

## Contemporary Trend

Modern audio at Haven Christian Church

By Linda Seid Frembes

**T**he trend toward contemporary worship has had a mighty impact on the church sound market. The desire for more dynamic presentation continues to drive the use of increasingly sophisticated sound reinforcement technology and systems.

Haven Christian Reformed Church, located in Zeeland, Michigan, highlights these trends, evidenced by a recent audio upgrade in its worship sanctuary. "Our primary focus had been traditional worship, but there was movement to a more contemporary style. Thus we felt it was time to upgrade to a sound system that could handle a broader range of program-

ming," explains Cal Timmer, chairman of Haven's technical services.

Built in the 1960s, the sanctuary was modern for its era, with a "barn" architecture that was atypical at the time. Arching wooden ceilings and beams top a classic shoebox-shaped space that seats approximately 600. A balcony stretches across the rear of the room, backed by a choir loft and large stained glass window.

In the late '80s, an audio system upgrade also resulted in the move of the house mix position to the front of the balcony. That system stayed in place for nearly 15 years until the decision for a new audio direction was hatched.

"The most pressing need for the new system was increased coverage and intelligibility. Attaining adequate gain before feedback had also presented a challenge through the years," notes Gary Zandstra, who headed up the system project for Michigan-based design/install firm Parkway Electric & Communications. "And with the increasing use of electronic-based musical performance, another goal was to present sound more 'hi-fi' and enveloping in nature."

Rather than rushing into a new direction, Parkway partnered with the Haven technical team on a time-intensive evaluation process where a wide range of options – loudspeakers in particular – were studied and in some cases, brought in for live demo purposes.

Out of this process came a focus on Eastern Acoustic Works (EAW) Digitally Steerable Array (DSA) Series of loudspeakers to provide primary coverage of the sanctuary, backed by compact loudspeakers (on delay) to serve shad-



A voluminous sanctuary served largely by two low-profile (but full-range) loudspeakers. Gary Zandstra (left) with Matt Lucas (center) and Cal Timmer of the Haven Christian sound team, discussing "tweaks" on the new system.



# Show Notes

owed seating areas under the balcony. The DSA concept, the brainchild of EAW's Dave Gunness, is fairly simple to explain and implement, but that simplicity belies a lot of sophisticated design work. (For more about the DSA Series, see "Designer Notebook" in the October 2003 issue of *Live Sound*.)

The powered DSA enclosures, similar in look and shape to classic "column loudspeakers," incorporate elaborate digital signal processing (DSP) that allows their output to be tightly focused on the audience, and kept off of surrounding surfaces. This cuts reverberation, resulting in cleaner, less cluttered and more direct sound – a particular challenge in more reverberant worship spaces.

## OFFSET "LINES"

Specifically, the model DSA250 loudspeakers used on this project include eight 4-inch cone drivers in an offset "line" configuration that minimizes the height of the enclosure. The high-frequency section is made up of eight 1-inch soft-dome tweeters integrated with a shallow multi-cell horn designed to keep the acoustic centers as close as possible. Both component configurations are designed to optimize the onboard DSP control.

Zandstra was already familiar with the DSA concept. He had implemented it's "grandfather" technology – found in the large-format KF900 Series loudspeakers – as the basis for a high-output system at Spartan Stadium, an 80,000-seat open-air stadium at Michigan State University.

"Obviously these are vastly different projects in terms of scale and objectives," Zandstra points out. "However, the concept, in general, is scalable, particularly in this newer DSA iteration used at Haven. Another aspect of this design, and one that frequency comes up with church systems, is to minimize the aesthetic impact of the loudspeakers. The thin profile of these boxes played into that need."

While the previous system had utilized a mono central cluster design, the sound team wanted to try a stereo setup that would help "open up" musical programming, giving it added spatial imaging. For the demo, Zandstra brought in Genie lifts and flew single DSA250 boxes left and right at the front platform. Following the sound team evaluation, he invited church leadership to sit in for a listen.

"We were concerned about attaining sufficient spoken word intelligibility with the left-right design, but the

demo proved that this could be achieved," Zandstra says. "The bonus to their ears was the rather large audio image the system put into the room."

Once this direction was endorsed, the Parkway install team, which also includes electricians, got busy running the additional cabling and AC power "drops" needed for the new system. Church staff also proved helpful with handling some of these system infrastructure issues, including setting up additional patch panels and patch "pockets" on stage.

Following removal of the existing center cluster, the new loudspeakers were flown left and right about 20 feet above the front platform via load-rated aircraft cable attached to certified beam structures above the ceiling. DSA Pilot software, loaded on a PC at the house mix position linked to the loudspeakers via RS-485, provides optimized DSP parameters, tailored by the user.

The DSA250 loudspeakers offer a fixed 120-degree horizontal coverage pattern and, with the DSP, the vertical beamwidth can be established anywhere from 15 degrees to 120 degrees. Coverage is supplied side-to-side across the room's approximate 50-foot width, with the output of the loudspeakers divided at the center aisle.

In addition, coverage extends to



To the left, one of the underbalcony loudspeakers serving shadowed regions, and above, a rear view of one of the DSA250 mains.



*The new Crest HP Series console heading up the balcony FOH position that meets functionality needs at a nice price point.*

the last row on the main floor to the point where shadowing from the balcony begins to occur. The DSP allowed optimizing the focus of coverage to the balcony level as well.

Prior to the installation, the loudspeakers were painted a brown hue that blends well with the sanctuary's color scheme. As a result, they're quite unobtrusive to the aesthetic of the room.

To add a boost on the low-end, a single Mackie SWA1501 (15-inch-loaded) powered subwoofer was installed on the floor, at the rear of extreme stage left. "We tailored the output of the main loudspeakers to stop at 100 Hz, with the subwoofer then taking things down lower, adding punch and fullness when they want it," Zandstra says. (The subwoofer is fed source material via an auxiliary bus on the new Crest house console. More on this later.)

### SMART AND SAVING

A QSC DSP30, located at the mix position, provides processing and time/signal delay of the two EAW Commercial SMS5 compact loudspeakers mounted on the underside of the balcony. This also provides a feed to four more EAW CIS400 ceiling loudspeakers distributed in the church lobby.

Some smart, and budget-saving, planning went into the stage monitoring approach. Four Mackie SRM450 powered loudspeakers can be quickly

removed to serve double duty as a portable system for Haven's youth room, as well as for other events outside of the main sanctuary.

With the purchase of a couple of Ultimate Support loudspeaker stands, a Whirlwind 24-8 cable snake combined with a portable Mackie SR24-4 mixer, the church now has a very useful portable system. "When only two monitors are needed, or if the sanctuary is not in use, they have a portable solution that's easy to set up in a matter of minutes," adds Zandstra.

Back to the new console, which heads up the mix position at the front of the balcony and does double-duty for both house and monitors. The former 24-channel board was replaced with a recently introduced Crest HP840 40-channel console.

The console was so new, in fact, that a couple of months were needed to fulfill the order for a production model, a factor that turned out to be a blessing in disguise. The system operators were able to get used to the new left-right configuration while operating on the much more familiar existing console, helping to lessen the immediate learning curve.

In addition to 40 channels, the HP Series desk provides 10 aux buses, two matrix mixes, eight subgroups, four mute groups and four bands of equalization with two overlapping

bands of sweep for the mid-frequency region. An intended purpose of the HP Series was to hit an attractive "price and features" point for applications like this one, and Zandstra notes that the mark has been hit pretty much dead-on.

With the additional routing and mixing capability, the church decided to invest in Shure PSM200 wired and wireless personal in-ear monitoring (IEM) systems. The wired units receive feeds from the new floor boxes that also serve the powered monitors, with a total of six discrete feeds available.

In most cases, musicians use the wired IEM systems and/or monitors, while the worship leader goes the wireless route both for IEM and microphone.

The new system was rounded out with a new distribution amplifier and compressor for recording to CD and tailoring a feed for live broadcast via the Internet, as well as a computer hard disk recording system and a "good old fashioned" cassette deck.

According to Timmer, this will be the last of any significant additional audio upgrades for the foreseeable future. Next up, the sound team will be looking for ways to expand facilities for musicians, in addition to cutting the stage levels they can produce. ■

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