Sound Design for Outdoor Events

by James Schleich

Outdoor performances are becoming routine in many churches today. Hosting events outside the church walls is a great way for churches to bring the message of the Gospel to the community.

Churches today are using all types of outdoor performances to reach a larger group of people. Outdoor plays, concerts, and services are also a great way for the church to attract new worshippers. With this increase in outdoor performances, church sound and media ministers, technicians, and directors need to be able to implement professional quality sound reinforcement solutions for these events.

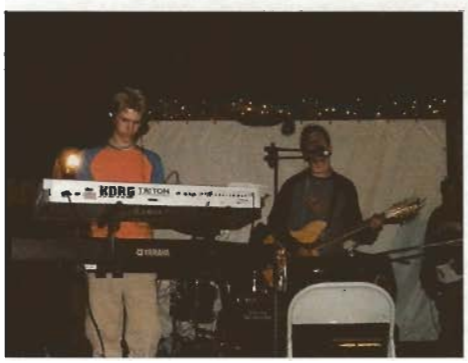
Being asked to oversee the sound reinforcement and recording for a large community outreach event in November has caused me to think about the enormous amount of planning, preparation, and know-how that is involved in producing an outdoor event. In this article, I hope to be able to reduce some of the stress and technical hustle and bustle that normally occurs around this time of the year by presenting some basic pointers to remember when planning and operating the sound system for any outdoor event, large or small.

PLANNING IS HALF OF THE BATTLE

Planning is the necessary foundation for an outdoor event of any size. However, planning can be easily overlooked in the busy environment of the modern church. Planning for some outdoor events, such as plays, concerts, and holiday events may often begin months before the actual event is to take place, giving the technical team ample time for planning and practicing.

planning can be easily overlooked in the busy environment of the modern church

howls of feedback, malfunctioning equipment, and a distracting experience for those attending the event



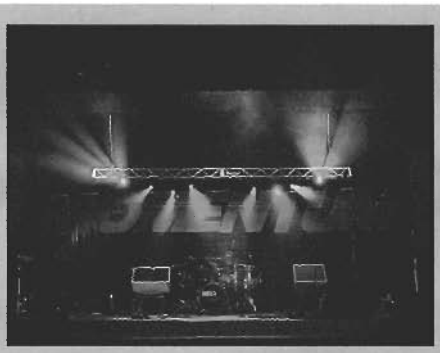
However, planning time for other events may be extremely short, such as an outdoor church service (which sometimes may happen for emergency reasons), or a weekly community outreach event. Church leaders should be careful to give the technical ministry the necessary time needed to plan for the unknowns of an outdoor event. Often, simply "throwing together" a sound system for an outdoor event with little or no planning can result in poor performance, howls of feedback, malfunctioning equipment, and a distracting experience for those attending the event.

Technical ministry team members should be present at production meetings from the beginning of the development and planning process. Having the technical support personnel present during the initial stages of planning an outdoor performance will benefit everyone involved by allowing the technical team to have input on the design of the performance as well as allow them to begin understanding what the sound system for the event must be able to accomplish. This will avoid the stress that results when the sound team finds out too late about an event and doesn't have the time to develop a good plan or gather the proper equipment.

WRITE IT DOWN

As the needs for the sound system and the time frame for the production become apparent, the next helpful planning step for the technical team is to produce an equipment rider and a technical schedule. These two documents are immensely helpful in managing any type of large production, but are especially useful in an outdoor setting where manpower is often stretched to the limit, and the sound system must often be completely assembled on-site.

The equipment rider is a document listing the technical components of the sound system, such as the number of console channels, microphones, direct boxes, amplifiers, and outboard processing gear that will be needed for the event. The rider also may include a projected console input list, patching diagrams, stage or set layouts, and other pieces of information that will be helpful in gathering, assembling, operating, and troubleshooting the sound system. Copies of the rider should be distributed to everyone involved in the production, such as the producer, director, worship leader, and other media teams such as video and lighting. This is perhaps most important for those who will be volunteering or working with the sound crew during the event. Having a document like the equipment rider helps to make sure that everyone is "on the same page" technically during the setup, rehearsal, event, and strike. The rider also allows members of the sound team to work faster and more accurately. For example, one person can be hooking up the stage lines to the main snake while another person is wiring the house amplifiers and loudspeakers, and still another is setting up the FoH and/or monitor consoles. Since everyone is working from the same rider, the system can be assembled and tuned much faster, with less worrying and shouting of orders on the part of the audio team director.



the equipment rider helps to make sure that everyone is "on the same page" technically during the setup, rehearsal, event, and strike

The other essential document that the sound team should consider producing is the technical schedule. A technical schedule is a document detailing the events that must take place leading up to, during, and after the event. This includes important events, such as load-in, system setup and tuning, troubleshooting, band and drama rehearsals, and teardown. I feel that one of the leading causes of bad system performance during outdoor events is the lack of proper system tuning and rehearsal that results when no one is sure when things are supposed to happen and in what order. This results in a hastily and often improperly assembled sound system, and often a lot of hair-pulling stress as several different groups such as actors, musicians, and other technical teams all compete to rehearse at the same time. The technical schedule should first list all the events that will need to take place in order for the production to be successful. This schedule should be shared with the other departments and proper amounts of time should be allocated for all of the necessary events. Once the schedule is finalized, copies should be provided to all those involved in the production. This will prevent the sound crew from running into the problems that result when not enough time is available for necessary tasks, such as ringing out the front of house and monitor systems, and properly sound checking any musical groups that will be playing during the event.

Having these two documents in the hands of everyone involved with the production will make sure that the sound system is assembled properly and efficiently, and that all the necessary tasks are carried out to ensure an excellent sound during the event.

...more speakers and more amplifier power is often required to produce adequate sound pressure levels outdoors

OUTDOOR ACOUSTICS

Another area that must be considered when planning and conducting an outdoor event is the difference between indoor and outdoor acoustics. The people who will be operating the system and mixing during the event need to be aware that the acoustic environment that is encountered when mixing outdoors is very different from the acoustics we are used to hearing when we mix inside a building. If the technician is not prepared for this difference, serious equalization and mixing mistakes can result.

Sound behaves very differently outdoors. One of the major differences to be aware of when mixing outdoors is the lack of a significant reverberant field. Indoors, the sound waves emitted from the loudspeakers travel through the room eventually bouncing off of the various surfaces in the room, such as walls, ceilings, floors, and other objects. These multiple, gradually decaying reflections create a reverberant field inside the space; giving each room it's characteristic "sound". This reverberant field also tends to thicken up the sound and reinforce low frequencies, causing the sound to seem louder and "wetter".

However, there is no such highly reverberant field in an open outdoor environment. While small-scale individual reflections still occur (from the stage, podium, people, etc.), there is no overall reverberant field to speak of in an open outdoor area because there are most often no walls, ceilings, or enclosed areas for sound waves to bounce off of.

Sound waves emitted from a loudspeaker placed outside decay according to the Inverse Square Law (for every doubling of distance from the sound source, a 6 decibel drop in sound pressure level occurs). Although indoor sound waves obey the same laws of physics, the reverberant field tends to mask this effect to some extent because of the reflected sound energy present in the room.

Outdoors, the effect is not masked, and the sound level quickly drops the further someone is from the loudspeakers. Sound outdoors also lacks the characteristic "wetness" and thickening effect that reverberation provides. There are also less large

boundaries to reinforce low frequencies outdoors (although the ground itself is an obvious option). Outdoors, the system may tend to sound abnormally dry and lacking in low frequencies.

What this means is that more speakers and more amplifier power is often required to produce adequate sound pressure levels outdoors. If the crowd is large and deep, delayed loudspeaker systems may be necessary to provide adequate volume to those people far away from the main loudspeakers while not deafening those close to the stage.

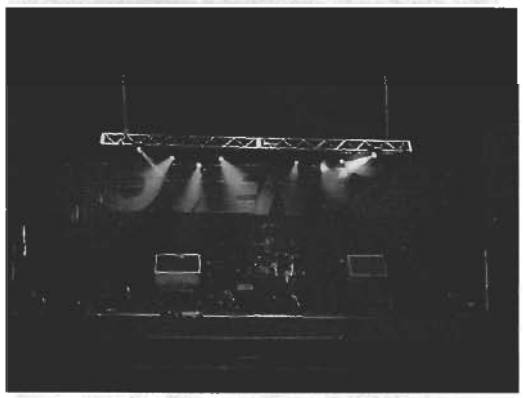
Also, more low frequency drivers (such as subwoofers or bass horns) are required to compensate for the lack of bass reinforcement that is commonly present in an indoor environment. System equalization outdoors may also tend to be heavier in low frequencies than in an indoor system. To compensate for the lack of natural reverberation, artificial or digital reverb units are often used to provide a wetter and thicker sound to vocals and various instruments.

Another concern can be environmental and wind noise. While indoor air conditioning units can sometimes produce a similar effect, a strong gust of wind at the wrong time can be disastrous outdoors. This may become especially critical in lapel microphones, handheld vocal microphones, and other microphones that are typically run at relatively high gain levels. When working outdoors, be sure to have several microphone windscreens available to help deaden this effect if the wind picks up. Also, using a console equipped with a good high pass filter can go a long way to eliminating annoying wind noise in critical microphones.

USE A PRODUCTION OR RENTAL COMPANY IF NECESSARY.

For some larger outdoor events, the sound system requirements may be very extensive. Multiple loudspeaker boxes may be needed, along with the amplifiers to power them. Many outdoor events can consume large numbers of console channels and may need large amounts of outboard processing equipment, such as compressors, noise gates, and equalizers. Many churches may not own all of the necessary equipment or have enough knowledgeable volunteers available to set up a large and complicated sound reinforcement system.

Also, in many cases, using gear from other sound systems on the church campus may not be feasible since these systems may need to remain operational for other church functions. In cases like this, it would be wise to work with a sound production or rental company to provide the sound system for the event. Sound rental companies, music stores, and production companies are some common sources of equipment rental available in almost all locations. These companies have sound systems of various sizes available for renting.



A well produced outdoor concert, pageant, cantata, or church service is a great way to tell the greatest story of all

Many of these companies also sell, rent, or lease new and used audio equipment such as processing gear, cables, and mixing consoles. These companies can be very helpful because they can relieve the church's technical team of the need to set up and tune the sound system for the event. This can allow the technical team to concentrate more on the actual execution of the event.

For a rental fee, the company will send technicians to the event with the needed equipment and setup tools. The company's technicians will set up, wire, and often can tune and align the sound system. Some companies will even make their technicians or engineers available during the performance to help fix any problems that may come up with the sound system.

Most companies will allow the church's sound engineers to operate the system, or if the church wishes, the company can provide a qualified sound engineer to operate the system. However, be aware that the sound company's technicians may not be thoroughly familiar with the planning, script, cues, and finer points of the production. If the company's technicians will be running the system and mixing during the performance, make sure to provide adequate time for rehearsals so that these outside operators can learn the script and flow of the production or event.

Once the event is over, the company's technicians will break down the sound system and return it to the company. The church's sound crew can then return to normal church life without having to spend long hours making sure that equipment is properly returned to the various places on the church campus (especially the main auditorium). This can prevent embarrassing errors on the Sunday after a large outdoor event.

Hence, renting a system is a great solution when an outdoor event occurs within a short time of a regular church service, for which the church's regular sound system is needed. Also, helping professionals from a production company setup, tune, operate, and break down the sound system for the event can be a valuable learning experience for many church technicians.

Renting a sound system is a great way to relieve some of the stress that can result from trying to gather, setup, operate, and break down a large sound system for a major outdoor production. Not only may the reinforcement system sound and perform better, but also the church technical team can concentrate more on an excellent execution of mix and script, rather than hassling with thrown-together and problematic equipment.

A well produced outdoor concert, pageant, cantata, or church service is a great way to tell the greatest story of all during this upcoming holiday season. I hope that these suggestions can help to relieve some of the stressful technical hair pulling that can often result within church technical teams around this time of year. With proper planning, preparation, and execution, your church's outdoor event can successfully take the gospel to the streets with technical excellence. ◆

James Schleich works extensively as a staff audio technician at Brownsville Assembly of God Church in Pensacola, Florida. He can be contacted at (850) 456-2221. His e-mail address is james@the-soundman.org