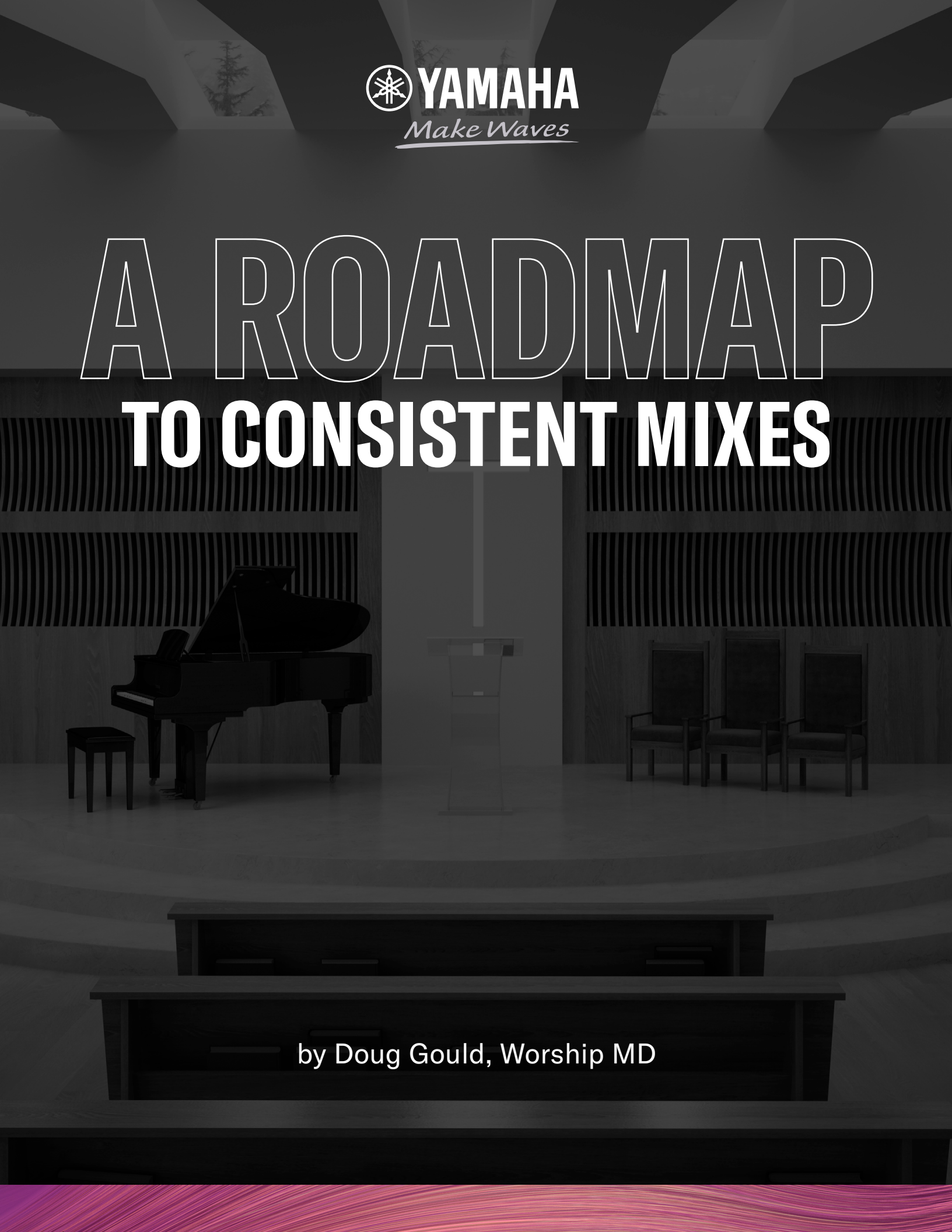

YAMAHA
Make Waves
A ROADMAP
TO CONSISTENT MIXES
by Doug Gould, Worship MD

IN A RECENT CONFERENCE CALL with a church tech director and the creative arts pastor, we talked about the different sound issues in their main sanctuary. They were looking for suggestions on how to fix these problems and take their audio system to the next level. There was no shifting of blame or finger-pointing. In fact, the creative arts pastor was adamant in his support for the entire tech team and their leadership. He acknowledged their dedication and drive to make things better. Very refreshing!

We started the conversation with a critique of the room's overall shape, dimensions and the materials that make up its surfaces. Recognizing that its configuration might not be the best for acoustics, we discussed the need to explore possible ways to improve the acoustic characteristics. I strongly urged them to bring in a qualified acoustician to analyze the room. Investing in an acoustician can be invaluable. Their analysis will tell you the room's acoustic behavior and how it can be improved before considering loudspeakers and their placement. It's important not to be swayed by systems promising outstanding audio performance without first considering the room's acoustics. Starting with a thorough discussion of room acoustics is fundamental for achieving a sound that will work for your space.

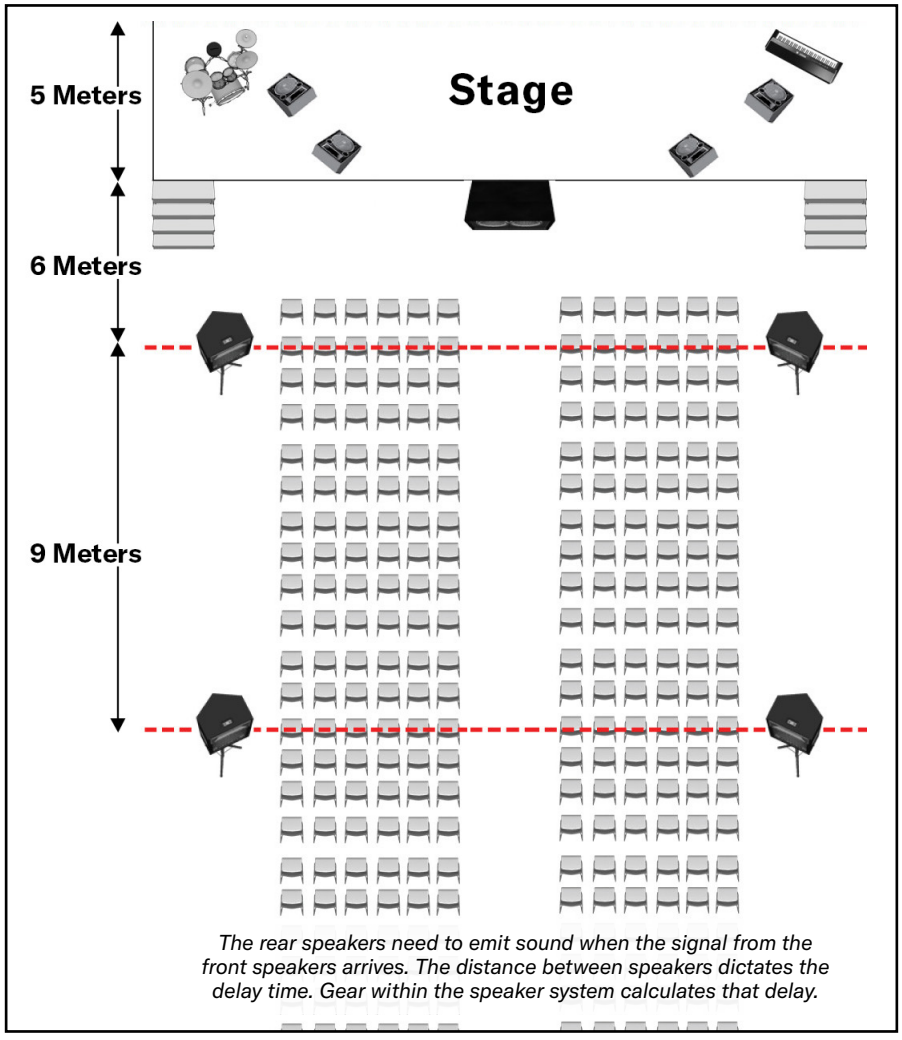
Primacoustic is an example of a highly regarded manufacturer of acoustic treatment solutions. They supply free quotes for churches and offer products that you can install yourself. Look at what they offer and decide if it makes sense to talk with an acoustician.

SPEAKER PLACEMENT AND TIME ALIGNMENT

Our discussion then shifted to the existing speaker placement. The tech director and pastor explained that a center cluster of speakers is suspended from the vaulted ceiling, covering most of the sanctuary. However, because they needed sonic support on the sides of the room, they added side fills to address those zones.

I was curious about the positioning of the side fills and where they were in relation to the center cluster. Based on their description, the fill speakers were positioned about three to four feet behind the main cluster and around 20-30 feet above the floor.

Then I asked if the side fills were time delayed to align sound with the main speaker. The tech director and pastor said they were unfamiliar with the concept. I explained the importance of time-arrival, or phase coherence. The principle behind signal delay is to ensure that loudspeakers and other sound sources are time-aligned, reaching the listener's ears naturally, simultaneously and in phase. This synchronization enhances the intelligibility and clarity of the sound. To achieve this, adjustable delays are used on different components to avoid the problem of disjointed signals. This careful sound alignment enhances the overall audio experience, allowing for a seamless and immersive sound environment.



The rear speakers need to emit sound when the signal from the front speakers arrives. The distance between speakers dictates the delay time. Gear within the speaker system calculates that delay.

ENHANCING THE SOUND OF THE BAND

During our conversation, we talked about the church's worship style, which blended modern elements with some traditional aspects. While the style didn't align with many modern contemporary Christian songs sung in churches today, it seemed to be an appropriate setup for the space and the congregation. Notably, the church had successfully transitioned to in-ear monitoring, removing the need and concerns of loud stage monitors and guitar amps. This positive change reduced overall stage volume, ensuring it no longer interfered with the house mix.

In-ear monitors not only help the musicians and singers, but they create a better overall house mix. There is greater control and precision in managing audio levels, leading to an improved experience for the worship band and worshipers.

The worship pastor shared that he had used some advice I had given at a recent conference about arranging the band in a way that helps musicians know when, where, what and how to play their parts. This strategic arrangement heightened the band's awareness of each member's significance in creating a cohesive musical sound. As a result, they became more attentive listeners, both to each other and the overall environment, allowing them to effectively contribute to the worship experience.

This feedback was truly encouraging to me. It's all too common for the sound operator to get the blame for a less-than-satisfactory musical sound. As the saying goes, "Garbage in, garbage out." While I don't mean to put all the responsibility on the band, it's where the foundation is laid — at the source.

When I have the pleasure of running sound for a well-rehearsed band that has a lot of experience playing together, the difference is remarkable. Their ability to listen

and play off each other rather than over one another is evident. It's almost as if they are self-mixing, making my job much easier.

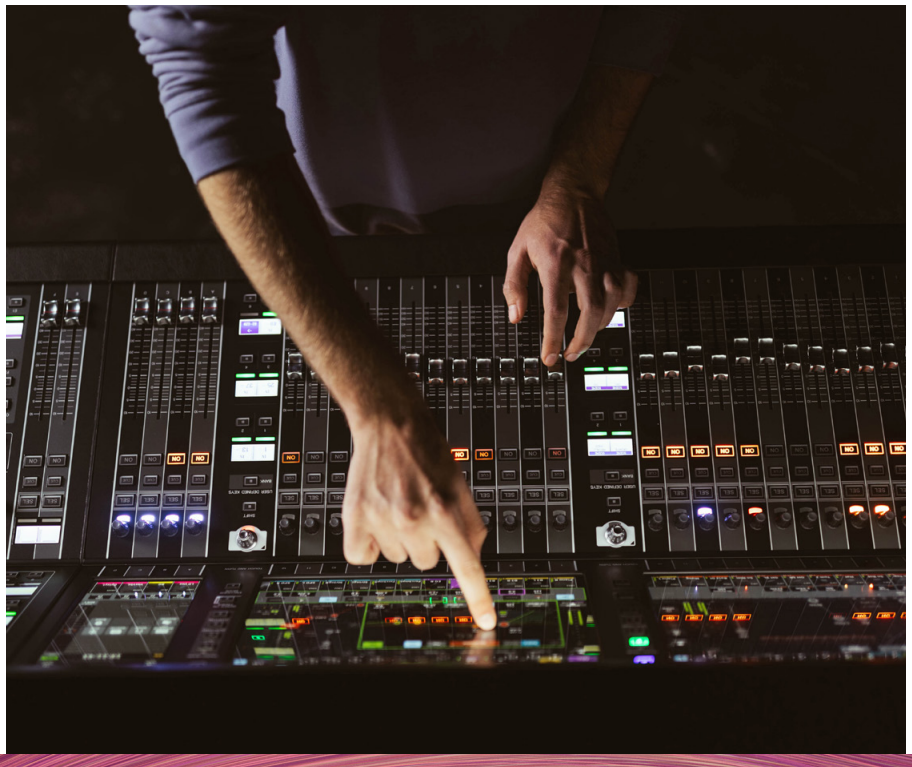
As sound operators, we can help enhance the band's overall sound with depth, effects and emotional elements and ensure the proper audio output levels. Nevertheless, the band is the crucial first step in achieving a fantastic mix. A band that lacks this self-awareness will always be more challenging to manage. Understanding this dynamic and working harmoniously with the band is key to achieving a truly exceptional musical experience.

SOUND OPERATORS

Churches, both large and small, often have a rotation of volunteer sound operators who share the mixing responsibilities. Within this team, some individuals will have more experience and skill while others are just beginning their journey in sound operation. I find it highly beneficial to include some operators who are also musicians because they understand the dynamics of sound reinforcement and how a band works together.

Of course, not all sound operators will be musicians, and that's okay. But, from my perspective, it's still crucial for non-musicians to at least have a passion for music. Without this passion, it will be challenging for them to grasp how the music is supposed to sound. Sound operation is not a solely scientific or engineering-oriented task; it also involves an artistic side. Having a blend of technical knowledge and an appreciation for the artistry of music makes for a well-rounded sound operator who can effectively create an enjoyable and harmonious audio experience for the worship band and congregation.

Here is a link to a great video series from Yamaha that discusses the points I have made: How to Mix Live Music.



Alright, let's assume everyone on the team shares a genuine love for music and is enthusiastic about sound mixing. Moreover, they all strongly desire to build their skill level and contribute their best to serve the church body. Despite this shared passion, some team members will inevitably have more experience, talent and knowledge than others.

While a collective passion for music unites the team, their varying ability levels create a valuable opportunity for mutual learning and growth. Through collaboration and mentorship, the team can harness the strengths of everyone to create a harmonious and well-balanced sound-mixing environment for the church. Their collective effort and willingness to improve ensures that they will continue to deliver exceptional audio experiences for their worship services and events.

BEST PRACTICES

To achieve a consistent sound mix each week and avoid subjecting the congregation to varied or extreme differences between services, several key practices should be implemented:

1. **SOUND CHECK PROTOCOL**: Develop a comprehensive sound check routine that the sound team follows diligently before each service. This will ensure that all instruments and vocalists are properly balanced and mixed, laying the foundation for consistency.

2. **STANDARDIZED SETTINGS**: Create and use standardized settings on the mixing console for various instruments and vocalists based on the room's acoustics. These settings will serve as a starting point for each service, supplying a consistent reference.

3. **DOCUMENTATION**: Keep a detailed journal of sound settings, equipment configurations and any changes made during rehearsals and/or services. This record should be used as a reference to replicate successful mixes from previous weeks.

4. **TEAM COMMUNICATION**: Encourage open communication within the sound team, allowing members to share feedback and insights on achieving consistency. Address any concerns promptly and collaboratively to find solutions.

5. **CONTINUOUS TRAINING**: Offer regular training sessions for the sound team to improve their skills and stay updated with the latest techniques and equipment. This will help ensure all team members are on the same page regarding achieving a consistent sound.

6. **REHEARSALS AND SOUND CHECKS**: Conduct thorough rehearsals with the musicians to fine-tune their performances and ensure that they are clear about the sound they want to achieve. Use sound checks to set levels and create a shared understanding of the desired sound for that service.

7. **RECORDING AND REVIEW**: Consider recording each service so the team can review the sound mix afterward. This allows the team to find areas for improvement and learn from past performances.

8. **FLEXIBILITY AND ADAPTABILITY**: While aiming for consistency, remain flexible and adaptable to accommodate any necessary adjustments based on the specific needs of each service or event.

By implementing these practices, your sound team can work together to achieve a consistent mix from week to week, creating an immersive and enjoyable worship experience for the congregation.

PRACTICE, EVALUATE AND REFINE THE SOUND

Improvement for musicians comes with dedicated practice and spending as much time as possible playing their instrument at home. The sayings “Time in makes us better!” and “Practice makes perfect,” apply here.

For a volunteer sound operator, honing their craft requires a different approach. I would recommend using multitrack recording during rehearsals and services. This method allows sound operators to practice their mixing skills by playing back the recorded sessions whenever the church is unoccupied. Many new digital consoles cater to this need with the “virtual soundcheck” feature. You could miss a great training opportunity if you don’t use virtual soundcheck.

By taking advantage of that function, a sound operator can review their mixes, experiment with different settings and fine-tune their techniques. This invaluable practice tool can offer significant growth for individuals or the whole sound team. Just as musicians improve through dedicated practice, sound operators’ commitment to refining their craft will undoubtedly lead to a more skilled and capable sound team, enhancing the worship experience for the worship band and the congregation.

Next, gather the sound team and worship leader (the worship band is taking the night off) and have each tech mix virtual tracks in front of the group, one at a time. During this exercise, certain patterns may appear. Some operators may lean heavily on the bass spectrum and subwoofers, resulting in an overpowering low-end sound. Others may boost higher frequencies due to their inability to hear those frequencies to a level that becomes uncomfortable for everyone else. It’s crucial for every sound operator to undergo an annual hearing exam to check for potential loss, creating a reference point for comparison year after year.

You may also encounter mixes that sound okay but lack musicality, or they feel sterile without depth or dimension. Some mixes might have excessive reverb, creating an unrealistic and distant ambiance reminiscent of a cathedral or gym, which you may already be in. Reverb should be used primarily for vocals and sparingly at that.

By hearing these differences in mixing styles, you can give constructive feedback and engage in discussions to improve the skill set of each tech. The goal is to achieve a consistent and balanced musical sound mix that enhances the overall worship experience without compromising the auditory comfort of the congregation.

When you, as tech director and/or worship leader, give constructive feedback, it needs to foster an environment of collaboration and improvement. While the aim is certainly to create a consistent sound that everyone agrees on, you are also setting a standard for everyone to aspire to. While this bar is crucial, the ultimate goal is continuous improvement over time, progressively elevating the sound mix's quality and the team's cohesiveness and camaraderie.

This is not a one-time exercise but an ongoing journey. Regular practice, evaluations and refinements are necessary to ensure everyone is aligned and working toward the same goal. Patience and encouragement are pivotal in this journey, motivating the team to learn and grow together.

Giving ample time for training and learning resources is vital for a team to thrive. Sound teams can constantly develop their skills and function cohesively by offering this. Emphasizing teamwork and fostering a culture of support will lead to harmony in the team, enhancing the weekly worship experience for the congregation.

INSIGHTS FROM ROOM RECORDING

Recording individual tracks is beneficial for personal and team practice but I recommend recording the actual room service in the sanctuary to gain a good understanding of what the audio sounds like in the sanctuary. This approach can be more straightforward because you don't have to go through the mixer, although that is an option. A pair of condenser microphones connected to a hand-held digital recorder or a stereo recorder with built-in microphones can be used to record the house mix in the room. If you want to use the FOH mixer, those same condenser microphones can be routed to a digital mixer connected to the board, giving you the same recording.

By using this method, you can hear a better representation of how the music and vocals blend with the space's acoustics and how the congregation is experiencing the sound. Room recording can give you valuable insights into the overall sonic experience, enabling you to hear any room-related challenges or improvements that may be needed.

This approach complements individual track recording and helps the sound team fine-tune their mixing decisions for the best possible sound in the live environment. Combining individual track recording and room recording ensures a comprehensive understanding of the sound, causing continual improvement and creating a more immersive and satisfying worship experience for the congregation.

A stereo recording of the worship service will show clearly what adjustments are needed. It will indicate what may be too loud or not loud enough and whether certain frequencies sound harsh or muddy. When you record a copy of the main mix through the mixer to a recorder, the vocals will tend to dominate. Whereas a direct recording of the room will give you a better representation of the instruments due to the natural loudness of guitars and drums. These instruments don't require as much reinforcement as vocals do, so they may not be as prominent in a direct recording of the mix as opposed to a live recording of the room.

However, by using room microphones, a more balanced representation of the sound in the room is captured. This room recording lets you discern the levels of the loudest and softest elements in the mix. When such discrepancies are clear, finding, addressing and correcting imbalances or sound issues becomes easier.

Room recording gives you a holistic view of the worship service's sound, helping the sound team make informed decisions to create a more immersive and balanced worship experience. By combining the stereo and room recording insights, the sound team can achieve a better sonic result for the congregation.

Instead of continuously telling Johnny Guitar that he's too loud, save time and effort by simply hitting the play button on the recorder. The recording will speak for itself, making it clear to Johnny and everyone else what adjustments are necessary. This way, you won't feel guilty about addressing the issue directly — the recording will

serve as an objective reference for sound adjustments. Let the recording give the feedback, making the process more effective and less confrontational.

Our aim must always be to strive for improvement, giving God our very best and enabling the church to enter worship for His glory, not seeking recognition for ourselves.

Frequently listen to the recordings as a group. Over time, you'll notice the mixes from different operators start to sound more alike and, more importantly, better! Remember that creating the best mix is an ongoing process requiring technical knowledge, practical experience, and a keen ear for sound. It's important to adapt your approach based on your church's specific needs and the congregation's preferences. Creating a good working relationship with and between your tech team will go a long way in minimizing conflicts and inconsistencies when the need to rotate techs becomes necessary.

ABOUT THE AUTHOR

Doug Gould is the CEO and Founder of Worship MD and has been a veteran of the Pro Audio and Music Technology industry for nearly 30 years, serving in management roles at Shure, Tascam and E-Mu Systems. Doug has served as a worship leader, musician and sound tech at various churches throughout his career.

Over the last 18 years, Doug has been a very effective presenter at hundreds of worship conferences all over North America and beyond, focusing his experience on consulting and teaching.

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Doug can be reached at worshipmd.com or by email: doug@worshipmd.com.
You can also find him on Facebook at facebook.com/officialworshipmd.

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