
Harvesting the Right Sound

Audio and video are not only gaining acceptance among churches, they are rapidly becoming integral components of the worship experience, as they have proven themselves adept at making the teachings of the church a more engaging experience -- particularly among a younger generation of worshippers. Recognizing the significance of this, the Harvest, a non-denominational, contemporary church located in Lexington, S.C., recently completed a new sanctuary where music and sound are key components of the worship experience.

The church, guided by Senior Pastor Ken Jumper and Worship Pastor / Music Director Keith Stone, recognized early on the key to implementing their vision was heavily dependent upon good planning. Their quest for the right equipment, properly installed, began with a call to Sid Gattis, President of Lexington, S.C.-based Gattis Pro Audio.

According to Gattis, "Church management wanted the sound system in their new sanctuary to be an integral part of the facility design. On that note, we recommended the hiring of an acoustician to oversee the specifics of the new A/V system. The church was extremely supportive of this recommendation and, as a result, we brought in Michael Schwartz of Deliberative Designs Consulting -- based in Phoenix, Ariz. and Denver, Colo. -- to assist with the project. From the earliest stages, church management, Michael Schwartz and my own company made this a team effort and adopted a 'built from the inside out' approach to every aspect of the project. Planning and preliminary construction for this facility exceeded two years."

The Harvest's new sanctuary is designed to accommodate over 1,200 people, with 1,000 seated on the main floor, and the balance of the seating capacity located in a balcony along the back wall. The dimensions of the space are approximately 117 feet by 109 feet. Built much like a theatre, the sanctuary includes a generous stage area that measures 60 feet across and 25 feet deep. Installation of the A/V system began in June 2006 and was completed in late October.

Determining the Type of Use

Gattis placed a high priority on a thorough understanding of how the church envisioned using their system.

"Understanding the nature of the church's activities is a must," states Gattis. "When we realized this was a space where 30-voice choirs were supported by instrumental ensembles consisting of guitars, bass, keyboards, drums, percussion, and the occasional brass section is the norm, we immediately recognized the need for a system on par with a touring concert rig, but with the aesthetics that would enable it to blend with the décor of a sanctuary. We also stressed the need to equip the space with an adequate amount of sound absorbing and diffusing materials so as to avoid the problems caused by hard surface reflections."

Michael Schwartz first worked with the architect, Craig Otto, to optimize the room, and then recommended a number of different acoustical treatment methods. He specified a multi-element broadband sound absorber along the back wall of the stage, and a Low-Frequency-absorbing/Mid-High-Frequency-diffusing system on the sides of the stage. This system frames the stage and combines with the finished hardwood stage floor to help control low end "boominess," allow a normal stage volume and retain a sense of the room and the crowd energy.

A similar LF absorber is used over the entire sanctuary ceiling area, combined with flown mid-high-freq. curved diffusion panels, arranged in a fan shaped pattern overhead. The sanctuary floor and balcony areas are carpeted to absorb and balance the sound of the sanctuary. The rear walls are treated with an acoustic fabric wall absorber system comprised of recycled cotton, with a track system from WallMate, that attaches acoustically transparent wall fabric over the top of the absorbent cotton core. The sanctuary side walls are splayed to prevent flutter echo, and the fronts of the side walls are treated with absorption to prevent unwanted reflections where required.

Loudspeaker Selection

Determining the type of loudspeaker system was somewhat simplified by the fact that church management had shown a preference for a line array system. "We auditioned a substantial number of line arrays," says Gattis. "The decision was made to go with the Worx-Audio Technologies TrueLine Series line array, as everyone involved in the selection process felt their equipment offered the best performance with the right size form factor that made the most sense for this space. Further, the system price was highly competitive."

The Harvest's SR system consists of 21 WorxAudio TrueLine V10i-PMD3 Install line array elements. The main left and right line arrays consist of eight V10s while the center down fill section is comprised of five additional V10s. These arrays are positioned approximately 24 feet in the air at the top of the flybar. Accounting for the J-curvature of the main left and right arrays, the lowest point of these systems is roughly 18 feet above the stage.

When queried why these particular loudspeakers were chosen, Gattis pointed to several key factors. "The V10 is an extremely articulate loudspeaker system," says Gattis. "It produces a very detailed sound and its dispersion pattern is very even and wide. It is possible to hear a clearly defined stereo sound field throughout 80% of the audience area, which is why we also went with the LC-R configuration to provide even coverage everywhere as well as source

localization in the front center of the room.

"The powered version of the V10 was selected for two reasons -- we wanted the power source to be optimized for the loudspeakers and we needed to conserve space, as the equipment room isn't terribly large. When we auditioned the powered version of the V10, we fell in love with them, and the company's TrueGrid rigging hardware is very cool. The system attaches to a single point and uses 2-inch diameter pipe with all the cable running internally. This creates a very clean-looking setup."

Complementing the V10s for the sub bass frequencies is the WorxAudio TrueLine 215S Touring compact subwoofer. There are four 215S enclosures -- two per side -- placed in specially designed acoustical isolation soffit wall chambers at floor level and slightly off to the side of the V10 arrays. Power for the 215S subwoofers is provided by four Yamaha PC9501N power amplifiers -- one for each subwoofer enclosure.

Microphones, Monitor Systems, and Front of House

Monitoring provisions for performers include both floor monitoring and wireless PMs. "The bulk of the monitor systems are PMs, while floor monitoring is provided for special guest performers," says Gattis. "We're starting out with 10 Sennheiser EW300IEMG2 wireless PMs, and these are augmented by Renkus-Heinz CF121M self-powered floor monitors." The Sennheiser wireless monitor systems are being fed via the Aviom A-16II On Stage Monitor Mix System. There are 16 such systems distributed throughout the stage area.

Like every aspect of the design, provisions were made for a dedicated FOH mix position. FOH is situated 55 feet from the front of the stage area and is outfitted with a Yamaha M7CL Digital Mixing Console with 48 mono mic/line inputs, 4 stereo inputs, and three Yamaha mini card slots. FOH is manned by Mr. Seth Frizell, who acts as the Church's tech director and multimedia minister.

To accommodate special events where a larger sound reinforcement system may become necessary, there is a microphone split and multiple tie-lines designed into the house wiring system that can accommodate an on-stage monitor mix position should one become required.

Since not all activities require the support of a dedicated audio technician at the mix position, the 16-channel Ashley automix system consisting of the Ashley 24.24M Matrix Processor with three additional 4-channel expansion cards for support of 16 microphones.

Microphones for performers at the Harvest include 18 Shure SLX24/Beta58 Handheld Wireless Systems, selected for their easy setup/channel configuration as well as their excellent sound quality. Additionally, there is an Audix D6 microphone for miking kick drum, used in conjunction with Sennheiser e604 drum mics for the toms, along with various Shure SM and Beta series mics, and large diaphragm condensers from MXL. For traditional choir miking, AKG C 3000 B cardioid condenser microphones are employed.

Loudspeaker management for the system is handled by two Lake Contour systems. There is also a TASCAM CD-A500 combination CD player and reversible cassette deck to accommodate playback of pre-recorded materials, as well as a Marantz CDR632 rackmount CD recorder for recording events that take place in the sanctuary.

The Finest Worship Space in South Carolina

By identifying the capabilities they wanted, hiring the services of a dedicated acoustician/ system designer early in the design phase of the facility, and working with professional installers, the Harvest has assembled a state-of-the art A/V system with the capability to support future expansion as their worship requirements evolve.

"From the onset," says Gattis, "this entire sanctuary was developed with a focus on music and contemporary worship. Similarly, acoustics was a key consideration all through the design phases of this facility. As the Harvest's Worship Pastor, Keith Stone played a vital role in the development and selection of the overall system, and recognized the need to involve an acoustician and other professionals from the start of the project. This is a system that was done right, and I am absolutely convinced the Harvest is the finest worship space anywhere in the state of South Carolina."