

M104C Filter Coupler (Moog 904C)

FUNCTION DESCRIPTION



The 104C Filter Coupler is a complete clone of the renowned Moog 904C module. Here is a detailed description of its functions copied from the Archive Moog web site:

<http://www.moogarchives.com/m904c.htm>

The 104C (Moog 904C) Filter Coupler is a connecting module which combines the functions of the M104A (Moog 904A) Lowpass and the M104B (Moog 904B) Highpass Filters together. In the 'OFF' position, the Highpass and Lowpass Filters are disconnected from the M104C and may be used independently. When switched to the 'Bandpass' mode, Highpass and Lowpass Filters are coupled in parallel to process a central band of frequencies, deleting both bottom and top. The Band-Reject mode presents the inverse relationship, rejecting a central frequency band AND PASSING ONLY THE LOWEST AND HIGHEST FREQUENCY COMPONENTS. Voltage controlled bandwidth and center frequency controls are included on the coupler. Bandwidth can be extended to three octaves with manual settings or control voltage. Center Frequency ranges from 5hz to 20khz, via manual or voltage controlled settings.

When using the M104C for Bandpass or Band-Reject filtering, the following standard settings should be observed:

M104A Fixed Control Voltage	= +6
M104A Frequency Range	= 2
M104B Fixed Control Voltage	= -1
M104B Frequency Range	= Low

Note:

- Passband settings = Bandwidth knob plus control voltage.
- Notch-width = Minus bandwidth knob minus control voltage.

Musical Application

The M104C Filter Coupler has a broad variety of applications. It simplifies the combined use of the high and lowpass filters by placing all controls within one module. Original timbres useful for both conventional and non-standard performance techniques are achieved with both Bandpass and Band-Reject modes. In either mode the amplitude relationships of a standard harmonic series can be radically altered to depart substantially from any acoustically generated sound or electronic simulation. Some instrumental simulations, like full string section sounds, are more effective when bandpass filtering deletes the fundamental

strength as well as the 'buzziness' of upper harmonics. Utilizing the band-reject mode for percussive 'rhythm boxes' if low frequency controls are put on the bandwidth input, with pink noise as the signal.

The signal processing capabilities of the Filter Coupler present a wide variety of possibilities from rumble and hiss deletion, to a very clean 'phasing' effect, obtained by creating a notch in the audio signal, which can be moved in creative and predictable patterns using low frequency control voltages.

The printed circuit board

The PCB has been designed to fit behind a 2U Moog style front panel. It is a double side board 2.6" X 5.5" and is mounted using 4-40 1.5" hexa standoffs to keep accessible all the onboard trimmers. All the parts are through hole types. Connector P1 and P2 are positioned to be adjacent to their dedicated pots. Two front panel 5k Ω lin potentiometers (P1, P2) are used for Center Frequency and Bandwidth control. Nine 4 pins Molex connectors (H4,5,6,7,8,9,10,11,12) link the PCB to the 3 positions Function front panel rotary switch. Two small 6 pins Molex connector (H2, H3) are used to link the M104C to both 104A and 104B modules to achieve Bandpass or Band Reject functions.

Power is connected by use of a 6 pins 0.156" Molex type connector. All the wiring cables are shielded type. 2 shielded conductors for all the pots wiring, and Belden RG-174 coax are used for all the input/output jacks connections.

Schematic differences from the original Moog 904C:

Most of the M104C has been copied from the 60's Moog schematics. The only sections that have been modified (for better performance) are the audio output buffer which is now made of a NE5532 (U2A) opamp. The input Bandwidth control voltage inverter is now made of the second section of the NE5532 (U2B).

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ELECTRONIC SPECIFICATIONS

POWER CONNECTOR

PIN ASSIGNMENTS

1	-15V
2	A GND
3	A GND
4	+15V
5	D GND
6	+5V

Panel Size: Double width 4.240" w x 8.75" h.

Bandwidth control input: 1

Center Freq. control inputs: 2 summed

Bandwidth input impedance: 50k +/-1%

Center Freq. inputs impedance: 50k +/-1%

Bandwidth response: Lin

Center Freq. response: Lin

Function Switch:

Position#1: Band-Reject

Position#2: OFF

Position#3: Bandpass

Signal input impedance: 100kohms +/-5%

Signal output impedance: 620ohms +/-5%

Power:

+15V @ 8mA,

-15V @ 16mA,

+5V @ 0mA.

