Compressors, Limiters, Expanders and Gates

What is Compression?

- A compressor is an audio processor that decreases the dynamic range of a signal

- This is usually accomplished by turning down the loudest sounds

Why Compress?

- Makes the average level more consistent
- Protects the system and audience from jarring spikes in level
- Increases audibility of quiet sounds
- Can also be used as an effect, or to shape the “envelope” of a sound

Compressor Controls

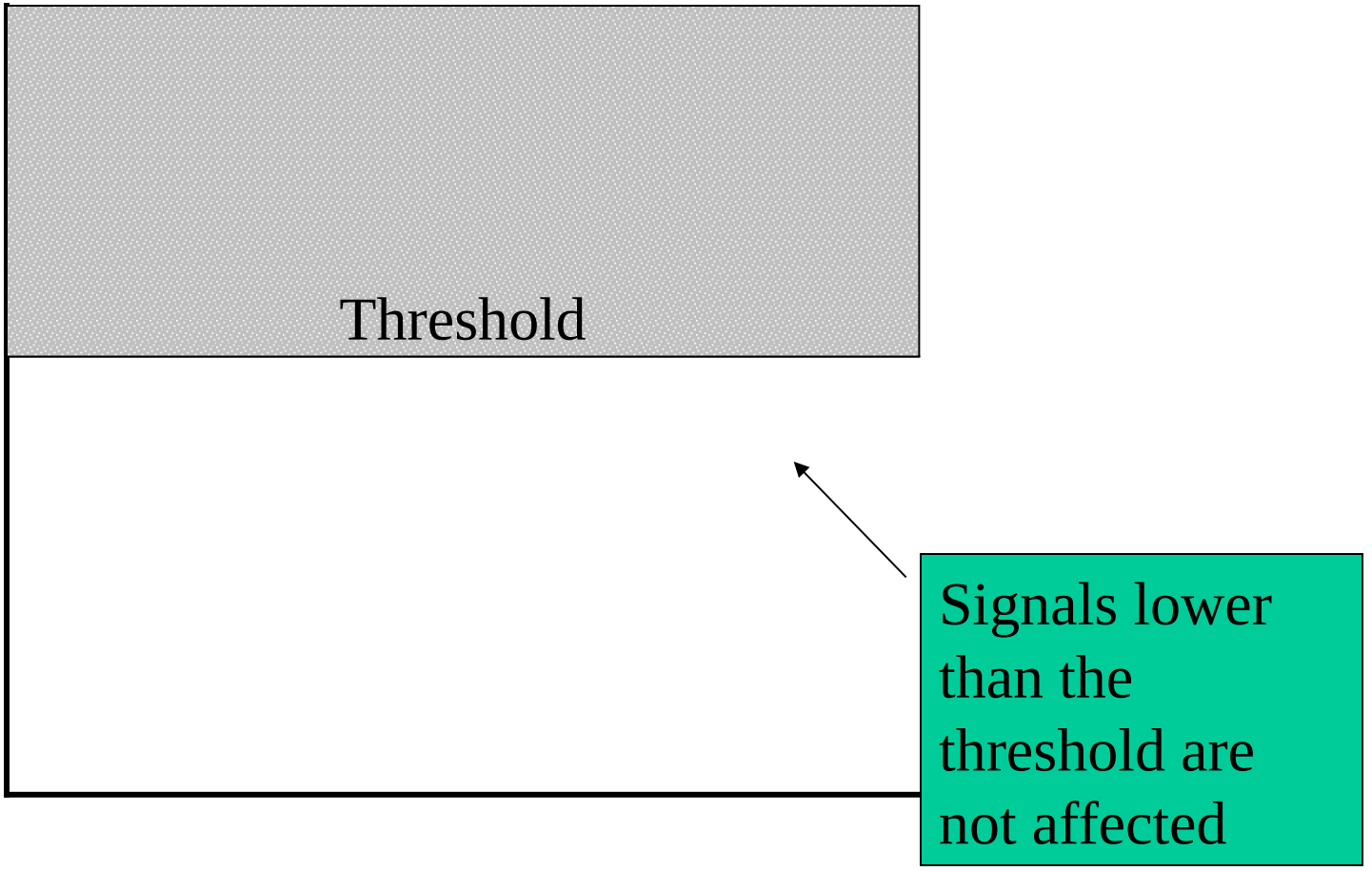
- **Threshold**

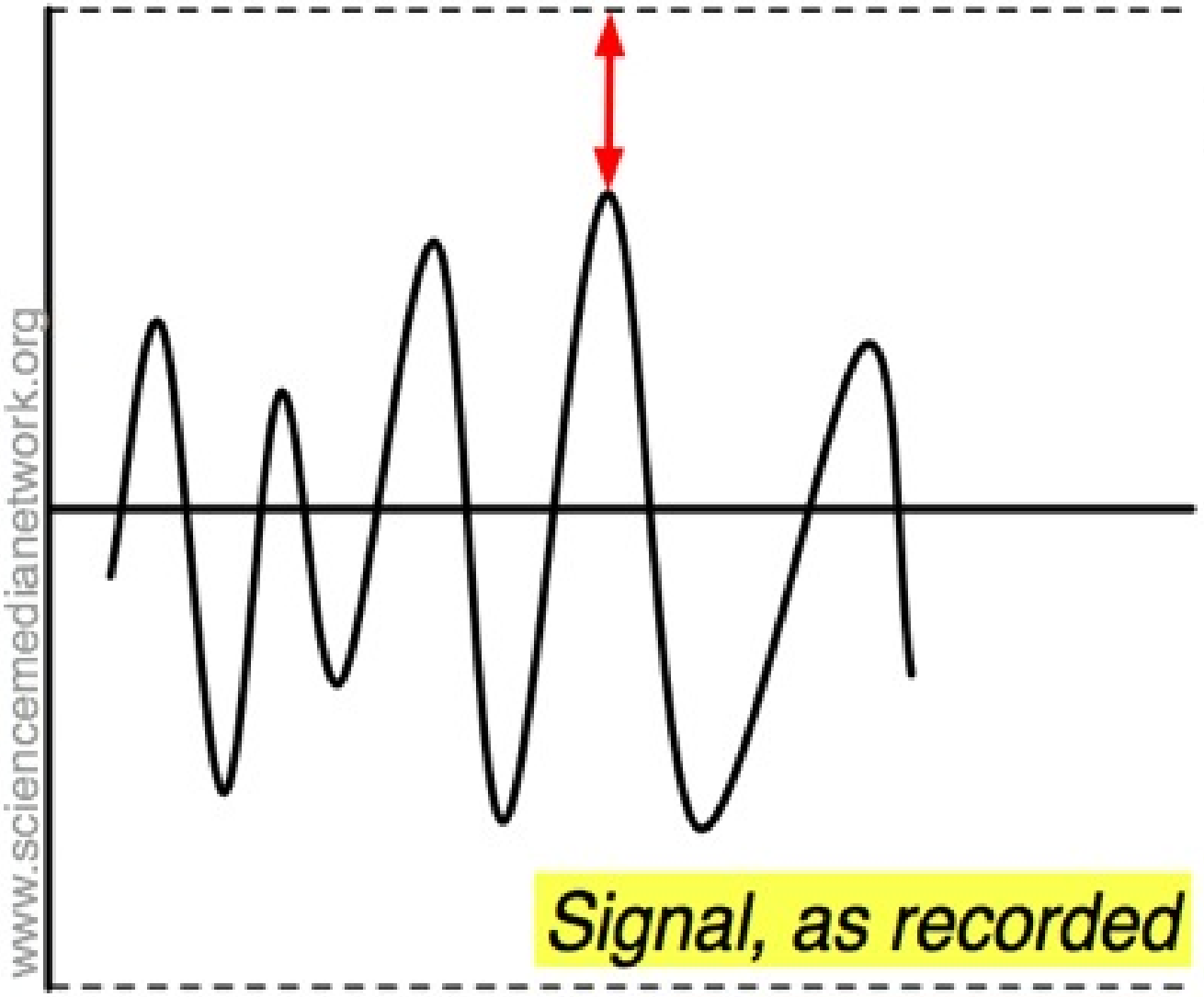
The point past which the compressor lowers the level

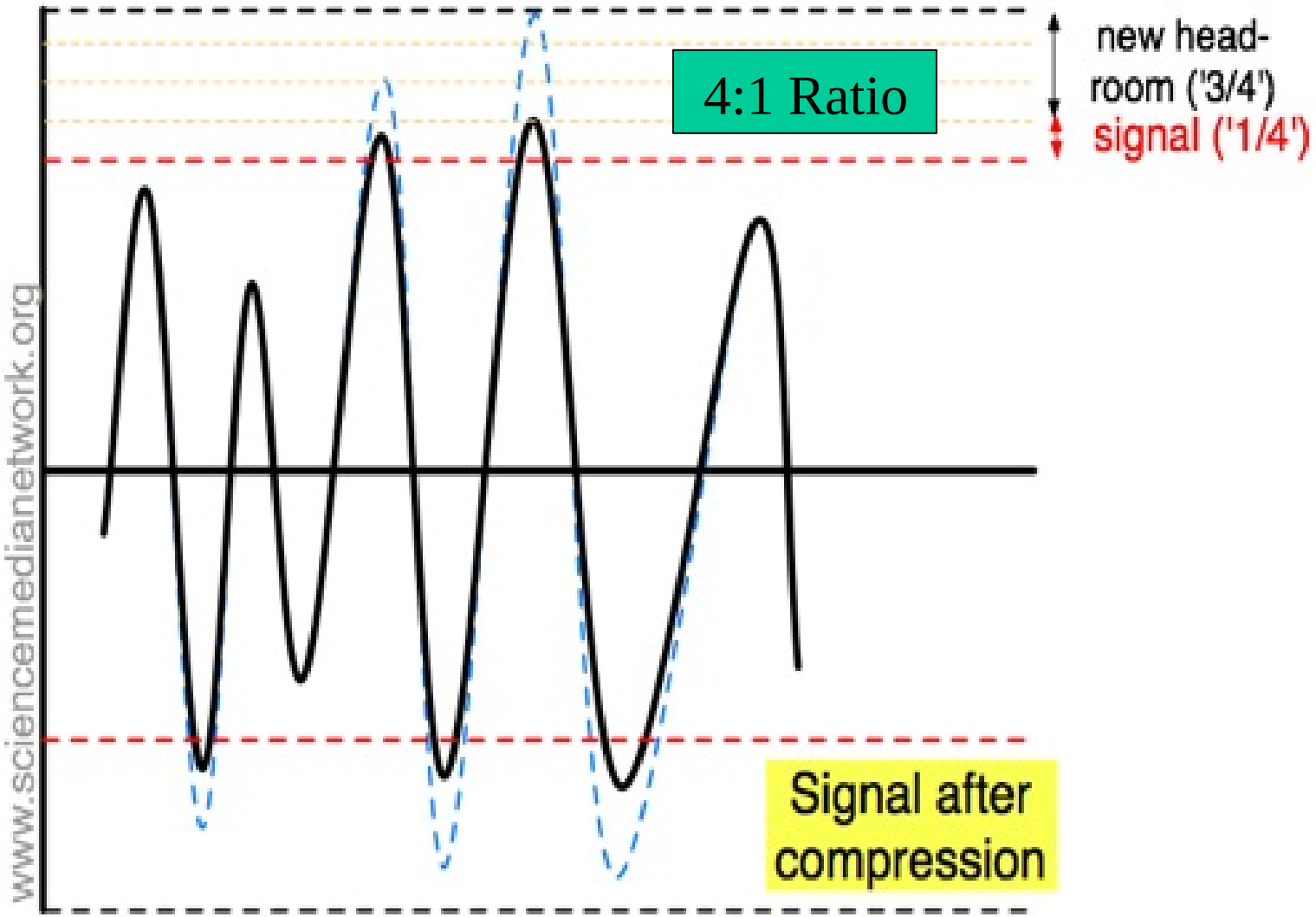
- **Ratio**

How much the compressor lowers the level

Threshold

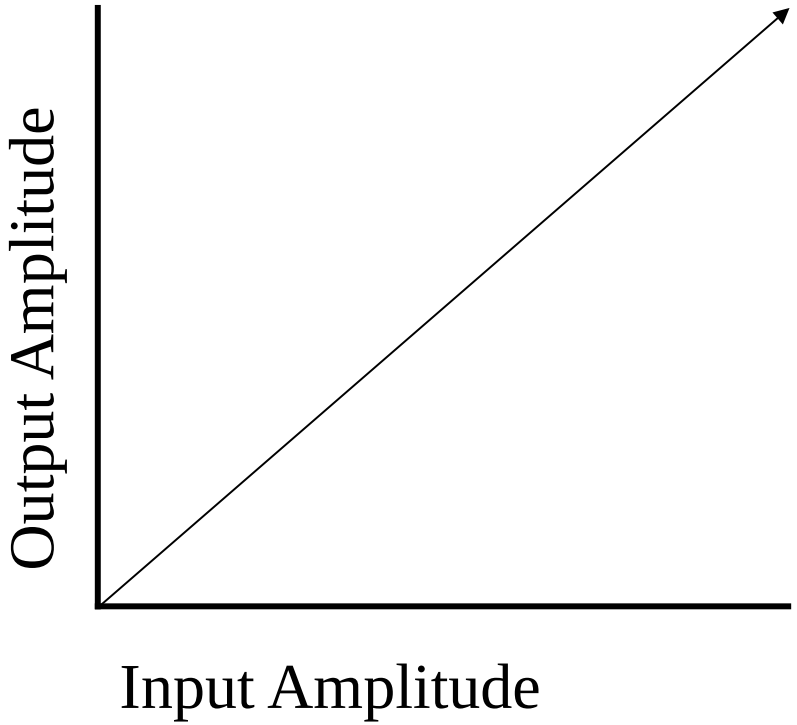

Threshold
Signals lower than the threshold are not affected


www.sciencemedianetwork.org
Signal, as recorded

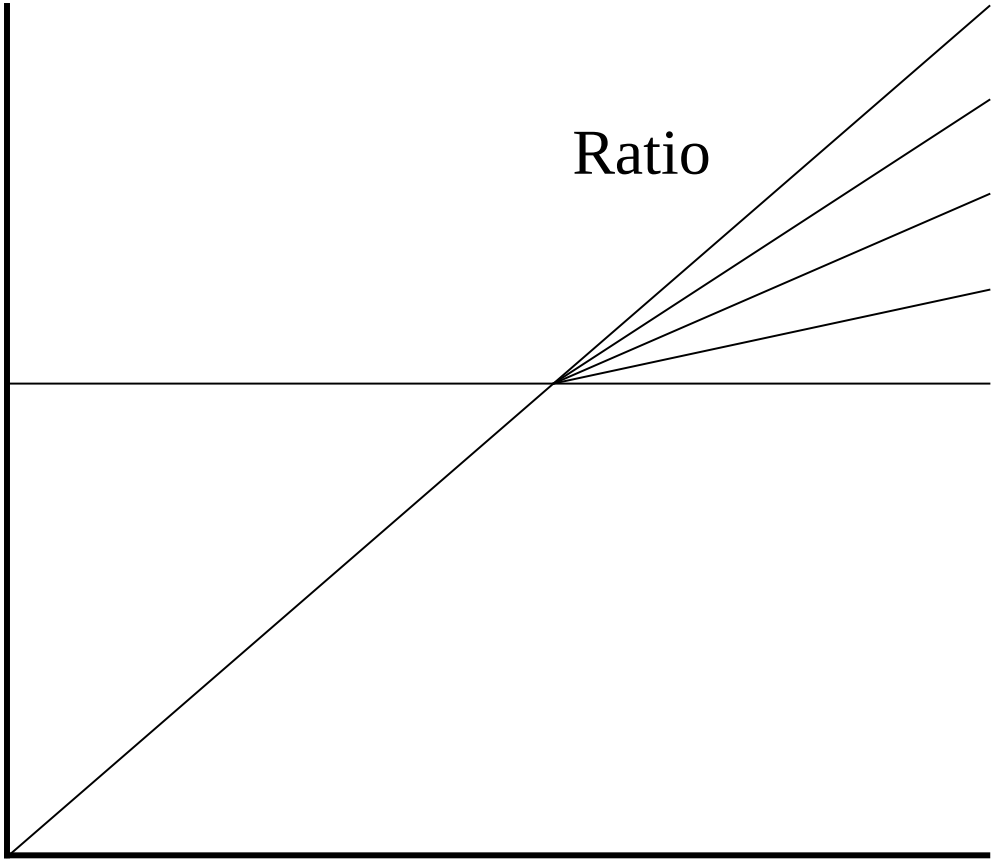

4:1 Ratio
new head-
room ('3/4')
signal ('1/4')
Signal after
compression
www.sciencemedianetwork.org

Another Type of Chart:

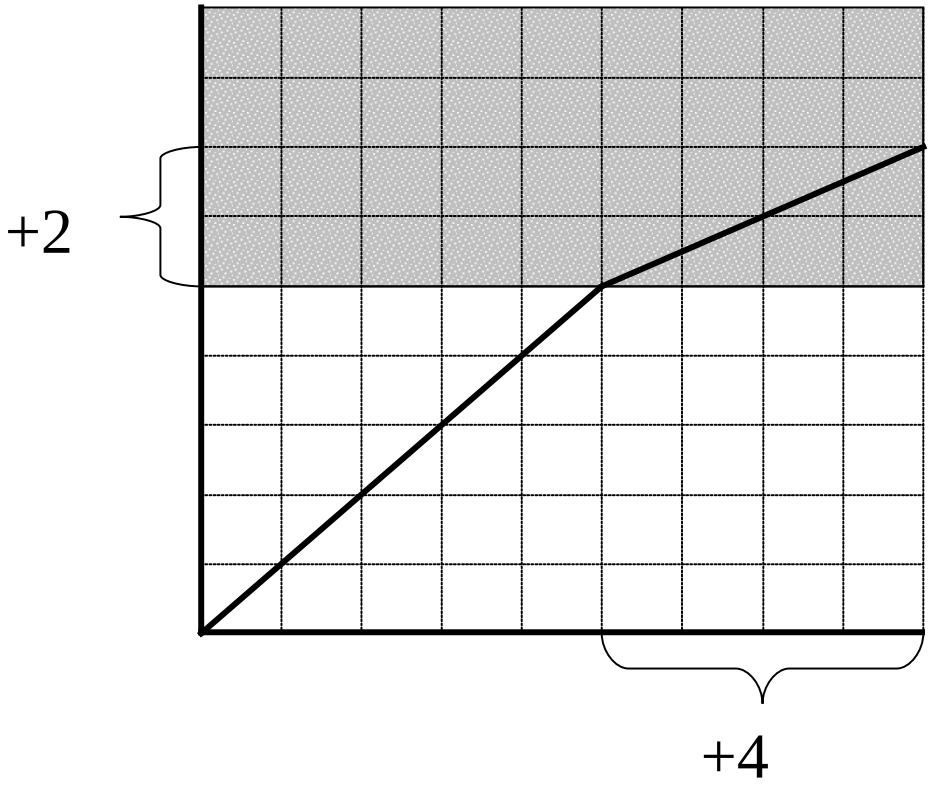
- Input Level Compared To Output Level



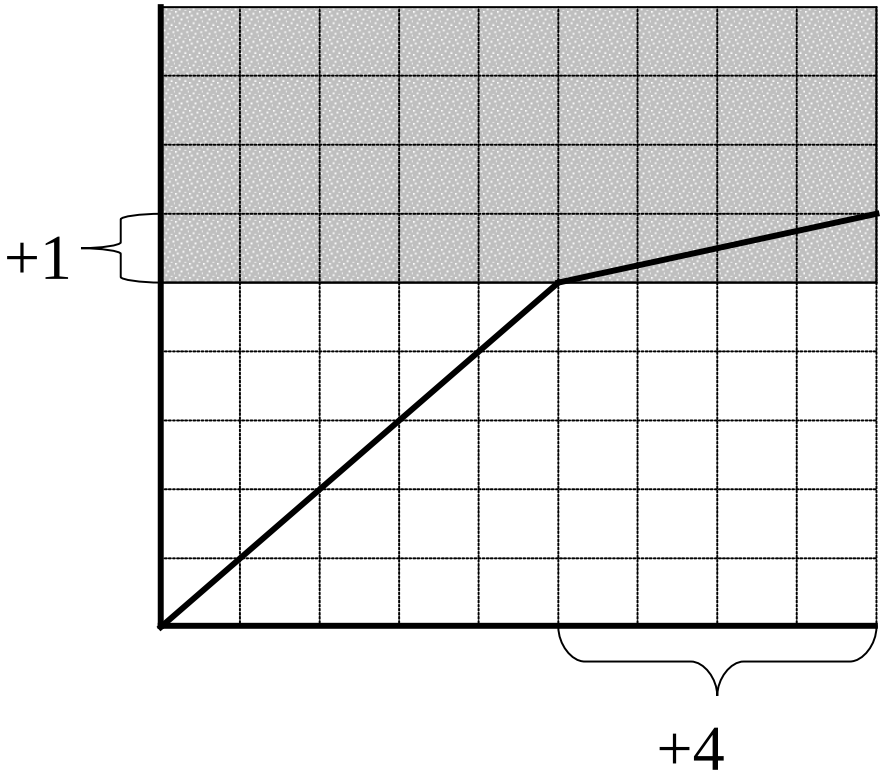
Compression Ratio



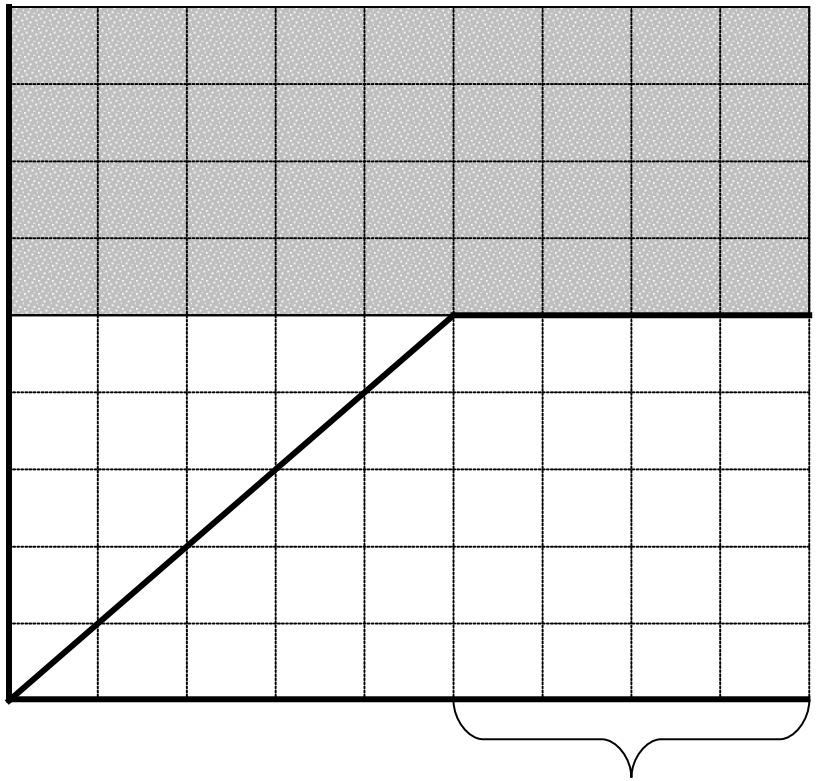
2:1 Compression Ratio



4:1 Compression Ratio



:1 "Brick Wall" Compression or “Limiting”



A “Limiter” is Compressor With a Ratio of 10:1 or Greater

Attack and Release

- Many compressors allow us to adjust the amount of time that passes before starting or ending the gain reduction
- This can smooth out the compression, and allows for less obvious effects

Compressor Controls

- Attack: *How long before the compressor “kicks in”*
- Release: *How long before the compressor “lets go”*
- Make Up Gain: *Brings up the overall level, post-compression*

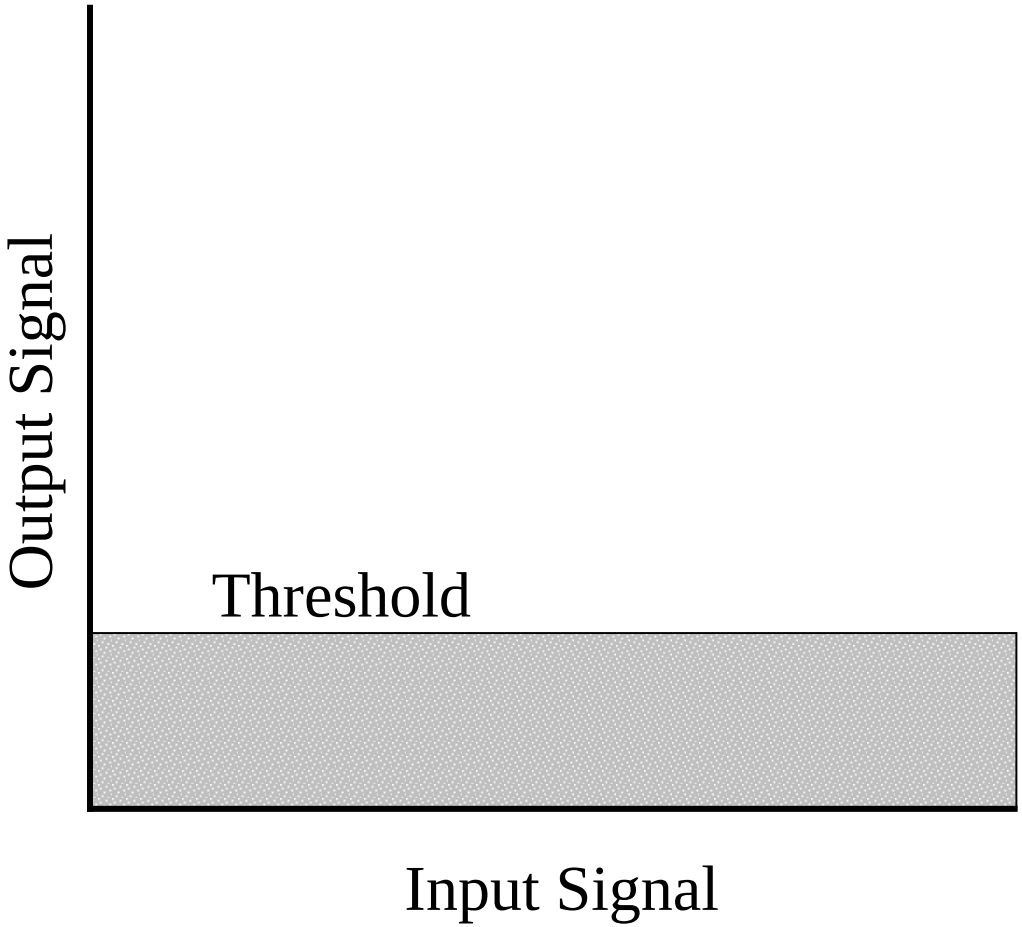
Expander

- Turns down the level of any signal *beneath* the threshold

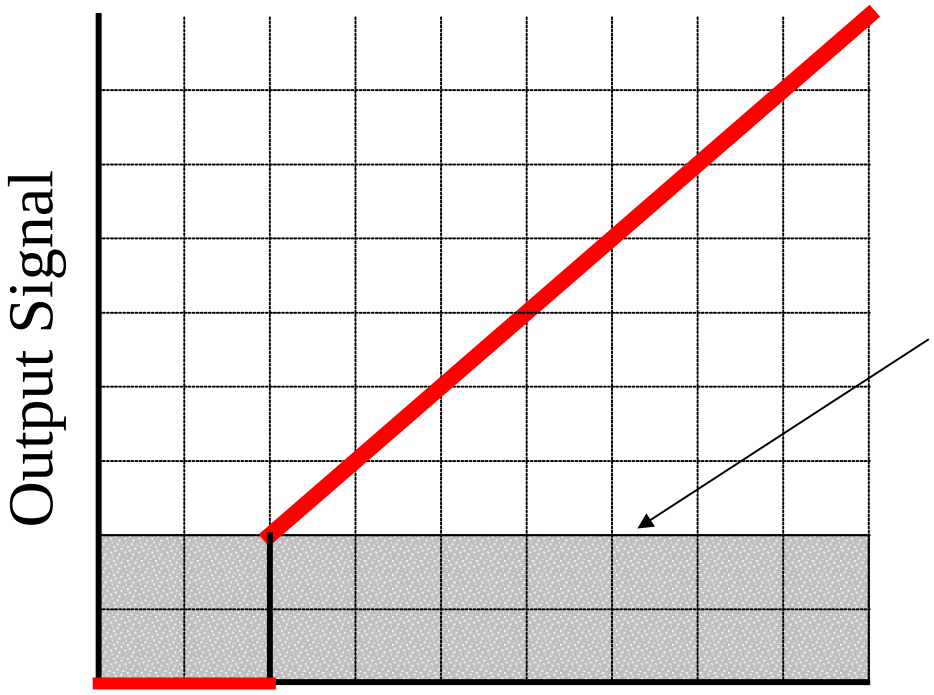
Noise Gate

- Allows only those signals above the threshold to pass
- Shuts down the circuit if the level is lower
- Useful for eliminating background noise

Noise Gate Parameters



Noise Gate



Signal Lower than the threshold is affected

Sidechain

- A second input that allows an alternate signal to trigger the compressor

- For instance, the narrator’s voice could trigger a compressor that turns down the level of the background music