



Chapter 4

Sounds in Space



OUTLINE

Doppler

Reverberation

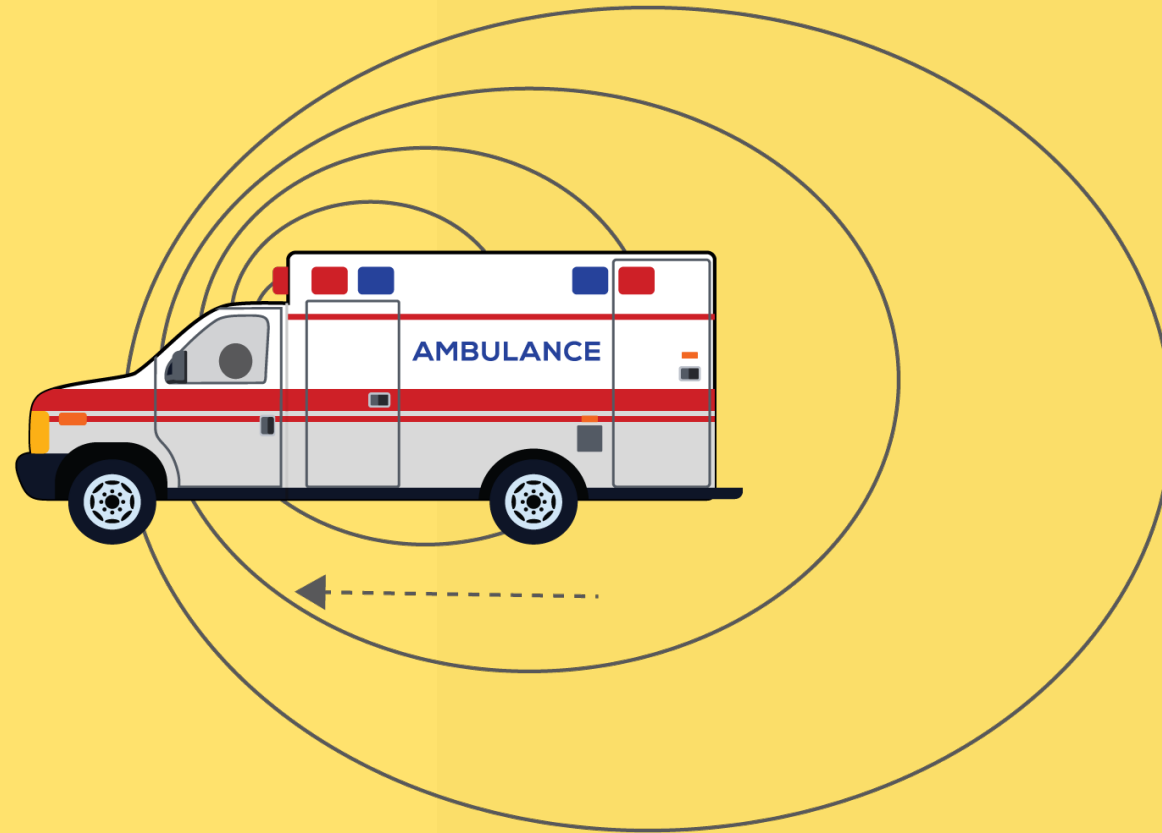
- Reflections
- Flutter & Standing Waves
- Resonance

Absorption & Diffusion

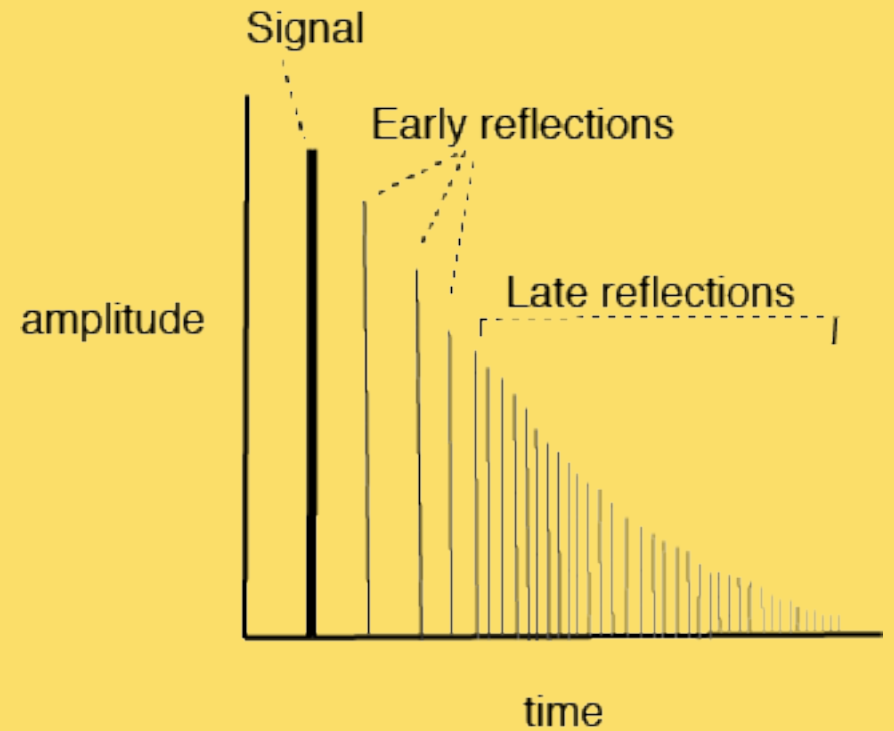
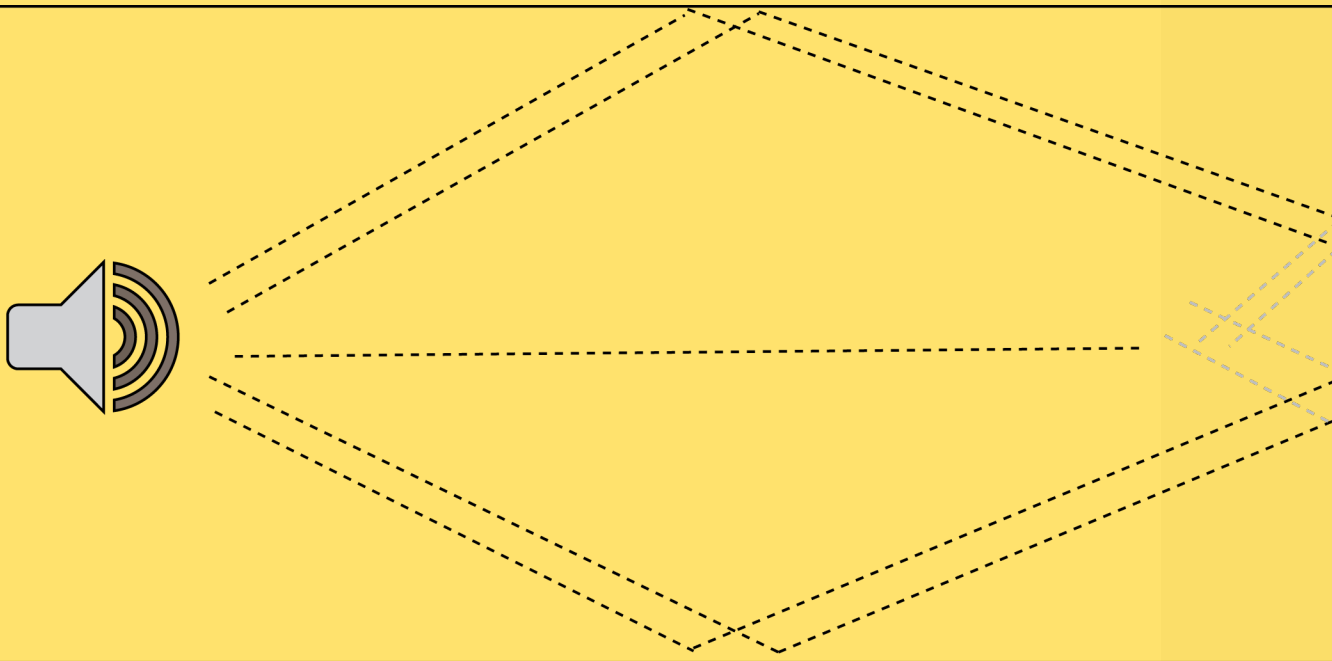
Digital Reverb

Echo and Delay

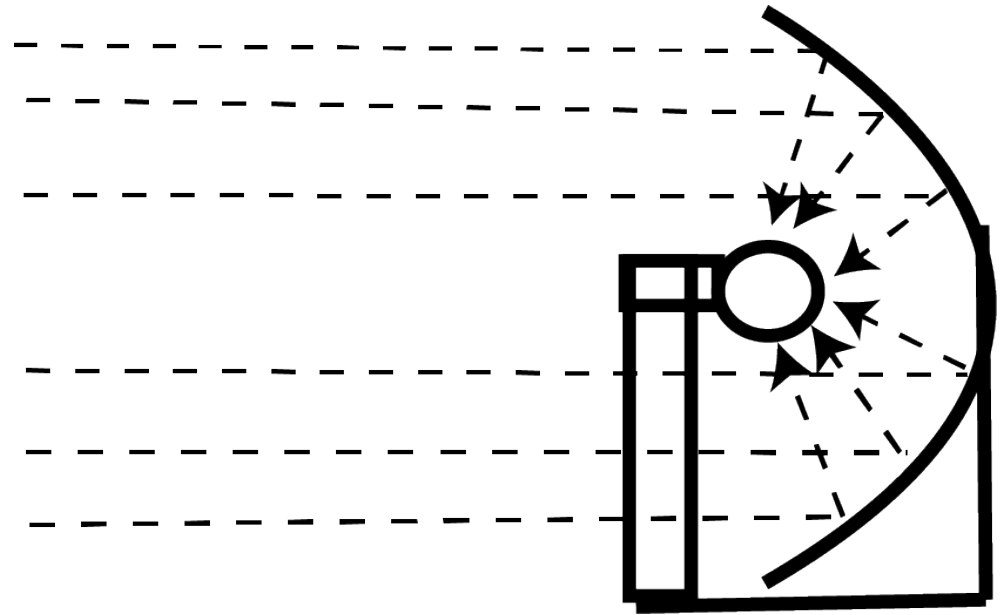
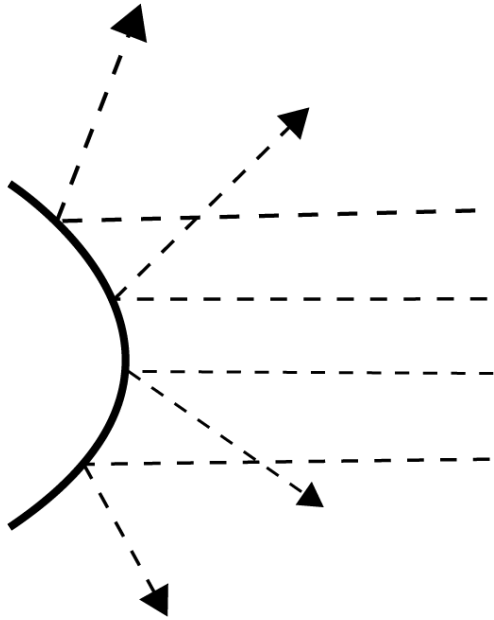
Doppler Effect



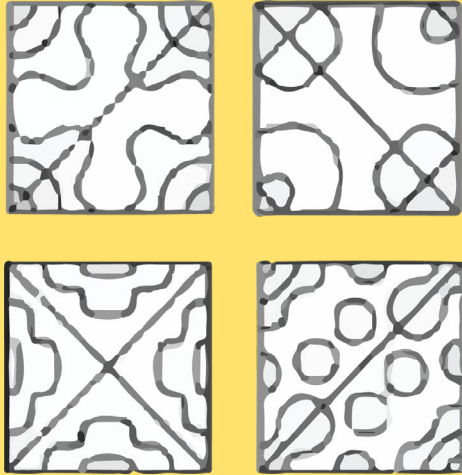
Reverberation: Reflections



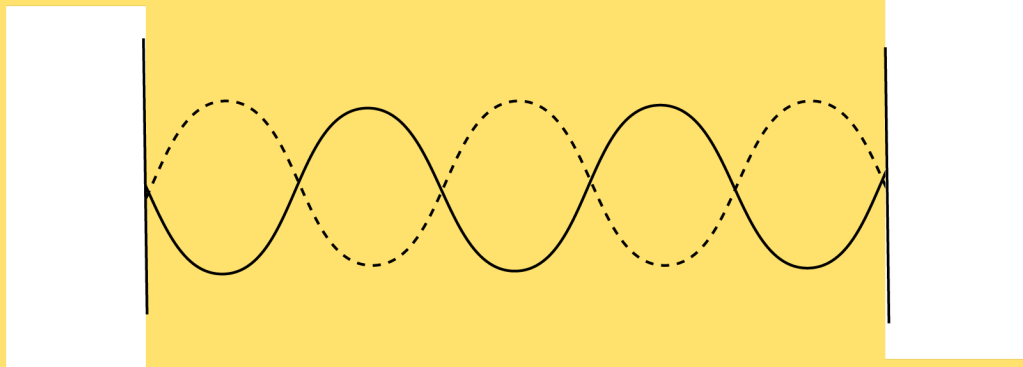
Parabolas



Standing Waves



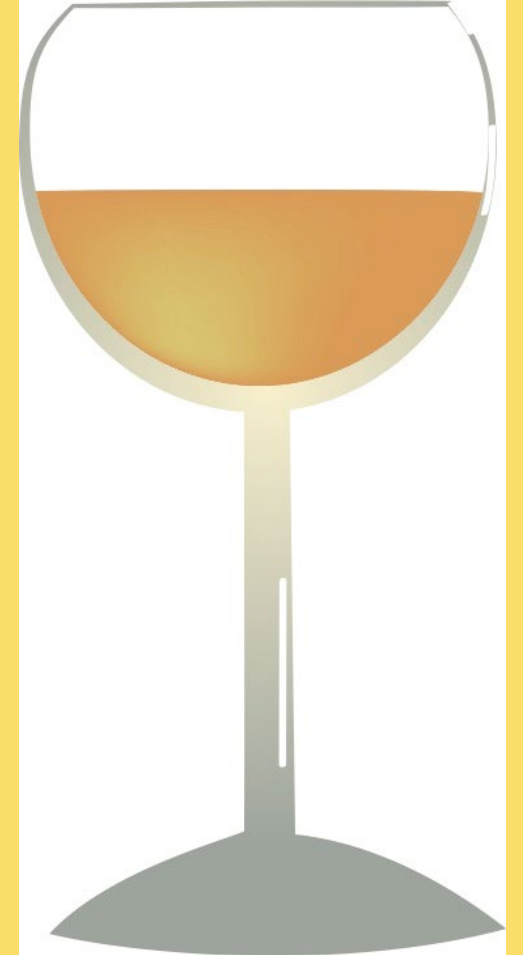
Chladni Plate Patterns



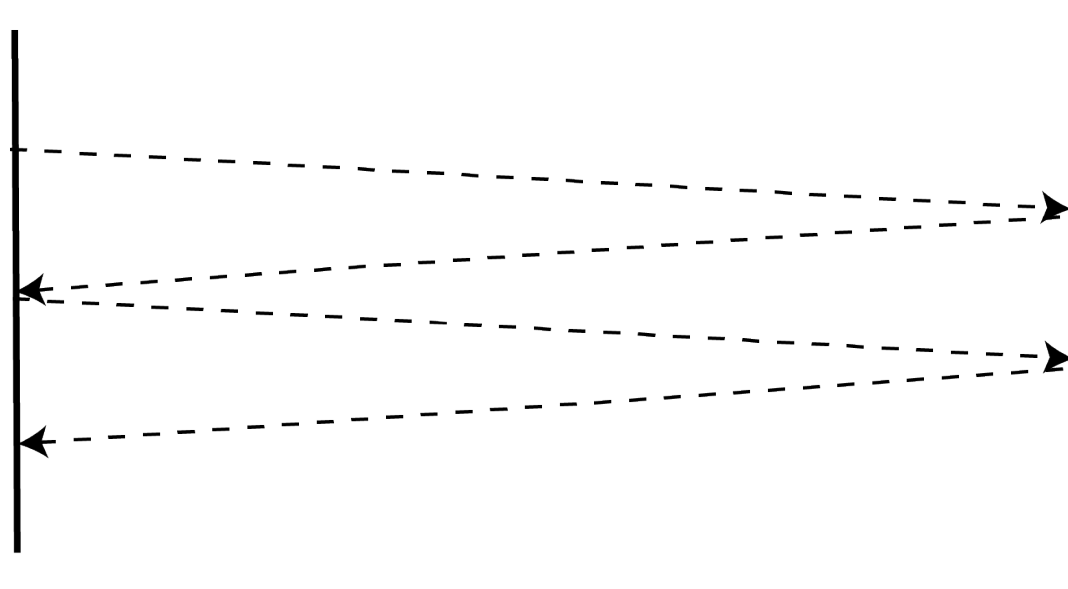
Resonance



Pasco.com



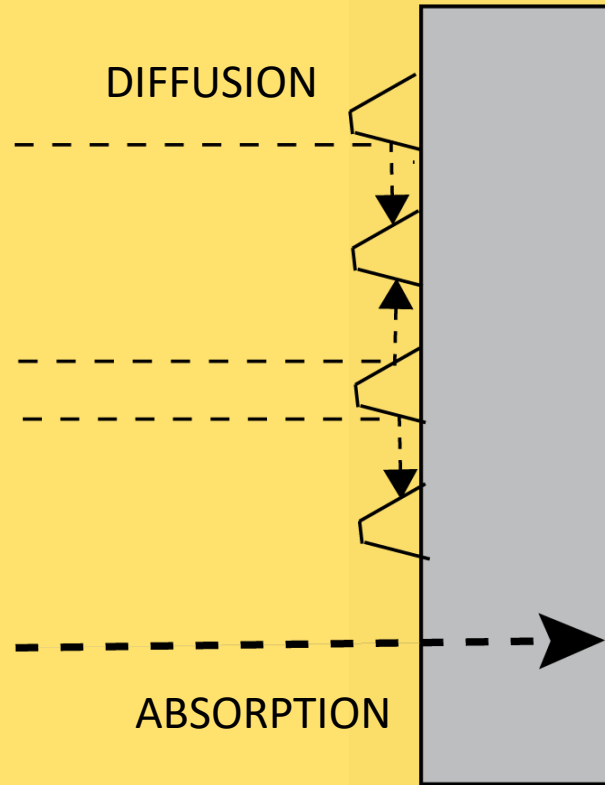
Flutter



Absorption & Diffusion

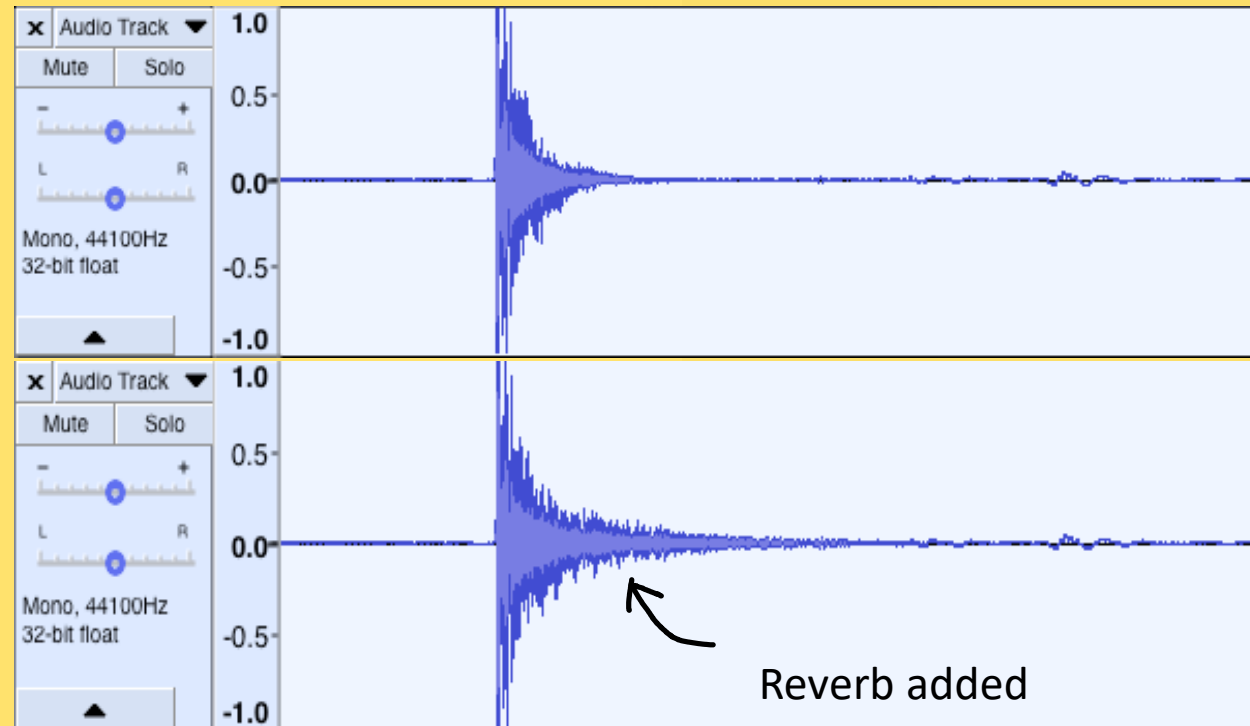


Keepitquiet.co.uk

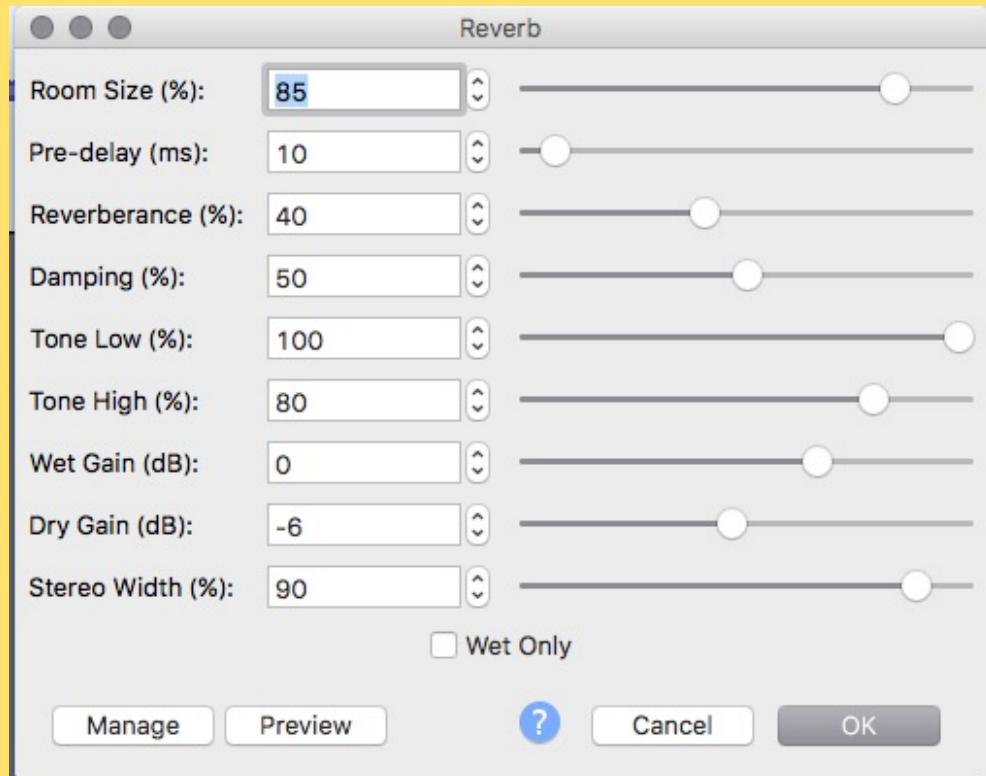


Alphacoustic.com

REVERB IN AUDACITY



Reverb Settings



Room Size: simulated space

Predelay: How much time before first reflection

Reverberance: Length of tail

Damping: high frequencies decay more quickly

Tone Low: reduce low freq

Tone high: reduce high freq

Wet gain: increase volume of reverb

Dry gain: increase volume of signal

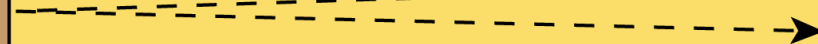
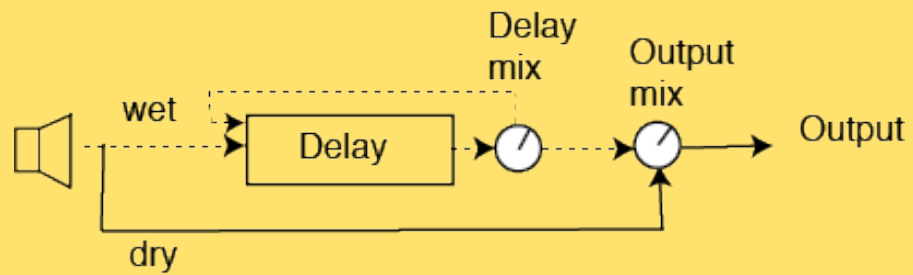
Stereo width: channel separation

Wet only: remove original signal

Preverb

1. Duplicate a sound file (**Ctrl/Cmd A**, **Ctrl/Cmd C** + **tracks > add new > mono track**, **Ctrl/Cmd V**)
2. Reverse Track 2 (**Effects > Reverse**)
3. Apply reverb **Effects > Reverberation > Manage > Factory Presets > Large Room**
4. Reverse Track 2 again (**Effects > Reverse**)
5. **Tracks > Mix > Mix and Render**

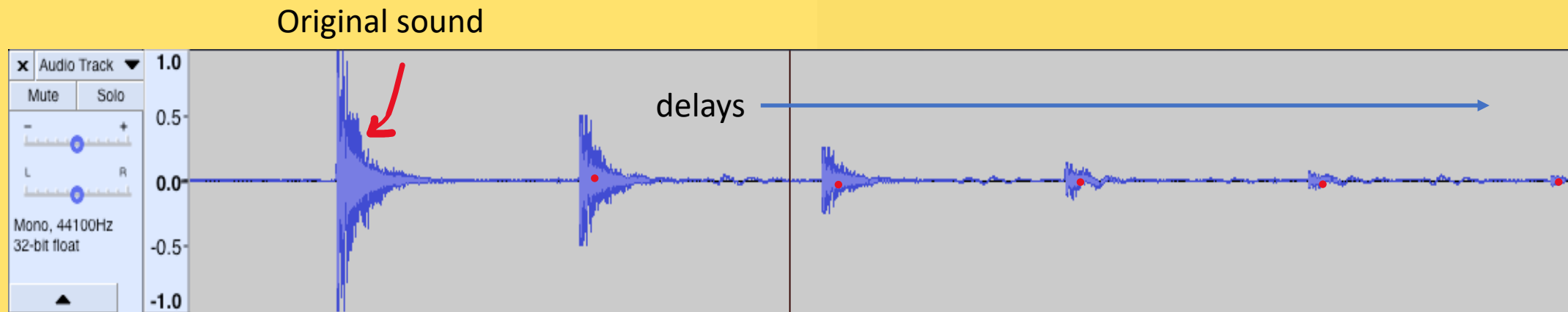
Echo and Delay



17+ m



Delay



Delay

Delay Type: regular, bouncing ball (reduces time as repeats), reverse bouncing ball (increases time as repeats)

Delay Level Per Echo: Amount of change in amplitude in each delay

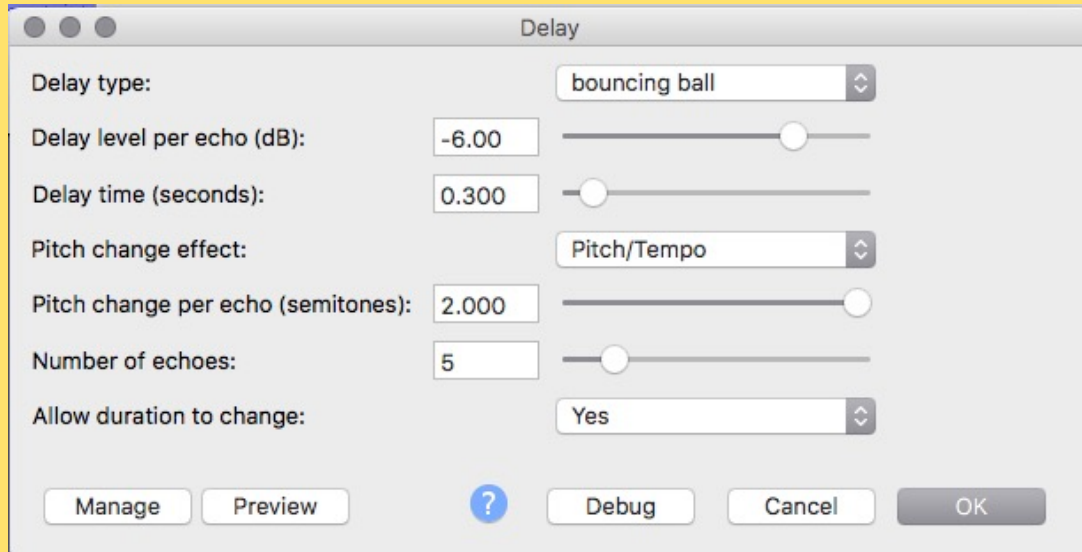
Delay Time: time between repeats

Pitch Change Effect: delay will change frequency/tempo

LQ Pitch Shift: Changes frequency while maintaining time

Pitch change per echo: in semitones

Delay



Number of Echoes: how many times repeats

Allow duration to change:
***need room in file for delay

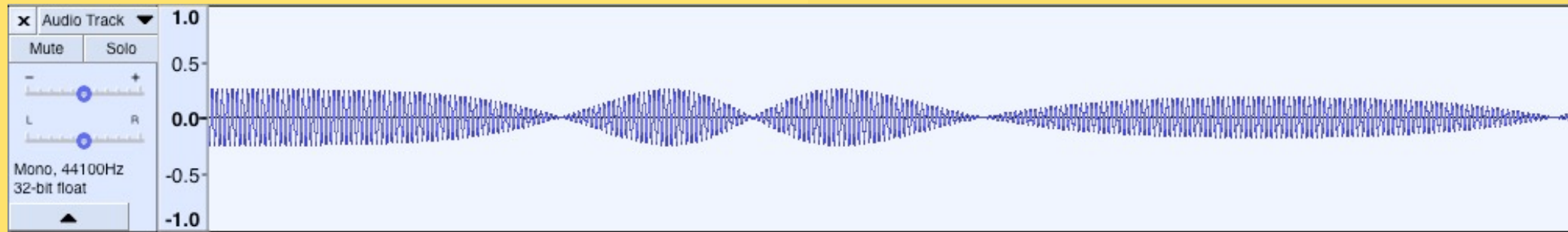
ADT & Chorus

Chorus: Multiple delays with deviations to create effect of chorus singing

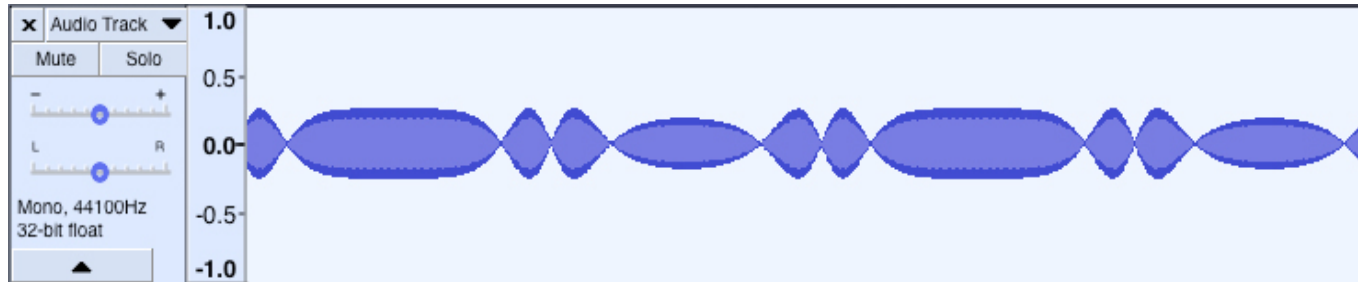
Automatic Double Tracking: ADT: automated chorus-style effect

Phaser (Phase Shifter)

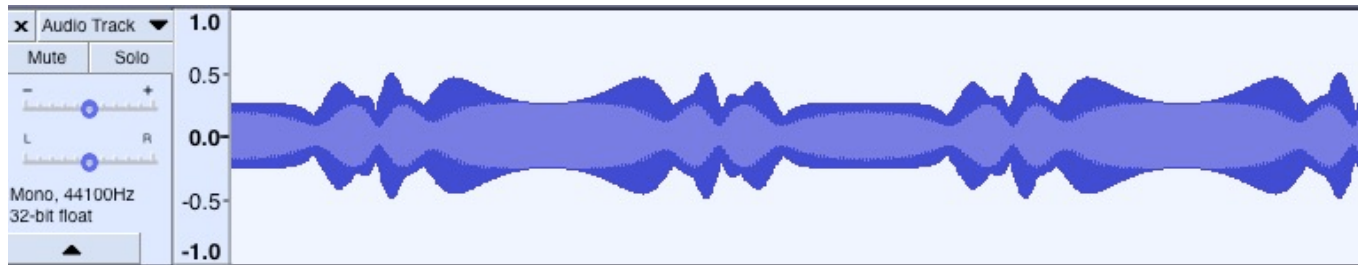
Uses constructive and destructive interference "swept" by LFO



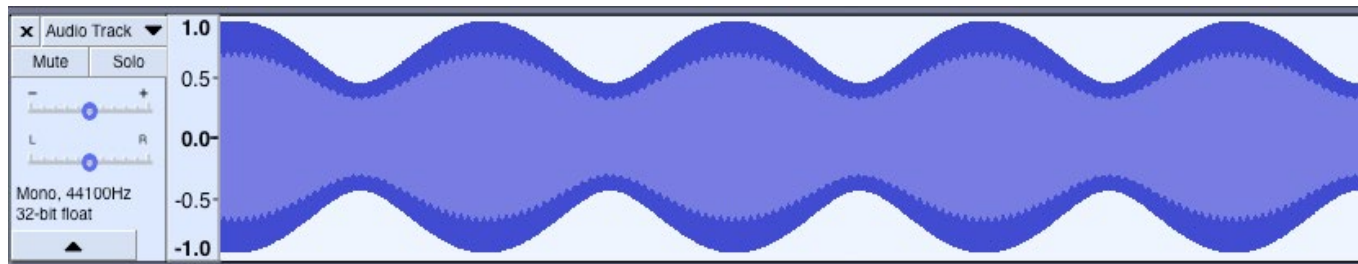
Phaser (Phase Shifter) and Flanger



Phaser on sine wave



Phaser on square wave



Flanger on sine wave

Audacity Phaser

Stages: more = stronger effect

Dry/Wet: 0 = unprocessed, 255 = only delay. Most = 128

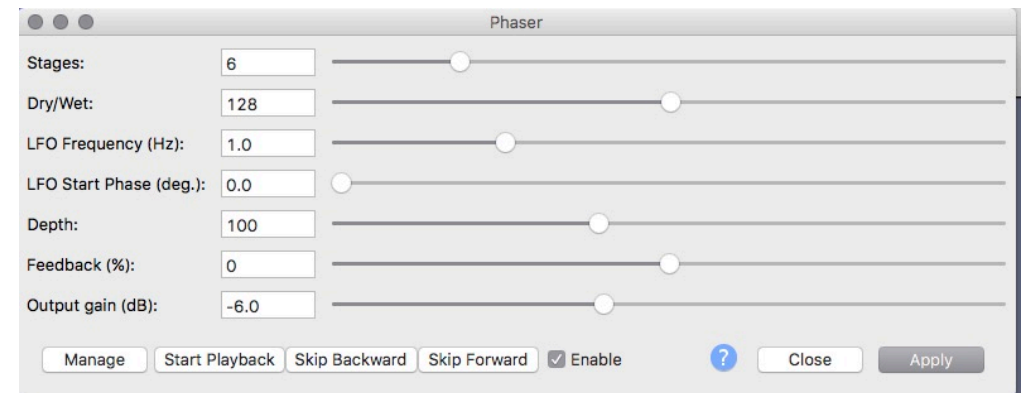
LFO Freq: adjusts sweep rate

LFO start: starts in cycle

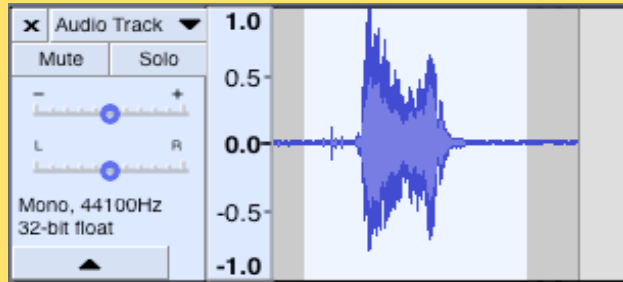
Depth: How high sweep is

Feedback: feeds signal back into phaser

Gain: increase output amplitude



Time Stretching



Original



Effect > Change Tempo



Effect > Change Speed

Worldizing– Walter Murch