

The Best Microphone for the Job

("Won't this make me look like Garth Brooks?")

Headworn Microphones

by Bob Applegate

The use of a headworn microphone is a very viable choice for the church wishing to provide the highest quality sound possible. Before you decide this E-Sound Workshop newsletter is not for you, (because your pastor would never do that) please read on with an open mind. Remember – it is our job to be the audio professionals within the local congregations.

I understand the unwillingness of most pastors to look like Garth Brooks or Madonna. That said, when you listen to the sound quality available from that type of headworn microphone in direct comparison to ANY lapel mounted microphone there is simply no comparison in terms of quality and gain before feedback. Why is that? Two reasons: Distance and Proximity Effect.

If you remember from the Integrated Audio Systems Church Sound Workshop, the sound level (volume) increases as you move towards the sound source and decreases as you move away. This seems obvious in the big arena of talking across a medium size room and moving towards or away from the talker. It may not be so apparent in the close up and personal world of microphones and singers, but the working relationship is still the same.

THE RULE: Every doubling of the distance away from a sound source results in a 6 decibel loss of signal and every halving of the distance towards the source results in a 6 decibel increase in level. Now let's look at the distance comparison of the two microphone concepts.

Lapel type, distance to mouth is approximately 10"
Headworn, distance to mouth is approximately ¾"

10" to 5"	= +6dB
5" to 2.5"	= +6dB
2.5" to 1.25"	= +6dB
1.25" to .67"	= +6dB

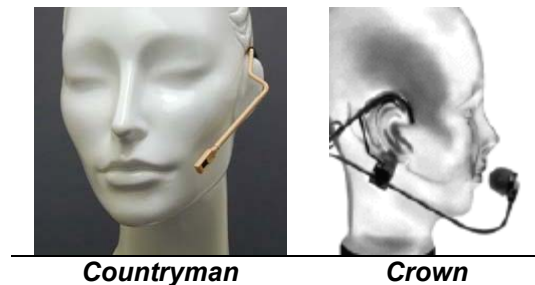
This shortening of the distance from mouth to microphone results in a 24dB gain without any increase in the likelihood of feedback. Remember every 10dB of gain is perceived as a doubling of volume, 24dB is approximately 5 times as loud as the lapel reference. Now, in all fairness most pastors do not want (or need) to be 25dB louder. However, virtually all of them would benefit from 4-6 dB and improved tone quality that headworn microphones bring to the mix. Remember Proximity Effect.

Proximity effect is the bass boost that occurs when a talker is using a directional microphone within a few inches of the mouth. (Also, it's what makes directional microphones sound thin at a distance of 1' or more, but that's another class). Lapel microphones are far enough away from the voice to not benefit from proximity effect and in fact often exhibit a bump or resonance in the 500-700Hz range due to picking up chest resonance from the talker.

Another wonderful attribute of the head worn microphone is that as the talker turns or moves their head, the microphone stays the same distance from the talkers' mouth. When the talker uses a lapel microphone and lowers their head to read or pray the volume increases and popping from breath noise suddenly appears. With the use of a headset mic, the talker can turn their head to the right or left with out a change in volume. The result is a more consistent volume and tone and the pastor is now in control of his own voice level.

Now for a simple test: we can do this with an actual wireless system, however that is sometimes not practical as many manufacturers use different wiring configurations. Therefore, to convince yourself and/or the pastor, simply have him wear his lapel microphone while handholding an SM58 or other high quality cardioid pattern microphone. Make sure the handheld is near the mouth (1" or less) and aimed in slightly from one side. Switch between the two channels using mute controls if you have them. You should have a tremendous quality difference, both in terms of gain and tone.

Headworn microphones can be adapted to most wireless systems and are also available as hardwired mics for those stationary folks who are yet to be wireless. There are many styles available that are less obtrusive than the Garth Brooks type (which is a Crown CM311, like we wore at the seminar), and many sound quite good. The cost of a headset microphone is in the same range as any high quality cardioid condenser: generally between \$100.00-350.00.



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Contact *Integrated Audio Systems*.

- Sale@IntegratedAudio.com
- www.IntegratedAudio.com
- 800-500-8005