

Sound Principles

How Does Acoustics Influence the Microphone Choice?

Room acoustics are indeed an important factor in choosing the microphone type and its pattern.

The “echo” in a room will need to be taken in consideration. Ideally, attenuating reverb in a room is the main goal when planning an installation. Too much echo will make it difficult to capture participants with good speech intelligibility, as sound waves that are bouncing off reflective surfaces in the room, will surely be picked up by the same or other microphones at different times and be processed in the DSP as another source. This will be perceived by others on the other side of the room as either phasing or ‘echo’, depending on how quickly the sound wave is captured and reproduced a second time by the signal processor.

No reverb at all can also sound strange to us, as we are used to hearing a bit of reverb and typically perceive it as normal. A room with no reverberation can sound “dead” and altogether unnatural.

In auditoriums and studios, where good sound reproduction is imperative, designers usually consider tailoring these larger spaces to have lower reverberation in order to optimize the sound of their space. When considering sound performance and reproduction, the effects in conference rooms and medium to large training rooms are not always as obvious. However, with the continued improvements in audio and video conferencing today, customers are becoming more and more aware of audio quality and have higher expectations for sound. It is important to note that sometimes even when a system is built with top-of-the-line products, having poor acoustics will greatly decrease the intelligibility of speech.

Acoustic panels, bass traps and diffusers are a good solution for tailoring a room’s sound quality. However functional, these panels, with their plain-Jane designs, don’t always compliment the architect’s intended aesthetic. This has created a shift in recent years, and manufacturers are adapting to provide a better fit and design for today’s innovative boardrooms and large meeting spaces. For instance, now you will find that sound absorbing materials come in different colors, shapes, and sizes so they are easier to blend into or accentuate the décor.

Most acoustic panel manufacturers have a wide selection of designs and materials and many welcome the chance to have their products become a more integrated part of the design space.

Another factor to consider before choosing microphones is the level of reverberation in the environment. When reverb and/or echo are still present and need to be dealt with, the most reliable practice is to bring the microphones as close as possible to the speech source. This captures the desired sound at a significantly higher level than the “room effects”.

For example, in a room that is acoustically treated, and where reverb is almost non-existent, boundary microphones are often a good option because they can pick up the participants’ voice from the center of the table. Here, boundary mics as a solution can be unobtrusive and out of the way and there will be no need for proximity since the noise level of the room is attenuated.

If the noise level is critical, then the option is to bring the mic element closer to the participants. This raises the level of speech over the room noise without compromising speech intelligibility. Goosenecks are also a good way to do this. With the right length of shaft, a gooseneck can easily tower over a laptop screen and capture the participants’ voice very clearly, while leaving the room noise in the room.

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