# Gearing Up for Church Sound

by Loren Alldrin

In countless thousands of houses of worship across the country, sound systems are used to deliver a message to each and every person in the congregation. That's millions of ears, give or take a few, relying weekly on microphones, mixers, speakers and other electronics to do their job.

And what is that job? For most churches, it's to reliably deliver clear, intelligible speech to every seat in the facility. Many churches expand this job description to include consistent distribution of high-quality, full-bandwidth music. Many more add the requirement that the equipment be easy to understand and use for their eager (though not necessarily experienced) volunteer technical staff. Finally, considering the long-term investment most churches make in their equipment, it needs to perform its vital role for the equivalent of several lifetimes in any other application.

**Leo Gunther**
Leo Gunther Enterprises

A tall order? You bet it is. But, with care and the right help, any church can gear up its facility with equipment that meets its needs for many years. This article will take a look at some of the factors that come into play in any church sound system purchase, with a focus on the unique needs of small, medium and large churches. Along the way, we'll consult with Leo Gunther of Leo Gunther Enterprises (Orland, CA), a licensed audio-visual contractor with more than 20 years experience in church sound system design and installation.

## First Things First

The place any sound system purchase needs to start, whether a retrofit installation or brand-new facility, is with a thorough needs assessment. What does the sound system need to accomplish, and where is the existing system falling short? How important is music reproduction as compared to speech? How loud is loud enough? Does the system need to be intuitive enough for the youth group to run? How many years—or decades—should the system last? In other words, any sound project should start with the end in mind by specifying clear, measurable goals and outcomes. Remember—your goal is not to acquire just a sound system, but a sound *solution*.

While the church's immediate needs are important, a good plan looks 10 or even 15 years down the road and tries to cover all reasonable and foreseeable needs. Every sound system should be purchased with enough capabilities to handle realistic growth. Does your traditional church plan to add a contemporary service in the next 10 years? If so, buy a sound system that's up to the task today. Is your strip-mall church considering a ministry that hosts movie nights in surround? Address those needs now. Some additional investment up-front can pay off many times over if it eliminates additional purchases in the future.

Planning for the future requires buying equipment that will get you there. According to Leo Gunther, thinking only about the short-term fix is the greatest mistake any church can make. "Too many churches think about a solution for next week instead of the next decade," says Gunther. "If they buy a cheap mixer, for example, chances are it's going to have a lifespan of four to seven years. Perhaps they don't plan to have the same gear in 20 years, but they should spend 40% more money now so they have a 15-year product instead of a seven-year product."

## Acoustics

With a clear view of what needs to be accomplished, critical attention needs to be paid to an "unglamorous" area that many churches overlook at their peril—acoustics. The sound quality in any enclosed space is *profoundly* influenced by the shape, size and surfaces that make up that space. Many argue that proper acoustic treatment or design has a greater impact on overall

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sound quality than a truckload of new equipment. Despite what some manufacturers and "experts" might say, no sound system—regardless of price—can deliver intelligible audio in a sanctuary with poor acoustics.

Treating problem acoustics and selecting a sound system to complement the resulting space requires years of experience and education, which is where an acoustical consultant enters the picture. According to Gunther, churches should enlist the help of this key ally as early in the planning process as possible—especially if a new facility is in the works. "Half of all facilities need acoustic treatment in some fashion, treatment that needs to be designed and applied in a knowledgeable way. We're not talking about contractors that pose as acoustical consultants—they really need to have an acoustical degree. Many acoustical consultants are third parties that cannot, even if they wanted to, sell you equipment. But they can specify the acoustic treatment and equipment that will meet the church's goals. Ideally, you should get an acoustical consultant in the loop before plans are drawn."

According to Gunther, a church with serious acoustic problems may need to spend as much on acoustic treatment as on new equipment. If this brings to mind images of gray foam and egg crates, you needn't worry. Many manufacturers offer products designed to address problem acoustics invisibly or in an aesthetically-pleasing way, including Auralex, AcousticsFirst, Perform Acoustics and Illbruck-Sonex. Some treatment product manufacturers, such as Acoustic Sciences Corporation (ASC), offer acoustic consultation and analysis to complement their acoustic treatment products.

**What's New in Equipment**

The past few years have been busy ones for R&D engineers, and many advances have been made to directly impact almost every aspect of church sound. Some of the most significant advances have been in the area of speaker technology, specifically in the realm of self-powered loudspeakers. Placing amplification, filtering, processing and driver protection for each component right inside the cabinet has many benefits.

"Blowing" a speaker by driving it too hard becomes nearly impossible, which greatly reduces costly repairs and frustrating downtime. The sound system is made less complex the elimination of outboard amps and crossovers, and the possibility of a few bumped knobs upsetting a painstakingly dialed-in system goes away. The most significant benefit of self-powered speakers is in sonic quality. Because manufacturers can perfectly match active crossover settings, equalization and amplifier response to each driver, self-powered speakers have the potential to significantly out-perform their passive brethren.

Self-powered speakers are now available from most manufacturers in a wide range of sizes. From compact two-way speakers bearing names like QSC, Yamaha and Mackie up to large-format speakers from EAW, Meyer Sound and KV2 Audio, self-powered speakers are showing up in small and large churches alike. Even self-powered monitors from companies like dB Technologies and JBL are gaining in popularity.

All the on-board electronics can make it appear that speakers have jumped in price. Factor in the cost of equipment no longer needed, however, and self-powered speakers are a bargain. Still, the initial perception of higher cost can worsen a problem that plagues many churches—the temptation to skimp in the area of loudspeakers. Don't do it, cautions Gunther.

"Speakers are definitely the most undervalued, overlooked part of the sound system," says Gunther. "In the church world, people sometimes think that spending a lot of money on speakers is decadent. It's not true. The speaker is the hardest component to get the sound accurate, and it costs the most money to perform its task without coloration. Churches often have to spend more money to get the dispersion they need as well. They may be thinking only about bandwidth or volume; they also need to consider consistent coverage."

Another relatively recent development in speaker technology is the line array. A line array combines multiple cabinets in a special arrangement to increase throw (SPL over distance) and control dispersion. Though the technology debuted in the touring market, many manufacturers

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offer line array cabinets suitable for church installations, including EAW, SLS, Meyer Sound, Community and others.

Many speaker makers have jumped on the line array bandwagon; churches should be careful to avoid doing the same. As with many new technologies, "line array" has become a bona-fide industry buzzword—but it's not appropriate for all applications. While few small churches really need a line array system, some larger venues with challenging acoustics can reap real benefits.

Controlling stage volume and giving performers a satisfactory monitor mix is a challenge with any live music, churches being no exception. Two developments in monitoring technology are making these much easier tasks—in-ear monitors and personal cue mixing systems. Both have the potential to pay larger dividends as church—and band—sizes increase.

When adopted by all performers, in-ear monitors spell end of floor wedges. Switch to electronic drums (or an isolation "tank" and miked drums) and get amps off the stage, and stage volume drops dramatically. This means less indirect sound competing with the main mix, and greatly improved clarity at lower house volumes. Shure is a leader in in-ear monitoring technology, with Samson, Nady, Sennheiser and a handful of other manufacturers also delivering wireless in-ear systems suitable for church use.

Personal cue mix systems allow performers to set the monitor mix and level that suits their fancy, without having to bark out requests to a sound engineer. Mixing systems from Aviom, Hear Technologies, Rolls, Boling, ART and others give a performer control over anywhere from a few channels to 16 or more, and interface readily with traditional monitor wedges or in-ear monitors. If keeping your church's performers happy with their monitor mix is a constant challenge, a personal monitor mix system could restore the peace to your rehearsals and services.

Though not exactly new technology, recent years have seen major improvements in wireless microphone technology. Whereas a wireless system that worked reliably used to cost in the neighborhood of $2,000, today's wireless mics offer even better performance at price points closer to $500. Most new wireless mics offer easy setup, greater freedom from interference, improved sound quality and a host of "duh!" features that have finally arrived (like a transmitter battery level meter on the *receiver*). Manufacturers of wireless mic systems are numerous, including Audio-Technica, Shure, Sennheiser, Electrovoice, Sony, Lectrosonics, Sabine, Nady and many others.

**Challenges In Three Sizes**

Whether your church is small (less than about 250 seats), medium (250 up to around 750 seats) or large (more than 750 seats), purchasing a sound system will present some unique challenges.

Small churches often mean smaller budgets, which can make it all too easy to just buy gear here and there as a need (or crisis) arises. This puts a church on the fast track to failure. Having a plan is crucial for smaller churches, especially if a sound system purchase will come in smaller phases. "Small churches need a one-provider solution to map the whole thing out and give them good advice on what piece to buy first, second, third," says Gunther. "They need a game plan, and should only buy equipment that fits the game plan. This process might mean the end of immediate gratification, but it's the only way to go. If they don't work with a knowledgeable consultant or contractor, they're subject to whoever's the in-house 'professional' at that time. And before they work with *any* contractor/consultant, they should check five recent references."

Medium-sized churches often have larger budgets to work with, making the hiring of an acoustic consultant an option they should exercise. If that doesn't seem exciting, or feels like money poorly spent, remember the goal is a sound *solution* and not just a sound system. Work acoustic treatment into your plan from the start, and budget accordingly.

"Medium-sized churches should also shoot for a monitoring system that allows them to get their stage volume down," says Gunther. "In-ear monitors take some getting used to, but they're

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great for churches of this size. You just have to make sure that everybody's on-board with in-ear monitors, and you have to invest in high-quality in-ear systems."

Large churches with larger budgets need to plan carefully for renovation or new facilities, and not rush the process. A few months isn't enough time to plan even for a minor remodel—two or three years is more like it, especially with new construction. Large churches should get plenty of help as early in the planning process as possible, and it needs to be good help. "Large churches have a lot at stake. They really need to scrutinize their provider," says Gunther, "and this size of a project should never go without a good acoustical consultant. Large churches also need to make sure they buy a speaker system that's adequate for their venue. Too many large churches suffer from inadequate output or coverage from their speakers."

**Take Heart**

Though gearing up your church facility for excellent sound still has its challenges, the process has never been easier or more affordable. Advances in technology have pushed the quality and value of sound equipment to a new level, and your church reaps the benefit. Just remember these keys to achieving a successful sound *solution*: 1) have a game plan, 2) get qualified help early in the process, and 3) address equipment and acoustics as equal players.

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