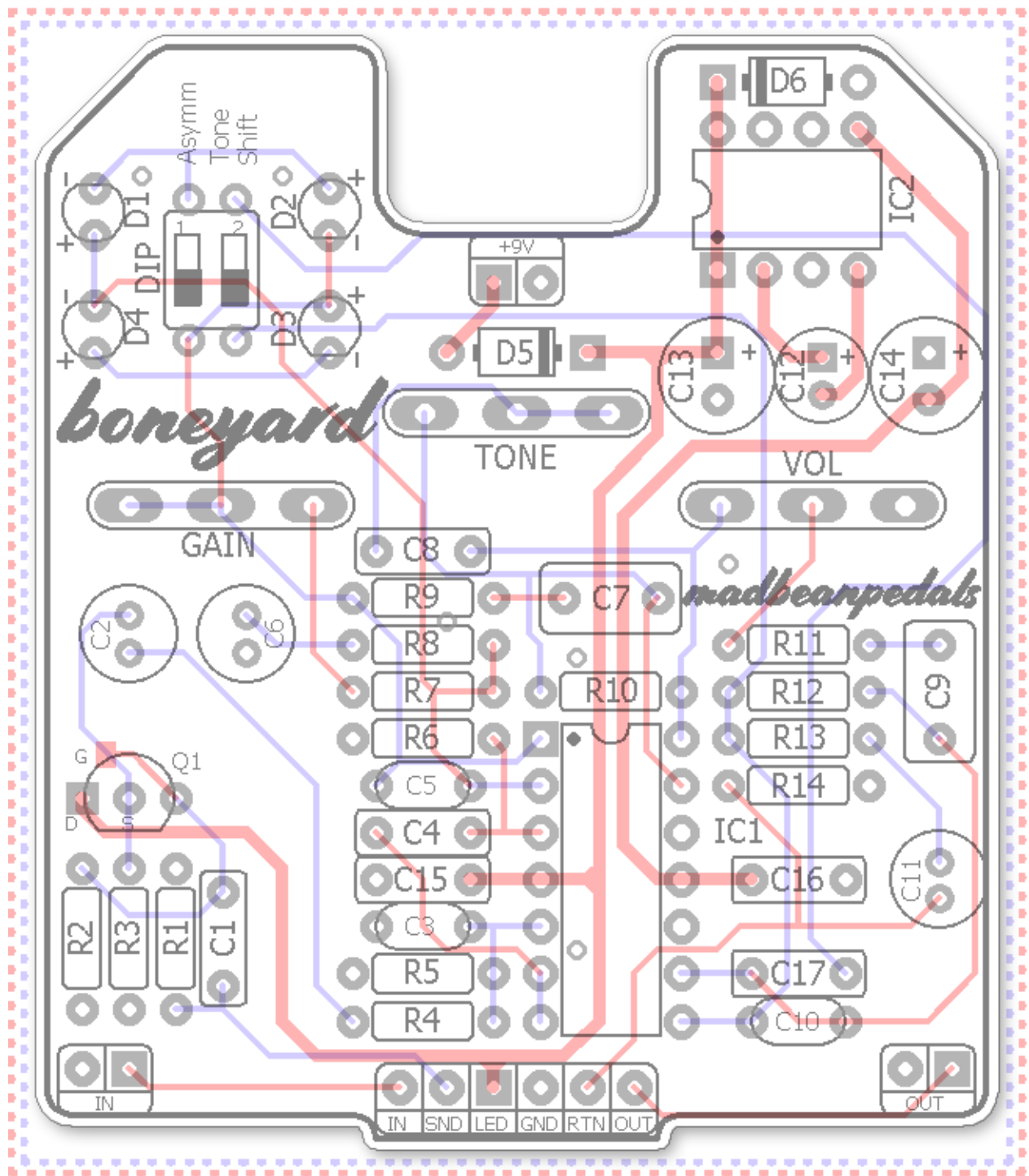
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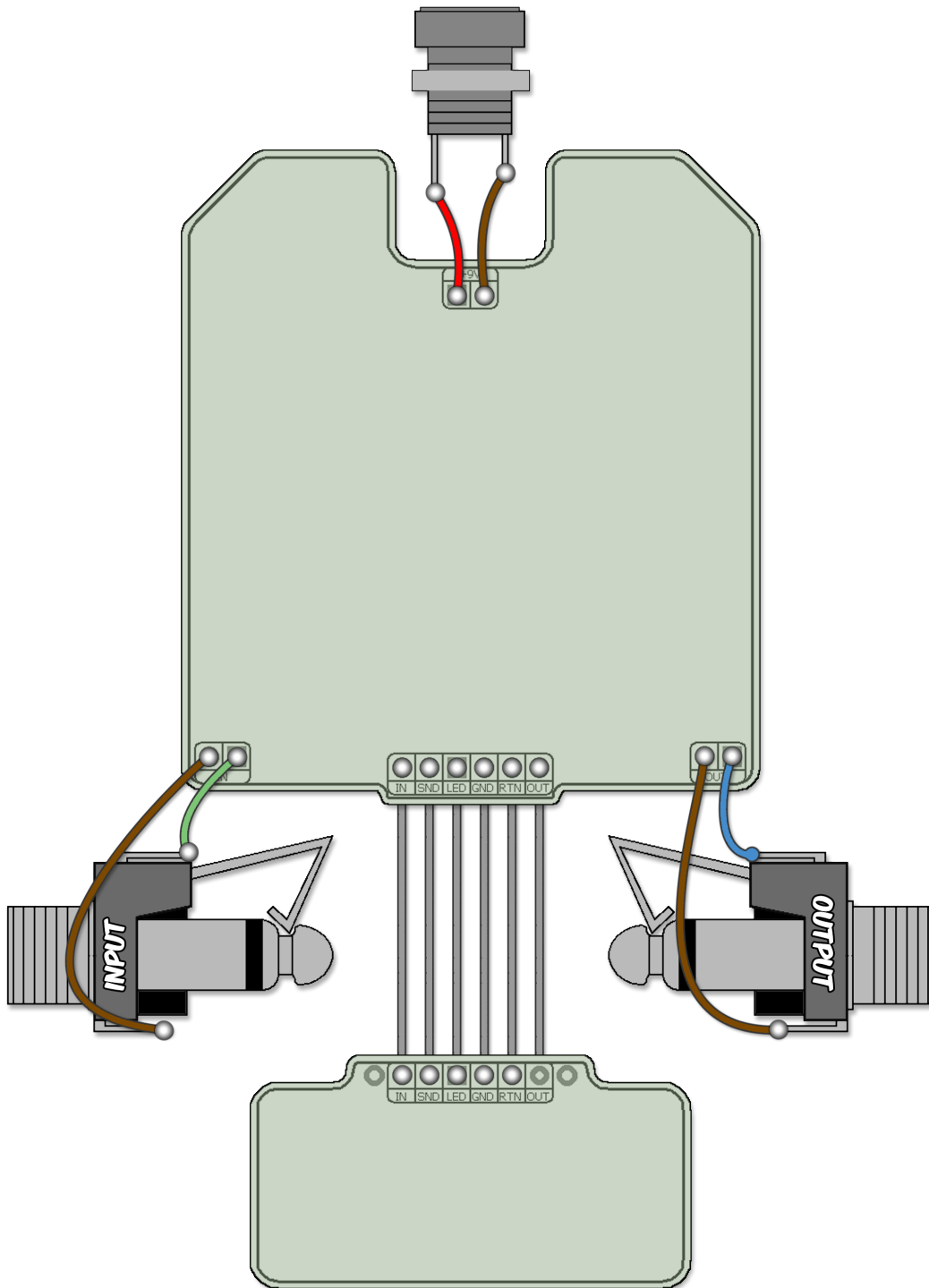
Parts Layout



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	47n	D1	LED
R2	1M	C2	2u2 BP	D2	LED
R3	10k	C3	330pF	D3	LED
R4	1k	C4	33n	D4	LED
R5	1M	C5	330pF	D5	1n5817
R6	47k	C6	2u2 BP	D6	12v
R7	2k	C7	470n	Transistors	
R8	47R	C8	68n	Q1	J201
R9	4k7	C9	470n	IC	
R10	22k	C10	330pF	IC1	LF347
R11	22k	C11	2u2 BP	IC2	TC1044SCPA
R12	22k	C12	10uF	Switches	
R13	100R	C13	220uF	DIP	2-pos.
R14	1k	C14	220uF	Pots	
		C15	100n	VOL	5kA
		C16	100n	TONE	5kB
		C17	1n5	GAIN	100kB

Shopping List

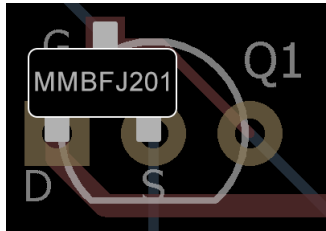
Values	QTY	Type	Rating
47R	1	Carbon / Metal Film	1/4W
100R	1	Carbon / Metal Film	1/4W
1k	2	Carbon / Metal Film	1/4W
2k	1	Carbon / Metal Film	1/4W
4k7	1	Carbon / Metal Film	1/4W
10k	1	Carbon / Metal Film	1/4W
22k	3	Carbon / Metal Film	1/4W
47k	1	Carbon / Metal Film	1/4W
1M	3	Carbon / Metal Film	1/4W
330pF	3	Ceramic / MLCC	16v min.
1n5	1	Film	16v min.
33n	1	Film	16v min.
47n	1	Film	16v min.
68n	1	Film	16v min.
100n	2	Film	16v min.
470n	2	Film	16v min.
2u2 BP	3	Electrolytic, Bi-Polar	16v min.
10uF	1	Electrolytic	16v min.
220uF	2	Electrolytic	16v min.
LED	4	Red, diffused	5mm
1n5817	1		
12v	1	Zener	1W
J201	1	SMT or Through-Hole	
LF347	1		
TC1044SCPA	1		
2-pos.	1	Mini Dip Switch	
5kA	1	PCB Right Angle	16mm
5kB	1	PCB Right Angle	16mm
100kB	1	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

- It probably seems like a redundancy to have two buffers at the input (one JFET and one op-amp) but the proof is in the pudding. Most likely the very low output impedance of the JFET works to counteract any possibility of oscillation as was experienced by a number of builders with this circuit in the past. That said, I've only built the "Crunch" version of the circuit. If you want the "High Gain" version, make the Gain pot a 1MA. Try not to blow yer house up, dog.
- For the JFET device itself, you have the option of either a through-hole or surface mount device. Rather than using two separate parts the JFET is combined into one so the surface mount version takes advantage of the two through-hole pads. This works out great and is actually easier to solder than a fully surface mount part.



- In the stock Plexitone™, IC1_C is the boost circuit. Since that is not included for this version it was made into a unity gain amplifier. This offers a small advantage of making the effect output in phase with its input, although that's not really important. Also, the Plexitone™ has no coupling cap at the output. While it isn't totally necessary since ideally the DC voltage is 0 at the output, I added a coupling cap nevertheless (2u2 BP).

Circuit Voltages

IC1	LF347	IC2	TC1044
1	4mV	1	9.22
2	1mV	2	5.43
3	1.5mV	3	0
4	9.22	4	3.57
5	8.4mV	5	-8.82
6	8.8mV	6	4.46
7	9mV	7	6.75
8	1.8mV	8	9.22
9	1.8mV	Q1	J201
10	0.8mV	D	9.22
11	-8.82	S	69mV
12	0.8mV	G	588mV
13	2.2mV		
14	2.2mV		

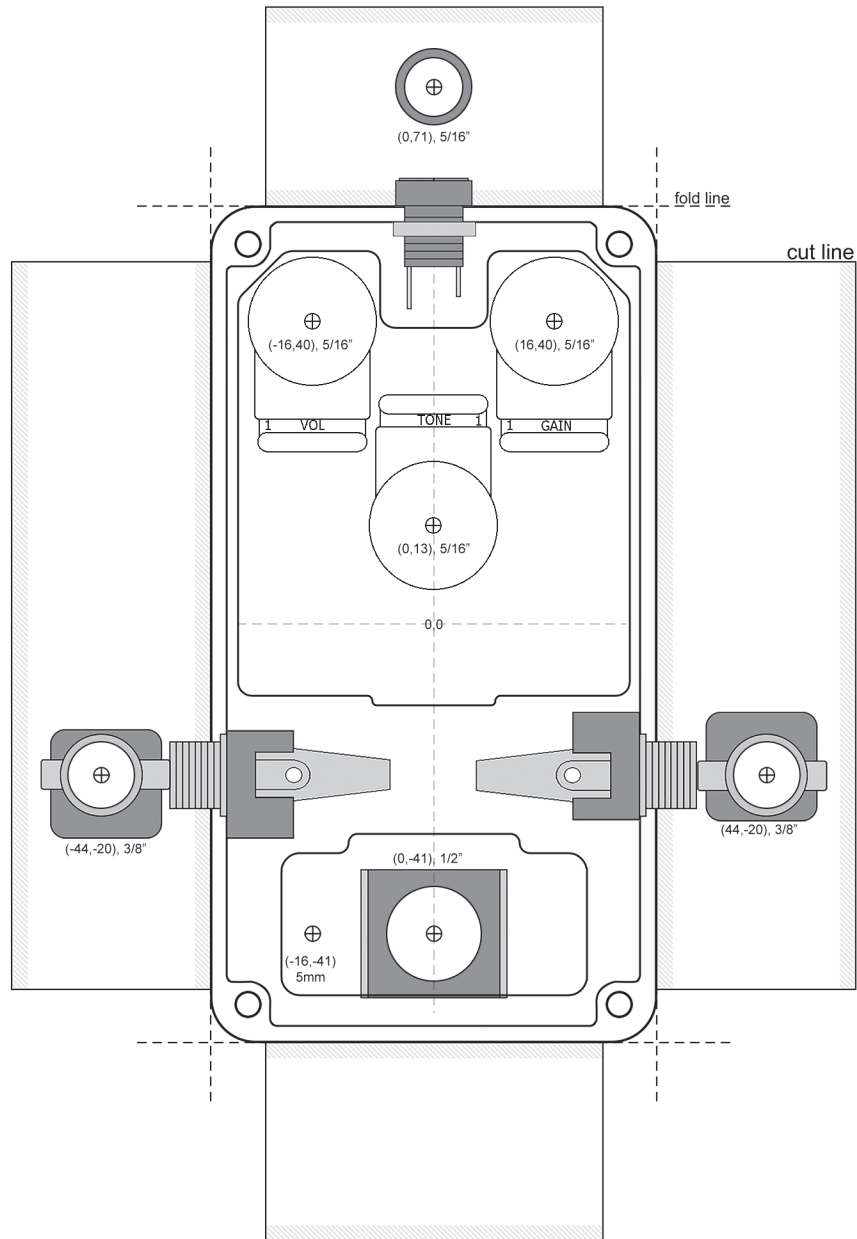
9.44vDC One Spot supply
Current Draw: ~19mA
Knobs @ 50%

Note: Measurements under 10mV
can be regarded as effectively
0vDC.

1590B Drill Template

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

[Link to Tayda Standard Series master drill template](#)

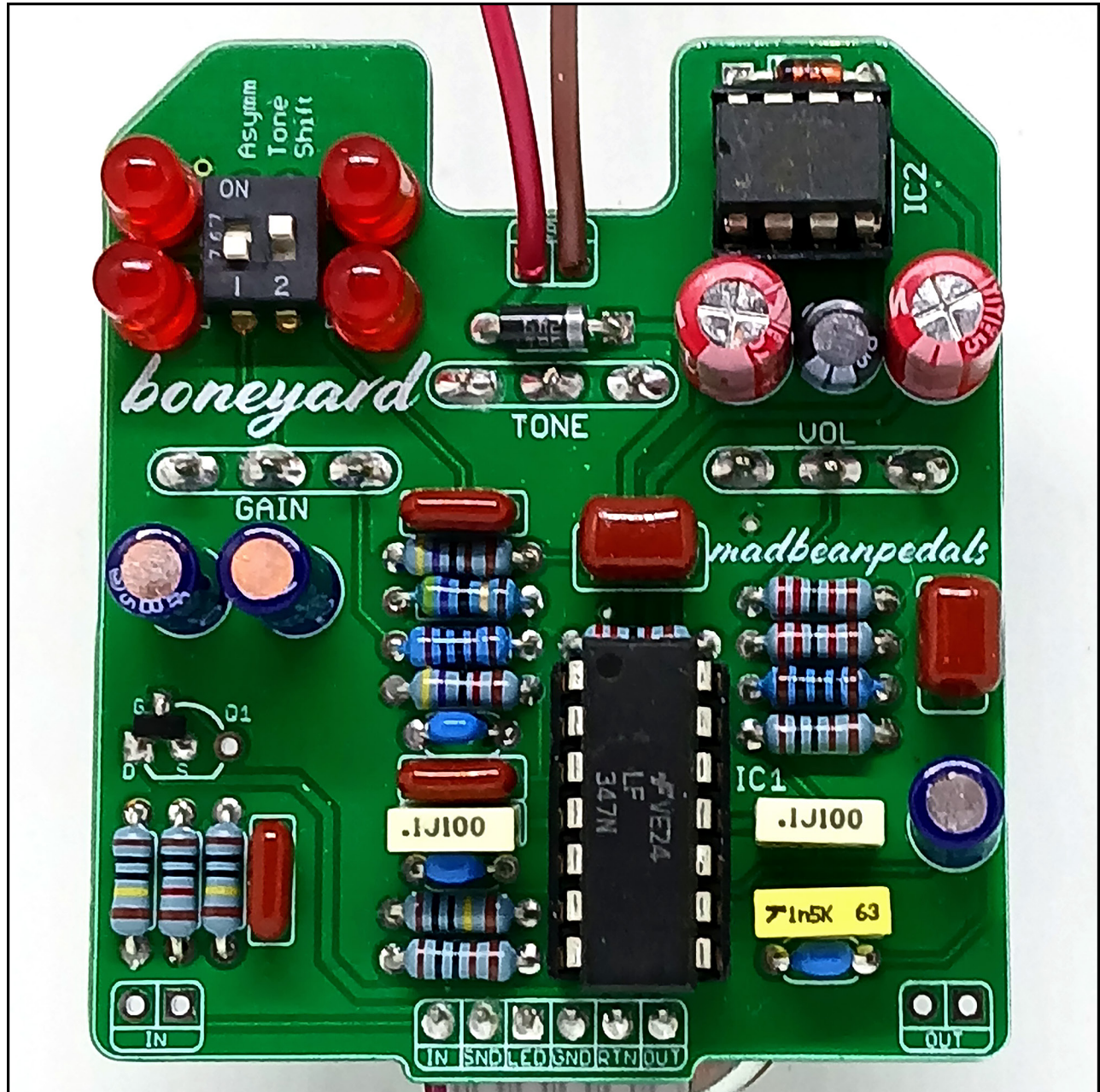


Hardware

1590B enclosure
16mm pots
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

