

## Example of Video Transcriptions for Course 200: Audio Applications

### Lesson 200\_10\_1: Mixer Gain Structure

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#### 1. Introduction

A good system gain structure begins with a good mixer gain structure. Get this part right, and the system gain structure is easy. Get it wrong and the rest is a mess. Some objectives of a good mixer gain structure are as follows

- Have all of the level controls operate in their optimal range.
- Have visual feedback of the proper level from the mixer's meter.
- Minimize the output noise from the mixer, and
- Avoid distortion due to clipping.

These are the objectives for setting up any analog or digital mixer, no matter the make or model. The first two objectives assure the realization of the second two. If the meters and faders are right, the gain structure is right.

#### 2. Dynamic Range

Two levels of interest for an audio component are the maximum output level and the residual noise level, or noise floor. The difference between these two levels establishes the dynamic range (DR) of the device. Modern audio components can be expected to have a dynamic range of around 100 dB, give or take. The objective of a good gain structure is to use all of it.

#### 3. Signal-to-Noise Ratio

A third level of interest is that of the signal. This is the program level - the RMS voltage of the audio signal at the device's output. The difference between the program level and the noise floor level is the signal-to-noise ratio (SNR). If the RMS program level is too high, clipping distortion will occur. If the RMS program level is too low, the SNR will be low and the noise floor may be audible in the output signal. The objective is to maximize the mixer's the SNR without exceeding its DR. This is accomplished in one of two ways.

1. Drive the mixer until the program peaks approach the maximum output level.
2. Drive the mixer until the RMS program level is about -20 dB relative to the maximum output level.