

# GLITCHEE

## FX TYPE: SubOctave-Filter

Enclosure Size: 125B

"Softie" compatibility: none

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## Overview

tl;dr: The Glitchee is what you get when you combine an EQD® Bit Commander® with a Seamoon Funk Machine. It does distortion, octave down, and sub-octave tones with the ability to dial in a dynamic filter over the whole thing.

Story: I liked the simplicity of the Bit Commander and wanted to do something with it, but not a straight up clone. It occurred to me that adding a dynamically driven filter could produce some synth-style tones and that was the genesis of the idea. What came after was a bit a slog. The Glitchee ended up being the most breadboarded project I've ever done. I think it was four or five teardowns and re-dos.

Anyway, it took a while to find the right filter and envelope control. I ended up with a modded Seamoon Funk Machine then used a little trick to make the LM386 double as the distortion generator and envelope detector. Like most solutions, they become obvious after you find them. Sometimes it takes a while to find the right path to "optimal topology" (that's fancy speak for 'making shit work good'). As the name implies the effect is rather glitchey. Octave generation is not too smooth in its decay but that is part of the charm of all analog octave down. Mostly, it's just a lot of fun to play!

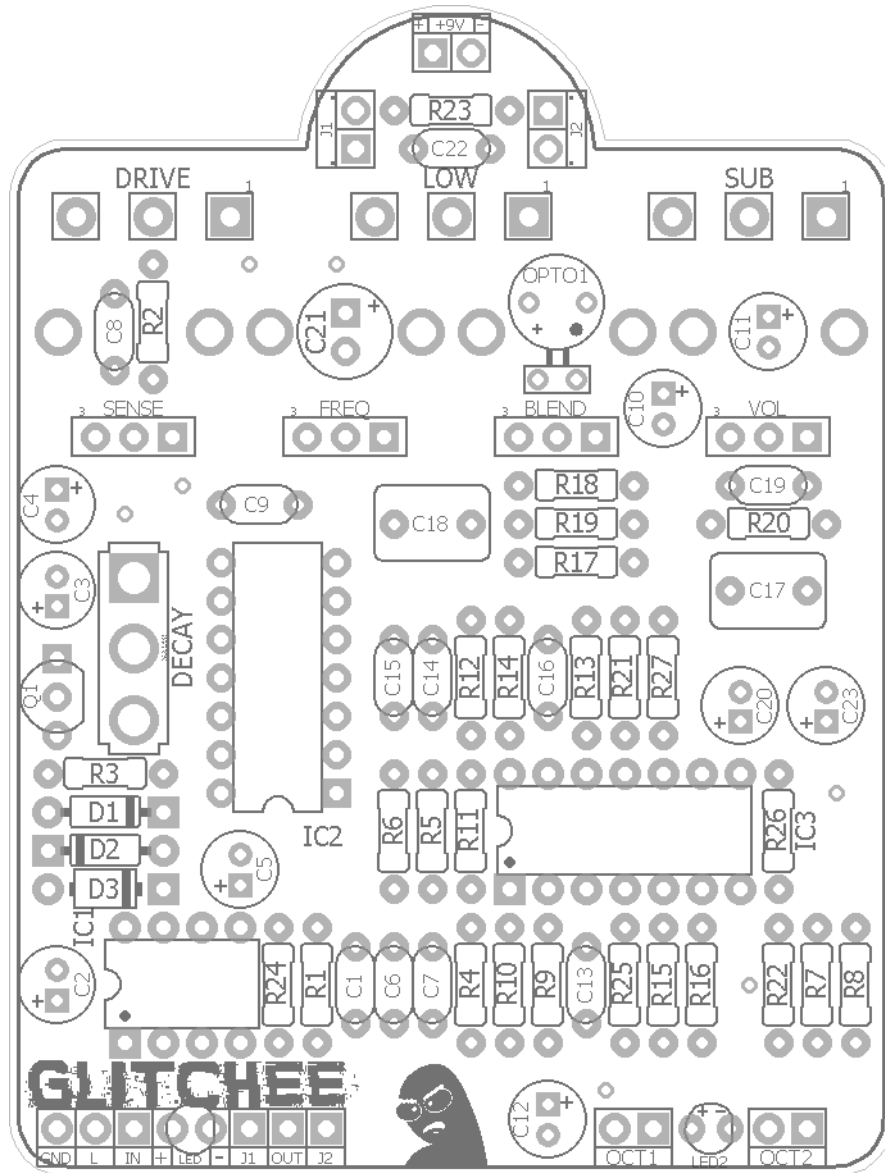
## Controls

- **DRIVE:** Sets the volume of the distorted tones.
- **LOW, SUB:** Volume of one and two octaves down, resp.
- **BLEND:** After the DRIVE, LOW and SUB summing stage the audio splits into two paths, clean and dynamic filter. The Blend control sets the mix between those.
- **VOL:** Total output volume.
- **SENSE:** Sets the envelope response (IOW, the sensitivity to pick attack).
- **FREQ:** Sets the filter response (really, it's a gain control for the filter). The SENSE and FREQ are used together to set the overall shape and response of the filter.
- **DECAY:** This was intended to set different decay responses in the envelope filter but I later changed my mind. It might be more accurate to call this switch "TRIM" as it cuts off a bit of low end from the filter in the Up position. Down position is normal response. Please see the Notes section for further explanation.
- **OCT:** This secondary footswitch allows you to toggle the octaves down on and off.

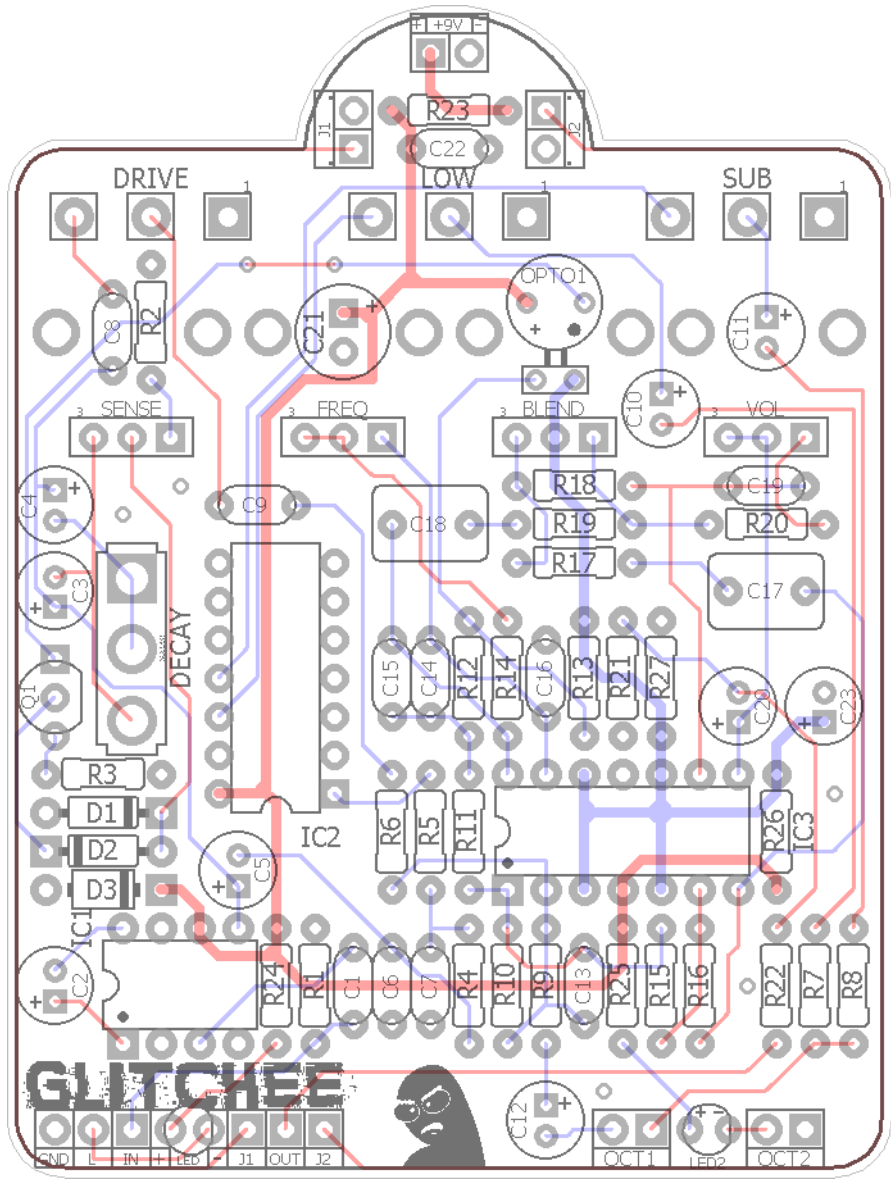
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**Technical assistance** for your build(s) is available via the [madbeanpedals forum](http://madbeanpedals.com/forum). Please go there rather than emailing me for assistance on builds. This is because (1) I'm not always available to respond via email 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.







Resistors		Caps		Diodes	
R1	1M	C1	100n	D1	1n914
R2	2k2	C2	10uF	D2	1n914
R3	470R	C3	4u7	D3	1N4001
R4	22k	C5	1uF	C4	1n914
R5	100k	C6	10n	Transistors	
R6	220k	C7	22n	Q1	2n3904
R7	220k	C8	22n	IC	
R8	220k	C9	22n	IC1	LM386
R9	220k	C10	1uF	IC2	CD4024
R10	220k	C11	1uF	IC3	TL074
R11	22k	C12	1uF	OPTO1	
R12	100R	C13	22pF	OPTO1	NSL32R1
R13	220k	C14	4n7	Switch	
R14	470k	C15	4n7	DECAY	On/On
R15	10k	C16	1n	Pots	
R16	10k	C17	1uF	BLEND	10kA
R17	10k	C18	1uF	SENSE	10kB
R18	22k	C19	150pF	VOL	50kA
R19	10k	C20	4u7	FREQ	1MB
R20	22k	C21	100uF	DRIVE	100kA
R21	100k	C22	100n	LOW	100kA
R22	1k	C23	10uF	SUB	100kA
R23	100R				
R24	4k7				
R25	4k7				
R26	10k				
R27	10k				

Value	QTY	Type	Rating
100R	2	Carbon / Metal Film	1/4W
470R	1	Carbon / Metal Film	1/4W
1k	1	Carbon / Metal Film	1/4W
2k2	1	Carbon / Metal Film	1/4W
4k7	2	Carbon / Metal Film	1/4W
10k	6	Carbon / Metal Film	1/4W
22k	4	Carbon / Metal Film	1/4W
100k	2	Carbon / Metal Film	1/4W
220k	6	Carbon / Metal Film	1/4W
470k	1	Carbon / Metal Film	1/4W
1M	1	Carbon / Metal Film	1/4W
22pF	1	Ceramic / MLCC	16v min.
150pF	1	Ceramic / MLCC	16v min.
1n	1	Film	16v min.
4n7	2	Film	16v min.
10n	1	Film	16v min.
22n	3	Film	16v min.
100n	2	Film	16v min.
1uF	2	Film	16v min.
1uF	4	Electrolytic	16v min.
4u7	2	Electrolytic	16v min.
10uF	2	Electrolytic	16v min.
100uF	1	Electrolytic	16v min.
1n914	3		
1N4001	1		
2n3904	1		
LM386	1		
CD4024	1		
TL074	1		
NSL32R1	1		
SPDT	1	On/On Solder or Pin Mount	
10kA	1	PCB Right Angle - Plastic Shaft	9mm
10kB	1	PCB Right Angle - Plastic Shaft	9mm
50kA	1	PCB Right Angle - Plastic Shaft	9mm
1MB	1	PCB Right Angle - Plastic Shaft	9mm
100kA	3	PCB Right Angle	16mm

**TL074:**

<http://smallbear-electronics.mybigcommerce.com/ic-tl074/>

**CD4024:**

<http://smallbear-electronics.mybigcommerce.com/ic-cd4024be/>

**LM386:**

<http://smallbear-electronics.mybigcommerce.com/ic-lm386-n3/>

**NSL32R1:**

<http://smallbear-electronics.mybigcommerce.com/photocoupler-silonex-nsl-32/>

**On/On:**

<http://smallbear-electronics.mybigcommerce.com/spdt-on-on-short-lever/>

**16mm PC Mount pots:**

<http://smallbear-electronics.mybigcommerce.com/alpha-single-gang-16mm-right-angle-pc-mount/>

**9mm PCB Right Angle - Plastic Shaft:**

<http://smallbear-electronics.mybigcommerce.com/alpha-single-gang-9mm-right-angle-pc-mount-w-knurled-plastic-shaft/>

**Thinline DC Jack:**

<http://smallbear-electronics.mybigcommerce.com/dc-power-jack-all-plastic-unswitched-2-1-mm/>

**Enclosed Mono:**

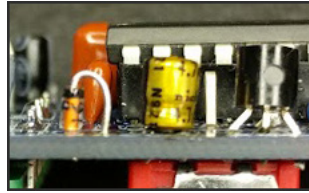
<http://smallbear-electronics.mybigcommerce.com/1-4-in-mono-enclosed-jack/>

<http://smallbear-electronics.mybigcommerce.com/1-4-in-mono-enclosed-switchcraft-111x/>

**Lumberg Mono:**

<http://smallbear-electronics.mybigcommerce.com/lumberg-1-4-compact-shrouded-mono-jack/>

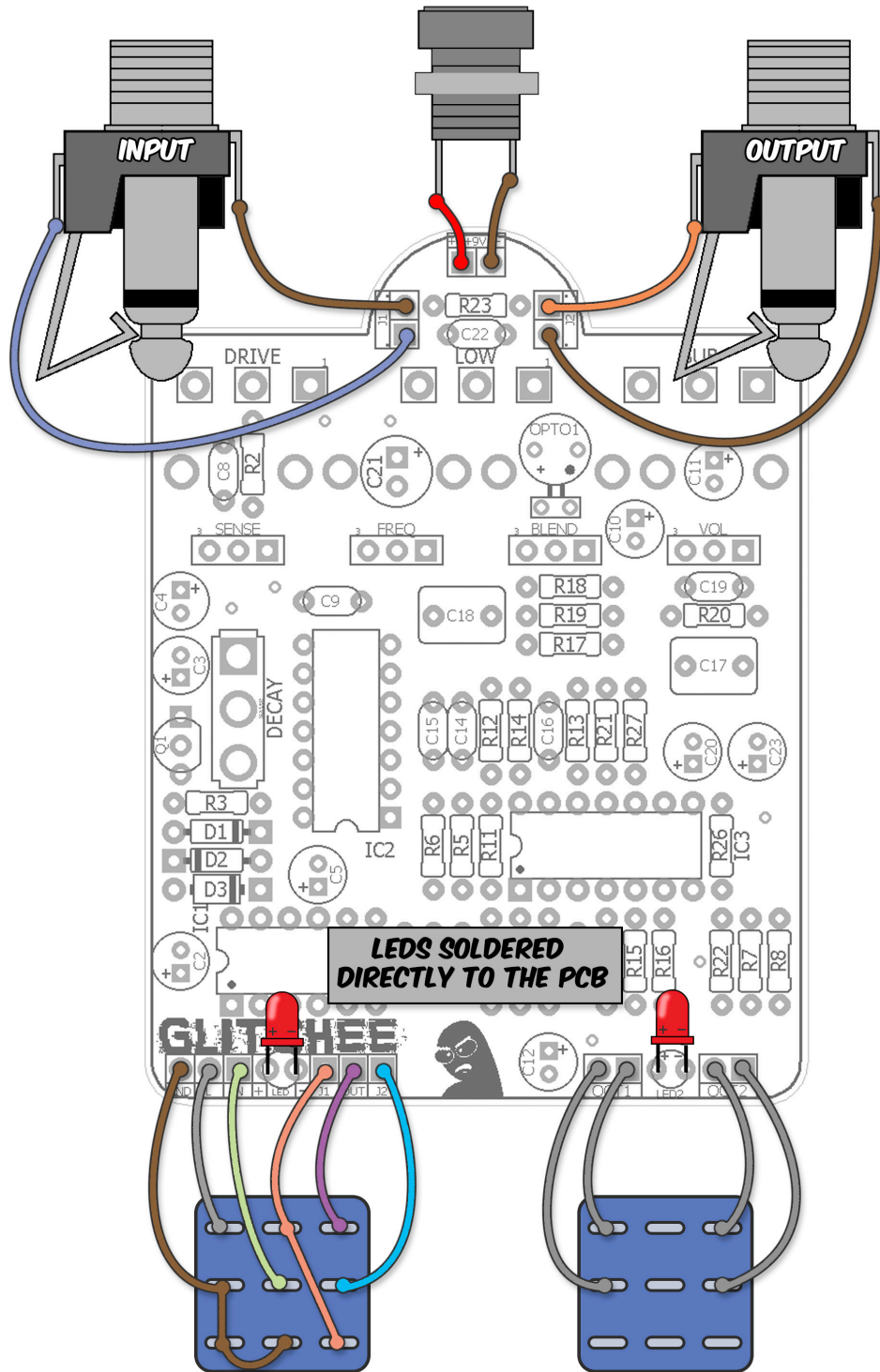
- As shown on the Values layout pic on page 3, C4 is replaced with a 1n914. The anode goes to the square pad, and cathode to the round one. Or, use this pic as a reference.



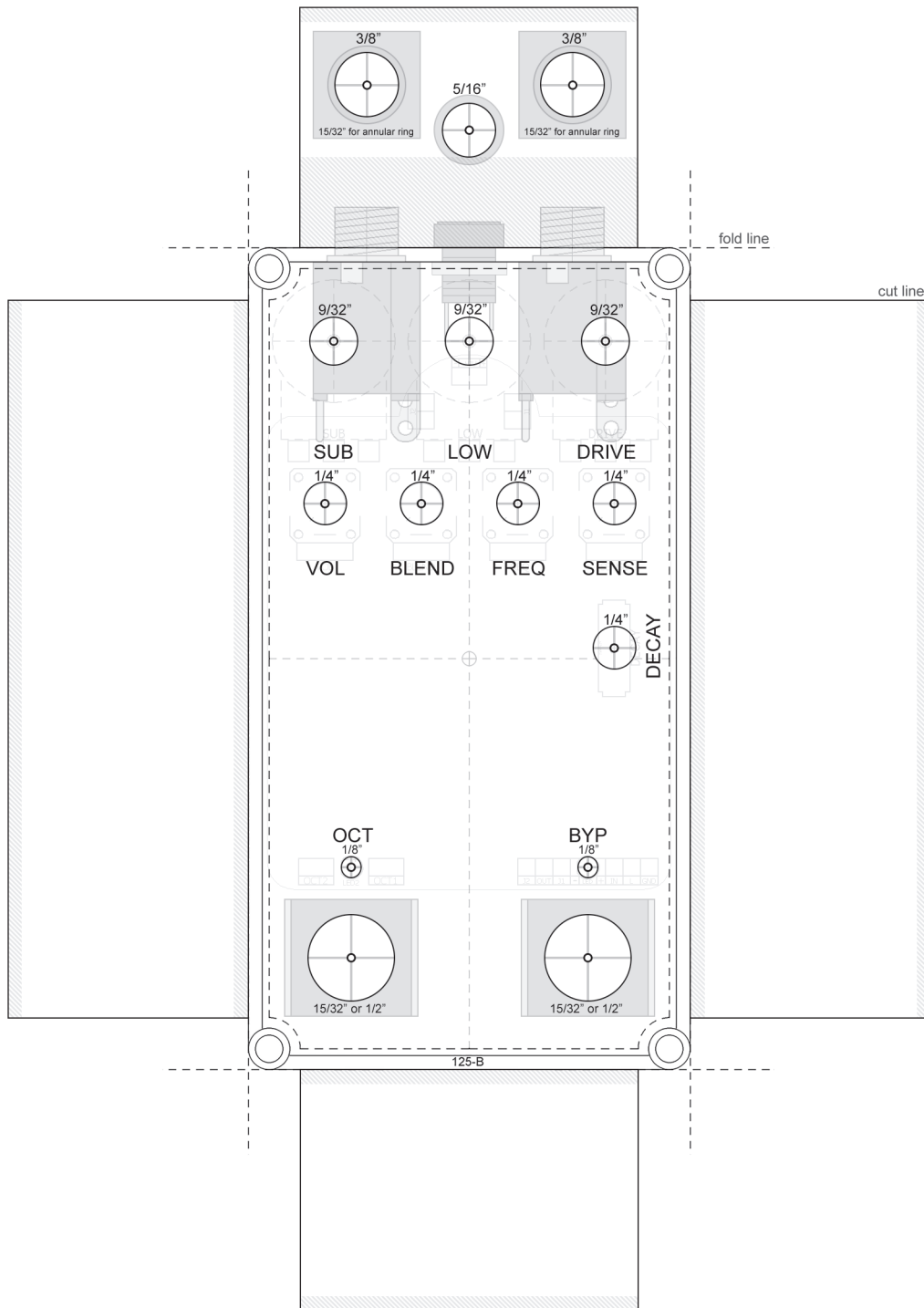
The reason for this change: throughout the development I had been testing different size electrolytic caps on the envelope follower to try and get some variation on the note decay. While it does have an effect on the LED that drives the optocoupler, in the end I just felt like it wasn't enough to warrant the toggle switch (and it was too late since the boards were done). So, in trying alternatives I found putting a small signal diode in parallel with C3 actually did make a cool variation. It seems to lop off a little more low end of the filter section when the Sense knob is in the first half of its rotation. It becomes more apparent when the low octaves are on. So, a mistake turns into a win. The madbeanpedals motto.

- I don't have much in the way of mod recommendations. You can alter the filter by changing C14 and C15 (use equal values). So, for a bass maybe socket those and try 10n. Or you could go smaller if you like really sharp pointy filters.
- A 10kC for the Sense knob is actually preferred but they seem to be hard to get right now. 10kB is fine enough.
- Be sure you install your NSL32 in the correct way! Cream dots, and so forth.





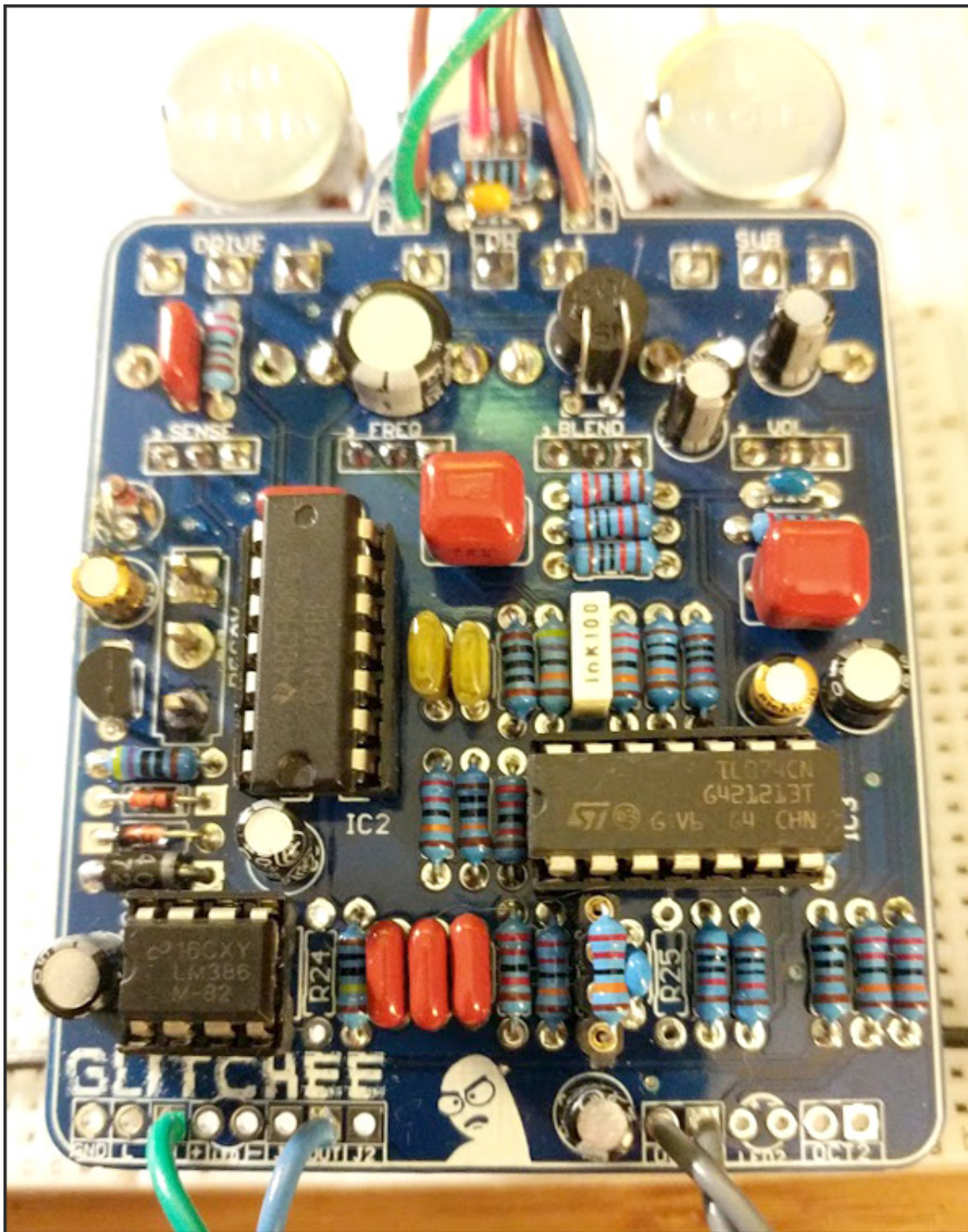
**Note:** Drill Guides are approximate and may require tweaking depending on the types of jacks, switches and pots you use.



IC1	LM386	IC2	CD4024	IC3	TL074
1	1.26	1	ignore	1	3.94
2	0	2	0	2	4.02
3	7mV	3	7.96	3	3.97
4	0	4	7.96	4	7.96
5	3.93	5	7.96	5	3.98
6	7.96	6	0	6	3.98
7	3.99	7	0	7	3.98
8	1.23	8	ignore	8	3.98
		9	0	9	3.98
Q1	2n3904	10	0	10	0
C	6.35	11	7.89	11	3.98
B	0.55	12	7.89	12	3.98
E	39mV	13	ignore	13	3.98
		14	7.96	14	3.98

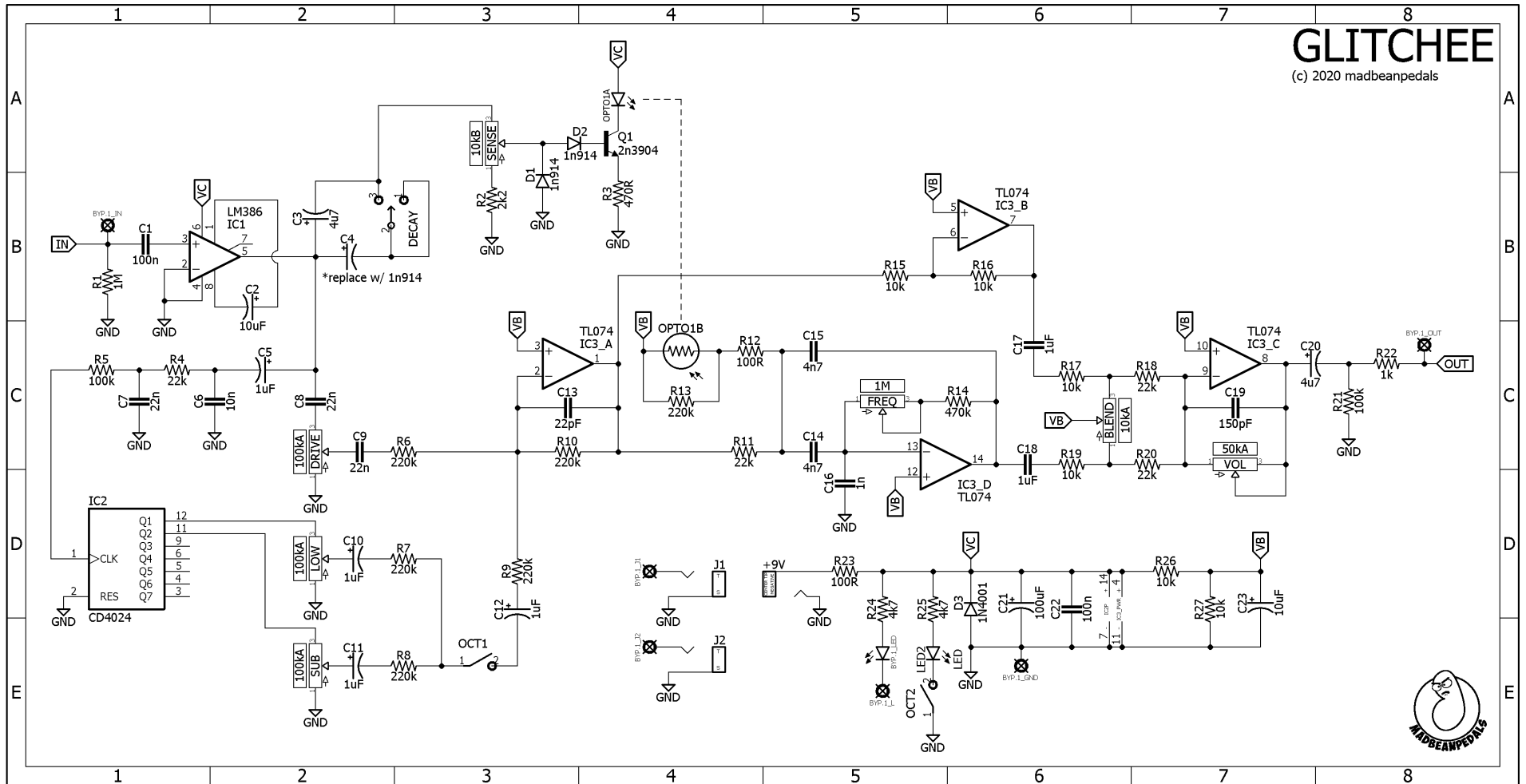
The 100R current limiting resistor on the power supply drops the supply voltage quite a bit. However, this effect does not seem to need a lot of headroom. You can always jumper it *or* use 47R in its place. I went with 100R for heavier noise filtering on the supply line, JIC.

- 9.42vDC One Spot
- Current Draw: ~ 17mA



See how expertly I removed C4 and replaced it with that diode? Perfect desoldering technique. Yep.

LOOK AWAY!



The FREQ. pot is B type (linear)