

Chapter 10. Meeting 10, Compression and Limiting

10.1. Announcements

- Materials for second processing report will be out on Wednesday
- Next quiz on Monday, 19 March

10.2. Review Quiz 2

- ?

10.3. Preamps in MOSS

- True 8



- TwinQ



- Vintech

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10.6. Dynamics Processors: Input-Output Transformation

- Graph input amplitude to output amplitudes via transfer curve

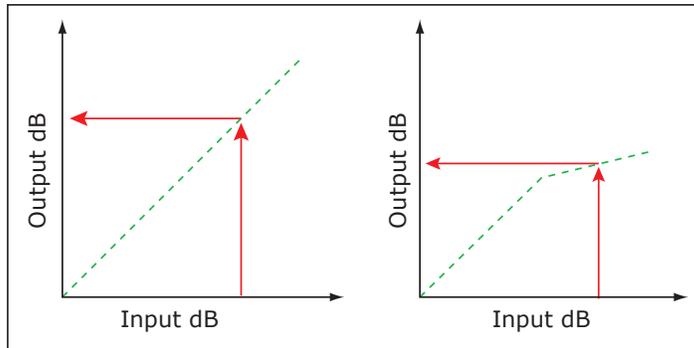


Image by MIT OpenCourseWare.

- A ratio of 1:1 is no change, or bypass
- A shifting the 45 degree line up or down is a boost or cut in amplitude

10.7. Dynamics Processors: Two Basic Families

- Processors that reduce amplitudes when amplitudes are above a threshold (downward compression and limiting)
- Processors that reduce amplitudes when amplitudes are below a threshold (downward expansion and gating)
- While amplitudes are reduced, this does not mean that dynamic effects only make sounds more quiet

10.8. Gain Reduction Above a Threshold: Compressor

- Reduces (compresses) dynamic range and increases average signal level
- Handles situations where a track needs to be turned up but cannot be turned up without clipping
- Often used to reduce the amplitude volatility of a signal: vocals
- Can raise level of quiet signals: can increase sustain, background, and ambience
- Can increase leakage and noise floor

10.9. Compression: Two Steps

- Two steps
 - 1. Reduce gain above a threshold with a ratio
 - 2. Increase gain of the modified signal
- Steps

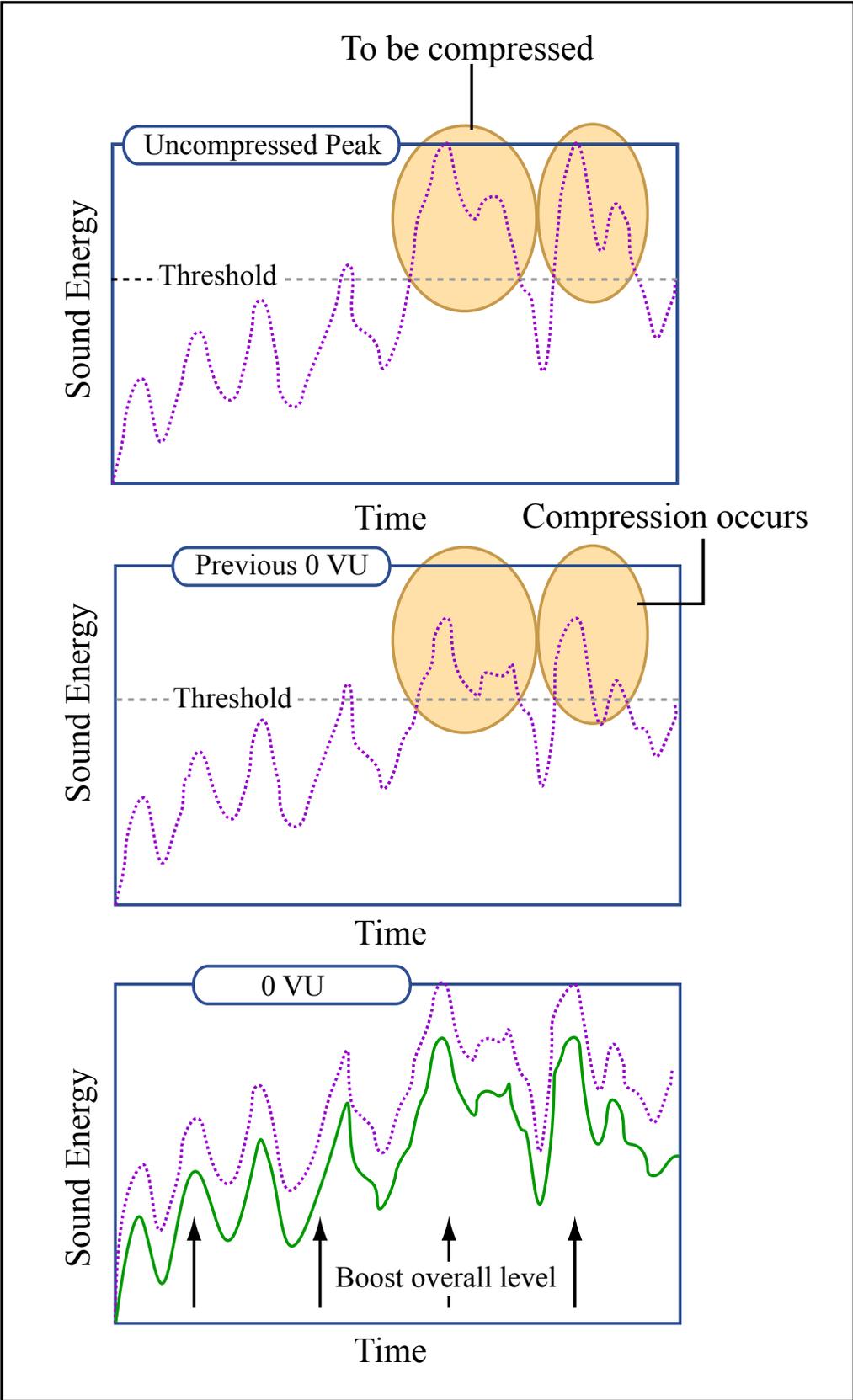


Image by MIT OpenCourseWare.

10.10. Compression: Ratio

- Ratio

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"Compression with a 3:1 Ratio" from Gibson, B.
Microphones & Mixers. Hal Leonard Corp., 2007.

10.11. Compression: Knees

- Hard and soft knee

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"Hard Knee vs. Soft Knee Compression/Limiting" from Gibson, B.
Microphones & Mixers. Hal Leonard Corp., 2007.

10.12. Compression: Attack and Release

- Attack and release

Image removed due to copyright restrictions.
"Using the Attack Time Setting to Control Understandability and Punch"
from Gibson, B. *Microphones & Mixers*. Hal Leonard Corp., 2007.

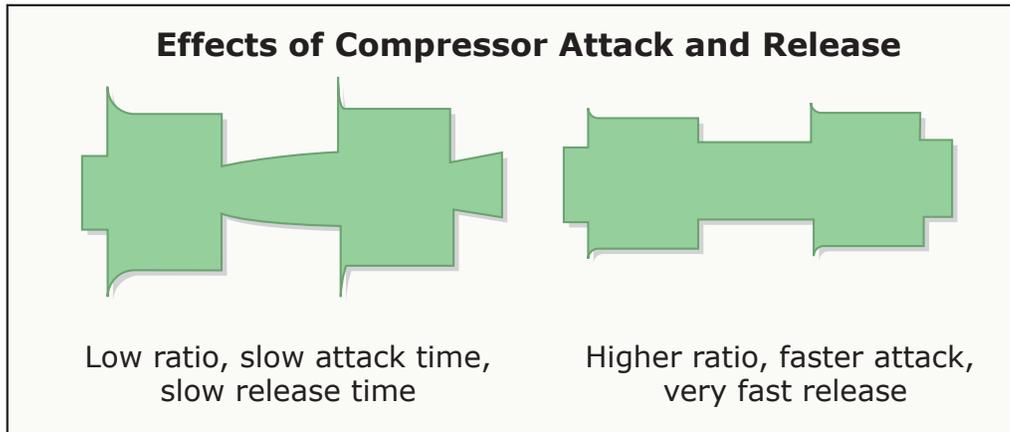


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- Attack times generally around 20-50 ms
- Release times generally around 100-300 ms
- Slower attack times are critical for letting transients pass unaffected: this is often desirable
- Fast attack times can result in lifeless and unnatural percussion sounds
- Slower release times continue to reduce gain of sustain of instruments
- Pumping: attack and release are too fast and compression is audible; sustain of a signal fades in and out after attack of louder signals
- Breathing: hearing the noise floor slowly rise after the signal falls below threshold; remove by decreasing release time

10.13. Gain Reduction Above a Threshold: Limiter

- A compressor taken to an extreme ratio
- Ratios are in the range of 10:1 to infinity:1
- Flattens the top of amplitudes (generally) without distortion (depending on attack)
- Often used to protect equipment and limit dynamic ranges

10.14. Limiting: Example

- Example

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"Limiting" from Gibson, B.
Microphones & Mixers. Hal Leonard Corp., 2007.

10.15. Reading: Katz: How to Manipulate Dynamic Range for Fun and Profit

- What does Katz say should be the paradigm of sound quality? Why is this often not possible?
- Why was “popcorn noise” necessary for mastering audio for movies?
- According to Katz, what affect does hard-knee compression have?
- Why does Katz state that, in regard to attack and release times, its “probably better to remove all the labels on the knob (except slow and fast) and just listen!” ”

- How is lookahead implemented in digital compressor?
- What is a brick-wall limiter?
- How does Katz describe the release characteristics of an opto-compressor?
- What is soft clipping, as found as a feature on some digital processors?

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