

CurrentLover24

F X Type: **MODULATION**

Build Level: Advanced

Based On: EHX® Electric Mistress™

Last Updated: August 9, 2024 3:38 PM

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Overview

The 2024 version of the Current Lover has no circuit changes and minor layout adjustments to the 2023 version. Whereas the older versions of this project were limited to 9 or 12v operation and the MN3007 BBD, the 2023 and 2024 editions allow for up to 18v operation (15v regulated) and a choice of MN3007, MN3207 or v3207 BBDs.

The Current Lover is based on the “9v Deluxe Electric Mistress” schematic that floated around the DIY forums for many years. It has been converted to use the MN3007 in place of the nearly impossible to source SAD1024. While the Current Lover does not exactly align with any one particular version of the DEM (there are many), it can be considered a very good representation of the sound of it. I highly suggest reading through the history of the Electric Mistress™ provided in the link below to get a better picture of the changes to the design over the years.

Controls

- **RATE** : Flanger speed.
- **RANGE**: In Auto mode, this is the flanger depth control. In Matrix mode, it controls the notch point of the filter.
- **FDBK**: Sets the amount of signal sent back to the flanger circuit input.
- **VOL**: Effect output volume.
- **FILTER**: This switch toggles between automatic (left pos.) and manual (right pos.) modes for the flanger.
- **BIAS**: This trimmer sets the bias point of the BBD.
- **CLOCK**: Sets the clock range from the LFO to the BBD.
- **LIMIT**: This trimmer is used to limit the FDBK control so it doesn't go into self-oscillation.

Further Study: <http://www.metzgerralf.de/elekt/stomp/mistress/index.shtml>

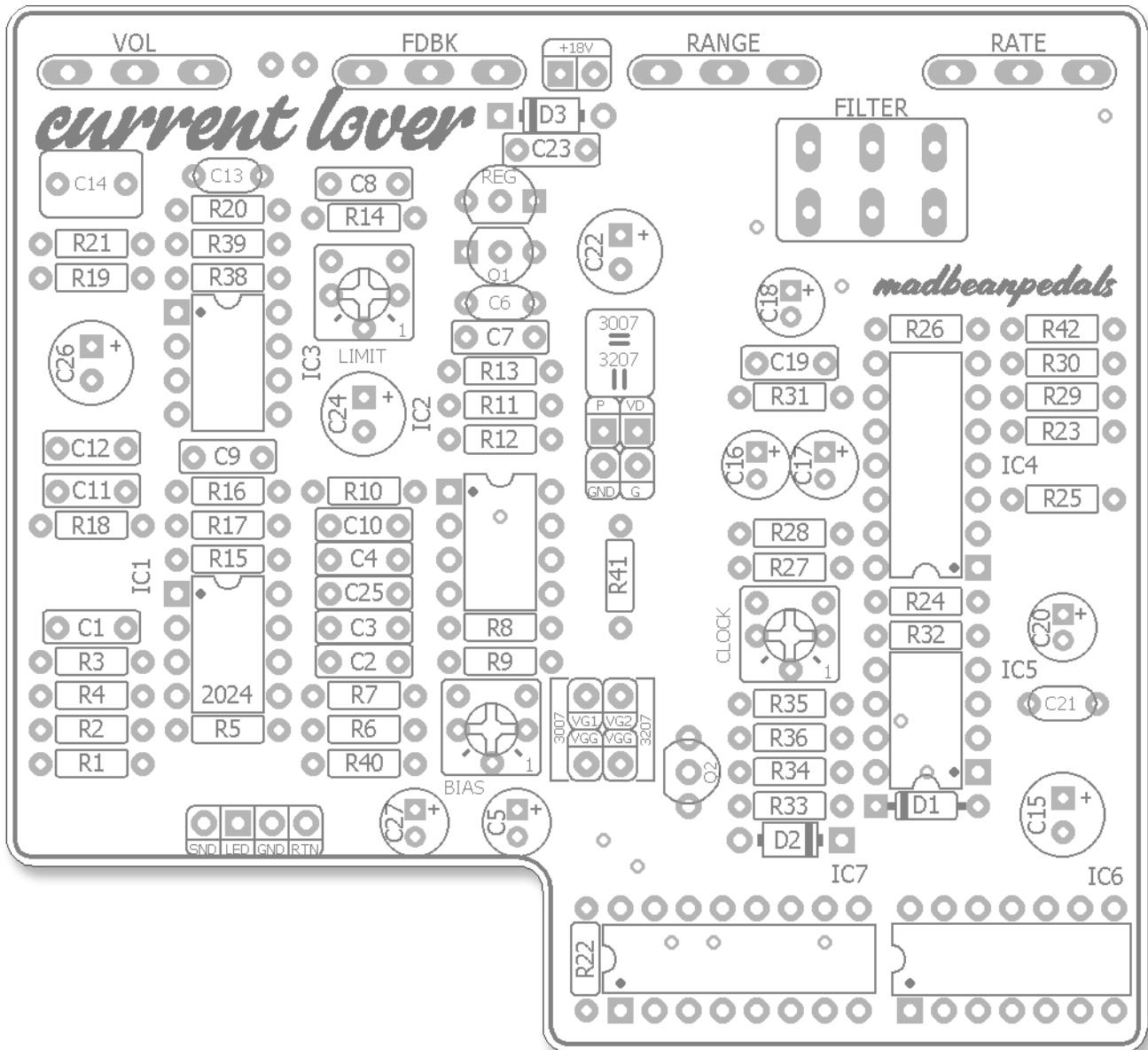
08.09.24 update: Mismatched values for C25-C27. The BOM has been corrected.

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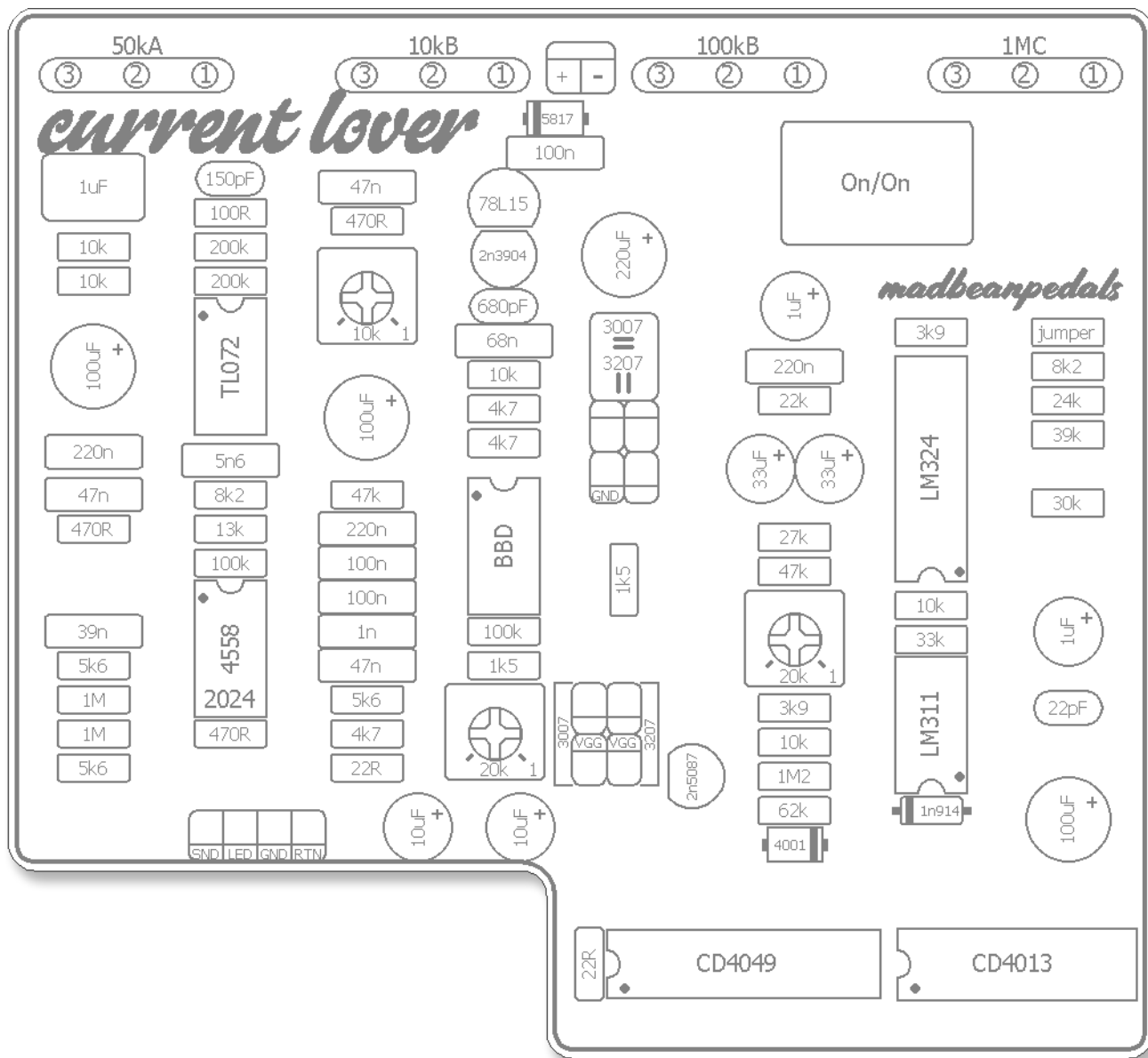
Technical assistance for is available via the [madbeanpedals forum](#). Please go there rather than emailing me for personal assistance. This is because (1) I'm not always available to respond via email in a timely and continuous manner, and (2) posting technical problems and solutions in the forum creates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

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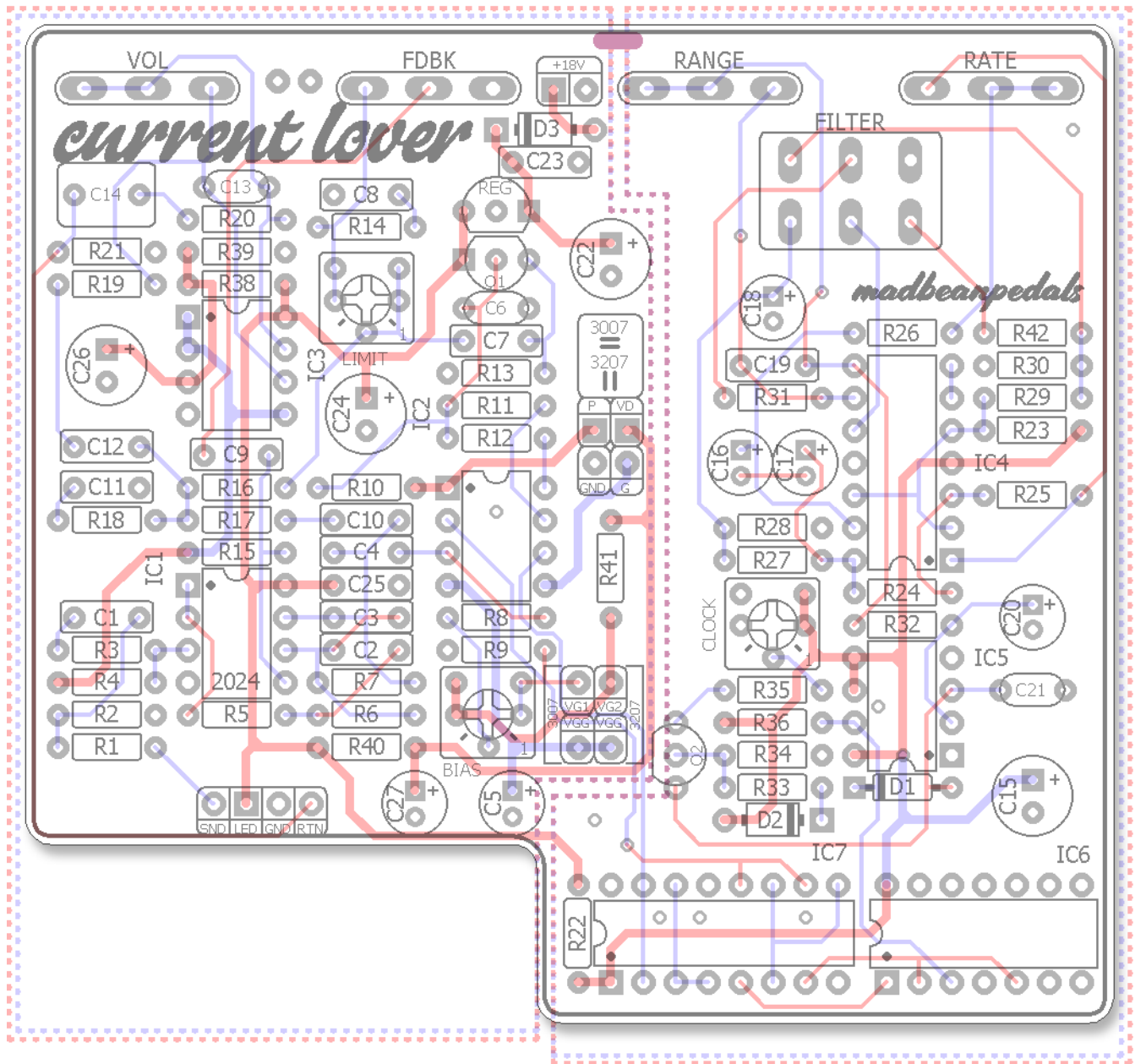
Parts Layout



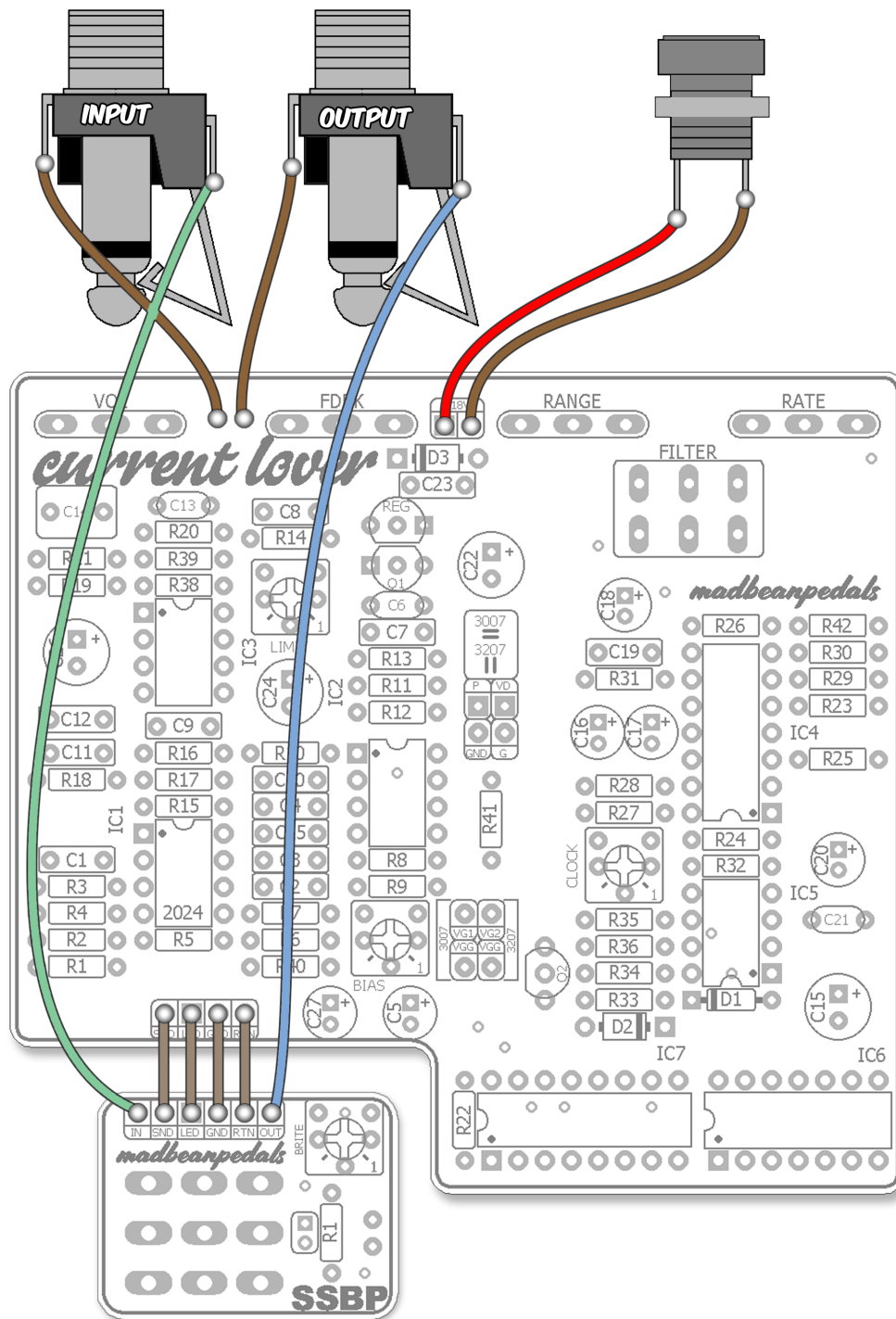
Component Values



Trace Layout



Wiring



The Current Lover is compatible with the **SSBP** bypass board offered at madbeanpedals.

B.O.M.

Resistors		Resistors		Caps		Diodes	
R1	5k6	R28	27k	C1	39n	D1	1n914
R2	1M	R29	24k	C2	47n	D2	1n4001
R3	5k6	R30	8k2	C3	1n	D3	1n5817
R4	1M	R31	22k	C4	100n	Transistors	
R5	470R	R32	33k	C5	10uF	Q1	2n3904
R6	4k7	R33	62k	C6	680pF	Q2	2N5087
R7	5k6	R34	1M2	C7	68n	ICs	
R8	100k	R35	3k9	C8	47n	IC1	4558
R9	1k5	R36	10k	C9	5n6	IC2	BBD
R10	47k	R38	200k	C10	220n	IC3	TL072
R11	4k7	R39	200k	C11	47n	IC4	LM324
R12	4k7	R40	22R	C12	220n	IC5	LM311
R13	10k	R41	1k5	C13	150pF	IC6	CD4013
R14	470R	R42	jumper	C14	1uF	IC7	CD4049
R15	100k			C15	100uF	Regulator	
R16	8k2			C16	33uF	REG	78L15
R17	13k			C17	33uF	Switch	
R18	470R			C18	1uF	FILTER	On/On
R19	10k			C19	220n	Trimmers	
R20	100R			C20	1uF	BIAS	20k
R21	10k			C21	22pF	CLOCK	10k
R22	22R			C22	220uF	LIMIT	10k
R23	39k			C23	100n	Pots	
R24	10k			C24	100uF	FDBK	10kB
R25	30k			C25	100n	VOL	50kA
R26	3k9			C26	100uF	RANGE	100kB
R27	47k			C27	10uF	RATE	1MC

Correction: C25-C27 had the values mismatched with component numbers. The above BOM is the corrected version. (08.09.24)

Shopping List

Value	QTY	Type	Rating	Value	QTY	Type	Rating
22R	2	Metal / Carbon Film	1/4W	1uF	2	Electrolytic	25v
100R	1	Metal / Carbon Film	1/4W	10uF	2	Electrolytic	25v
470R	3	Metal / Carbon Film	1/4W	33uF	2	Electrolytic	25v
1k5	2	Metal / Carbon Film	1/4W	100uF	3	Electrolytic	25v
3k9	2	Metal / Carbon Film	1/4W	220uF	1	Electrolytic	25v
4k7	3	Metal / Carbon Film	1/4W	1n914	1		
5k6	3	Metal / Carbon Film	1/4W	1n4001	1		
8k2	2	Metal / Carbon Film	1/4W	1n5817	1		
10k	5	Metal / Carbon Film	1/4W	2n3904	1		
13k	1	Metal / Carbon Film	1/4W	2N5087	1		
22k	1	Metal / Carbon Film	1/4W	4558	1		
24k	1	Metal / Carbon Film	1/4W	BBD	1	v3207, MN3207 or MN3007	
27k	1	Metal / Carbon Film	1/4W	TL072	1		
30k	1	Metal / Carbon Film	1/4W	LM324	1		
33k	1	Metal / Carbon Film	1/4W	LM311	1		
39k	1	Metal / Carbon Film	1/4W	CD4013	1		
47k	2	Metal / Carbon Film	1/4W	CD4049	1		
62k	1	Metal / Carbon Film	1/4W	78L15	1		
100k	2	Metal / Carbon Film	1/4W	DPDT	1	On/On, Solder Lug or Pin Mount	
200k	2	Metal / Carbon Film	1/4W	20k	1	Bourns 3362p or 6mm	
1M	2	Metal / Carbon Film	1/4W	10k	2	Bourns 3362p or 6mm	
1M2	1	Metal / Carbon Film	1/4W	10kB	1	PCB Right Angle	16mm
22pF	1	Ceramic / MLCC	25v min.	50kA	1	PCB Right Angle	16mm
150pF	1	Ceramic / MLCC	25v min.	100kB	1	PCB Right Angle	16mm
680pF	1	Ceramic / MLCC	25v min.	1MC	1	PCB Right Angle	16mm
1n	1	Film	25v min.				
5n6	1	Film	25v min.				
39n	1	Film	25v min.				
47n	3	Film	25v min.				
68n	1	Film	25v min.				
100n	3	Film	25v min.				
220n	3	Film	25v min.				
1uF	1	Film	25v min.				

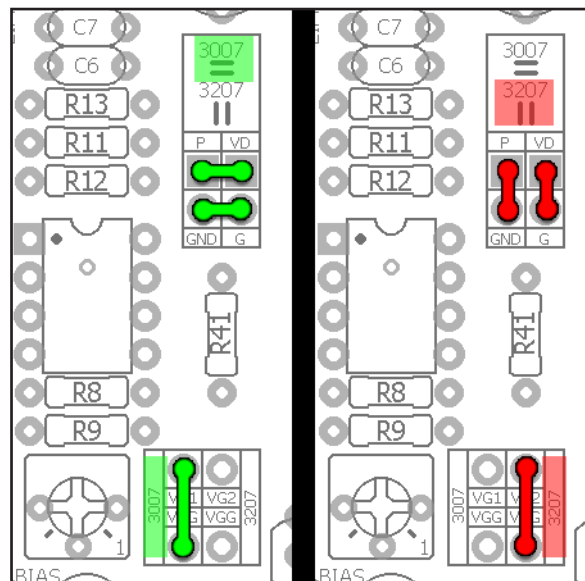
Additional Hardware

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

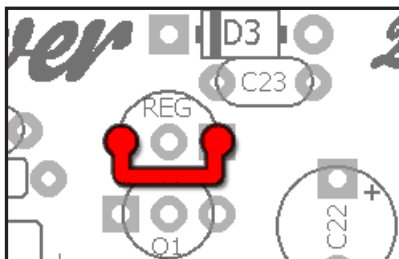
Build Notes

BBD	Operational Voltage	Regulator
MN3007	9v or 12v	no
MN3007	18v	yes
v3207	9v only	no
MN3207	9v only	no

The chart above shows the different BBD technologies you can use and the operational voltages for each. At 9v, there won't be much difference between the three types in terms of effect quality. With the MN3007 at 12 or 18v, you should find a bit more dynamic range and richness in the tonal quality but I would characterize it as profound. My suggestion is if you have the MN3007, then run it at 12v or 18v.



When using the MN3007, set the jumpers as shown in green. For the MN3207 or v3207, follow the jumpers in red. The jumpers determine which pins get power and ground and also what the Vgg voltage will be for the two different BBD technologies.



You only need to use the 78L15 regulator when using an MN3007 *and* 18v power supply. For all other permutations, omit the regulator and jumper the outer pads of the REG on the PCB as shown above.

Build Notes

- Calibration of the Current Lover is pretty easy. It's best if you have an audio probe but it's not required.
- Before you begin, make sure you have the PCB jumpers set correctly for your BBD type and voltage supply. Set the controls as follows:

RATE @ 0
RANGE @ 50%
FDBK @ 0
VOL @ 50%
SWITCH @ left
LIMIT @ 0
BIAS @ 50%
CLOCK about 1/3rd up

- Using your guitar or signal source at the effect input, audio probe pin3 of IC2 to confirm you have audio input to the BBD. Now probe either pin7 or 8 of IC2 and adjust the BIAS trim until you have the cleanest output possible. It's usually around the middle. If you are not using an audio probe, simply listen to the effect output instead.
- Turn the FDBK control all the way up. Adjust the LIMIT trimmer until just before you get any self-oscillation. Try different RANGE and RATE settings to verify you have no oscillation at any setting.
- Leaving the FDBK and RANGE controls all the way up, adjust the CLOCK trim to the point just before you hear any "chirps" at the peaks of the flange sweep. Adjust the RATE control as necessary to verify there's no chirp at any of the RATE, RANGE, or FDBK settings.
- Toggle the switch to the right position. Now you are in manual mode (filter matrix). You should hear the fixed flanger change its notch as you adjust the RANGE control from 0 to 100. The RATE control is disabled in Matrix mode.

You're done!

- If you switch between BBD or voltage supplies, your CLOCK and LIMIT trimmers will have to be adjusted using the same procedure described above. IOW, one setting does not fit all! For 18v/ MN3007 I had to adjust my CLOCK trim pretty close to the maximum setting. For 9v, it was more around 50%.

Circuit Voltages MN3007 & 9v supply

IC1	4558	IC4	LM324	IC6	CD4013	IC7	CD4049
1	4.58	1	7.94	1	~4.6	1	9.11
2	4.58	2	~4.1	2	4.4	2	varies
3	4.21	3	varies	3	varies	3	varies
4	0	4	9.1	4	0	4	varies
5	4.57	5	~4.2	5	4.4	5	varies
6	4.61	6	~4.1	6	0	6	varies
7	4.64	7	~4.1	7	0	7	varies
8	9.22	8	varies	8	0	8	0
IC2	MN3007	9	varies	9	0	9	varies
1	9.22	10	varies	10	0	10	varies
2	~4.3	11	0	11	0	11	varies
3	4.6	12	~4.2	12	0	12	varies
4	0.6	13	~4.2	13	9.13	13	varies
5	0	14	varies	14	9.13	14	varies
6	4.6	IC5	LM311			15	varies
7	4.4	1	0			16	varies
8	4.4	2	varies			Q1	2n3904
IC3	TL072	3	varies			C	9.24
1	4.6	4	0			B	4.74
2	4.6	5	9.13			E	4.02
3	4.6	6	9.11			Q2	2n5087
4	0	7	varies			C	8.79
5	4.6	8	9.11			B	8.26
6	4.61					E	varies
7	4.61						
8	9.22						

- 9.5vDC One Spot
- Current Draw: 12mA
- All knobs @ 0, switch left.
- If you use an the v3207 or MN3207 for 9v operation, most of these voltages will be about the same. However, you will get different readings on pins1, 4 and 5 of the BBD. Pin3 voltage reading will be unique to each BBD device, as well.
- Clock range (with Rate @ 0 and Range @ 100%): 66kHz - 560kHz.

Circuit Voltages - MN3007 & 18v supply

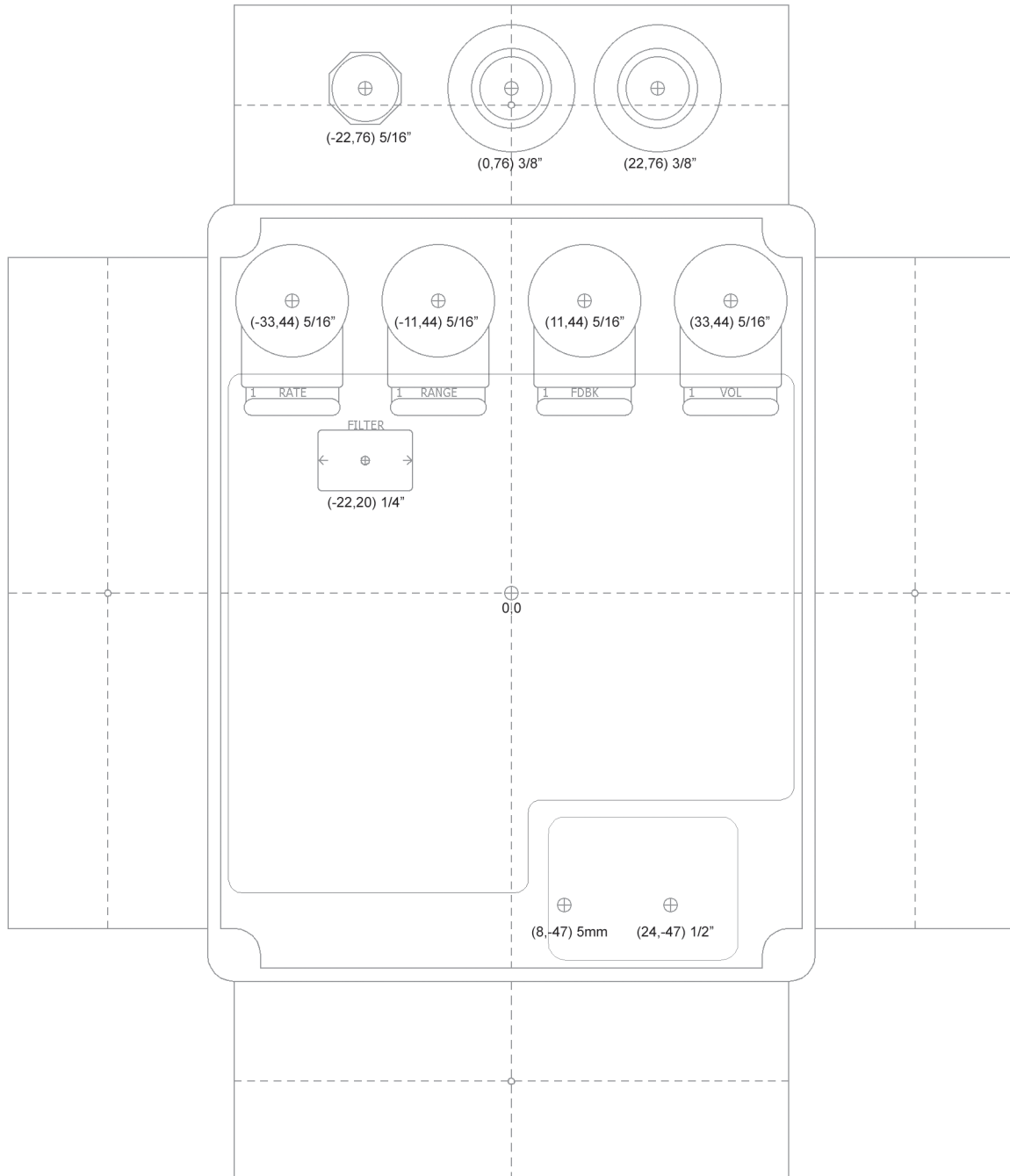
IC1	4558	IC4	LM324	IC6	CD4013	IC7	CD4049
1	7.39	1	varies	1	7.6	1	14.8
2	7.39	2	~6.8	2	~7.2	2	varies
3	6.73	3	varies	3	varies	3	varies
4	0	4	14.82	4	0	4	varies
5	7.37	5	~6.8	5	~7.2	5	varies
6	7.45	6	~6.9	6	0	6	varies
7	7.5	7	~6.7	7	0	7	varies
8	15.01	8	varies	8	0	8	0
IC2	MN3007	9	varies	9	0	9	varies
1	15	10	varies	10	0	10	varies
2	7	11	0	11	0	11	varies
3	7.11	12	~6.7	12	0	12	varies
4	0.98	13	~6.7	13	14.8	13	varies
5	0	14	varies	14	14.8	14	varies
6	7.56	IC5	LM311			15	varies
7	~6	1	0			16	varies
8	~6.4	2	varies			Q1	2n3904
IC3	TL072	3	varies			C	15.01
1	7.45	4	0			B	6.15
2	7.45	5	~14.8			E	5.8
3	7.45	6	14.8	REG	78L15	Q2	2n5087
4	0	7	varies	I	17.99	C	14.2
5	7.44	8	14.8	G	0	B	13.67
6	7.45			O	15.01	E	varies
7	7.45						
8	15.01						

- 18.24v Dunlop Supply
- Current Draw: 18mA
- All knobs @ 0, switch left.
- Clock range (with Rate @ 0 and Range @ 100%): 68kHz - 715kHz.

Drill Template

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

Tayda drill link: https://drill.taydakits.com/box-designs/new?public_key=M3RyRTIVNmdUcUhFRFdmY0JXV1FuUT09Cg==



Hardware

1590BB enclosure

1/4" mono jacks

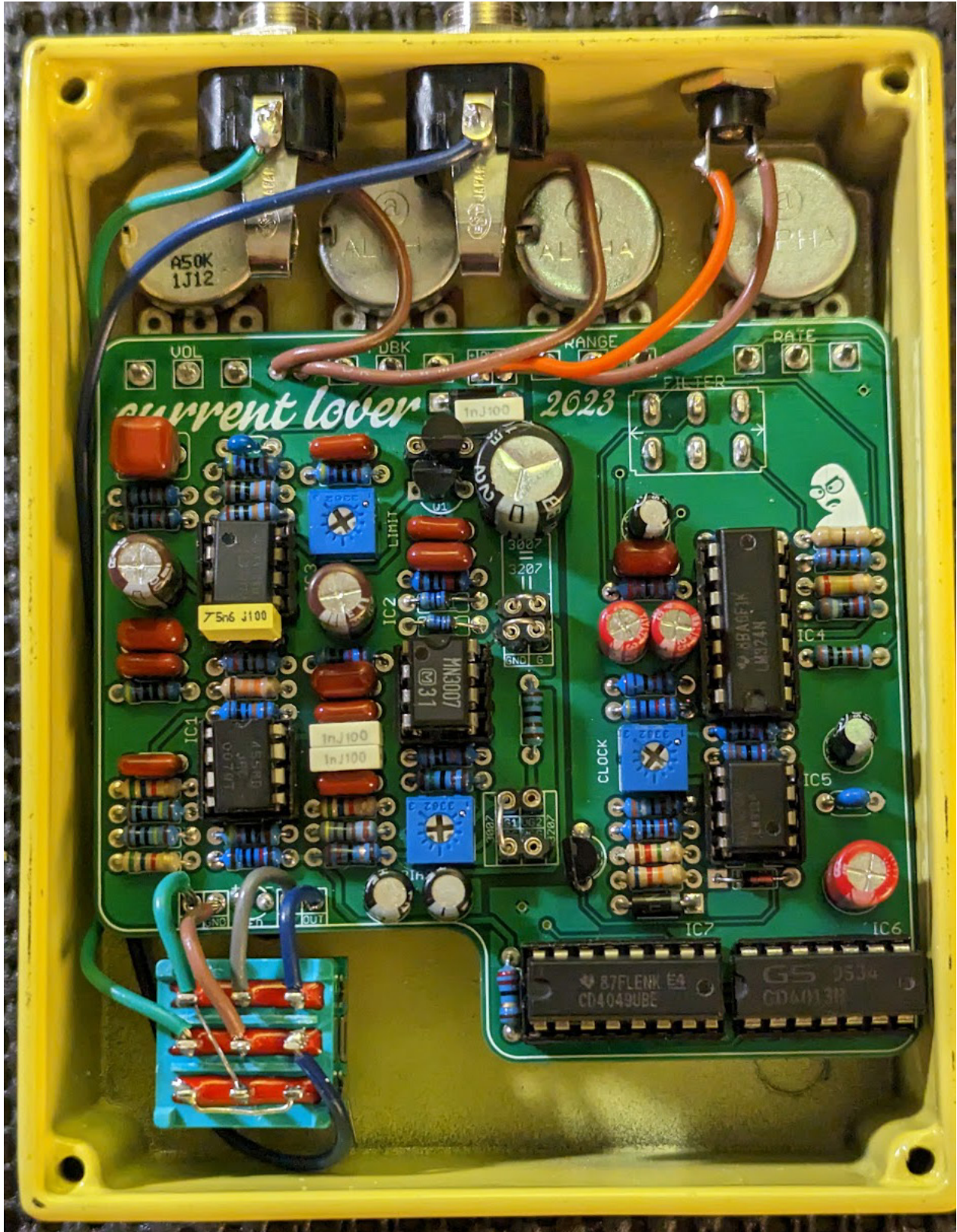
Slim 2.1mm DC jack

Standard 3PDT footswitch

5mm LED

NOTE: Different 1/4" and DC jack styles may require different sized drill holes.

Build Pic



Previous version build.

Schematic

