

# SOUND / EQUIPMENT

GSI Caller School





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## CHARACTERISTICS OF SOUND

**Sound** is vibrating air pressure. The pressure fluctuations cause the eardrum to move and the brain interpret.

**Pitch / Frequency** - The musical pitch of a sound is determined by the speed of the vibrations. Most sounds, like voices and music recordings, are not just a single note. They are made up of the fundamental note plus an array of other frequencies called overtones. The mix of overtones lets a person identify a difference between instruments, or between one person's voice and another's.

**Loudness** of a sound is determined by how large the pressure variations are. A sound produced by a person's vocal cords is usually softer than the same note produced by a musical instrument.

**Directivity** - An important characteristic of sound is its ability - or willingness - to go where it is aimed. High notes go where they are aimed, low notes go everywhere. The air pressure vibrations are reflected off of walls.



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## EQUIPMENT

**Amplifier** – Important characteristics are the power output, accuracy of reproduction of the input signal, tone control, and ease of use.

**Microphone** - The basic function of a microphone is to convert the air pressure variations that are sound into an electrical signal that can be amplified.

- Omni-directional microphones will pick up sounds almost equally from almost any direction.
- A cardioid will receive sounds well only if they are from a source directly in front of the head of the mike.

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## EQUIPMENT

**Speakers** - The electrical signal created by the microphone and made larger by the amplifier goes to the speaker to be converted back to sound.

- Impedance is measured in ohms. The lower the impedance of the speakers they are connected to, the more power they try to produce. Most amplifiers have a particular impedance into which they will perform best generally between 4 and 8 ohms. The problems arise when several speakers are connected to a single amplifier.
- The connection must be kept the same to be sure that all speakers used at one time are in phase with each other – series or parallel. In series connections the impedances add to each other. In parallel connections they are divided by the number of speakers that are in parallel with each other.



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## ENVIRONMENT

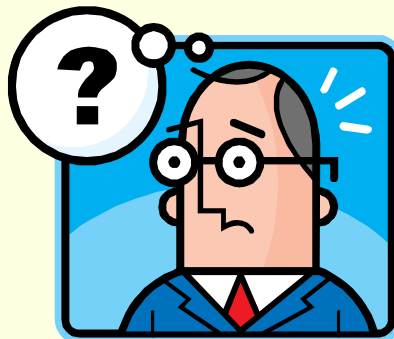
**Acoustics** - When the sound leaves the speaker what happens to it depends on the acoustics of the hall.

- Four hard walls and a hard ceiling is the most difficult. Sound will bounce all over no matter what equipment creates the sound.
- You can exercise some control by placement of speakers. Aiming the speaker(s) into the crowd helps to reduce sound bounce. The more precise sound pattern of the column speaker is a significant advantage when trying to control the placement of sound in a difficult hall.

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# QUESTIONS



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# ANSWERS