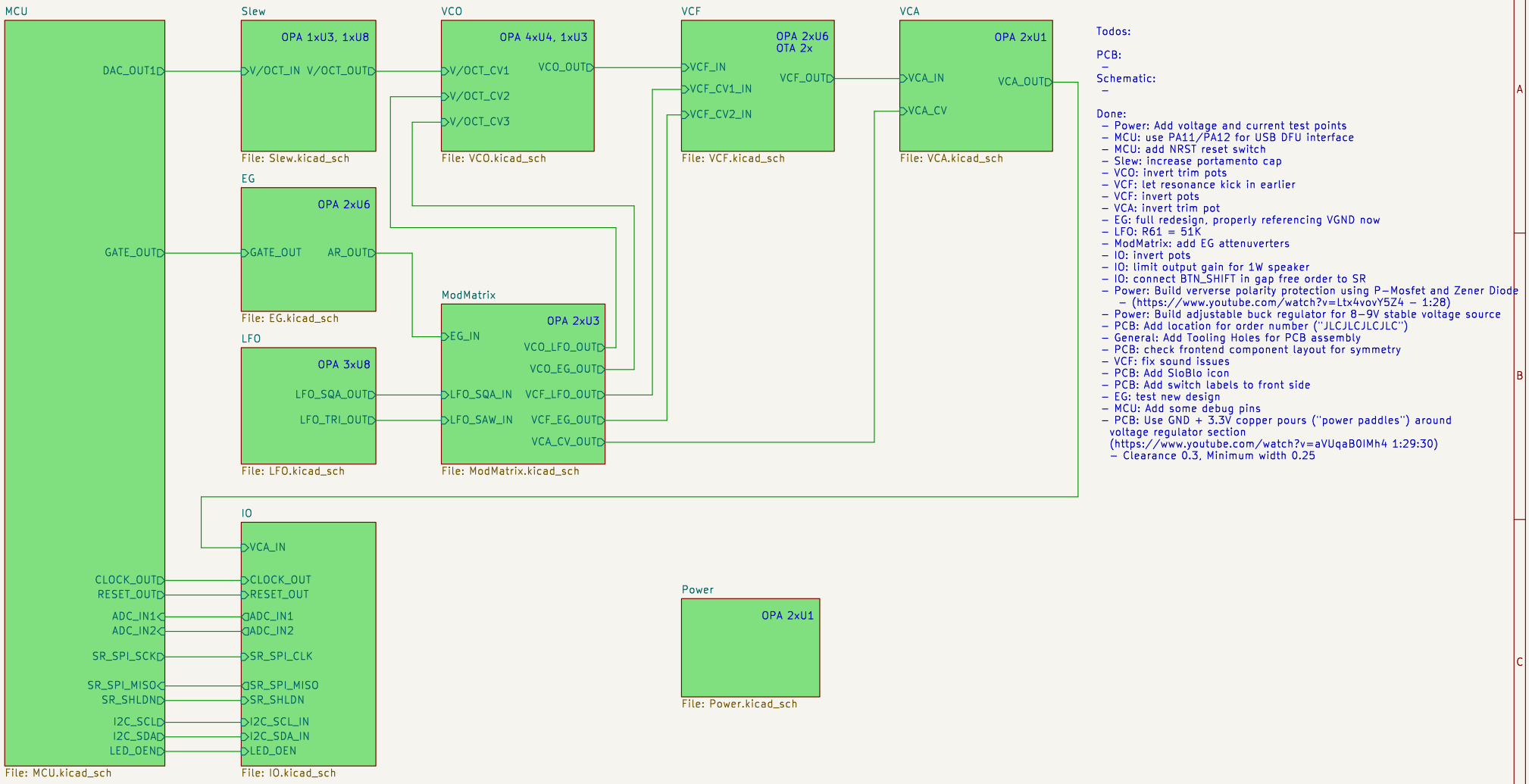


Todos:

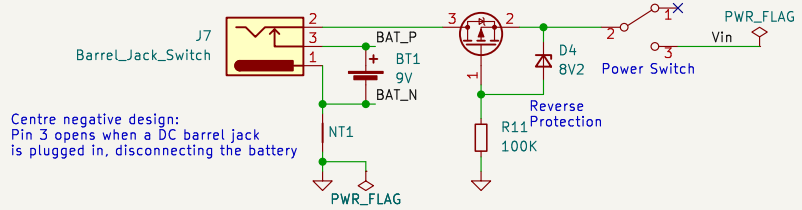
PCB:
- –

Schematic:
- –

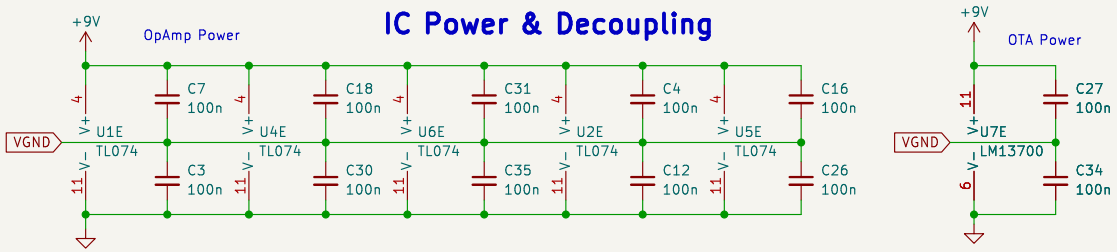
Done:
- – Power: Add voltage and current test points
- – MCU: use PA11/PA12 for USB DFU interface
- – MCU: add NRST reset switch
- – Slew: increase portamento cap
- – VCO: invert trim pots
- – VCF: let resonance kick in earlier
- – VCF: invert pots
- – VCA: invert trim pot
- – EG: full redesign, properly referencing VGND now
- – LFO: R61 = 51K
- – ModMatrix: add EG attenuverters
- – IO: invert pots
- – IO: limit output gain for 1W speaker
- – IO: connect BTN_SHIFT in gap free order to SR
- – Power: Build ververse polarity protection using P–Mosfet and Zener Diode
  - – (https://www.youtube.com/watch?v=Ltx4vovY5Z4 – 1:28)
- – Power: Build adjustable buck regulator for 8–9V stable voltage source
- – PCB: Add location for order number ("JLCJLCJLCJLC")
- – General: Add Tooling Holes for PCB assembly
- – PCB: check frontend component layout for symmetry
- – VCF: fix sound issues
- – PCB: Add SloBlo icon
- – PCB: Add switch labels to front side
- – EG: test new design
- – MCU: Add some debug pins
- – PCB: Use GND + 3.3V copper pours ("power paddles") around voltage regulator section (https://www.youtube.com/watch?v=aVUqaBOIMh4 1:29:30)
  - – Clearance 0.3, Minimum width 0.25

SloBlo Labs		
Sheet: /		
File: LivSynth_Hardware.kicad_sch		
Title: LivSynth		
Size: A4	Date: 2022–07–18	**Rev: 0v2**
KiCad E.D.A. kicad (7.0.0–0)		Id: 1/11

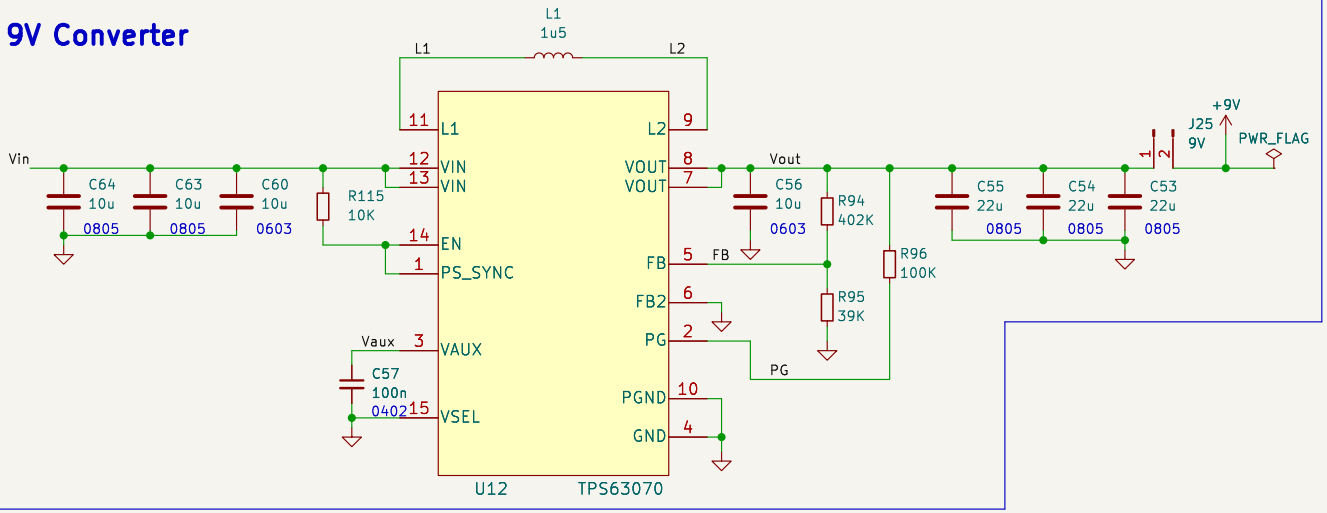
Power Input



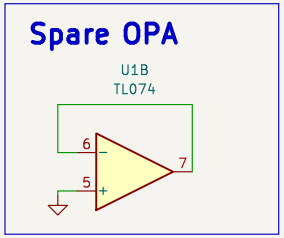
IC Power & Decoupling



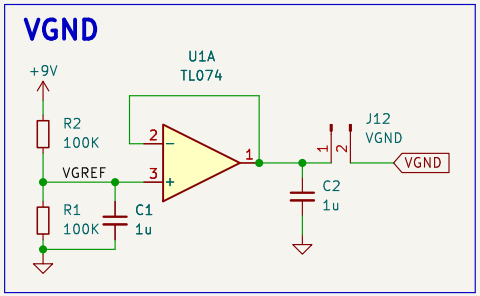
9V Converter



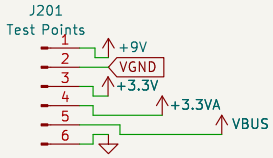
Spare OPA



VGND



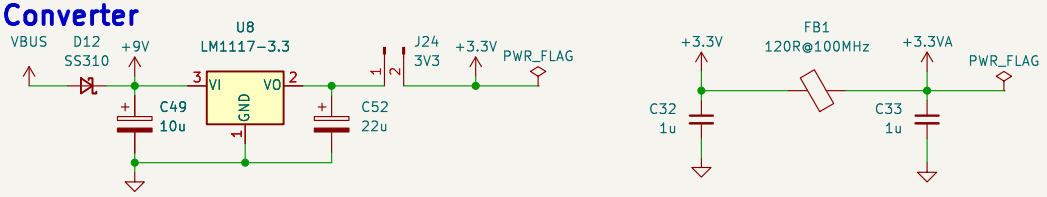
Test Points



Holes

H1 MountingHole
H2 MountingHole
H5 MountingHole
H6 MountingHole
H4 JLCPCB_Toolinghole
H3 JLCPCB_Toolinghole
H7 JLCPCB_Toolinghole

3V3 Converter

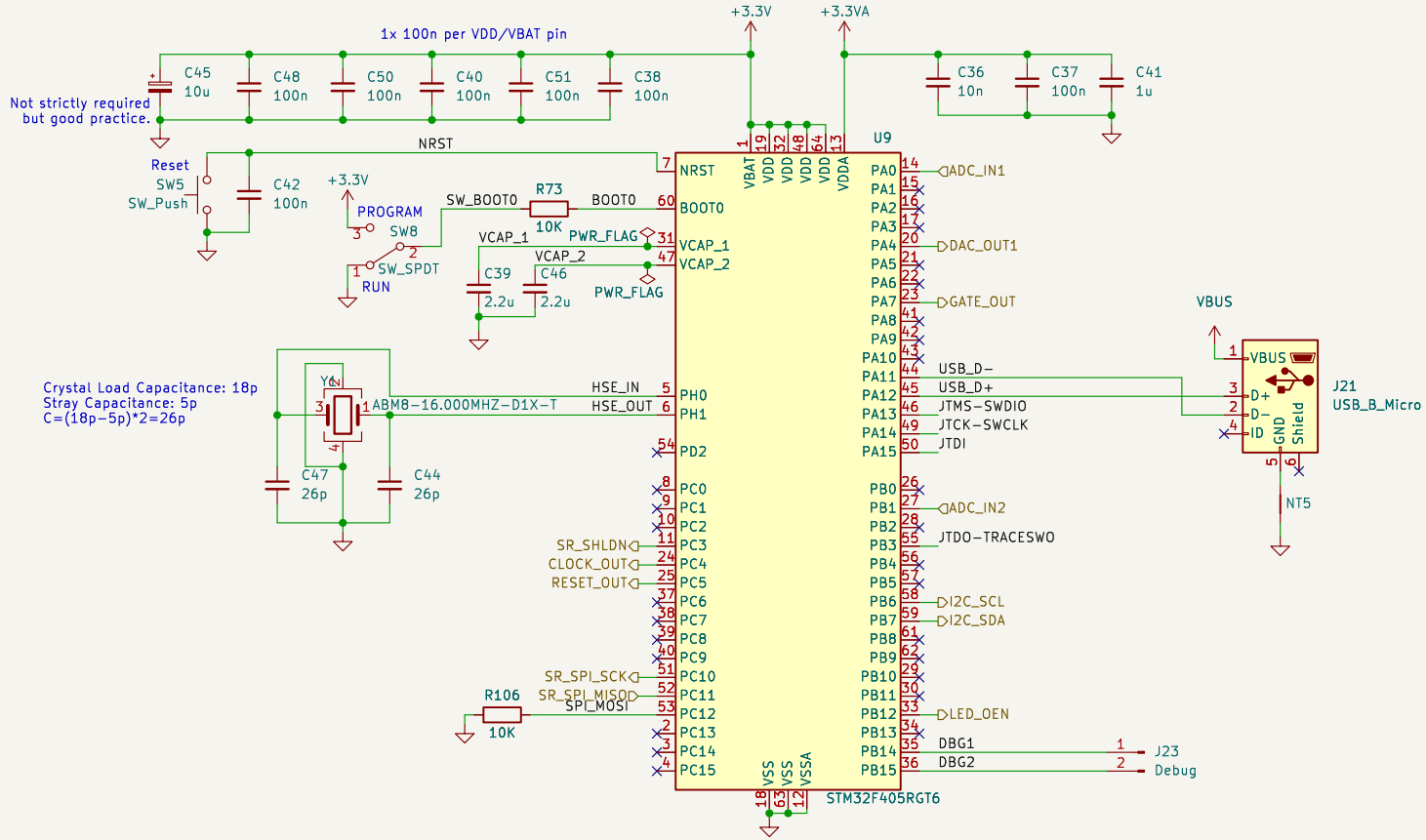


SloBlo Labs

Sheet: /Power/
File: Power.kicad_sch

Title: LivSynth – Power

Size: A4	Date: 2022-07-18	**Rev: 0v2**
KiCad E.D.A. kicad (7.0.0-0)		Id: 1/11



SloBlo Labs

Sheet: /MCU/

File: MCU.kicad_sch

Title: LivSynth – MCU

Size: A4	Date: 2022-07-18	**Rev: 0v2**
KiCad E.D.A. kicad (7.0.0-0)		Id: 2/11

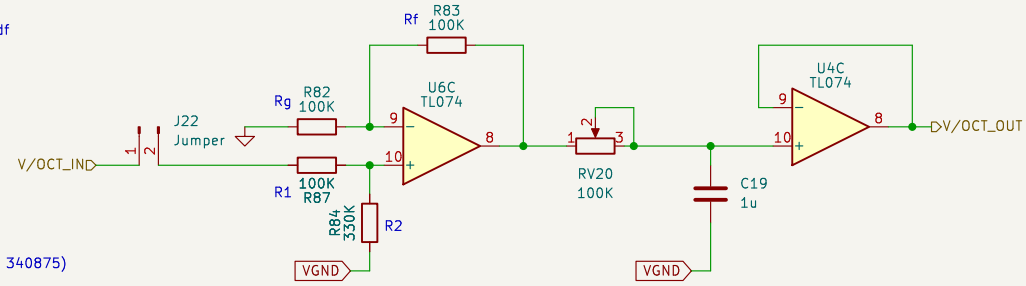
Ref: https://www.ti.com/lit/an/sloa097/sloa097.pdf

y=mx+b

m = (VoutH − VoutL) / (VinH − VoutL)
  = (7 − 2) / (3.3 − 0) = 1.51

b = VoutL − m * VinL
  = 2 − 1.51 * 0 = 2

R1 = 100K (det)
R2 = (Vref * R1 * m) / b
  = 4.5 * 100K * 1.51 / 2 = 340875
Rf = 100K (det)
Rg = (R2 * Rf) / (m * (R1 + R2) − R2)
  = 340875 * 100K / (1.515 * (100K + 340875) − 340875)
  = 104227

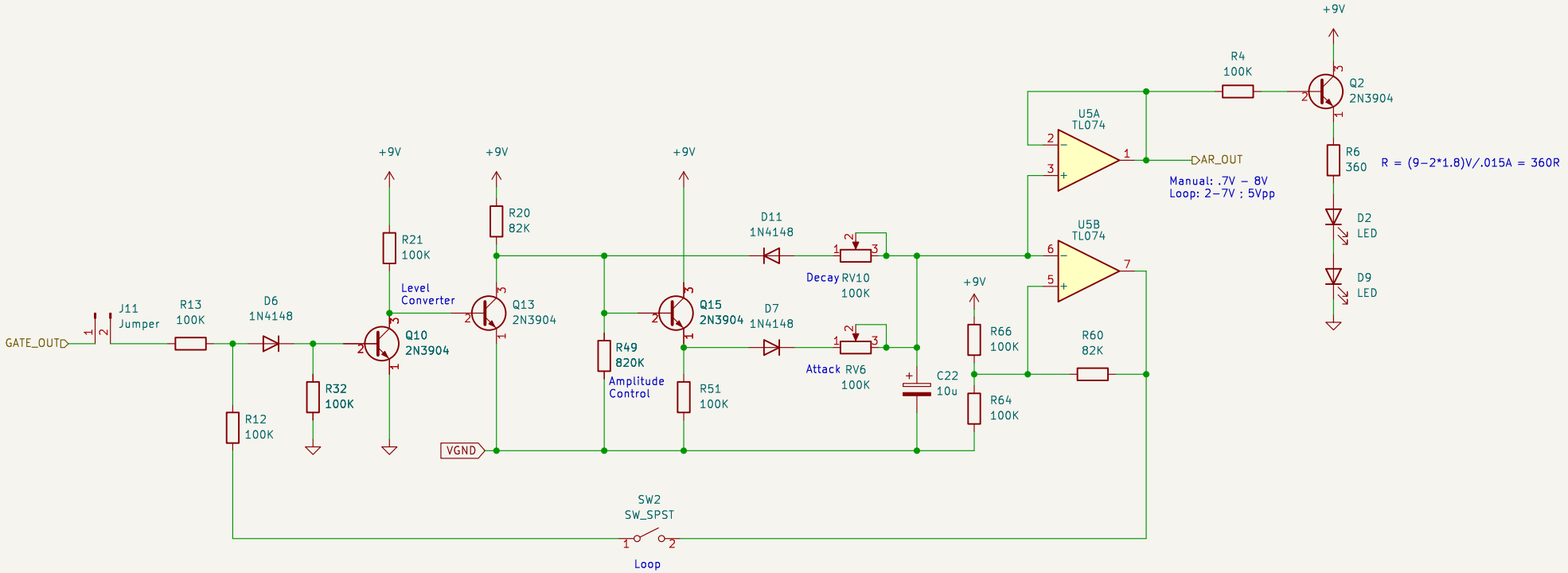


SloBlo Labs

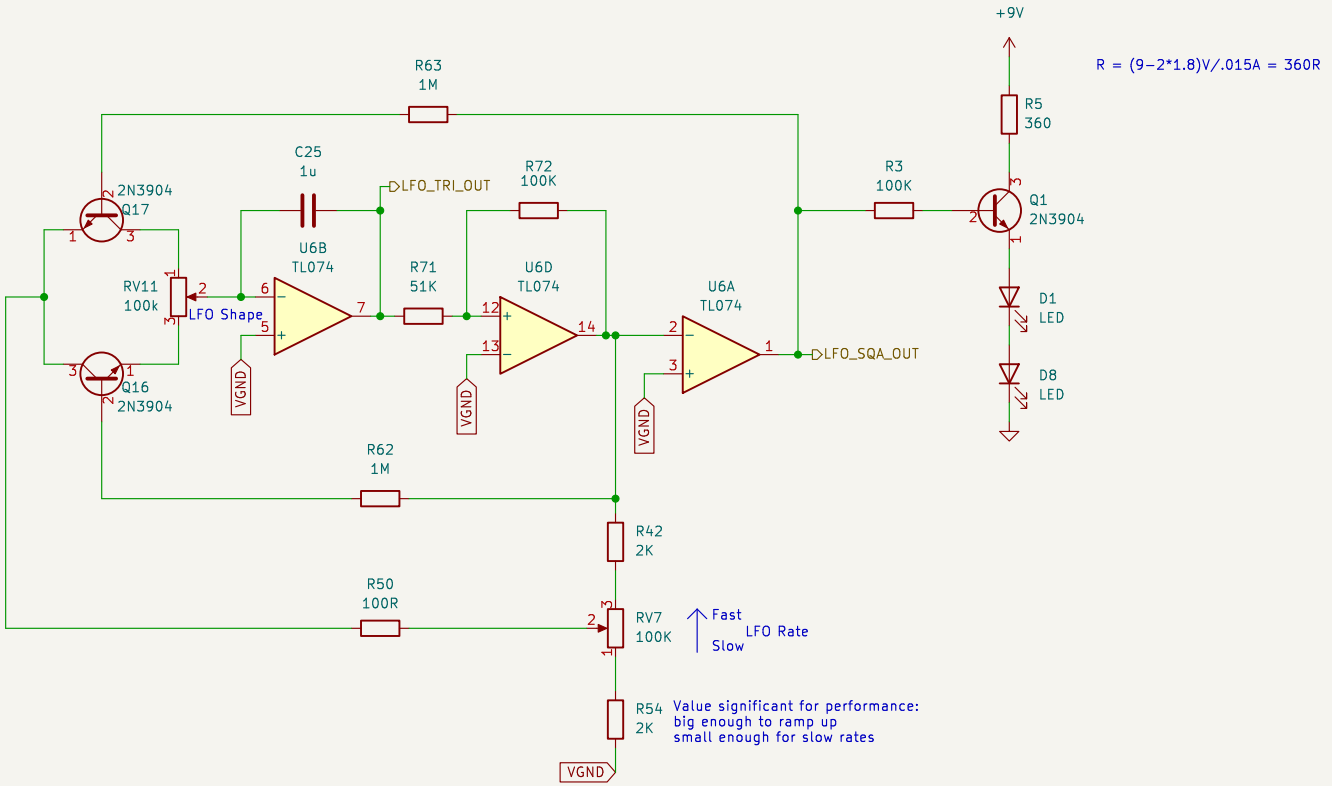
Sheet: /Slew/
File: Slew.kicad_sch

Title: LivSynth − Slew

Size: A4	Date: 2022-07-18	**Rev: 0v2**
KiCad E.D.A. kicad (7.0.0-0)		Id: 3/11



SloBlo Labs		
Sheet: /EG/		
File: EG.kicad_sch		
Title: LivSynth – EG		
Size: A4	Date: 2022-07-18	**Rev: 0v2**
KiCad E.D.A. kicad (7.0.0-0)		Id: 4/11

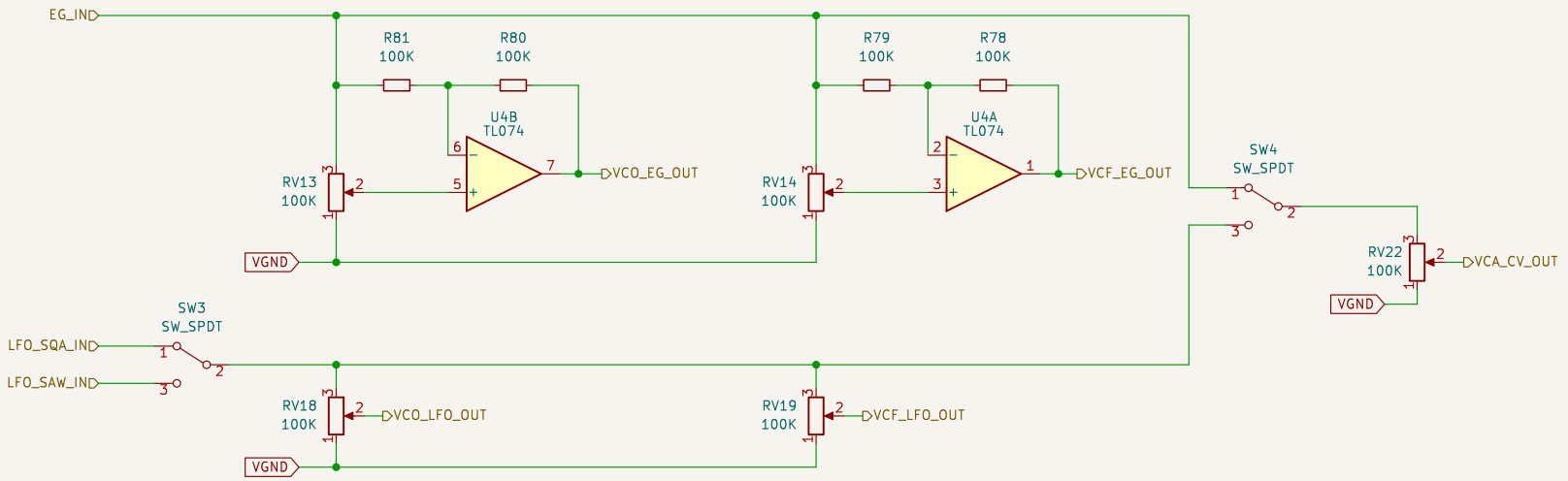


SloBlo Labs

Sheet: /LFO/
File: LFO.kicad_sch

Title: LivSynth – LFO

Size: A4	Date: 2022-07-18	**Rev: 0v2**
KiCad E.D.A. kicad (7.0.0-0)		Id: 5/11

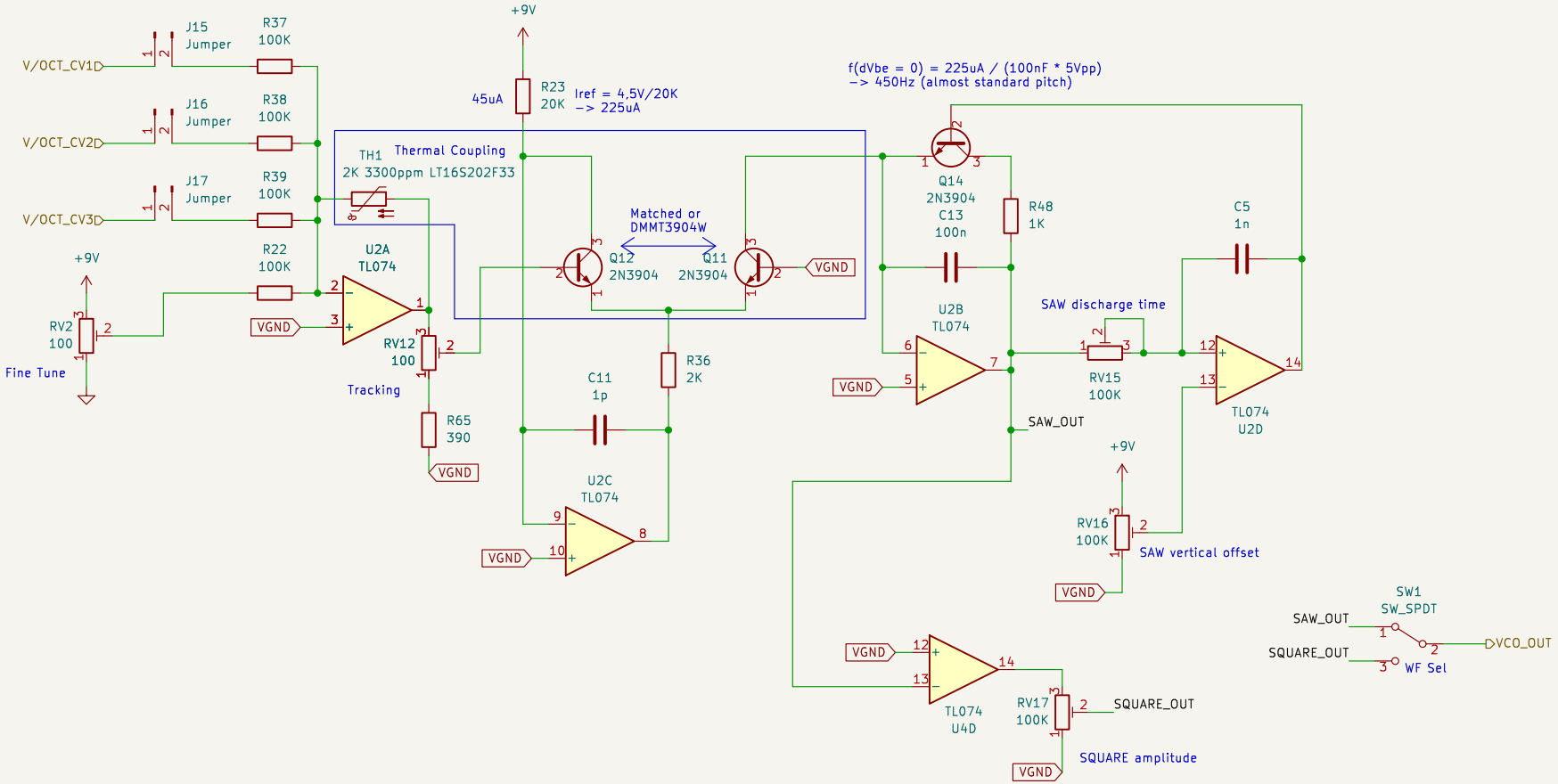


SloBlo Labs

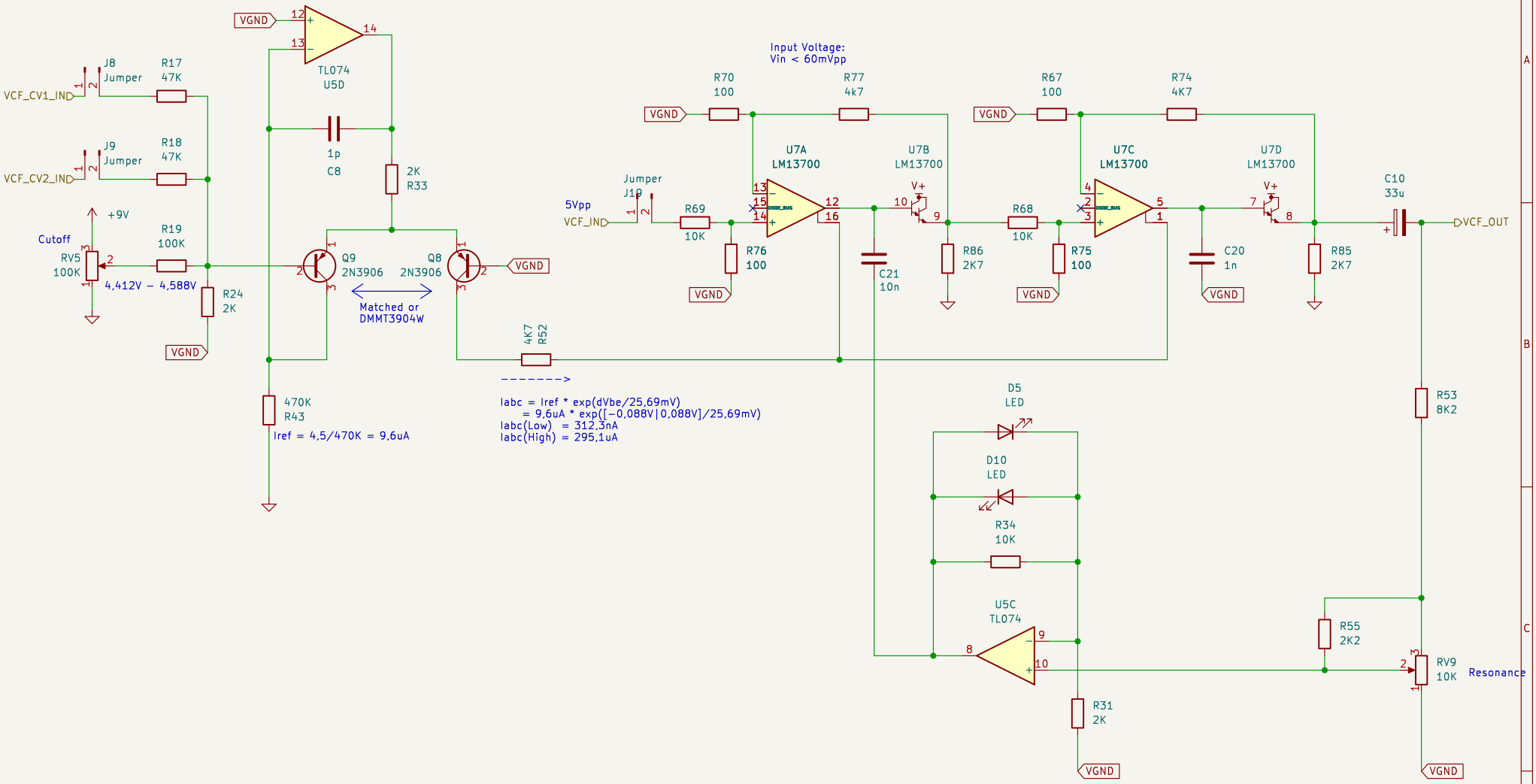
Sheet: /ModMatrix/
File: ModMatrix.kicad_sch

Title: LivSynth – ModMatrix

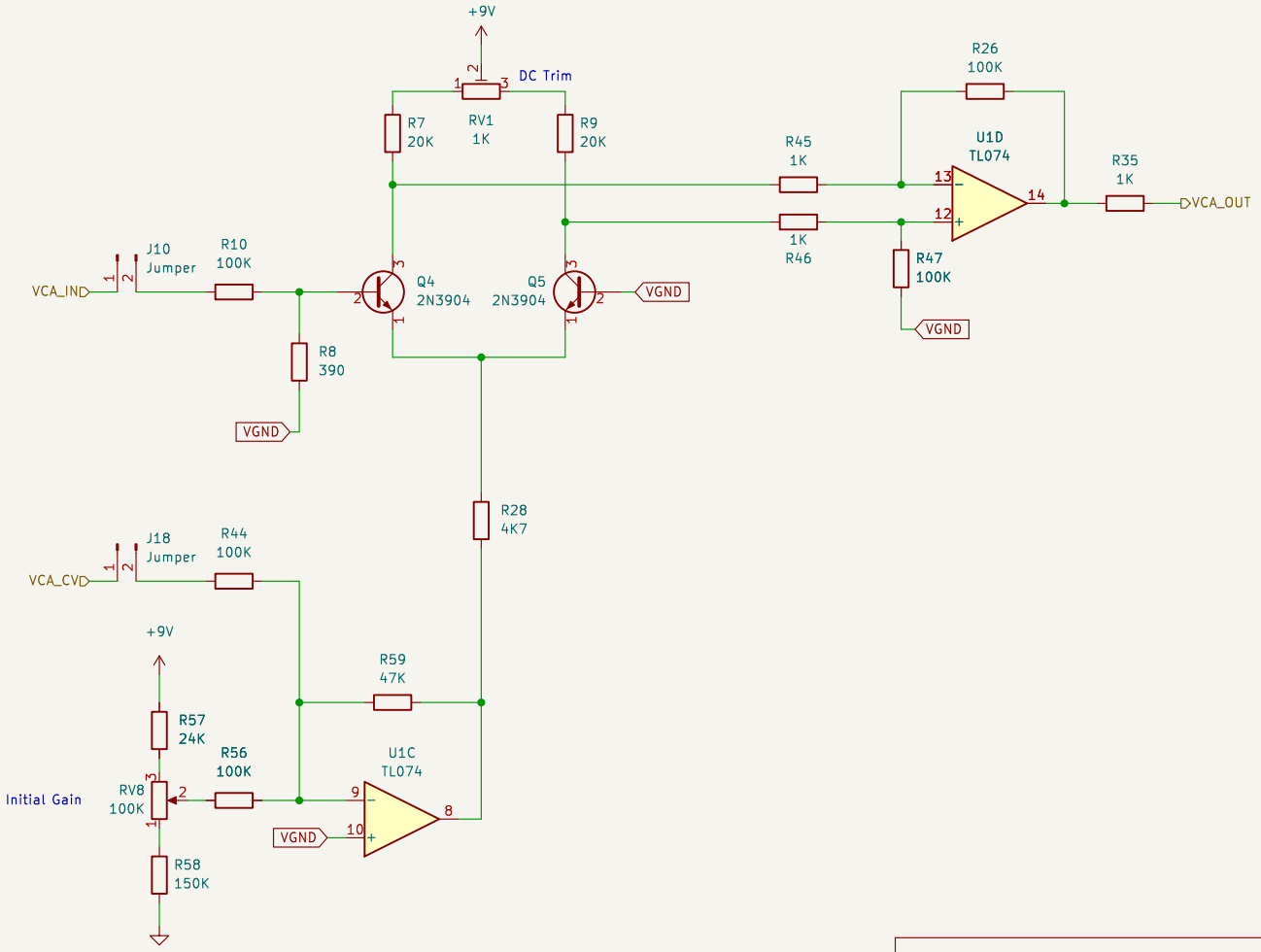
Size: A4	Date: 2022-07-18	**Rev: 0v2**
KiCad E.D.A. kicad (7.0.0-0)		Id: 6/11



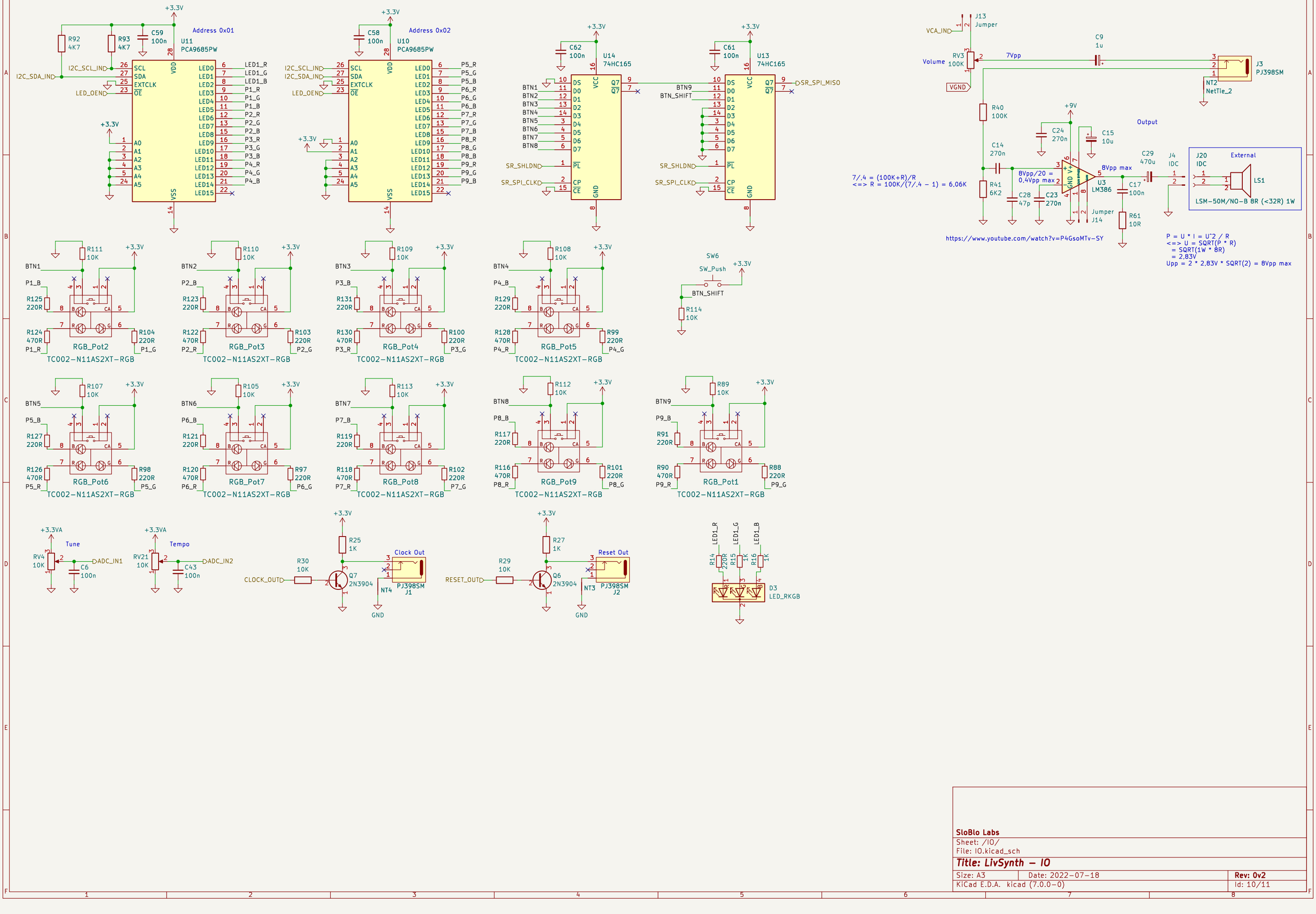
SloBlo Labs		
Sheet: /VCO/		
File: VCO.kicad_sch		
Title: Liv Synth – VCO		
Size: A4	Date: 2022-07-18	**Rev: 0v2**
KiCad E.D.A. kicad (7.0.0-0)		Id: 7/11



SloBlo Labs		
Sheet: /VCF/		
File: VCF.kicad_sch		
Title: LivSynth – VCF		
Size: A4	Date: 2022-07-18	**Rev: 0v2**
KiCad E.D.A. kicad (7.0.0-0)		Id: 8/11



SloBlo Labs		
Sheet: /VCA/		
File: VCA.kicad_sch		
Title: LivSynth – VCA		
Size: A4	Date: 2022-07-18	**Rev: 0v2**
KiCad E.D.A. kicad (7.0.0-0)		Id: 9/11


Address 0x01
Address 0x02
U11
PCA9685PW
U10
PCA9685PW
I2C_SCL_IN
I2C_SDA_IN
LED_OEN
U14
74HC165
U13
74HC165
SR_SHLDN
SR_SPI_CLK
SR_SPI_MISO
BTN_SHIFT
RGB_Pot2
RGB_Pot3
RGB_Pot4
RGB_Pot5
RGB_Pot6
RGB_Pot7
RGB_Pot8
RGB_Pot9
RGB_Pot1
TC002-N11AS2XT-RGB
SW6
SW_Push
R114
10K
VCA_IN
Jumper
RV3
Volume
100K
7Vpp
C9
1u
J3
PJ398SM
NT2
NetTie_2
VGND
R40
100K
+9V
C24
270n
C15
10u
Output
C14
270n
8Vpp/20 =
0,4Vpp max
8Vpp max
U3
LM386
C29
470u
J4
IDC
J20
IDC
External
LS1
LSM-50M/NO-B 8R (<32R) 1W
R41
6K2
C28
47p
C23
270n
C17
100n
R61
10R
Jumper
J14
7/.4 = (100K+R)/R
<=> R = 100K/(7/.4 - 1) = 6,06K
https://www.youtube.com/watch?v=P4GsoMTv-SY
P = U * I = U^2 / R
<=> U = SQRT(P * R)
= SQRT(1W * 8R)
= 2,83V
Upp = 2 * 2,83V * SQRT(2) = 8Vpp max
Tune
Tempo
RV4
10K
C6
100n
ADC_IN1
RV21
10K
C43
100n
ADC_IN2
Clock Out
Reset Out
R30
10K
R25
1K
Q7
2N3904
CLOCK_OUT
NT4
PJ398SM
J1
R29
10K
R27
1K
Q6
2N3904
RESET_OUT
NT3
PJ398SM
J2
GND
D3
LED_RKGB
SloBlo Labs
Sheet: /IO/
File: IO.kicad_sch
Title: LivSynth – IO
Size: A3
Date: 2022-07-18
Rev: 0v2
KiCad E.D.A. kicad (7.0.0-0)
Id: 10/11