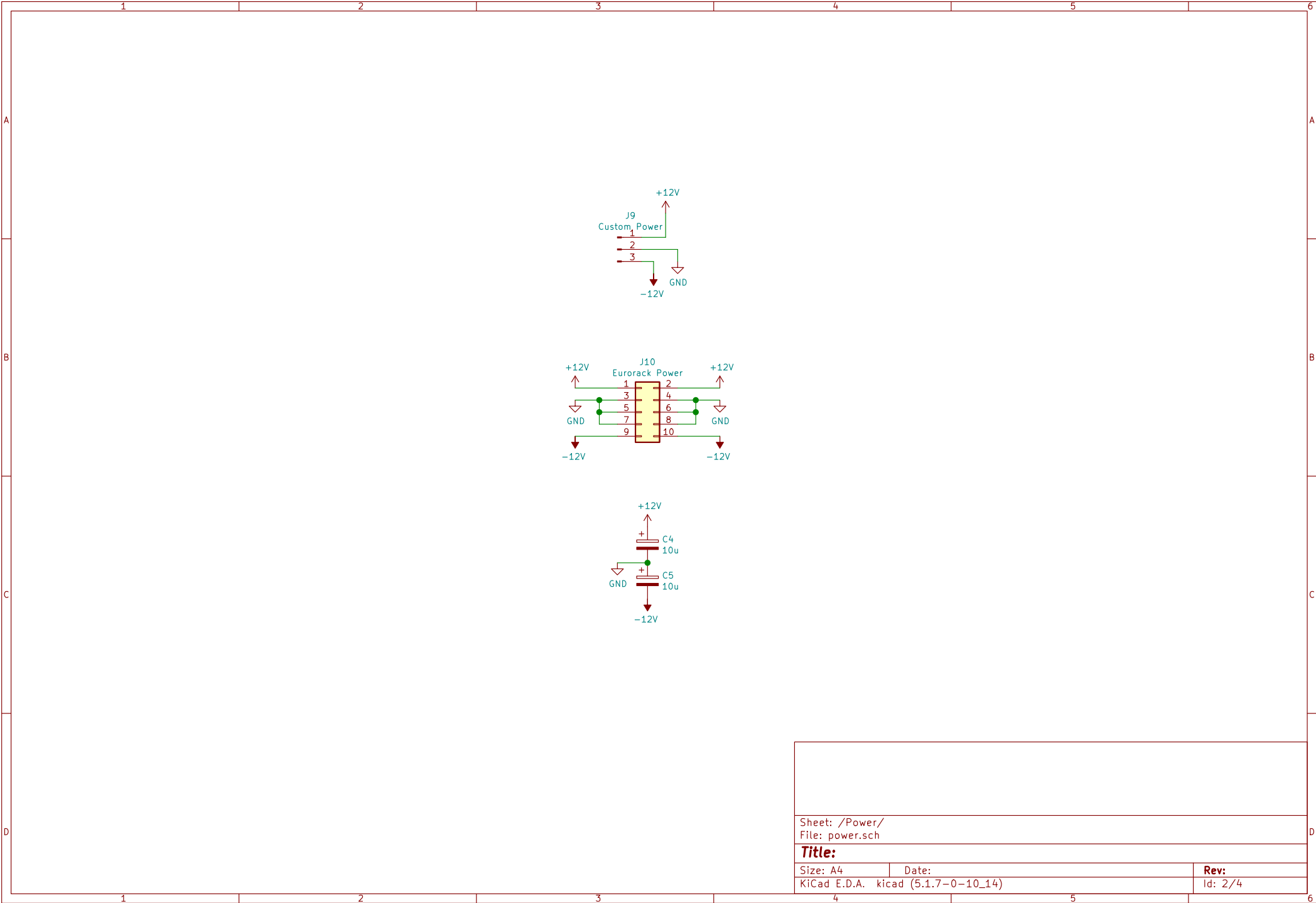Sheet: Power

File: sheets/power.sch

Sheet: OTA-VCA-1

File: sheets/vca-1.sch

Sheet: OTA-VCA-2

File: sheets/vca-2.sch

VCA 1: Used for voice
VCA 2: Used to control global LFO amount. Can be
connected to modwheel of keyboard.

+12V

J9
Custom Power
1
2
3

GND

−12V

J10
Eurorack Power
+12V   +12V
1   2
3   4
5   6
GND   GND
7   8
9   10

−12V   −12V

+12V

C4
10u

GND

C5
10u

−12V

Voice VCA

Calculations are in the LFO sheet.

R6 33k
R8 1k
GND

+12V
RV_CV_BIAS1 10k
−12V

R13 680k

D1 1N4148

C6 1n

U1A TL072

Q1 2N3906

J1 ADSR_CV
0−8V
GND

RV_ADSR_LEVEL1 100k

R2 330k

GND

R7 6.8k
0−500uA

J2 MOD_MATRIX_CV
−5 − 8V
GND

R1 240k

CV from the Mod mixer. This can either be +/−5V (e.g. LFO or VCO output) or 0−8V (filter ADSR). Negative values shouldn't be an issue because Q1 would be closed in that case, so the input should be prepared to 0−8V.

C11 47p

R9 33k

U2C LM13700
DIODE_BIAS

U1B TL072

R10 1k

J3 INPUT
+/−5V
GND

C3 470n

R3 100k

R4 620

R5 620

GND

J4 OUTPUT
+/−5V
GND

GND

+12V
C1 100n
C2 100n
GND
−12V

U1C TL072
U2E LM13700

U2D LM13700
V+
GND

LFO VCA

The purpose of this VCA is to be able to controll the
LFO amount via either the mod slider pot on the synth
or via the modwheel of a controller.

+12V

RV_CV_BIAS2
10k

−12V

R22
680k

0−15uA

R17
33k

0−495uA

R19
1k

$Ve(max) = -IR17 * R17 = -0.495V$

GND

Transistor's reverse
bias safety diode
in case of negative
CV inputs

D2
1N4148

C10
1n

$Ie = 0-510uA$

+12V

R11
15k

RV_MOD_AMOUNT1
10k

0−5V

R12
240k

0−15uA

U3A
TL072

2N3906
Q2

GND

This is the slider pot on the
frontpanel of the synth. It's
the same purpose as the
modwheel on controllers.

GND

Jack as switch here to enable direct
modwheel connection from controller.

R18
6.8k

Safety resistor, max Iabc = 12V / 6.8k = 1.76mA
(in case transistor's collector voltage = 12V)

$Iabc = Ic = Ie = 0-510uA$

C12
47p

R20
33k

$Vin(pp) = 10V * 620 / 100k + 620 = 61.6mV$
$(10V => +/-5V)$

J5
INPUT

C9
470n

R14
100k

U2A
LM13700

DIODE_BIAS

U3B
TL072

R21
1k

J6
OUTPUT

+/−5V

GND

R15
620

R16
620

GND

+/−5V

GND

GND

$IOut(pp) = (q/2kT) * Iabc * Vin$
$= 19.2 * 500uA * 61.6mV$
$= 591uA$

$Vout(pp) = 18k * 591uA = 10,6V$

+12V

C7
100n

U3C
TL072

C8
100n

GND

−12V

U2B
LM13700

V+

GND

Sheet: /OTA-VCA-2/
File: vca-2.sch

Title:

Size: A4   Date:

KiCad E.D.A. kicad (5.1.7-0-10_14)

Rev:

Id: 4/4