

Lesson 7 Chapter 12

Amplifier saturation results when the input signal is so large that its DC output supply isn't large enough to produce the required, corresponding output signal. Over driving an amp in such a way will cause a mild to severe waveform ~~distortion~~ distortion effect known as clipping.

The best way to avoid undesirable distortion is to be aware of the various amp and device gain stages throughout the studio's signal chains.

Operational Amp (op-amp) is a stable, high gain, high bandwidth amp that has a high-input impedance and a low-output impedance.

Negative feedback - is a technique that applies a portion of the out-put signal through a limiting resistor back into the negative or phase-inverted input terminal. By feeding a portion of the amp's output back into the input out of phase, the device's out-put signal level is reduced. This has the effect of controlling the gain (by varying the negative resistor value) in a way that also serves to stabilize the amp and further reduce distortion.

Preamplifiers - this amp type is often used in a wide range of applications, such as boosting a mic's signal to line level, providing variable gain for various signal types and isolating input signals and equalizers, just to name a few. Preamps are an important component in audio engineering because they often set the "tone" of how a device or system will sound.

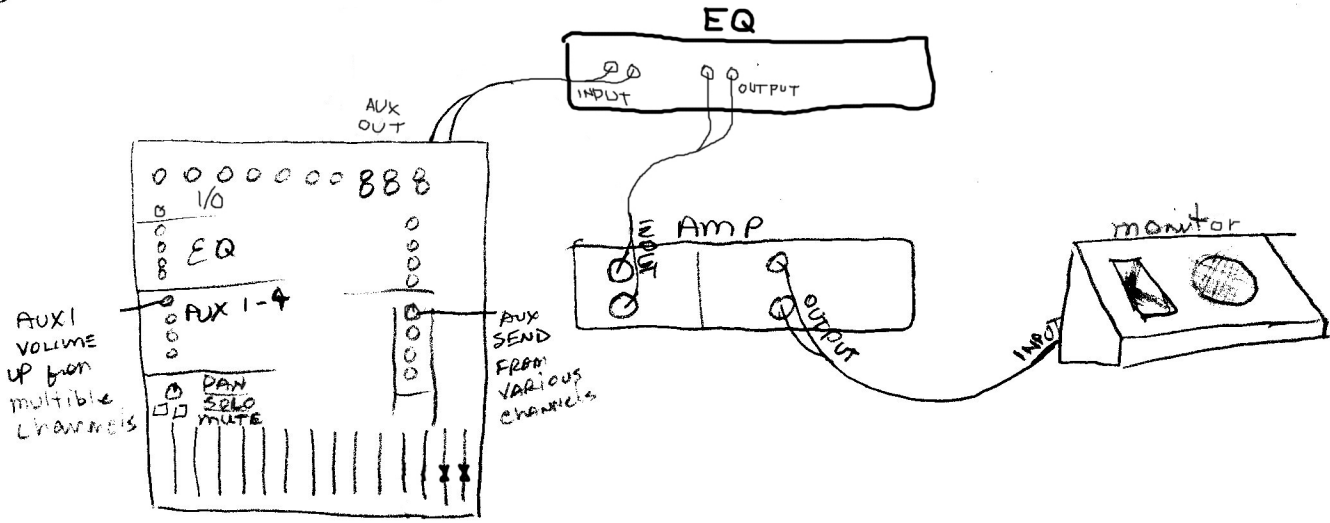
Equalizers - is nothing more than a freq-discriminating amplifier. In most analog designs, EQ is achieved through the use of resistor/capacitor networks that are located in an op-amp's negative feedback loop in order to boost or cut (attenuate) certain freq in the audible spectrum.

Summing Amp - (combining amp) is designed to combine any number of discrete input into a single output signal bus, while providing a high degree of isolation between them. The summing amp is an important component in analog console/mixer design because the large number of internal signal paths require a high-degree of isolation in order to prevent signals from inadvertently leaking into other audio paths.

Distribution Amp - isn't used to provide gain but instead will amplify the signal's current (power) that's being delivered to one or more loads.

Power Amp - are used to boost the audio output to a level that can drive one or more loudspeakers at their rated volume levels. Although these are often reliable devices, power amp designs have their own special set of problems. These include the fact that transistors don't like to work at the high temperatures that can be generated during continuous, high-level operation. Such temps can also result in changes in the unit's response and distortion characteristics - or outright failure. This often requires that protective measures (such as fuse or thermal protection) under a wide range of circuit conditions (such as load shorts, mismatched loads and even open, "no-load" circuit) and are usually designed to work with speaker impedance loads ranging between 4 + 16 ohms (most models @ 8 ohms)

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