

# VFE\_SPS\_MiniMu

F X Type: **ENVELOPE FILTER**

Build Level: Intermediate

Based On: VFE® MiniMu™

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## Overview

From the [VFE Website](#):

*The MINI MU is derived from the classic Mutron III envelope filter (aka autowah), and has all the same great fat and funky filter sweeps inside a much smaller box. A few extras have been added, namely an active clean gain stage and an “in between” position on the range switch. With the included charge pump, the MINI MU runs on +/-9V like the original without needing a special power supply or two batteries.*

The SPS MiniMu includes the TrueSoft 3.4 switching PCB *with* the voltage inverter. You will need additional parts and information included in the TrueSoft doc to complete all VFE\_SPS projects.

## Controls

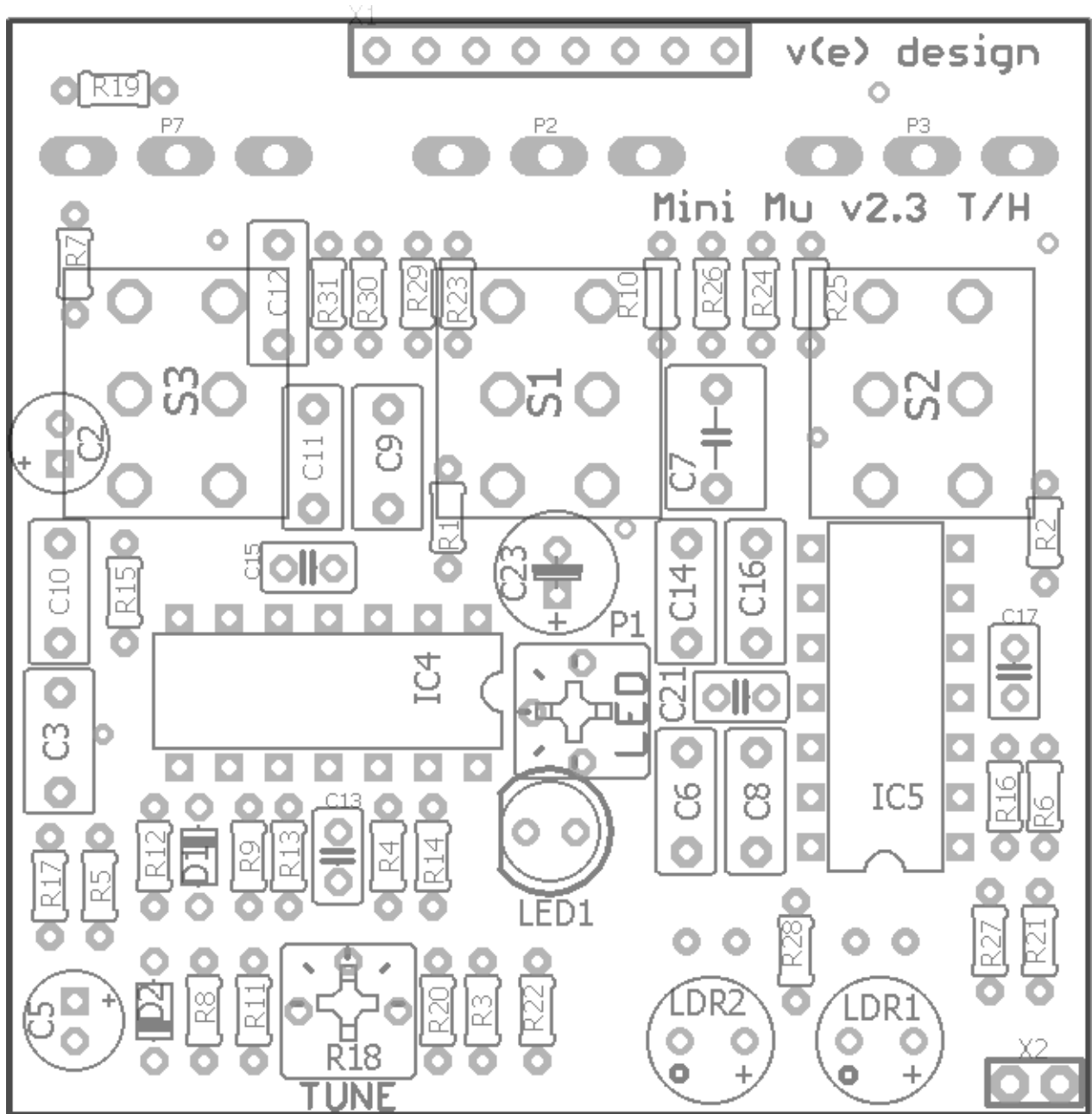
- **LEVEL:** Sets the output of the clean boost at the end of the circuit. Some settings are louder than others so expect to adjust this often.
- **PEAK:** Filter resonance amount.
- **GAIN:** This controls the pre-gain going into the circuit. It will also change the sensitivity and range of the envelope.
- **RANGE:** This switch changes the frequency range of the filter from Low, Mid to High.
- **MODE:** This switch changes the filter type from Low Pass, Band Pass and High Pass.
- **DRIVE:** This switch changes the direction of the filter sweep from Down to Up.
- **TUNE:** This trimmer sets the sensitivity of the two optical devices. Use it to tune the envelope response to taste.
- **LED:** This trimmer sets the bypass LED brightness.

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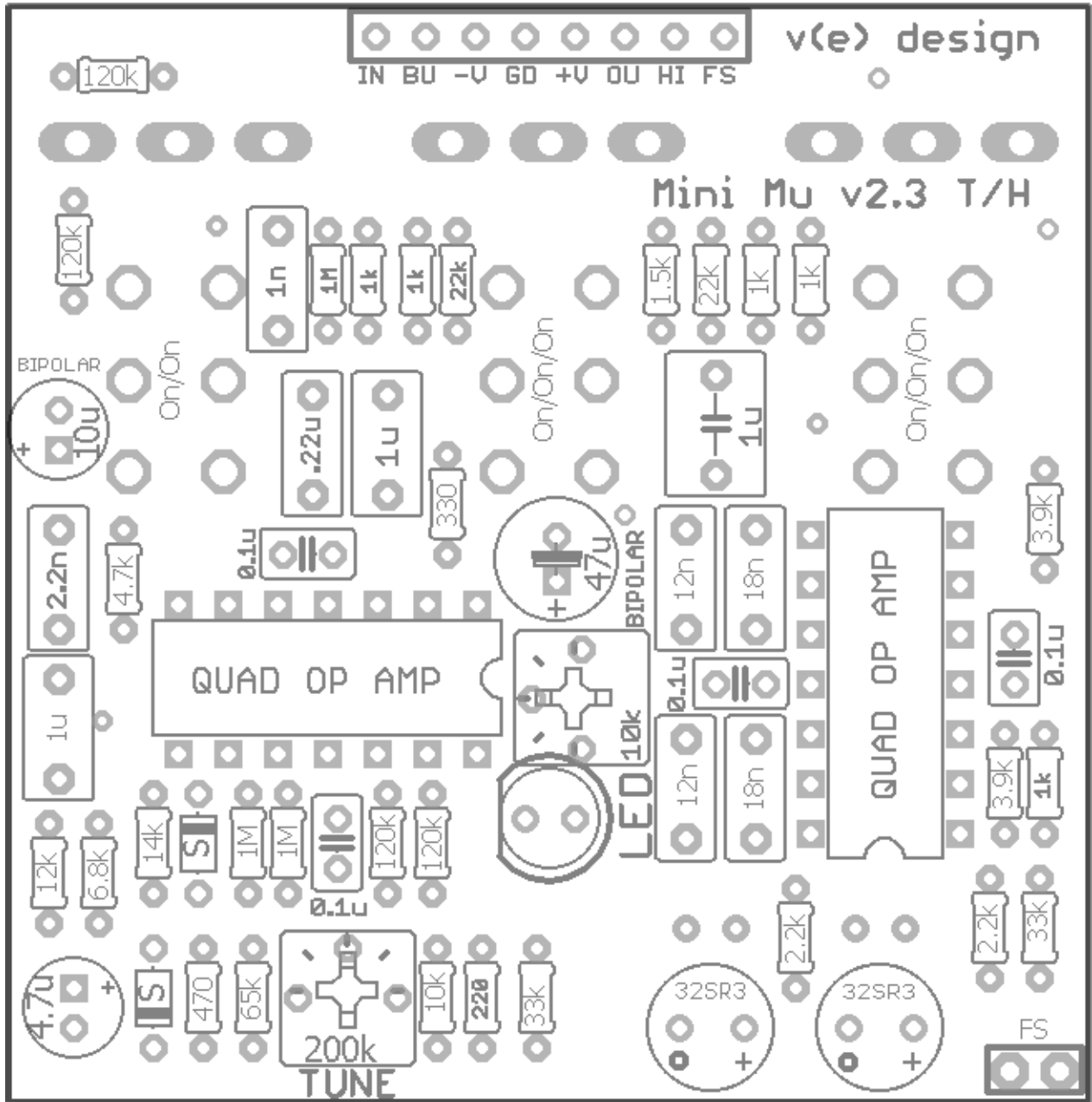
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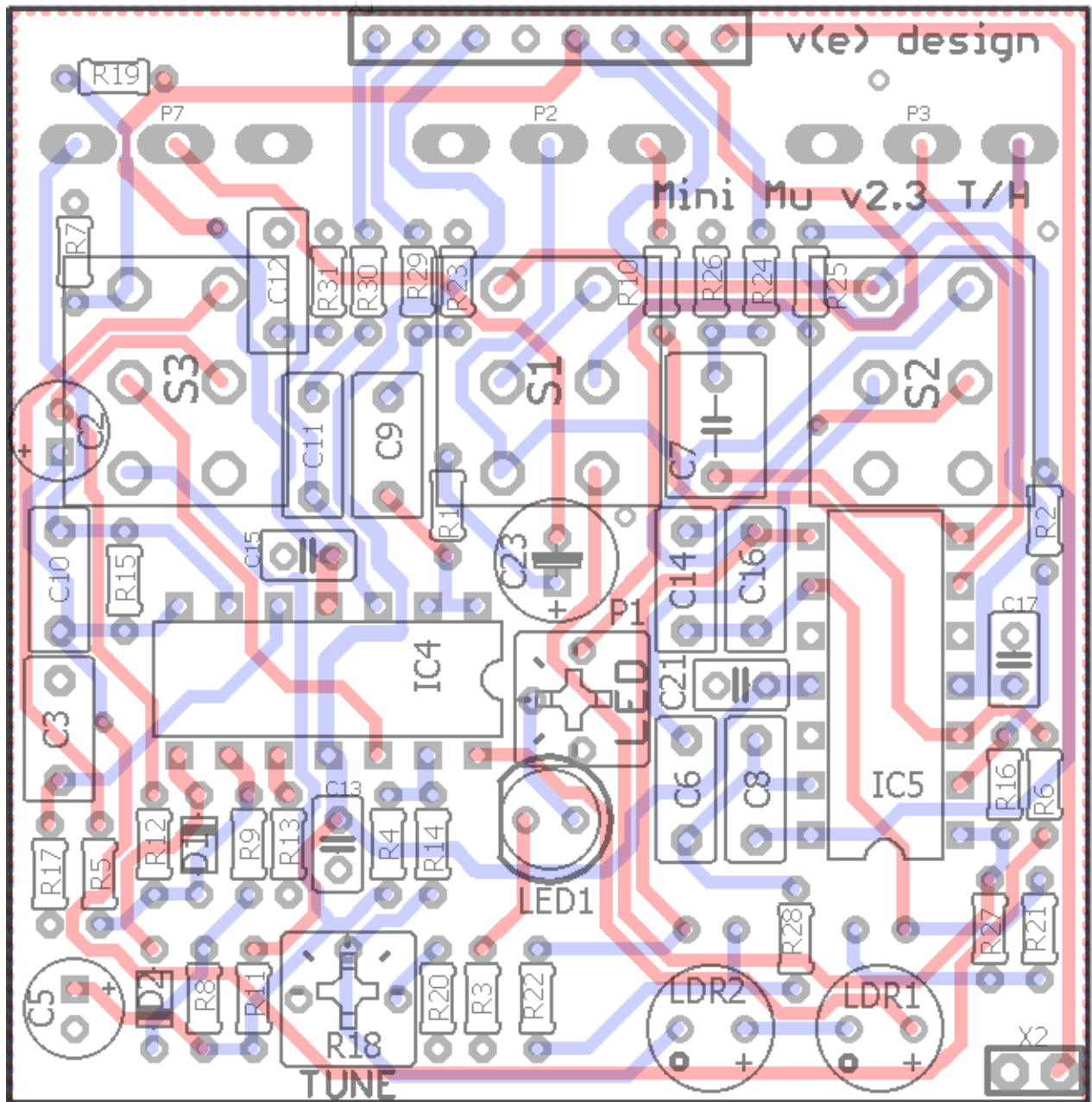
# Parts Layout



# Component Values



# Trace Layout



## B.O.M.

Resistors		Caps		Diodes	
R1	330R	C2	10u	D1	1n914
R2	3.9k	C3	1u	D2	1n914
R3	220R	C5	4.7u	LED1	5mm
R4	120k	C6	12n	Opto	
R5	6.8k	C7	1u	LDR1	NSL32SR3
R6	1k	C8	18n	LDR2	NSL32SR3
R7	120k	C9	1u	IC	
R8	470R	C10	2.2n	IC4	Quad
R9	1M	C11	.22u	IC5	Quad
R10	1.5k	C12	1n	Switches	
R11	65k	C13	0.1u	S1	On/On/On
R12	14k	C14	12n	S2	On/On/On
R13	1M	C15	0.1u	S3	On/On
R14	120k	C16	18n	Timmer	
R15	4.7k	C17	0.1u	P1	10k
R16	3.9k	C21	0.1u	Tune	200k
R17	12k	C23	47u	Pots	
R19	120k			P2	A100k
R20	10k			P3	A10k
R21	33k			P7	C20k
R22	33k				
R23	22k				
R24	1k				
R25	1k				
R26	22k				
R27	2.2k				
R28	2.2k				
R29	1k				
R30	1k				
R31	1M				

## Shopping List

Value	QTY	Type	Rating
220R	1	Metal / Carbon Film	1/8W
330R	1	Metal / Carbon Film	1/8W
470R	1	Metal / Carbon Film	1/8W
1k	5	Metal / Carbon Film	1/8W
1.5k	1	Metal / Carbon Film	1/8W
2.2k	2	Metal / Carbon Film	1/8W
3.9k	2	Metal / Carbon Film	1/8W
4.7k	1	Metal / Carbon Film	1/8W
6.8k	1	Metal / Carbon Film	1/8W
10k	1	Metal / Carbon Film	1/8W
12k	1	Metal / Carbon Film	1/8W
14k	1	Metal / Carbon Film	1/8W
22k	2	Metal / Carbon Film	1/8W
33k	2	Metal / Carbon Film	1/8W
65k	1	Metal / Carbon Film	1/8W
120k	4	Metal / Carbon Film	1/8W
1M	3	Metal / Carbon Film	1/8W
0.1u	4	MLCC - 2.5mm spacing	25v min.
1n	1	Film	25v min.
2.2n	1	Film	25v min.
12n	2	Film	25v min.
18n	2	Film	25v min.
.22u	1	Film	25v min.
1u	3	Film	25v min.
4.7u	1	Bi-Polar	25v min.
47u	1	Bi-Polar	25v min.
10u	1	Bi-Polar	25v min.
1n914	2		
LED	1	any	5mm
NSL32SR3	2		
Quad	2	see notes	
DPDT	2	On/On/On, pin mount	
DPDT	1	On/On, pin mount	
10k	1	Bourns 3362p	
200k	1	Bourns 3362p	
A100k	1	PCB Right Angle	16mm
A10k	1	PCB Right Angle	16mm
C20k	1	PCB Right Angle	16mm

## Build Notes

Stompboxparts does not have a C20k, but you can sub their C25k. Alternatively, you can sub a C50k and solder a 33k resistor across lugs 2 & 3 to approximate 20k total resistance.

C25k: <https://stompboxparts.com/pots/16mm-potentiometer-short-pcb-leg/>

### “Type 2” On/On/On DPDT

<https://lovemyswitches.com/taiway-dpdt-on-on-on-switch-pcb-mount-short-shaft/>

<https://stompboxparts.com/switches/dpdt-toggle-switch-on-on-on-pcb-pin-short-bat/>

### Non-Polar/Bi-Polar Electrolytic caps

<https://stompboxparts.com/capacitors/aluminum-electrolytic-capacitor-non-polarized-10-pack/>

### MLCC caps

0.1u 2.5mm MLCC: <https://www.mouser.com/ProductDetail/594-K104K15X7RF53L2>

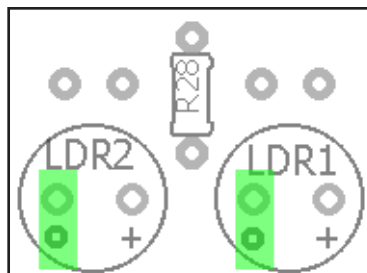
The MiniMu requires narrow width for the 1uF caps. I suggest using these WIMAs. If you can't get the WIMA's use 1uF MLCC instead.

WIMA 1uF: <https://www.mouser.com/ProductDetail/505-MKS2B041001C00JS>

### NSL32R3

<https://smallbear-electronics.mybigcommerce.com/photocoupler-silonex-nsl-32sr3/>

- The TUNE trimmer is used to tweak the overall envelope response and can make a difference in how the filter sweep operates. Start in the middle position and tweak to taste. What you are looking for in consistency across the many different switch and pot settings so they are balanced with one another. There is no “ideal” setting. Just use your own ears to select the right setting for you.
- The surface mount version of the MiniMu uses a OPA4134 IC, which is only available as an SMD package. You can sub in a TL074 or any other quad amplifier that can handle 18v or more.
- Be sure to note the orientation of the two NSL32R3 optos. The dot goes to the left!



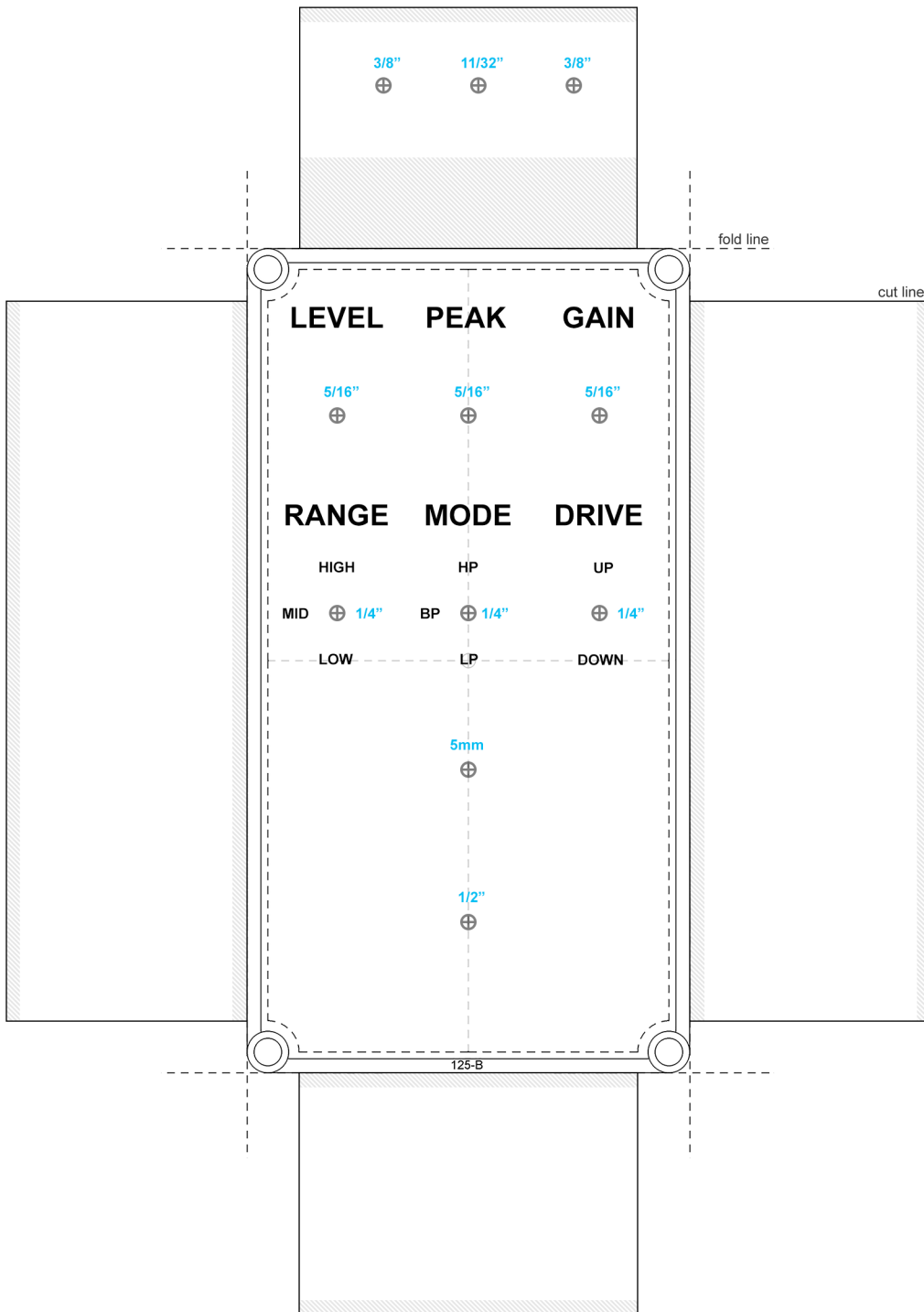
## Circuit Voltages

IC4	TL074	IC5	TL074
1	0.00	1	0.00
2	0.00	2	0.00
3	0.00	3	0.00
4	9.21	4	9.21
5	0.00	5	0.00
6	0.00	6	0.00
7	0.00	7	0.00
8	382mV	8	0.00
9	0.00	9	0.00
10	0.00	10	0.00
11	-9.12	11	-9.12
12	4.57	12	0
13	2.7	13	0
14	8.54	14	0

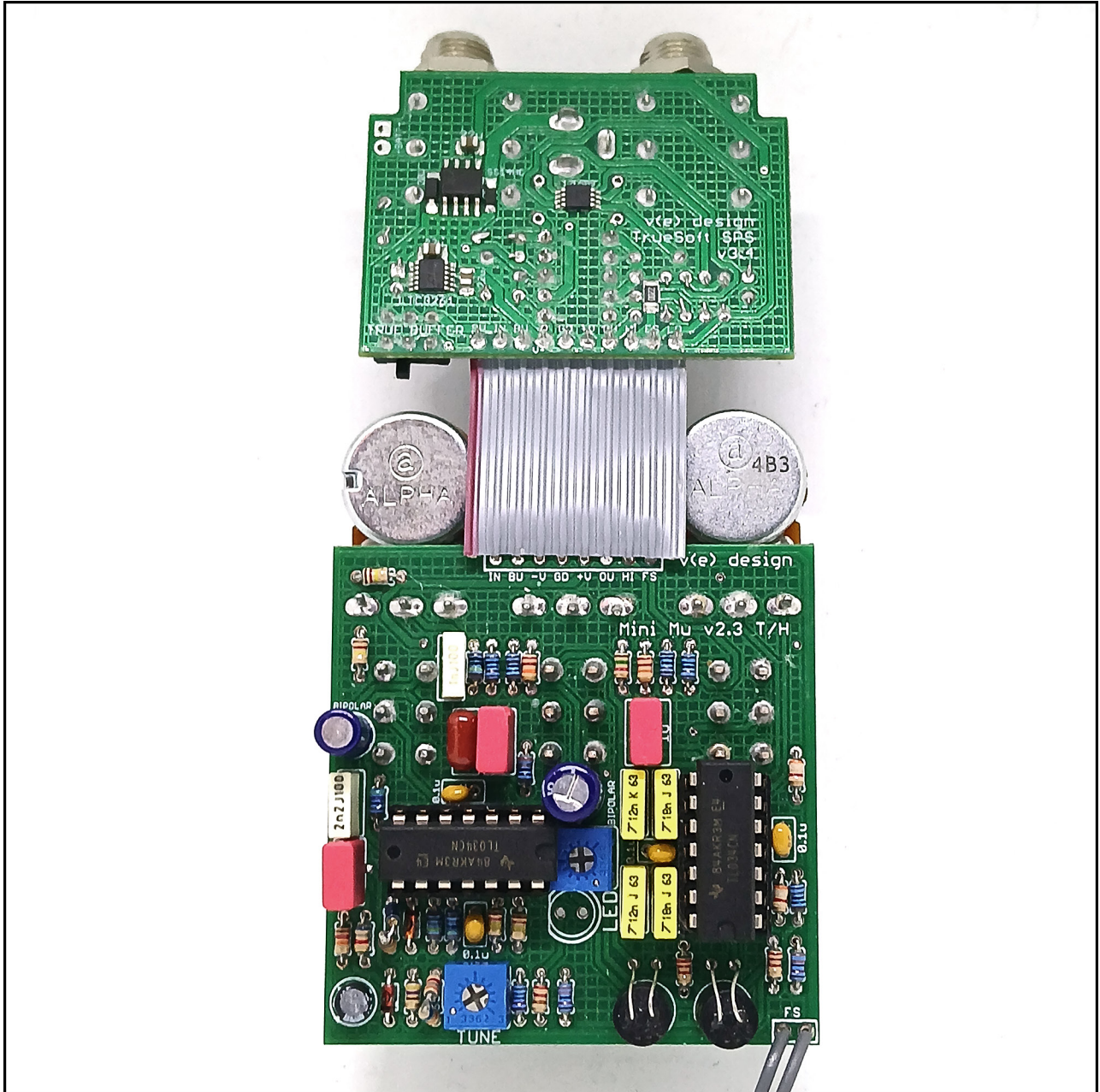
9.44vDC One Spot supply  
Current Draw: ~39mA  
Knobs @ 50%, switches down  
Split-rail design



# 125B Drill Template



# Build Pic



# Schematic

