

## **Monitors, fold-back & feedback**

There is sometimes a great deal of confusion when discussing musical equipment as people often use two or even three different names or terms for the same item.

For example; monitor speakers are also commonly referred to as fold-back speakers as they are perceived to “fold the sound back” to the performer. Neither term is more correct or incorrect, but the term “monitor speakers” is used more in professional touring audio systems. Fold-back is a more common term used between band members and musical performers.

Also there is often confusion between the words fold-back (monitor speakers) and feedback which is the name given to the howling or squealing noise heard when a microphone is placed (or held) too close to a speaker.

Let’s look at monitors, or “fold-back” speakers first:

The idea of monitor speakers (or fold-back) is to provide the performers on stage with enough sound power for them to be able to hear themselves singing over the noise of drums, guitar amplifiers, bass amps and keyboards all coming from stage as well. For a tiny little human voice to compete with all this huge amplified wall of sound, you need good monitor speakers.

Having a good monitor set-up assists the singer(s) to maintain good pitch as they can hear themselves singing at a reasonable volume in relation to the other instruments. Having a bad monitor set-up, with lots of howling, squealing feedback, actually may make things much worse for the singer than having no fold-back at all!

The key to good monitors (fold-back) is the clever and correct use of graphic equalizers. These units provide precise control over specific sound frequencies and can be used to isolate and remove certain sound frequencies that cause “feedback” in the monitors.

For each monitor speaker (usually fed from an auxiliary send on a mixing console via an amplifier) there should be at least a 15 band graphic equalizer in the signal chain before the amp. This allows the mixer or console operator to cut/boost sound frequencies to the monitor speaker and isolate the frequencies that are causing the feedback noise from the performer’s microphone which is usually set up right in front of the monitor. Of course, if budget allows you should use a 31 band graphic equalizer as this gives much more precise control over sound frequencies.

Also using microphones with a good cardioid (or super-cardioid) pick-up pattern will give good signal rejection at the rear of the mic (the cable end) which is usually pointed at the monitor speaker as the mic sits on a stand. This helps reduce the risk of feedback too.

OK, that's a brief look at monitors, let's examine "feedback" a little more:

Feedback is a very destructive signal and if it is allowed to continue over a long period of time it can destroy speakers very easily.

Feedback is caused when the signal from a microphone is fed through an amplification system (PA) and then gets "looped" back into the microphone again when the mic is placed close enough to a speaker to pick up the sound coming out of that speaker.

This causes a "feedback loop" with the microphone sending the same signal it is picking up from the speakers back into the amplification system and amplifying it AGAIN. This loop keeps gaining power until you hear that horrible howling, squealing sound which everybody universally hates!

Again, the correct placement of microphones in relation to speakers, using the rear rejection properties of a cardioid microphone pattern will assist with minimizing the risk of creating a feedback loop. The use of graphic equalizers in the circuit will also allow the operator to cut some of the sound frequencies that are causing the feedback and give a much higher "gain before feedback" setting. This means that the overall volume of the system can be raised to higher level before the microphones start to "feed back".

That whistling, howling, squealing sound is one of the most punishing sounds for human ears and can ruin a really good performance. Using good microphone placement techniques and cleverly applying graphic equalization to the signal chain will reduce the risk of this happening at your next gig.

Keep makin' music!