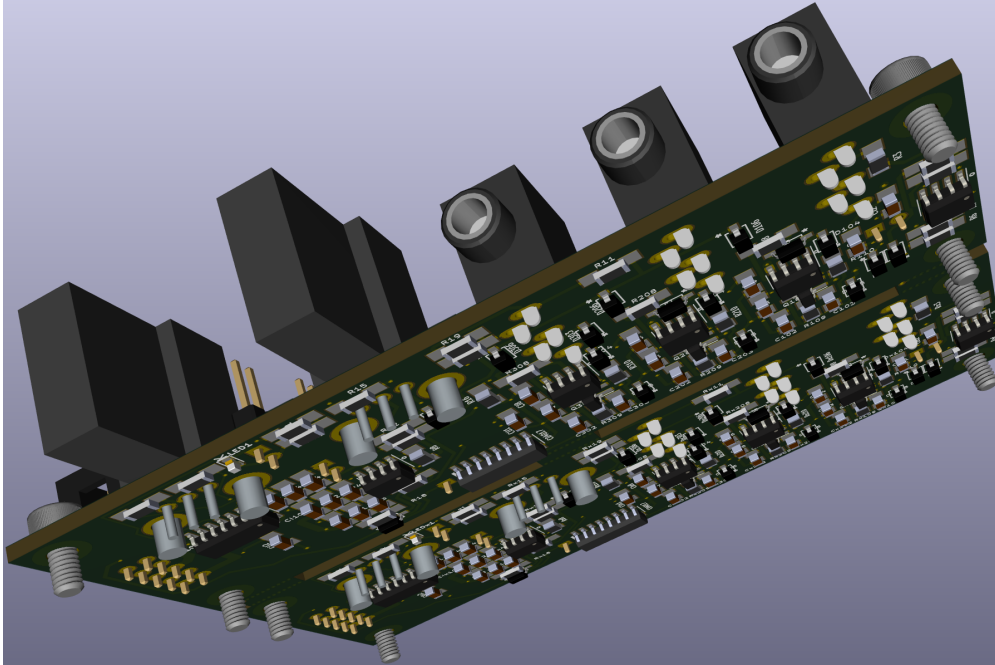


# Envelope Follower

based on Harry Bissel  
a SMD Variant, ready for Pick and Place  
open-hardware, all Kicad-Files, and Gerbers are included!



-shown 2 identical boards on one pcb - to save money..

## Features

- \* audio in \* Envelope out \* Gate out + Gate Threshold-Poti
- \* Full-wave rectifier
- \* 3 identical Peakdetectors which are Reseted from a "stepper"
- \* a Oscillator with tunable Frequency to drive the stepper
- \* Smoothingcap set via Jumper
- \* Debugging Jumpers
- \* PTC and Diode Polarity Protection on the Supply-side

## Hardware Requirements

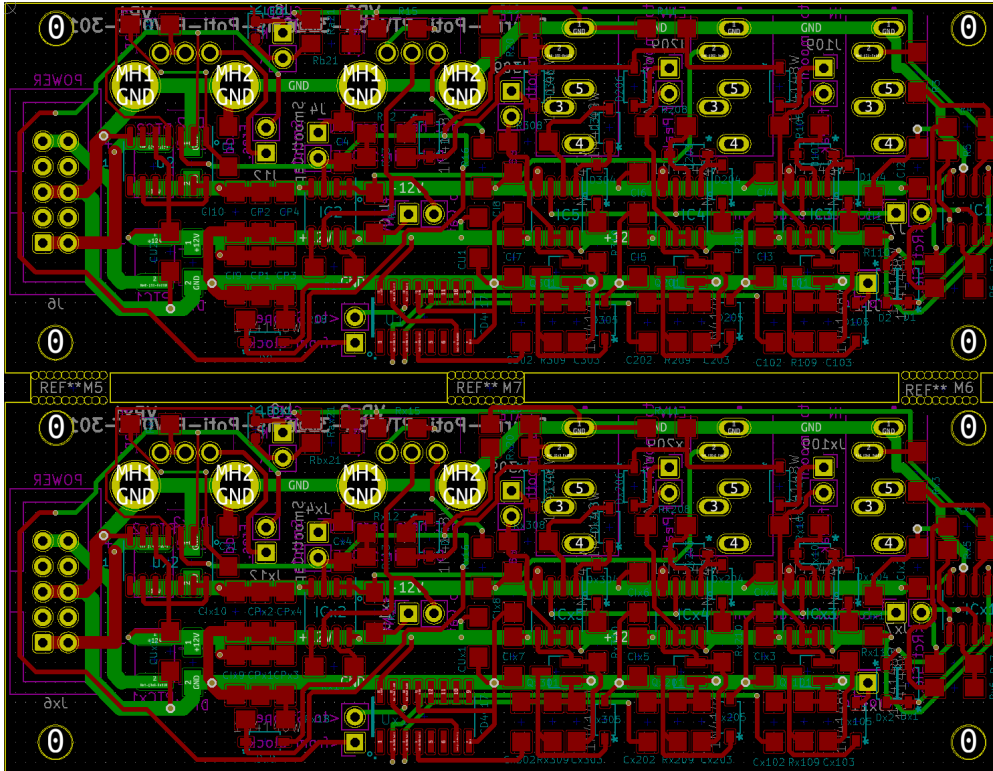
- This Device i build as input module for my [CV1](#) Project, but can be used for other things too
- Soldering Iron - with a Dip that can Handle SMD-Parts, Wires, solder Paste...
- Eurorack Power Source +-12V!

# Building

The Design is optimized for Pick and Place most SMD Parts are on the Top-PCB

i ordered 5 PCBs from JLCPCB with almost all SMD Parts presoldered(except 2 SOIC chips PTC and Protection Diode)

now waiting for Presoldered PCBs



## Frontpanel



- Eurorack Alu-Plate

## BOM LCSC

these are the parts which are presoldered by the Pick and Place Machine, these are “Basic” Parts the values with a “x” in it, like Dx1 — are because there are 2 Identical Parts on 1 PCB, because there 2PCBs on 1PCB.... so Dx1 is the same like D1, but its position is on the second board.

Value	Designator	Footprint	LCSC Part Number	Library-Type
100nF	C1,CU1,C11,C1x1,CU1x1,Cx1,CU2,C2,C2x2,CU2x2,CP3,C3,C3x3,CPx3,CP4,C4,C4x4,CPx4,C4,Cx4,C5,C5x5,C6,C6x6,C7,C7x7,C8,C8x8,C9,C9x9,C10,C10x10	1206	C24497	
1nF	C102,Cx102,C103,Cx103,C202,Cx202,C203,Cx203,C302,Cx302,C303,Cx303	1206	C35216	
47uF	CP1,CPx1,CP2,CPx2	1206	C96123	
1N4148W	D1,Dx1,D2,Dx2,D7,Dx7,D8,Dx8,D103,Dx103,D104,Dx104,D105,Dx105,D106,Dx106,D203,Dx203,D204,Dx204,D205,Dx205,D206,Dx206,D303,Dx303,D304,Dx304,D305,Dx305,D306,Dx306	SOD123	C81598	
TL072	IC1,ICx1,IC2,ICx2,IC3,ICx3,IC4,ICx4,IC5,ICx5	SOIC-8	C6961	
2N3904	Q101,Qx101,Q201,Qx201,Q301,Qx301	SOT-23	C20526	
100K	R12,Rx12,R13,Rx13,R17,Rx17,R18,Rx18,R108,Rx108,R110,Rx110,R208,Rx208,R210,Rx210,R308,Rx308,R310,Rx310	1206	C17900	
1K	R1,Rx1,R8,Rx8,R11,Rx11,R20,Rx20,Ra21,Rax21	1206	C4410	
2K	R19,Rx19	1206	C17944	
10K	R3,Rx3,R4,Rx4,R5,Rx5,R6,Rx6,R7,Rx7,R15,Rx15,R16,Rx16,R109,Rx109,R209,Rx209,R309,Rx309	1206	C17902	
220	Rb21,Rbx21	1206	C17958	

when making 10Boards...a total of **42,44€** presoldered on the PCBsincl Shipping and Import-Taxes

## BOM Mouser

These are the parts which has to be handsoldered

[copy list below, and paste in this link, you will need to order the project 2 times since 2PCBs are on 1PCB](#)

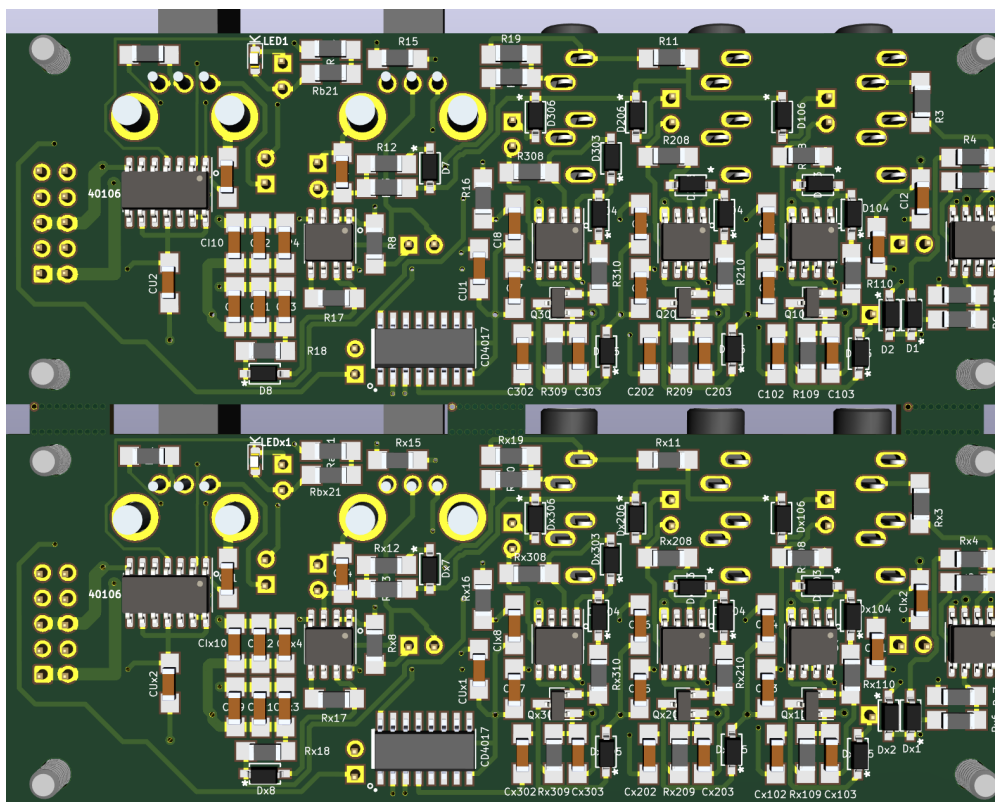
- 583-FM4002|2
- 490-SJ1-3535NG-GR|3
- 523-G821EU210AAL10Y|1
- 650-MINISMDC014F-2|2
- 771-HEF40106BTD-T|1
- 595-CD4017BM|1
- 652-PTV09A-3015FB103|1
- 652-PTV09A3020FB104|1

for prototyping i ordered:

**490-SJ1-3535NG-GR** instead of **490-SJ1-3535NG** because it is out of stock - so **GREEN sockets** for now!

when making 10PCBs this make a total of **69,83€** incl Shipping/VAT which is free above 50€!

There are 2 SOICs that have to get Handsoldered, i have done this before and its easy!



the actual Picture is this

## Overall Material Costs

PCB:**42,44€** + MouserParts: **69,83** = 111,46€ / 10 PCBs = **11,14€** a PCB

(where half off work is done by pick and place machine!)

## Kicad Files & Production Files

V1. from 05.01.2021 [env-follower.zip](#)

Schematic, Board, Gerber, Pick and Place and Booms, ready for Pick and Place!  
—at the moment untestet, since i order the project just now!  
as Example what you see if you got thru the ordering process:

2021-01-06 | W202101



SMT Assembly

Order #: ██████████ 23438-2436262A

Build Time: 1 day

5 pcs \$28.36

[Product Details](#)

bom-LCSC.xls

cpl.xls

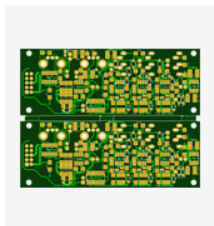
[Reviewing](#)

File review will be completed in 10-60 mins when business hours.

Merchandise Total: \$30.87

Shipping Charge: \$18.71

Order Total: \$49.58



PCB Prototype

Order #: ██████████ 62A

Build Time: 2-3 days

5 pcs \$2.51

[Product Details](#)

follow\_Y6

[Reviewing](#)

File review will be completed in 10-60 mins when business hours.



JiaLiChuang (HongKong)Co., Limited

Unit 21, 28/F, Metropole Square  
No.2 On Yu Street, Shatin  
New Territories  
HONG KONG  
support@jlcpcb.com  
+86 755 23919769  
JLCPCB.COM

Invoice No:	XXXXXXXXXXXXXXXXXXXX
Invoice Date:	06/01/2021
Batch No.:	W2021010XXXXXXXXXX

**Ship To:**

michael sigl  
XXXXXXXXXX  
XXXXXXXXXXXXXXXXXXXX  
AUSTRIA  
Email: higgemath@gmail.com  
Tel: ++43706076076  
VAT No:

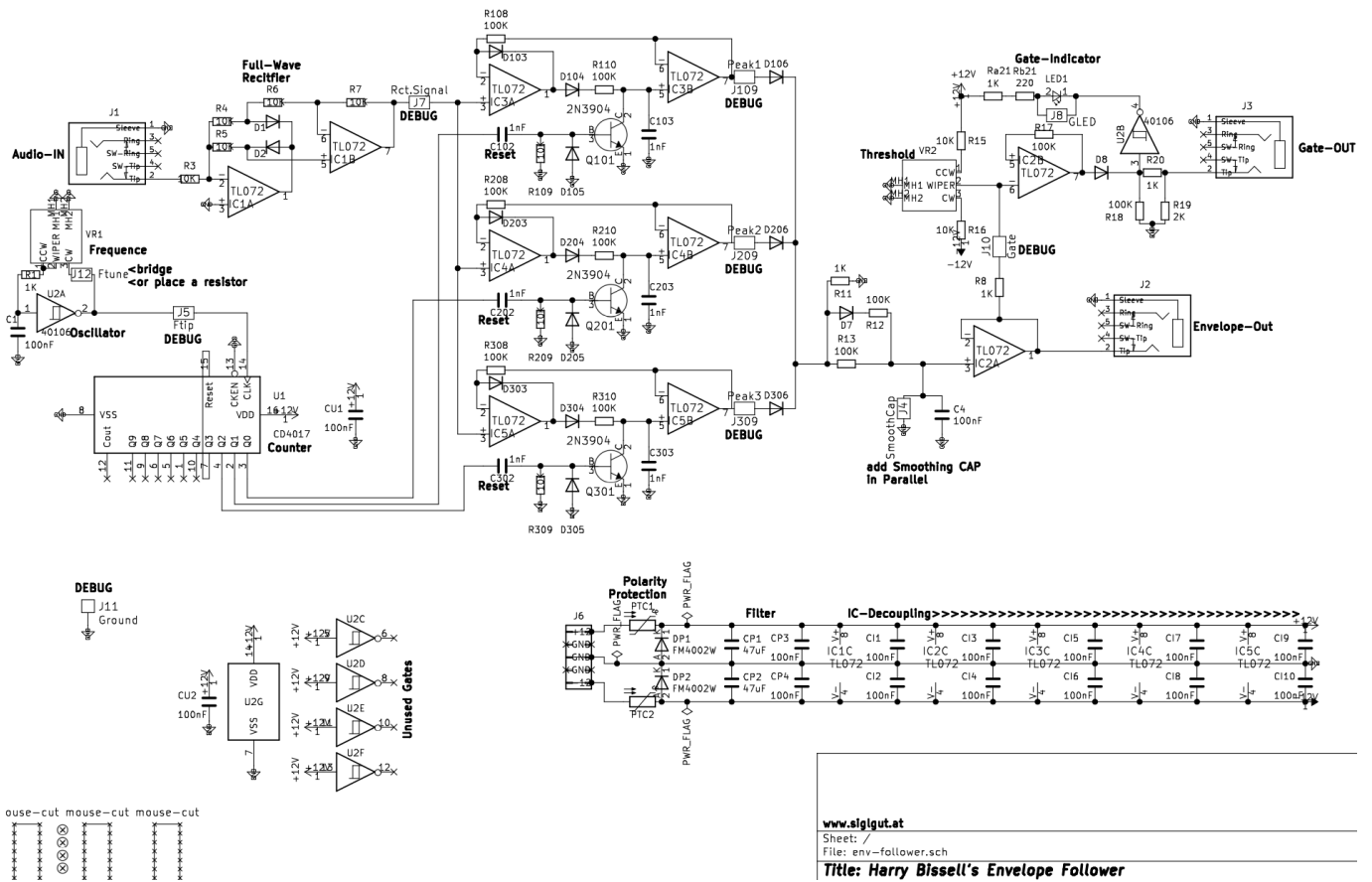
**Billing To:**

michael sigl  
XXXXXXXXXX  
XXXXXXXXXXXXXXXXXXXX  
AUSTRIA  
Email: higgemath@gmail.com  
Tel: ++43706076076  
VAT No:

Description	HS Code	Order Number	QTY	Unit Price	Total
PCB Assembly	73145XXXX	XXXXXXXXXXXX438	5	\$5.6720	\$28.36
PCB Samples	85340XXXX	Y6	5	\$0.5020	\$2.51

**Subtotal:** \$30.87  
**Shipping:** \$18.71  
**Grand Total:** \$49.58

# Schematic



## To Do

frontplate

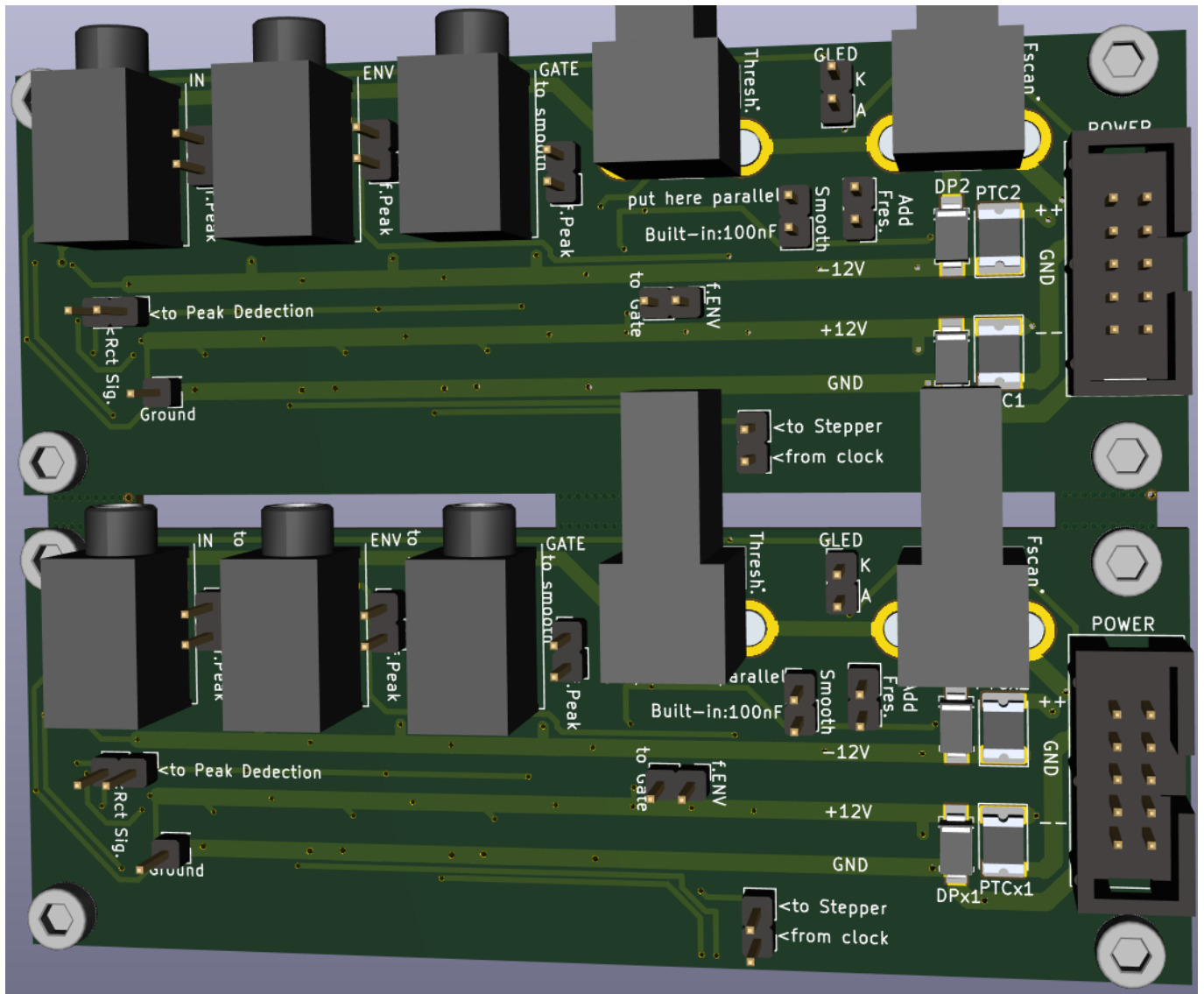
Debugging First Version

**experiment with the Smoothing CAP:** a Header is connected parallel to a integrated 100nF Cap, connect there a CAP to encrease the smoothing

**experiment with the Frequency Pot:** a lin10K + 1K internal Serial Resistor which gives a range of 1K-12K - i also made a Header here, which you can bridge then you have 1-12K, or you put a resistor there for example a 5K, then you will get a range from 6-16K...

I addet some Jumpers to break the circuit dfor debugging or measurement

Modding **Headers/Jumpers:**



## Resources

[muffwiggler-topic](#)

[modified-schematic](#)

[THT-PCB](#)

[THT-PCB-Schematic-BUT Attention it is not correct!](#)

[THT-PCB-BOM](#)

[Haralds-Hi-Clock-Measurements](#)

I give this links because it is the source: but i cant recommend that forum! (deletes of posts, shitstorm, non constructive posts...)

## Community users working on it

- **Phatline** = Programming, Documentation...

Just let a Private message on the forum to user already involved.

I have ProtoBoards here - i test one, and if it works, i can share them for Beta Testing-if you pay the

postage

From:

<http://www.midibox.org/dokuwiki/> - **MIDIbox**

Permanent link:

<http://www.midibox.org/dokuwiki/doku.php?id=envelope-follower-bissel-based>

Last update: **2021/01/22 02:06**

