

# Sound Advice!



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**Timothy Owen Mazur, Project Manager and System**

**Designer** for the internationally known **Clair Brothers Audio Systems** located in Lititz PA, shares his knowledge on current trends in church sound systems.

*Foreword: "It is important to understand that most of these questions are unique to each and every church. Certain text book answers may work and resolve some of the questions; however, the best way to save time, money and effort is to consult with an expert as early as you can. This should be someone to ask you questions and suggest various solutions based on experience. Audio, video and lighting are basically comprised of science, art and experience and this person should give you the feeling that all areas are being tossed into the equation for a resolve" Barry Clair*

## **Q. How have church sound systems changed in the last few years?**

**A.** The advent of digital mixing consoles and DSP (digital sound processor) units has brought high end audio feature and quality down to a price point previously attainable only to churches with very large AVL (audio, video and lighting) budgets. New technology has also shrunk the footprint of this equipment allowing it to be installed more discreetly where needed; and finally, newer technology has increased the ability of volunteers to repeatedly recreate the same high quality from week to week.

## **Q. What type of sound systems work best for older or historic church sanctuaries?**

**A.** Older and historic tends to denote what is referred to as 'traditional', these services deal primarily with the spoken word at a lectern with minimal musical accompaniment (an organ, piano and perhaps guitar), a choir and a single or small group of cantors. While these systems do not require the acoustical power and technical complexity of "Contemporary" worship installations, the inherent architecture of these spaces require a very specific approach. The architects' original intent of these structures was to inspire the congregants with awe and wonder, most of these facilities were planned and built before the advent of true sound re-enforcement; the congregation was separated from the altar area, both by physical distance and what could be heard. One must be concerned with the physical aesthetics of speaker placement while bringing the congregation closer to the service by overcoming the inherent reverberant properties of the room. Recent years have seen the advent of new technologies that give the user more ability to control the amount of audio that is coming from the speaker, literally focusing sound where you want it and away from places where it would be wasted and ultimately decrease the clarity of the sonic picture.

## **Q. Feedback seems to be a common problem, what can be done to reduce or eliminate feedback?**

**A.** While electronics can help with this issue, it always comes down to a simple rule of physics: a microphone in front of or near speakers = feedback. The system can utilize "delay" speakers; this refers to a set or sets of speakers that are placed in succession down the length of the room. This prevents 1 set of speakers from covering the entire room, the delay speakers' pick up where the sound from the first set of speakers drops off (and so on if more delay zones are required). When the front speakers don't have to push the sound as far (i.e.: not turned up as loud), this increases what is called "gain before feedback"

## **Q. What are some of the biggest challenges a church will face when choosing/installing a sound system?**

**A.** The largest issue is cost; no one is helped by skirting around this issue. Traditional Churches are almost always shocked at the cost of what is required to meet the standards of a truly well designed and installed system that

will actually produce what everyone considers to be “good sound”. This is not to say that you will not be able to find a myriad of companies and people that will insist that they provide you with an amazing system at an amazing price. The unfortunate reality is that our industry abounds with persons who claim to be experts in the audio field; many times this person is often a close member of the church. While good people do sometimes appear from the woodwork like this, the vast majority of people, who are experts, are actually working in the industry on a daily basis. Do your homework: ask for resumes, other clients and the pedigree of the company and or people you are considering working with. You would do no different when approaching an architecture or construction firm; the same should be done with your Audio, Video and Lighting team.

**Q. With all this new technology, how do you recommend churches train their staff to properly operate the sound equipment?**

**A.** A well designed and installed system should be tailored to the needs to the client, if the expertise to operate a complex audio system does not exist from either a full time AV person or knowledgeable volunteers, a complex audio system should not be installed. Insist that adequate training is included in the proposal; many contracts also stipulate that the training be videotaped so that it can be referred to later on when new volunteers enter the picture or when the current operators need a refresher course.

**Q. What technology is available for hearing impaired and/or language interpretation?**

**A.** The audio industry has many options to increase everyone’s participation in the worship service. For those who are hearing impaired, these generally revolve around a system that transmits audio from the microphones via the audio console and then transmits them over radio waves or infra red light to a receiver that is located on the patron’s person; the receiver either has small earpieces or can induct sound directly to the hearing aid. These units are given out before the service and are collected after so that they may be cleaned and re-charged. The same practice applies to language interpretation. Typically this is a closed loop system which consists of an interpreter speaking into a microphone which is then transmitted through the same type of system as for the hearing impaired. These system can be used in conjunction with each other with no issue, your audio consultant can ensure that the systems will work side by side.

**Q. For a church on a very limited budget, where is the best place to spend their "sound" dollars?**

**A.** The answer might be to not spend any money at all. The best decision could be to wait until more money could be put aside to assure that a system is installed that will both serve the present needs of the church and ensure that funds are in place to purchase a quality system. Spend your money wisely, do not dilute your purchasing power over a wide range of “what ifs”, install a system for what your church does week after week, don’t try and install a system for an event that “might” happen in the future, this will only degrade the quality of the entire system.

**Q. How does the diversity of church events (sermons, dramatic performances, video presentations, concerts, etc.) make designing a sound system more of a challenge?**

**A.** Diversity of services, construction surfaces and architectural elements such as windows are all challenges that can be overcome by an experienced consultant and installation firm. A system cannot be all things for all situations. An audio system that has been specified and installed to only ever amplify the spoken word will never be able to act as a loud concert sound system. This can only happen if the original intent of the design was figured in these variables.

**Q. What interior building materials are most recommended for optimum sound quality and how does an acoustical engineer impact this process? How do windows in a sanctuary affect the quality of the acoustics; and what can be done to remedy that?**

**A.** The optimal room would be devoid of 90 degree angles and would utilize mostly sound absorptive surfaces such as acoustic foam and drapery. Of course this would not be a very visually pleasing or practical room in any way, so this is when the experience of your audio team will come into play. Retrofitting older (20 years+) facilities offer a

unique set of challenges as opposed to installing a new system into a purpose-built sanctuary. Newer designs tend to be more inclusive of the congregation; site lines have improved, bringing everyone closer to the service. Sound and hard flat surfaces tend not to play well together; breaking up these hard lines can greatly increase intelligibility, which is key to any public event. A window is a flat surface, and just like a wall, it poses its own set of problems. A well designed and installed sound system will greatly reduce the amount of sonic energy that is directed at, and then in turn, is reflected back to the listening public. Sound reverberation is a very useful tool in the audio arsenal, a small amount is needed for speech and more is often required for music; but controlling that amount is the hard part.

**Almost everyone today experiences high quality audio in their everyday lives, sound systems in our homes now rival what you can experience in the movie theater and the automobile has become a legitimate venue for a high quality listening experience. These same ears expect and demand the same experience when they come to worship. Audio, lighting and video are now a priority no matter what type of worship experience your church offers!**



20A East Roseville Road, Lancaster, Pennsylvania 17601  
815 Cumberland Street, Lebanon, Pennsylvania 17042 (717) 273-7774  
(717) 569-4955 FAX (717) 560-1952 [www.beersltd.com](http://www.beersltd.com)