MUSIC EQUALIZER

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TASKS WE NEED TO DO:

Equalizer Selection

Filter Implementation

Design of the Presets Mode

Interaction with User

EQUALIZER SELECTION:

- Graphic Equalizer

$$B_i = \omega_{u,i} - \omega_{l,i} \qquad \omega_{M,i} \equiv \sqrt{\omega_{l,i}\omega_{u,i}}$$

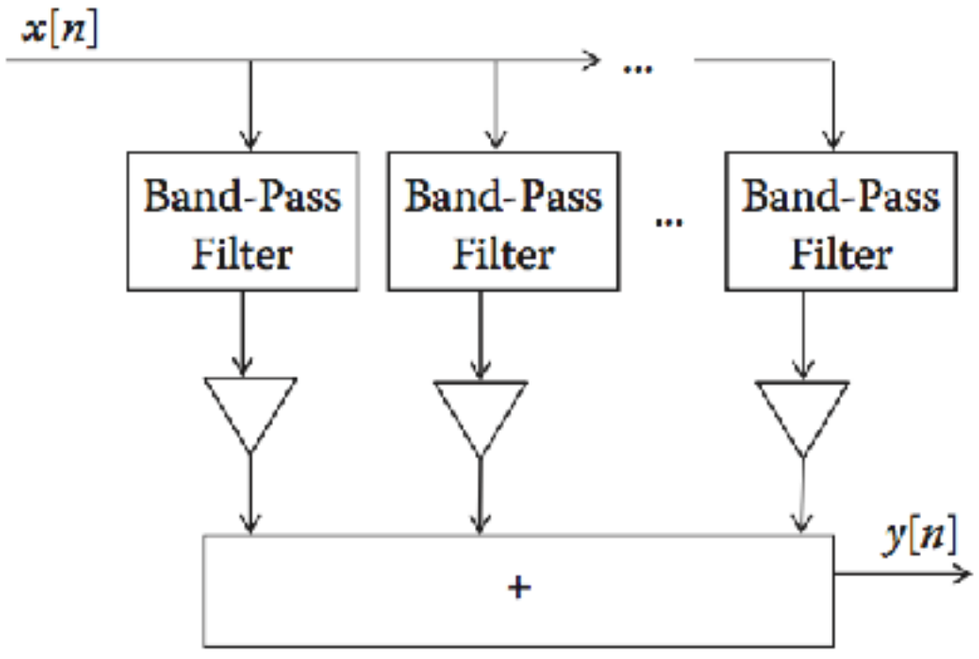
$$R = 2 \qquad \omega_{M,i+1} = R \cdot \omega_{M,i}$$

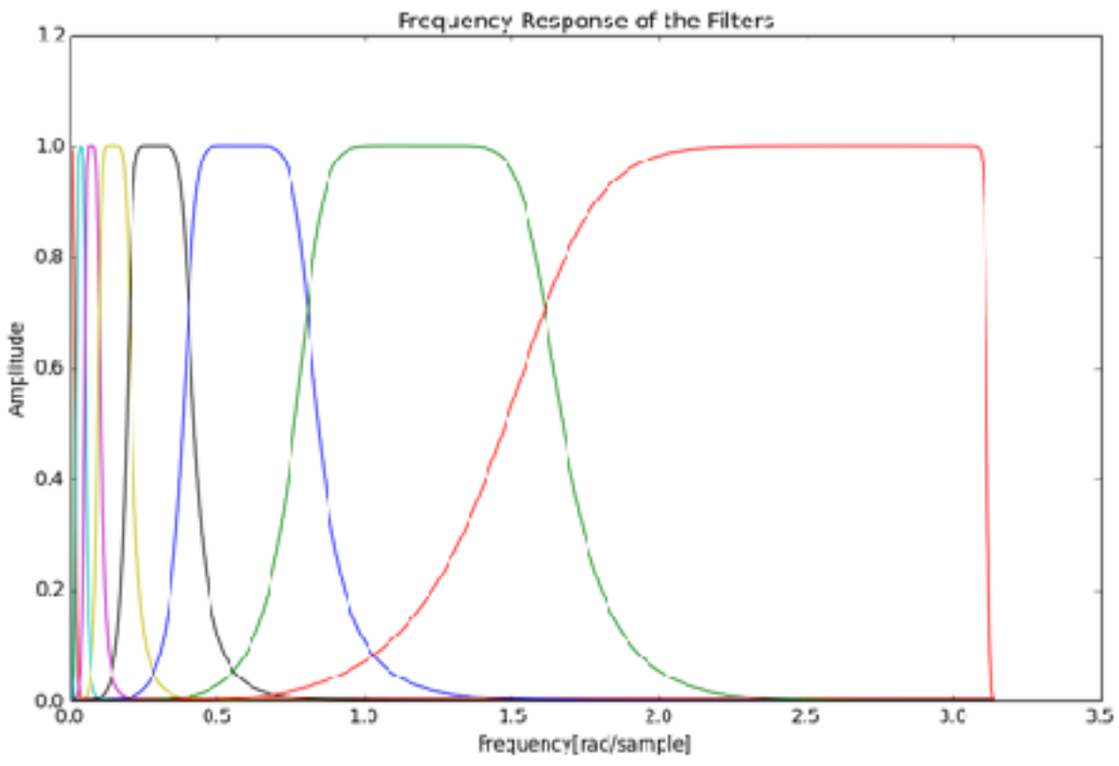
- 10-bands(Octave Frequency Bands)
- The ISO Standard

Octave Bands		
Lower Frequency f_l (Hz)	Geometric Mean Frequency f_M (Hz)	Upper Frequency f_u (Hz)
22	31.5	44
44	63	88
88	125	177
177	250	355
355	500	710
710	1000	1420
1420	2000	2840
2840	4000	5680
5680	8000	11,360
11,360	16,000	22,720

FILTER IMPLEMENTATION:

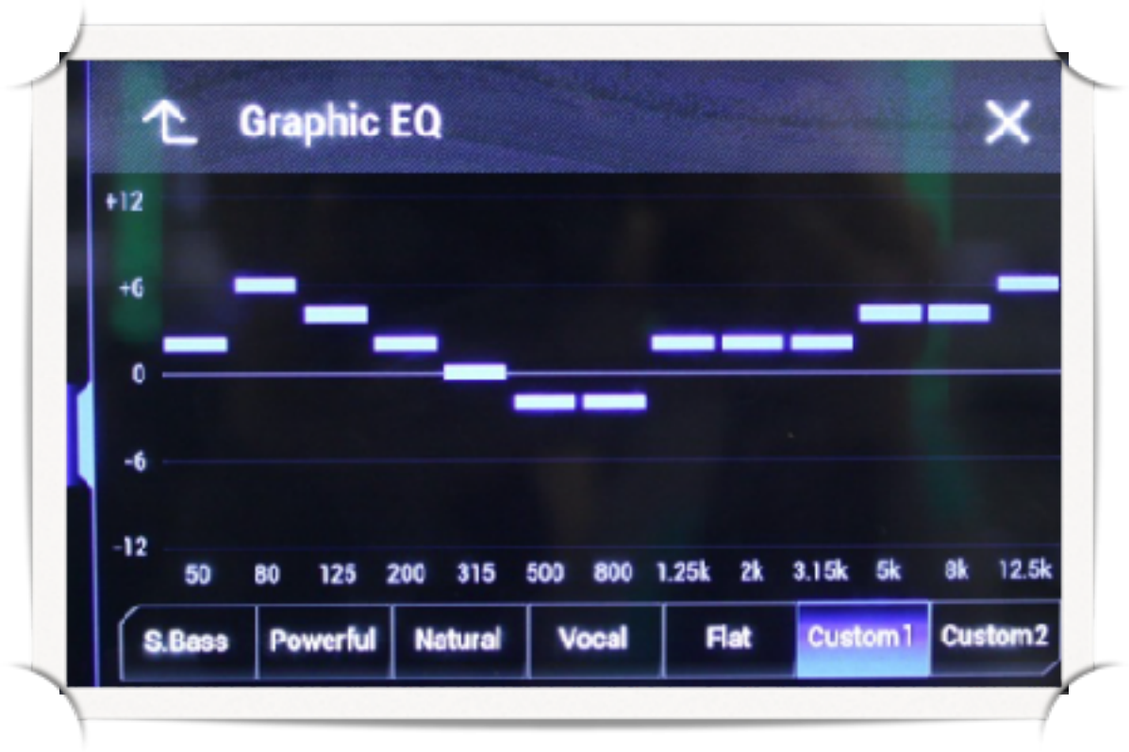
- Band-pass filters placed in parallel (IIR)
- Time domain: spicy.signal, differential equations(not good)
- 8th-order Butterworth Band-pass filter
- 4th-order elliptic low-pass filter





DESIGN OF THE PRESETS MODE:

- Six presets:
- Bass, Rock, Vocal, Pop, Classic, Special
- (Parameters: -12dB~+12dB)
- Customized Settings



INTERACTION WITH USER:

- GUI? No! CLI Q&A Dialog
- Music Playlist
- Presets-Mode List
- Input Error Prevention
- Keyboard Control(Later)
- Demo

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We have the following music:
003.wav
0032.wav
01.wav
04.wav
06.wav
author.wav
music1.wav
music2.wav
music3.wav
test3.wav
test4.wav
yue.wav
Enter the music filename you want to play:
```

THANK YOU!