

PorkBarrel24

FX Type: **FILTER**
Build Level: Intermediate
Based On: Boss® CE-2™

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The 2024 version of the **PorkBarrel** has no circuit changes and some minor layout adjustments. The PCB has been converted from a 2-layer to 4-layer design for low noise operation.

Overview

The Pork Barrel is a clone of the classic Boss® CE-2™. The CE-2™ has a signature sound and been a staple of many guitar and bass pedal boards for decades. Next to the EHX Small Clone, it is one of the most instantly recognizable chorus effects out there. Even if you don't like chorus, this is one of the best analog ones ever made.

The Pork Barrel is designed to utilize several different BBD types (MN3207 or MN3007) depending on availability and price. Minimal modifications are required to set the build up for these different BBDs, and this will be explained in detail later on in this document. A BLEND control mod has also been added. This allows for both a chorus and vibrato effect (by eliminating the dry signal). It is completely optional.

Controls

- **RATE:** Chorus speed from slow to fast.
- **DEPTH:** Chorus depth from min to max.
- **BLEND:** Mix of dry, chorus and vibrato. CCW is dry (no modulation), 1/4 up to middle is chorus and fully CW is vibrato.
- **T1:** Sets the bias of the chorus effect.

Further Study:

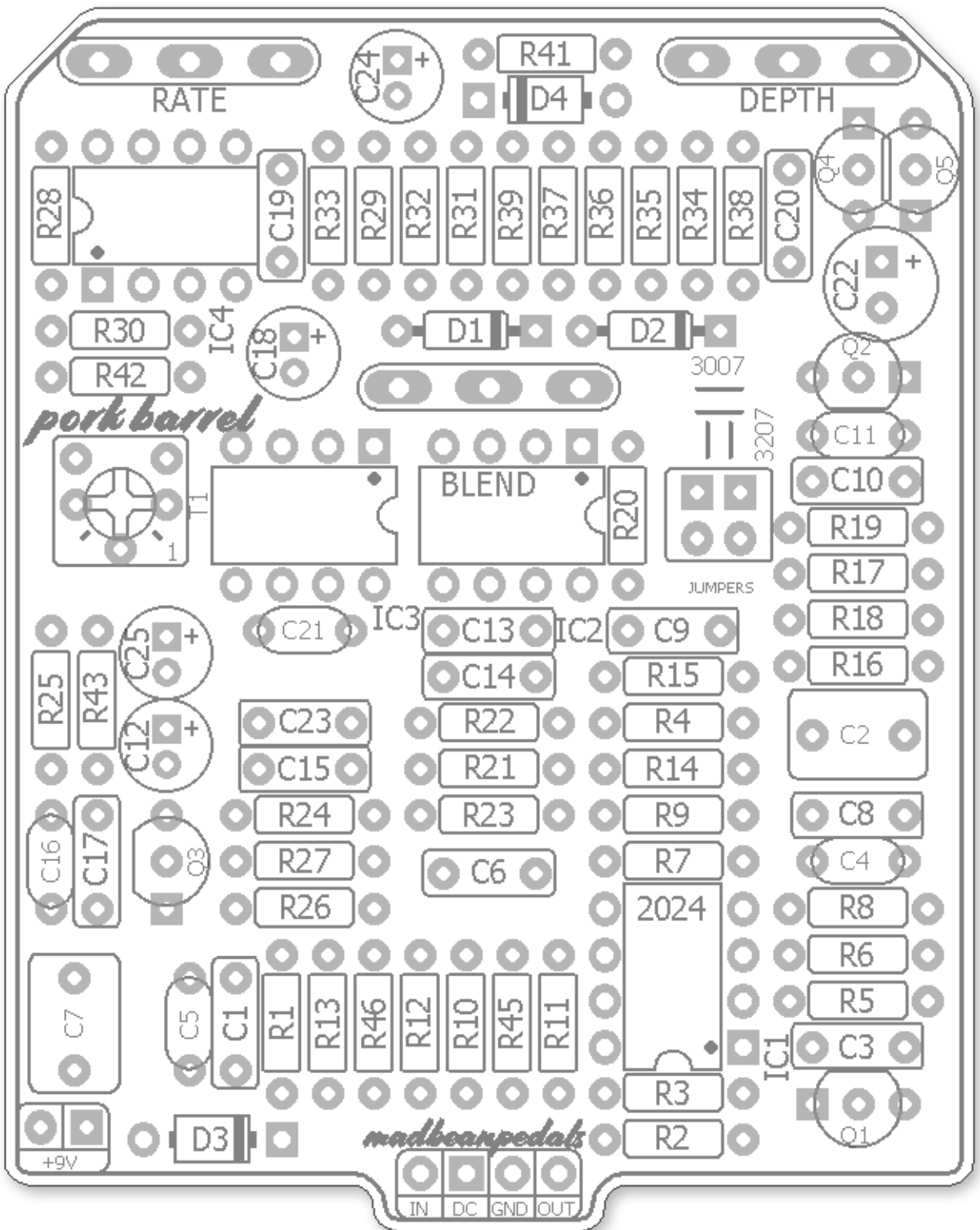
<https://www.electrosmash.com/boss-ce-2-analysis>

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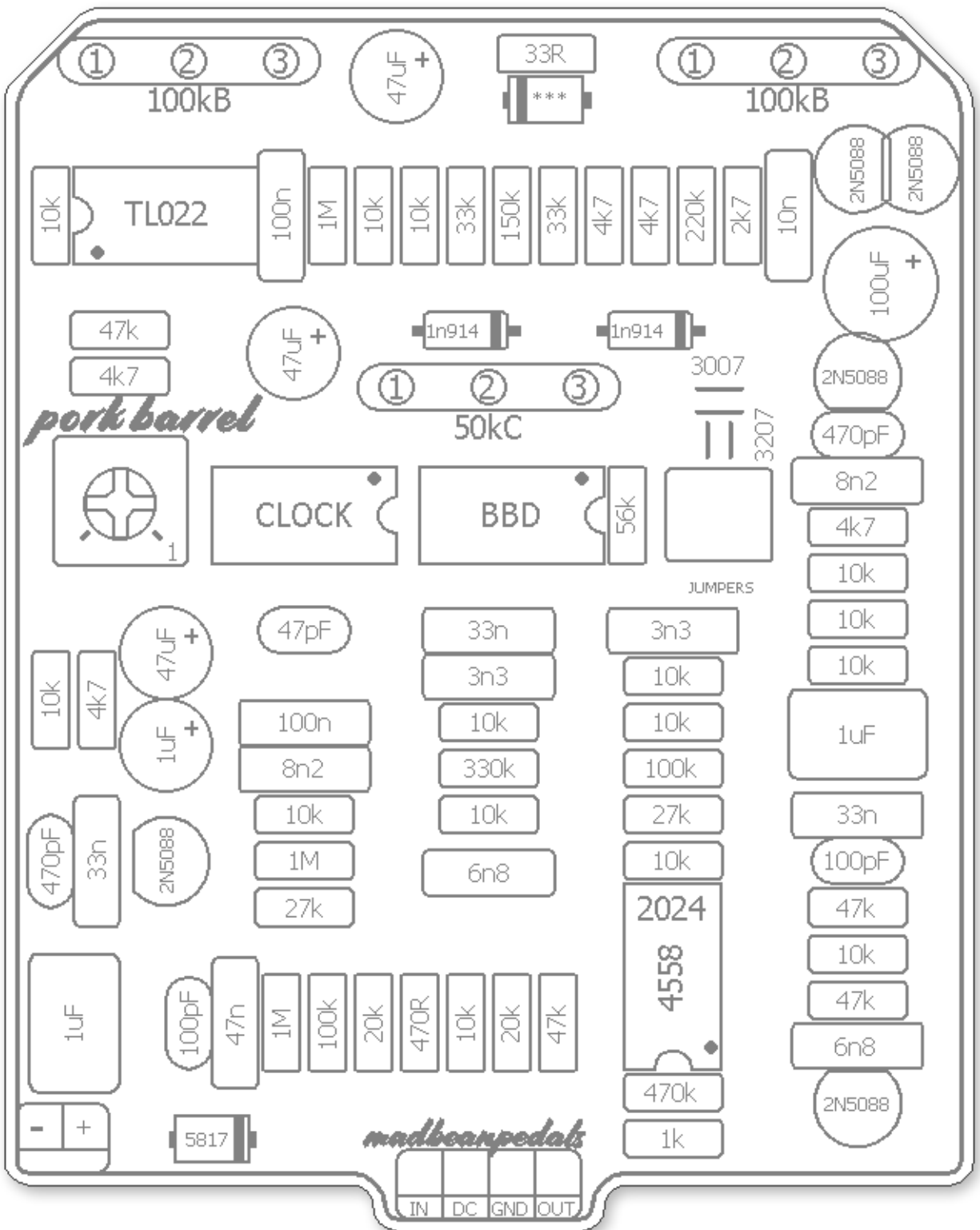
Technical assistance for is available via the [madbeanpedals forum](#). Please go there rather than emailing me for personal assistance. This is because (1) I'm not always available to respond via email in a timely and continuous manner, and (2) posting technical problems and solutions in the forum creates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

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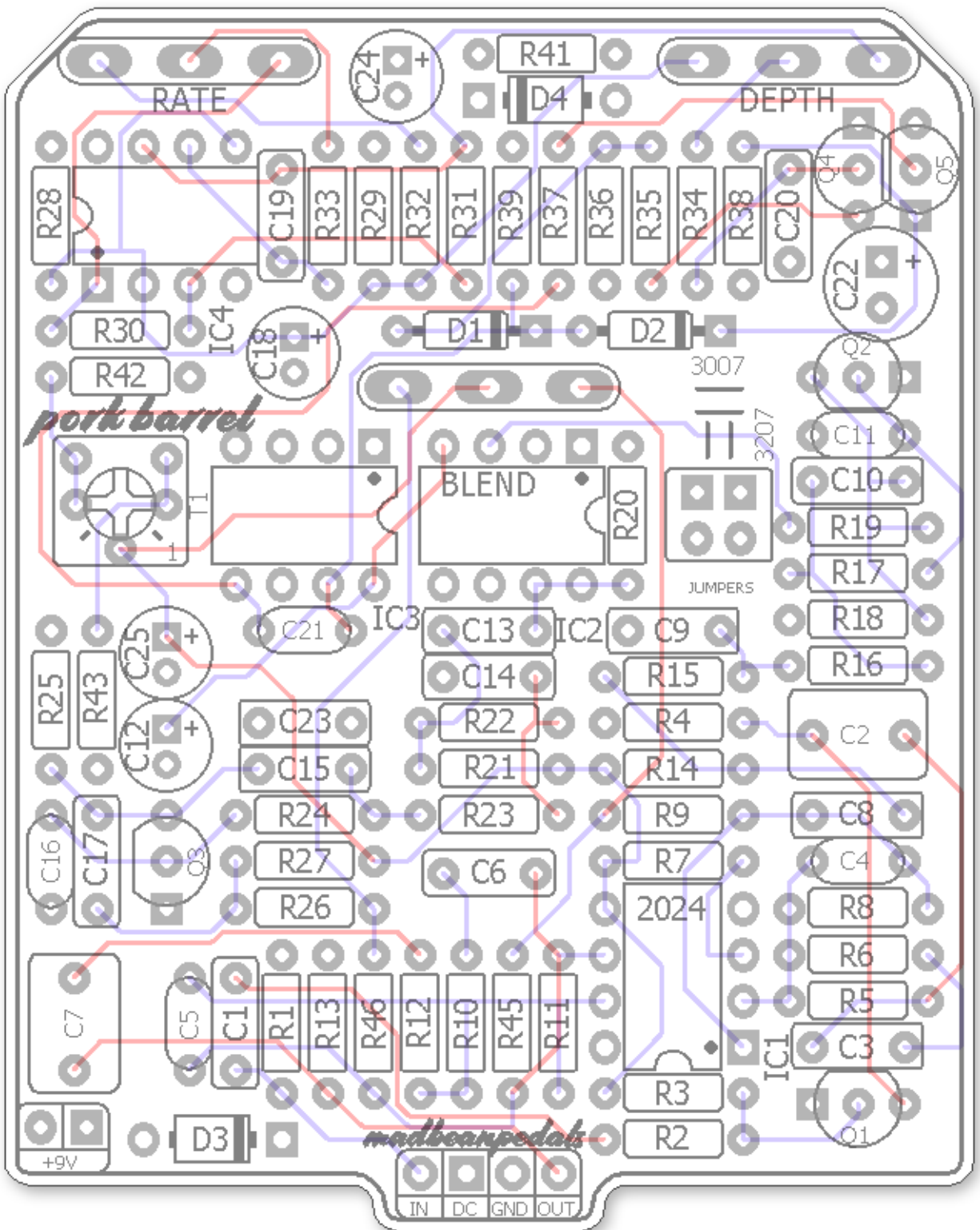
Parts Layout



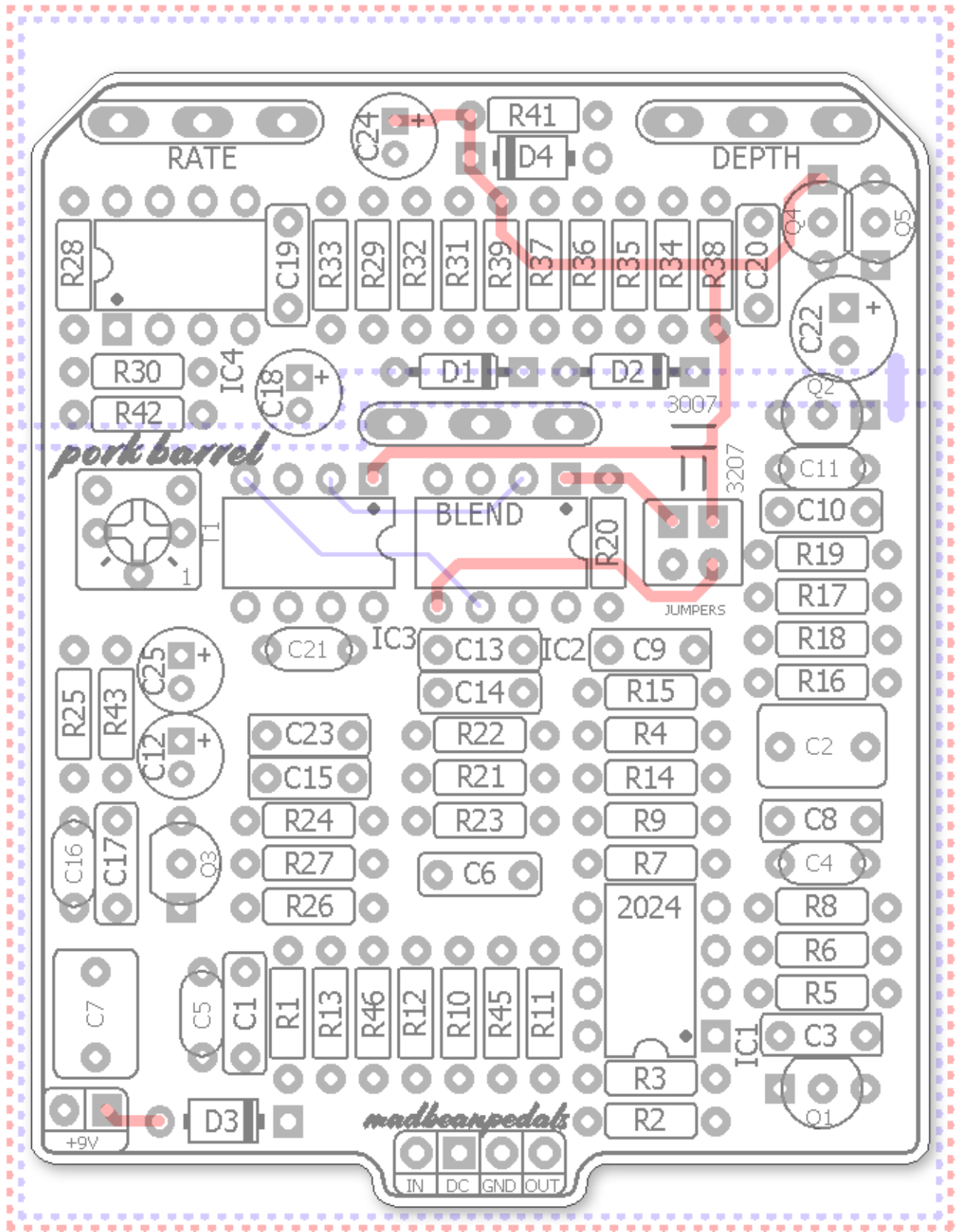
Component Values



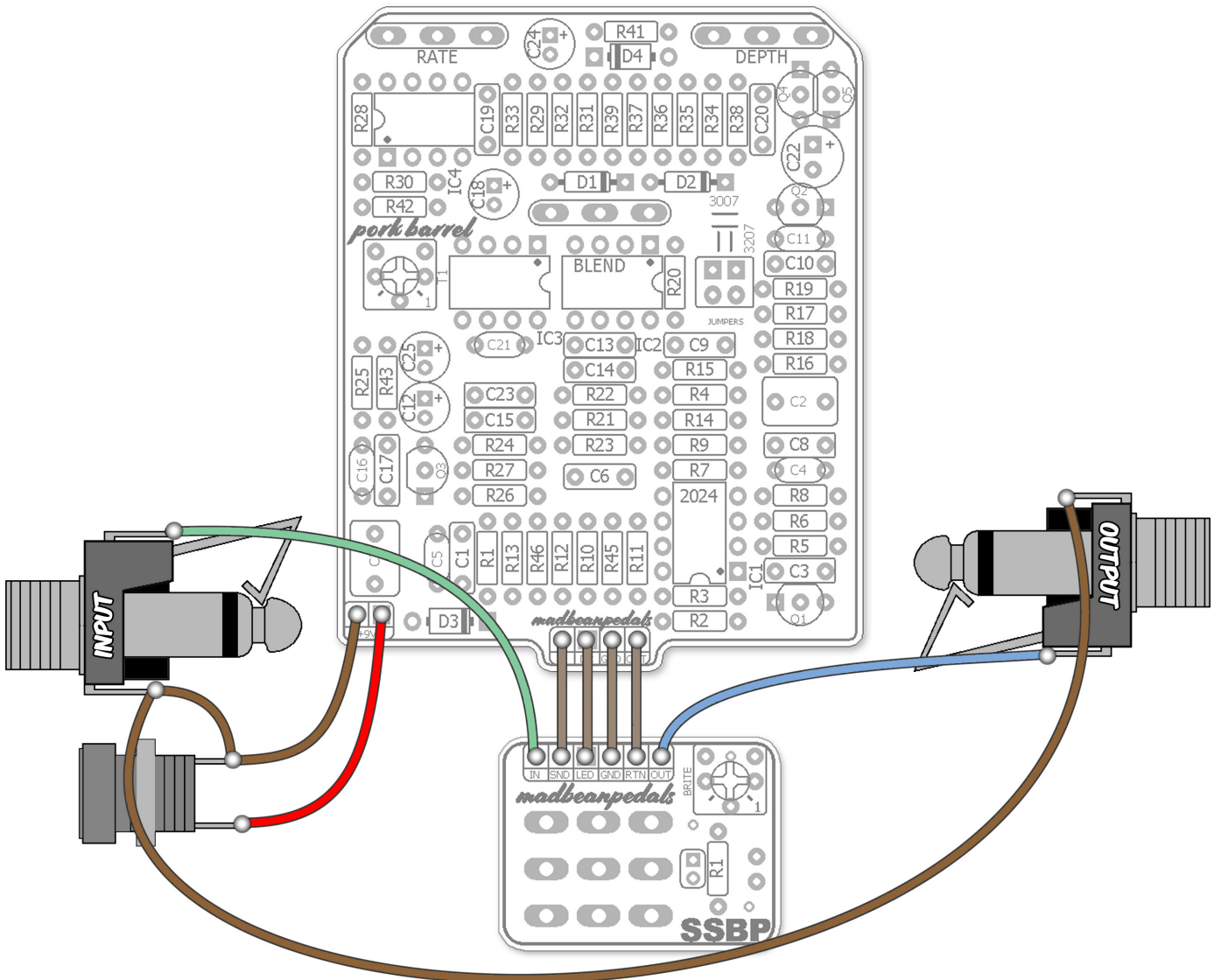
Trace Layout - Outer Layers



Trace Layout - Inner Layers



Wiring



The PorkBarrel24 is compatible with the **SSBP** bypass board available at madbeanpedals. There was no room for extra grounding pads on the layout so the ground wiring is slightly awkward here.

B.O.M.

Resistors		Resistors		Caps		Diodes	
R1	1M	R31	33k	C1	47n	D1	1n914
R2	1k	R32	10k	C2	1uF	D2	1n914
R3	470k	R33	1M	C3	6n8	D3	1N5817
R4	10k	R34	220k	C4	100pF	D4	*see notes
R5	47k	R35	4k7	C5	100pF	D5	omit
R6	10k	R36	4k7	C6	6n8	Transistors	
R7	10k	R37	33k	C7	1uF	Q1 - Q5	2N5088
R8	47k	R38	2k7	C8	33n	IC	
R9	27k	R39	150k	C9	3n3	IC1	4558
R10	10k	R41	33R	C10	8n2	IC2	BBD
R11	47k	R42	4k7	C11	470pF	IC3	CLOCK
R12	470R	R43	4k7	C12	1uF	IC4	TL022
R13	100k	R45	20k	C13	33n	Trimmer	
R14	100k	R46	20k	C14	3n3	T1	10k
R15	10k			C15	8n2	Pots	
R16	10k			C16	470pF	DEPTH	100kB
R17	10k			C17	33n	RATE	100kB
R18	10k			C18	47uF	BLEND	50kA
R19	4k7			C19	100n		
R20	56k			C20	10n		
R21	330k			C21	47pF		
R22	10k			C22	100uF		
R23	10k			C23	100n		
R24	10k			C24	47uF		
R25	10k			C25	47uF		
R26	27k						
R27	1M						
R28	10k						
R29	10k						
R30	47k						

Shopping List

Value	QTY	Type	Rating
33R	1	Metal / Carbon Film	1/4W
470R	1	Metal / Carbon Film	1/4W
1k	1	Metal / Carbon Film	1/4W
2k7	1	Metal / Carbon Film	1/4W
4k7	5	Metal / Carbon Film	1/4W
10k	15	Metal / Carbon Film	1/4W
20k	2	Metal / Carbon Film	1/4W
27k	2	Metal / Carbon Film	1/4W
33k	2	Metal / Carbon Film	1/4W
47k	4	Metal / Carbon Film	1/4W
56k	1	Metal / Carbon Film	1/4W
100k	2	Metal / Carbon Film	1/4W
150k	1	Metal / Carbon Film	1/4W
220k	1	Metal / Carbon Film	1/4W
330k	1	Metal / Carbon Film	1/4W
470k	1	Metal / Carbon Film	1/4W
1M	3	Metal / Carbon Film	1/4W
47pF	1	MLCC / MICA	25v min.
100pF	2	Ceramic / MLCC	25v min.
470pF	2	Ceramic / MLCC	25v min.
3n3	2	Film	25v min.
6n8	2	Film	25v min.
8n2	2	Film	25v min.
10n	1	Film	25v min.
33n	3	Film	25v min.
47n	1	Film	25v min.
100n	2	Film	25v min.
1uF	2	Film	25v min.
1uF	1	Electrolytic	25v min.
47uF	3	Electrolytic	25v min.
100uF	1	Electrolytic	25v min.
1n914	2		
1N5817	1		
Zener	1	*see notes	
2N5088	5		
4558	1		
BBD	1	*see notes	
CLOCK	1	*see notes	
TL022	1	or, TL062	
10k	1	Bourns 3362p or 6mm	
100kB	2	Right Angle, PCB Mount	16mm
50kA	1	Right Angle, PCB Mount	16mm

Additional Hardware

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

Build Notes

What are the advantages of the different BBDs?

The vintage unit used the MN3007. You can safely use 9 – 12v DC to power the effect, with the higher voltage providing a small amount of additional headroom. Note that if you use 12v, you will want it to be well regulated. Anything over 12v will not work for this design.

The MN3207, v3207 and BL3207 have lower current requirements, are less expensive and easier to source. These BBDs should not be operated at higher than 9vDC. IMO, there is little to no difference in the different BBD types for the CE-2™.

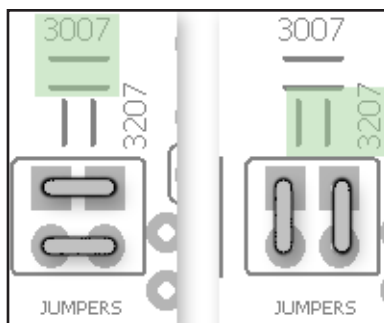
BBD Chart

These are the combinations of BBD and clocks you can use when building the Pork Barrel.

IC2 (BBD)	IC3 (Clock)	Zener (D4)	Max Power
MN3007	MN3101	12v or 15v	12v
MN3207	MN3102	9.1v	9v
BL3207	BL3102	9.1v	9v
v3207	v3102	9.1v	9v

Jumpers

You must set one pair of jumpers on the Pork Barrel PCB to correspond to the type of BBD you are using. These jumpers determine which pins get power and ground, and sets R20 to be a pull-up or pull-down resistor. The image below shows the jumper arrangements.



Biasing

Biasing the Pork Barrel is very straight forward. Set your Rate knob to its midpoint and the Depth knob to maximum. Adjust the T1 trimmer until you get the maximum chorus effect with minimal distortion. That's it!

Blend Pot

You can omit the Blend control option by simply not soldering in the pot. This gives you chorus only and is exactly the CE-2. If you do use the BLEND pot, you may find the Vibrato setting (full CW) has a bit of volume drop. You can counter this by decreasing the value of R46. I suggest 15k or 10k.

Mods

Because the CE-2 was not designed to be a vibrato, its overall speed range is not ideal for that type of effect (assuming you like really fast vibrato). You can modify the LFO to get a much faster max speed but it comes with the caveat of shifting the slowest speed forward as well. If you want to try different speed ranges, socket C19 and try 82n or 68n in place of the 100n. If you want to modify the overall intensity of the chorus, play with the value of C21. Try 68pF or 82pF in place of 47pF.

Circuit Voltages

IC1 4558		IC4 TL022	
1	5.62	1	8.56
2	5.59	2	varies
3	5.59	3	varies
4	0	4	0
5	5.6	5	varies
6	5.6	6	varies
7	5.58	7	varies
8	9.23	8	9.23
IC2 MN3207		Q1 2n5088	
1	0	C	9.24
2	4.34	B	4.51
3	4.86	E	4.25
4	8.57	Q2 2n5088	
5	9.16	C	9.23
6	4.51	B	5.4
7	6.8	E	4.86
8	6.8	Q3 2n5088	
		C	9.23
IC3 MN3102		Q4 2n5088	
1	9.16	B	5.1
2	4.35	E	4.66
3	0	Q4 2n5088	
4	4.5	C	7.73
5	~310mV	B	~420mV
6	8.77	E	0
7	~3.3	Q5 2n5088	
8	8.57	C	9.16
		B	varies
		E	varies

9.42vDC One Spot
 Current Draw: ~9mA
 Knobs @ 0

These measurements are for the 3207/3102 combo. If you use the 3007/3101, most voltages will remain the same except:

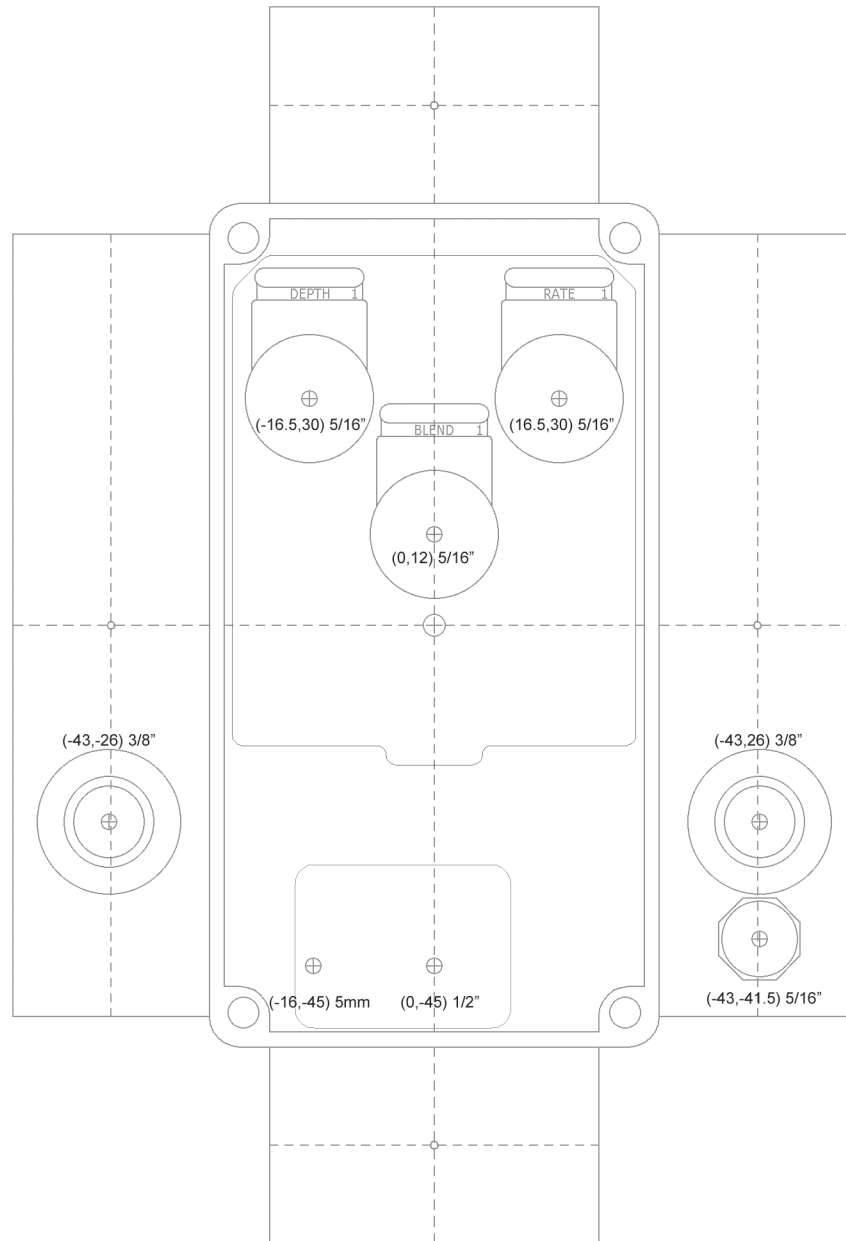
IC2 pins 1 and 5 will swap values and pin4 will be around 0.6V

NOTE: Because the bias trimmer alters the VB supply voltage you can expect to see some variation in other readings. Consider the chart here a guide, but not 100% accurate for every build.

Drill Template

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

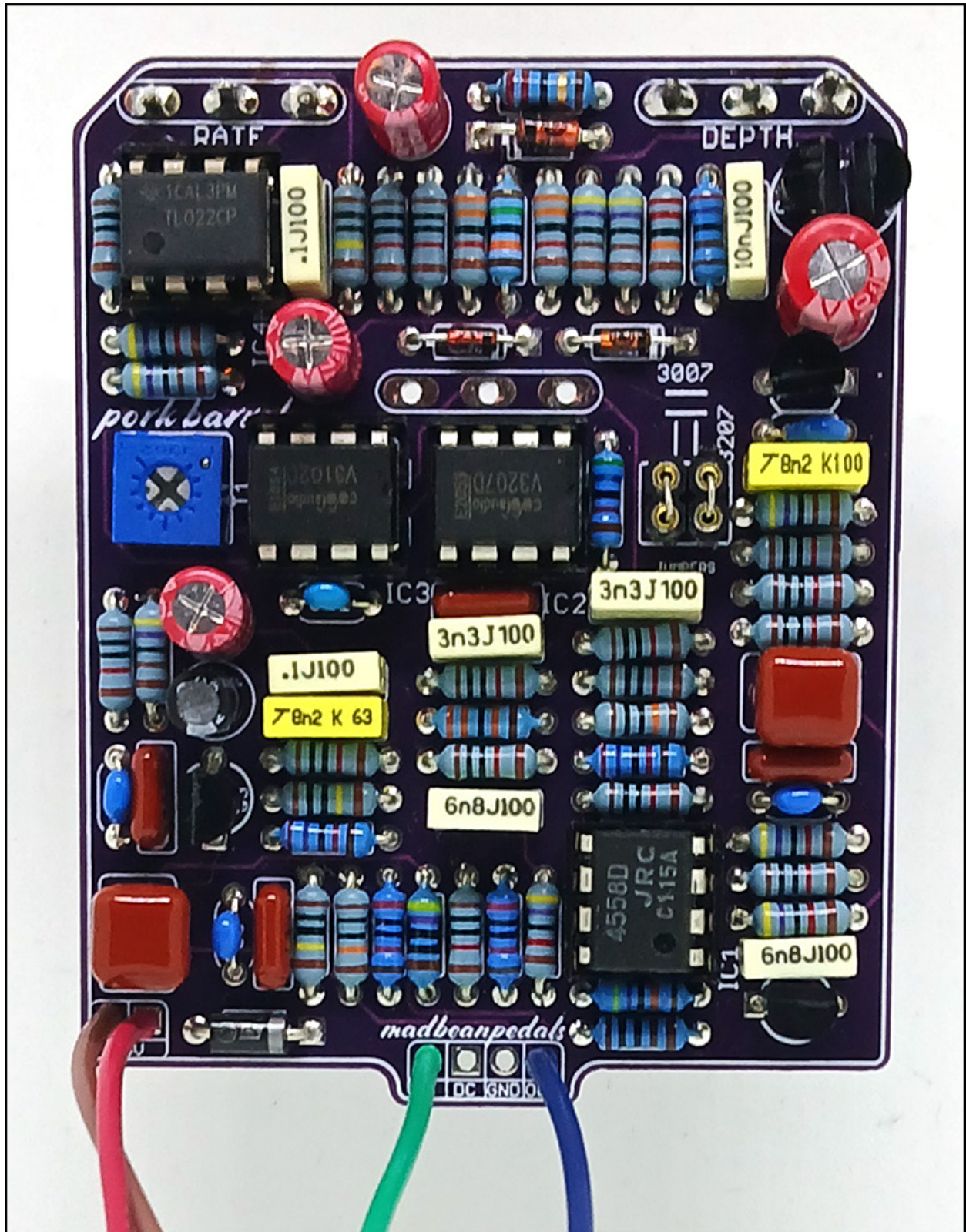
Tayda drill link: https://drill.taydakits.com/box-designs/new?public_key=WUpwalEzZzIIY1Ftc1ZERE5OV0FaQT09Cg==



Hardware

- (1) 1590B enclosure
- (2) 1/4" mono jacks
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Build Pic



Schematic

