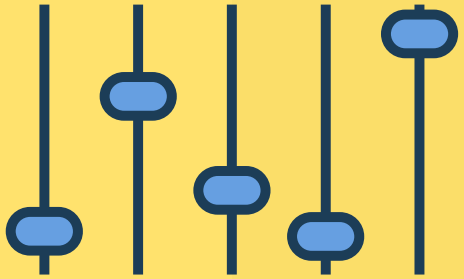


Chapter six

Mixing

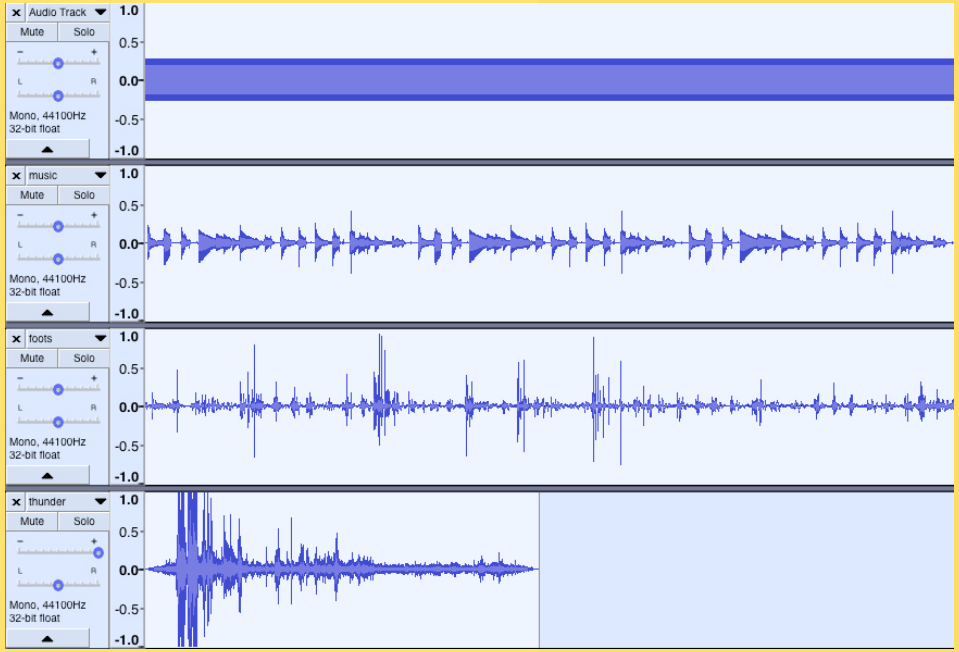
Studying Sound

OUTLINE

Dynamic Range
Compression, Limiting & Normalization
Expansion
Gating and Ducking
Noise Reduction
Mixing theories
Figure and Ground/ Signal to Noise
Panning
Point of Audition

Dynamic Range

Which has the MOST and LEAST dynamic range?



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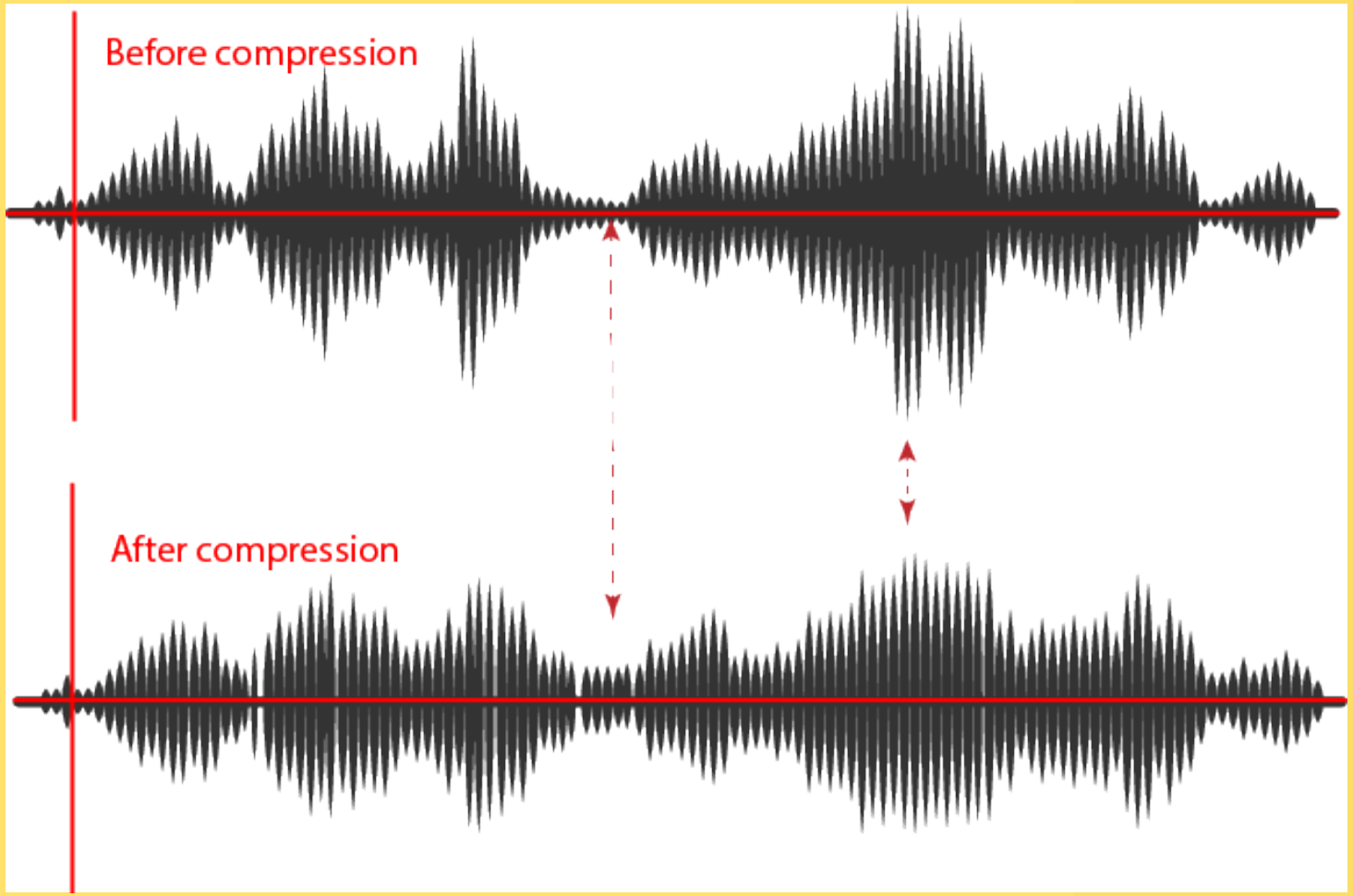
Compression



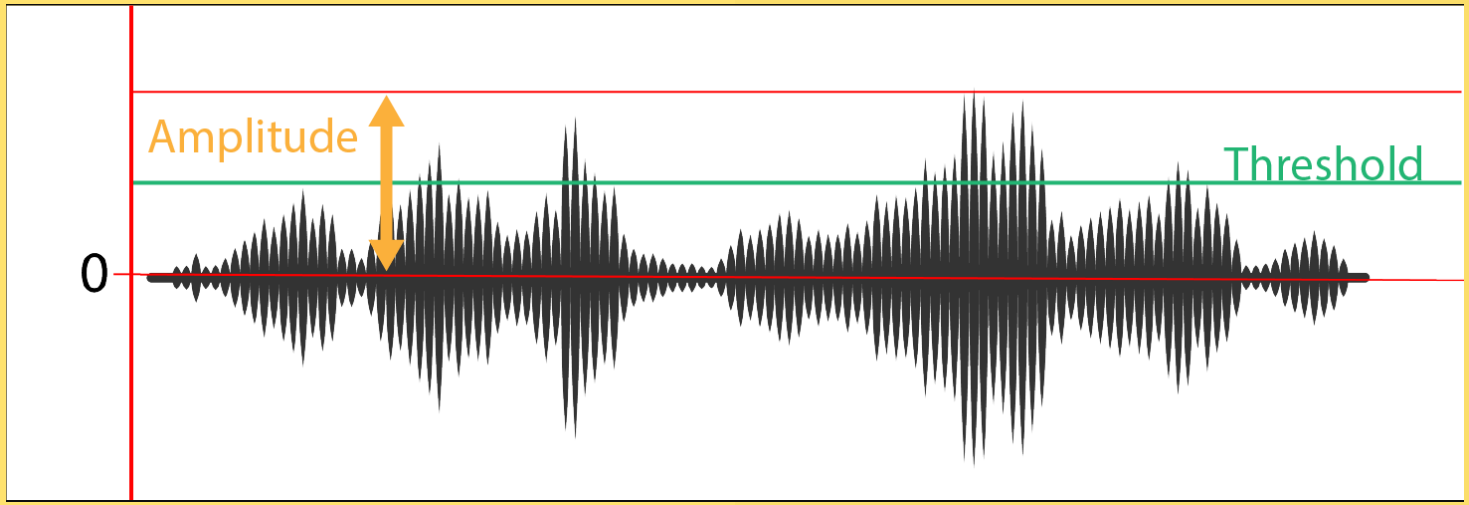
Reduces dynamic range over whole file

(“squashes”) by Cutting High and boosting Low

Studying Sound

Compression Threshold

How loud signal is before compression is applied

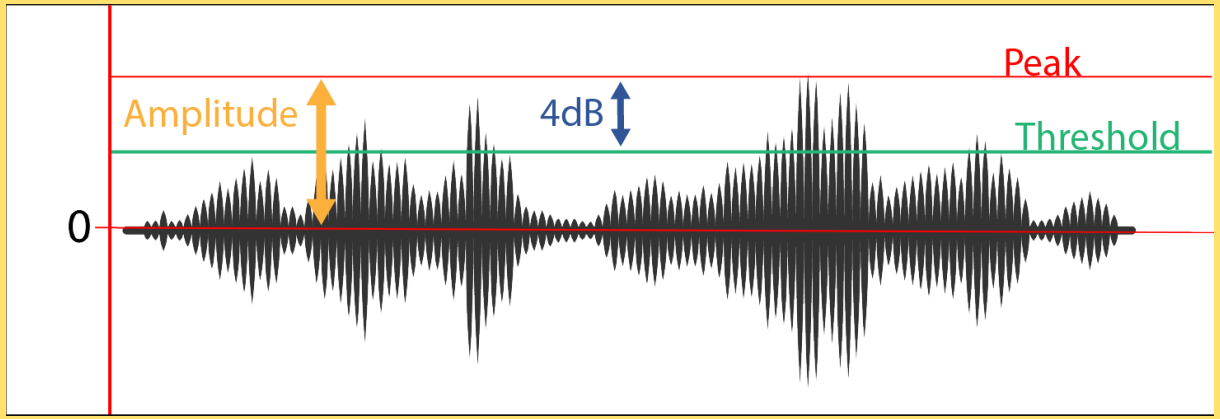


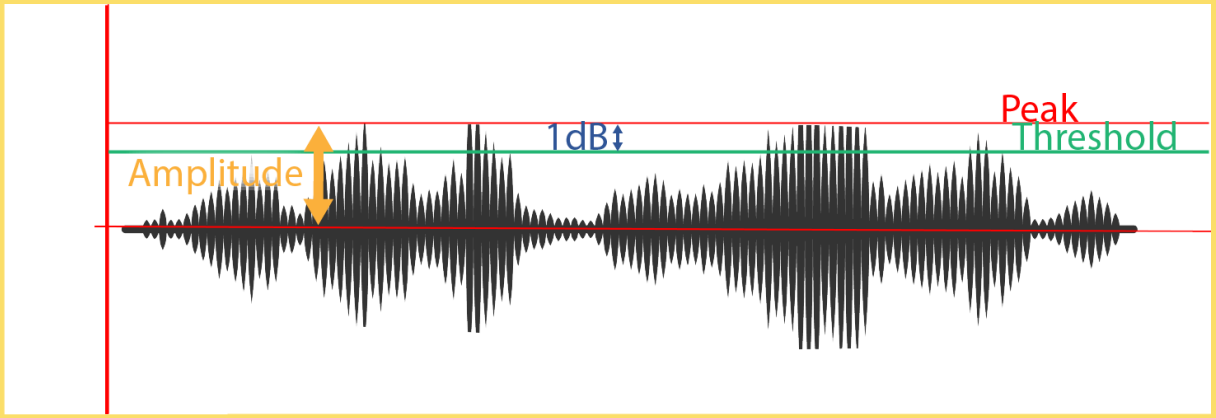
Studying Sound

Compression **ratio**

Change in output levels above the threshold

4:1 ratio: 3dB reduction above threshold (For every 4dB, reduce to 1dB)





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Examples: Compression Ratio

Raw file

2: 1 ratio

7:1 ratio

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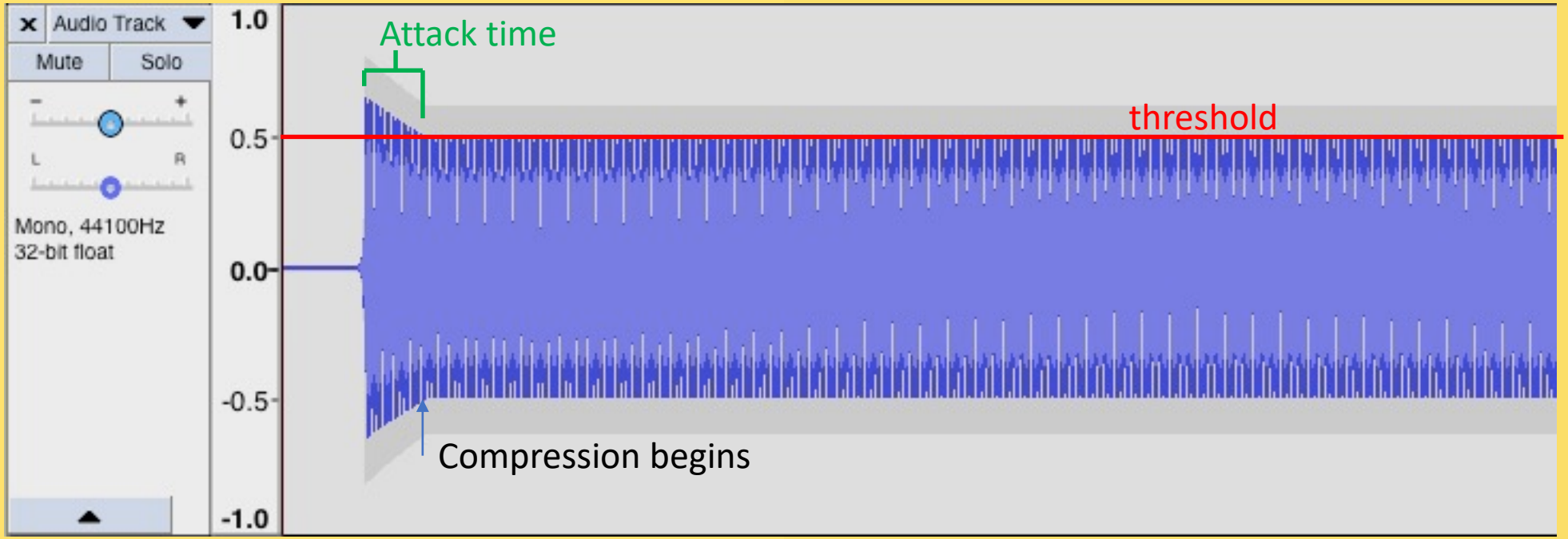
Compression: **Attack Time**

How quickly amplitude is reduced once input exceeds threshold



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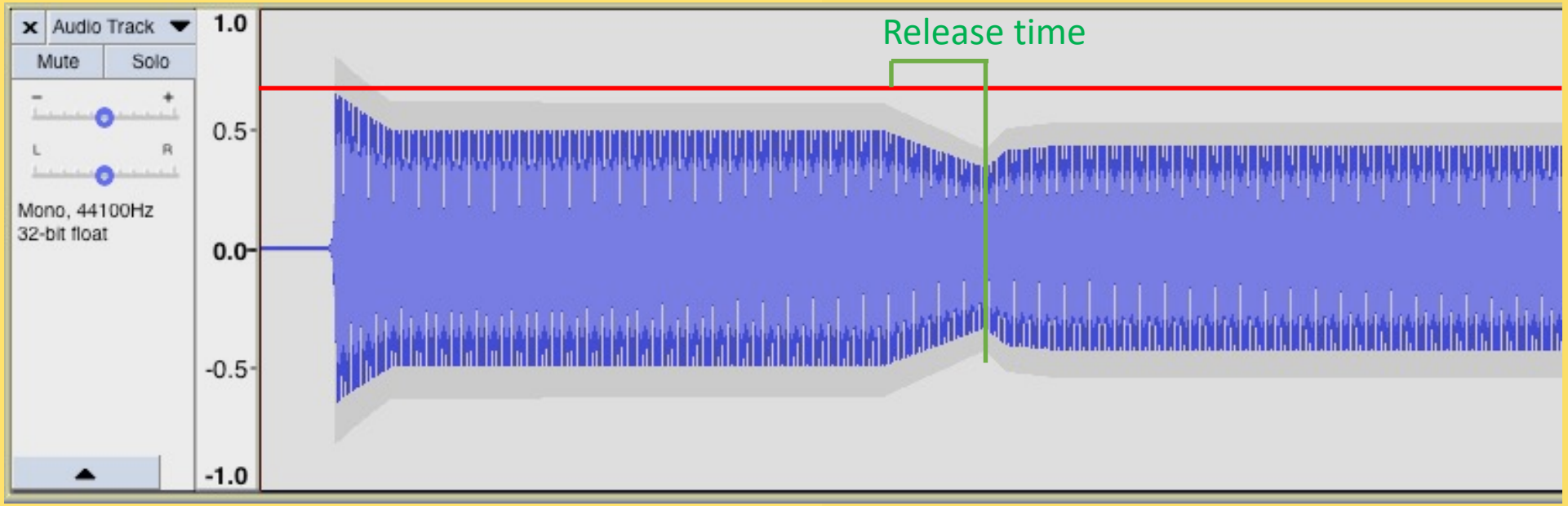
Compression: **Release Time**

How quickly compressor releases after sound wave drops below threshold



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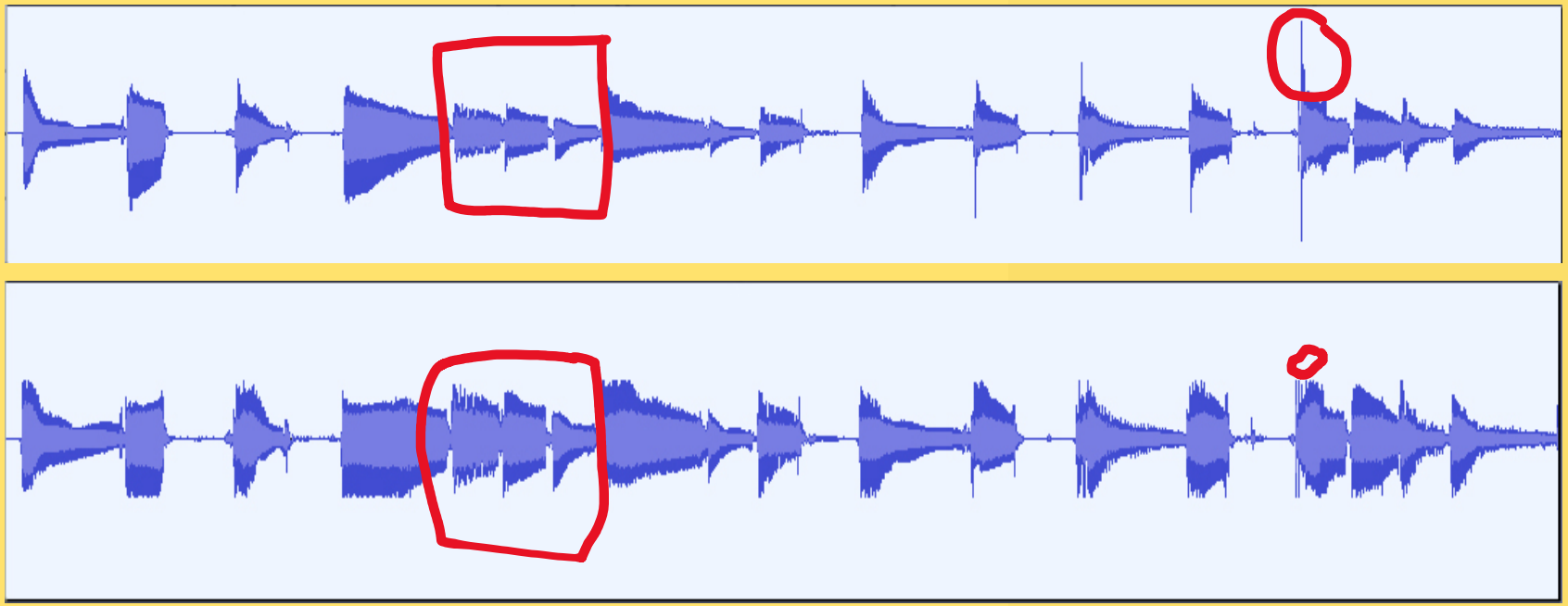
Limiting

Compression ratio > 10:1



Raw file

Limiting to -10dB

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Compression Tips

- ✓Don’t over-compress. Some dynamic range is good! (keep ratio under 5:1)
- ✓Settings in this effect work together. Adjust them together and see how they affect the output.
- ✓Takes a lot of practice—listen carefully
- ✓It will increase background noise
- ✓Some fast attacks can cause low frequencies to distort

Why compress?

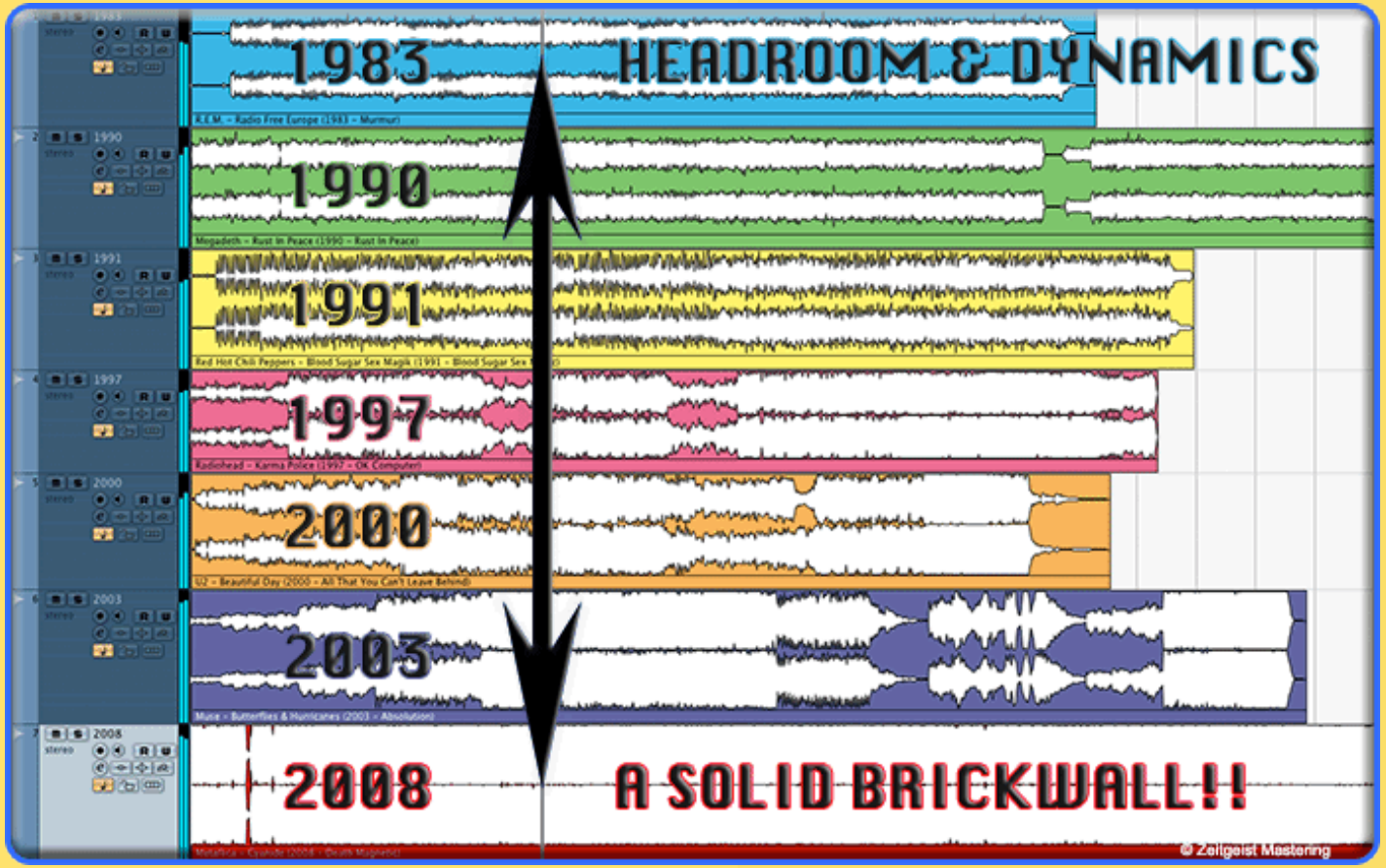
Makes overall average sound louder → advertising on TV

Prevents audience from “riding the remote”

Evens out vocal recordings

“pumping” percussion e.g. drums -> heavily used in dance music

The Loudness Wars



Zeitgeistmastering.com

Studying Sound

“Loudness war” explanation video

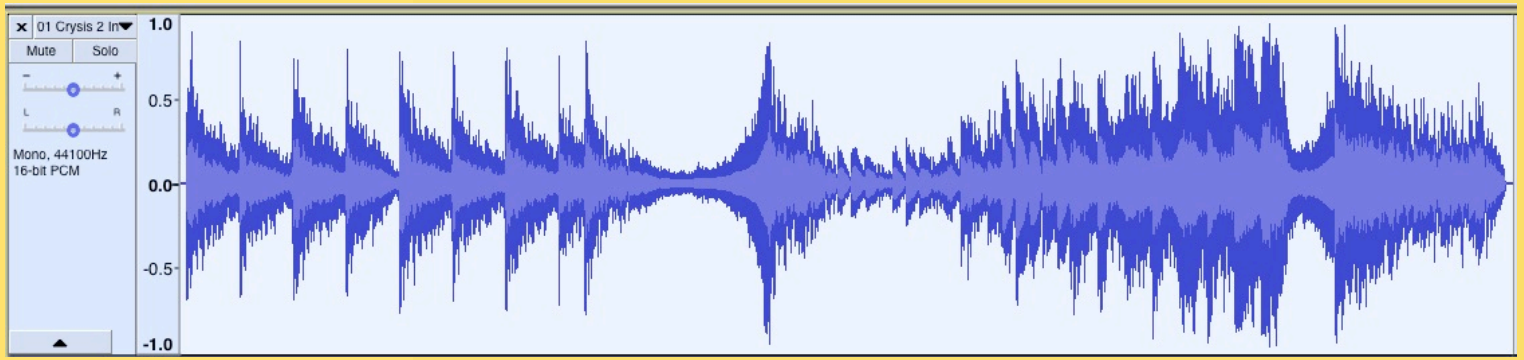
https://www.youtube.com/watch?v=3Gmex_4hreQ

Normalization

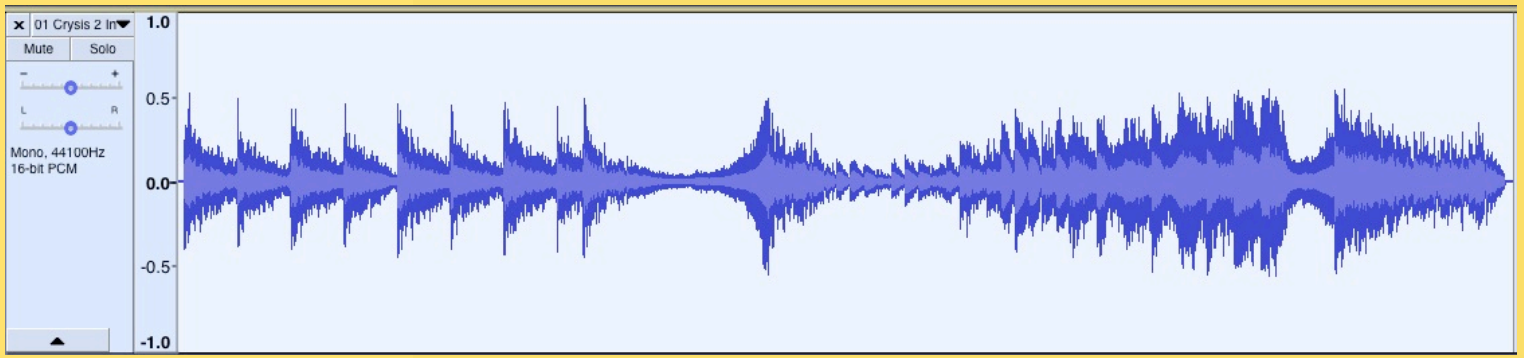
Sets loudest peak of file **to that level & adjusts rest to match**

Maintains dynamic range, adjusts overall level.

Original file



Normalized to -5 dB



Studying Sound

Expander (*no expander in Audacity)

FabFilter Pro-G expander

Waves PSE

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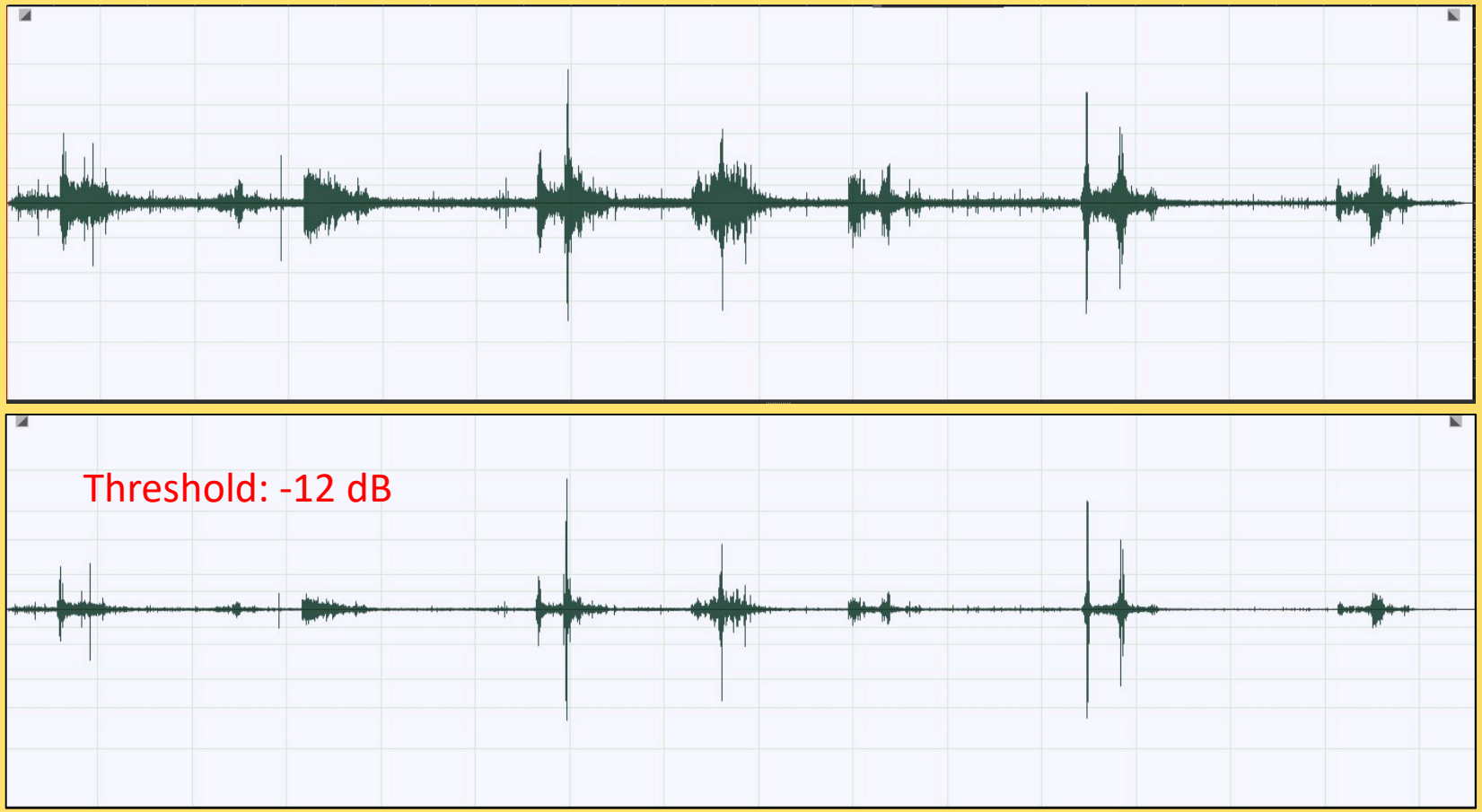
Expansion



Opposite of compression: expands dynamic range by reducing sounds below threshold

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Gating = Harsh Expander

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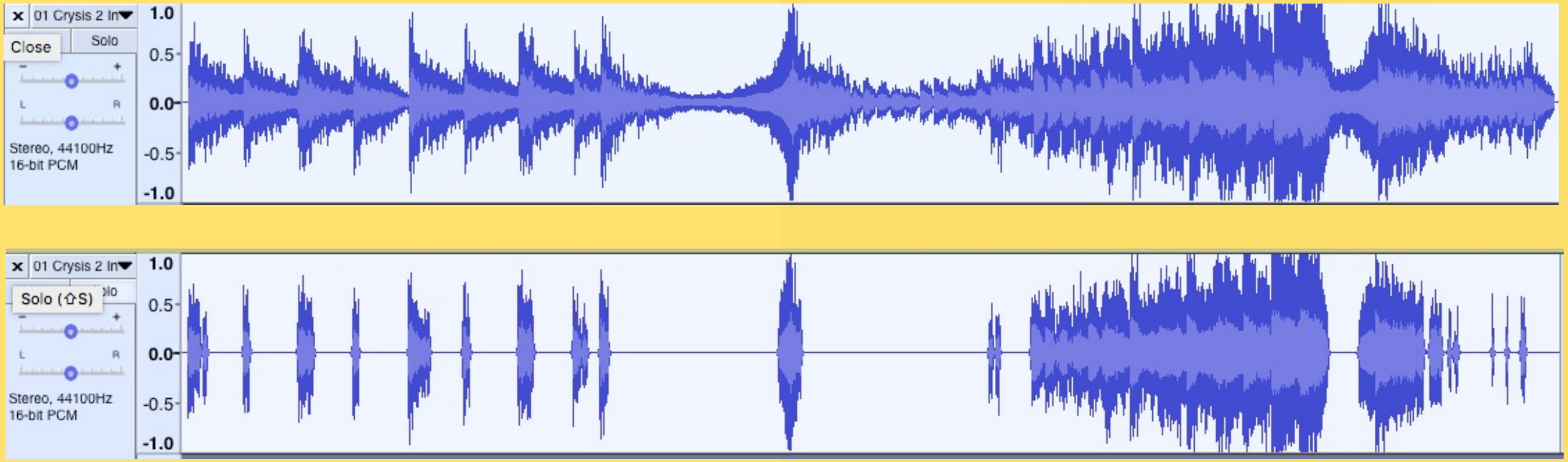
Hard gate to -6dB



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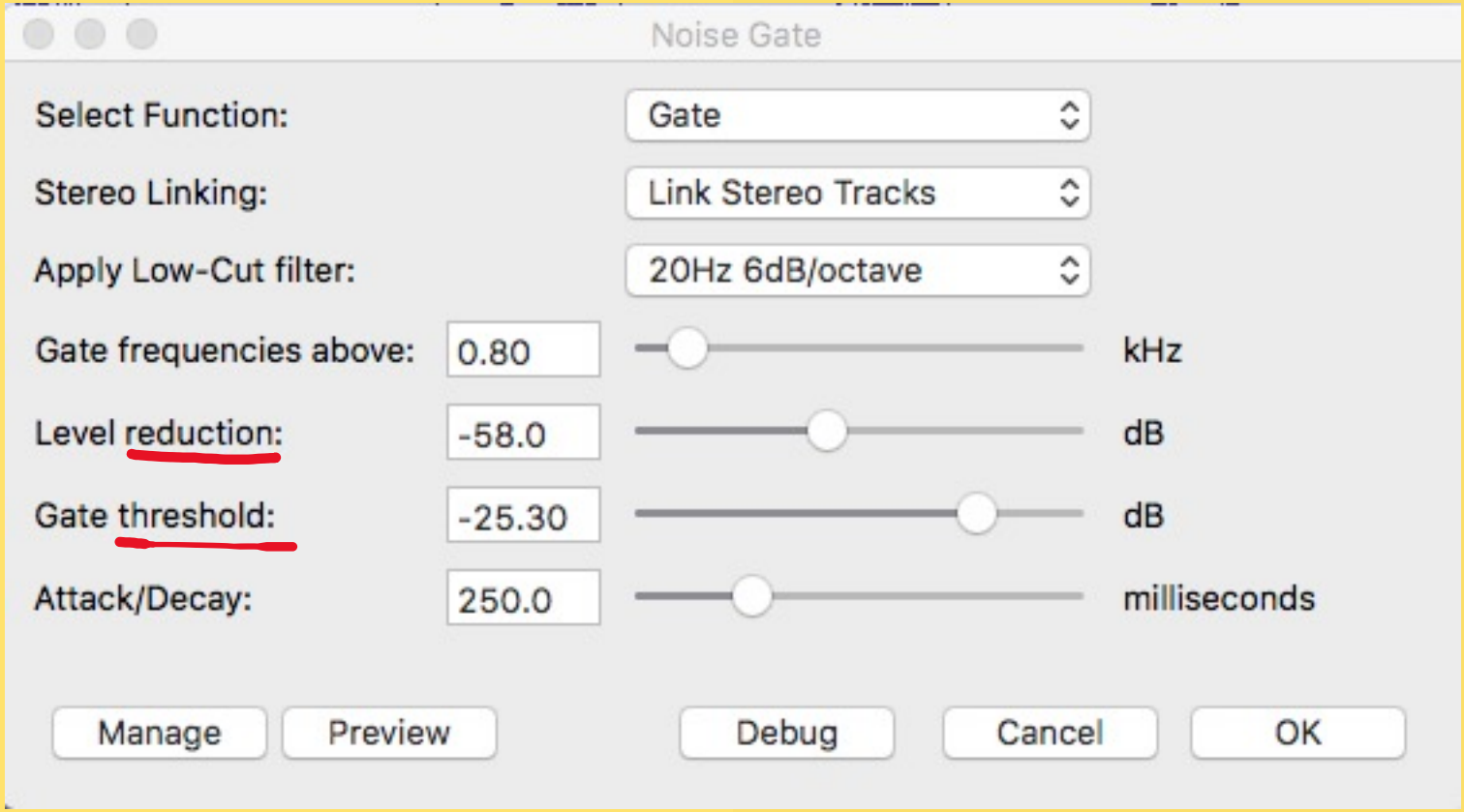
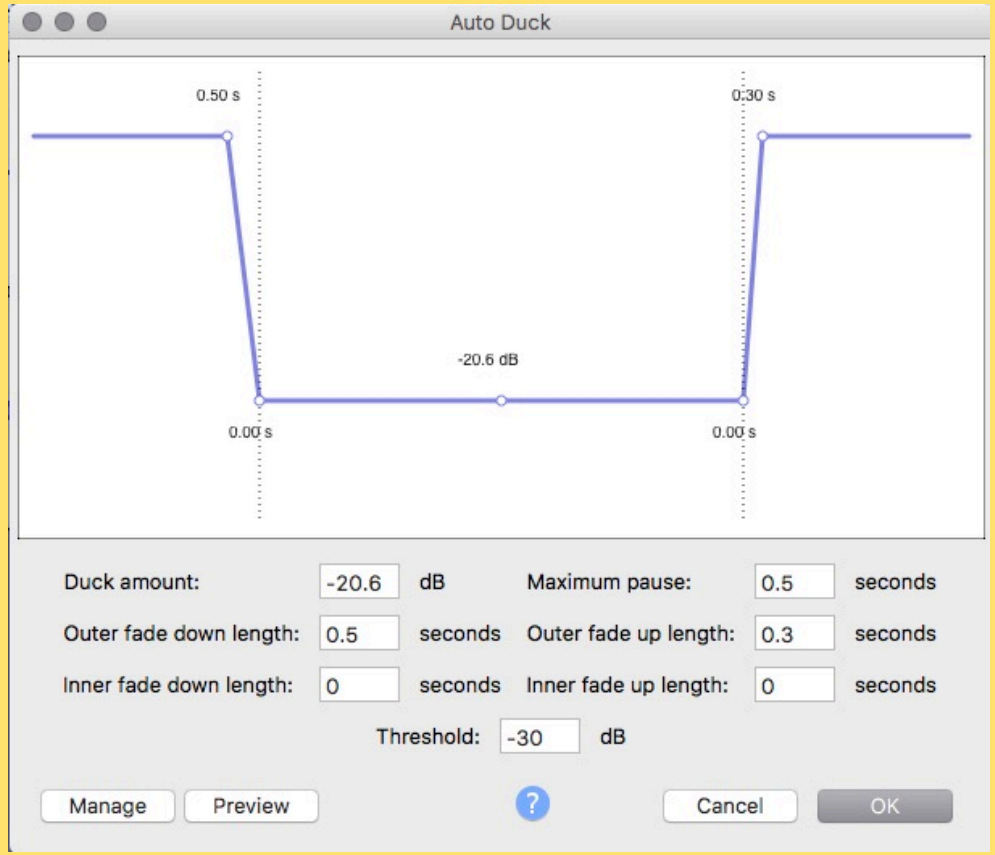
Noise Gate in Audacity



Studying Sound

Ducking

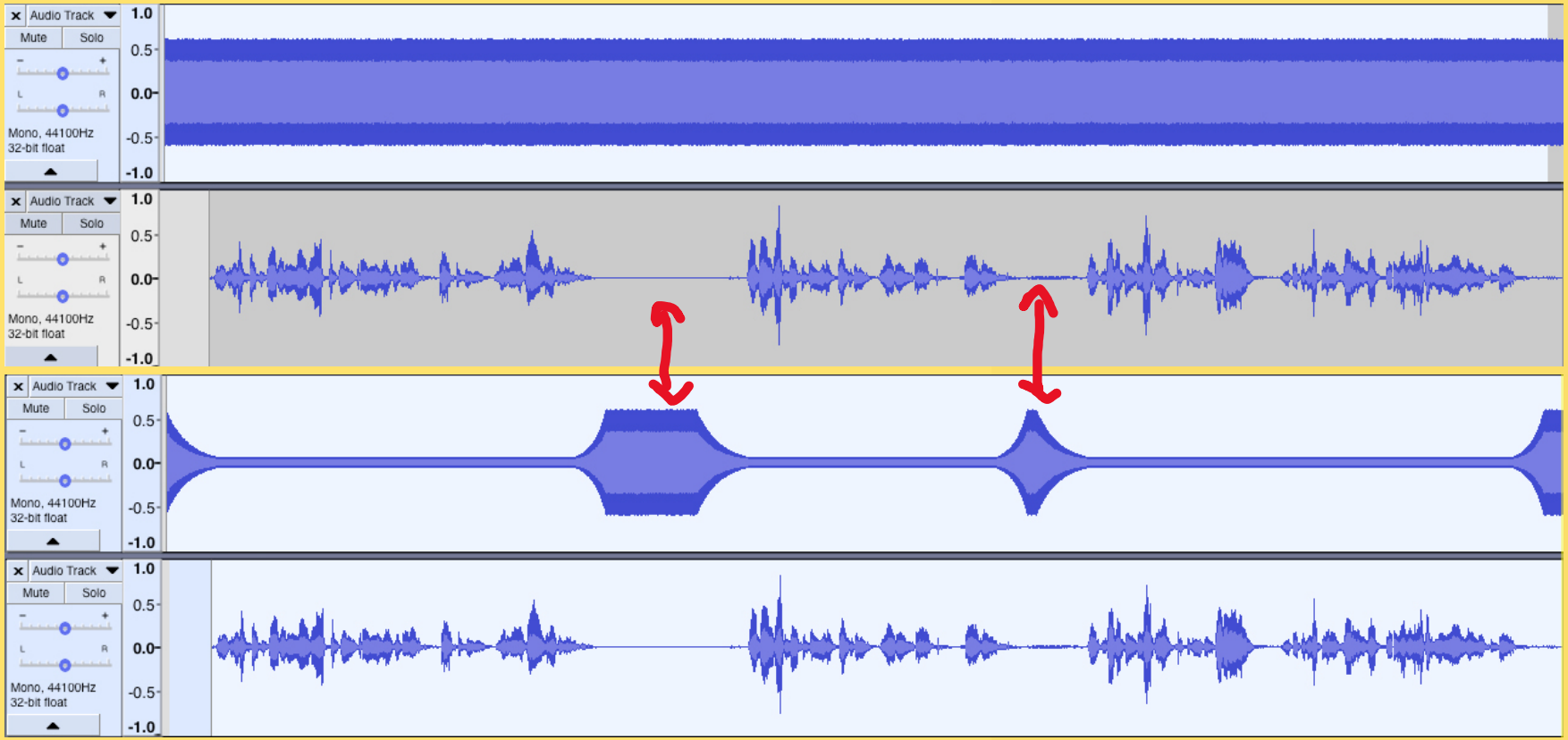


Reduces signals above a threshold by range by using second **control** file to set where ducking takes place

Common use in radio to duck music under voice

Studying Sound

Ducking



File to duck

Control file

Result--ducked

Control file

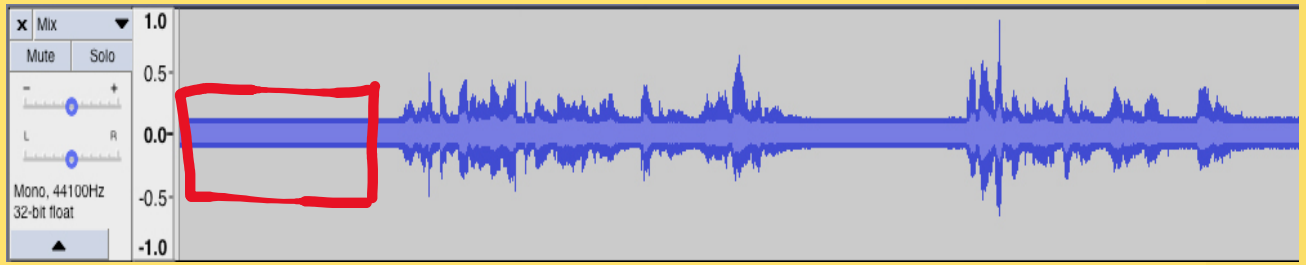
Studying Sound

Side-Chaining

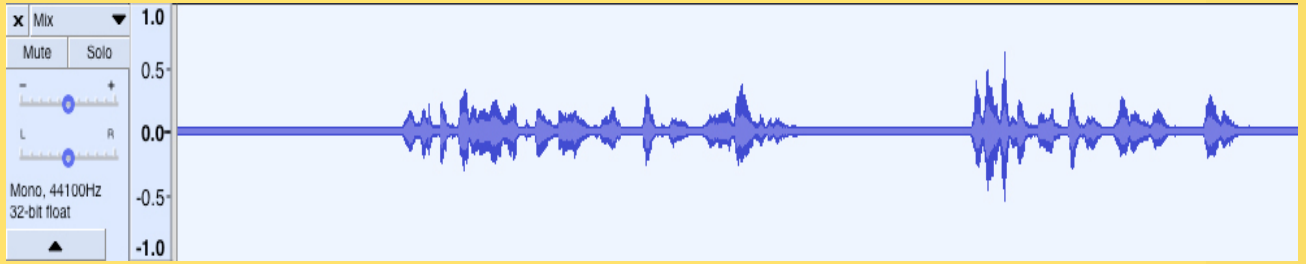
Using a control file to feed into an effect to alter the effect's amount

Mostly used on compression-related effects

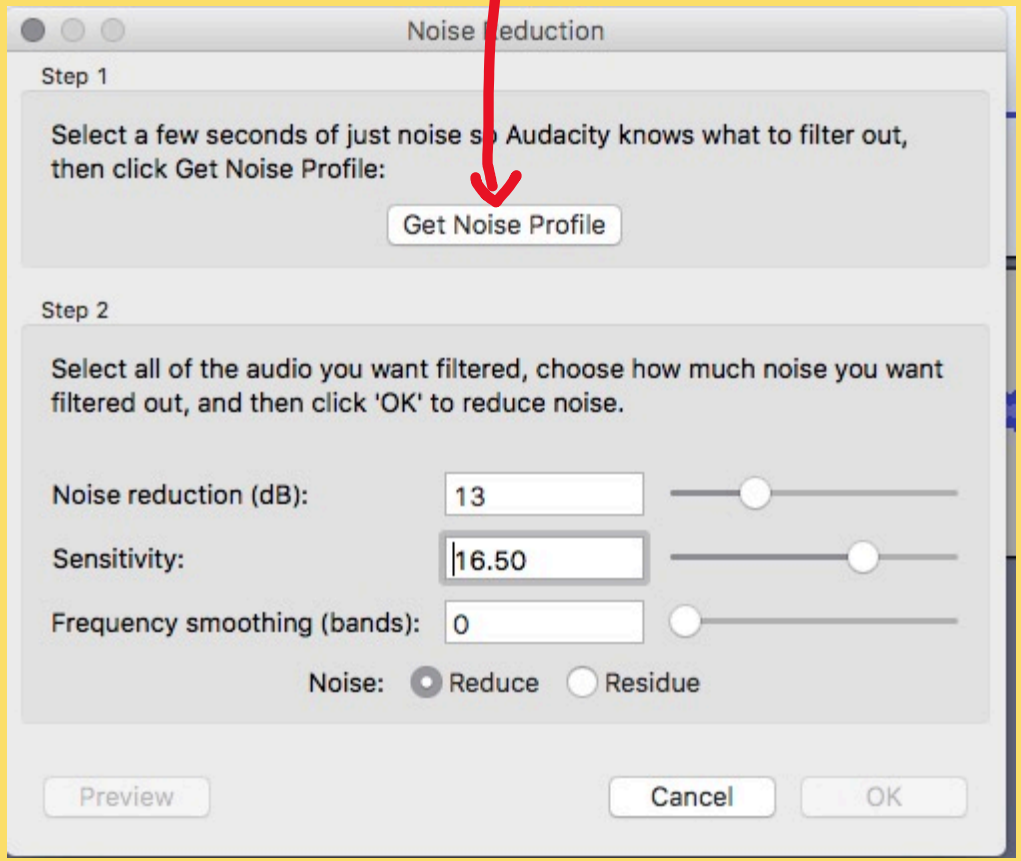
Noise Reduction



Noise profile: sample of noise you want to eliminate



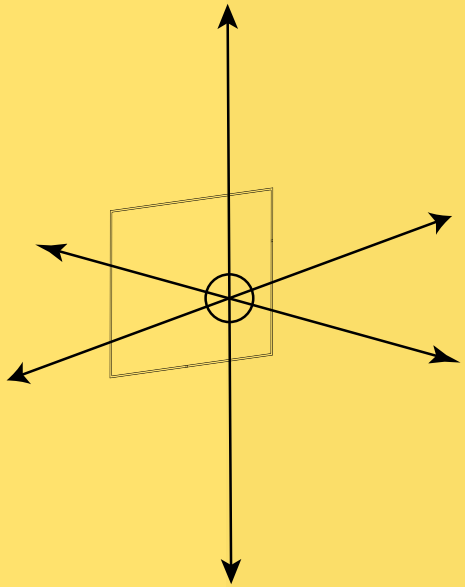
Control = “Noise profile”



Studying Sound

Mixing Theories

3 dimensions of mixing



Studying Sound

Near vs. Far

- Louder
- More EQ in mid to high frequency
- Less reverb/delay
- Hard compression
- Unusual effects → stick out

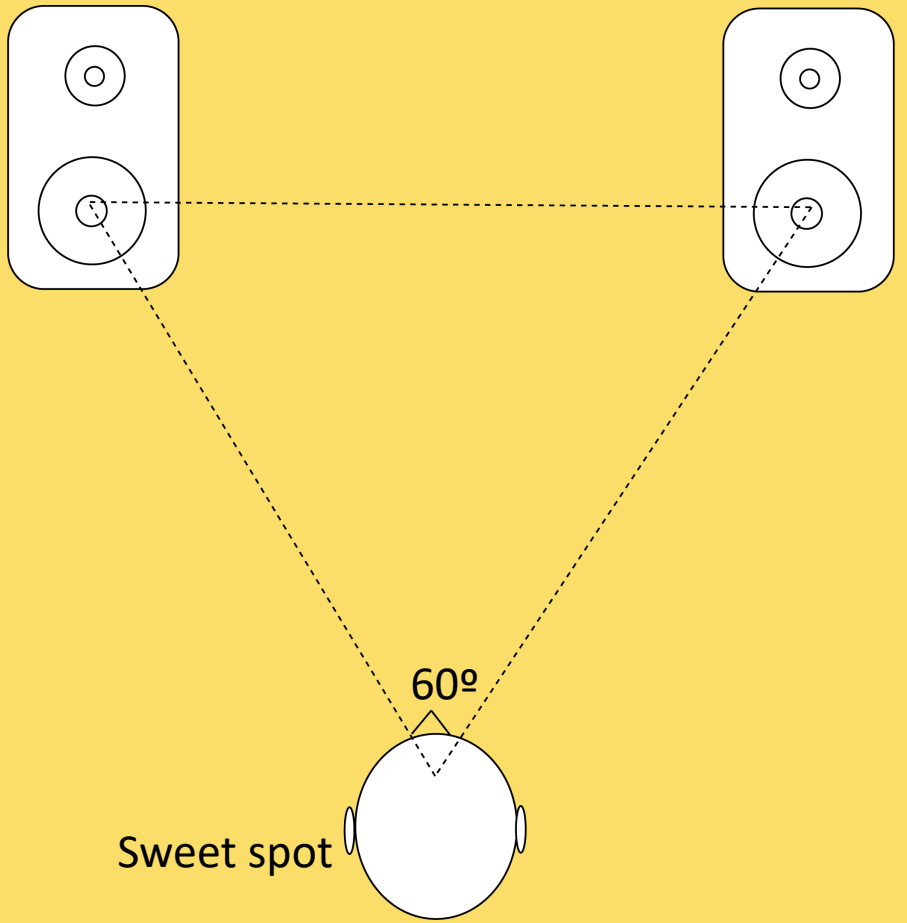
High and Low

EQ: high frequencies up high, low frequencies down low

Resonators in our body: head = high, gut = low

Left to right : Panning

- Stereo positioning:
- Sweet spot is at
- corner of equilateral triangle (when using loudspeakers!)



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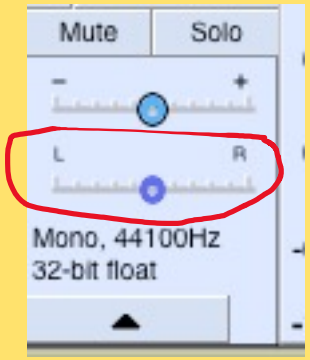
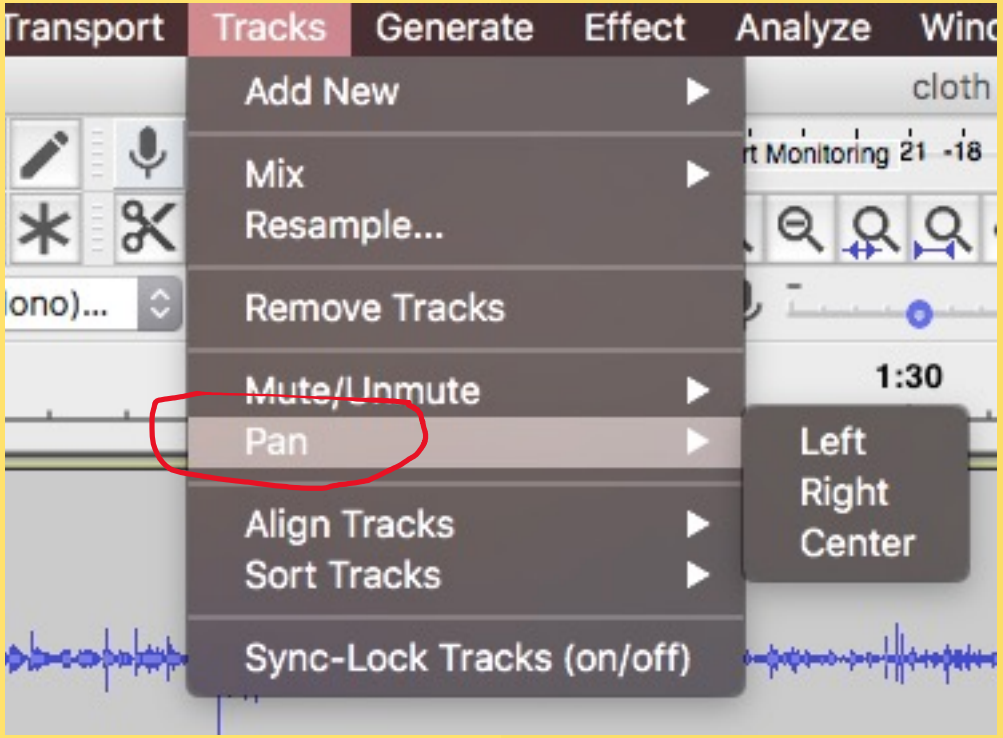
Panning in Audacity



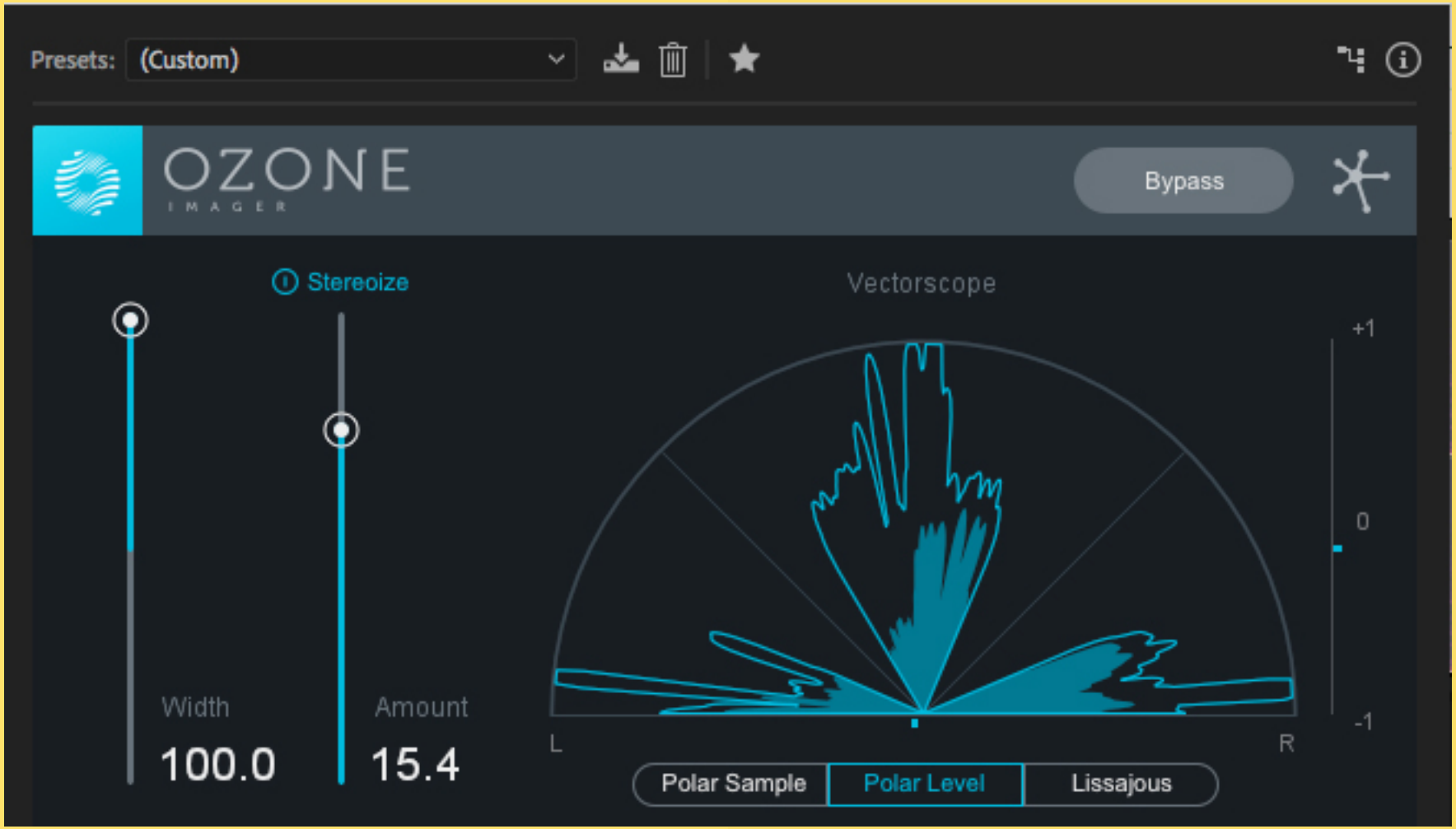


Studying Sound

Advanced stereo panning: Waves S1 ($)

Studying Sound

Advanced Stereo Imaging: Ozone Imager



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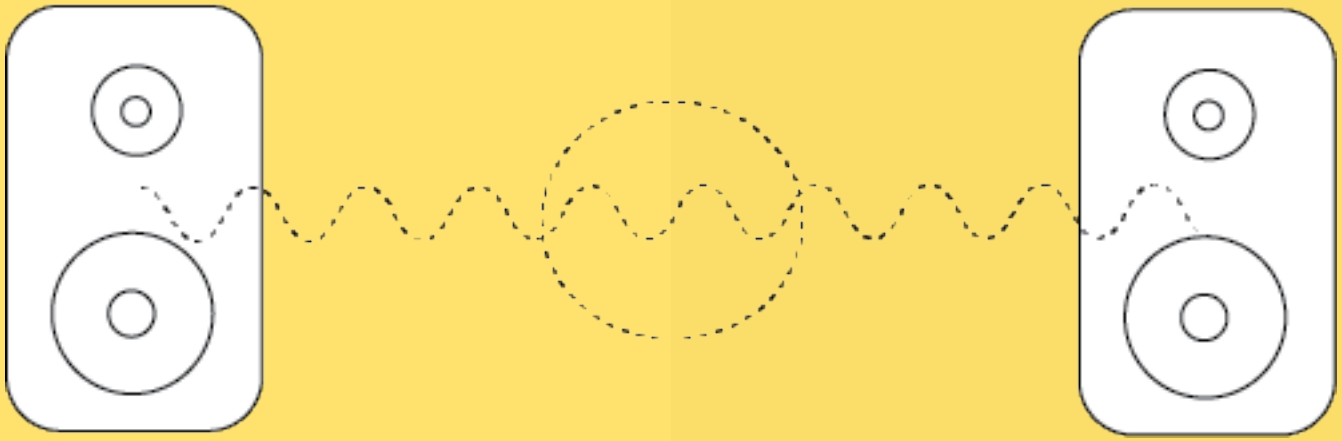
Phantom Images



Studying Sound

Figure and Ground

Photo: Earl Noble, http://vocm.com/news/rnc-urges-caution-near-emergency-scenes/

Foreground

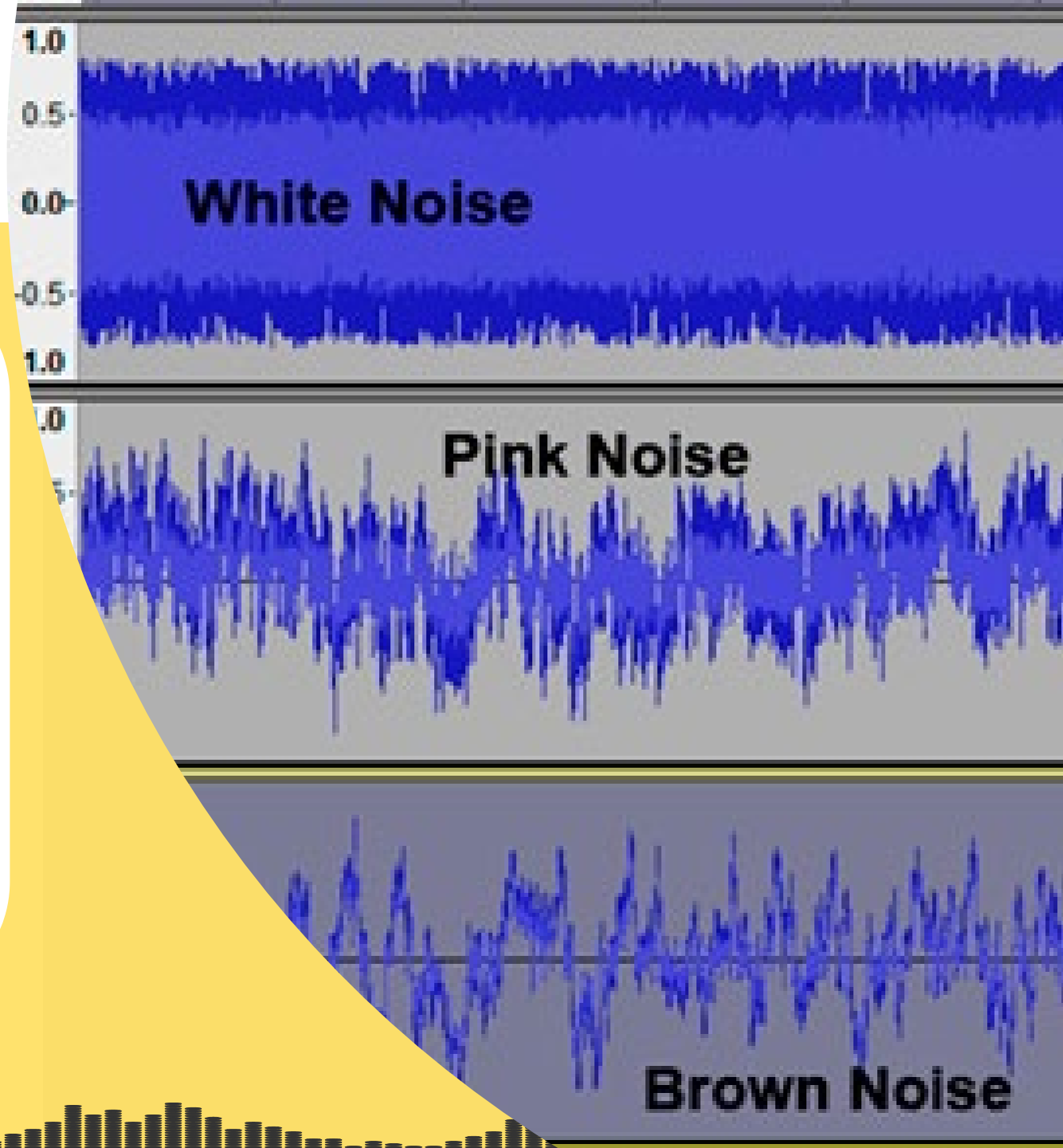
Midground

Background

Studying Sound

Masking : NOISE

- White noise = broad frequency spectrum, evenly across entire frequency
- Pink noise = white noise with high frequencies attenuated
- Brown noise = exaggerated pink noise (even more attenuation)



Studying Sound

Point of Audition

- Where is the audience?
- Analogous to POV in film– position as “in” a scene or outside a scene.

Studying Sound

Point of Audition

Emphasis in mix through EQ, panning and volume

Use of filters

Use of effects

Microphone selection

Microphone location

Channel/speaker location

Spatial location of sounds

Creative versus technical mix

Psychological state of character

Altered physical state of character

Focus audience’s attention