

# PepperSpray

FX Type: **FUZZ**

Build Level: Beginner

Based On: Interfax® Harmonic Percolator™

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## Overview

The Harmonic Percolator™ is a very rare and mysterious fuzzbox. Not many Interfax® production units were made in its short life-span. However, in the last few years there has been a resurgence of interest and at least a couple of companies have offered clones at one time or another.

If you've never heard of this beast, I suggest you watch these:

<http://www.youtube.com/watch?v=nahPA-RKEfQ>

[http://www.youtube.com/watch?v=7278zg\\_UQKQ](http://www.youtube.com/watch?v=7278zg_UQKQ)

<http://www.youtube.com/watch?v=XzNXKrMynW4>

The Percolator does not seem to have one “stock” design. Slight changes were made in component values over its life-cycle. Therefore, determining what constitutes the “ultimate” version involves some guess-work.

The schematic also lists alternate values in parenthesis. These reflect what was likely the “stock” unit although that is debatable. There are many, many variations listed for the Percolator. The main differences between the two are these:

- The Albin version is smoother and more controlled. It has a slightly over-compressed fuzz tone when the Harm is all the way up. IMO, it's a more aggressive than a FuzzFace with some unique characteristics.
- The Stock version is much more unruly. It has a very over-compressed sound (although this is not a bad thing). It also is noisier than the Albin version.

## Controls

- **HARM:** The “harmonics” control sets the input level of the effect.
- **BAL:** The “balance” control sets the volume output.
- **CLIP:** Toggle between the stock 1n695 (down) and your choice of clipping diodes (up).
- **T1:** This trimmer allows you to set some resistance in the clipping path of the second set of diodes (see Notes).

Further Study:

<http://www.diystompboxes.com/smfforum/index.php?topic=68649.0>

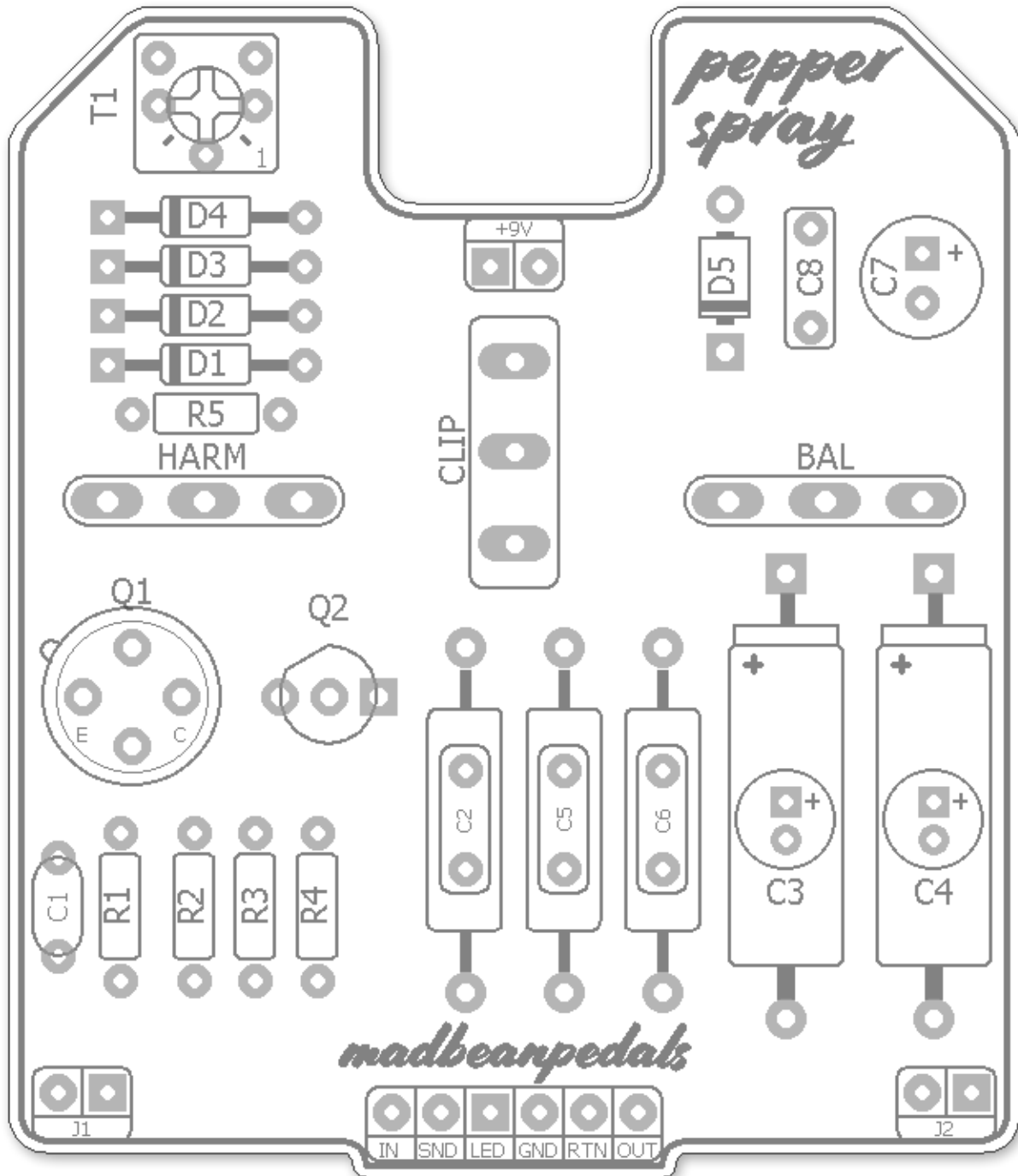
<http://www.freestompboxes.org/viewtopic.php?f=19&t=6675>

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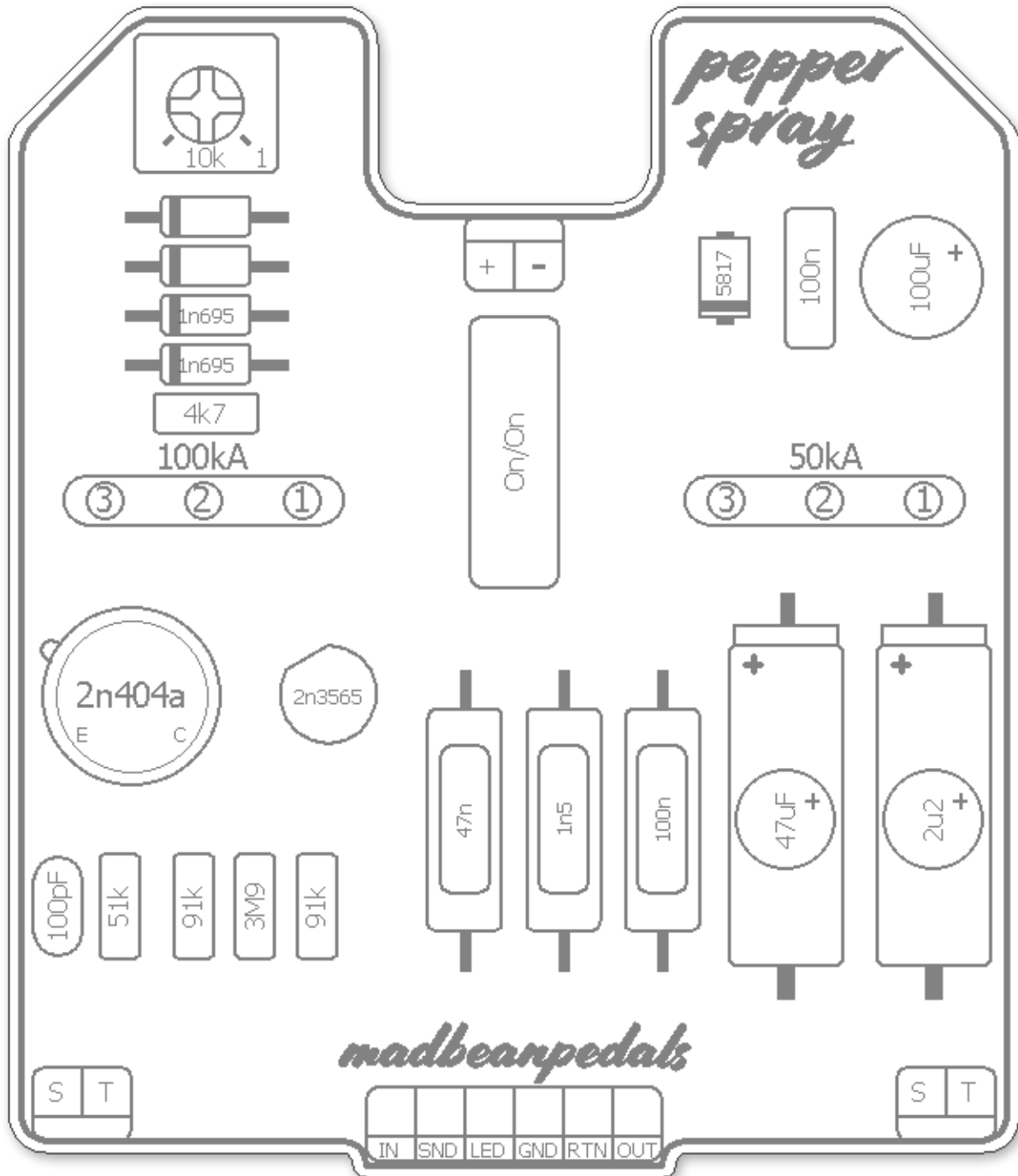
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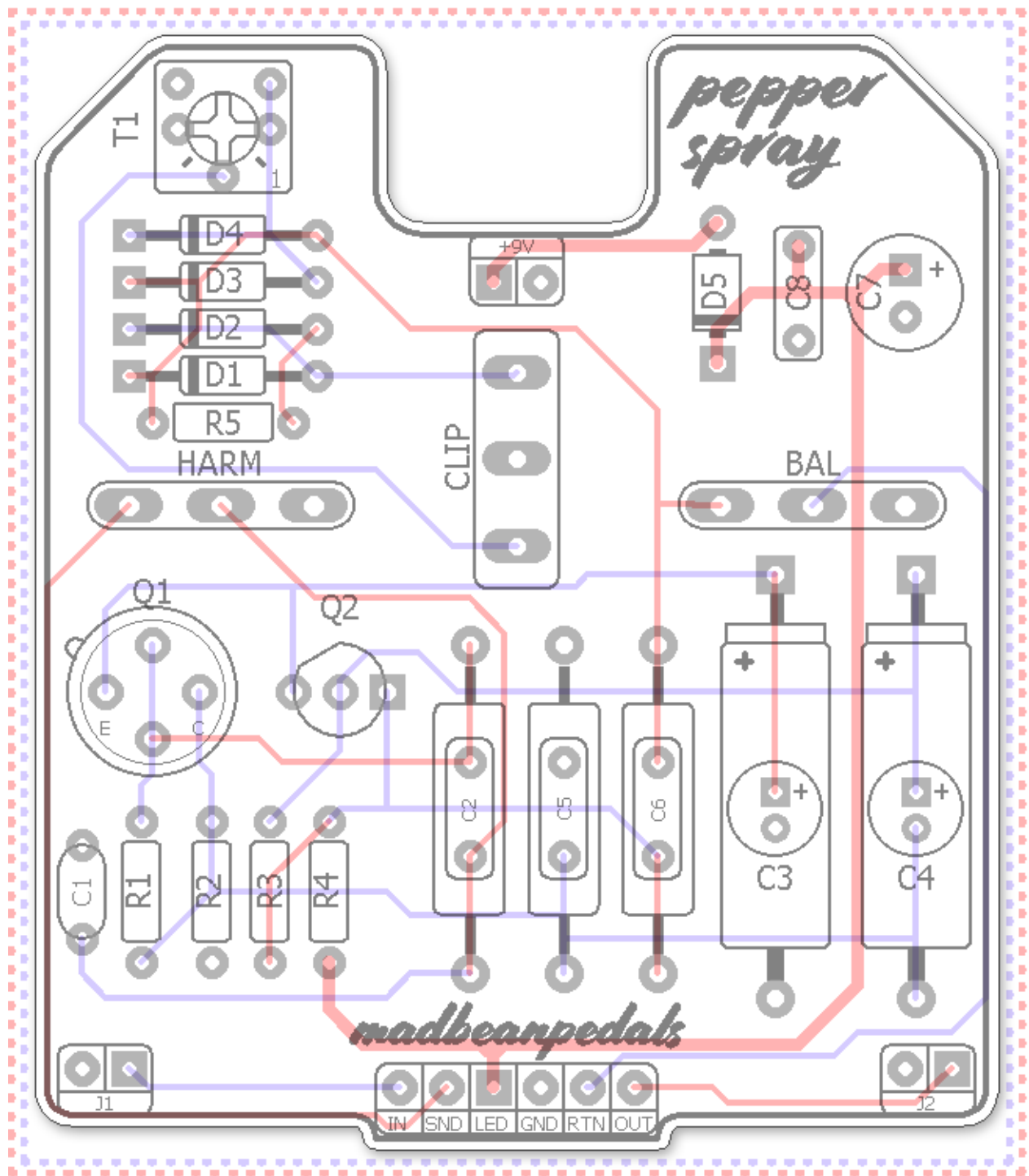
## Parts Layout



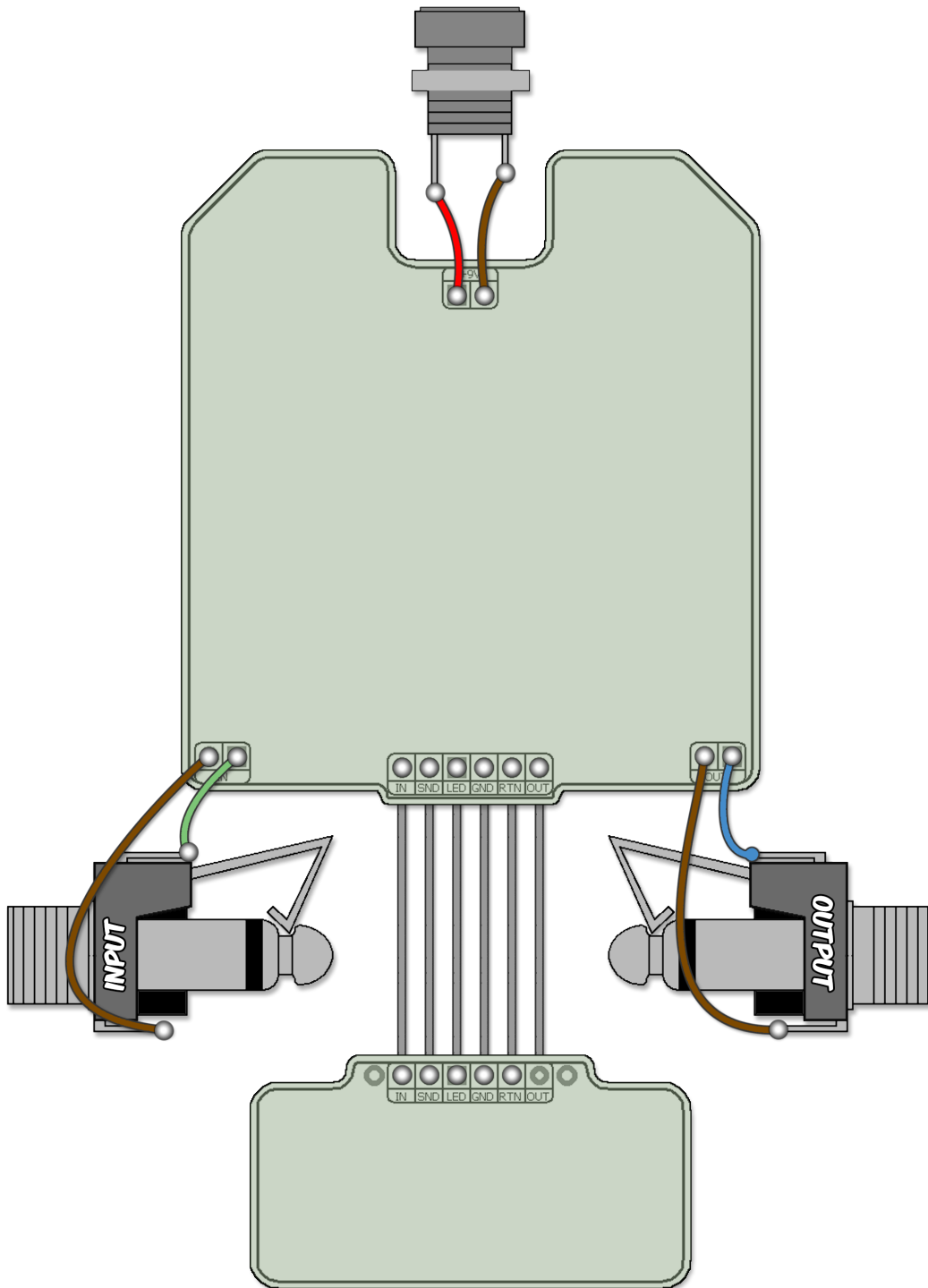
## Component Values



# 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.

Albini Edition				Stock Edition			
Resistors		Diodes		Resistors		Diodes	
R1	51k	D1	1n695	R1	220k	D1	1n695
R2	91k	D2	1n695	R2	20k	D2	1n695
R3	3M9	D3	your choice	R3	750k	D3	your choice
R4	91k	D4	your choice	R4	91k	D4	your choice
R5	4k7	D5	1n5817	R5	4k7	D5	1n5817
Caps		Transistors		Caps		Transistors	
C1	100pF	Q1	2n404a	C1	100pF	Q1	2n404a
C2	47n	Q2	2n3565	C2	47n	Q2	2n3565
C3	47uF	Switch		C3	47uF	Switch	
C4	2u2	CLIP	On/On	C4	1uF	CLIP	On/On
C5	1n5	Trimmer		C5	1n	Trimmer	
C6	100n	T1	10k	C6	100n	T1	10k
C7	100uF	Pots		C7	100uF	Pots	
C8	100n	BAL	50kA	C8	100n	BAL	50kA
		HARM	100kA			HARM	100kA

## Shopping List

Albini Edition				Stock Edition			
Value	QTY	Type	Rating	Value	QTY	Type	Rating
4k7	1	Carbon / Metal Film	1/4W	4k7	1	Carbon / Metal Film	1/4W
51k	1	Carbon / Metal Film	1/4W	20k	1	Carbon / Metal Film	1/4W
91k	2	Carbon / Metal Film	1/4W	91k	1	Carbon / Metal Film	1/4W
3M9	1	Carbon / Metal Film	1/4W	220k	1	Carbon / Metal Film	1/4W
100pF	1	Ceramic / MLCC / Mica	16v min.	750k	1	Carbon / Metal Film	1/4W
1n5	1	Film	16v min.	100pF	1	Ceramic / MLCC / Mica	16v min.
47n	1	Film	16v min.	1n	1	Film	16v min.
100n	2	Film	16v min.	47n	1	Film	16v min.
2u2	1	Electrolytic or Tantalum	16v min.	100n	2	Film	16v min.
47uF	1	Electrolytic	16v min.	1uF	1		16v min.
100uF	1	Electrolytic	16v min.	47uF	1	Electrolytic	16v min.
1n695	2	or, similar GE diode		100uF	1	Electrolytic	16v min.
diodes	2	your choice		1n695	2	or, similar GE diode	
1n5817	1			diodes	2	your choice	
2n404a	1			1n5817	1		
2n3565	1			2n404a	1		
SPDT	1	On/On, Solder Lug or Pin Mount		2n3565	1		
10k	1	Bourns 3362p or 6mm		SPDT	1	On/On, Solder Lug or Pin Mount	
50kA	1	PCB Right Angle	16mm	10k	1	Bourns 3362p or 6mm	
100kA	1	PCB Right Angle	16mm	50kA	1	PCB Right Angle	16mm
				100kA	1	PCB Right Angle	16mm

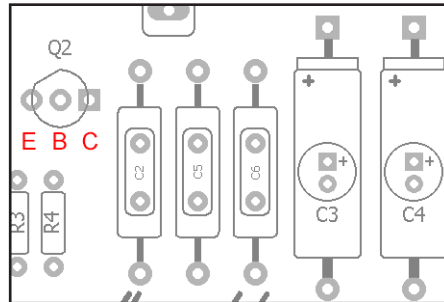
### Additional Hardware

- (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

### Caps

- For the Standard Series version of the Pepper Spray you can use either axial or radial caps on the critical components for the audio. So, if you like to build in the more traditional style of fuzz, use your favorite axial caps.
- Note the orientation of the 2n3565 transistor. The flattened end of the mushroom package transistor indicates the emitter. So, be sure to put the transistor in the right orientation.



### Clipping

- The previous version had a trimpot in place of a fixed 4k7 resistor on the primary diodes and the second set of diodes clipped straight to ground. For the Standard Series version, I changed this up. Now the stock clipping has the fixed resistor like the original circuit. For the alternate clipping mode, I put the 10k trimmer in series with both the back to back diodes. This option is symmetrical clipping but the trimmer allows you to adjust how much of the fuzz is clipped by them from max (CCW) to min (CW).
- Note: The 1n695 diodes may be hard to come by. Use another germanium equivalent as a sub. The 1n695 have a forward voltage of 0.26 which is quite low, so you may not be able to replicate the original exactly with a sub. However, these whacky [Philips OA9](#) might do the trick.
- For the second set of diodes, that is up to you. Try a different set of germs, Schottky or maybe low VF silicon. Or, you can go crazy and use a couple of LEDs. I used LEDs on a previous build and thought they sounded gnarly.
- Note: You can add a third clipping option by using an On/Off/On switch. The middle position will then be no clipping diodes. This is quite a bit louder but still has some good fuzz tones with it. You will need to turn the BAL control down when you select the middle position.



## Circuit Voltages

Albini		Stock	
2n404a	DC	2n404a	DC
C	3.7	C	1.37
B	3.77	B	1.89
E	3.9	E	2.01
2n3565	DC	2n3565	DC
C	5.41	C	2.91
B	3.8	B	2.58
E	3.9	E	2.01

These are the voltages recorded from the 1590A version. I compared my Standard Series stock ed. build and it was consistent with the voltages above.

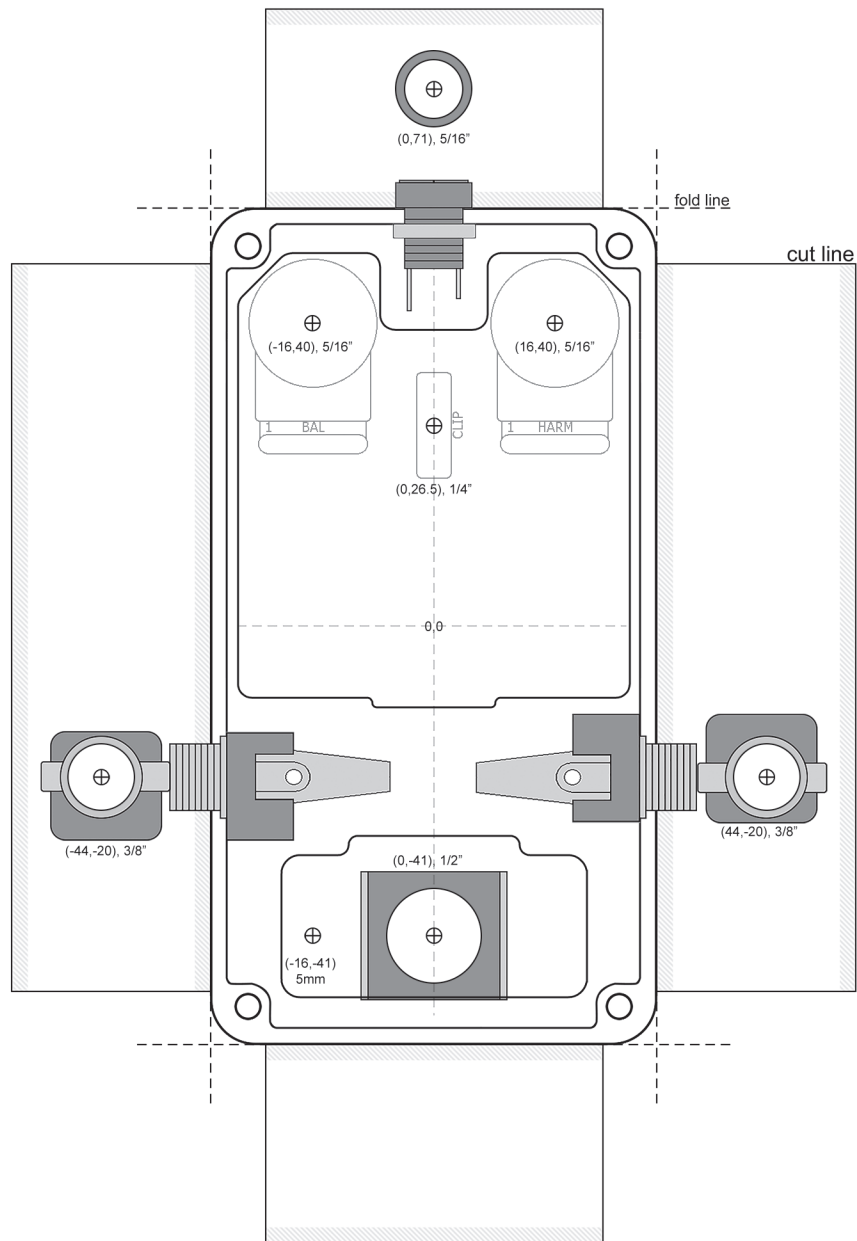
9.44vDC One Spot supply  
Current Draw: ~2mA

- Knobs @ 100%
- Switch Down

## 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](#)

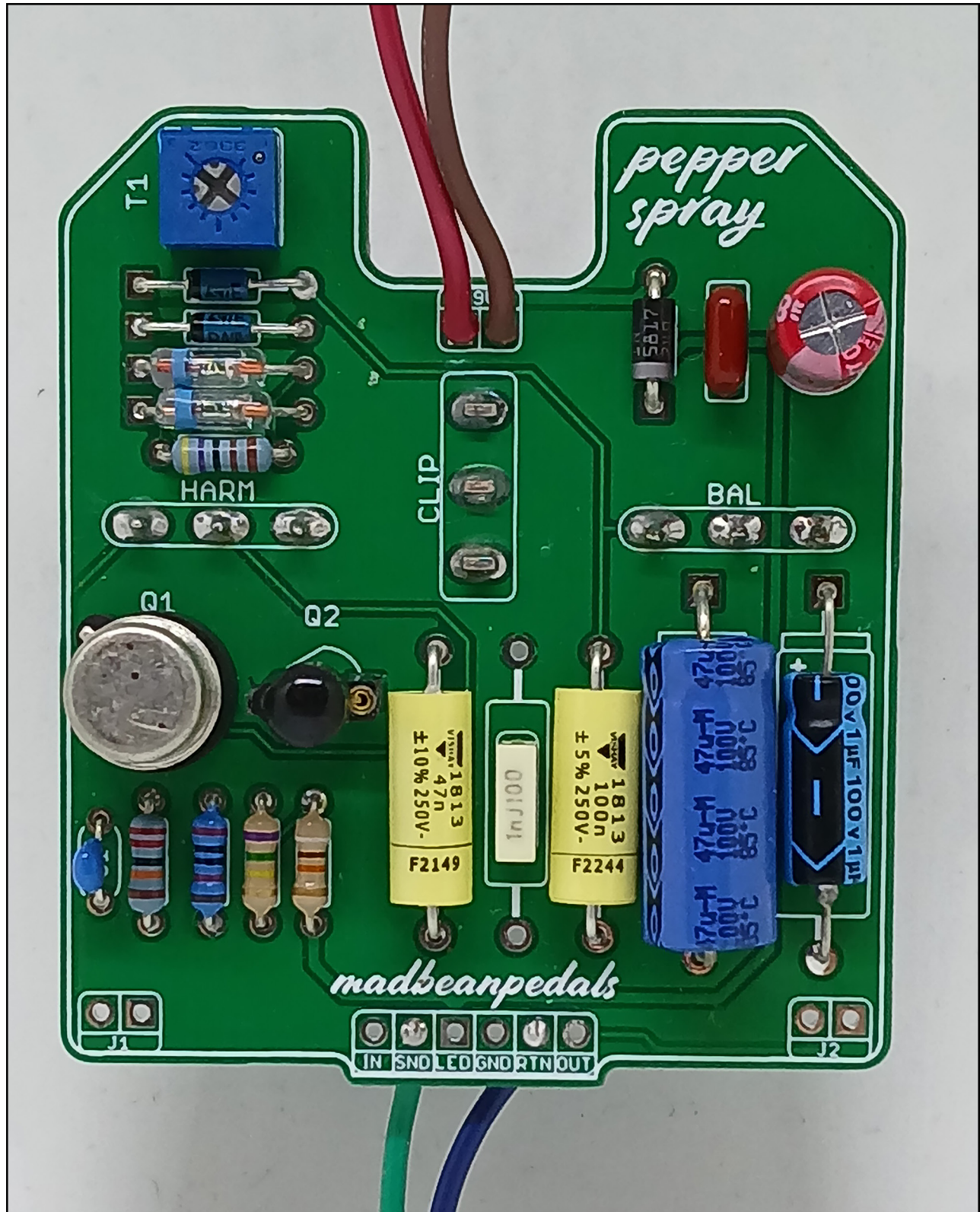


### Hardware

1590B enclosure  
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**



I went with the stock edition for this build.

# Schematic

