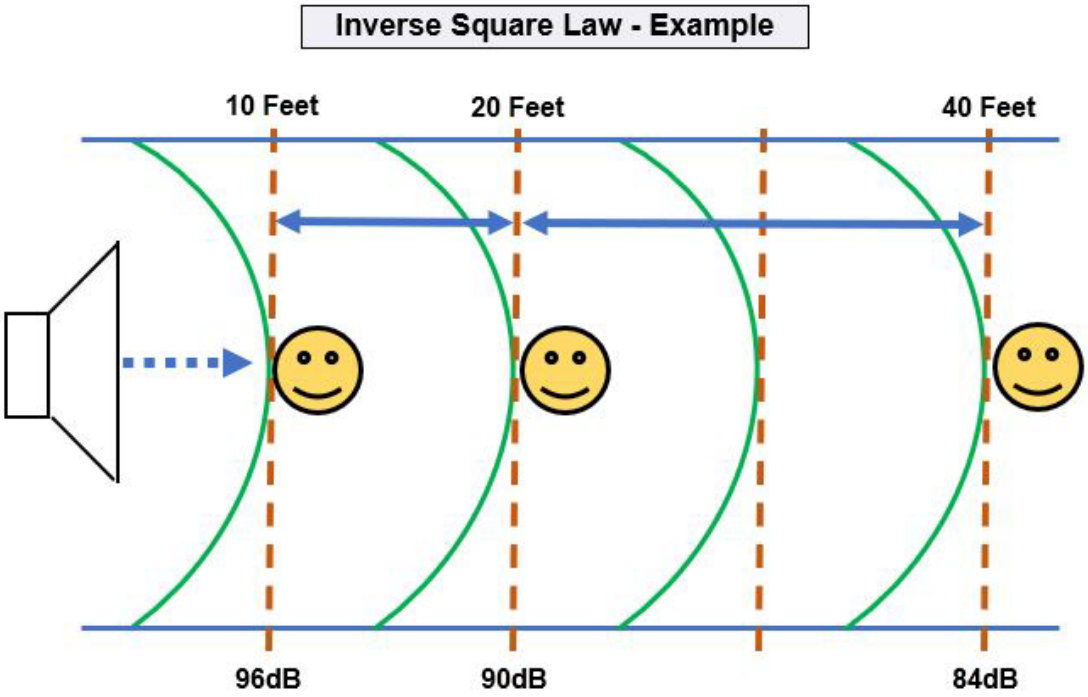
The Inverse Square Law – A Quick Overview

The Inverse Square Law states that the intensity of sound decreases with the "square" of the distance. Now what does that mean? Simply put, if you increase the "distance" (double the distance) between the "speakers" and the audience (move the speakers further away from the listeners) the sound pressure level (SPL) decreases by 6dB.

Example: Let's say the output of the speaker is 96dB at the listeners who are exactly 10 feet away from the speaker. If the listeners move to a position at 20 feet away, the sound pressure level will drop 6dB to 90dB. If the listener starts at 20 feet away, and moves to a position 40 feet away (doubling the distance) the sound pressure level will drop another 6dB to 84dB.



The formal description of the Inverse Square Law regarding audio systems is that the "Intensity of sound will decrease by approximately 6dB for each "doubling" of the distance from the source of sound (speaker).

Important Technical Note

How is the Inverse Square Law important to you as an audio technician, sound engineer, or musician? This "Law" also applies to how close a vocalist is to a microphone. For example: A vocalist is 2 inches from mic and you are getting plenty of signal at the mixing board. But the vocalist moves their position and is now 4 inches away from the mic – the signal will decrease 6dB. We all know what happens when a vocalist starts moving further and further away from the microphone – the Mic keeps getting turned up, and Feedback starts to occur! Sound Operators need to keep reminding vocalists to stay close and consistent with microphone placement (stay right up on the microphone).