Conquering Live Sound

A Guide to Mics and Live Acoustics

By Phil Selman

We've all attended services where a sound-related issue spoiled the experience. The pastor's voice had a metallic ring to it or just kept dropping out of the loudspeakers. Maybe the choir sounded muddy or the drums blotted out the rest of the worship team. Fortunately, there are many ways to deal with these common issues.

Feedback can sound like anything from a high-pitched squeal to a deep and ominous tone that shakes the walls of your worship hall. It's disruptive to your services, unpleasant to your ears, and potentially destructive to your equipment. Feedback occurs when sound — such as the pastor's voice — enters a microphone, is amplified and projected through a loudspeaker, and then re-enters the microphone, where the process begins over again, only louder. The audio gets boosted over and over again, until it overloads the system.

This phenomenon is most likely to occur with vocal microphones when speakers and vocalists position themselves in such a way that the sound coming from the monitors or main loudspeakers bleeds into the microphone. The simplest solution is to avoid stepping out in front of the loudspeakers or getting too close to the monitors. Live vocal microphones, such as the Shure SM58 (page 10), have a tight front pickup pattern and great side and back noise rejection. If you imagine the microphone as a flashlight, then its pickup pattern is its beam. So long as you avoid "shining" the microphone's "beam" on any of the speakers or directly at the back wall, feedback shouldn't be a problem.

Many pastors use lavalier microphones that pin onto their lapels or ties. These microphones pick up sound from an extremely wide angle, and since they are worn far from the speaker's mouth, the sound engineer often has to boost their output significantly. These conditions — high output and a wide pickup pattern — are a recipe for feedback. You can avoid this by using a headworn earset microphone, such as the Countryman IsoMax E6; you can get the receiving end of the mic mere inches from the speaker's mouth.

If there's one thing that every live sound environment absolutely needs, it's an automatic feedback suppressor. These small rackmountable devices listen to your mix and react to feedback with lightning fast reflexes, cutting problem frequencies before you can even hear them. There are excellent units — such as those in dbx's DriveRack series (page 52) — that also automatically tune your whole PA system to the acoustics of your worship hall.

When it comes to clearing up platform space and keeping setup simple, nothing beats going wireless. Our Sales Engineers receive intense and continuously updated training on all things wireless. Issues such as

frequency compatibility and the logistics of dealing with power and antenna distribution often lie at the roots of wireless problems.

See the sidebar to the right for real examples of different packages our Sales Engineers put together to address a larger house of worship's wireless needs.

Complete Wireless Worship Package

This package has everything you need for a full worship team (vocal mics for the lead and backup singers; systems for an acoustic guitar, an electric guitar, and a bass; plus a system for the pastor). To address issues such as disruptive wireless drop out, this system contains everything you need to spread out the antennas sufficiently, including the splitter, the cables, and the mounting hardware. Other considerations, such as the Line 6 wireless guitar systems compatibility with the Sennheiser Evolution Wireless system's frequency range, demonstrate the individualized attention to detail you can expect from your Sales Engineer.

Complete Choir Mic Package

Another consideration is how to properly reinforce the sound of a complete choir. Our approach to this is similar to the way we address wireless systems, in that we take your complete needs into account. When you mic a choir section, it is often best to use evenly spaced microphones and treat the ensemble as a single instrument.

Take a look at the Complete Choir Mic Package in the sidebar (right). This setup uses three large boom-equipped microphone stands to position the mics over the entire choir. In a configuration like this, each microphone captures an equal section of the whole choir, with little overlap. This allows you to adjust each microphone's level to create a balanced and clearly audible mix. By treating the choir as a single complex instrument, you are better able to express its ensemble quality and accent its strongest characteristics.

Total Acoustic Drum Control Package

Few houses of worship possess the acoustics to flatter the unregulated sound of a full drum kit, so the first thing to do is to rein in its volume. Clearsonic shields help control the level of the kit without visually isolating your drummer. Once you've controlled its overall volume, you use microphones to bring out each element of the kit.

This example package is complete, right down to the included stands and cables. One of the most convenient aspects of a package like this is that each of the microphones on the snare and the toms clips right on its respective drum's shell, eliminating the need for numerous stands. In fact, you need only two stands: one for the kick drum, and one for the RØDE NT4 overhead mic, which has a stereo pair of capsules built right in for maximum convenience.

Working with your Sweetwater Sales Engineer can help you solve major acoustic issues with simple solutions. Whether it's picking the right mics for the right jobs, going wireless, or reining in feedback, every house of worship is different. Just remember, you can always talk to your highly trained Sweetwater Sales Engineer for personalized assistance with any of your audio needs.

Audix DP5-A

This 5-piece drum mic kit comes with mounting hardware and a case!

$659.97

To Learn More, Go to Page 15.

Real Worship Sound Solutions

The packages below are examples of only a few complete solutions to real worship sound needs. When we put together a system, we begin with your specific goals and find the right gear to help you achieve them.

>> Complete Wireless Worship Package

Qty	ItemID	Description
1	EW112G3-A	Bodypack wireless w/ME2
1	EW135G3-A	Handheld wireless w/835
4	EW115G3-A	Handheld wireless w/e815
2	EW172G3-A	Instrument wireless system
1	XDSPlus	24-bit UHF guitar system
1	E6OW5TSD	EarSet Miniature Mic for Senn
4	GA3	Evolution Wireless rack kit
1	GA3	Evolution Wireless rack kit
2	A1031U	Wideband antenna
2	BB1	1' RG58 coaxial cable w/BNC
2	ASA1NT	Antenna splitter kit w/PS
1	MT8XFXM10	10', 8-ch XLRF – XLRM snake
2	TMO8B	Flange mount
2	BNC110	10' Series 59 BNC – BNC cable

Under $6,000!

>> Complete Choir Mic Package

Qty	ItemID	Description
1	NT5	Matched pair condenser mics
1	NT5Sing	Condenser mic (Single)
3	MicStdBoom	Heavy-duty boom mic stand
3	XLR50	50' XLRF – XLRM cable

Under $900!

>> Total Acoustic Drum Control Package

Qty	ItemID	Description
1	DP5A	5-mic drum mic package
1	NT4	Stereo condenser mic
1	MicStdBoom	Heavy-duty boom mic stand
1	MicStdShortBm	Kick drum/amp stand w/boom
7	XLR30	30' XLRF – XLRM cable
1	CSPA56	Acrylic drum shield 5.5', 6-sect

Under $2000!

Worry-free WIRELESS !

We wanted you to know that all of the wireless systems you see here — and all of the wireless systems available at Sweetwater — are 100% compliant with the Federal Communication Commission's new rules governing wireless systems. You can be confident that these systems will work safely and within the permitted frequency/power ranges, just as they are. However, please be aware that by choosing to use systems that operate in the 700MHz range or by modifying a new wireless system you receive from us, you may cause your system to operate outside of the FCC's new guidelines. If that's the case, you may need a license to operate the unit. To find out more, visit the FCC's wireless microphone website at www.fcc.gov/cgb/wirelessmicrophones or give them a call at 1-888-CALL-FCC.