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Where Should the House Mixing Desk Go?

By Curt Taipale

The issue of where to place the house mixing console often brings up an awkward debate between the church sound team, the building committee and the senior pastor. It could be that the sound team has been mixing from a compromised listening location for some time, and they look at building a new facility as their opportunity to finally get the location they need to do the job that the pastor and music minister have been asking them to do.

By comparison, if it were possible, many senior pastors would prefer that no sound equipment be visible anywhere in the auditorium. The church administrator may be looking at the cost per square foot of this building project, and finds it difficult to justify giving up anywhere from ten to thirty prime listening seats for the sound booth. The individuals in the sound committee find themselves sitting in the middle of this debate, but let's face it- they often bring their own preferences to the table as well.

So who's right? Obviously, each argument has it's own merit. Your style of worship service can have a bearing on the location of the sound booth as well. The key is the number of microphones in use and if any true mixing needs to be done to those elements. A worship service with a single open microphone is so simple that one could literally put the controls in a nearby closet and be fine. The moment you add that second microphone for anything- choir, piano et al; you'll need to consider the need for the mixing process and a suitable location for the sound mixer to hear what's going on.

Can we get one thing straight right off the bat? If you're serious about delivering a good musical mix, there are two awkward locations for the sound booth that a church should do their best to avoid: in an enclosed booth with an opening to the sanctuary cut into the wall, or worse yet, in a booth located behind a glass window. Neither of these locations will allow your sound mixing engineer to hear what they need to deliver a good mix.

By the way, when I use the term 'sound booth' I'm speaking in general terms of the area in which the house mixing desk and related outboard equipment are sectioned off. I don't mean an enclosed room with an opening cut into a wall, or worse yet- behind a window. At most, the walls that section off the sound booth should not rise above the height of the mixing console itself.

Don't do what this church did. Their main sanctuary is roughly 50 ft wide by 50 ft deep. The stage is 2ft high, and goes back an additional 15 ft. The roof has a pitch of 12:1 and comes to roughly 15 ft at the center, directly above the center aisle. The general lighting in the sanctuary consists of large hanging globes, roughly 2 ft in diameter, and hanging about 3 ft below the ceiling. There are three rows of lights, with four lights each, and one of those is directly down the center aisle.

When the church debated about how to install their sound equipment, they decided that it was important to hide the mixing console and related gear. Someone looked at the back wall of the auditorium and decided that if they were to cut an opening at the very top of the ceiling, that they could create a room above the main entrance to the sanctuary and put the sound equipment there.

They lived with this horrendous situation for the first year. Eventually they built a sound booth in the left rear corner of the main floor and moved the equipment there. The church called me a couple of years after they had moved into this building and invited me over to help them straighten out some of their remaining sound problems. As we talked, the sound engineer asked me if I'd be interested in seeing where the sound booth used to be. Well, you wouldn't have to ask me that question twice!

So picture this. He leads me into the church offices (through the pastor's study!), opens up the pastor's coat closet, and starts to make his way up a wooden ladder that has been built in the side of the closet wall!

We manage to shinny up this ladder, at which point he tells me to bend over so I don't hit me head. By now I feel like I'm going into a tree fort. I dutifully bent over, waddled into the room ahead, then straightened up and giggled uncontrollably at what he used to have to face every Sunday morning. Standing in this room barely big enough for one or two people, I can look through the A-shaped opening (cut into the back wall as mentioned earlier) out into the auditorium. I can't actually see the center of the stage, only the extreme left and right sides, because the globe lights block the line of sight entirely.

Along the wall to my left is a shelf where the mixing console and tape decks used to live. As the church's sound engineer describes how bad this situation used to be, he illustrates that in order to hear anything from the sound system he literally had to turn himself sideways and lean out of the opening to get his ears into the auditorium. Can you imagine how frustrating that must have been for the sound team? I shouldn't say that- maybe your sound team is in a similar predicament.

Now, to any sound mixer it's just common sense that the mixing desk should be located at a spot in the auditorium that will allow them to (1)clearly hear the direct sound from the loudspeaker system, (2)have an unobstructed view of the main platform, and (3)clearly hear the congregation as they worship. This hole in the wall offered none of the above. The sound team had tried to explain this problem to the church leadership during the installation, but to no avail.

I can't fault that church's leadership entirely for making such a costly decision. What a person holds as true is based on their knowledge. They simply didn't have the knowledge they needed to make an informed decision. At the risk of boring you or dwelling on the obvious here, I'm simply trying to make sure that you're armed with the knowledge you need to make an informed decision on your current needs. Take this advice from someone who has mixed from every imaginable house mix location in over a hundred different church sanctuaries, and who cares enough for your church and your sound team to fight for what is right.

So why is mixing from a hole in the wall such a bad thing? First off, the sound mixer doesn't get a true representation of what the congregation is hearing. The average member of the congregation simply enjoys listening to the music as a whole. If they can't hear or understand the words being sung by the worship leader, or if the sound is too loud overall, they'll know it and may even say something about it to an usher.

On the other hand, sound mixers listen to the worship music very analytically. They tear it apart in their mind and make a judgment about each component. They listen to hear if the vocal is too loud or loud enough as it relates to the overall mix. They listen to the timbre and quality of each sound to make a decision on whether or not it could be improved with a slight adjustment to the channel equalization. They listen for how the effects devices like reverb are being used and if a certain element needs more or less of the effect, and so on. They also listen for how loud the congregation is singing, and then use that as a gauge for how loud to run the sound system. Too soft and the congregation won't really enter into worship. Too loud and they'll lose the sense of corporate worship, and probably start complaining. The process is fairly involved, and yet each decision takes only the blink of an eye.

The balcony is another less than optimum location for the house mixing desk. Again, if you were mixing the sound, where would you best be able to make decisions on both the inner balance of voices and instruments that your congregation hears, and the balance between how loud the sound system is relative to how strong the congregation is singing? Your answer should be 'where the ears of the congregation are- in the main seating area on the main floor of the sanctuary!'

If the 'house' mixing console is not positioned so that the operator can clearly hear both the sound

system and the congregation in their own setting, then his/her mix will never be more than an interpretive mix at best. For example, let's say that the house mix position is on the balcony. The sound system could be too loud on the main floor and your engineer won't know it.

One thing you'll find when the sound system gets too loud is that the congregation starts to lose a sense of corporate worship. That corporate worship feel is one powerful difference that makes music in your church unique from other types of live music. It brings a tremendous life to the worship experience. Running the sound system too loud robs the congregation of their right to that experience. No amount of running down from the balcony to hear what it sounds like on the main floor will ever make up for simply placing the console where it should be in the first place.

If placing the house mix position on the main floor is unlikely, what are your options? I can't make a blanket statement that the console should never be in the balcony because in some cases it does work. If you're forced into putting the house console in the balcony, you may be able to improve the situation by adding a dedicated house loudspeaker out in front and slightly above the engineer's head that is delayed, equalized, and level-matched to represent a listener's seat on the main floor of the sanctuary. The engineer won't hear the congregation, but at least he will hear the mix okay.

Another point to consider is this- try not to place the console exactly on the centerline of the room. As the sound from your speaker system interacts with the acoustics of your sanctuary, there will be locations in the room where the sound energy cancels. Try setting up a sine wave oscillator at, for example, 100 Hz, and feed it over the sound system. Walk around the room listening for areas in which the sound cancels. It depends on the arrangement of your auditorium as well as the location of your main speakers, but since most church sanctuaries are fairly symmetrical, it's entirely possible that you'll have a significant cancellation in the center of the room. At low frequencies this null point could be physically quite wide. Therefore, it is entirely possible that a house mixing desk placed at the center of the balcony could miss some lower frequencies.

Given that situation, a beginning sound mixer's natural reaction would be to push the bass by adding more low frequency EQ than is needed, and/or by mixing the bass guitar and possibly other instruments louder than is needed. The only way to know if the low end is right is to walk away from the sound booth and listen in other areas of the room. While the engineer is away from the console, the mix could easily suffer. Worse yet, they could miss mic cues entirely if they chose the wrong moment to walk around and check their mix. That's no fun for the worship team, for the congregation, and it's certainly no fun for the house engineer.

And what if the loudspeaker system isn't doing its job in the balcony, leaving the sound at the house desk dull due to a lack of high frequencies? The task becomes one of an interpretive mix- that is to say, the sound mixing engineer has to compare the difference between what the congregation is hearing on the main floor and what he is hearing at the house desk, and then make adjustments accordingly. The unseasoned engineer would simply crank up the high frequencies on the channel EQ to make the mix sound like he wants it to at the house desk. That will make for a very harsh sound to the congregation.

Or what about this?! I was visiting a church just near us recently and noticed that the house mix desk was placed in an awkward location. The rear seating area is raked up at a steep angle, and the production booth is located in what could be considered as a balcony location. Standing at the mix desk, your ears are right on the centerline of the room, and get this- there are no loudspeakers aiming even near this area! There are two loudspeakers that aim into the seating areas adjacent to the production booth, so not only can he not hear a loudspeaker directly, he's exactly in the middle point between two distant loudspeakers. Sounds like a perfect invitation for phase cancellations, doesn't it?

As I mentioned earlier, another popular choice of churches is to place the console within an opening in the back wall of the sanctuary, and this solution generally forces a serious handicap on the engineer. The integrity of the sound heard inside that cavity can vary as much as 10 db to 20 db both in high frequency response and in overall level as compared with that of a prime seating location on the main floor.

Since the opening is a room of its own, it can also present its own acoustic imprint on the sound. In a setting like this, it is highly unlikely that the sound heard by the engineer is anywhere close to that heard by the congregation, not only in frequency response, but also in loudness. Mixing in that environment is like trying to drive down the highway with your windshield frosted over. Take a look at the TEF curves on the next page and you'll see what I'm talking about. The top curve is the frequency response of the sound system on the main floor. It's not performing very well to begin with- and that's a whole other discussion- but notice how poor the response is at the house desk in the booth. It's 10 db softer than what the congregation hears, and the high end is obviously lacking. This typical booth has an opening to the auditorium of roughly 15 ft high- a seemingly generous opening.

One more location to avoid- please never put the house mix position in a room behind a glass window, or in a closet somewhere! I've seen some awful mixing locations, but one of the worst was at a church in Singapore. The church sound engineer, who also happened to be the church administrator, was totally enclosed in a curtained room with dark glass walls. He had a tiny window, roughly eight inches high by twelve inches wide, that he could open to hear what was going on in the sanctuary. As is common in this type of booth he had a microphone suspended out of the sanctuary that fed a pair of small loudspeakers inside the booth so that he could hear a representation of the sound out there. Also, he couldn't actually see the stage clearly from this location, so he had a remote controlled camera positioned on a column up high and in front of the stage that fed a small video monitor sitting over the house desk. Put it this way- I was glad that I was there to teach, not mix.

Here's a brief checklist to help you properly locate the house mix position:

Can the engineer visually see down the throat of a high frequency horn aimed at that location?

Can the engineer clearly observe all that is happening on the stage?

Is the engineer physically close enough to the main body of the congregation to share in their worship experience, and therefore include the congregation's singing as part of his/her mix?

Is the area above or to the sides of the location free of all acoustical obstructions within 10 feet?

Is the frequency response and sound pressure level at the house mix position within 3 db of the frequency response and SPL measured at a prime location in the main seating section?

The bottom line- if the mix ain't happening, don't shoot the engineer. It may not be his fault. Instead we encourage you to try to be less concerned about hiding the sound equipment and the engineer, and more ready to equip the team to do the job you've asked them to do.

Let your consultant help you decide on a location for the house mixing desk that will accommodate the necessary technical needs of your production team without becoming a visual distraction to the congregation. And by the way, if you know one of those 'worst mixing locations on the planet', please send me a picture (email or regular mail is fine). I'd love to see it!

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