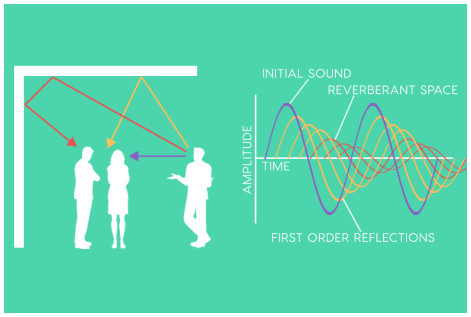
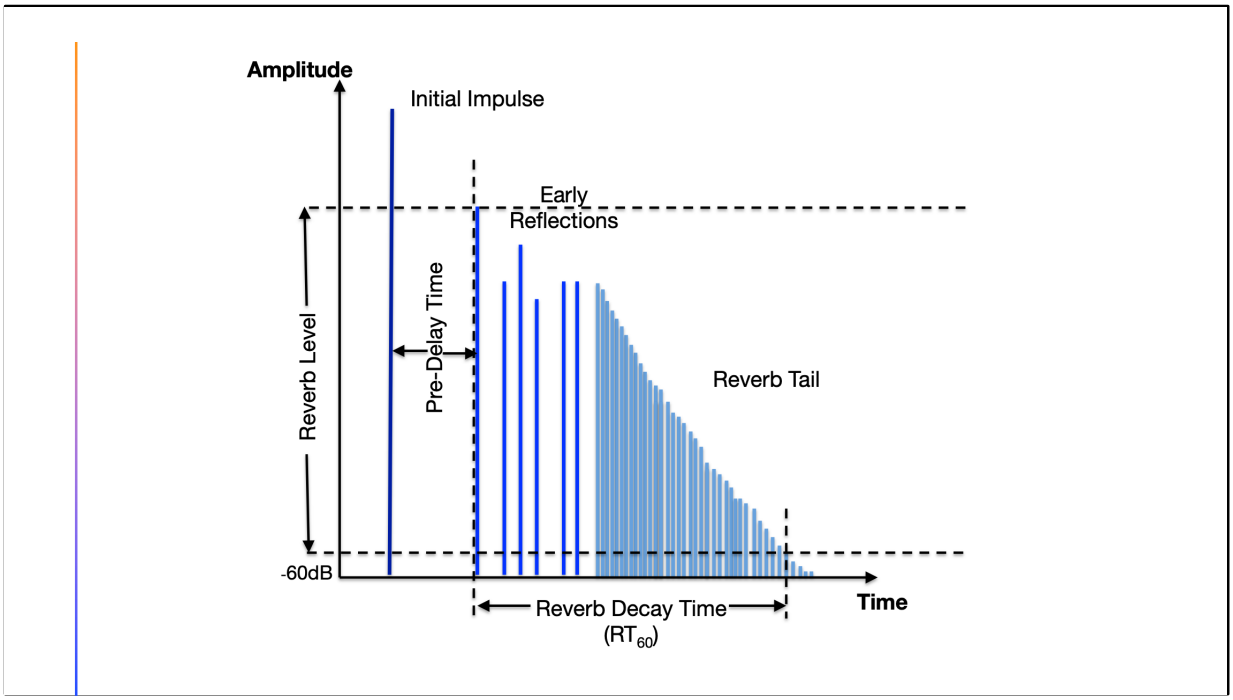
https://www.youtube.com/watch?v=cGBn7sU6m3k

What is Reverb?

- 'The persistence of sound after a sound is produced'
- Gives your brain information on the type of space you are in
- Occurs when sound bounces off of surfaces



Unless you are recording in an anechoic chamber, some reverb will be present



Sound is absorbed by the room's surfaces until the amplitude of the reflections reaches 0

RT60 = time it takes for a sound source's SPL to decay by 60dB

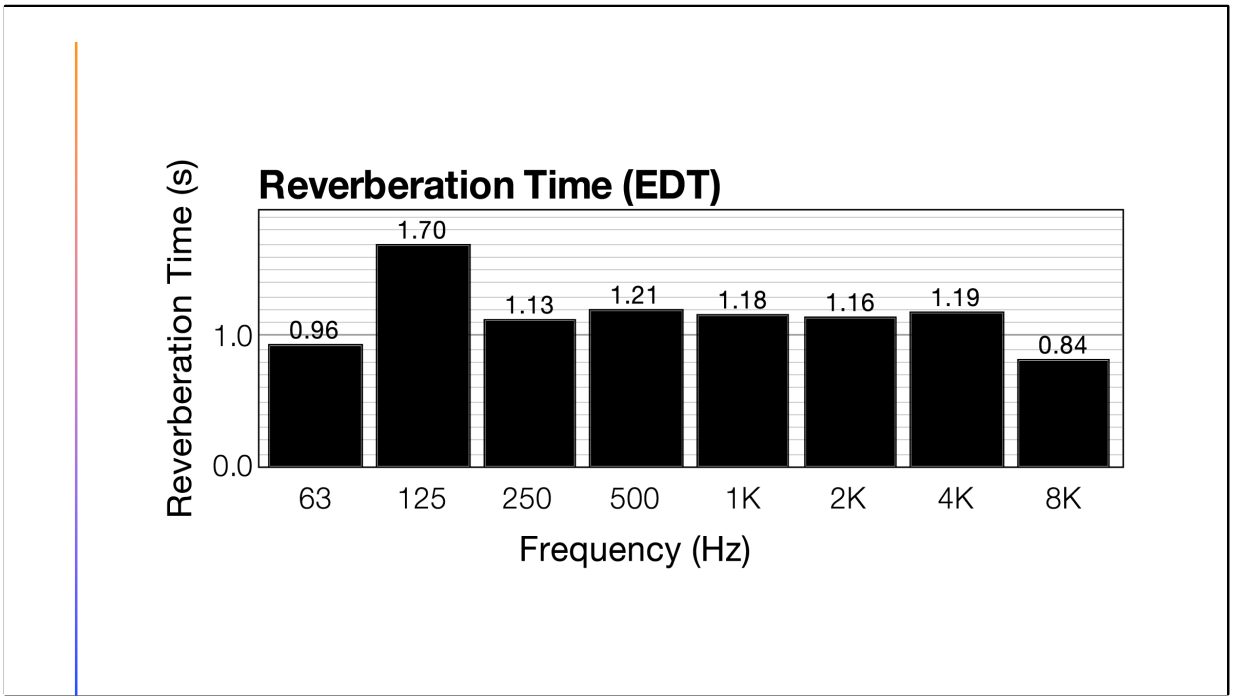
Orchestra playing forte = 100dB
Background level in concert hall = 40dB

Reverb Terms and Parameters

Term	Definition
Pre-Delay Time	The **gap** between the direct sound and the onset of the early reflections and reverb tail
Reverb Time	The amount of time taken for the reverb to decay to the point at which it is **inaudible**
Early Reflections	The first reflections that occur **after** the direct sound but **before** the reverb tail
Reverb Tail	The general wash of sound that occurs after the direct sound and early reflections
HF (High Frequency) Damping	Increases the perceived warmth of a space by attenuating higher frequencies
Wet/Dry	Controls the balance between the **altered** (wet) and **unaltered** (dry) signals

Reverb Time: Reverb time is also sometimes referred to as RT_{60} = The time it takes for the reverb to decay by 60dB

Early Reflections: They give your brain information about the perceived size of the room



Reverb is frequency dependent
- a high frequency signal will have a different reverberation characteristic compared to a lower frequency at the same volume

Reverb in Music

- Considered by some to be the 'oldest and most universal sound in music'
- Used as early as the 10th century by exploiting the acoustics of certain buildings

Gregorian chant may have materialised due to the long reverberation time present in many Cathedrals

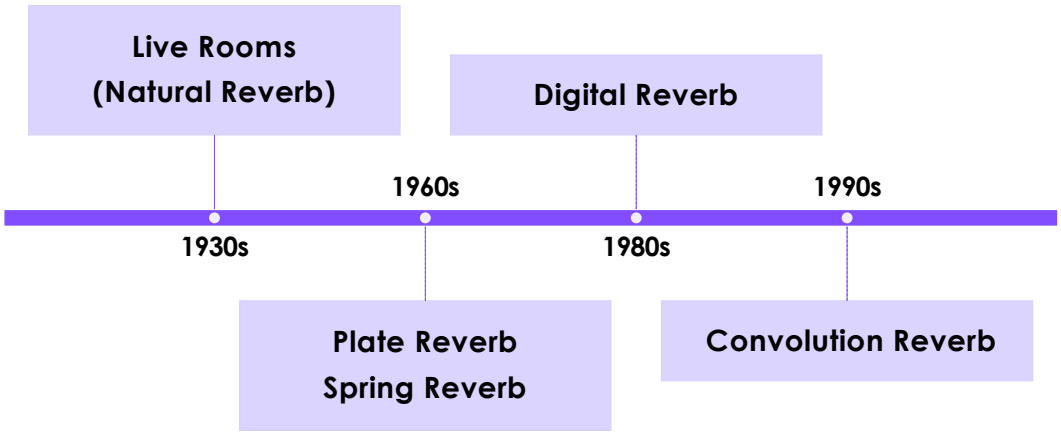
(Picture: St Mark's Basilica in Venice)
Choirs in the different galleries in the church would utilise its long reverberation time

Concert halls are specifically designed to control the transmission of reverberant frequencies

Uses for Reverb

- Close mic recording techniques aim to minimise the amount of natural reverb captured
- Allows you to control the amount of reverb present in the final mix

Reverb Timeline



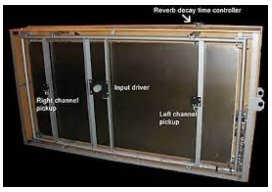
Natural Reverb (Live Rooms)

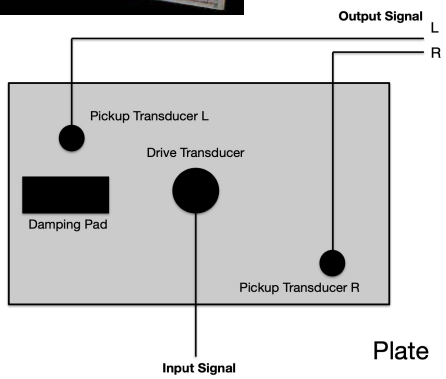
- Reverb would be captured in live rooms with varying reverberation characteristics
  - A booth, room, chamber or hall with an appropriate reverb characteristic would be selected
- Can't remove the reverb after the initial capture

Live rooms could become very expensive and people soon found ways of recreating reverbs in smaller rooms and in more artificial ways

Plate Reverb

- Audio is sent through a thin metal sheet that is suspended in a frame
- Used to create a rich-sounding reverb with a 'smooth' and 'bright' tone
- Most commonly used on vocals and drums





When audio is sent through, the drive transducer reproduces the signal causing the sheet to vibrate
As the sheet moves, the pickups convert the vibrations back into audio

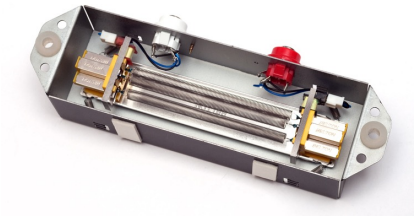
The reverb time can be adjusted by damping the vibrations with felt pads

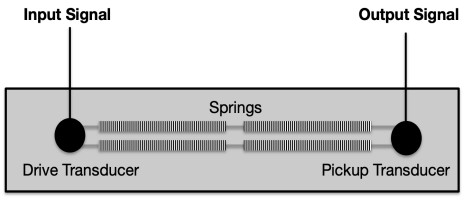
Good at helping melodic instruments shine through a mix

Some producers still prefer it to digital alternatives

Spring Reverb

- Audio is sent through to metal springs
- Commonly used in amplifiers
- Have a 'bouncy' sound





Spring

First seen in Hammond Organs in the 60s

Fender was one of the first to use them in their amps

Receives an audio input
The transducer then recreates it causing the springs to move
The output transducer then converts the motion of the springs into an electrical signal which his added to the dry signal

Cheaper and more practical that plate, but less sonically desirable
More metallic sounding

Digital Reverb

- First seen in the 1980s in effects units
- Creates a reverb effect by using many mathematically calculated delays
- Allows for the storage of pre-sets

Yamaha REV 7 and Lexicon 224

Filtering is also applied in order to help emulate the way in which natural reflections would behave in a room

As computer processors got faster, they became software plug-ins

Convolution Reverb

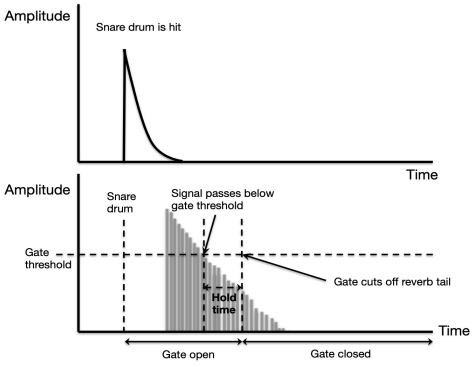
- Reproduces a real reverb from an existing space
- An impulse response is generated in a room and recorded
- Very heavy on processor usage

Developed by Sony in the late 90s

The most efficient way to route it in a DAW is by using and aux send/bus

Gated Reverb

- Combines a reverb with a noise gate
- Allows for very dense reverb to be used without creating a 'muddy' mix
- Often used on drums



Very much associated with 80s rock music (Phil Collins – In The Air Tonight)

Adding compression can increase the sustain level of the reverb tail which creates a denser reverb sound

Reverse Reverb

- The reverb tail is played backwards
- Would have been achieved in the 60s by recording a reverb to tape and then playing in backwards

The Only Ones – Miles From Nowhere (1:57)