M² SYNTH

SV VCF 112
Kit Assembly Instructions

State Variable Filter 112

LP Cut-Off   LP CV Depth   LP Mix

HP Cut-Off   HP CV Depth   HP Mix   HP Source
Low Pass
Off
Signal In

BP Cut-Off   BP CV Depth   BP Mix   BP Source
Low Pass
Off
Signal In

AP Cut-Off   AP CV Depth   AP Mix   AP Source
Low Pass
Off
Signal In

Resonance   Signal Level   Signal In   LP Out   HP Out

Mix Out   BP Out   AP Out

Low Pass CV   Hi Pass CV   Band Pass CV   All Pass CV   Common CV   Res CV

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Features

- 1 Volt / Octave cut-off frequency CV for each filter type plus a common CV input that controls all filters at once.
- Resonance potentiometer control with external CV control (controls all filter types)
- Each filter type has its own output
- A 4-channel output mixer blends the outputs of all 4 filter types to a common output
- Switches control the HP, BP and AP filter input route - off, main input signal or the LP filter output

Kit Contents				
Description	Reference	MOTM Qty	MU Qty	Notes
Components Kit	7216-112-1	1	1	See BOM
Accessories Pack including:	7216-112-2	1	1	
Pot Sticky Pads	7210-188	14	14	
10mm M4 Spacers	7210-186	5	5	
M4 x 14 Cap Head Screws	7210-187	5	5	
Toggle Switch Dress Nut	7210-196	3	3	
M3 x 8mm Stainless Panel Screws	7216-151	4		
8-Pin IC Socket	7212-331	6	6	
18-Pin IC Socket	7212-334	4	4	
Power Lead	7216-164	1		
MOTM Front Panel	7216-512	1		Black
MOTM Back Panel	7216-812	1		
MU Front and Back Panel	7219-512		1	
Main PCB	7216-012	1	1	
Jack Socket PCB	7215-703	1	1	
Jack Socket PCB	7215-731	1	1	
Jack Sockets	7216-612	1	1	Pack of 12
B100k Pots Long Shaft Angled	7216-710	1		Pack of 10
B100k Pots Short Shaft Angled	7216-740		1	Pack of 10
A100k Pots Long Shaft Angled	7216-724	1		Pack of 4
A100k Pots Short Shaft Angled	7216-754		1	Pack of 4
KM20B Knobs	7212-114	1		Pack of 14
MU Knobs	7219-114		1	Pack of 14
General Assembly Guidance Booklet		1	1	
BOM	S-7216-012-c	1	1	
Circuit Schematic	S-7216-012-c	1	1	
PCB Layout	S-7216-012-c	1	1	

Assembly Instructions

The SV VCF module has no particular requirements not already covered in the 'General Guidance on a M²Synth Module Assembly' booklet included with this kit.

Calibration

1. Power up module and allow to 'warm up' for 10 minutes
2. Connect a CV source to the Common CV input, a scope and frequency meter to the Mix Out
3. Set all toggle switches to the down 'Signal In' position, all pots fully CCW
4. The V/octave is set for each individual filter. If the frequency is flat (<target), use the specified trimmer and make the frequency lower (flatter), if above target frequency, use the trimmer to make the frequency even higher, this can be counter-intuitive. You will soon get the feel of how much to increase or decrease the frequency by
5. LP Filter – LP Mix pot fully CW, Resonance pot fully CW, CV to 0V
6. Adjust LP Cut-Off to giver an output self-oscillating frequency of 50Hz
7. Set CV to 5V, output frequency should be 1.6kHz, if not adjust PR1 as described in step 4
8. Repeats steps 5-7 until 1.6kHz, then set LP Mix pot fully CCW
9. HP Filter – HP Mix pot fully CW, Resonance fully CW, CV to 0V
10. Adjust HP Cut-Off to giver an output self-oscillating frequency of 50Hz
11. Set CV to 5V, output frequency should be 1.6kHz, if not adjust PR2 as described in step 4
12. Repeats steps 9-11 until 1.6kHz, then set HP Mix pot fully CCW
13. BP Filter – BP Mix pot fully CW, Resonance fully CW, CV to 0V
14. Adjust HP Cut-Off to giver an output self-oscillating frequency of 20Hz
15. Set CV to 5V, output frequency should be 640Hz, if not adjust PR3 as described in step 4
16. Repeats steps 13-15 until 640Hz, then set BP Mix pot fully CCW
17. BP Filter – BP Mix pot fully CW, Resonance fully CW, CV to 0V
18. Adjust HP Cut-Off to giver an output self-oscillating frequency of 20Hz
19. Set CV to 5V, output frequency should be 640Hz, if not adjust PR3 as described in step 4
20. Repeats steps 17-19 until 640Hz, then set BP Mix pot fully CCW
21. AP Filter – AP Mix pot fully CW, Resonance fully CW then back off until you get a clean sinewave, CV to 0V
22. Adjust AP Cut-Off to giver an output self-oscillating frequency of 20Hz
23. Set CV to 5V, output frequency should be 640Hz, if not adjust PR4 as described in step 4
24. Repeats steps 21-23 until 640Hz, then set AP Mix pot fully CCW

If at any time, you cannot set the initial starting frequency (50Hz or 20Hz) then adjust the corresponding trimmer to bring it into range.

Specification

- Supply voltage +/-12Vdc or +/-15V if using the external voltage regulator
- Supply current +40mA / -55mA
- Waveform levels +/-5V
- Main PCB dimensions 131.95x174.05mm

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