PEPPER SPRAY 2018

FX TYPE: Fuzz

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=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 2018 version of the Pepper Spray is the same as the "Steve Albini" Percolator; at least as far as anyone knows!

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 Albini 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 Albini version.

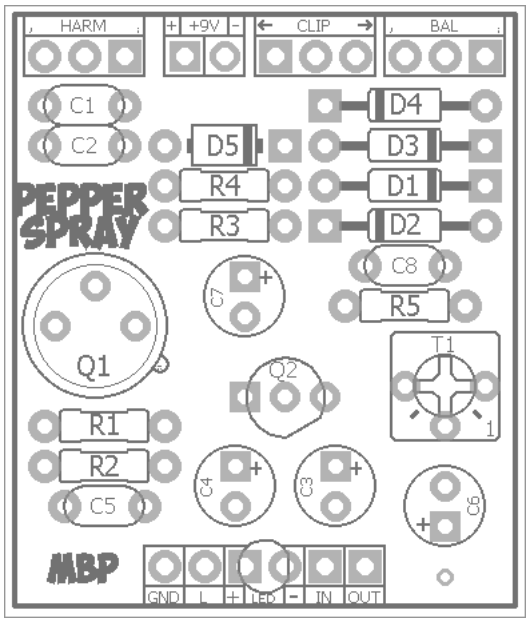
Between the two I prefer the Albini version. But, if you want something that is pretty sick and rude, the stock version is right up your alley!

Controls

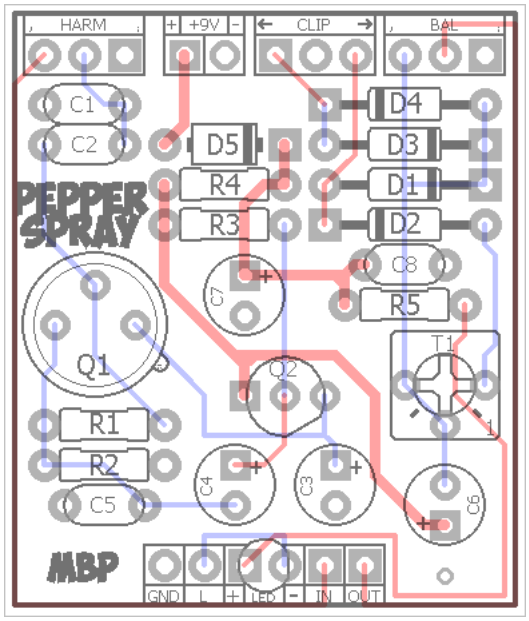
HARM: The "harmonics" control sets the input level of the effect.
BAL: The "balance" control sets the volume output.
CLIP: Toggle between the stock 1n695 and your choice of clipping diodes.
T1: Instead of the stock 4k7 resistor T1 is a 10k trimmer. This allows you to change the amount of clipping symmetry (turning it up makes it more asymmetrical and down is fully symmetrical). For stock sound, set T1 at or just below halfway.

Links with detailed information and analysis of the Harmonic Percolator
http://www.diystompboxes.com/smfforum/index.php?topic=68649.0
http://www.freestompboxes.org/viewtopic.php?f=19&t=6675

Dimensions: 1.3” W x 1.525” H



Trace Routing



B.O.M.

Resistors		Diodes	
R1	51k	D1, D2	1n695
R2	91k	D3, D4	your choice
R3	3M9	D5	1N5817
R4	91k	**Transistors**	
R5	4k7	Q1	2n404a
Caps		Q2	2n3965
C1	100pF	**Switch**	
C2	50n	CLIP	On/On
C3	47uF	**Trimmer**	
C4	2u2	T1	10k
C5	1n5	**Pots**	
C6	100n	BAL	50kA
C7	47uF	HARM	100kA
C8	100n		

Shopping List

Value	QTY	Type	Rating
4k7	1	Metal / Carbon Film	1/4W
51k	1	Metal / Carbon Film	1/4W
91k	2	Metal / Carbon Film	1/4W
3M9	1	Metal / Carbon Film	1/4W
100pF	1	Ceramic / MLCC / Mica	16v min.
1n5	1	Film	16v min.
50n	1	Film	16v min.
100n	2	Film	16v min.
2u2	1	Electrolytic / Tantalum	16v min.
47uF	2	Electrolytic / Tantalum	16v min.
1n695	2	or, 1n34a	
diodes	2	1n914, 1N4001, LED, etc	
1N5817	1		
2n404a	1		
2n3965	1	or, BAT41	
On/On	1	Mini SPDT	
10k	1	Bourns 3362p	
50kA	1	Solder lug	9mm or 12mm
100kA	1	Solder lug	9mm or 12mm

See notes about C6.

BOM Notes

- 50n is not a common value for caps anymore (at least in the US). You can use 47n in its place.
- The 2u2 and 47uF were tantalum in the production unit. But, you can sub regular electrolytic there, too.
- The second set of clipping diodes is up to you. If you want stark contrast between the two options, use 3mm LEDs (diffused red). 1n914 or 1N4001 will be louder and less grainy than the 1n695 but not as aggressive as LEDs.
- **You can use BAT41 diodes as subs for the 1n695**. I've used them in a couple of builds and they sound great!

BOM Links

Tantalum:
http://www.smallbear-electronics.mybigcommerce.com/dipped-tantalum-15-f-10-f-16-volt/
http://www.smallbear-electronics.mybigcommerce.com/dipped-tantalum-47-f-16-volt/

1n695:
http://www.smallbear-electronics.mybigcommerce.com/diode-1n695/

2n404a:
http://www.smallbear-electronics.mybigcommerce.com/transistor-2n404a/

2n3565:
http://www.smallbear-electronics.mybigcommerce.com/transistor-2n3565/

Mini SPDT:
http://www.smallbear-electronics.mybigcommerce.com/spdt-on-on-mountain-10tc410/

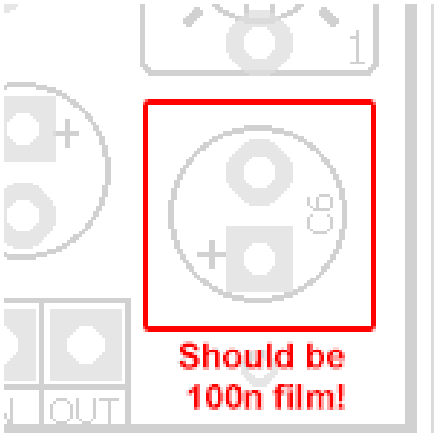
Bourns 3362p:
https://www.taydaelectronics.com/potentiometer-variable-resistors/cermet-potentiometers/3362p/10k-ohm-trimmer-potentiometer-cermet-1-turn-3362p.html
https://www.mouser.com/ProductDetail/Bourns/3362P-1-103LF?qs=sGAEpiMZZMvygUB3GLcD7k%252bod3ZqvEIQboRRPdOKB6M%3d

9mm Pots:
http://www.smallbear-electronics.mybigcommerce.com/alpha-single-gang-9mm-pc-mount/

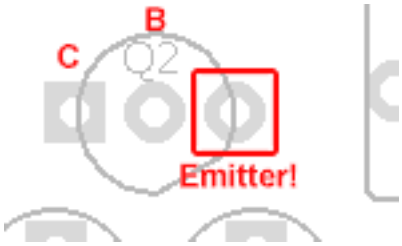
12mm Pots:
http://www.smallbear-electronics.mybigcommerce.com/alpha-single-gang-12mm-solder-terms/

Board Error

There is one error on the board. When I re-drew the schematic for the 2018 version I accidentally made C6 a 1uF electrolytic. While some Percolator schematics do list this as the output cap, I've always built it with 100n film (which many other schematics also indicate). So, I do suggest using 100n film. To do that, you will need to bend one of your leads to fit in the alloted 2.5mm space. But, hey, the board is free!



2n3565



The 2n3565 has a flattened end on the mushroom style casing. The flattened part indicates the emitter. Be sure to put the transistor in the right way!

Also, the leads for the 2n3565 are in a triangle formation, so you will need to push them more into a straight line to fit in the transistor package on the PCB.

Voltages

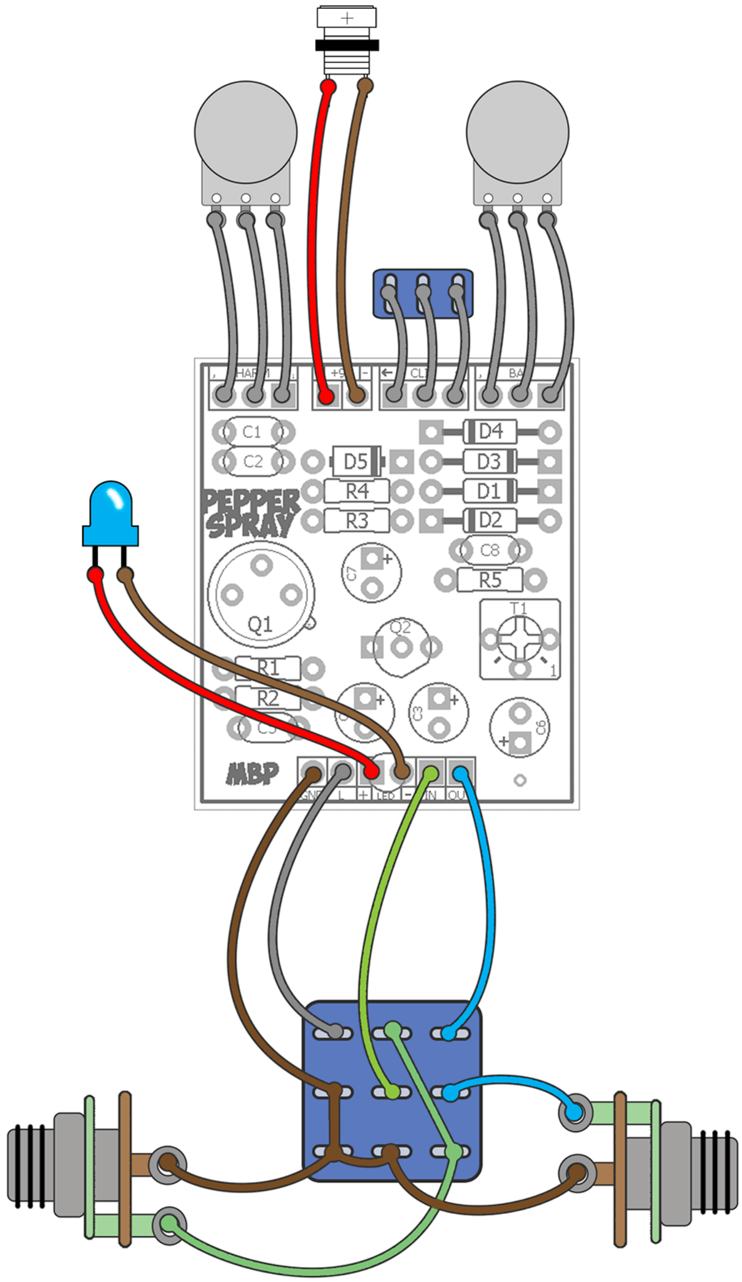
Albini	
2n404a	DC
C	3.7
B	3.77
E	3.9

Stock	
2n404a	DC
C	1.37
B	1.89
E	2.01

2n3565	DC
C	5.41
B	3.8
E	3.9

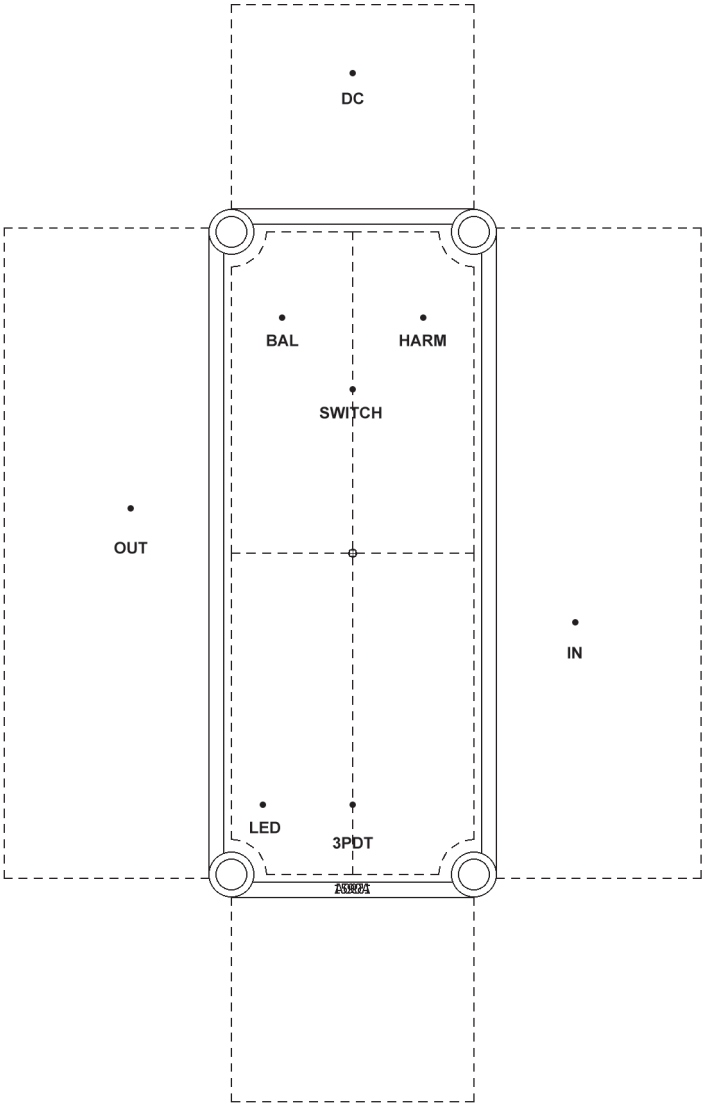
2n3565	DC
C	2.91
B	2.58
E	2.01

Wiring

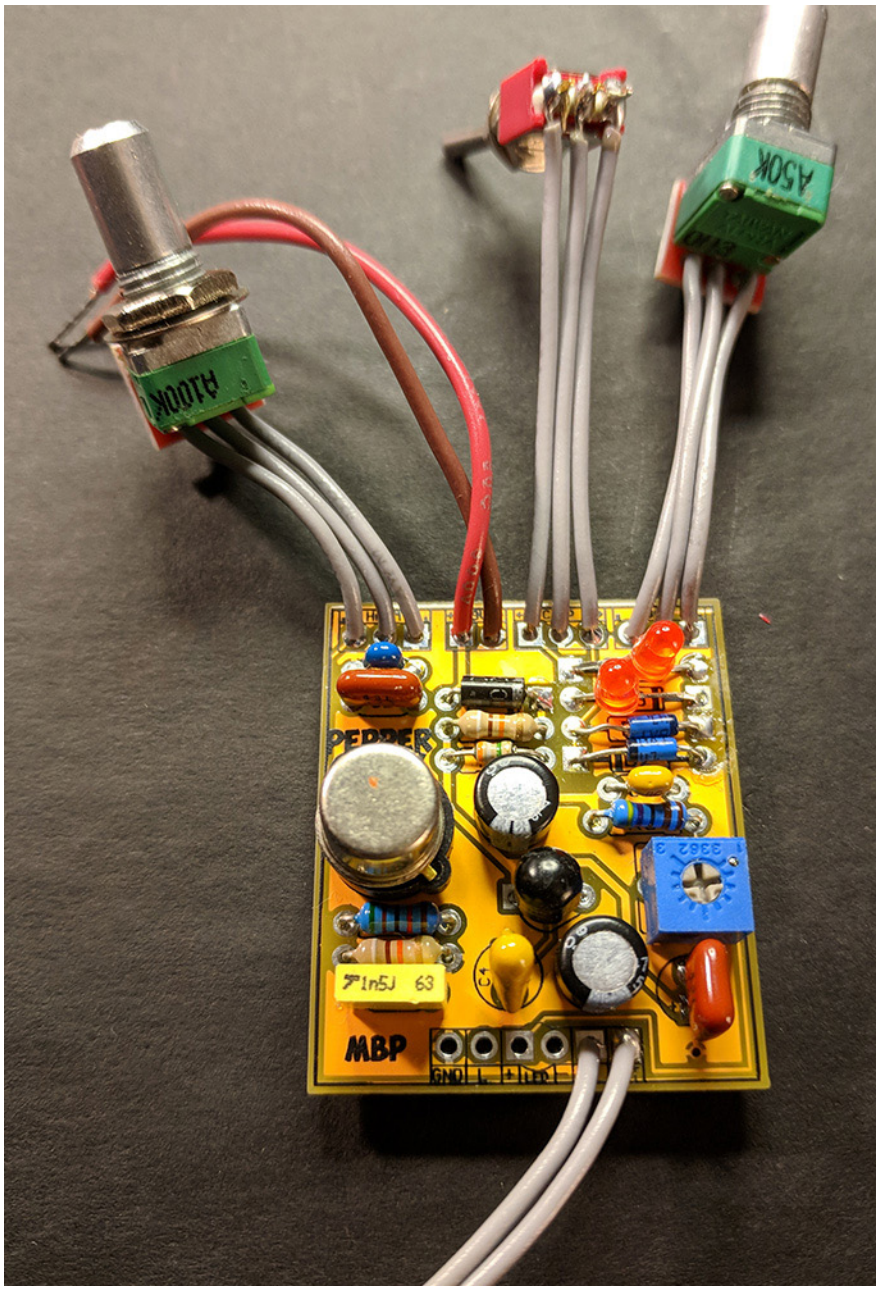


PEPPER SPRAY
MBP
C1
C2
D5
R4
R3
D4
D3
D1
D2
C8
R5
Q1
Q2
C7
R1
R2
C3
C6
T1

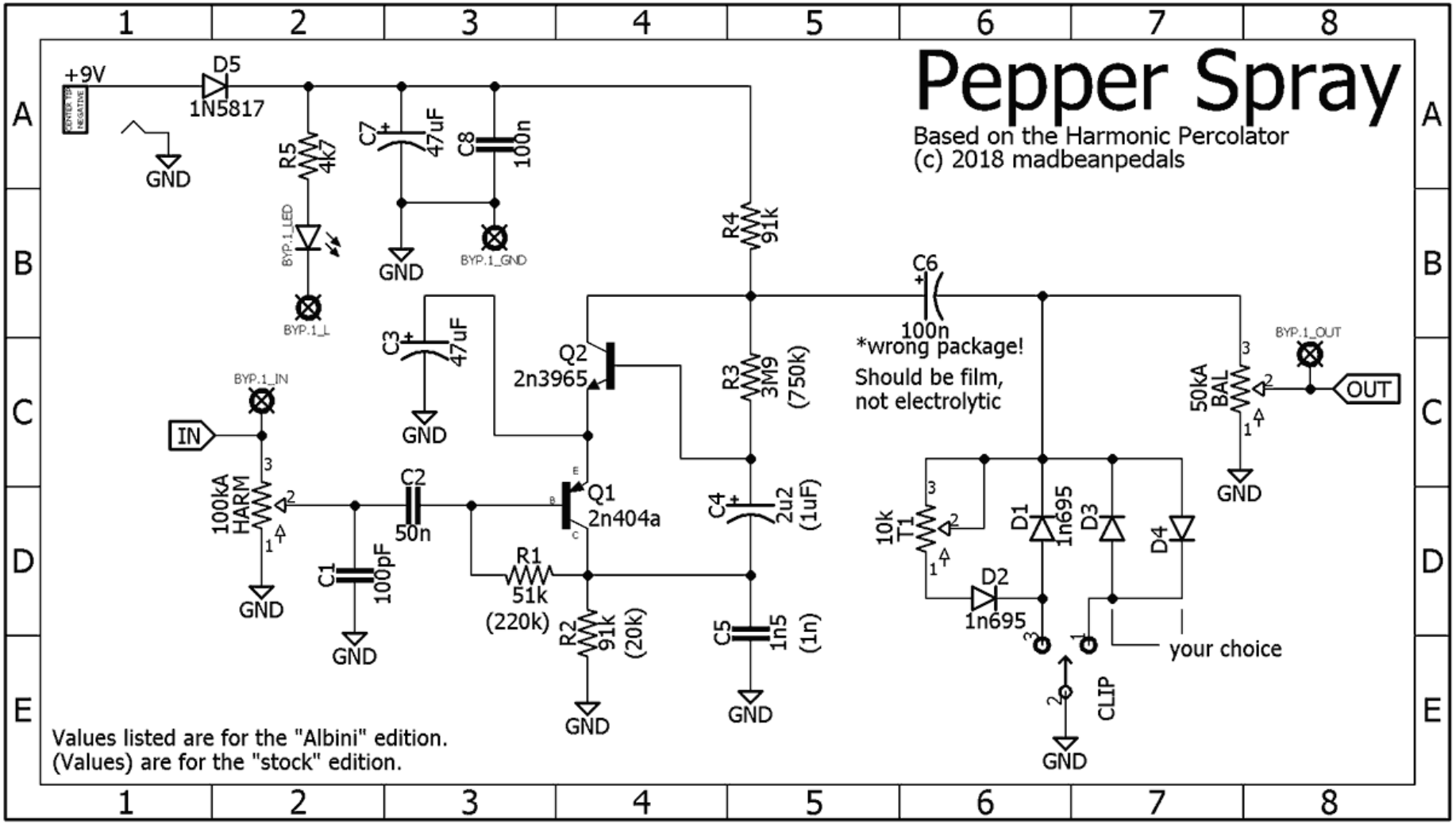
1590A Drill Template



Build Pic



Schematic


Pepper Spray
Based on the Harmonic Percolator
(c) 2018 madbeanpedals
+9V
D5
1N5817
GND
R5
4k7
BYP.1_LED
BYP.1_L
C7
47uF
C8
100n
BYP.1_GND
R4
91k
C6
100n
*wrong package!
Should be film,
not electrolytic
C3
47uF
Q2
2n3965
R3
3M9
(750k)
BYP.1_IN
IN
100kA
HARM
C2
50n
Q1
2n404a
C4
2u2
(1uF)
C1
100pF
R1
51k
(220k)
R2
91k
(20k)
C5
1n5
(1n)
10k
T1
D1
1n695
D3
D4
D2
1n695
your choice
CLIP
50kA
BAL
BYP.1_OUT
OUT
Values listed are for the "Albini" edition.
(Values) are for the "stock" edition.