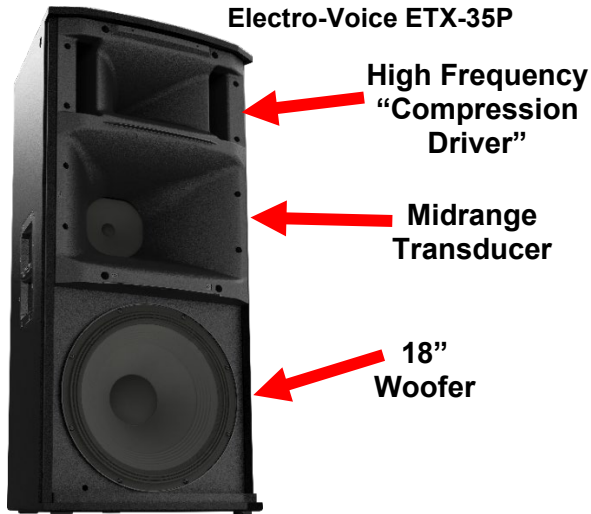


# Speaker Components - Basics

## Typical 3-Way "Passive" Speaker Cabinet



Electro-Voice ETX-35P

High Frequency  
"Compression  
Driver"

Midrange  
Transducer

18"  
Woofer



**Tweeters** – A type of speaker with a small "Cone" that reproduces sound in the "higher" frequency ranges. Usually, tweeters will be crossed over around 3kHz (depending on the tweeter's specifications). Too much power can easily destroy a tweeter very quickly – use caution.



**High Frequency "Compression Drivers"** are mainly used as tweeters but can be utilized as mid-range loudspeakers as well. This "horn-loaded compression driver" type can achieve very high sound pressure levels. An important specification of High-Frequency Drivers / Tweeters is their coverage angles. Example: 90° X 60° (H x V). Means it has a 90° Horizontal X 60° Vertical throw pattern.

**Midrange Transducers** – These speakers handle the mid-range of frequencies – usually between the 500Hz – 3kHz / 4kHz range. Midrange Transducers are very crucial as they reproduce frequencies in the instrument and vocal ranges.



**Woofers and Sub-Woofers** are not the same – there is a difference in the Frequencies that each can produce:

**Woofers** – Usually 60Hz-6kHz  
**Sub-Woofers** – Usually 30Hz - 250Hz.  
Of course, it will depend on the

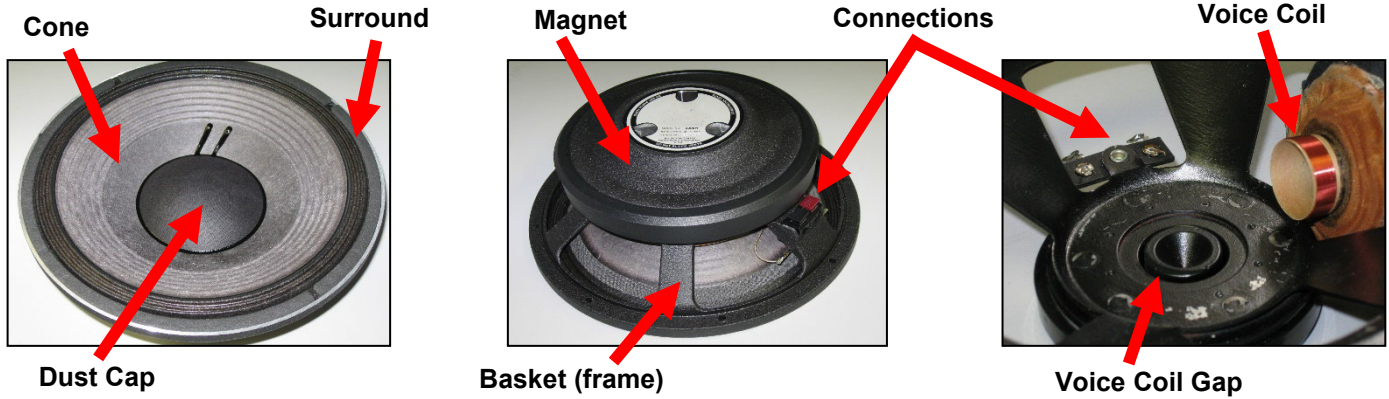


**Woofers** reproduce the Low and Mid-Range frequencies. Woofers are usually smaller than most Subwoofers, and it's essential to understand that they are not the same. Woofers can generally produce frequencies in the 60Hz – 6kHz range.

**Subwoofers** reproduce very low frequencies, some as low as 28Hz, but usually somewhere around 30Hz - 250Hz. The speaker size is usually 18" (but there are some larger). At these lower frequencies, you will "feel" the sound more than you will "hear" the sound. Adding "Subs" to your sound system will increase the audio's overall clarity.

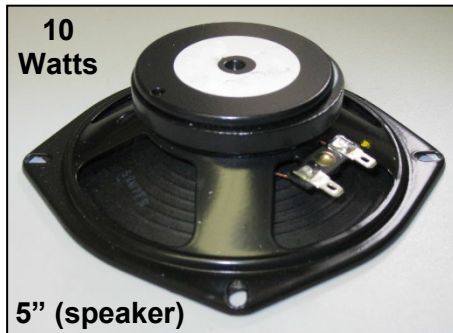
**Tech Note:** Speakers can be technically referred to as "Output Transducers."

## Basic Parts of a Speaker



**Notes:** Magnets – The "Magnet" size will determine the speaker's efficiency (the larger the magnet, the higher the wattage that can be generated). Cones – The shape of the cone affects the frequency response of a speaker. The cone is used to "push" the air that makes the sound. Dust Cap – The dust cap is nothing more than a "cover," it's there just to keep the dust out of the voice coil. The speaker will still work if the dust cap falls off, but if dust gets into the voice coils gap area, it can cause a "scratchy" sound. Voice Coil – The "Voice Coil" has wire windings around a cylinder and can handle large amounts of power for their size. The voice coil fits perfectly into the voice coil gap and is wired to the terminals on the speaker. The voice coil must be able to move "in and out" without touching the side walls of the gap opening. Voice coils can "burn up" if too much power is delivered to them and can sound scratchy or distorted if dust gets in between the gap and the voice coil.

**Wattage – Does size Really matter?** The answer to this question is "Yes!" The size of the speaker's magnet does matter. The larger the magnet, the stronger the magnetic field, and more heat can be dissipated (which means removal of heat from the voice coil) – this helps to increase a speaker's efficiency.



The examples (pictured above) are displaying speakers with different size magnets, and the wattages of each. You will notice that the larger the magnet (the stronger the magnetic field becomes), the higher the Wattage!

## Types of Instrument Speakers – Full Range, Woofers

**Full Range speakers** are designed to reproduce the full audio frequency range (more or less). Commonly used in Guitar Amplifiers. Typical Sizes for Guitar Amps are 8, 10, and 12-inch speakers.



Above Left – Is a basic "2-way" speaker (horn and woofer), and Right – Is a typical 10" full range guitar amplifier speaker



**Woofers** – Are designed to reproduce frequencies below 500hz or less. PA Systems, Bass / Keyboard amplifiers utilize woofers to handle the lower bass notes / audio frequencies.



Typical Sizes for Woofers are 10, 15, and 18-inch speakers. Subwoofer speakers (18"- 24") reproduce frequencies lower than regular Woofers. Don't confuse Woofers and Subwoofers!