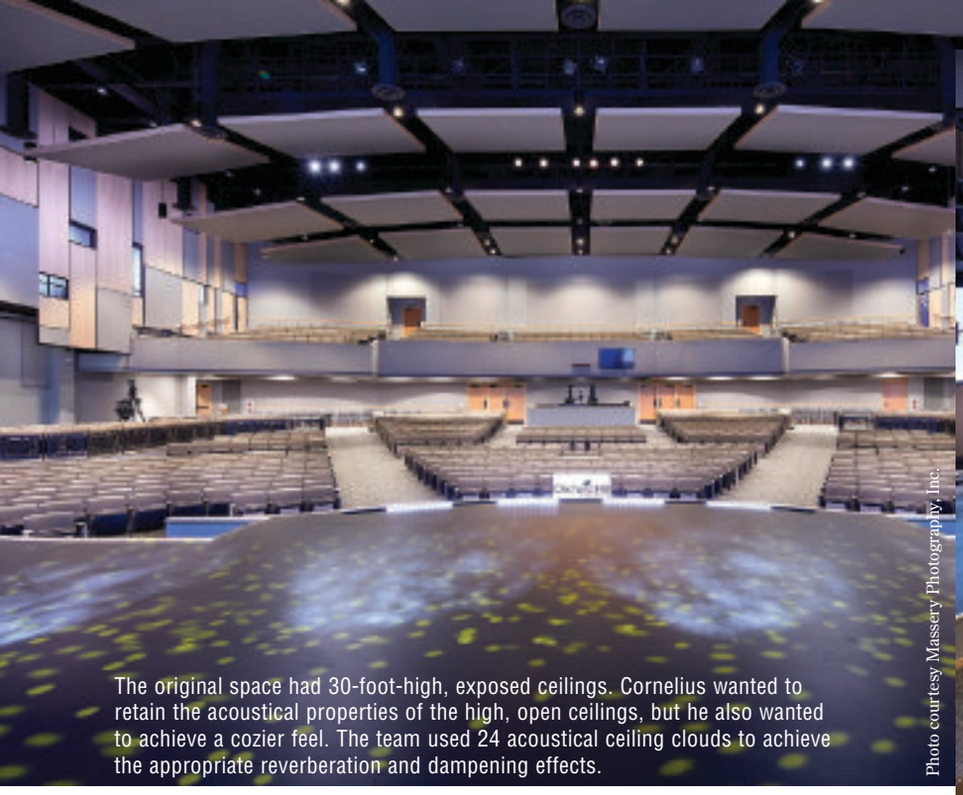
New Normal

Streaming, videowalls and communication blend with classic aesthetics for Orchard Hill Church.

The church tech team can set up the integrated POV cameras to capture the keyboards, drums or any people on the stage.



The original space had 30-foot-high, exposed ceilings. Cornelius wanted to retain the acoustical properties of the high, open ceilings, but he also wanted to achieve a cozier feel. The team used 24 acoustical ceiling clouds to achieve the appropriate reverberation and dampening effects.

Photo courtesy Massery Photography, Inc.

The L-Acoustics L-ISA immersive technology was demonstrated to cover 82 percent of the sanctuary. It offers spatialization far superior to an LCR system or a traditional line-array solution.

Governor Tom Wolf's recommendation to avoid gatherings of more than 10 people.

As the construction timing coincided with the church being closed, Orchard Hill didn't have to worry about accommodating worshippers by fitting them into sanctuaries at its other locations—those are in nearby Butler PA and Pittsburgh—or into overflow spaces on campus.

Construction was delayed shortly in March, and then, after that, Key Code faced construction delays and supply-chain issues as a result of the pandemic. However, Walbrown complimented the general contractor, Burchick Construction Co. Inc., on how quickly it worked to make sure Key Code could meet its project timeline.

"Considering the size of the project, the general contractor, the vendors and working with John at the church all made this go a lot easier than it could have," Walbrown said.

Rigging The Trusses

Rigging the trusses for lighting, mounting the LED walls and rigging the arrays took a bit longer than expected. That was primarily because the teams, including Hollowood Music & Sound—that's the McKees Rocks PA-based firm that completed the rigging—were communicating entirely via email. Rigging included a total of 84 endpoints, including 24 audio points, 24 video points, 12 lighting points (six motor points and six fixed points) and 24 points for the curtain.

"It all got settled quickly once we got the structural engineer, Key Code and Hollowood here onsite to collaborate, instead of trying to trade emails around," Cornelius said. "At that point, things fell into place pretty quickly."

Updating Streaming For A New Normal

Another element of the project that the pandemic affected was, not surprisingly, the video systems. In particular, the church and Key Code opted to upgrade the cameras used for streaming services, and they chose to add an Avid VENUE S6L 24C broadcast console. The video systems include four Hitachi professional broadcast cameras, two Panasonic AW-HE130 pan-tilt-zoom (PTZ) cameras, one Panasonic AG-UX180 with a SWIT FLOW500 for a wireless camera, and four Marshall CV503 point-of-view (POV) cameras.

"The wireless camera can cover 70 percent of the facility," Walbrown said. The church tech team can set up the POV cameras to capture the keyboards, drums or any people on the stage. The cameras feed to a Ross Video Carbonite Ultra production switcher and Ross Expression Live for graphics within the completely renovated master control room. The central equipment room, which is located next door, houses Middle Atlantic racks containing a Ross Ultrix router to route video to any location within the church. "We also added endpoints, so the church team can plug in a monitor as a feed virtually anywhere," Walbrown confirmed.

The church invested in Hitachi Z-HD5500 cameras, which use fiberoptics rather than traditional cabling, and which can be controlled via the Ross dashboard. "That was a huge benefit to the cameras we selected," Walbrown declared. "When you're using fiber, you know you're set for quite a few years with the technology."

Blending LED Walls Into The Architecture

In addition to using the Panasonic and Hitachi cameras to stream services, Orchard Hill uses their image-magnification (IMAG) capabilities to serve the 16'x9' Absen Acclaim LED walls that flank the stage. An additional lyrics banner hangs at the back of the platform.

The church purchased the LED walls in 2019, prior to the start of construction, Cornelius explained. Key Code Media was tasked with renegotiating the warranty because the units had been packed in crates for a year before they were installed, he said.

The architect wanted the screens to look as if they were part of the wall, even though they were mounted in front of it. The team added some features on the wall so the screens would blend in, while also contributing to the contemporary look of the sanctuary.

Orchard Hill's overall renovation not only

The master control room was completely renovated as part of this project. The central equipment room, located next door, houses Middle Atlantic racks containing a Ross Ultrix router to route video to any location within the church.

Photo courtesy Massery Photography, Inc.

modernized its technology but also its architectural design and aesthetic. Medium gray walls and light maple wood contribute to what Cornelius described as a "modern but classic look."

New Life & A Lighter Look

The original sanctuary, which was constructed in the 1990s, resembled a live-performance theater more than a church, boasting dark red carpet and dark wood. The renovation gave the sanctuary space new life and a lighter look and feel. These serve to lift the spirits of visitors and congregation members. "It's very calming when you walk in now, as compared to the old space," Walbrown agreed.

The original space had 30-foot-high exposed ceilings. Cornelius wanted to retain the acoustical properties of the high, open ceilings, but he also wanted to achieve a cozier feel. The team used 24 fully custom acoustical ceiling clouds to achieve the appropriate reverberation and dampening effects. "We wanted to reinforce the energy so that the sound [generated by] the crowd singing would come back to the crowd, whereas the sound that originated from the stage would be absorbed by the back wall," Cornelius said.

Cornelius acknowledged that church leaders shaved some budget dollars off the lighting system to accommodate enhanced video capabilities for streaming, but he refused to budge on getting the intercom system of his dreams. "In the 20 years I've worked here, we've had four different wireless-intercom systems," he began. "From a workflow perspective, we were used to having those capabilities." However, he continued, "I've always wanted a matrix system, especially since the camera operators are mostly volunteers."

Cornelius said it was important that he have a direct line to the church video director, who is a paid staff member, as well as private lines to each one of the volunteers. "Being able to have point-to-point conversations was very appealing," he remarked.

The Clear-Com system includes an Eclipse HX Delta, six FSII digital-wireless beltpacks, three FreeSpeak II 1G9 IP transceivers, four desktop intercom user panels and five VI-PNL-12R-X4 Iris panels. The five-channel, full-duplex system delivers everything that Orchard Hill could ever want, facilitating communication among technical team members. "I fought hard to keep the intercom system in our budget," Cornelius said. "I knew I wanted it to be right from the get go."

The Clear-Com team visited Orchard Hill to commission the system, and the team provided in-person training, as well. Cornelius said that offered a distinct advantage to the team, helping them learn how to use the new technology quickly.

Updating Audio For An Immersive Experience

The L-Acoustics line-array deployment was major for Orchard Hill. The line-array technology replaced a left-center-right (LCR) system that was far past its prime. "This facility opened in 1997, and most of the technology hadn't been touched in 22 years or so," Cornelius reiterated. "So, the bright side is that the original systems really lasted a long time!"

Once Cornelius heard the L-Acoustics line-array technology in a demo, he was sold. He abandoned the original LCR and sidefill approach and, instead, opted for L-Acoustics' L-ISA, which the company describes as "immersive hyperreal sound." According to Cornelius, "It was important for us to have a consistent experience across as many seats as possible in the space."

The L-ISA immersive technology was going to cover 82 percent of the sanctuary, and it could offer spatialization far superior to an LCR system or a traditional line-array solution. Plus, Cornelius said, going with L-ISA (as compared to choosing a traditional system) was cost neutral because fewer speakers were required to deliver comparable coverage.

"Upgrading to L-Acoustics meant we were getting a more immersive experience," Cornelius enthused. "You can make the audio feel very focused to provide an intimate experience, even though it's a fairly large venue."

Increased Loudspeaker Resolution

The L-ISA system increases loudspeaker resolution to deliver a more natural and intelligible soundscape. This is what L-Acoustics calls "hyperreal sound." The system also took up less space due to its configuration—namely, seven arrays across the top front of the stage. "Splitting it across the horizontal plane is nice, from an aesthetic [standpoint]," Cornelius said. "None of the arrays has to be too long, so they're a nice, tight solution for many churches, if the budget permits it."

In addition to the arrays, the design called for a few rear fill speakers for the under-balcony seats. "Those are really only for those who may be walking along the back wall or sitting in the first couple of seats against the rear wall," Walbrown said. "The system really provides great coverage of a big area."

As it does with any system of this type, L-Acoustics spearheaded the system design and placement. "This was only the third house-of-worship deployment that L-Acoustics had of this particular system, so we're excited to be on the front edge of that," Cornelius said. "It has proven to be everything I expected it to be."

Key Code Media used an AuviTran audio toolbox to handle multichannel audio digital interface (MADI), audio video bridging (AVB) and Dante routing for the audio system. Avid S6Ls are used for the house and broadcast mix; meanwhile, the preacher, singers, instruments and house band are equipped with Shure wireless audio microphones and receivers.

"The AuviTran enabled us to route all the channels where we wanted them to go, between the two Avid engines, at a reasonable cost," Walbrown remarked.

The church retained more than 100 ETC Source 4 fixtures from the original installation, but it added Ovation E-260WW LED ellipsoidals, as well as some additional ETC and Elation Lighting gear. (All of it was furnished by the church prior to Key Code Media joining the project.) The team selected a ChamSys MagicQ MQ500 Stadium console for lighting control. The console supports up to 200 universes, with no external processors, and it offers fully motorized faders and encoders with 42 playbacks.

"That console gives us a lot of universes for DMX and a lot of control for a good price," Cornelius enthused. "We have a lot of capacity and a lot of room to grow into it. We look forward to really making it sing in the years to come."

Orchard Hill Church's audio, video and lighting systems are more than up to the task of delivering a memorable multimedia experience, as with this production occurring during the holiday season.

Upgrading Network Speeds

The final components of the project are ones that today's AV integrators can't neglect—namely, the network and cabling. The project included 30,000 feet of Ethernet, category, coaxial and Society of Motion Picture and Television Engineers (SMPTE) fiber cables to accommodate all the equipment on a cohesive network.

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Photo courtesy John Cornelius.

Key Code Media installed two network switches in the rack room and one at the front-of-house (FOH) location, keeping the audio, video and lighting network separate from the church's house IT network that handles operations and Wi-Fi.

The integrator broke out the new network into subnetworks, accommodating Dante primary, Dante secondary, a broadcast network and more. "To achieve greater speeds between the network switches, we used fiberoptics instead of copper," Walbrown described.

Amid a spreading and deadly global pandemic, the architectural, general-contracting and technology-integration teams that oversaw the Orchard Hill project, collaborating closely with numerous vendors, worked together seamlessly. In so doing, they achieved a result that exceeded expectations. Orchard Hill's Wexford campus is now set for live services and livestreaming as church attendance continues to grow.

"The church and the congregation have been thrilled with the results of this project," Cornelius declared. "All the contractors were a pleasure to work with. We look forward to growing into and fully utilizing these systems to tell the story of Jesus both in person and online."

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Photo courtesy John Cornelius.