BMC32. Blended Bandpass

Written May 11th, 2015

I.Using The Module

A. What does it do?

This is a manually controlled bandpass filter with additional controls for blending the filter's output with it's input. These controls help give a finer degree of control over how the sound is shaped, and the inversion switch allows for a psuedo-notch filter effect.

B. Controls/IO

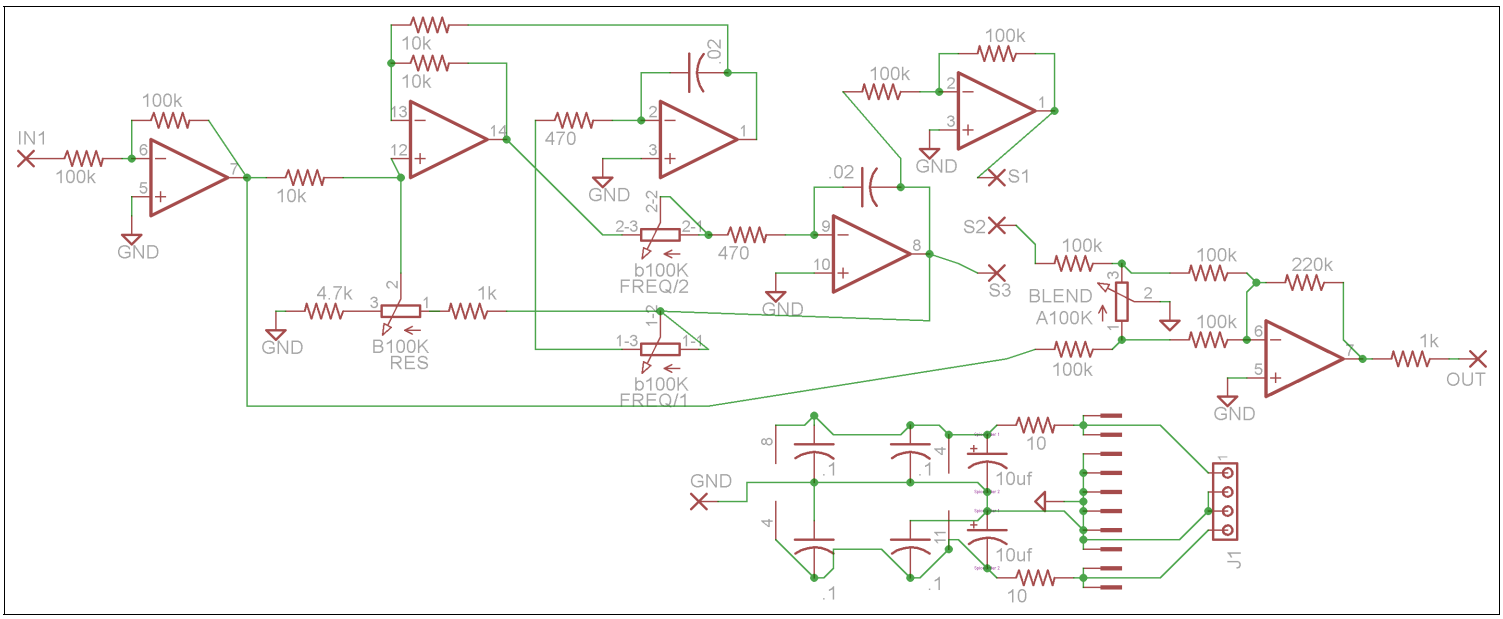
1.Frequency Knob – This knob sets the center frequency of the filter.

2.Resonance Knob – This knob controls the amount of feedback used in the filter. This helps control the amount emphasis on the chosen frequency.

3.Blend Knob – This knob controls how much of the filter's input is blended with it's output. Like the resonance knob, it helps control emphasis, but it works in a very different way.

4.Inversion switch – This toggles whether or not the filter's output is inverted before being sent to the blend control. By inverting the signal and then blending a little bit of the input signal, the frequencies which would have been emphasised by the filter will be de-emphasised.

5.Input/Output Jacks – These are the audio ins and outs of the module.



II. Schematic

In the upper left corner is the input of the module. It immediately goes into an inverting buffer. The output of the buffer is sent to the blend/mixer section and also into the bandpass filter section. The bandpass filter section is the same as used in BMC23. Analog Decaying Noise, with some alterations of the resonance control so more extreme settings could be acheived.

The filter is composed of three op amps and two potentiometers. The op amp on the far left is a differential amplifier which mixes our input signal with positive and negative feedback from our output. The differential amplifier feeds into one of two integrators, each integrataor has a dual ganged pot on it's input. The first integrator's output is sent on to the filter and then splits off into a negative feedback path on the bottom part of the diagram and into a second integrator to form a positive feedback path on the top.

The filter's output is then sent to one lug of the inversion switch and then to another inverting buffer. The output of the inverting buffer is then sent to the other outside lug of the inversion switch. The switch's center lug then connects to the blend/mixer section. The blend control is set up so that when the blend pot is set completely clockwise, the filter's output is completely grounded and the dry signal will be attenuated by half. When completely counter-clockwise, the opposite will happen. These signals are then mixed together by an inverting gain stage with gain of 2, to make up for the attenuation by the blend control.

On the bottom is the power section. The negative and positive rails of the power supply are filtered by a 10 ohm resistor and 10 uf capacitors forming a low-pass filter. Additional .1uf capacitors are placed at the power pins of all of the op-amps.

III. Construction

A.Parts List

Semiconductors

Value	Qty	Notes
TL074	1	14 pin DIP
TL072	1	8 pin DIP

Resistors

Value	Qty	Notes
10 ohm	2	7.5mm lead spacing. 1/4w Metal Film unless otherwise noted on all resistors
470 ohm	2	" "
1K	2	" "
4.7K	1	" "
10K	3	" "
100K	8	" "
220K	1	" "
B100K	1	16mm PC Mounted Single Gang
A100K	1	" "
B100K	1	16mm PC Mounted Dual Gang

Capacitors

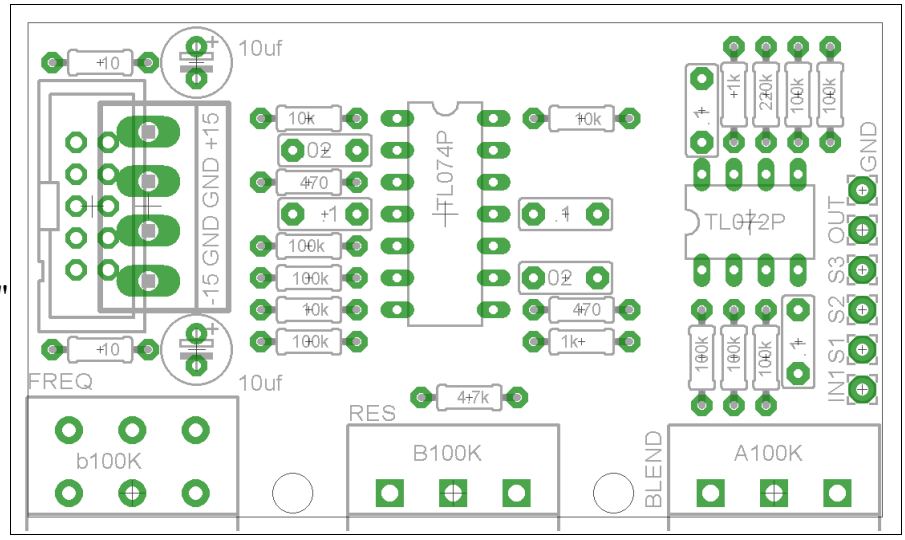
Value	Qty	Notes
.1uf	4	2.5mm lead spacing, use cheap ceramics
.02uf	2	Poly Box type
10 uf Capacitor	2	Electrolytic

Other

Value	Qty	Notes
8 pin Dip socket	1	
14 pin DIP socket	1	
Power Connecter	1	either Eurorack or MOTM style
SPDT On-On	1	
Jack	2	

B. PCB Information

To the right is the PCB. It's dimentsions are 67mm x 39mm. The pots are spaced 1" apart and the mounting holes are also spaced 1" apart



C. Wiring

Below is a photo of the offboard wiring for this module.