

Reverberation/Reverberant Sound:

Totality of sound = direct sound, multiple echoes and “clutter”

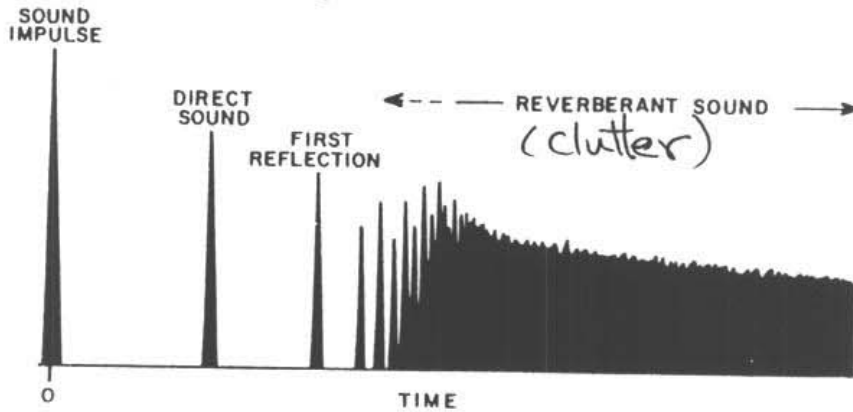


FIG. 2. Multiple reflections of a sound impulse as heard by a listener.

Reverberation Time, T = time for sound to decay to 10^{-6} (one millionth) of its original intensity, I .
 Corresponding change in Loudness Level/SPL: $\Delta L = 10 \log_{10} (I_2/I_1) = 10 \log_{10} (10^{-6}) = -60 \text{ dB}$.
 Hence, reverberation time T is also known as T_{60} .

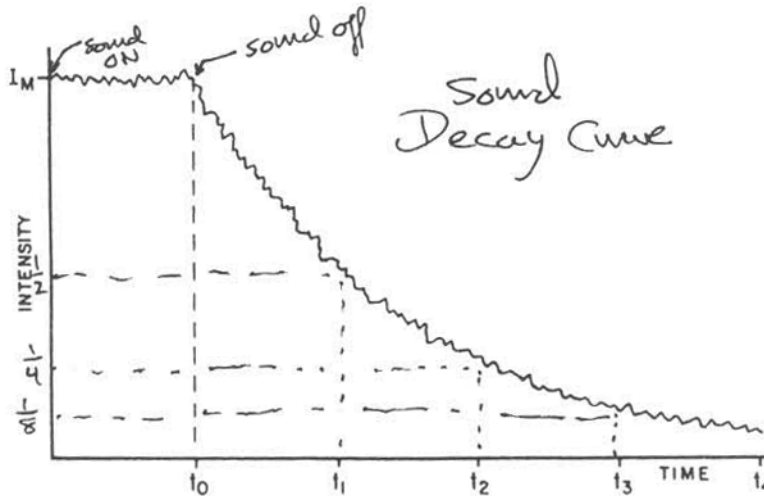


FIG. 3. Decay of reverberant sound in a room.

Reverberation Time, $T \propto$ (= proportional to) room volume, V - i.e. $T \propto V$

Reverberation Time, $T \propto 1/\text{Area}$ of “hole(s)” in room, A $T \propto 1/A$

Sabine Equation:
$$T = K \frac{V}{A}$$
 where K = constant of proportionality = $T \frac{A}{V}$

If we know V and A and then measure T , we find $K=0.049 \text{ sec/ft}$ (= universal number!!!)