

## Sound System Components

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**Source:** The origin of the sound signal, such as a tape deck, CD player, microphone, etc.

**Mixer:** A mixer is a device which takes a large number of audio signals and combines them into a fewer number of signals. For example, three microphones mixed into a single program.

**Processors:** Devices which change an audio signal. EQs, compressors, and effects processors are all examples.

**Amplifier:** a device which boosts the power of an audio signal. Pre-amps, in general, boost from **microphone level** to **line level**. Power amps boost from line level to **speaker level**.

**Destination:** Speakers and recording decks are examples of the ultimate destination of an audio signal. Your destination must be driven by an appropriate signal level. Don't try to drive speakers with a line level signal!

**Cabling:** A number of different sorts of cables are used in audio production:



RCA connectors are very common for the interconnection of audio components. They usually carry **line level** signal. The connector ends are usually red and white, the red carrying the right stereo channel.



XLR connectors carry a **balanced** signal. XLR connectors are generally found on higher-end professional gear such as audio processors and pro-grade CD players. Two XLR cables are required for a stereo signal.



Phone Plugs come in three common sizes: 1/4", 1/8", and 1/16". They can be either mono or stereo connectors. Stereo phone plugs can be used to connect line-level devices. Mono 1/4" phone cables are the most common type of speaker cable.

**Signal Types:** The level of a signal refers to its power, which correlates to the amplitude of the electrical wave representing the audio signal.

**Line Level** signals are audio signals used to interconnect audio devices.

**Microphone Level** signals have a much lower amplitude. They require a pre-amp in order to be processed. Microphone level signals are nearly always balanced.

**Speaker Level** is a high-power amplified signal used to drive speakers. Speaker signal is almost always unbalanced.

**Unbalanced Signal** uses two conductors: a signal and a ground.

**Balanced Signal** uses three conductors to send a single signal. Two conductors are mirror images of each other – the same amplitude waveform at opposite polarities. When the signals are later subtracted from each other, any noise induced in the cable will be cancelled out.

## Assembling a Sound System

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Sound systems range in scope from simple to extremely complex, depending on the application. However, within the system, there is a clear and logical signal flow. Breaking the system down into its individual components will make a system easier to understand and work with.

When assembling a sound system, it's important to keep in mind the various signal types which will be encountered. Pre-amps and **balancing transformers** (devices which convert from an unbalanced to a balanced signal, usually ¼" to XLR) may be necessary in order to get the system to function properly.

Note that many mixers have pre-amps and balancing functions built in.

Consider your components and determine which sorts of cables you will need. Adaptors, couplers, splitters, and other devices can be used to change from one cable type to another, to connect cables end-to-end or change their gender, and to split a signal into multiple identical signals.

Keep in mind that outputs connect to inputs, and inputs to outputs. Signal will always flow from a source to a destination.

## Reading

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TD&P Ch. 19 & 20

<http://www.soundcraft.com/palz.asp> (Guide to Mixing)

Additional optional info:

[http://www.prosoundweb.com/studyhall/ab\\_index.php](http://www.prosoundweb.com/studyhall/ab_index.php)