

## **BMC062. Simple Blend**

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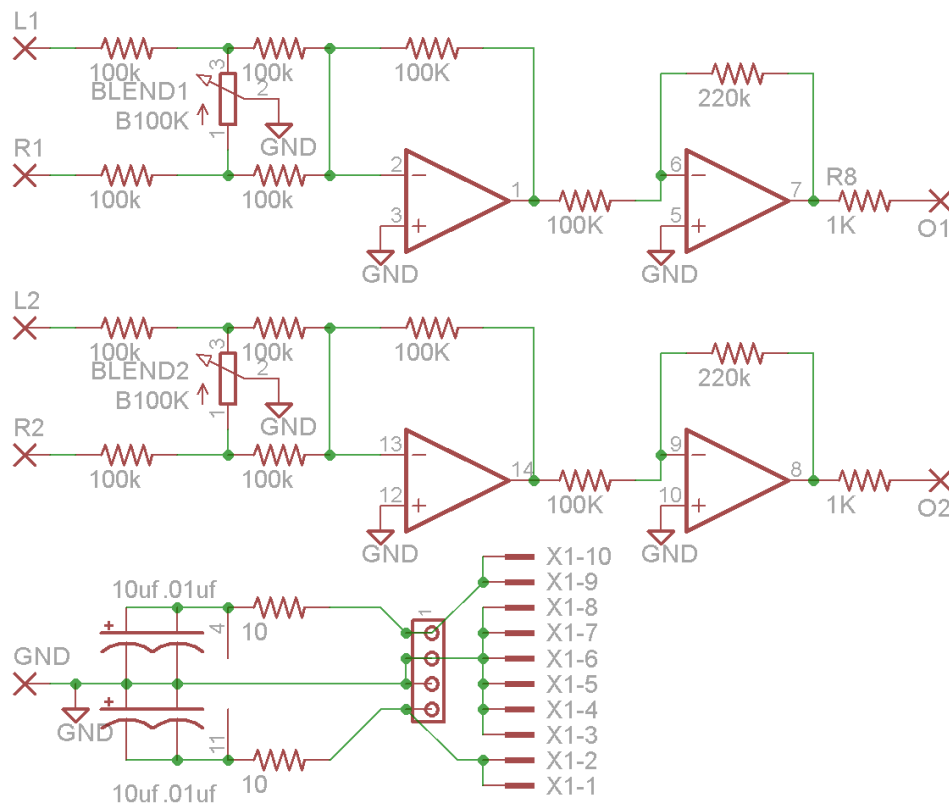
## I. What it Does

This module is two channels of “blend” style mixing. Each channel has two outputs, a blend knob and a single output. The blend knob controls how much of each input is present at the output. The fully clockwise and counterclockwise positions of the knob will result in an output of only a single output.

The output voltage when in fully clockwise and counterclockwise positions is slightly attenuated, so this module will detune your 1V/Oct CV signals.

This module can be used in both +/-12V or +/-15V systems without modification.

## II. Schematic



Above is the schematic for this module. Each channel's schematic is identical with inputs marked “L” and “R.” The “L” input will become more dominant as the blend knob is turned counterclockwise and “R” will become more dominant as turned clockwise. Each input is in series with a 100K input resistor that then connects to an outside lug of a 100K potentiometer with its wiper connected to ground.

This arrangement makes it so that when the knob is turned fully clockwise, the “L” input will go directly to ground through a 100K resistor, while the “R” input will be halved by the 100K/100K voltage divider formed by its input resistor and the potentiometer. When the pot is rotated to the center, each input will see a 100K/50K voltage divider that will result in the signal being attenuated to 1/3 of the input signal.

These attenuated signals are mixed together by a pair of op-amps wired as inverting amplifiers. The first amplifier uses all 100K resistors on the inputs and in the feedback loop to set the gain at 1 (no increase or decrease). The second amplifier uses a 100K input resistor but a 220K resistor in the feedback position to set the gain at 2.2 which compensates for the attenuation at the start of the circuit. A 1K resistor connects the output of the op-amp to the output wirepad.

At the bottom of the schematic, are the power connections. On the right are the PCB footprints for MOTM an Eurorack style connectors in parallel. The +/- power rails are filtered by a passive lowpass filter formed by a 10ohm/10uf RC pair. Additional .01uf capacitors are placed next to the power pins of the TL074 for additional filtering of high frequencies.

### III Construction

#### A.PARTS LIST

#### SEMICONDUCTORS

Name/Value	QTY	Notes
TL074	1	14 pin DIP package. Any quad op-amp with this pinout should work

#### RESISTORS

Name/Value	QTY	Notes
10 ohms	2	All resistors 1/4W metal film except potentiometers
1K	2	
100K	12	
220K	2	Labeled as 100K in first run of the PCB, see next section
B100K PC Mounted Pot	2	Alpha 16mm.

#### CAPACITORS

Name/Value	QTY	Notes
.1uf	2	cheap ceramic disc. Value not critical.
10uf	2	Electrolytic, 16V or higher rating.

#### OTHER

Name/Value	QTY	Notes
14 pin DIP socket	1	
Power connector	1	MOTM or Eurorack style
Jacks	6	

## B. THE BOARD

On the right are images of the PCB. The first production run of this PCB has an error, the 220K resistors are marked as 100K. These are highlighted in the image.

The PCB is 45mm x 42mm with the pots spaced 26.67mm apart.

Wiring is very simple for this module. Other than the “GND” wirepad, each wirepad connects to the tip connectors of the corresponding jack. “L1” and “R1” are the Left and Right input jacks for channel 1. “O1” is the output for channel 1. Channel 2 follows channel 1's convention. The “GND” wirepad should connect to the sleeve connector of any one jack.

On the next page are a couple of photos of a fully build module.

