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	Name	Initials	Date	Title:		
Drawn	Peter Konecny	PK	13/04/2022	Interface between eurorack CV and Monotron		
Chkd				Document No:	Rev:	Sheet of
Approved				CV_MONOTRON-002	2	1/3

**Eurorack-monotron interface**

**R20 trimming range worst case:**  
min:  $\frac{47 \cdot 101\%}{(47 \cdot 101\% + 10 \cdot 90\% + 110 \cdot 99\%)} = 0.287$   
max:  $\frac{(47 \cdot 99\% + 10 \cdot 90\%)}{(47 \cdot 99\% + 10 \cdot 90\% + 110 \cdot 101\%)} = 0.333$   
for 5V:  $V_{min} = 1.435V$ ;  $V_{max} = 1.666V$

**R19 Trimming range worst case:**  
min:  $\frac{39.8 \cdot 101\%}{(39.8 \cdot 101\% + 10 \cdot 90\% + 50.3 \cdot 99\%)} = 0.406$   
max:  $\frac{(39.8 \cdot 99\% + 10 \cdot 90\%)}{(39.8 \cdot 99\% + 10 \cdot 90\% + 50.3 \cdot 101\%)} = 0.488$

**Desired output: 1.56V**

**Desired output: 0.44V/oct**

**Desired output:  
NOTE ON:  
0.44V/oct, starting at 1.56V  
NOTE OFF:  
0V**

**I(Q1) < 0.2mA for maximum inputs**

**Do not place JACKS too close to each other,  
as the connectors are wider than the plugs and might not fit**

**pitch\_CV J1**

**gate\_CV J2**

**cutoff\_CV J3**

**TP1**

**TP2**

**TP3**

**TP4**

**TP5**

**TP6**

**GATE\_MONOTRON**

**CUTOFF\_MONOTRON**

**Q1 N-MOSFET**

**IC1A LM324D**

**IC1B LM324D**

**IC1C LM324D**

**IC1D LM324D**

**R1 47k**, **R2 10k**, **R3 47k**, **R4 47k**, **R5 33k**, **R6 3k3**, **R7 100k**, **R8 10k trimmer**, **R9 33k**, **R10 6k8**, **R11 10k**, **R12 10k trimmer**, **R13 47k**, **R14 47k**, **R15 47k**, **R16 47k**, **R17 47k**, **R18 68k**, **R19 68k**, **R20 500k trimmer**

**C1 1n**, **C2 10n**, **C3 100n**, **C4 1u**, **C5 10u**

**+5V**, **-0.9V**, **GND**

**README:**  
Both gate and pitch testpads on monotron enter a summing op-amp, which controls the VCO.  
However, the pitch itself does not trigger the VCO enable, while the gate does.  
The gate starts triggering at about 1.4V and C0 is generated when 1.56V is applied and then its 0.44V/oct.  
Eurorack voltages are 1V/oct so we need to scale it down to 0.44V/oct and offset it by 1.56V for the lowest note.  
Moreover, to prevent gate being triggered when note is not playing, the external gate\_cv controls a transistor Q1, turning it on when the note is OFF. By turning Q1 ON, the transistor pulls the + junction of the summing op-amp to 0, resulting in the output being 0 as well, which disables the monotron VCO, because its less than 1.4V,

The cutoff\_monotron signal connects to a summing op-amp in Monotron.  
The internal cutoff signal enters the op-amp through 68k resistor so doubling the value to 2\*68k will reduce the incoming signal effect by 2.  
However, it is important to measure the internal cutoff signal to see its magnitude.  
then choose R17, R18 to scale external signal accordingly.  
500k trimmer for attenuation control.

All resistors must be at least 1% accuracy  
All capacitors should be rated atleast 5V  
unless stated otherwise

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