Build documentation for:

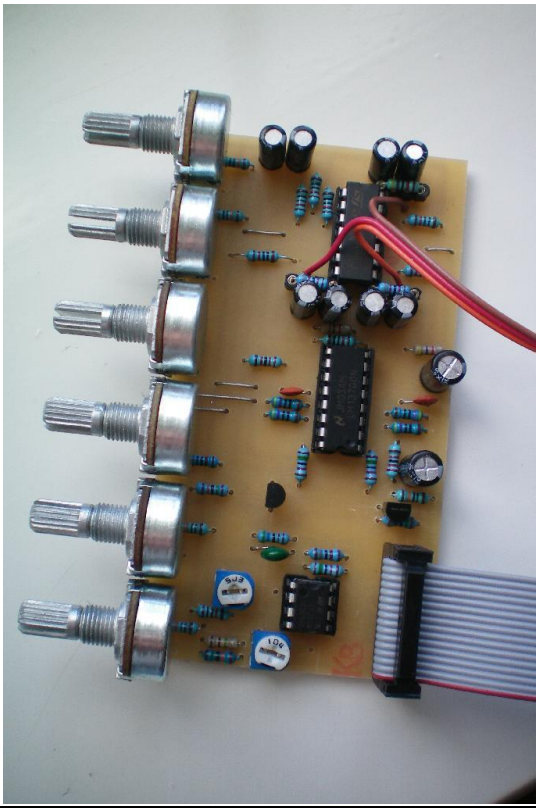
"FC►UK MULTIMODE FILTER"

LM13700 based Multimode Filter
Layout and documentation by

FREQUENCY CENTRAL

This module is based on an LM13700 filter from an early 80's copy of E&MM magazine's Synbal project. I've adapted it for modular use: cut out non-essentials; added CV input sub-circuit (from Roland 100M VCF); changed a bunch of values; balanced the relative volumes of all three outputs. Actually, there is not so much left from the original design now, but even so, credit where credit's due. Sounds great! The resonance gets squelchy but does not reach self-oscillation. However, by feeding an output back into the input you can get it to oscillate.

Colour coding:
Red traces: +12v
Brown traces: Ground
Green traces: -12v
Grey pads: Inputs
Blue pads: Outputs



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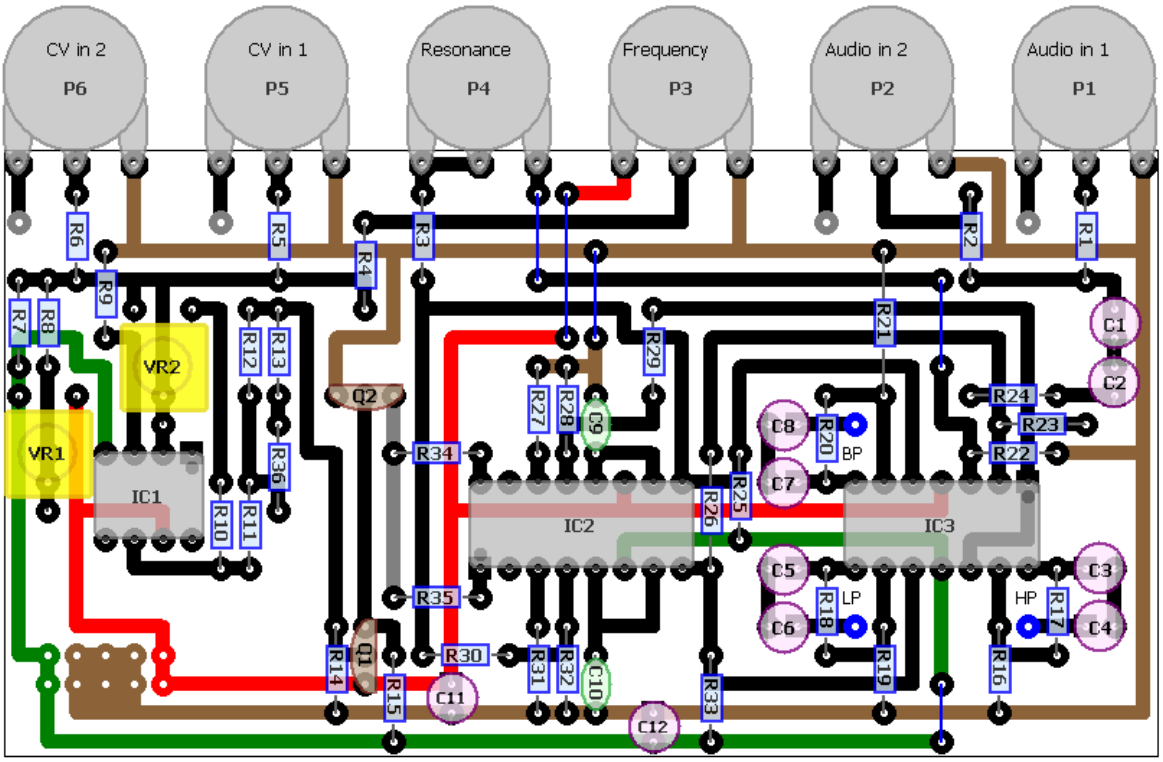
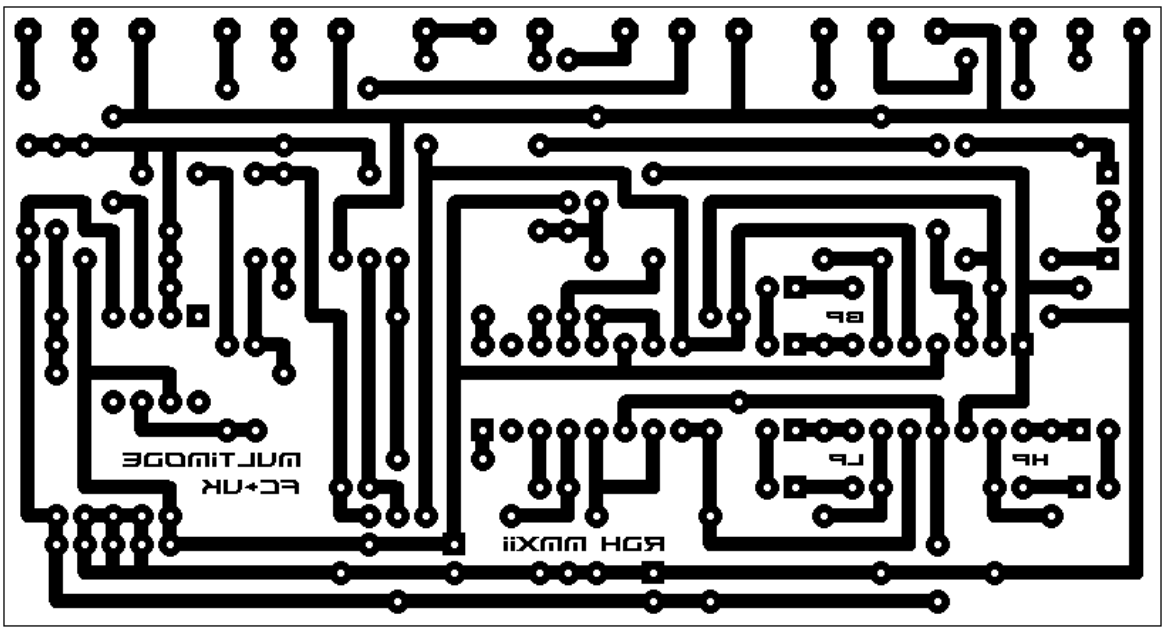
Layout by frequencycentral





R1: 100K R2: 100K R3: 1K R4: 150K R5: 100K R6: 100K R7: 150K R8: 1M R9: 10K R10: 15K R11: 10K R12: 5.6K R13: 1.8K R14: 1.5K R15: 100K R16: 10K R17: 47K (HP gain) R18: 82K (LP gain) R19: 10K R20: 82K (BP gain) R21: 10K R22: 10K R23: 10K R24: 10K R25: 4.7K R26: 10K R27: 470R R28: 470R R29: 22K R30: 22K R31: 470R R32: 470R R33: 4.7K R34: 15K R35: SDT-1000*	C1: 22uF C2: 22uF C3: 22uF C4: 22uF C5: 22uF C6: 22uF C7: 22uF C8: 22uF C9: 470pF C10: 470pF C11: 100uF C12: 100uF	IC1: LF351 IC2: LM13700 IC3: TL084 Q1: BC547 NPN Q2: BC557 PNP	P1: 100k Log Alpha 16mm P2: 100 Log Alpha 16mm P3: 100K Lin Alpha 16mm P4: 500K Log Alpha 16mm P5: 100K Lin Alpha 16mm P6: 100K Lin Alpha 16mm VR1: 100K (Freq trim) VR2: 22K (Width trim) **Jumpers: Five (5)**

R17, R18 and R20 set the relative volumes of HP, LP and BP. I used sockets and found the stated values worked well. Higher resistor values increase the gain.

* SDT-1000 is a 10K NTC Thermistor for temperature stability. Tayda sell a part that seems to me to do the job well. You can optionally use a 10K resistor instead.

Calibration

VR1 sets the initial frequency. Turning it anti-clockwise lowers the initial frequency. You'll probably want to turn it anti-clockwise by about 80° from the mid position

VR2 sets the width (ie V/oct). Turning it anti-clockwise broadens the sweep. You'll probably want to turn it anti-clockwise by about 100° from the mid position to achieve the most desirable sweep range.

To check that your calibration is playing nice, take a lowpass output. The signal should be fully cut at the Frequency pot's minimum position, and completely unfiltered at the Frequency panel pot's maximum position.

Frequency Central website: http://www.frequencycentral.co.uk/

PCBs available from me! £15 GBP (inc shipping) Paypal GIFT to: rickholt22@hotmail.com