

Knowing Your System

Written by Jamie Rio

Many of you walk into your church just before the service begins; you turn on the system and wait for the congregation to show up. You do your mixing job, turn off the system and go home. This approach to mixing is not a problem unless some piece of gear or cable fails, then you're stuck, and so is the congregation.

In reality, I know many of you have a much deeper understanding of your worship house system and how it operates. Ideally, you should be able to unplug all your components (from microphones to speakers), plug everything back in and make it work beautifully. If you are somewhere between the person who just turns on the system and someone who can dismantle it and then rebuild it, we have something to talk about.

Identify the Signal Flow

Signal flow is a term that describes the path that the audio signal takes on its journey from the microphones to the front of house speakers or monitors.

If you think of the microphone as “hearing” a voice or instrument, sending what it hears to the mixing console and then to the FOH speakers, it may be easier to visualize the path of the sound.

The sole purpose of a mic is to capture sound waves and turn those waves into electric impulses that will travel through your system and ultimately be turned back into sound waves.

A Typical System Setup

So, let's run through a typical system setup as we follow the signal flow.

Assuming that you have a microphone secured to a microphone stand, you will first plug the female end of an XLR cable (the one with the three holes) into the microphone. Don't try to force anything. If necessary, turn the connector end until it fits into the mic's male receptacle. You'll know it's the right fit when the two connect and you hear a small click. Plug the other end directly into your mixer or into the stage snake box. On our way to the mixer we go.

The location of your mixing console determines how this next stage of signal flow is set up. If you are mixing close to the platform or stage, usually at the side, cables will go directly

into the mixing console input channels. Should you be mixing a distance from the platform, a snake will be necessary.

Strategically place the snake stage box out of sight of the congregation. Plug the male end of the XLR into one of the snake inputs. Plug the corresponding male end of the snake into the mixing console channels.

Once the signal enters the mixer, it can flow only where you send it. It's up to you whether it flows through an auxiliary send to a monitor mix, whether it's assigned to a bus group for group level control or whether exits the main outputs into a piece of outboard gear.

As a house of worship technician, you are truly the master of any audio signal that enters your mixing console. Rather than attempt to discuss all the different mixing boards and features (I'll save that for another time), I want to look at the two most common output areas and any mixing console.

From Mixer to Speakers

The signal will leave the main outputs, ultimately arriving at the FOH speakers. The audio signal can simultaneously exit the auxiliary outputs on its way to the monitors. It is likely that as the signal leaves the main outs of your mixer on the way to the FOH speakers it will pass through an equalizer of some sort (probably a graphic EQ). From the equalizer it will then travel to the power amps or powered speaker boxes.

Check your board and see where the output cables are going. If they are plugged into an equalizer, they will have to leave that equalizer on their way to the FOH speakers. The aux send cables may also travel through equalizers on the way to the monitors.

From the equalizer, they will then have to be plugged into the power amps or directly into powered monitors. If you are using a snake in your house, both the FOH and monitor signals from the mixing board will travel back to the snake stage box.

The signal travels in the opposite direction in the snake through cables called "returns." That term makes perfect sense, because the signal is being returned to the stage. From there, the signal will travel to its designated destination.

Snakes and Speaker Wire

If the main or monitor signals enter power amps, they will leave the power amps via speaker wire. Should your house be using powered FOH speakers or powered monitors, the signal will travel via a cable directly from the snake stage box to the monitors or FOH speakers.

If possible, follow all the wires from the microphones to the FOH speakers and monitors. I know that sometimes snake cable and speaker wires travel through the worship house walls or attic or floor, but the main idea here is to identify the signal flow in your particular house.

Once you understand the path of the audio signal, all those cables and wires will become much less intimidating. You will also find that it is much easier to troubleshoot your sound system if you understand how the audio signal moves through it.

Not only will understanding the signal flow and how the gear is connected help you during your weekly mixing duties, but this knowledge will be invaluable should your house of worship attempt any type of outreach events. Being able to tear down a sound system, move it to another location, set it back up and make it sound good is what live sound reinforcement is all about. It is also what outreaches are all about. So, don't limit yourself to being that person who just comes to church and mixes the service, then goes home, when with just a little effort you can develop all the knowledge necessary to be the king of sound at your house of worship

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