

## Example of the Video Transcriptions for Course 50: How Sound Systems Work

### 50\_02 The Signal Chain – Clip 1

#### 1. The Signal Chain Overview – 0:08

Sound systems vary dramatically in scale and complexity, but all of them can be broken down into a chain of components that include program sources, a mixer, signal processing, amplification, at least one loudspeaker, the room, and at least one listener. Simple systems may have only one of each. A large system may have dozens or hundreds of amplifiers and loudspeakers spread out over several rooms or buildings. This flow diagram shows the signal chain from program source the loudspeaker. We will use it often in SynAudCon training. In this lesson I walk through the signal chain and consider the function of each component.

#### 2. Program Sources - 1:09

Program sources produce the electrical signals to be reinforced by the sound system. The most common ones are microphones, musical instruments, and consumer or professional media players. The electrical attributes of a program source include level, source impedance, and circuit topology. These electrical attributes can vary dramatically between program source types, which is why mixers have several input connector types and accept a wide range of levels. Each program source is connected to a unique channel on the mixer. This gives it its own channel strip for level control, signal processing, and routing.

Program sources are often selected based on artistic criteria. For example, various types of microphones will make a performer sound different. Which one is best may be purely subjective. Consumer electronics devices can be used as program sources if they are correctly interfaced to the mixer. An external interface box may be required. Many mixers provide special inputs and outputs that are optimized for use with consumer devices. Professional program sources offer higher signal levels and a balanced output topology.

The major differences between consumer and professional sources include interference immunity, and the length of the cable that can be driven.

#### 3. Interface Boxes – 2:54

Mixers can handle many program source types, but in special cases an external interface box may be required to modify the program source's electrical characteristics. This is a direct box or "DI." A DI can give a keyboard or a guitar the electrical characteristics of a microphone. A pad can reduce the signal level if it is too high for the mixer to handle. This device converts a consumer interface to professional, or a professional interface to consumer. Consumer gear is cheap, but the lower price may be offset by the cost of the interface box. Every audio person should have a DI in their ...