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AUDIO SYSTEMS DESIGN

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INTELLIGENT AUDIO SYSTEMS DESIGN FOR WORSHIP

Insights on audio design from church-experienced experts in the field

By Andy McDonough • Church tech teams have a tendency to look at audio systems as a series of independent products rather than as a functioning whole. When loudspeakers and mixing consoles dominate the conversation in the planning stages of a new audio system, it can overshadow the many other components that must work together to deliver a quality system with long-term viability. Just as important, any system designed for worship should evidence good stewardship while matching the vision and mission of your church. ***Yes, it's a lot to consider.***

Instead of letting gear guide the conversation, this article will focus on insights from church technology leaders garnered from years of experience planning for and designing audio systems. Ideas from these audio pros can help churches of all sizes, guiding them to better quality audio and a better long-term ROI on their audio systems investments.

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Lakewood Church, Houston, Texas—photos courtesy of www.facebook.com/LakewoodChurch

Build on a foundation

Brad Duryea may have one of the biggest jobs in church audio as the director of audio technologies at Houston's famed Lakewood Church, home to televangelist and senior pastor Joel Osteen. Osteen's sermons are heard loud and clear by over 40,000 attendees each week and broadcast to 10 million viewers in over 100 countries. In addition to the audio quality of each production at Lakewood Church, Duryea is directly responsible for the organization's audio technology standards and implementation. With over 20 years of experience in live and studio production, Duryea has more than a passing acquaintance with the principles of audio system design.

Though few audio systems designers will have Duryea's sizable responsibility for audio, he is quick to point out that there is commonality in audio systems of all sizes. "When designing an audio system of any size," Duryea says, "a common goal is to have clear sound that is devoid of distractions." To accomplish that, he says, you have to look across the entire system and think through everything, right down to operational issues and microphone placement. "You have to look at the whole picture, including the infrastructure, your networks, and dedicated power for audio, because the parts we don't generally think about can make a big difference. In audio system design, nothing is a given."



"Everyone has a budget. You must consider what is appropriate for your church, the room, and your worship style. What is the standard for what you hope to achieve? What features do you really need?"

Brad Duryea, Director of Audio Technology, Lakewood Church, Houston, TX

Duryea sees creating a solid foundation with room acoustics, speakers and infrastructure as a common starting place for all audio system designs. "With these in place," he says, "you have something to build upon. Similarly, not having these critical pieces

"Go for what will make the BIGGEST impact first."

Brad Duryea, Director of Audio Technologies, Lakewood Church, Houston, TX

right at the start can cause trouble down the road." Experience has taught him that these items can be among the most difficult to fix after-the-fact, both physically and financially.

Another commonality is budget. "Everyone has a budget," says Duryea. "You must consider what is appropriate for your church, the room, and your worship style. What is the standard for what you hope to achieve? What features do you really need?" While Duryea recognizes that the answers will be different for every situation, being able to call the right priorities, he notes, is what will really make a difference.

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"Use a bad mic or cheap wireless and people will notice. It's distracting. People will more likely notice the distractions rather than the things that are done well."

Brad Duryea, Director of Audio Technology, Lakewood Church, Houston, TX



Photo by Seth Macey on Unsplash.com

... while consoles that cost 10 times more can make an engineer's job easier, feature-rich consoles may only provide a marginal increase in sound quality.



Photo courtesy of Shutterstock.com

“Go for what will make the biggest impact first,” he says. “While it’s important to strive for high-quality audio, consider that your new install or upgrade might have a second—or even a third—phase.” He reminds churches that they don’t have to buy equipment all at once for the results to be stellar. “Maybe your budget won’t allow for what you need today, but you can make it happen with a plan.”

When looking at equipment features, Duryea urges technical leaders to be practical by considering what the people will actually experience. “It may not always be necessary to spend a lot on a console,” he reminds us. “Consoles with high channel and bus counts, and with loads of features, will cost you more, but there are plenty of very nice, affordable consoles available today that will get the job done.” He argues that while consoles that cost 10 times more can make an engineer’s job easier, feature-rich consoles may only provide a marginal increase in sound quality.

Although his views toward audio are practical, over the years, Duryea has learned that spending on quality gear can be necessary to achieve

a successful audio design. “Use a bad mic or cheap wireless and people will notice,” he says. “It’s distracting. People will more likely notice the distractions rather than things that are done well.” In particular, he points to trouble with some wireless microphones. “Especially with wireless,” he observes, “the more expensive units have better stability, allowing all devices to work optimally together, whereas lesser models have a greater potential for unpleasant interaction.” He points out that in some cases churches might be better off with wired microphones, if the budget won’t allow for quality wireless units. “If it’s wireless,” he says, “it should be high quality with similarly good antenna systems. Plus, the better units may have better resale value.”

Set priorities

Jeff Sandstrom is a Dove Award-winning music producer and engineer with a career that spans over two decades. He’s been a part of North Point Community Church

in Atlanta since 1997, and held the critical position as front-of-house engineer for popular Christian music artist, worship leader, and songwriter, Chris Tomlin, for almost 10 years. Today, he works with churches across the country through an effort called Sonnet House, a technical community that directly addresses both the technical and the spiritual challenges faced by production teams.

While Sandstrom does not consider himself a system designer, per se, his experience in production puts him in a particularly advantageous position to offer thoughts on audio system design. He speaks both in terms of technology and stewardship. “Unlike businesses, the choices we make for production designs aren’t competing with other business development ideas,” he observes. “They compete directly with the resources to help others.” Good stewardship is as important as technical excellence in Sandstrom’s eyes. “Sometimes, there is an audio director who is enamored by a particular manufacturer’s console,” he says, “and he will fight for that expenditure with all good intentions. But, he might not know about senior leadership’s plans to, say, go multi-campus. Knowing about those plans can change the priorities. Success with audio design is all about setting the right priorities.

“Key to the success of an audio design,” notes Sandstrom, “is having all the right voices at the table when making the important decisions.” Having the input of a senior church leader along with the technical expertise and financial guidance gives system designers the best chance to succeed. “It’s also important to find a voice of experience to help you avoid



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Jeff Sandstrom, Engineer,
North Point Community Church, Atlanta, GA

mistakes, especially with new construction,” he says. “You wouldn’t think of starting a large construction project without a general contractor, and designing an audio system is much the same. Just because you have used the gear, and have opinions, does not make you a designer. It’s important for you to hear other voices.”

Because of the wide scope of expertise needed to conquer the multi-faceted problems

(human and technical), Sandstrom maintains that the best audio system designs are collaborative. “We rely heavily on architects, integrators, and other partnerships,” he says. “They are all hugely important. It’s worth paying someone if they can help you ‘avoid the potholes.’” Sandstrom suggests finding an integrator with a good reputation, that you can rely on, who has worked with a church having a similar mission. “It gives you a head start,” he says, “and something to use as a model—a good starting foundation.”

Sandstrom cautions audio system designers not to be so enamored with the gear that they ignore the acoustics of the room. “An engineering mindset might think that a better, more expensive console might make a better mix,” he says, “but trying to overpower audio problems in a room is rarely successful.”

He adds that basic audio skill building is frequently overlooked as part of audio solutions. “There is so much you can do outside

of equipment buying: building a bridge to the stage and performers, employing the basic drum tuning, experimenting with mic placement, and improving basic mixing skills. Even as the gear gets more advanced, we should be sure that we have the basics down.” System design, Sandstrom reminds us, is not solely an engineering exercise, but only works well in combination with a positive human element.

Facebook and other online sources are great resources for fact-finding, according to Sandstrom, but not necessarily great for decision making.

“You need to be able to look at someone across the table who understands your vision and mission; what your church is and does,” he says. “For me, I want to partner with people who have the same heart for the church as I do. I want to be sure that we can partner on the ‘why’ as much as the ‘how’ and ‘what.’”



VIDEO:

Claremont United Church of Christ, Claremont, Calif. — Church pastors reach every pew with a pair of Renkus-Heinz ICONYX Gen5 IC24-RN digitally steerable arrays.



It's a Conversation

Matt Wentz is the audio systems engineer at Willow Creek Community Church in South Barrington, Ill. For the church's multiple Chicago-area sites that include an 800,000+-square-foot main campus with four large venues and a 7,200-seat main auditorium, Wentz is in charge of everything audio. His design experience over the past 15 years has run the gamut: from systems for children's rooms and chapels to powerful concert-style contemporary worship in Willow Creek's main auditorium.

Willow Creek's unique organization of technical teams allows Wentz and his production systems department to act as in-house consultants for any venue that needs design expertise. "In addition to maintaining the campus infrastructure and keeping equipment running in top shape, our systems department works with our 'customers' to design the audio systems that they need," he says. The church venues come to Wentz with a request from which he develops a gear list and a budget to meet their needs. That, however, is just the beginning of the process.

"Our first step is to understand the venue's needs," says Wentz. "That is based on their vision, what is currently happening at that venue, and leadership's plans for the future." Once Wentz has a design and budget in mind that is consistent with other Willow Creek systems, he will present the plans to the church and venue.

"From there, it becomes a conversation," Wentz notes, "so we all have agreement about what is needed and why." One reason



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Matt Wentz, Audio Systems Engineer,
Willow Creek Community Church,
South Barrington, I

the system works so well is that Wentz can provide the venue honest feedback on the equipment they will need to meet their needs and can share his experience designing systems across multiple venues.

DESIGN GUIDELINES

Considering these thoughts from the experts can offer audio system designers the best chance of meeting design goals, avoiding future problems, and being good stewards:

Collaborative designs have the best chance of meeting expectations and being inline with the mission and vision of your church.

Setting priorities and planning phases can help adapt to budget constraints.

Investing in quality gear will provide both better audio quality and a better ROI.

Starting from a foundation of either an existing system or key system parts can accelerate the process, help guarantee quality, and avoid issues as you grow.

Thinking of audio systems as a whole can prevent devoting too much time or money to one part of the system.

Thinking through each item in a design can help to find weak links and avoid problems.

Seeking out expertise where needed can save time and money while improving results.

Wentz advises audio system designers and venues to look past today's design challenges and have a firm grasp on future plans. "Where is your church headed? Is there a plan to connect audio and video between venues? Will you be moving to a bigger room or going multi-campus? Is broadcasting in the picture? Know your values and your vision," he says. "Based on your answers, priorities for today's audio system design could significantly change."

Something Wentz and his production systems department communicate to their venues is understanding the investment in quality. "The other option," he says, "is that you are willing to go with lesser quality and face the fact that you will have to replace it sooner." Having conversations about cost and quality help to get his "customers" on the same page with his technical recommendations. "Sometimes, if you only have 'x' to spend, it can be a tough conversation," he

adds, “but we know that both underspending and overspending can be wasteful.”

In addition to Wentz’s design approach of listening, observing, and having conversations to reach agreement before system building begins, Wentz encourages churches to seek honest help. “Having a good integrator or consultant to guide you can be very valuable,” he says. “They can help you find your blind spots. By having someone with experience you’re never in a position of spending the money and hoping it all works.”

Andy McDonough is a freelance writer, photographer, musician, educator and consulting engineer based in Middleton, N.J. Among his favorite topics—the application of technology and music in houses of worship. He welcomes email at: andymcd@comcast.net.

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