

## How Feedback Occurs

The sound at the microphone is amplified and enters the room via the speakers.

This sound arrives at the microphone the just as the sound from a voice being reinforced does.

When you turn up a microphone's amplification you not only amplify the voice you wish to make louder, you also amplify the sound from the speaker that is picked up by the microphone.

Feedback results when the sound reaching a microphone from the speakers of the sound system is louder than the sound from the source to be reinforced.

Once you amplify a voice to the point that it's reinforced level at the microphone is as high as the original level direct from the voice at the microphone, you have reached a point where you can get no more useful amplification.

To increase the amount of reinforcement, the only options at that point are to:

1. Use equalization to cut amplification at the frequencies that feed back.
2. Move microphones and or speakers to reduce the amount of sound from the speakers that will get to the microphone.
3. Increase the level of the voice reaching the microphone by either making the voice louder or moving the microphone closer to the voice.

Sound spreads from its source in a increasing wavefront. As the distance increases the level decreases. This happens at a rate such that if you double the distance from the source the level is reduced by a factor of four.

This chart shows the drop of level as distance from a microphone is increased.

Distance	Relative Level	Distance	Relative Level
1.5"	1	2'	1/256
3"	1/4	4'	1/1024
6"	1/16	8'	1/4096
1'	1/64		

Thus the distance to a microphone has an extreme affect on the level of the voice that it picks up.