

## **WELCOME TO THE LITURGICAL MUSIC CORNER!**

This portion of our semi-monthly newsletter will focus on various aspects of Musical Liturgy. In this month's newsletter, we will take a look at two types of mixing consoles: *analog* and *digital*. Each type brings its own advantages and disadvantages when it comes to blending all sound sources into a single audio mix.

### **WHAT IS A MIXING CONSOLE?**

A *mixing console*, also known as a *mixing board*, *mixing desk*, or *mixer*, is an electronic device that accepts various sound sources in order to blend them into a single and cohesive audio program known as a *main mix* or *house mix*. In addition to the ability to individually adjust the volumes of each sound source to achieve cohesiveness, a mixer is also used to tailor the tonal quality of these sources for clarity or for microphone feedback reduction and elimination. A separate mix for monitor speakers which is known as *foldback*, can also be achieved via the mixer when needed.

### **CHANNEL STRIP**

The main set of controls on the surface of a mixing console are contained within an individual vertically oriented row known as a *channel strip*. Each audio channel is numbered from left to right. The largest control at the bottom of the strip is a slider which adjusts the volume of the sound that goes out to the main speakers from the individual channel – it is known as either a *volume fader* or *fader*.

Above or next to the fader is a button that is labeled either “Solo,” “PFL” (**P**re-**F**ader **L**isten), or “Cue.” When activated, this feature isolates the selected channel via headphones without affecting the main mix by shutting off all other sound sources to allow only that selected one to be heard. It is used to verify if sound is coming through a particular channel especially when doubt arises if something is working or not. It can also be used, if mixing an ensemble, to find a problematic vocalist or instrumentalist so that their volume can be properly calibrated (or completely cut!) amongst the other musicians. Moreover, if the tonality of a sound source within an ensemble needs to be equalized but difficulty arises in figuring out which channel the source is on, the Solo or PFL can assist in pinpointing where it is in the mix.

Located in roughly the same area is an LED, usually red, that is labeled as either “Clip” or “Peak” – this is an overload indicator that is activated when the volume of the signal entering the channel is too loud. The “Gain” or “Trim” control at the top of the channel can be turned down to alleviate the overload, or the sound source that is producing the signal can be reduced volume-wise.



Somewhere near the Solo or PFL might be a button labeled “Mute.” Pressing it turns off the channel without having to bring the volume fader all the way down. Press it again and the channel is then turned back on. This is an extremely useful feature so that the positions of the faders need not be touched, thus maintaining the mix without any unnecessary adjustments.

The first of several knobs then appears above the buttons and is labeled “Pan.” Short for “panning,” it is essentially a balance control that assists in placing the channel within the left, center, and right of the stereo image.

We then encounter a set of knobs that are labeled either “Aux” or “Mon” – these are used to send signals to auxiliary devices or to monitor speakers for the foldback mix.

As we move higher up the strip, the next set of knobs comprise what is known as a *parametric equalizer*. This type of equalizer consists of low (bass), mid (midrange), and high (treble) frequency adjustment controls that adjust the tonal “parameters” of the channel. Some mixing boards have what is known as a “mid sweep” selector, in that various midrange frequencies from around 250Hz to 4kHz can be selected then boosted or cut using the “mid” equalization control. When used effectively, mid sweep can be of great assistance in quelling feedback by selecting and cutting the offending frequency. It can also be used to shape the midrange to obtain more present or warmer tonal qualities.

And finally, at the top of the channel strip, there is a knob that is labeled as either “Gain” or “Trim.” This control assists in regulating the amount of sound that enters the channel in order to prevent overload which can result in garbled audio quality also known as *distortion*.

Click [here](#) for an in-depth tutorial on how a mixing console can be utilized effectively. Also, keep in mind that various audio electronics companies will vary the design in regard to where the previously mentioned controls are placed on the surface of their consoles. Some mixers will follow the order that has been described so far, whereas others may place entire sections of controls in different locations.

## **ANALOG VERSUS DIGITAL**

### **ANALOG CONSOLES**

The description and details that have been disclosed so far are primarily those of an *analog* mixing console. They feature physical sliders, knobs, buttons, and numerous LED indicator lights. For the most part, these consoles can be easy and straightforward to use since all controls and labels are clearly marked and are fully



manual. In addition, the [basic] design of analog boards has been around for numerous decades, thus making them a time-tested, tried and true technology with many improvements and enhancements over the years. However, the fully manual operation of this device can bring forth a few disadvantages.

One of the dilemmas that is associated with analog consoles is the daunting and sometimes intimidating appearance of the control surface, especially if the console is large. For anyone who has little to no experience using a mixer, seeing all those sliders, knobs, buttons, and indicator lights can be overwhelming – however, once familiarity and basic user knowledge is established, the level of intimidation will gradually decrease. In addition, due to the immediate manual access of all controls, it can be very easy for others to adjust things to their own preferences and forget to set things back to the way they originally found them – this is a frustrating situation that various pastoral musicians and ensemble leaders often grapple with at many parish communities. And when it comes to the equalization of microphones, there may be times when the parametric equalizers might not be as effective in assisting to suppress feedback, especially if the music ministry is expanding and additional microphones are needed to properly amplify everyone.

These aforementioned issues can be partially or fully remedied with the use of a digital mixer.

## DIGITAL CONSOLES

A *digital* mixing console relies on digital coding for a majority of its operation – this coding is known as *binary* and is in the form of a combination of zeros (0) and ones (1). The way that it is used by the internal electronics is complex and beyond the scope of this article -- it is this complexity that makes these types of consoles somewhat easier to use in several regards as well as produce audio that is of extremely high quality.

Digital mixers are, for the most part, available as physical devices that, in several ways, resemble their analog counterparts. They may have a volume fader, buttons for Solo/PFL and Mute, and knobs for Pan and Gain/Trim. However, when it comes to equalization and auxiliary/monitor, those controls are found within the mixer's display screen or touch screen as graphic representations. They are designed in this way to allow for much more detailed adjustments and options in comparison to analog boards.

Most digital consoles utilize remote control capabilities by means of apps that can be installed on a phone, tablet, or computer. Some mixers, such as the Behringer XR series, are designed with no physical control surface and completely use their apps



for all adjustments – the only piece of hardware that they employ is an audio interface which accepts all intended sound sources via analog inputs.

The remote control capability is a breakthrough feature since the one using the mixer can be in the main worship space during rehearsal, soundcheck, or even during the duration of the Liturgy – doing so enables them to adjust all parameters accurately according to what the gathered faithful will hear. Instead of the need to place the console in the middle or back of the worship space as what has been the norm for decades with analog boards, the sound operator can now use their phone or tablet to accomplish the same mixing tasks but can also walk around the space with their device, while making adjustments, to ensure that the audio is equal in all areas.

Because of the binary coding that governs its operation, many digital consoles contain features that can assist the user, especially those who are new to the world of audio mixing. Some notable features are: automatic feedback suppression, room calibration in which the board can equalize itself based on the worship space's acoustics, automatic volume control within individual channels ([\*compression\*](#) and/or *limitation*), effects and signal processing such as reverb and time delay, and a very important feature known as *scenes*. It was previously stated that, when using an analog board, there can be times when settings may be adjusted by someone else and not returned to their original positions afterward. Most digital desks can store hundreds of "scenes" which are various settings such as volume, pan, equalization, aux/monitor, effects, etc. For instance, if a parish community has two or more music ministry ensembles, each ensemble can have its own scene of parameters that were previously set and saved – when they arrive at the music area, the user of the mixer simply selects the scene of which they are associated and all parameters move to their exclusive settings. These scenes can be password protected so that nothing can be altered by anyone who does not have security credentials.

Although there are many useful and time-saving features within digital mixing consoles, here are a few things to consider.

Some digital devices are straightforward in regard to the learning curve – others, however, may be more complicated. The key is to find a console that is not overly saturated with too many features but can also assist in delivering optimal sound quality that is needed for the worship space. It should also contain certain features that will benefit all members of the music ministry, especially *scenes* and other capabilities that can make things more convenient based on the audio skill level of the pastoral musicians and audio operators. In a nutshell, it should not be too difficult to learn and use.

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### FINAL THOUGHTS: EXPENSIVE IS NOT ALWAYS BETTER!

Amidst the sheer variety of professional audio components currently on the market, it can be very easy to get persuaded into purchasing the most top-of-the-line analog or digital console due to their rich feature sets and other “amazing” capabilities. If persuasion such as this begins to take root within the buying process, we should be reminded that amidst all of the musical preparation and technical aspects, the Ministry of Music is *not* a performance organization, nor is the choir area or choir loft a stage. In addition, as stated in *Sing to the Lord: Music in Catholic Worship* (STTL), the acoustics of a church or chapel should be resonant so that there is no need for excessive amplification of musical sound in order to fill the space and support the assembly’s song (STTL, no. 104). Each member of the assembly should be able to sense their voice joined to the music ministers and the entire community in a swell of collective sound (STTL, no. 102). In other words, the music ministry should never overpower or drown out the assembly but rather be joined as one voice to each other. The audio within a worship space is present to support the gathered faithful in their full, active, and conscious participation.

While the most top-of-the-line audio devices can easily impress, it is imperative to keep in mind that church sound components should *not* be excessive, overly complicated to use, nor packed with too many “extras” that will not be fully used or even used at all. Approach the buying process from a practical point of view by understanding what the parish community and music ministry truly need so that it can produce the best possible quality of sound while staying well within its means.

For additional information and consultation regarding audio within the Liturgy, please contact Victor A. Wheeler, Coordinator of Sacred Music Formation. He is also a former audio engineer who has mixed sound for various small to large music events through the years and can be reached at (213) 637-7054. You can also send him an e-mail at: [vwheeler@la-archdiocese.org](mailto:vwheeler@la-archdiocese.org).

The next article within the upcoming newsletter will cover the selection of music for the Funeral Liturgy.