

WHAT IS AN AMPLIFIER

We see amplifiers in almost all the electronic equipments around us. Though we usually relate them to stereo equipments they are also found in TV's, computers, MP3 players and so on. All these devices have a speaker which is used to reproduce the original sound.

Therefore an amplifier can be device that is used to change the amplitude of a signal. This increase in amplitude can be calculated by a factor known as transfer function, which is actually the ratio between the output and input given to the amplifier. The magnitude of this transfer function is called the gain of the amplifier.

When referring to electronic circuits, the signal used in an amplifier is mostly either current or voltage. A sound is said to be amplified, when the device makes the sound louder than usual with the same clarity. The amplifiers are divided according to the source that is supposed to be amplified, the driving device, the frequency of the signal and the type of signal.

The source can be an electric guitar and the driving device can be a head-phone amplifier. The frequency of the signal is defined in its range like audio, IF, RF, VHF and so on. The type of signal refers to two parameters – inverting and non-inverting. Another major classification is in the device that is used to design the amplifiers. The most commonly used devices are Field-Effect transistors, and valve.

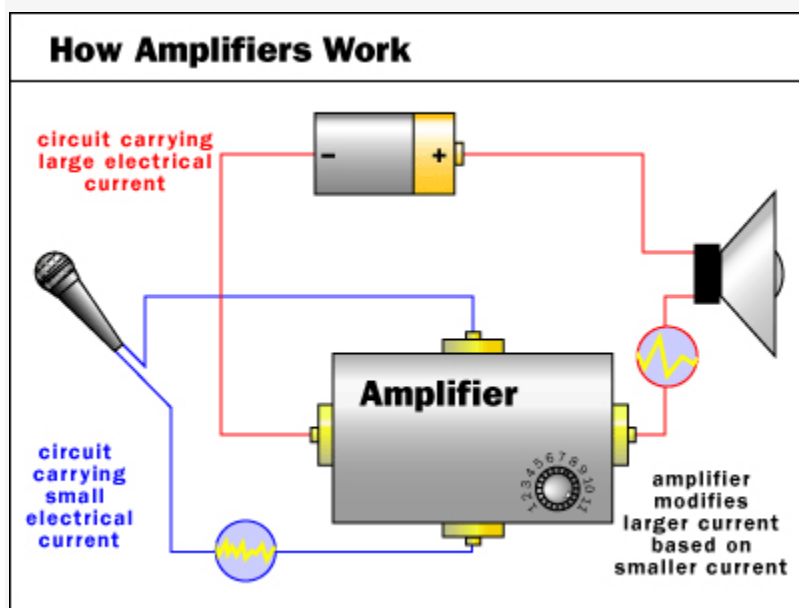
Role of an Amplifier

The amplification process is similar to the way in which the human receives the sound from our surrounding. When a voice is made it starts to vibrate in the atmosphere, thus beginning to move the air particles in hits. This causes more air particles to be hit and thus creates a vibrating pulse in the air. When it reaches our ears, they will be received as an air pressure and will be converted to the appropriate signals by our brain. We can define the working of amplifiers in the same sense.

Sound waves will be sent through a microphone. The diaphragm of the microphone moves it in a peculiar motion and converts it into electrical signals. This fluctuating electric signal will be represented as compressions and rarefactions of the original sound.

The electric signal will be encoded by the recorder and stored in a tape, CD and so on.

A player for the particular recorded signal interprets the electrical signal and is given to the speaker which turns the cone back and forth. The same variation in pressure will be reproduced by the speaker as it was in the beginning. The basic block diagram of an amplifier is given below.



How Amplifiers Work

From the above method you must have understood that translators play a major role in the working. That is, from a sound signal to electrical signal and vice versa. The main translators here are the microphone and the speaker. The microphone diaphragm has to be designed in a careful manner so as to make it highly sensitive

to even the smallest pressure variations the sound produced. Thus, its design will be slim in nature and will produce a small electric current as it can move only a very small distance. The design of the other translator, the speaker is a little more difficult. The cone of it has to move backwards and forwards and for this you need its input signal to be high so that it maintains a large current so as to keep the manner of charge fluctuation constant. This role can only be done by the amplifier. That is, the weak electric signal from the microphone has to be amplified by the amplifier before producing it to the cone of the speaker.

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