AUDIO ARTICLES
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Welcome! Let's explore these topics:

- The A/B Loudspeaker method to improve gain-before-feedback
- How to Localize Amplified Sound on Stage
- Baffles Improve Floor Mic Rear Rejection

The A/B Loudspeaker Method Improves Gain-Before-Feedback, Simplifies Mixing

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Suppose you are using a few floor microphones for sound reinforcement of actors. You want the amplified volume to be as high as possible without feedback occurring. In other words, you want good gain-before-feedback.

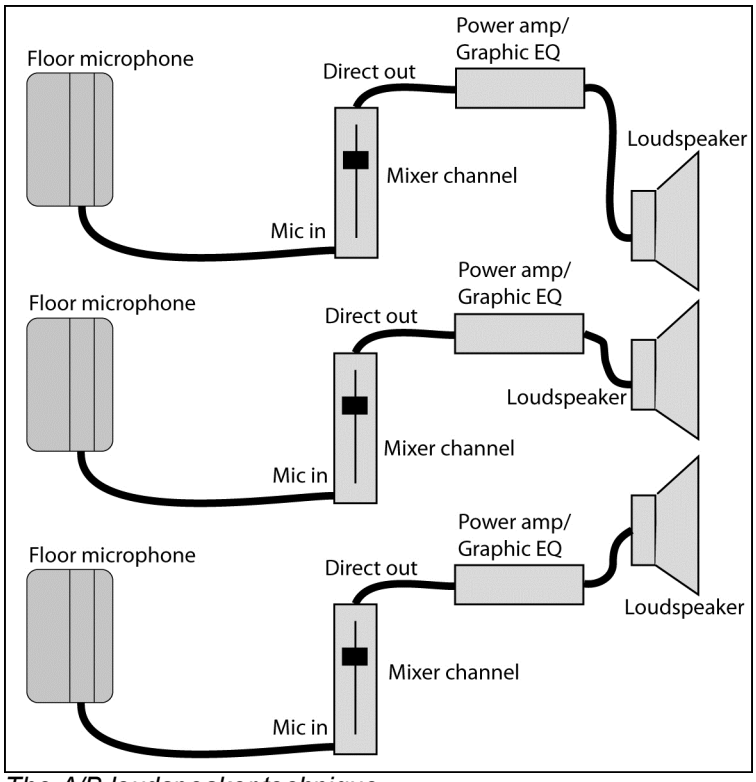
One way to do that is to reduce the number of open microphones (N.O.M.). Every time you halve the number of open or "on" microphones, gain-before-feedback increases 3 dB. If you start with four mics and turn up only two, GBF goes up 3 dB. If you turn up only one mic, GBF goes up 6 dB, which is a big improvement.

Using fewer microphones also increases clarity by reducing the pickup of ambient sound reflections. When two mics pick up the same actor, you hear the actor's voice doubled or smeared in time, which causes comb filtering or a hollow, muddy sound.

Ideally you turn up one microphone's fader at a time, following the action on stage. Of course, that can be inconvenient, as the sound engineer will be occupied for the entire show.

Let's look at a technique that makes riding the faders unnecessary: the A/B loudspeaker method. I'd call it the "one speaker per microphone" method. Other names might be "one PA system per microphone" or "one amplification channel per microphone".

Basically, if you have three floor microphones, each mic's signal goes to a separate amplifier channel and loudspeaker. The three loudspeakers are mounted close together. The number of open microphones per PA "system" is one -- providing maximum gain-before-feedback and clarity. And what's great is, you can leave all three mics turned up all the time. That's much easier than trying to follow the action with your mixer faders to minimize the N.O.M.



The A/B loudspeaker technique

The three loudspeakers are close together so the audience does not hear the sonic image shift as an actor moves across the stage. Y ou could argue for separating the speakers over the stage and having the stereo image follow the actor. However, that effect may be valid only for people sitting near the center of the audience.

If you have the time and funds to experiment, try the A/B loudspeaker method. It can make life easier for the sound mixer, while providing better gain-before-feedback than is possible with all mic signals feeding the same loudspeaker.

How to Localize Amplified Sound on Stage

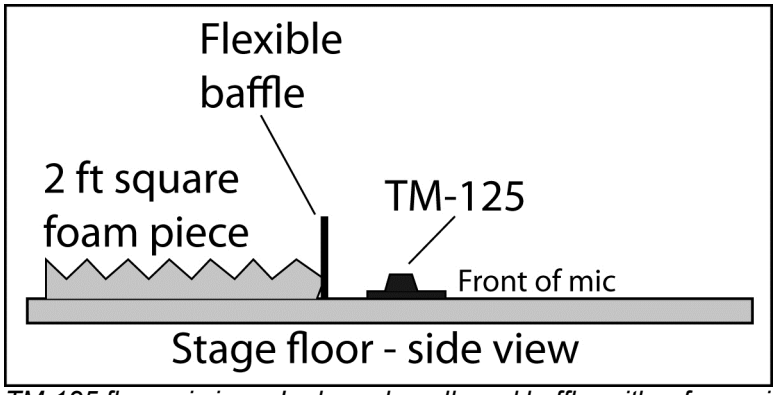
The Bartlett TM-125 mics do not work miracles, but they can provide surprisingly good volume and intelligibility if the loudspeakers are closer to the audience than to the microphones. That involves either hanging the speakers over the audience (high enough to not block the view of the stage), or putting the speakers on the side walls (if you can get enough coverage in the center of the audience). If the speakers must be over the stage, use line arrays to reduce the sound radiation down toward the microphones.

Then delay the speakers' signals so that the sound localizes on stage and not at the nearest speaker. That technique utilizes the Haas effect or precedence effect, which states that we localize sound to the earliest sound-wave arrival. The delay time T is critical. On your digital delay processor, set T slightly greater than D/C, where T = delay time in seconds, D = distance from actors to the audience near the speakers in meters, and C = speed of sound (344 meters/sec).

For example, suppose the audience members who are near the speakers are 10 meters from the actors. Delay the signal to the speakers slightly more than D/C or 10/343 or .029 second (29 msec). Then the audience will hear the sound as if

it originated on stage, not from the nearest speaker. That's because the first arrival of sound at the listeners' ears will be from the stage if the speakers' signal is delayed slightly more than 29 msec.

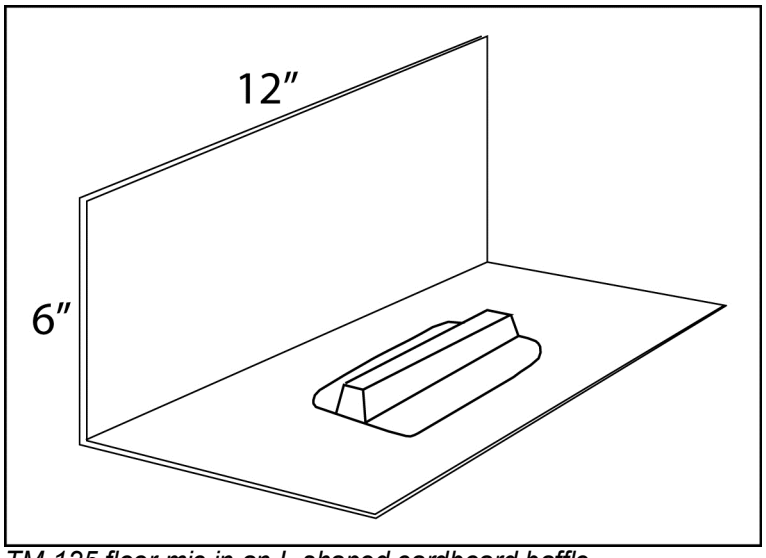
Baffles Improve Floor Mic Rear Rejection



TM-125 floor mic in an L-shaped cardboard baffle, with a foam piece behind to block sound from the pit orchestra ***(the TM-125 is now the Stage Floor Mic)***

If your TM-125 picks up too much of the pit orchestra, try putting a small cardboard baffle and a foam pad behind the microphone. Both measures work well to reject sound behind the mic. The baffle absorbs lows; the foam absorbs mids and highs.

You can make an L-shaped baffle of thin cardboard (a file folder). It measures 12òlong by 6òhigh, and has a 90-degree corner. Also put a foam pad just behind the baffle. This pad is a 2-foot-square piece of acoustic foam with 3òwedges.



TM-125 floor mic in an L-shaped cardboard baffle

The cardboard baffle alone roughens the front frequency response, but it improves rear rejection of the pit orchestra. However, it slightly degrades rejection of the house P.A. speakers.The foam pad alone does not degrade the frequency response. It improves rear rejection of the pit orchestra.