

JH. Living VCOs Bill Of Materials (updated V.1.3)  
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Errors excepted

Quantity	Component	Remarks
<b>Semiconductors</b>		
3	LM311	Comparator
7	TL072	BiFET OpAmp
1	LM13600	OTA (or LM13700)
3	CA3046	Transistor Array (or CA3086, or LM3046) Only using 2 of its 5 transistors. So you can use a transistor pair like 2SC1583 or SSM2210 as an alternative, with some minor additional wiring or bending of legs.)
12	BC550C	NPN Transistor
11	BC560C	PNP Transistor
17	1N4148	Diode
<b>Tempco Resistor</b>		
3	1k	3000ppm/K ... 3500ppm/K
<b>Trimpots</b>		
3	2k	10mm trimpot (see PCB layout for footprint and dimensions). May also be 2.2k or 2.5k
3	50k	10mm trimpot (see PCB layout for footprint and dimensions). May also be 47k or 100k
3	10k	multiturn trimmer (see PCB layout for footprint and dimensions).
3	100k	multiturn trimmer (see PCB layout for footprint and dimensions. Labeled as "104").
<b>Capacitors, ceramic, 2.5mm</b>		
3	22pF	22p
5	100pF	100p; the one unlabeled cap is 100p as well
3	1nF	1n
<b>Capacitors, Polystyrene</b>		
3	2.7nF	2n7
<b>Capacitors, electrolytic (polarized!)</b>		

3	1uF	1u
8	22uF	22u; 25V or higher voltage rating
<b>Capacitors, Polyester</b>		
1	47nF	47n; 5mm spacing
1	1uF	1u; 5mm or 7.5mm spacing
<b>Capacitors, SMT</b>		
18	100nF	0805 or 1206 (on solder side)
<b>Ferrite Beads</b>		
8	Panasonic EXC-ELSA 35	RS Components Number 226-8185 (That's the one I've tested. I'm sure others will work as well. Specified as 50 Ohm at 100MHz.)
<b>Resistors, 0.1%</b>		
You don't really need 0.1% tolerance. It's ok to use 1% resistors and match them in pairs or triples. You should match all resistors that go from CV inputs to <u>one</u> node, like R1, R2, R3. Also R74, R75, R79. Also R114, R115, R119. Finally, R145, R146. There is <u>no</u> need to match between these groups (like, R1 and R79), though!		
11	100k	
<b>Resistors, 1%</b>		
1	100	
1	300	
6	330	
13	1k	
6	2k	
3	3k3	
3	5k1	
3	6k2	
14	10k	
3	12k	
14	15k	
12	20k	
3	51k	
1	56k	
6	62k	
3	68k	

9	100k	
6	150k	
1	200k	
1	430k	
4	510k	
3	750k	
14	1M	
<b>Resistors, 10% or better</b>		
1	4M7	
3	10M	
<b>PCB Connectors (optional)</b>		
4	MOTM Power Connector	or Synthesizers.com Power Connector
11	PSS254/2G	or similar 2 pin, 2.54mm spacing
21	PSS254/3G	or similar 3 pin, 2.54mm spacing
<b><u>Some off-board components</u></b>		
Normally I only list the components that go onto the PCB, and not the various potentiometers, jacks and switches. I won't list them for thi sproject, either; but here are some important components that go to the front panel, at least:		
3	10k	10-Turn Potentiometers (I used Reichelt 534-10k)
3	Vernier Dials	for the 10-Turn Potentiometers
2	100k	front panel mounted multiturn trimmers (or you can place ordinary mutliturn trimmers elsewhere - these are for adjusting the octave switching.)