



ARENA SOUND SYSTEM OVERVIEW

“Can You Hear Me Now?”

WHAT’S THE SCORE?

Ah, the sound system! The system you love to hate! Perhaps you’ve never been quite happy with your sound in the arena (*what did they just announce, I didn’t hear it?*), or the system goes dead the day of the hockey playoffs... with a full house. ARGH!

Let’s go over some basic function and design issues that apply to any arena sound system, and how you can ensure you’re getting the best bang for the buck....

RELIABILITY AND INTELLIGIBILITY

As a sound contractor, reliability and intelligibility are the two most important aspects of any sound system. We want our customers to hear the score and other announcements, and we want the system you have to be reliable so that you don’t have the ‘sorry-it-doesn’t-work-it-was-working-yesterday-and-I-know-the-playoffs-are-in-two-hours’ syndrome.

A sound system for an arena should consist of commercial products that are designed to run 24/7 without fail. A well designed sound system should last 10-20 years with perhaps a preventative maintenance service call by a service tech every 5 years or so. The only exception to this rule would be any CD player or cassette deck that is subject to moisture and cold, and is treated as a disposable item. Any mixer, amplifier, signal processor or speaker should last many years before replacement is required.

A well designed sound system can also be subject to a certain amount of abuse without breaking down. This includes dropping a mic onto the arena floor or ice which causes a loud THUMP in the sound system, or that hockey team that just LOVES to crank their music a little louder than it should be. A well designed and installed sound system will take this type of abuse without a hiccup and certainly without blown speakers and smoked amplifiers.



Let’s face it, an arena isn’t exactly the ideal listening environment for either voice or music. You have echo and reverberation to deal with which muddies the sound. The more reverberation you have in the arena, the more challenging it will be to hear the score. It therefore becomes paramount for the design of a sound system to take the acoustic environment into consideration.

LESS IS MORE

It's a common misconception that more speakers will sound better than a lower number of speakers in an arena. Let's examine why:

An arena is full of hard surfaces; a concrete floor or an ice surface, a metal ceiling and concrete walls all reflect sound very well, resulting in echo or reverberation in the arena. Add a bunch of speakers over an ice surface that point straight down as pictured, and you have a whole bunch of sound sources that will reflect sound off the ice surface, then off the ceiling, back down to the ice surface, and you'll end up with an unintelligible sound system. Turning up the volume level will increase the sound reverberation in the arena, and you'll get a 'wall of mud' that no one can understand.

Change the speaker system layout to a central cluster over the middle of the arena, and you get the cluster of speakers acting as one large speaker, not a bunch that are scattered over the arena. One central cluster is only one sound source, and with speakers aimed everywhere other than straight down at the ice surface, the sound is broken up at many angles and is eventually absorbed by the structure, resulting in more intelligible sound for music and for announcements.

The overall layout of the arena and the amount of spectator seating will determine the number of speakers required for the central cluster. A central cluster of speakers will effectively cover the entire ice surface, and can also cover seating areas. In the case of a scoreboard being dead centre over the ice surface, the speaker cluster can be split into two parts to cover the arena.

Spectator speaker coverage

While a central cluster of speakers can effectively cover some of the seating areas, hockey dasher boards can cut off the line of sight from the speakers to the spectators, resulting in muffled sound for some patrons. To overcome this, a series of delay speakers can be installed over the spectator seating area. These smaller speakers work in conjunction with the main speaker cluster so that the sound from the delay speakers arrives at the spectators' ears at the same time as the main cluster. These delay speakers provide direct sound to all of the spectators, resulting in better overall sound quality and intelligibility. The sound generated by these delay speakers is mostly absorbed by the spectators in the stands, resulting in low reverberation from the additional speakers.



MORE BASS!

A common request that we get is to turn the sound system in the arena into a night club system with MORE BASS! While many sound systems are indeed capable of massive amounts of bass, adding bass into an arena without fine tuning the sound system can 'excite' the arena, causing rattles, feedback from microphones and a poor sounding sound system. A properly set up and calibrated sound system will have an adequate amount of bass at low and high volume levels without sounding like the sound system (or the arena) is about to fall apart.

IMPROVING ARENA SOUND OUTSIDE OF THE SOUND SYSTEM

Since arenas have a significant amount of reverberation/echo, a number of steps outside of the sound system itself can be done to make the room sound better. The key to a great sounding building is to have sound absorbing material within the building, the more the better. Anyone that has attended an event at Rogers Arena in Vancouver has probably noticed that the sound system sounds good compared to other similar arenas. The reason? Cushions on the seats! When seats are vacant, the seat cushions help absorb sound.



Any sound absorbing material, such as banners, spray on foam, curtains, etc will help break up reverberation and sound within the arena, making the arena sound better.

In our next article, we will take a look at microphones, both wired and wireless. Should you have any comments or questions, feel free to email us at info@soundsolutionscanada.com.

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