

## **BMC57. Gated Slew / Sample Hold**

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**NOTE: Version 1 of this PCB has an error in the silkscreen. The quad op-amp is labeled as an LM324. It should be a TL074. Sorry for the mistake, will fix in the next revision!**

## **I.Using The Module**

### **A. What does it do?**

This module can be used either as a Gated Slew or a Sample Hold. "Slew" is also sometimes referred to as "glide." In musical terms it's referred to as "glissando," sliding between the notes instead of changing in discreet steps. It's slide guitar instead of fretted guitar.

In Gated Slew mode, the amount of slew is controlled by the ONSLEW and OFFSLEW pots. When a gate or trigger is input or a button is pressed the ONSLEW controls the amount of slew, and the rest of the time OFFSLEW controls the amount of slew.

In Sample and Hold mode, whenever a gate or trigger is applied to the gate or trigger inputs, it will sample the voltage on the CV In and then hold that voltage on the CV output until the next gate or trigger. When using gates, it will technically be a "Track and Hold" as it will continuously sample the input. The "ON SLEW" control can be turned up in Sample and Hold mode to slew the path from input to output.

### **B. Controls/IO**

1.CV IN – A CV signal in the range of 0 to +10V should be input here. This is the signal that will be sampled or slewed

2.CV OUT – The slewed or sampled signal is output here.

3.Gate IN – Positive voltages on this input will activate the ONSLEW signal path.

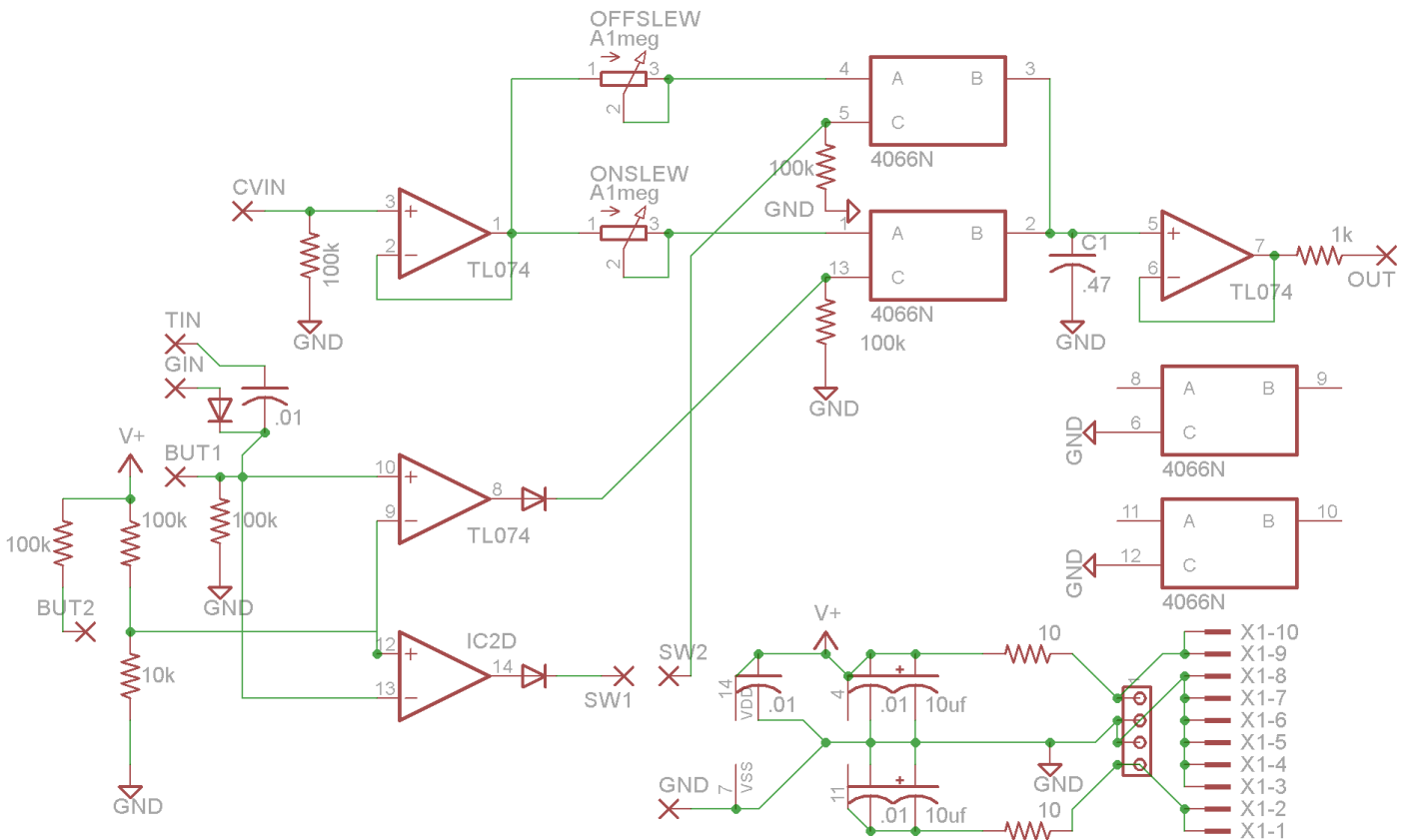
4.Trigger IN – Like the GATE IN, but goes through a trigger converter first.

5.Button – This creates a gate in signal.

6.SH/Slew toggle – This selects between the slew or Sample Hold mode.

7.ONSLEW – This knob sets the slew rate when the gate is active.

8.OFFSLEW – This knob sets the slew rate when the gate is not active. It has no effect in Sample Hold mode.



## II. Schematic

Above is the schematic for this module. All capacitor values are presented in microfarads. The CV signal goes into an op-amp buffer and is then sent to the ONSLEW/OFFSLEW pots which are wired as variable resistors. These resistors are each in series with a 4066 switch. The switches each lead to a .47uf capacitor to ground connected to an output buffer. The potentiometer and .47uf capacitor form a low-pass filter which creates the slew signal. In Sample Hold Mode the capacitor will hold the sampled voltage.

The Gate and trigger inputs (GIN and TIN) go through a switching diode and 100K resistor respectively before connecting to the inputs of a pair of comparators. The trigger input (TIN) goes through a .01uf capacitor into a 100K resistor to ground, forming a high pass filter which will make gate signals seem like very short triggers. The button connects to the V+ supply through a 100K resistor (BUT2) and then connects to the inputs of the comparators (BUT1).

The two comparators inputs are reversed so that when one is turned on the other is turned off, so that in slew mode one 4066 is always active. A 100K/10K voltage divider sets their threshold voltage at  $1/10^{\text{th}}$  of V+. The top comparator turns on the 4066 in series with ONSLEW and the bottom goes through the SH/Slew toggle before connecting the 4066 for OFFSLEW. When the SH/Slew toggle is open, the 4066 for OFFSLEW is never active due to the 100K pull down resistor.

In the bottom right are power connections. A 10ohm/10uf low pass filter will help keep power stable in case of noise on the power rails. The TL074 is run on a bi polar power supply, but the 4066 is unipolar, connecting to ground and V+. .01uf capacitors are placed near the power pins to further filter the power.

### III. Construction

#### A.Parts List

##### Semiconductors

Value	Qty	Notes
CD4066	1	DIP 14 pin version
TL074	1	DIP 14 pin. Marked "LM324" in version 1 of PCB. Any JFET input quad op amp should work.
1N4148	3	Or other switching diode.

##### Resistors

Value	Qty	Notes
10 ohm	2	7.5mm lead spacing. 1/4w Metal Film unless otherwise noted on all resistors
1K ohm	1	
10K ohm	1	
100K ohm	6	
A1MEG Pot	4	PC mounted 16MM

##### Capacitors

Value	Qty	Notes
.01uf	4	Ceramic type.
.47uf	1	Polyester Film Box type
10uf	2	2.5mm lead spacing Electrolytic 16V or higher

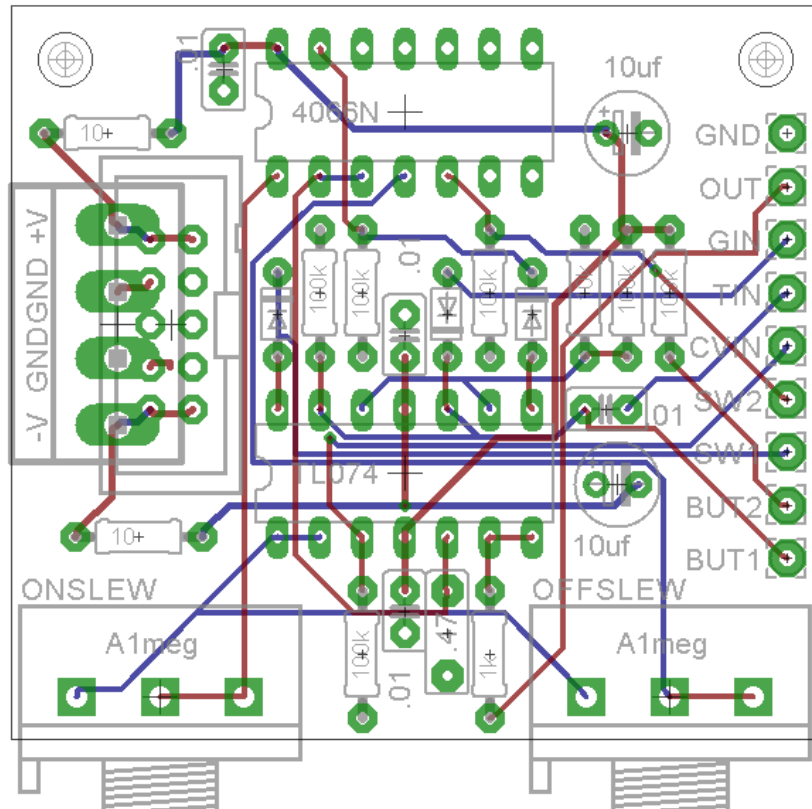
##### Other

Value	Qty	Notes
14 pin Dip socket	2	
Power Connector	1	either Eurorack or MOTM style. See last section for more information.
SPDT ON-ON	1	Or SPST
Jack	4	
Pushbutton	1	

## B. PCB Information

To the right is an image of the PCB with its traces. Blue traces are the top and red are on the bottom. The "ground fill" is not shown for clarity.

Potentiometers are spaced 30.5mm apart and the mounting holes are 44.9mm apart.



## C. Wiring

Below is a photo of a completed module. Wiring is straightforward, all jack connections go to the tip connectors. The wirepads should connect like this:

- |                        |  |
|------------------------|--|
| 1. GIN – Gate Input    | 5. GND – Sleeve connector of any jack.         |
| 2. TIN – Trigger Input | 6. SW1 – Center lug of toggle                  |
| 3. CVIN – CV Input     | 7. SW2 – Top lug of toggle                     |
| 4. OUT – CV Output     | 8. BUT1/BUT2 – The two lugs of the pushbutton. |

