

BMC043. 4X Decay.

Last updated 3-30-2016

If you have any questions, or need help trouble shooting, please e-mail
Michael@Bartonmusicalcircuits.com

I Overview/Features

II Schematic

III Construction

A.Parts List

B.The Board

C.Photos/Final Thoughts

I. Overview/Features

This module is a specialized envelope generator which produces only percussive decay type envelopes. It has four channels, each channel features a single input, output and decay knob. Inputs can be trigger, gate or oscillator type. The design goal was to be simple to use and provide many channels in a small module for use with larger patches.

II. Schematic.

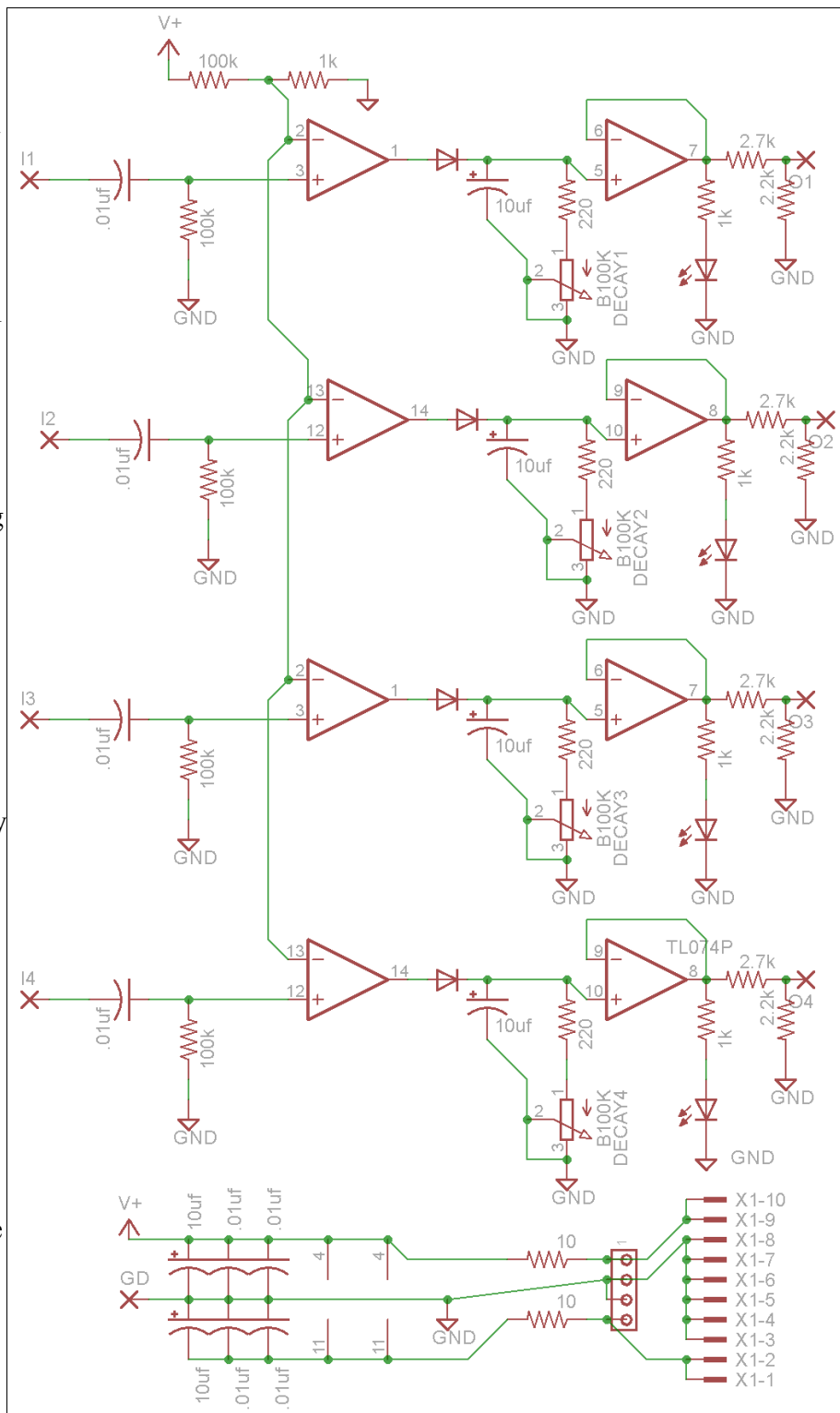
On the right is the schematic for the module. The schematic and PCB shows values for use with a 12V system, modifying for 15V just requires changing the 2.7K resistor to 6.2K. As you can see all four channels use an identical circuit. I will describe the circuit using channel 1 as an example.

The input is inserted through the wirepad on the left of the diagram titled "I1." The signal flows through a .01uF capacitor and 100K resistor to ground which form a pulse shortening circuit before going to the input of a comparator. The comparator's threshold is set by the 100K/1K voltage divider connected to its negative input terminal setting it at .12V for a 12V system or .15V for a 15V system.

The output of the comparator is connected to a switching diode only current to flow away from the comparator. This current will very quickly charge the 10UF capacitor. The capacitor will then discharge slowly through the 220 ohm resistor in series with 100K potentiometer to ground. The larger the total resistance, the slower the capacitor discharges.

The voltage present on the capacitor is then buffered by an op amp wired as a unity gain buffer. The output of this is then sent to an LED through a 1K current limiting resistor and then to the output wirepad marked "O1" through a 2.7K/2.2K voltage divider.

At the bottom are the power connections. There are two footprints for power headers, Eurorack and MOTM style. The power rails are filtered through 10ohm/10uF capacitor filters. Each TL074 then has .01uF capacitors at its power rails to filter out high frequency noises.



III. Construction

A.Parts List

Semiconductors

Name	Quantity	Notes
TL074	2	14 pin DIP package
1N4148	4	Or other small signal switching diode
LED	4	3mm

Resistors

Name/Value	Quantity	Notes
10 ohm	2	1/4W Metal film for resistors unless otherwise noted
220 ohm	4	
1K	5	
2.2K	4	
2.7K	4	Or 6.2K for 15V
100K	5	
B100K Potentiometer	4	PC Mounted 16MM Linear Taper

Capacitors

Name/Value	Quantity	Notes
.01uf	8	Ceramic disk
10uf	6	Eletrolytic

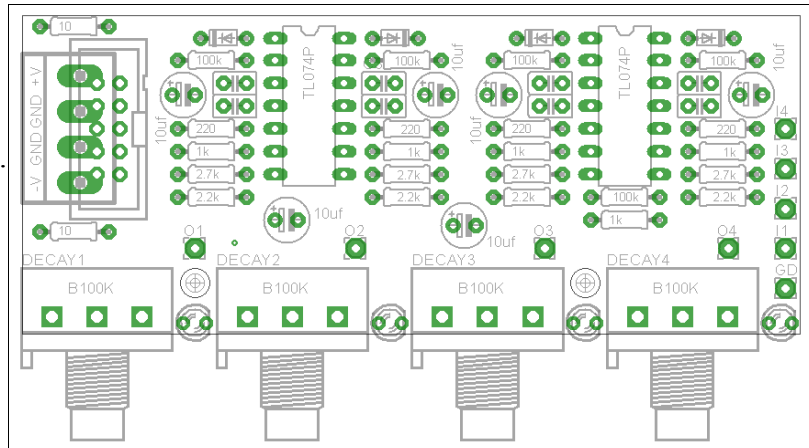
Other

Name/Value	Quantity	Notes
Power connecter	1	Eurorack or MOTM
Jack	8	
14 pin DIP socket	2	
Knob	4	

B. The PCB

To the right is a rendering of the PCB. Its dimensions are 36x86mm. The mounting holes are spaced 43.2mm apart, and the pots are spaced 21.6mm apart.

The “I” wirepads should be connected to the tips of the input jacks. The tip of one jack should be connected to the switch of the next to normalize inputs. The “O” wirepads should be connected to the tips of the output jacks



Below is an image showing the steps to installing the LEDs onto the PCB. And a photo of the wiring.

