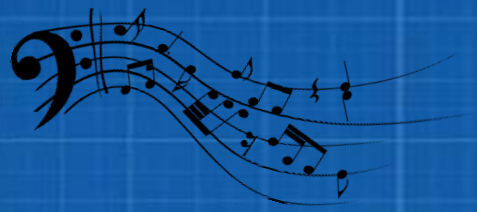
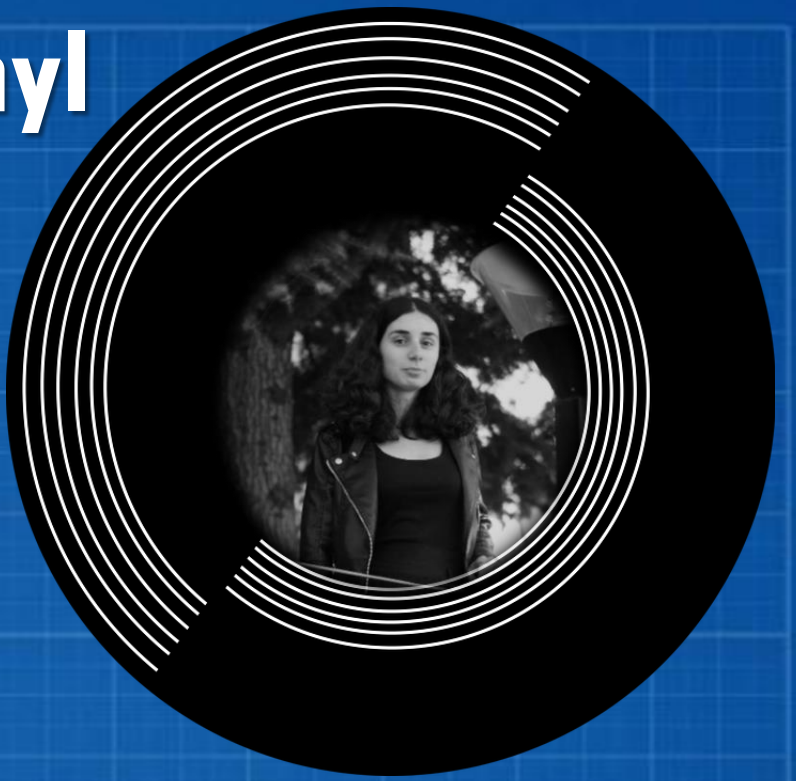
Frequency Filter Of Vinyl





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Plan

Introduction:

- Vinyl as a main character
- How it works

Main:

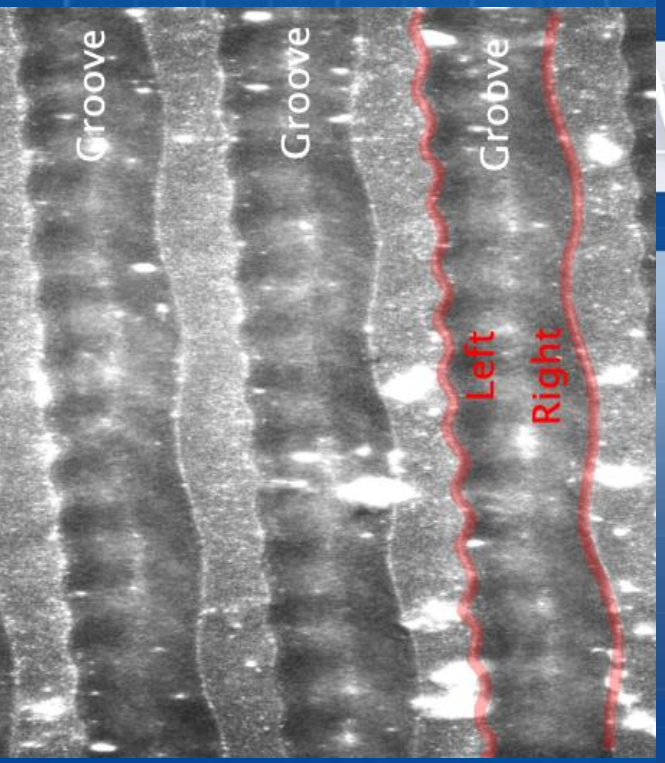
- RIAA with frequency table
- Comparing curves
- Circuits: Frequency Filter + Mixer

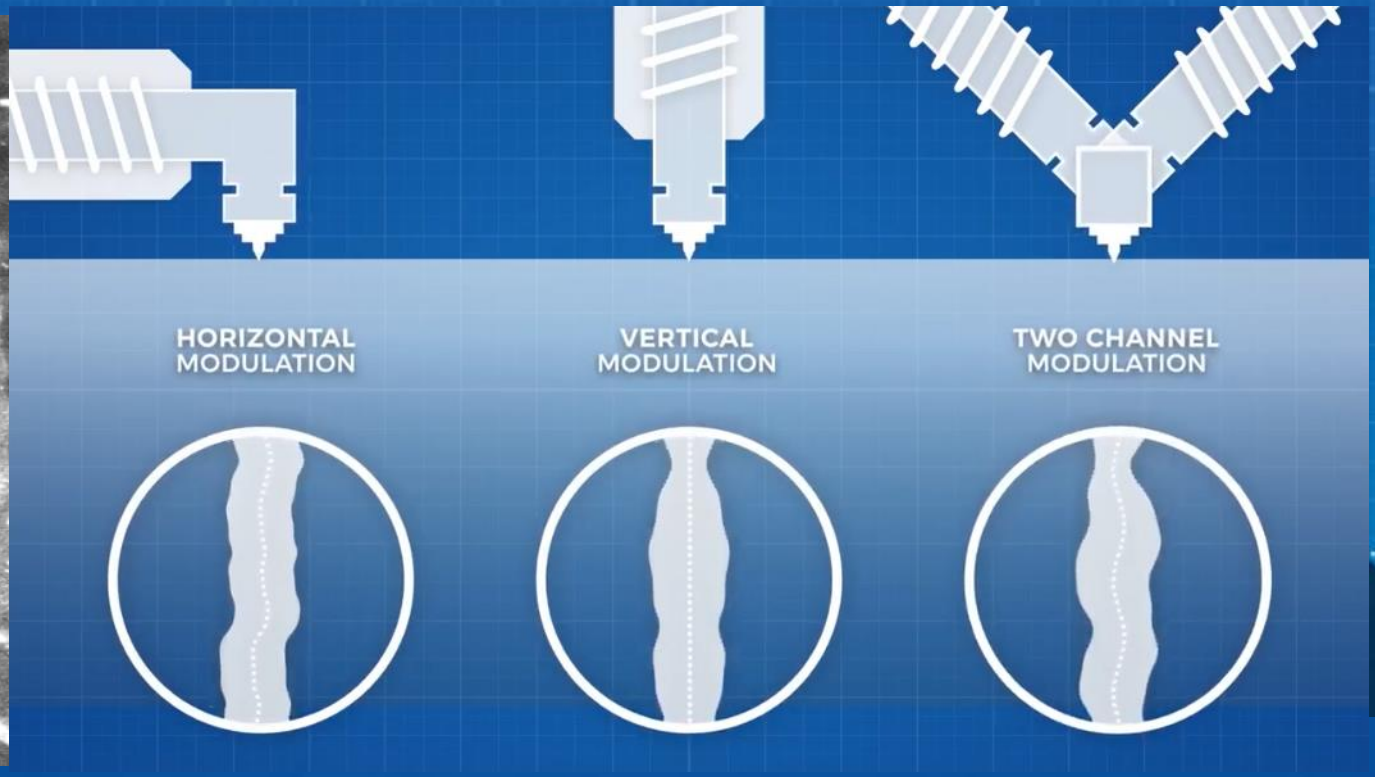
Conclusion:

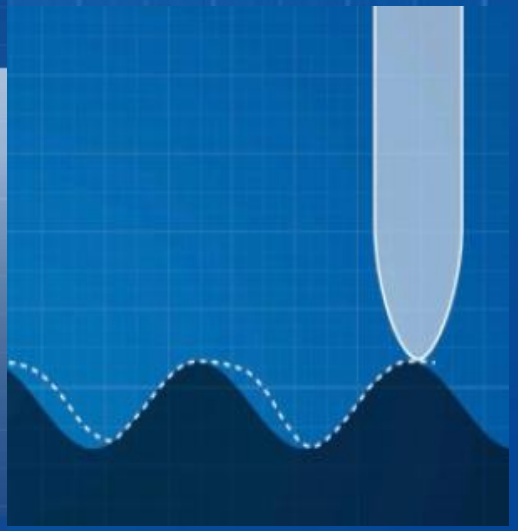
- Pros and Cons
- Development

Information recording process

Stereo Plate
Left: high-frequency waveform (Above 3000Hz)
Right: low-frequency waveform (Up to 800 Hz)

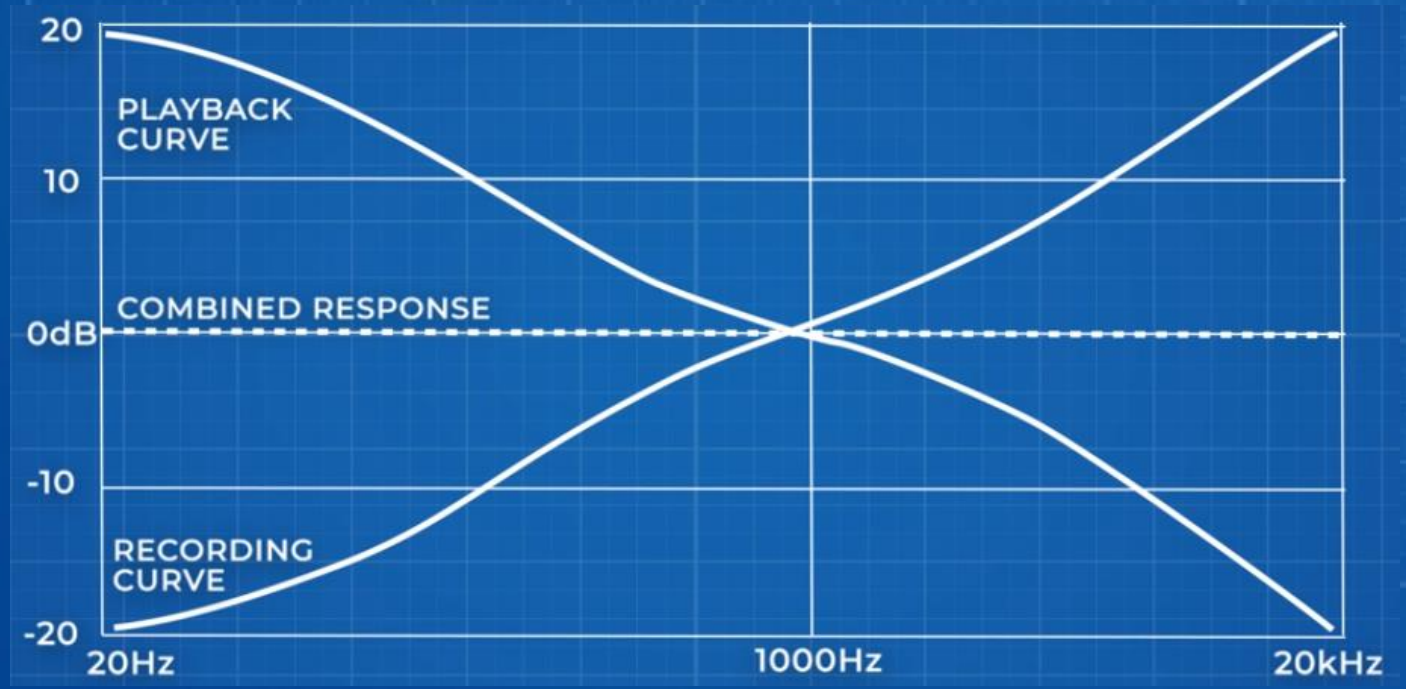






RIAA equalization

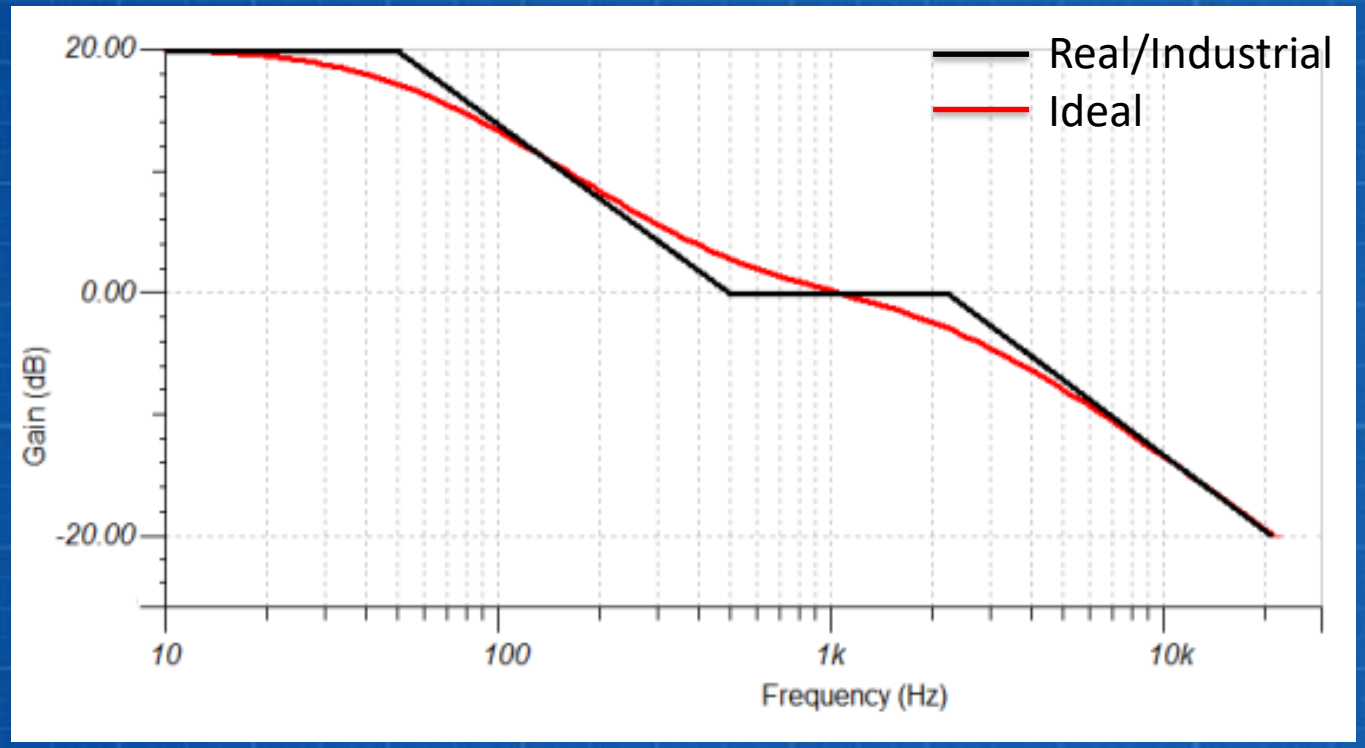
- It allows for more time per side of the vinyl record.
- It reduces typical noise like hiss and clicks associated with records.
- reduces the groove damage
- improves sound quality,



Decibels corresponding frequency

Hz	dB	Hz	dB
10	19,8(9,8)	630	1,6
20	19,3(14,2)	800	0,8
31,5	18,6(15,8)	1 000	0
40	17,8(16,2)	1 250	—0,8
50	17,0(15,7)	1 600	—1,6
63	15,8(15,0)	2 000	—2,6
80	14,5(13;9)	3 150	—5,0
100	13,1(12,7)	4 000	—6,6
125	11,6	5 000	—8,2
160	9,8	6 300	—10,0
200	8,3	8 000	—11,9
315	5,2	10 000	—13,7
400	3,8	12 500	—15,6
500	2,6	16 000	—17,7
		20 000	—19,6

Real vs Ideal Amp-Freq characteristic of Vinyl Filter



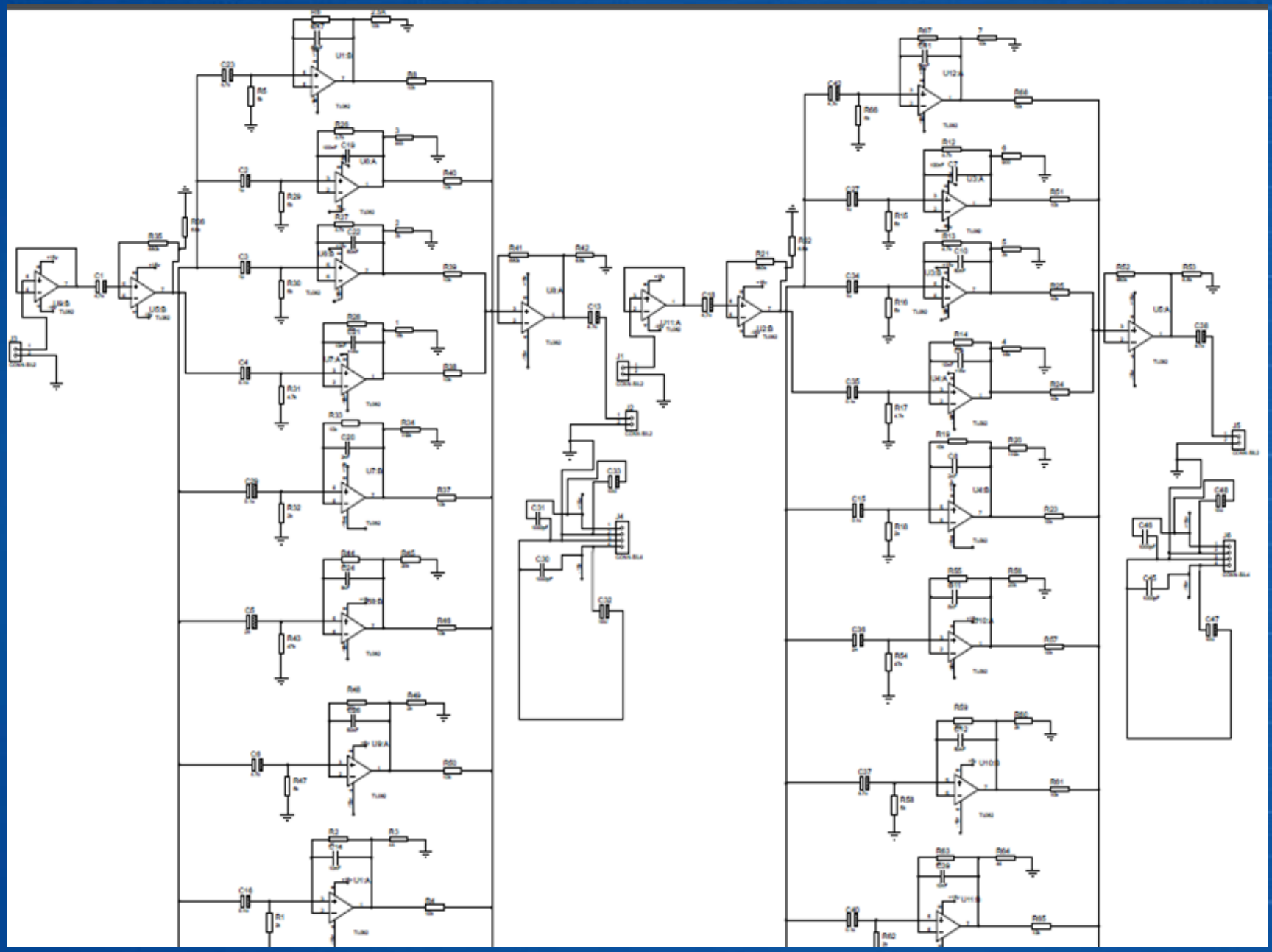
Disadvantages of industrial vinyl filter

- Incomplete amplify of frequencies
- High thermal noise
- Sound distortion



Circuit Design

- Frequency Filter: Ideal/Real
- Mixer; adjusting volume



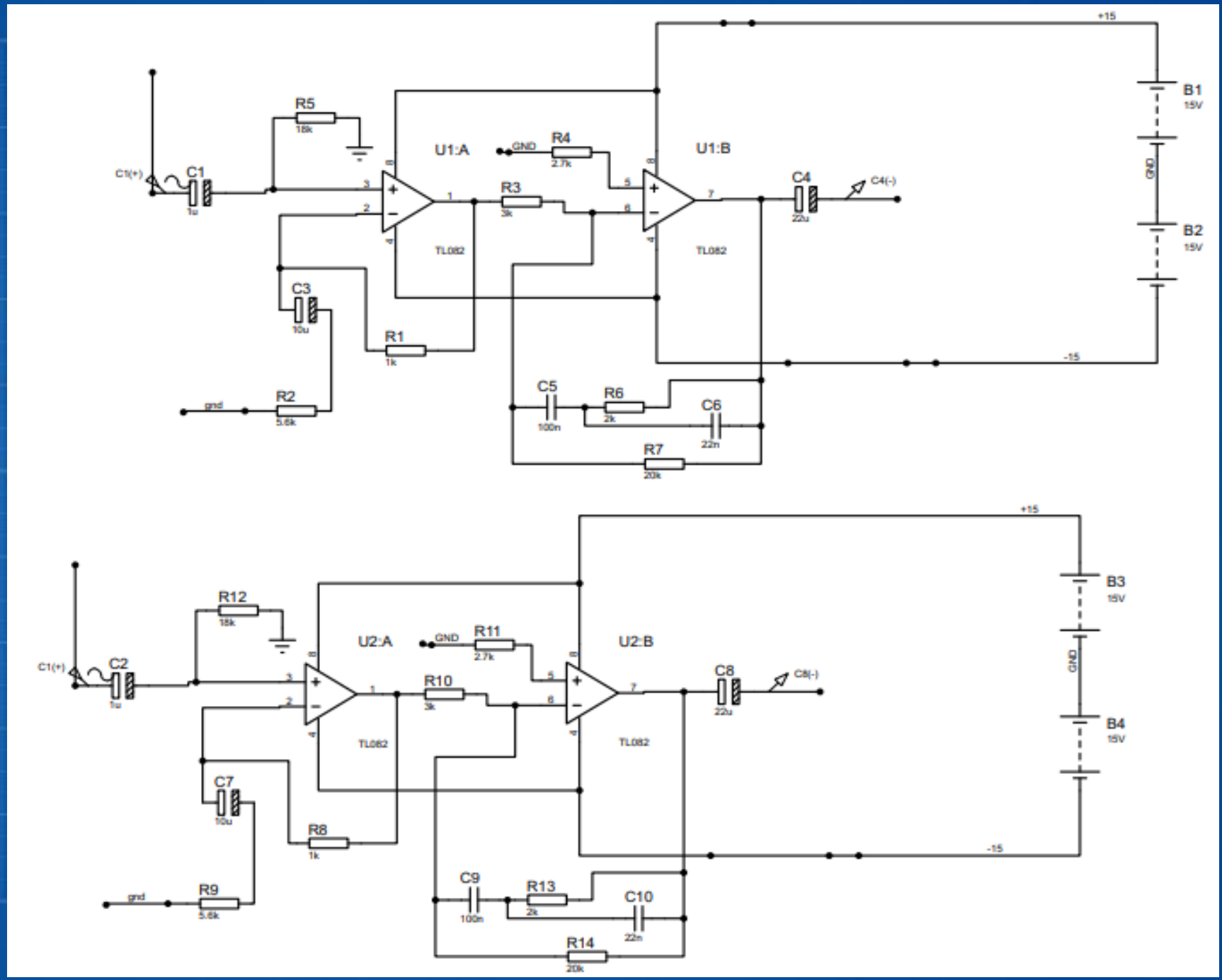
Ideal Frequency Filter of Vinyl

Problems

- Unrealized in practice
- High Thermal Noise
- High cost

Solution

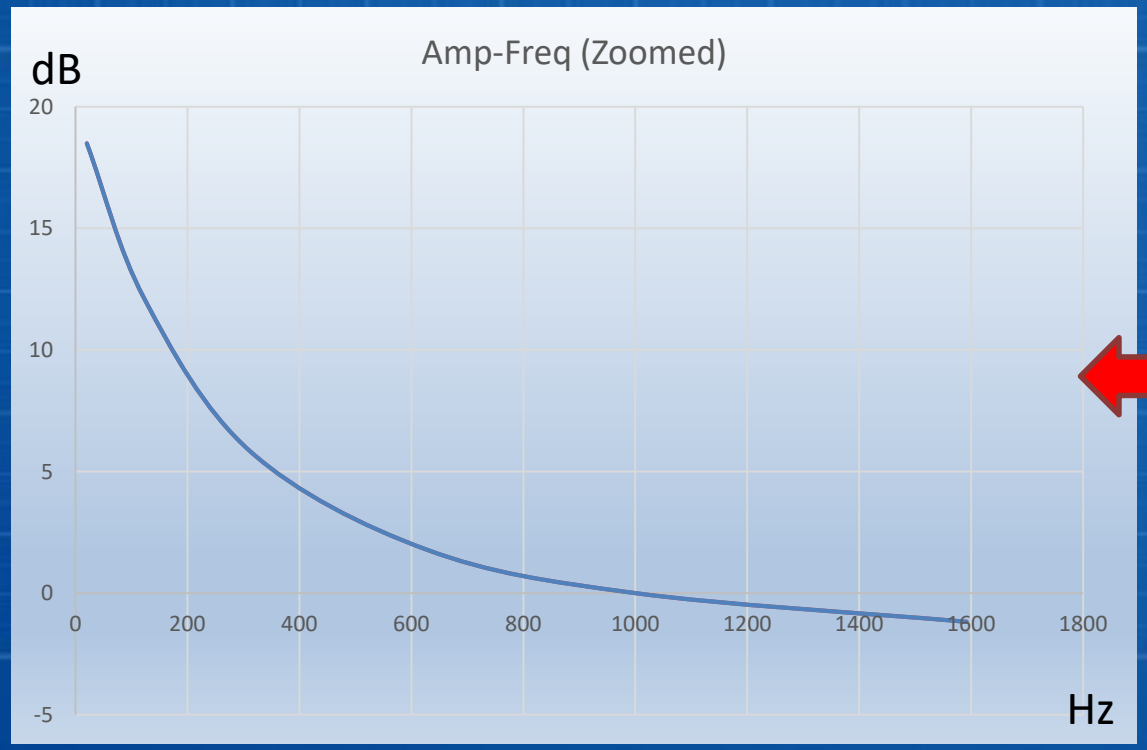
- Practical
- Almost Ideal Amp-Freq characteristic
- High Efficiency
- Low cost

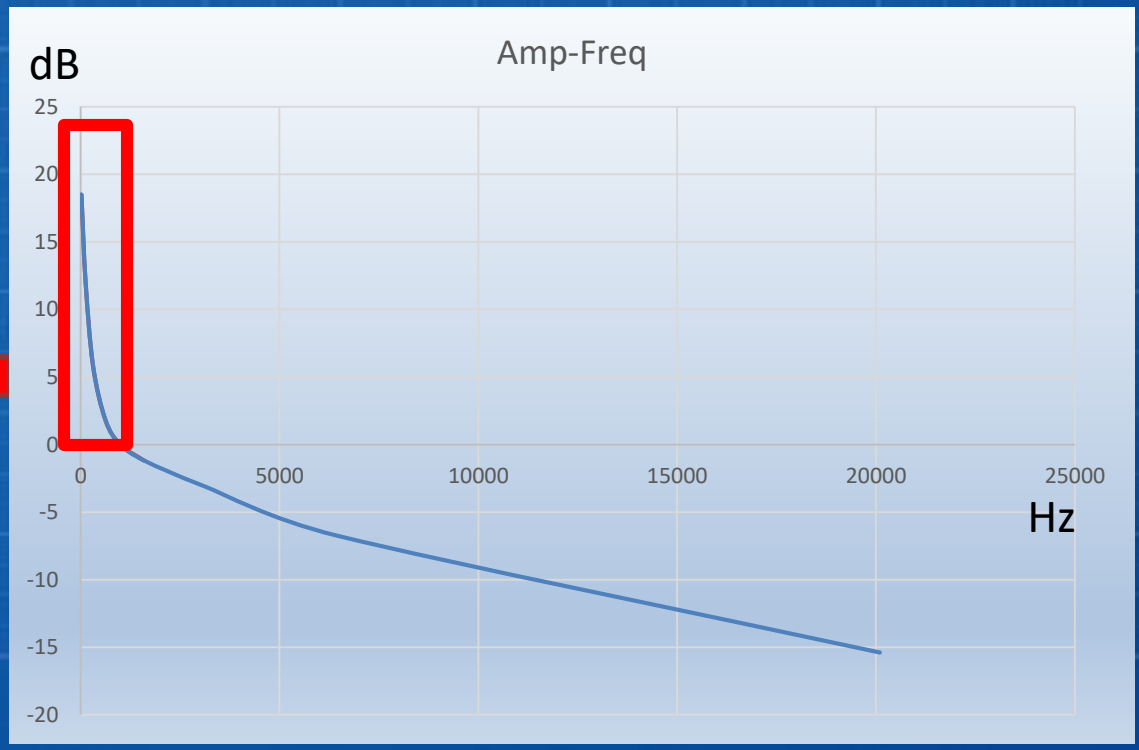


Estimated amplitude-Frequency Curve

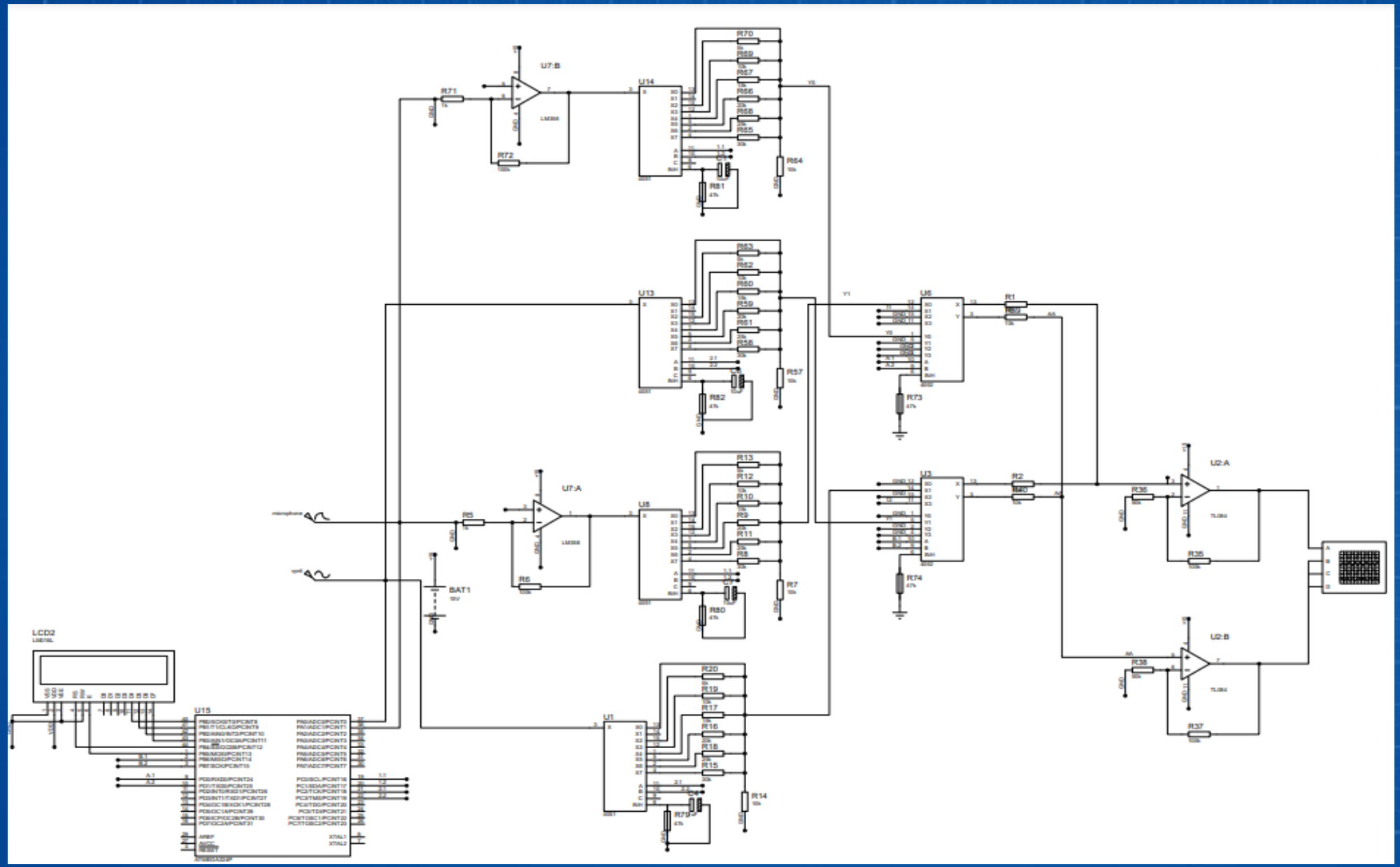
Hz	dB
20	18.5
123	12.1
312	5.83
627	1.79
1000	0
1592	-1.18
3144	-3.13
6450	-6.75
20100	-15.4

Filtered frequencies according to the circuit

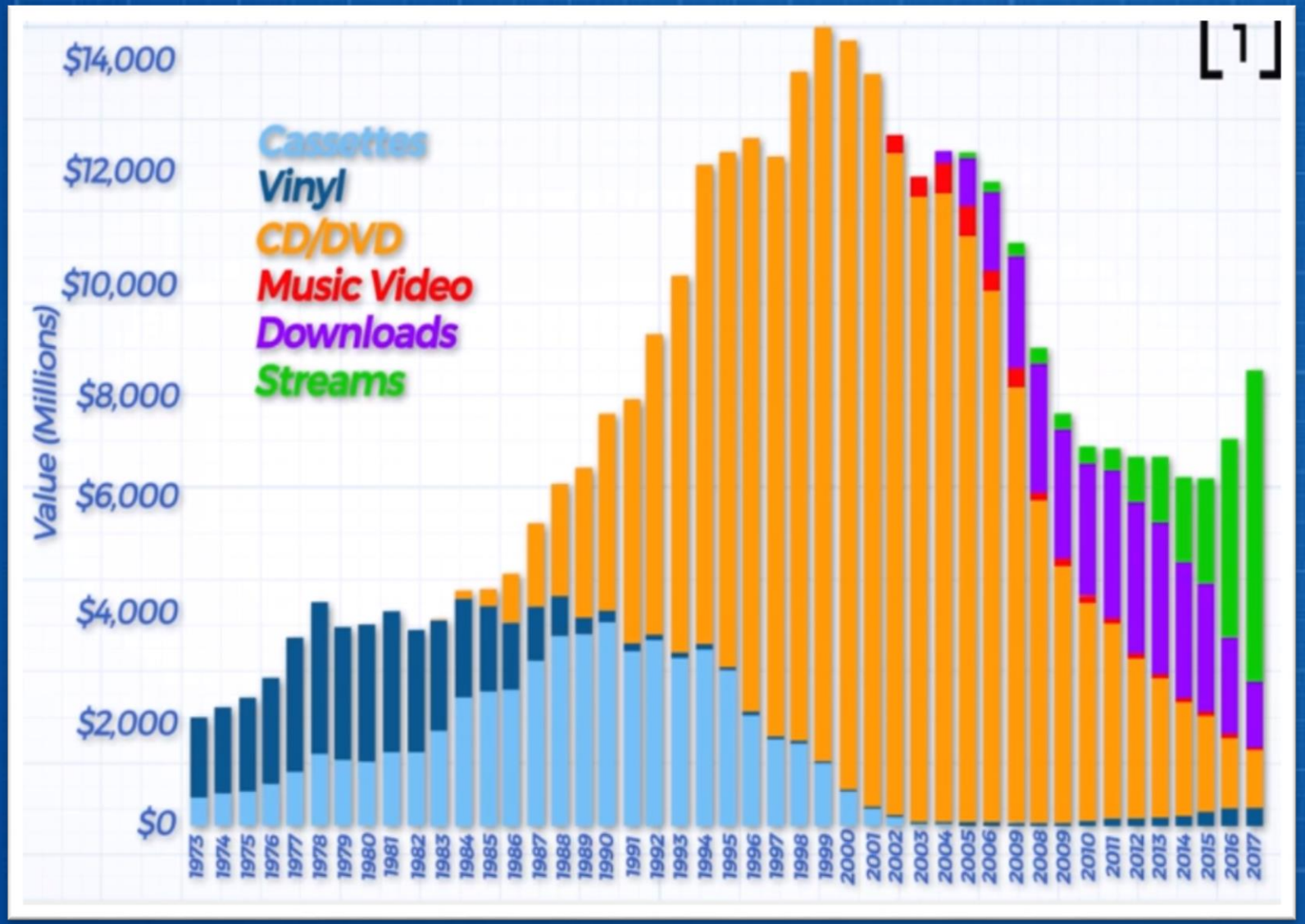




Mixer


U7:B
U7:A
U14
U13
U8
U1
U6
U3
U2:A
U2:B
U15
LCD2
BAT1
microphone
R70
R69
R67
R66
R68
R65
R64
R71
R72
R61
R58
R57
R82
R73
R13
R12
R10
R9
R11
R8
R7
R80
R5
R6
R74
R20
R19
R17
R16
R18
R15
R14
R79
R1
R2
R36
R35
R38
R37

Music Industry Sales



Last decade the demand of vinyl has increased by 10% (approx.) worldwide

Future Plans

- To add other analog signals in mixer
- External regulation of signal amplitude

Time For Simulation

Thank you ☺