



## Tech Notes

### Challenge

- ▶ Balancing the audio mix for a contemporary worship team with eight vocalists to improve the worship experience for a large congregation.

### Solution

- ▶ By creating a vocal-driven mix, the audio team helps the worship team successfully lead the congregation into worship each week.

### Products used

- Avid VENUE D-Show Systems
- Avid Reverb One plug-in
- Fairchild 660 and 670 compressor plug-ins
- Massey De:Esser plug-in
- Sennheiser MKH 416 shotgun mics
- Shure UHF-R wireless system, Beta 87 mics, and PSM 700 IEMs

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—John Garlick, audio engineer,  
Cottonwood Church

# Mixing Worship Vocal Teams with VENUE



Photo by B. Baker, Cottonwood Church

## Bringing vocals to the front of the mix helps the congregation become part of the worship celebration

House of worship (HOW) audio engineers mix a wide variety of worship team performers for contemporary services, ranging from solo worship leaders playing an acoustic guitar or keyboard to multi-piece bands with a full complement of voices and instruments. At Cottonwood Church in Los Alamitos, CA, the audio team mixes a regular weekend worship team that includes eight vocalists backed by a full band for a congregation of over 3,000 people at each weekend service.

“The vocal mix is extremely important to our worship services,” says John Garlick, audio engineer at Cottonwood Church. “Our vocal team is spread across the front of the stage to help the congregation connect and enter into worship, so it is important to build a mix that features the vocalists and yet still blends well with the entire band.”

The Cottonwood worship band includes acoustic and electric guitars, bass, drums, percussion, keyboards, and often a small horn section. Garlick relies on two VENUE D-Show® Systems at both front of house (FOH) and monitor mix positions to manage consistent workflows and deliver a balanced mix to not only the congregation, but also to each individual musician on stage. All stage inputs are split between the two D-Show consoles, and a common channel layout is used for consistency and ease-of-use between the monitor and FOH positions.

“During the worship songs, my fingers are always riding the faders for the lead vocalist and background vocalist VCA group,” says Garlick. With more than four years of experience running monitors and FOH for Cottonwood, Garlick has developed a number of mix techniques that enable him and the audio team to deliver a consistent, vocal-rich sound each week.

## Mixing vocals at FOH

Garlick builds the FOH vocal mix from the individual mic channels and assigns them to either the lead vocal or background vocal (BGV) bus send. All vocalists use a Shure UHF-R wireless system with handheld Beta 87 mics, which are labeled so that each singer typically uses the same mic each time he or she is scheduled in a service. On the console, the audio team

dedicates a bank of eight faders to the vocal mics, arranged to align visually with the singers on stage with one exception—the lead vocal is always the left-most fader in the bank for easy access.

On the FOH system, Garlick busses the lead vocal directly to the house mains, with vocal processing taking place on the vocal channel's insert path. In addition to making EQ adjustments, Garlick also uses a soft compressor and the Massey De:Esser plug-in on the lead vocal channel. This combination of processing enables him to retain a large amount of dynamics in the voice while minimizing any harshness in certain frequencies.

The background vocals (BGVs) are routed in a different manner than the lead vocal to help build the mix. After setting up each individual BGV channel with the appropriate gain and EQ, Garlick busses all BGVs to a dedicated group in order to apply a soft compressor across the whole group.

"I tend to favor the Fairchild compressors because of their warmth and transparency," says Garlick, referring to the Fairchild 660 and Fairchild 670 plug-ins that are included with every VENUE system. Applying group compression helps keep the BGVs positioned near the front of the mix, without overpowering the worship leader or instrument solos.

The BGV group output is routed to the house mains and assigned to a VCA for level control. Using this configuration, Garlick has complete control of the vocal mix using two faders—the lead vocal channel fader and the BGV VCA fader. If he needs to make adjustments in the blend between vocalists, he can use the individual channel faders to optimize the mix.

All vocals are further treated with an extended room reverb—the Avid® Reverb One™ plug-in—that Garlick adds to each mic channel through an Aux bus. He then routes the reverb output to the house mains and controls it through a different VCA for easy access in the console master section.

## Monitor mixing for IEMs

All vocalists at Cottonwood use Shure PSM 700 wireless in-ear monitors (IEMs), which are mixed from a dedicated monitor console located just off stage. The monitor engineer mixes eight stereo IEMs for the vocalists through the VENUE D-Show Aux busses. The monitor engineer also manages a combination of Aviom personal monitors and wedges used by the worship band.

Signal routing is straightforward, with each Aux output connecting to the input of the respective IEM transmitter. The audio team provides all musicians on the Aviom network with a channel for the lead vocalist and a separate mix of the BGVs supplied by a group output from the monitor console.

The monitor mix for each vocalist is typically set up so that the mic of each individual vocalist is about 10-15% hotter in his or her personal mix than all other vocalists and instruments. Garlick adds instruments to the IEM mixes very carefully, depending on the type of ear molds or buds that are being used by each vocalist.

"The IEM mix can quickly get saturated with too many sources hitting the vocal ranges," says Garlick. "Typically we only add essential instruments for each song to the vocal IEM mix, along with a cue mic from the music director on stage." A pair of dual 18" subs are also mixed from the monitor desk and aimed toward the stage from the sides to supplement the low-end for the vocalists and musicians.

Two Sennheiser MKH 416 shotgun mics are used to capture the congregation, which helps the lead vocalists not feel sound-isolated on stage. The audio team also uses a compressor across the audience mics set with a 2:1 ratio and very slow attack and release times in order to achieve about an 8 dB gain reduction during loud songs.

## Preventing IEMs from clipping

Garlick also takes advantage of a unique VENUE feature that provides him with visual feedback of the output levels going to the IEMs. The VENUE meter clip indicators are proximity warnings that display when an input or output signal reaches or exceeds a user-configurable Clip Margin.



You can customize both the VENUE meter ballistics and clip margins to alert you to potential issues.

"The ability to calibrate the VENUE meters to turn red a few dB before overdriving our IEM transmitters allows me to keep my eyes on stage instead of on the transmitter rack," says Garlick. By setting the Output Clip Margin at 11 dB below the maximum (peak level of +20 dBVU), he has enough signal headroom to react and adjust the overall output level to the PSM700 without disrupting the IEM mix.

The combination of a consistent system configuration, mix technique, and VENUE live sound technology enables Garlick and the audio engineers at Cottonwood Church to assist the worship team in leading the congregation in their weekly celebrations.

