

5 Simple Tips to get a Great Sound from your Vocal PA System

By Lee Wright

We've all heard bad sounding speech from a Public Address (PA) system. The symptoms can include:

- Poor intelligibility (hard to understand)
- Squeeling feedback
- Clear but harsh, annoying speech
- Booming or popping
- Uneven coverage



So what can be done to avoid these problems?

Firstly there's one underlying principle: **Quality not Quantity**. The better the quality of the speech the less volume you need & this reduces a host of problems. So instead of just turning up the volume, focus on the quality of the sound first.

1. Speaker & Microphone Placement

One of the keys to great sound is preparation. If you have control over microphone & speaker placement – such as with a portable system, then there's a number of things you can do.

- Avoid putting the microphone in front of the speakers. This will reduce the chance of feedback.
- Ensure that speakers are elevated adequately. For a typical portable speaker in a hall seating 100 to 300 you would want at least 2 meters height.
- Ensure that speakers are pointed correctly. It might seem a good idea to point the speakers at the mid point of the audience. Often this may not be a good idea. The ideal is normally to have the speakers pointing parallel with the floor.

2. Equalization

A whole article could be easily written on the subject of equalization. There are at least 3 types of equalization, **Room Equalization** (typically with a 31 band equalizer), **Desk equalization** using the mixer's on-board equalizer on each channel & **Notch Filtering** which is found in dedicated feedback elimination devices. We'll just look at Desk Equalization.

Normally the best way to equalize is to find & **reduce** frequencies that are causing poor intelligibility of speech. This is called "**subtractive equalization**". Most modern mixers have equalizers with "sweepable" mid frequencies. In this case reduce the gain for the first of these bands by say 6db, then sweep the frequency selector until the speech sounds clearer. Repeat with the next band if available. In some rare cases it may be necessary to boost a frequency to achieve clarity. The increased clarity will

reduce the amount of gain needed & reduce feedback problems. If the speech becomes harsh sounding then you may need to reduce the 3 to 4kHz range.

3. Know Your Gain Before Feedback Level

OK so you've got your speakers & microphone set up right. You've equalized to get a nice clear vocal sound. This will greatly reduce your chance of feedback but will not totally eliminate it. Since it can be such a serious problem damaging equipment, upsetting listeners & making you look bad it's worth a bit of effort to further reduce the risk. Before the event, push up the fader till you start to get feedback. After that preferably get someone else to walk around with the microphone to make sure there's no spots that are particularly bad for feedback. Watch in particular if microphones are pointed at stage monitors. Basically you want to know what's the maximum gain you can have without feedback anywhere. It may be worth marking this on the desk with some tape. This way during the event you'll know well before you approach your limits.

4. High Pass Filter

This is a filter that attenuates frequencies below a certain frequency. Most modern mixers will have a high pass filter set around 100Hz. This is very useful for channels with vocals for preventing booming or popping of the microphone when the person speaking uses particular consonants such as "p".

5. Going Walkabout

Just because it sounds good at the sound desk doesn't mean that it will sound good everywhere. It's important to move around the room periodically & check that every area has a suitable level & quality of sound.

So there you have it, 5 helpful tips. There's much more that can be done also. Dedicated feedback destroyers can be very effective without affecting the rest of the mix & digital desks have a host of equalization capabilities but if you start with these 5 tips you should be well on your way to great sounding vocals.

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