MUGSHOT

FX TYPE: Boost

Based on the Moog® MF-104™

Enclosure Size: 1590B

“Softie” compatibility: Softie2

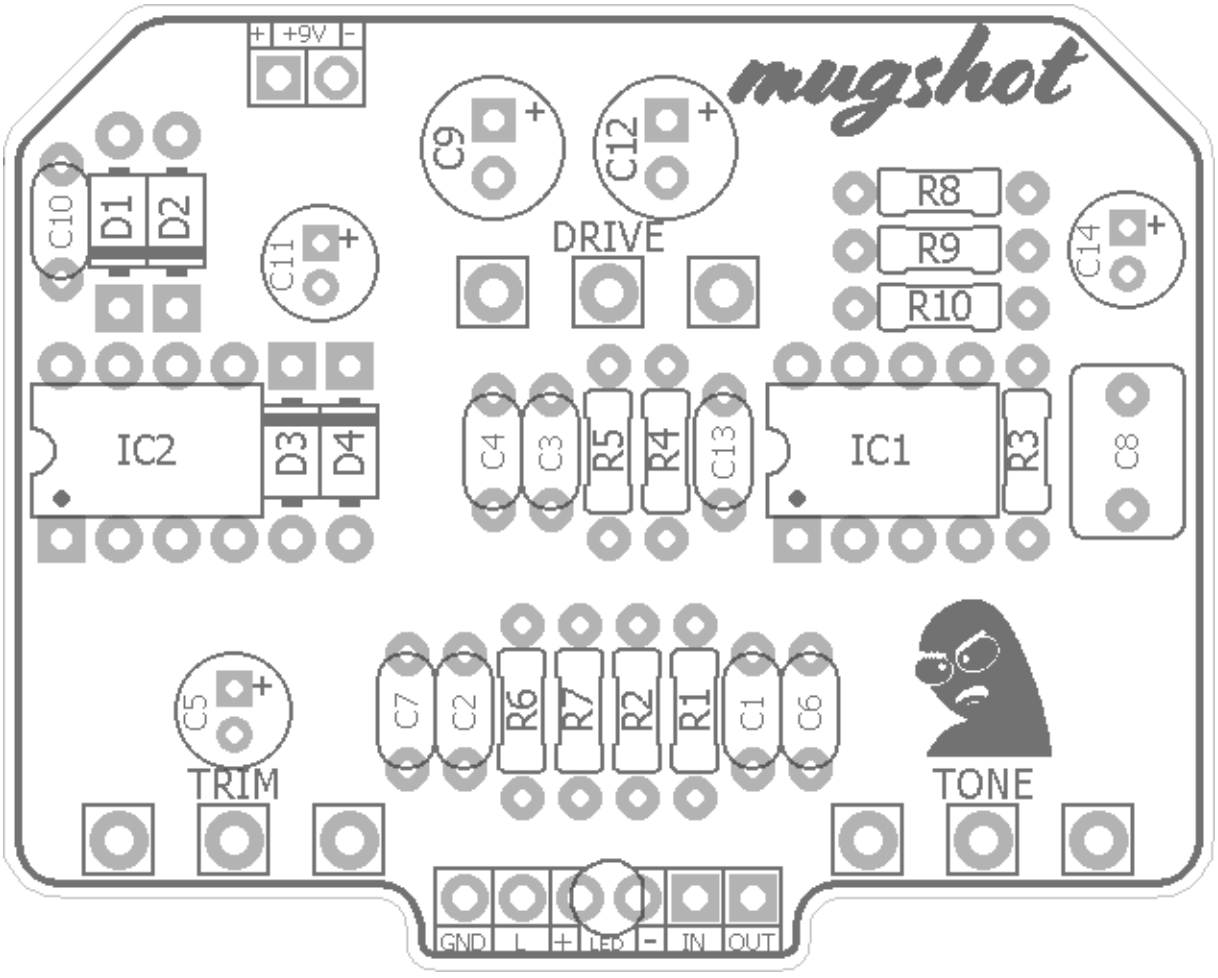
Overview

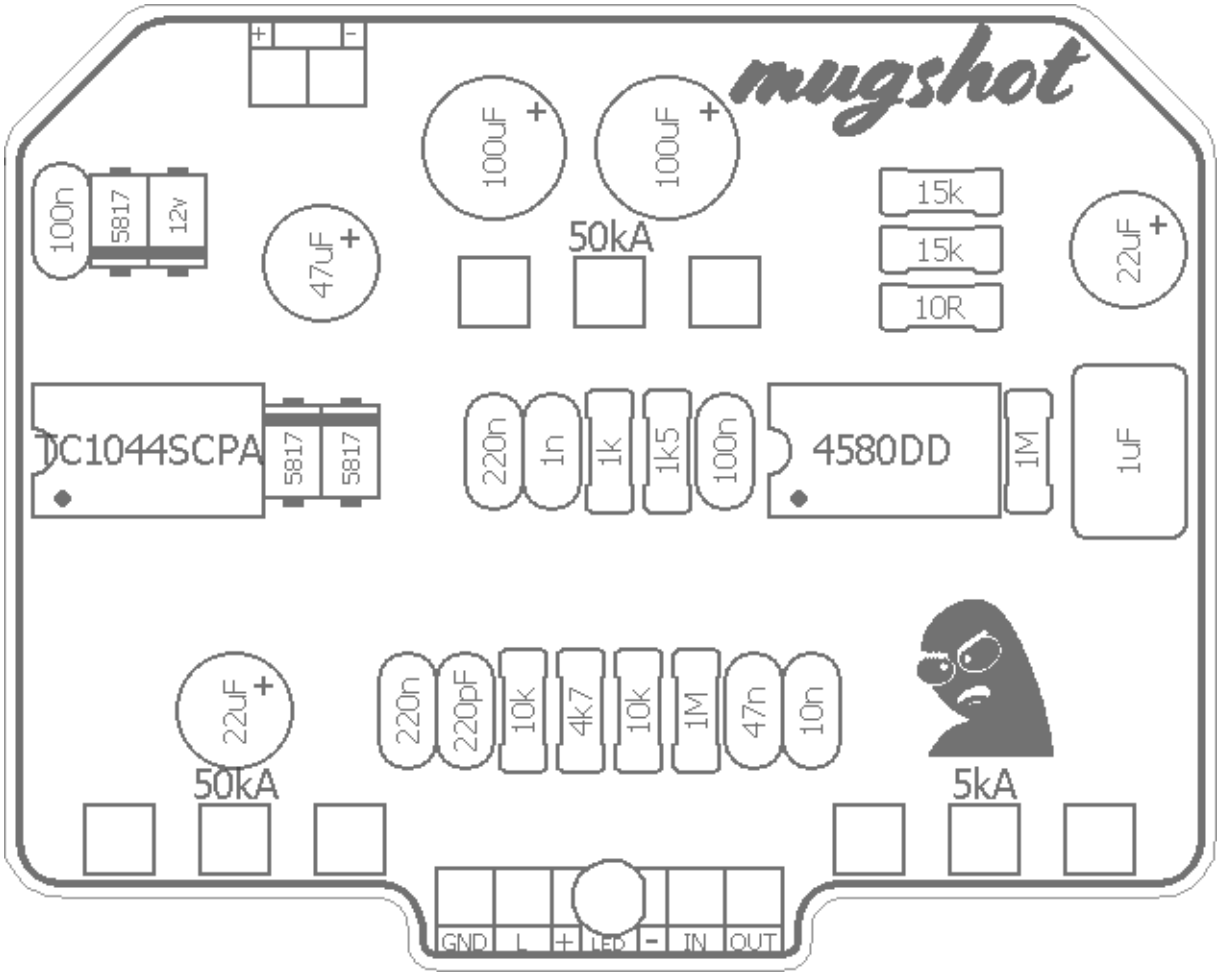
It would be great to do a full (or partial) clone of the discontinued Moog MF-104 BBD delay. It wasn’t on the market for that long and used prices are going toward the $2k mark. I may acquire one if fortune chooses me. In the meantime, the input boost section of the MF-104 turns out to be an excellent stand-alone pedal. It’s simple, inexpensive to build and provides a huge range of very clean boost. I added a couple of mods to trim the bass content and roll-off some of the treble to make it more palatable for a wide range of guitars/amps. Give it a try! Or, mod up your own version.

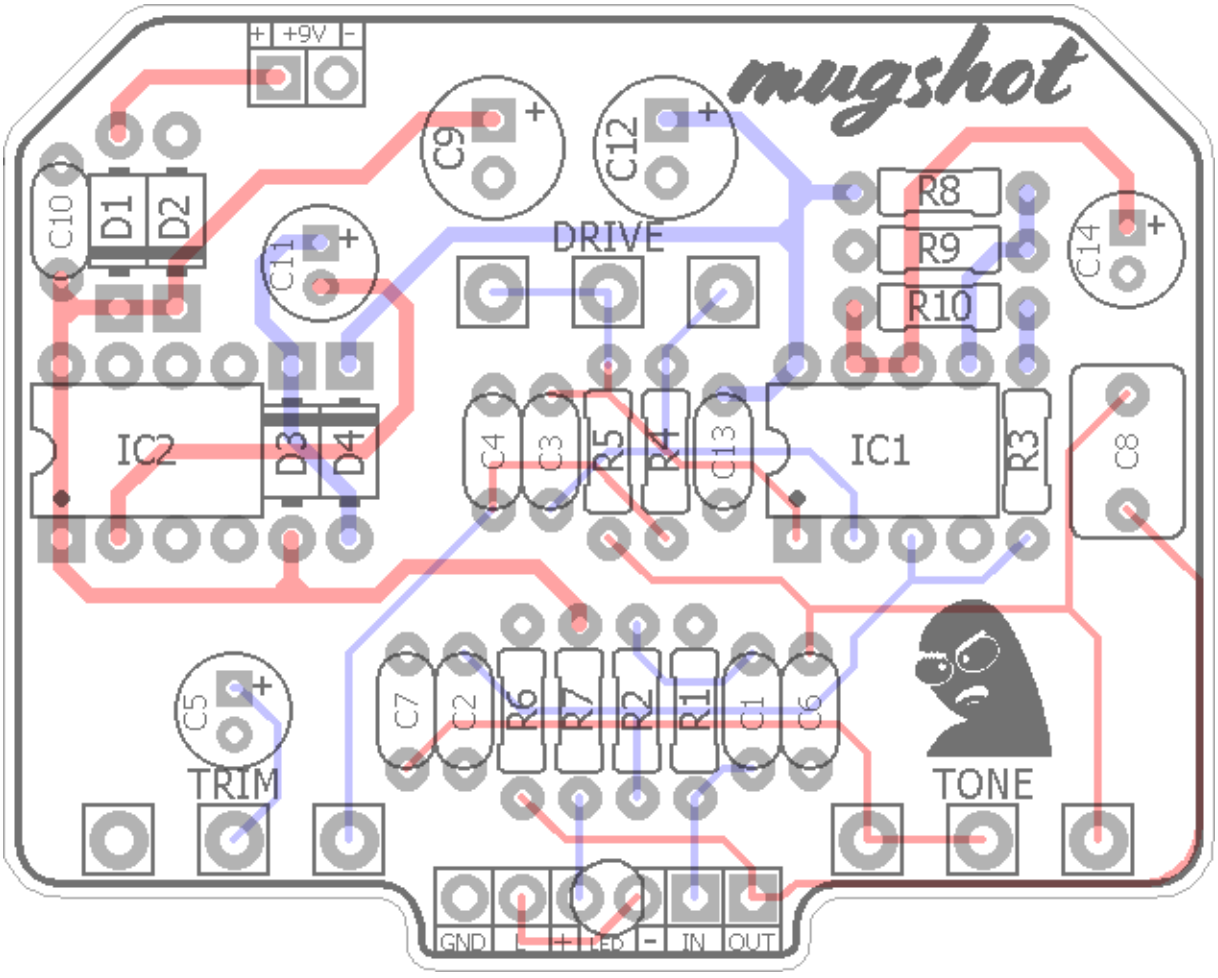
Controls

- **Drive -** Boost amount.
- **Trim -** CCW: stock. CW: reduces the low end frequency boost.
- **Tone** - CCW: rolls off some top end. CW: full brightness.

Technical assistance for your build(s) is available via the madbeanpedals forum. Please go there rather than emailing me for assistance on builds. 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.


+9V
mugshot
C9
C12
C10
D1
D2
C11
DRIVE
R8
R9
R10
C14
IC2
D3
D4
C4
C3
R5
R4
C13
IC1
R3
C8
C5
TRIM
C7
C2
R6
R7
R2
R1
C1
C6
TONE
GND
IN
OUT


mugshot
100uF
100uF
100n
5817
12v
47uF
50kA
15k
15k
10R
22uF
TC1044SCPA
5817
5817
220n
1n
1k
1k5
100n
4580DD
1M
1uF
22uF
50kA
220n
220pF
10k
4k7
10k
1M
47n
10n
5kA
GND
L
+
LED
-
IN
OUT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R2
R1
C1
C6
C5
TRIM
TONE
GND
IN
OUT

Resistors		Caps		Diodes	
R1	1M	C1	47n	D1	1n5817
R2	10k	C2	220pF	D2	12v Zener
R3	1M	C3	1n	D3	1n5817
R4	1k5	C4	220n	D4	1n5817
R5	1k	C5	22uF	ICs	
R6	10k	C6	10n	IC1	4580DD
R7	4k7	C7	220n	IC2	TC1044SCPA
R8	15k	C8	1uF	Pots	
R9	15k	C9	100uF	TONE	5kA
R10	10R	C10	100n	TRIM	50kA
		C11	47uF	DRIVE	50kA
		C12	100uF		
		C13	100n		
		C14	22uF		

Value	QTY	Type	Rating
10R	1	Metal / Carbon Film	1/4W
1k	1	Metal / Carbon Film	1/4W
1k5	1	Metal / Carbon Film	1/4W
4k7	1	Metal / Carbon Film	1/4W
10k	2	Metal / Carbon Film	1/4W
15k	2	Metal / Carbon Film	1/4W
1M	2	Metal / Carbon Film	1/4W
220pF	1	Ceramic / MLCC	25v min.
1n	1	Film	25v min.
10n	1	Film	25v min.
47n	1	Film	25v min.
100n	2	Film	25v min.
220n	2	Film	25v min.
1uF	1	Film	25v min.
22uF	2	Electrolytic	25v min.
47uF	1	Electrolytic	25v min.
100uF	2	Electrolytic	25v min.
1n5817	3		
Zener	1	12v 1W Zener	
4580DD	1		
TC1044SCPA	1		
5kA	1	PCB Right Angle	16mm
50kA	2	PCB Right Angle	16mm

4580DD:
https://www.mouser.com/ProductDetail/513-NJM4580DD

You can sub other dual op-amps here. This happens to be the one I preferred. Anything that can tolerate 18+ volts should work fine.

TC1044SCPA:
https://stompboxparts.com/semiconductors/tc1044scpa-charge-pump-ic/
SUB - MAX1044CPA: https://smallbear-electronics.mybigcommerce.com/ic-max1044cpa/

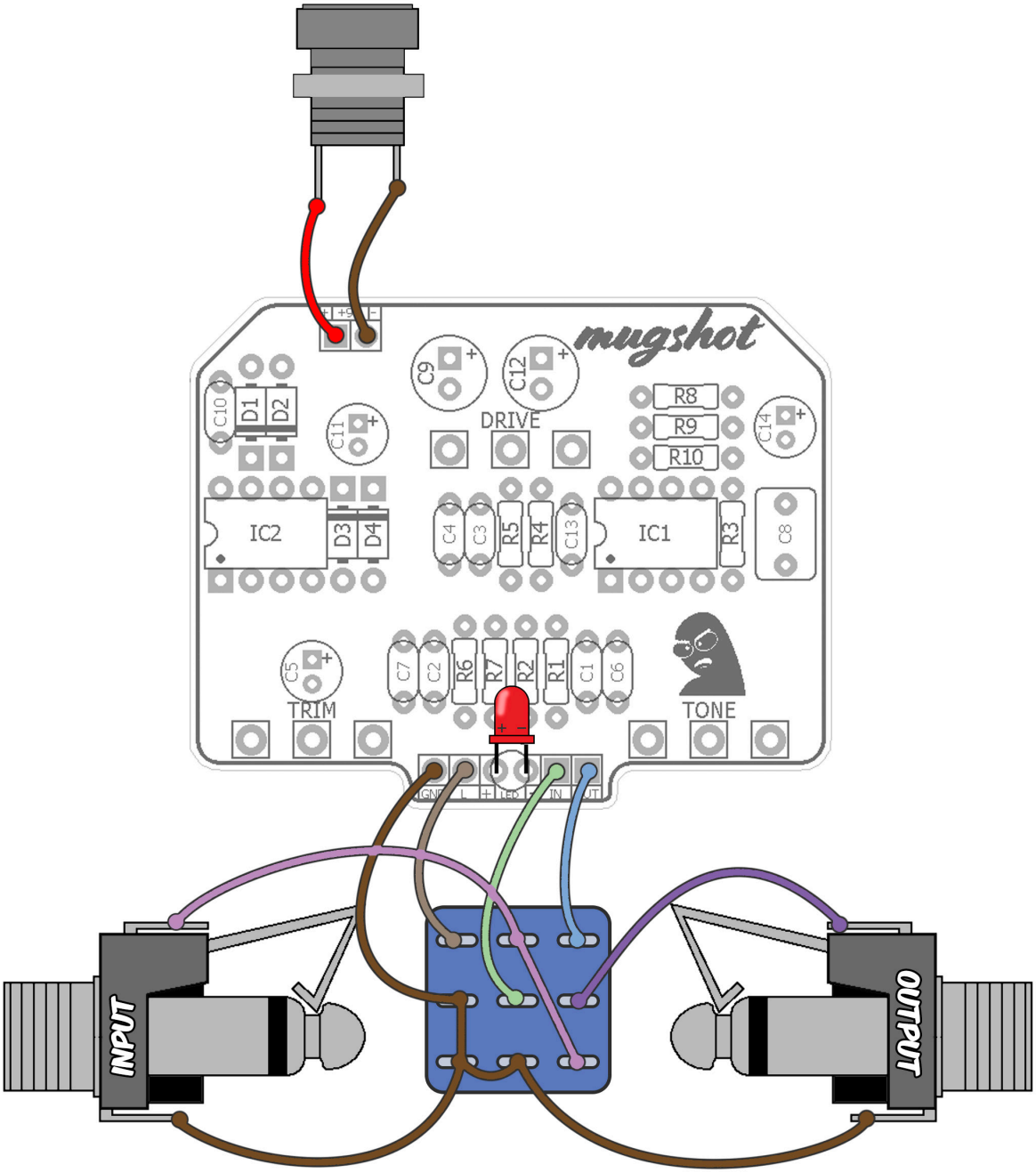
16mm Right Angle PCB mount pot:
https://smallbear-electronics.mybigcommerce.com/alpha-single-gang-16mm-right-angle-pc-mount/
https://stompboxparts.com/pots/16mm-potentiometer-short-pcb-leg/
https://lovemyswitches.com/16mm-potentiometers-1-4-smooth-shaft-right-angle-pcb-mount/

DC Jacks:
https://smallbear-electronics.mybigcommerce.com/2-1-mm-all-plastic-round/
https://stompboxparts.com/power-connections/dc-power-jack-2-1mm-low-profile/
https://lovemyswitches.com/thinline-lumberg-dc-power-jack-2-1mm/

1/4” jacks:
https://smallbear-electronics.mybigcommerce.com/1-4-in-mono-nys229/
https://smallbear-electronics.mybigcommerce.com/1-4-in-mono-switchcraft-11/
https://lovemyswitches.com/1-4-mono-jack-lumberg-klbm-3/
https://lovemyswitches.com/1-4-mono-jack-neutrik-rean-nys229/

My preferred 3PDT switch:
https://lovemyswitches.com/pro-3pdt-latched-foot-switch-solder-lugs-feather-soft-click/

- Use a low ESR (equivalent series resistance) electrolytic cap for C11 if you have one. The value shouldn’t matter too much. It’s spec’d at 47uF but I actually used a 27uF low ESR in my build. If you don’t have any of these types of electrolytics just use a plain 47uF. The current demands from this circuit are very low so you won’t gain much efficiency from the charge pump regardless. It’s more a matter of “good practice” rather than absolute necessity.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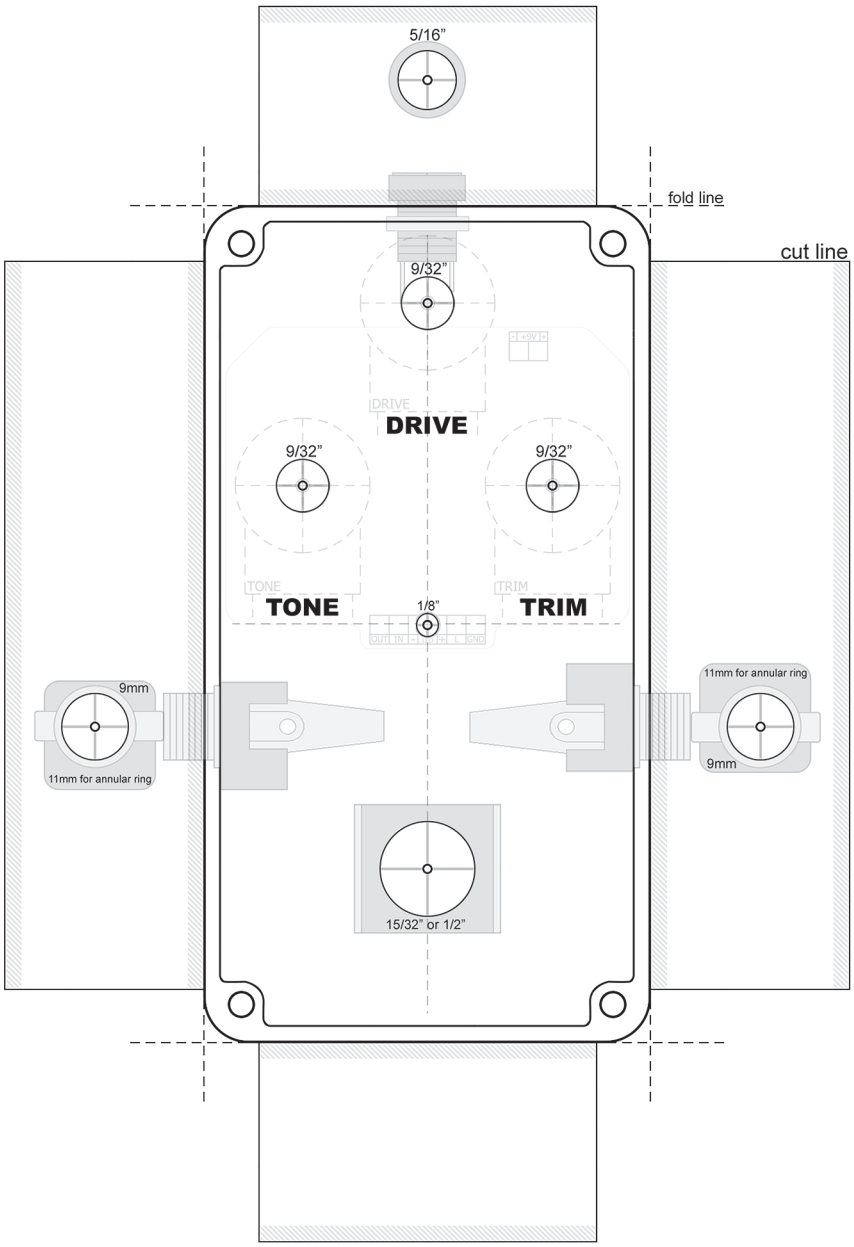
R3
C8
C5
TRIM
C7
C2
R6
R7
R2
R1
C1
C6
TONE
INPUT
OUTPUT

Note: *Drill Guides are approximate and may require tweaking depending on the types of jacks, switches and pots you use.*

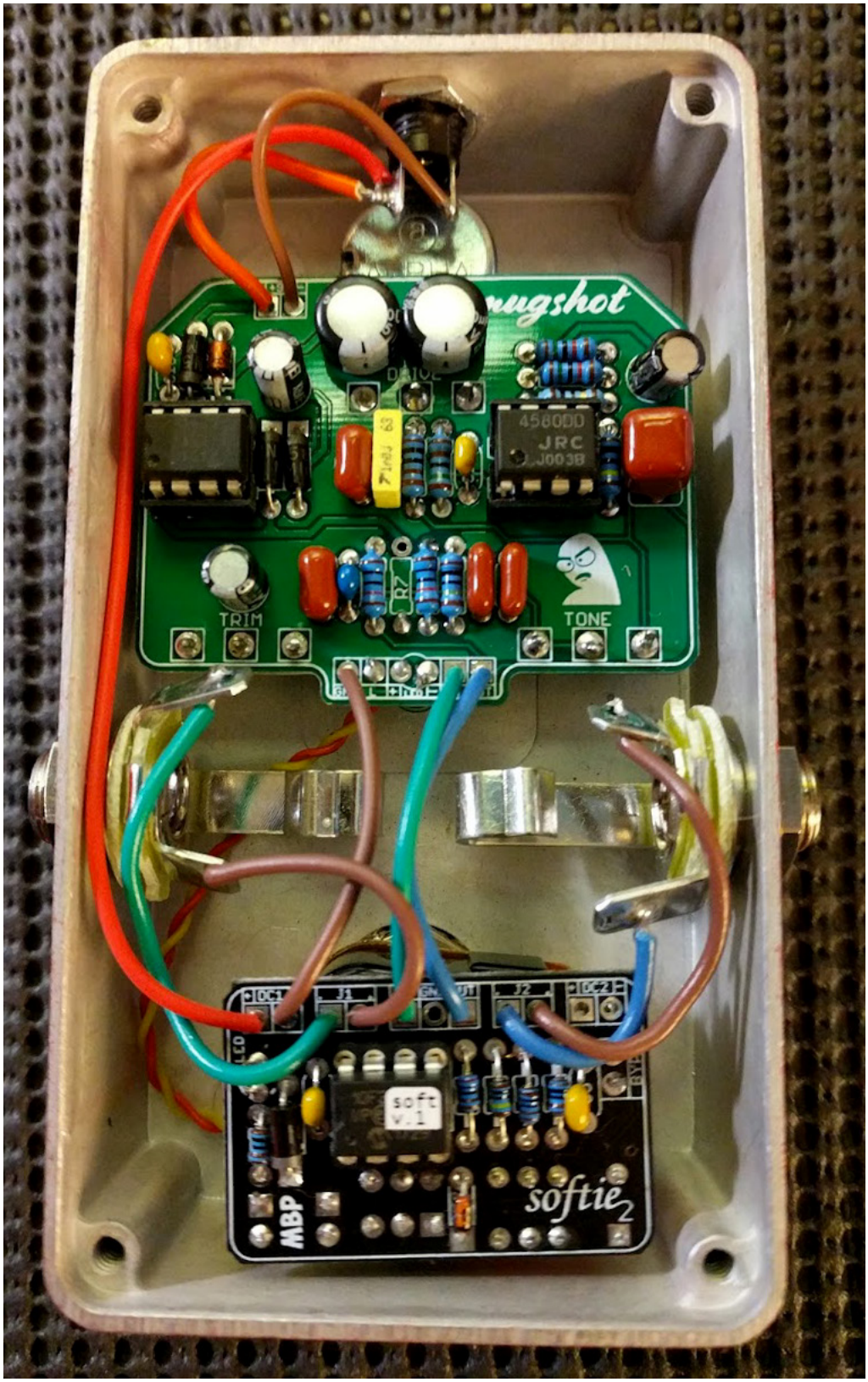


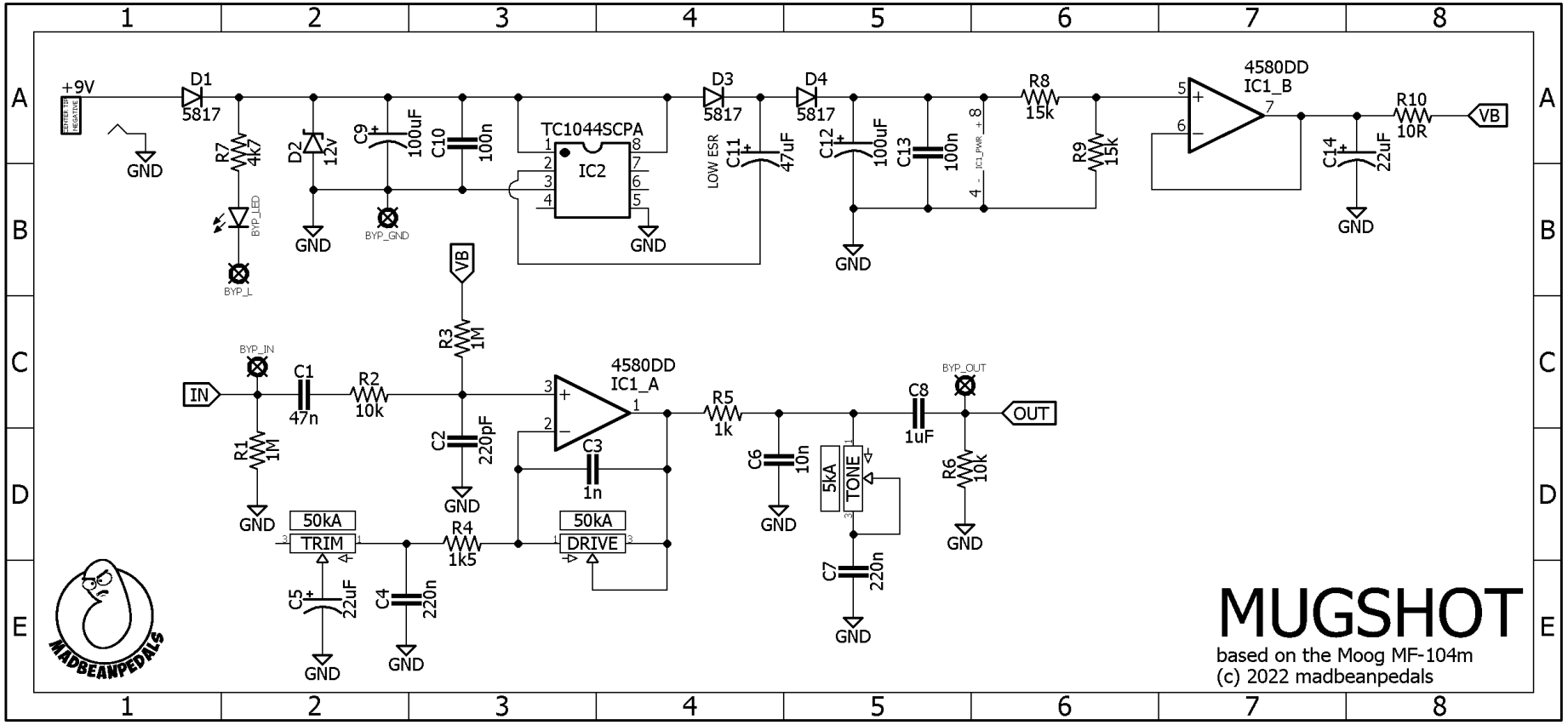
- If using the Softie2 bypass system, use the same drill spot for the bypass switch. For the LED, it's probably easier to fit it on the left of right of the switch rather than directly under the PCB as shown above.

- A Softie3 could also be used, but does not have extra ground wire connections for side jacks (it's designed more for my top-mount jack projects). If you do use the Softie3, move the bypass switch location down a bit.

IC1	4580DD
1	8.59
2	8.59
3	7.87
4	0
5	8.75
6	8.9
7	8.9
8	17.81
IC2	TC1044SCPA
1	9.24
2	4.73
3	0
4	~1.2mV
5	0
6	4.32
7	6.18
8	9.24

- 9.42vDC One Spot
- Current Draw: 13mA
- Current Draw w/ Softie3: 53mA


mugshot
4580DD
JRC
TRIM
TONE
softie2
MBP


+9V
D1
5817
R7
4k7
BYP_LED
BYP_L
GND
D2
12v
C9
100uF
C10
100n
BYP_GND
TC1044SCPA
IC2
D3
5817
D4
5817
LOW ESR
C11
47uF
C12
100uF
C13
100n
IC1_PWR
R8
15k
R9
15k
4580DD
IC1_B
C14
22uF
R10
10R
VB
R3
1M
BYP_IN
IN
C1
47n
R2
10k
R1
1M
C2
220pF
4580DD
IC1_A
C3
1n
R5
1k
C6
10n
5kA
TONE
C8
1uF
BYP_OUT
OUT
R6
10k
50kA
TRIM
R4
1k5
50kA
DRIVE
C5
22uF
C4
220n
C7
220n
MADBEANPEDALS
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based on the Moog MF-104m
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