

STUDY ON AMPLIFIERS

An amplifier is a device that takes a signal and makes it louder. There are several different types of amplifiers and many different uses of them, and this website offers useful information about where to purchase and evaluate Amplifiers.

1. Amplifiers - Basics
 2. Window to the Past
 3. Evolution of Amplifiers
 4. Places to Go
 5. How Amplifiers work
 6. The Techniques
 7. Control
 8. Types of Amplifiers
 9. Amplifier the Band
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[1. Amplifiers - Basics](#)

An amplifier can be considered to be any device that uses a small amount of energy to control a larger amount, although the term today usually refers to an electronic amplifier. The relationship of the input to the output of an amplifier — usually expressed as a function of the input frequency — is called the transfer function of the amplifier, and the magnitude of the transfer function is termed the gain. There are numerous types of electronic amplifiers depending upon the application.

[2. Window to the Past](#)

Today most sound systems use transistor amplifiers for economic reasons, but valve amplifiers remain popular for guitar amplification, for "high end" hi-fi systems and analog production and replay equipment in recording studios.

[3. Evolution of Amplifiers](#)

One of the first devices to amplify signals was the carbon microphone. By channeling a large electric current through the compressed carbon granules in the microphone, a small sound signal could produce a much larger electric signal. The carbon microphone was extremely important in early telecommunications until other types of amplifiers were available.

4. Places to Go

Amplifiers can be purchased at major consumer electronics retailers or at retailers specializing in audio.

5. How Amplifiers work

The most common type of amplifier is the electronic amplifier, commonly used in radio and television transmitters and receivers, high-fidelity ("hi-fi") stereo equipment, microcomputers and other electronic digital equipment, and guitar and other instrument amplifiers. Its critical components are active devices, such as vacuum tubes or transistors.

How much an amplifier increases the signal level is called the gain. This is usually measured in decibels (dB). Mathematically speaking, the gain is equal to the output level divided by the input level.

A typical integrated amp, such as the one found in a receiver, can only produce a limited amount of current. A speaker, or other load, that will draw too much current at the output voltage will cause the sound to distort risking damage to both the speaker and amplifier. You should never turn an audio system up above the point at which it begins to noticeably distort (this is commonly known as "clipping"). Separate "power amps", mentioned above, can produce much larger amounts of current and can drive very low impedance speakers.

6. The Techniques

A good audio amplifier will have a band ranging from around twenty hertz to more than twenty kilohertz (the range of normal human hearing). It must be responsive to at least the highest frequency that can be reproduced by a Average CD.

7. Control

The properties of amplifier circuits distort the signal. This distortion comes in several forms including harmonic distortion and intermodulation distortion.

Harmonic distortion is fairly easy to explain. Hook an amplifier up to a spectrum analyzer, a device which graphs frequency against amplitude. Then apply a pure tone on the input channel, typically a sinusoidal signal of 1 KHz is used. The biggest hump on your analyzer should be the signal at 1 KHz. You will sometimes see humps at even intervals along the graph at even multiples of that base signal. These are the harmonics. The total harmonic distortion (THD) is the sum of these components relative to the signal.

How much noise is introduced by the amplification process? This is an undesirable thing that is the inevitable result of the electronics devices and components. It is measured in either decibels or the peak output voltage produced by the amp when no signal is applied.

Efficiency

How much of the input power is usefully applied to the amplifier's output? Class A amplifiers are very inefficient, in the range of 10-20% with a max efficiency of 25%. Modern Class AB amps are commonly between 35-55% efficient with a theoretical maximum of 78.5%. Commercially available class D amplifiers have reported efficiencies as high as 97%. The efficiency of the amplifier limits the amount of total power output that is usefully available. Note that more efficient amps run much cooler, and often do not need any fans even in multi kW designs.

8. Types of Amplifiers

- Electronic amplifiers
- Musical Instrument amplifiers
- Carbon microphone

- Magnetic amplifier

- Optical amplifiers

- Miscellaneous amplifiers

9. Amplifier the Band

For those requesting information on Amplifier the musical band, please feel free to visit www.amplifiertheband.com

Source : <http://mediatoget.blogspot.in/2011/05/amplifiers.html>