



TECH NOTE series

Microphone Equalization:

The Ground Plane Technique

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In every church, cathedral, synagogue, etc. around the world, there is one paramount necessity:
clarity and intelligibility of the spoken word

Some of the factors that play a major role in perceived spoken word quality are:

- acoustical environment
- loudspeaker configuration and placement
- type of microphone used
- flexibility of mixing console equalization controls

Typically, many priests, pastors, etc. rely on the use of lavalier (lav or lapel) microphones to provide reinforcement for the spoken word. This type of microphone is worn on clothing, placed as close as possible to the mouth – usually on a tie or the lapel of an outer jacket or robe. While these microphones provide great flexibility for the speaker; they can pose a great challenge for the audio operator.

Sufficient gain-before-feedback (GBF) is typically the greatest obstacle that audio operators are faced with. Without good GBF, intelligibility is severely compromised. This requires that the microphone be “rung out” before the service to ensure good GBF and sound quality; which is typically achieved with the use of an equalizer. Most mixing consoles provide a pseudo-parametric type of equalization filter – a great tool to help achieve good GBF.

If possible, insert an additional, external parametric equalizer (3-5 bands) into the microphone channel signal path. This will provide the filters needed to “ring out” the microphone – leaving the onboard equalizer of the mixing console for use with different types of speakers. In other words, the external equalizer can be considered the “room” EQ and the onboard equalizer could be the “person” equalizer.

Here's what to do:

- STEP 1: Bypass (or flatten) the console equalizer and the external equalizer.
- STEP 2: Ensure that the podium is located where it will be used during the service.
- STEP 3: Lay the lav microphone onto the podium surface, creating a ground plane pickup. Tape down with gaffer's tape if necessary.
- STEP 4: Slowly increase the amplitude of the microphone signal in the loudspeaker; to the point of oscillation (“ringing”).
- STEP 5: Using the external equalizer, set the EQ filter to the appropriate frequency and decrease 2-5dB

Repeat steps 4 and 5 until the desired GBF is achieved.



TIP: A good stopping point is when the fader has reached 0dB or you can speak from about 30-50 feet from the podium and be heard through the loudspeakers. This should provide a good starting point from which to use the lav microphone for the service.



NOTE: Once the external equalizer is set, it should not be touched; write down the settings if necessary.

The onboard equalizer can then be used to adjust the quality of the microphone depending on the speaker, the placement of the microphone, etc.

This technique is very useful in situations where many different speakers will be using the same microphone. Simply make the necessary adjustments with the mixing console channel equalizer. One important key to successful sound with a lav microphone is training your ears to identify the frequencies at which feedback occurs. Then offending frequencies can be dealt with before becoming audible oscillation. And this comes with practice, practice, practice. :^)

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