

BMC041. CV Spreader.

Last updated 3-7-2016

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

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I. Overview

This module takes a CV input and then outputs evenly spread apart voltages above and below it. The amount of spread is controllable by external control voltage. This allows it to be used as a voltage inverter, or as a fixed gain amplifier.

INPUTS

1. Main input – This is the center voltage which the outputs are spread around.
2. Spread CV Input – This is the CV which determines the amount of spread.

OUTPUTS

1. +1 – This output's voltage will be equal to the the main input plus the spread CV.
2. +2 – This output's voltage will be equal to the the main input plus the spread CV doubled.
3. -1 – This output's voltage will be equal to the the main input minus the spread CV.
4. -2 – This output's voltage will be equal to the the main input minus the spread CV doubled.

CONTROLS

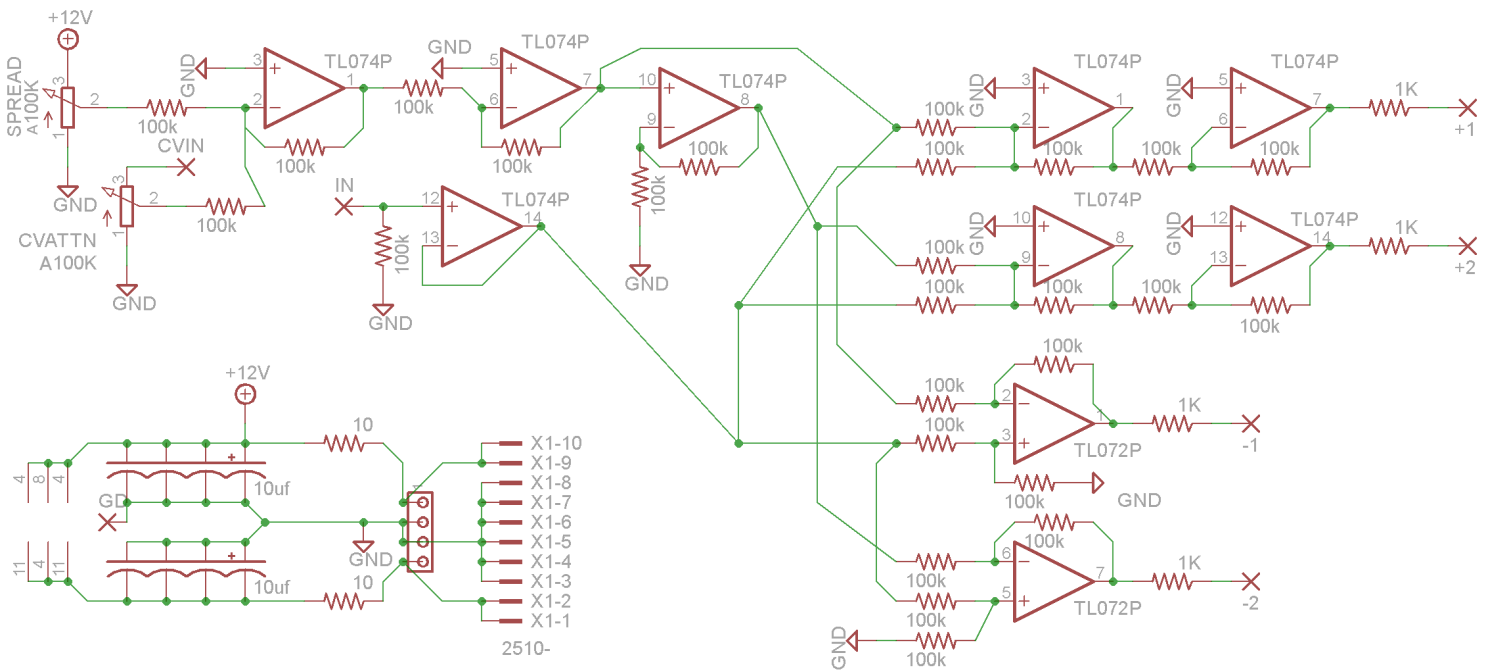
1. Spread – This is an offset voltage for the spread CV and can be used to determine spread without external CV.
2. CV ATTN – This attenuates the Spread CV Input.

II.Schematic

The schematic is on the next page. In the top left corner are the Spread and CV attenuator pots, the voltages on the wipers of these pots are mixed together by a pair of op amps configured as inverting amplifiers with a gain of 1 (no increase of voltage), I'll refer to the output of these op-amps as "V1". +1 is then sent to a non-inverting amplifier with a gain of 2 (doubling the voltage), I'll refer to this as "V2".

Under these op amps is the main input which is sent to a buffer and the output of the buffer's voltage is then compared V1 and V2 by the op amps to the right. The top two are pairs of inverting amplifiers with unity gain which are mixing together the V1 or V2 voltages with the input voltage to generate the "+1" and "+2" outputs. Under these two are a pair of differential amplifiers whose outputs are the difference between the input and V1/V2 to generate the "-1" and "-2" outputs.

Finally there's a power section in the lower left hand corner. There are PCB footprints for two types of power connector. The positive and negative rails are filtered by a 10 ohm/10uf passive low pass filter and then .01uf capacitors are placed near the power pins of the ICs to further filter noise out.



III. Construction

A. Parts List

Semiconductors

Name	Quantity	Notes
TL074	2	14 pin DIP
TL072	1	8 pin DIP

Resistors

Name/Value	Quantity	Notes
10 ohm	2	1/4W Metal film for resistors unless otherwise noted
1K ohm	4	
100k ohm	26	
A100K ohm Pot	2	Log taper, PC Mounted. The PCB is marked for linear taper but the module is easier to use with log.

Capacitors

Name/Value	Quantity	Notes
.01uf	6	Ceramic disc
10uf	2	Electrolytic

Other

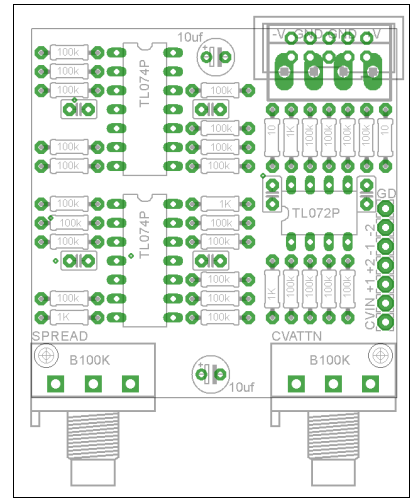
Name/Value	Quantity	Notes
Power connector	1	Eurorack or MOTM

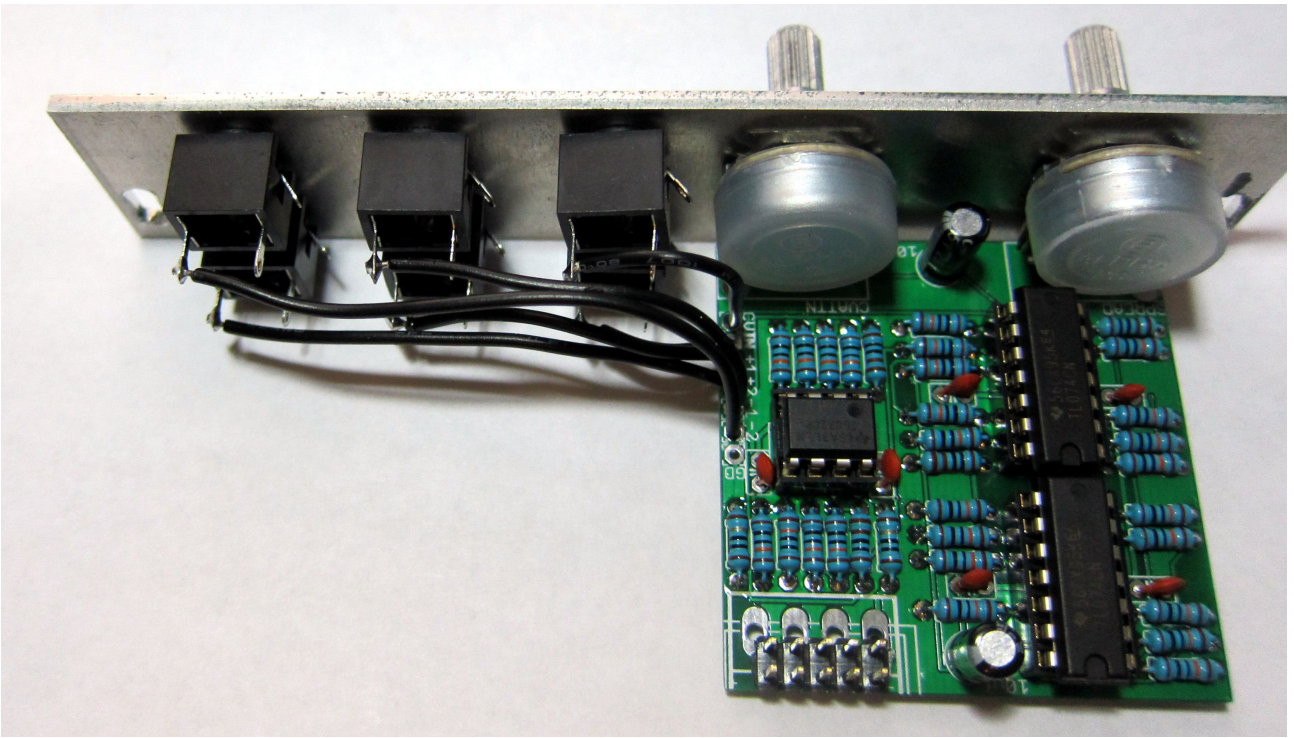
14 pin DIP socket	2	
8 pin DIP socket	1	
Jack	6	
Knob	2	

B. The PCB

To the right is a rendering of the PCB. It is 49mm x 50mm. The mounting holes are 45mm apart and the pots are 32.39mm apart.

All wirepads other than “GD” should be wired to the tip of the appropriate jack. “GD” is ground and should be wired to the sleeve connector of a jack.





Above is a photo of a completed module.