Filter

I/O

VCF

LP — ▷LP_IN   AUDIO_OUT▷ — OUT
HP — ▷HP_IN
CUTOFF — ▷CUTOFF
RESO_VALUE — ▷RESO_VALUE   RESO_MAX▷ — RESO_MAX

File: sheets/vcf.kicad_sch

Default patch connector

HP_IN ✕ — 1
LP_IN ✕ — 2
CUTOFF_1 ✕ — 3   J1
CUTOFF_2 ✕ — 4   Conn_01x06
OUT ✕ — 5
N/C ✕ — 6

J2
Conn_02x04_Counter_Clockwise

LP — 1   2 — HP
CUTOFF — 3   4
    5   6
    7   8 — OUT

GND   GND

J3
Conn_02x02_Counter_Clockwise

2   1 — RESO_MAX
4   3 — RESO_VALUE
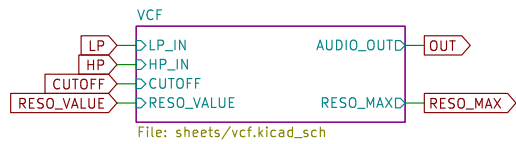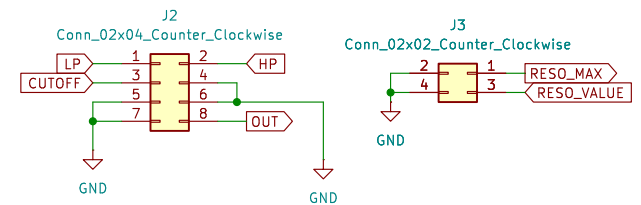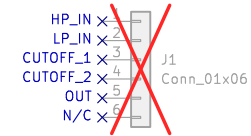
GND

Shielding pairs
DO NOT GROUND ON UI BOARD!

Power

Power

File: sheets/power.kicad_sch

H1   MountingHole   H2   MountingHole   H3   MountingHole   H4   MountingHole

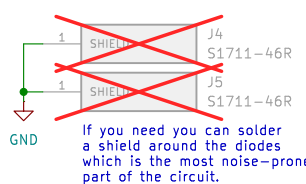Shmøergh
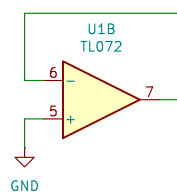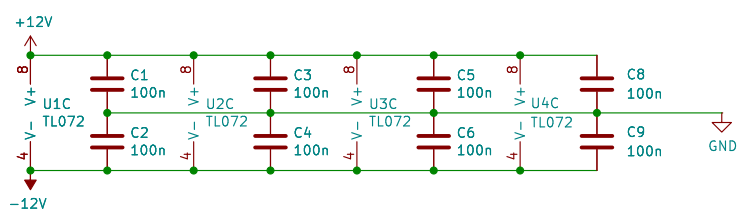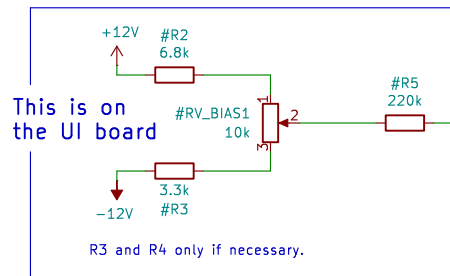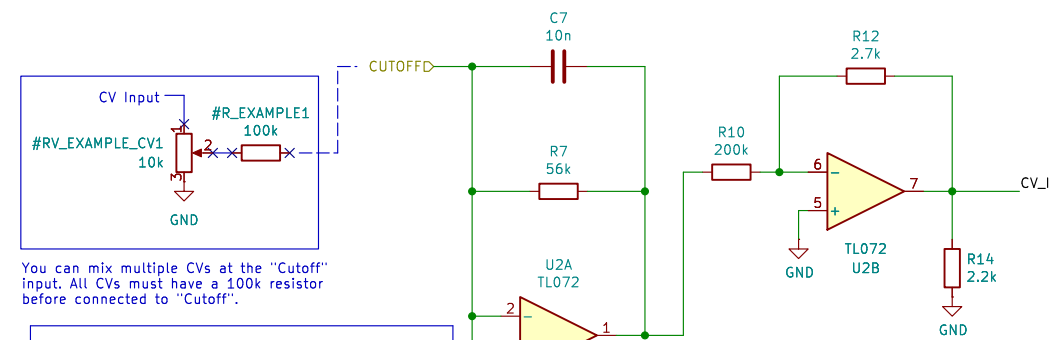Sheet: /
File: vcf-core.kicad_sch
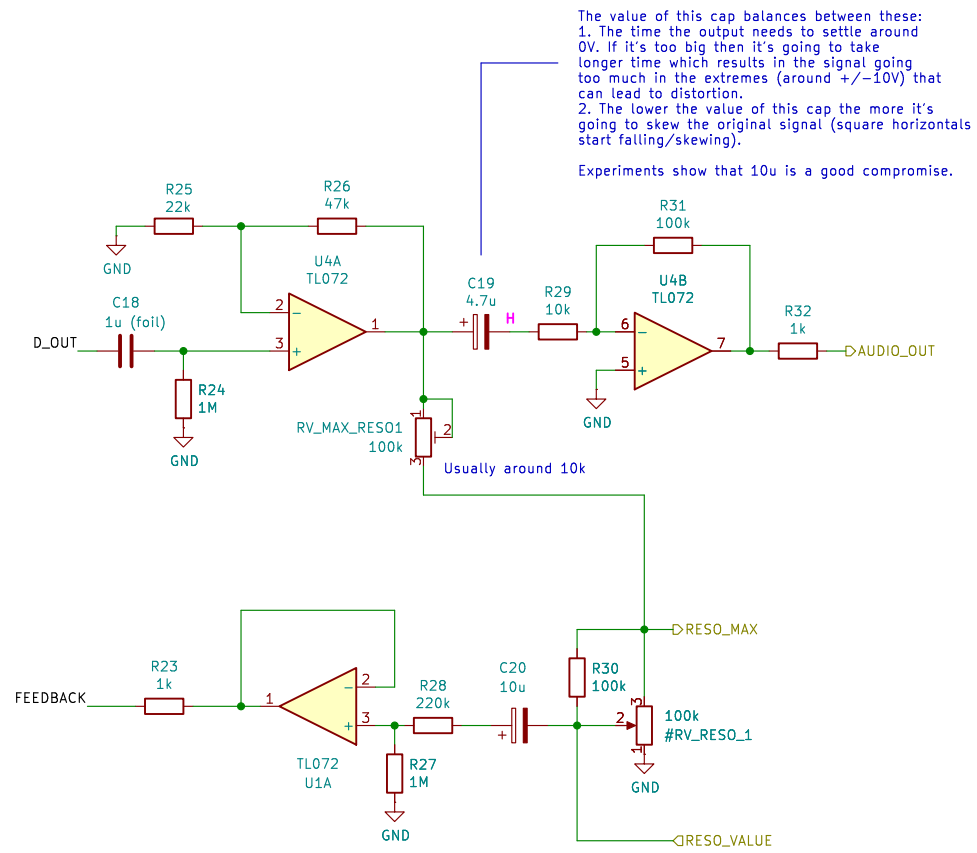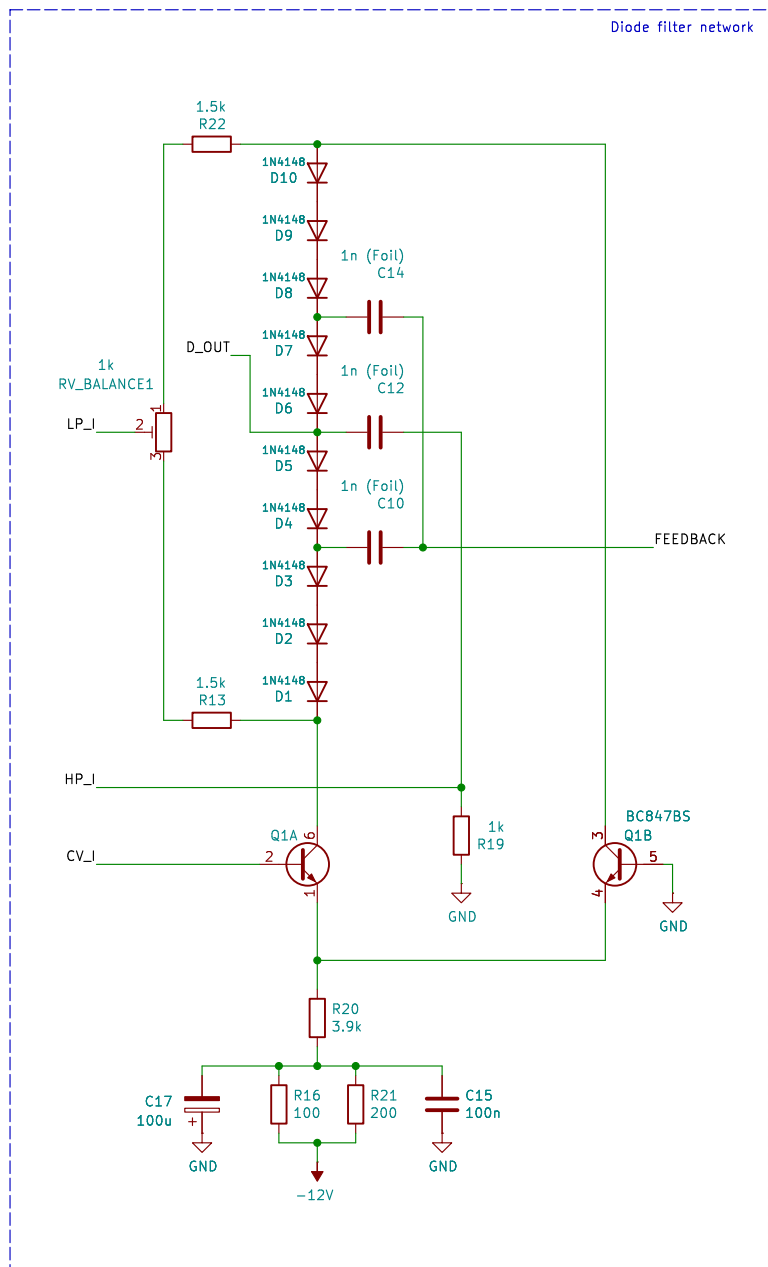Title: Moduleur VCF
Size: A4   Date: 2026-02-21   Rev: v1.0
KiCad E.D.A. 9.0.6   Id: 1/3

Diode filter network
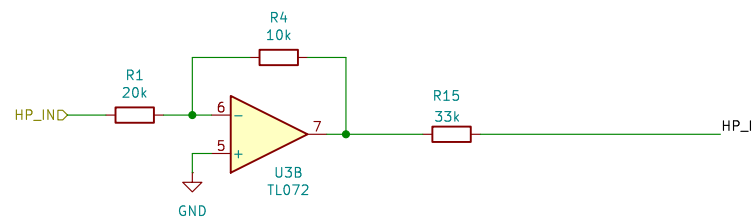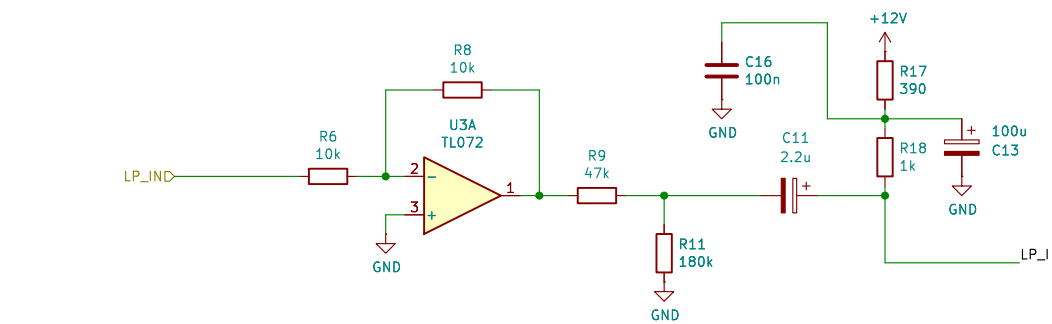
The value of this cap balances between these:
1. The time the output needs to settle around
0V. If it's too big then it's going to take
longer time which results in the signal going
too much in the extremes (around +/-10V) that
can lead to distortion.
2. The lower the value of this cap the more it's
going to skew the original signal (square horizontals
start falling/skewing).

Experiments show that 10u is a good compromise.

R8 10k
U3A TL072
R6 10k
LP_IND
GND
R9 47k
C16 100n
+12V
R17 390
R18 1k
C13 100u
GND
C11 2.2u
GND
R11 180k
GND
LP_I

R4 10k
U3B TL072
R1 20k
HP_IND
GND
R15 33k
HP_I

CV Input
#R_EXAMPLE1 100k
#RV_EXAMPLE_CV1 10k
GND
CUTOFF
C7 10n
R7 56k
R12 2.7k
R10 200k
U2B TL072
R14 2.2k
GND
CV_I
U2A TL072
GND

You can mix multiple CVs at the "Cutoff"
input. All CVs must have a 100k resistor
before connected to "Cutoff".

+12V
#R2 6.8k
This is on
the UI board
#RV_BIAS1 10k
#R5 220k
3.3k
#R3
-12V
R3 and R4 only if necessary.

1.5k R22
1N4148 D10
1N4148 D9
1N4148 D8
1n (Foil) C14
D_OUT
1N4148 D7
1n (Foil) C12
1N4148 D6
1k RV_BALANCE1
LP_I
1N4148 D5
1n (Foil) C10
1N4148 D4
1N4148 D3
FEEDBACK
1N4148 D2
1.5k R13
1N4148 D1
HP_I
CV_I
Q1A
1k R19
GND
BC847BS Q1B
GND
R20 3.9k
C17 100u
R16 100
R21 200
C15 100n
GND
GND
-12V

R25 22k
R26 47k
GND
U4A TL072
C18 1u (foil)
D_OUT
R24 1M
GND
C19 4.7u H
RV_MAX_RESO1 100k
Usually around 10k
R29 10k
R31 100k
U4B TL072
R32 1k
GND
AUDIO_OUT

R23 1k
FEEDBACK
TL072 U1A
GND
R28 220k
R27 1M
GND
C20 10u
R30 100k
100k #RV_RESO_1
GND
RESO_MAX
RESO_VALUE

+12V
C1 100n
U1C TL072
C2 100n
C3 100n
U2C TL072
C4 100n
C5 100n
U3C TL072
C6 100n
C8 100n
U4C TL072
C9 100n
GND
-12V

U1B TL072
GND

J4 S1711-46R
J5 S1711-46R
GND

If you need you can solder
a shield around the diodes
which is the most noise-prone
part of the circuit.

H = Hand soldered

UI power connection

Eurorack PSU connection

+12V

+12V

D11
1N5817

+12V

J6
Conn_02x03_Odd_Even

1 2
3 4
5 6

C21
100u

GND −12V

GND

J8
Conn_02x05_Odd_Even

10 9
8 7
6 5
4 3
2 1

GND

D12
1N5817

−12V

C22
100u

GND −12V

J7
Conn_01x02

1
2

GND

GND