nonlinearcircuits

FAST AND BULBOUS VCF build & BOM

The SSI2140 is based on the SSM2040 VCF chip, tho with a few updates.

My first thought when I read the datasheets was that it would be great to design a module that could switch between a phaser and a VCF. Looking back at old SSM2040 designs, it seems most of the usual suspects (T. Henry, J. Blacet, C. Anderton et al) had much the same idea.

This module is based on Anderton's design in Device 1-6 (yes, I spotted the error) with modifications to suit the SSI2140 and Eurorack.

There are 4 switches, one for each OTA stage, to select between (all pass (phaser) and low pass filter mode. You can have quite a lot of fun with 2-3 switches in one mode and 1-2 in the other.

There is a dry mix pot to mix the incoming signals into the OUT signal, which is taken from the 4th OTA stage. This is probably more commonly used in Phaser mode, but there are no rules, so do whatever you like.

POLES is a weighted mix of the outputs of each pole, it is a bit shy when all switches are turned to Low Pass but perks up very nicely when one or more switches turned to Phaser.

The SSI chip is a bit tight to solder, have your bottle of flux ready, otherwise it is a pretty easy build.

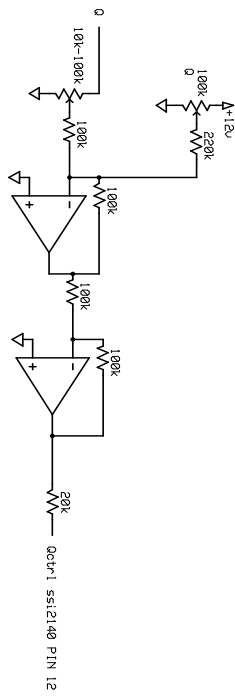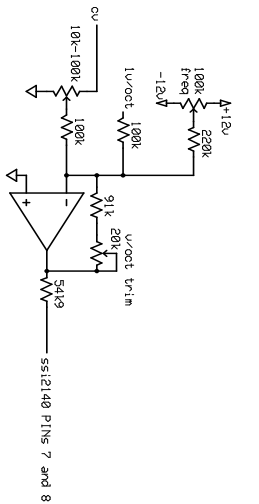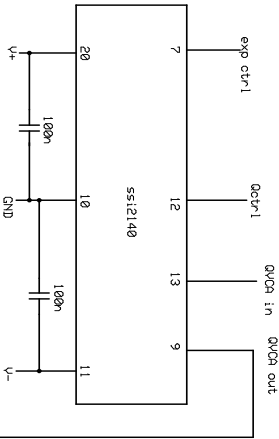# <mark>BOM</mark> — The Tayda & Mouser part numbers are given as examples

VALUE	QUANTITY	DETAILS
1n	4	0805
100n	4	0805
220n	2	0805
10uF	2	0805 25V or higher voltage rating Mouser:963-TMK212BBJ106MG-T or similar
220R	4	0805
1k	4	0805
10k	11	0805
16k2	1	0805
20k	1	0805
27k	1	0805
33k	1	0805
51k	1	0805
54k9	1	0805
68k	1	0805
91k	1	0805
100k	10	0805
220k	2	0805
TL072 or TL082	3	Soic Tayda: A-1139
SSI2140	1	check NLC webstore for stock or Synthcube
Eurorack 10 pin power connector	1	Tayda: A-198 cut to size
S1JL, Schottky, power rectifier or 10R (worst option)	2	SMD SEE NOTES #1. **dot on PCB indicates CATHODE (stripe on component).**
3.5MM SOCKET Kobiconn style	7	Tayda: A-2563 or Thonkiconn Jacks (PJ301M-12) from Thonk, Synthcube or Modular Addict
100k pot	6	Tayda: A-5623 or A-4729 or similar
20k trimpot	1	Tayda: A-592
toggle switch SPDT	4	Tayda: A-5389 or A-5387 or similar

Additional notes:

<mark>1.</mark> , Schottky (best option) **or** standard power rectifier diode 50-600v 1A or more, **or** use a resettable fuse **or** just a 10R. Examples: BAT54GWX, PMEG2005EGWX, AEC-Q101, 20V, SOD-123, PMEG2005EH DIODE, SCHOTTKY, 0.5A, 20V, 1N400x or S1JL or similar.

<mark>2.</mark> The chips, resistors, caps are cheapest from Tayda. Schottky diodes, CMOS & 1uF, 10uF 25V 0805 caps from Mouser/E14/Farnell/etc.
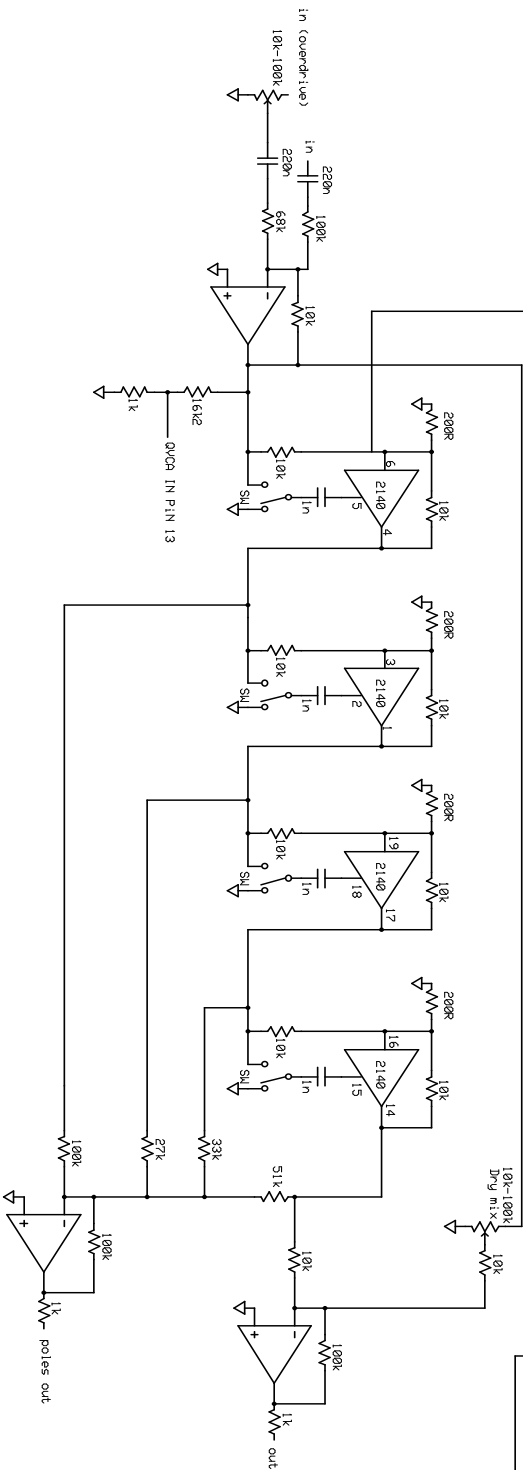
<mark>3.</mark> Join the Nonlinearcircuits Builders Guild on FB: https://www.facebook.com/groups/174583056349286/ and ask questions there if you have any. If you prefer not to FB then email is fine.

exp ctrl

Qctrl

QVCA in   QVCA out

v+   20
100n
GND   10
100n
v-   11

ssi2140
12   13   9
7

in (overdrive)
10k-100k

220n
in   220n
68k   100k
10k

1k
QVCA IN PIN 13
16k2

200R
10k
1n
Sw
2140
6 5 4
10k

200R
10k
1n
Sw
2140
3 2 1
10k

200R
10k
1n
Sw
2140
19 18 17
10k

200R
10k
1n
Sw
2140
16 15 14
10k

cv
10k-100k
100k
1v/oct   100k
freq
-12v   220k
+12v

91k
v/oct trim
20k
5419
ssi2140 PINS 7 and 8

Q
10k-100k
100k
Q   100k
220k
+12v
100k
100k

Qctrl ssi2140 PIN 12
20k

100k
27k   33k
51k
100k
10k   10k-100k
Dry mix
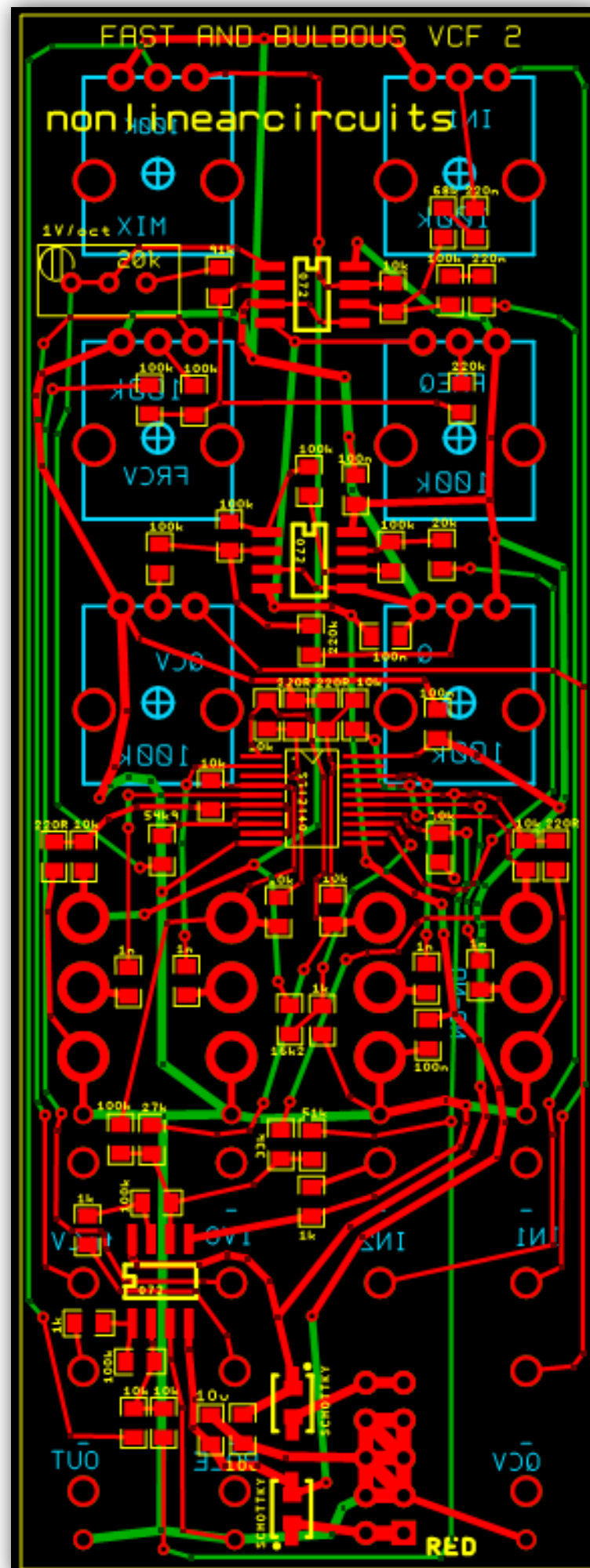1k
poles out
100k
10k
1k
out

nonlinearcircuits
FAST & BULBOUS ssi2140

Designer's name | Rev 1.0 | Page # or name
                   | 10/29/2024 |

FAST AND BULBOUS VCF 2

nonlinearcircuits

IN

MIX

1V/oct XIM

20k

FREQ

FREQ

FRCV

VCO

100K

100K

IN2

IN1

OUT

DRIVE

VCO

SCHOTTKY

SCHOTTKY

RED

FAST AND•BULBOUS VCF 2

nonlinearcircuits

W203

SSI2140
0398J

220R 220R 10k

RED