



TECH NOTE series

*Sound Systems:*

# **In-Ear-Monitors vs. Loudspeakers**

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To IEM or not to IEM, that is the question.

This tech note is simply a comparison chart between the two most common types of stage foldback monitoring systems available. It is intended as a self-help guide for choosing which solution is right for your church's needs. A properly-implemented worship stage monitoring solution should enable the on-stage musicians to adequately hear themselves while providing least possible impact to the audience's perception of the main loudspeaker system; all the while, maintaining clear, intelligible sound without excessive levels.

<b>STAGE ISSUES</b>				
	<b>Floor Monitors</b>		<b>In-Ear-Monitors</b>	
	<i>Advantages</i>	<i>Disadvantages</i>	<i>Advantages</i>	<i>Disadvantages</i>
<b>Stage Volume</b>		Can become excessively loud	Significantly lower stage volume	
<b>Monitor leakage into microphones</b>		Can produce excessive leakage	No leakage into microphone	
<b>Feedback (oscillation)</b>	If feedback occurs, musician can easily move away from loudspeaker	Can produce excessive feedback with little or no warning	No feedback with user's microphone	If feedback does occur (resulting from the use of a loudspeaker mix elsewhere on the stage), the IEM wearer cannot simply move away. Thus, A LIMITING CIRCUIT IS NEEDED FOR SAFETY.

<b>AUDIENCE ISSUES</b>				
	<b>Floor Monitors</b>		<b>In-Ear-Monitors</b>	
	<i>Advantages</i>	<i>Disadvantages</i>	<i>Advantages</i>	<i>Disadvantages</i>
<b>Audience Intelligibility</b>		Can produce excessive spill into audience, masking the mains loudspeakers, thus reducing intelligibility	Audience can hear the mains loudspeakers more clearly	

<b>MUSICIAN ISSUES</b>				
	<b>Floor Monitors</b>		<b>In-Ear-Monitors</b>	
	<i>Advantages</i>	<i>Disadvantages</i>	<i>Advantages</i>	<i>Disadvantages</i>
<b>Musicians can each other</b>	Musicians can hear each other reasonably with the ambient environment	One's mix can interfere acoustically with an adjacent mix, thus creating "volume wars"	Musicians can hear their own mix in their own way – creating a studio-like environment	May feel somewhat "disconnected" from the other musicians – "in a box" Can be remedied effectively with the placement of an omnidirectional mic, centrally located and carefully mixed back in.
<b>Band synergy</b>	Musicians "feel" off of each other – flowing in a dynamic environment	The stage levels can become quite excessive with dynamic portions of music – thus, masking details and losing synergy	Musicians hear themselves and others with more clarity and detail; i.e. everyone now knows where the actual downbeat is	May feel somewhat "disconnected" from the other musicians – "in a box" Can be remedied effectively with the placement of an omnidirectional mic, centrally located and carefully mixed back in.

<b>SYSTEM CONSIDERATIONS</b>				
	<b>Floor Monitors</b>		<b>In-Ear-Monitors</b>	
	<i>Advantages</i>	<i>Disadvantages</i>	<i>Advantages</i>	<i>Disadvantages</i>
<b>Console</b>	Can be achieved utilizing available auxiliary output busses of mains console	Changes made to accommodate the mains mix can adversely affect stage mixes	Can be achieved utilizing available auxiliary output busses of mains console	Subtle changes made to accommodate the mains mix can severely affect stage mixes – a separate and dedicated stage mix console is optimum for best performance
<b>Equalizer</b>	Can be used to optimize the mix for best gain-before-feedback performance	Will not automatically prevent feedback	No equalizer is required for operation – rather, can be used be as a tone control to accommodate personal taste	Potentially can be harmful if excessive high frequency energy is boosted