

Example of the Video Transcriptions for Course 310 – Sound System Design – Direct Field

1. Introduction

The main function of a sound system is amplification. The amplification of microphones has an upper limit, since too much gain will make the system unstable. The acoustic gain of a system is determined by distance choices made by the system designer. It's logical to evaluate the potential acoustic gain of a system during the design phase of a project.

The SynAudCon IntelliKwik™ app will be used for many of the calculations needed to design a sound system. I will use it to make the principles visual and interactive. This lesson will use the PN calculator that can be launched from the main screen. PN is short for "PAG-NAG." PAG is Potential Acoustic Gain. NAG is Needed Acoustic Gain. The examination of PAG and NAG will enable you to answer the question "Will it be loud enough?" before the system is installed.

2. Communication

The most effective communication system known to humans is face-to-face conversation. The talker is an information source with a storage medium - the brain. Information from the brain is modulated into pressure waves by the speech system. These waves propagate through the atmosphere. When they pass a human auditory system they modulate the hearing system, which converts them to electrical signals that travel to the listener's brain, which decodes the signal and receives the information that it carries. The process begins with information and intelligence, and it ends with information and intelligence. There are no "chance" processes at work here.

This course considers the direct sound field coverage of an audience. We'll start with a single listener, but then expand the scope to include the entire audience. We will look at how to cover planes - the regions where the audience resides. The factors that inhibit communication between talker and listener in a free field include distance and noise. The objective of a sound system is to overcome these detriments so that information can be delivered.

3. Acoustic Gain

The acoustic gain of a room can be found by measuring the level of an outdoor talker at a distance and comparing that to the level of the talker indoors at the same distance. The level difference is the acoustic gain. Small rooms can have significant acoustic gain, possibly negating the need for a reinforcement system. Large rooms lack strong early reflections, so they have less acoustic gain than small ones.

The same process can be used to find the acoustic gain of a sound system. Measure the level of the un-reinforced talker, and then switch on the system and remeasure. The level difference is the acoustic gain. Acoustic gain is the objective of a sound reinforcement system.