TECHNOLOGIES FOR WORSHIP®

Connection Through Technology at Pinelake Church

Out of the Box:
BLACKMAGIC DESIGN'S VIDEO ASSIST 3G
THE K PLUS SERIES FROM ABSEN
THE SLX-D DIGITAL WIRELESS SYSTEM FROM SHURE
TVU PARTYLINE™

REVIEW:
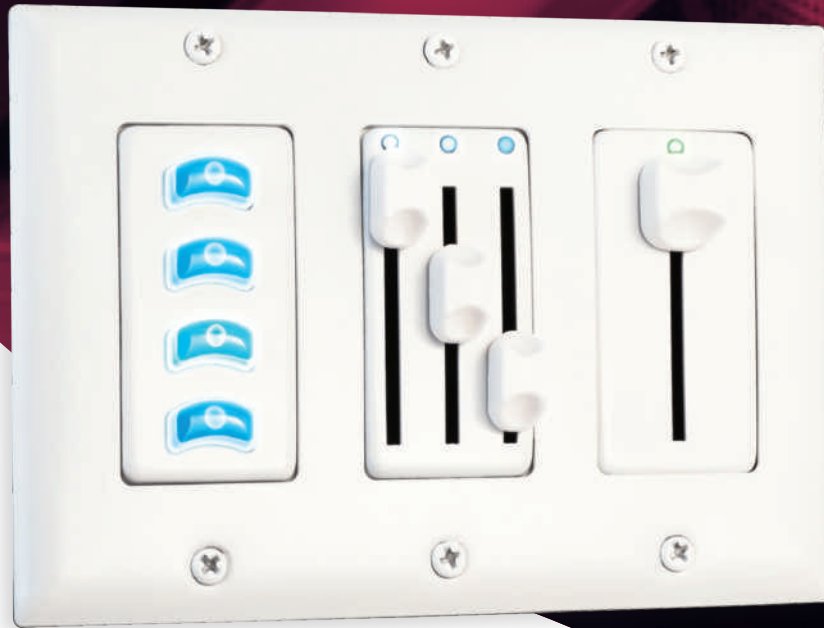**THE R-121 LIVE MIC FROM ROYER LABS**
SESCOM SES-IL-LPTT AND SESCOM IL-19
LISTEN EVERYWHERE FROM LISTEN TECHNOLOGY

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EDITORIAL NOTE

MICHELLE MAKARIAK

When I think of the month of September, I typically think of new beginnings. This is odd, I know – but bear with me. September is the end of summer, but the start of fall: cooler days and crisper nights. School starts, and children move into a new, exciting year of learning. The trees, at least in my neck of the woods, start changing into their evening wear of bright oranges, brilliant yellows and deep reds. And – for so many of you – September is the start of an exciting new season of worship which builds and culminates in the joyous celebration of Jesus's birth, an event that changed the world and gave us all new life in Christ.

However, this year is different and many of us face new challenges. So many of the church techs and leaders I have talked to over the last several weeks are trying to figure out what the new normal is going to look like heading into Christmas. Many have told me they are trying to figure out the best way to blend their live, in-person worship with their growing online worship to create a new type of production for the holiday season that reaches all their congregants, regardless of where they are. Now that September is here, this planning will be starting in earnest.

My question to you, our wonderful readers, is this: what are your plans for the fall? What is your church looking at doing for Christmas? In this semi-stasis we are all in as we wait for Covid-19 to just go away already, how do you shepherd a flock that's more dispersed than ever before? How do you keep the wolves at bay? I would love to hear what you are doing, how you are planning on using different technologies to hold your community close while also welcoming in new members to worship with you? What types of articles would be most helpful to you over the next few months as we explore this brave new world? Email me at mm@tfwm.com, or call me at 705-500-4978 and let me know – I would love to hear from you.

In this month's issue, we look at Pinelake Community Church and their recent d&b audiotechnik install. Our case study focuses on the Church of The Nazarene, and how they are using Telestream's Wirecast to spread words of hope. Our reviews cover the R-121 Live Mic from Royer Labs, SESCOM's SES-IL-LPTT and SESCOM IL-19 and Listen EVERYWHERE from Listen Technology, and we also run the full gamut of educational articles ranging from A to V (sorry for the pun!), including Best In Show's for Yamaha, Pathway Connectivity, Digital Projection and Mackie.

Lastly, don't forget that CFX's virtual conference starts the October 5 and offers 60 days of access to an amazing selection of seminars from over 20 industry leaders, and a virtual exhibit hall to boot! You can learn more and register at churchfacilitiesexpo.com

Catch you again in October! ◨

Michelle Makariak

TECHNOLOGIES FOR WORSHIP®

COVER:
PINELAKE CHURCH

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BEST IN SHOW

MICROPHONES

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STREAMING

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Kris Landrum

> " ... I'm the worship pastor for a church of about 1500 members in Houston, Tx. We completed a major sound upgrade for our church with many moving parts and my one and only point of contact was Kris Landrum. The experience I had with Kris was above exemplary. His consumer service was excellent, and his knowledge of the equipment was next to none. His patient and well-spoken demeanor and professionalism made me feel at ease and well taken care of. He is representing SoundPro well. Keep it up, thank you. " -Sam

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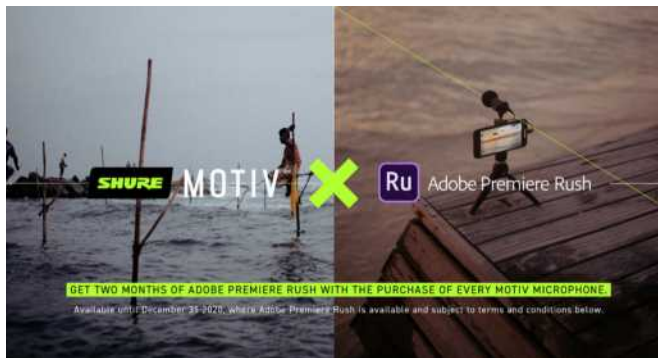
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Shure Partners with Adobe to Provide Two-Month Adobe Premiere Rush Subscription with MOTIV™ Purchases

Shure has partnered with Adobe to offer a two-month subscription of Adobe Premiere Rush for customers who purchase a Shure MOTIV™ Microphone starting July 1, 2020 through December 31, 2020. Specifically designed for mobile creators, Adobe Premiere Rush is a premium video editing software that gives users the flexibility to record and edit pro-quality video content on their mobile devices wherever they are. When used together with MOTIV microphones, content creators can record professional quality audio right out of the box.

"By partnering with Adobe, MOTIV customers now have full video editing capabilities at their fingertips," said Paul Crognale, Senior Marketing Manager of Musician and Consumer Audio, at Shure. "They can easily create a professional production on the go while also saving valuable time with the intuitive Adobe Premiere Rush software."

Shure's award-winning MOTIV line of microphones enables creators to produce high-quality audio with ease. Now users can take their professional-grade content captured with MOTIV, edit the footage directly in Adobe Rush Premiere, and share to all social channels on the go. Available on both mobile and desktop, the software syncs all content to the cloud, making it easy to work across mobile and desktop platforms. The microphones that are part of the promotion include:

- [MV88+ Video Kit](#)
- [MV88 Digital Stereo Condenser Microphone](#)
- [MV51 Digital Large-Diaphragm Condenser Microphone](#)
- [MV5 Digital Condenser Microphone](#)
- [MVL Lavalier Microphone](#)

Customers can sign up and register for their Premiere Rush subscription at: www.shure.com/adobe. ▪

Sound Productions Forms Advisory Board

SoundPro has asked leading experts to join forces and help shape their best in class customer experience and give tactical advice on the journey ahead, as they implement their vision for the future.

"Sound Productions does not want to be another vending machine," said SoundPro CEO, Joshua Curlett. "We want to create a better way to serve our industry and preserve what makes us special - our people. We are thrilled to welcome these established leaders to the SoundPro Advisory Board."

SoundPro has appointed: Charles Kitch, the Founder and former CEO of Sound Productions; Craig Johnson, CEO of BIGNAME Commerce; and Jonathon Curlett, CFO of Cultivate Behavioral Health & Education to the SoundPro Advisory Board.

"It is important that we lead with culture and that we remain humble at every level, always asking ourselves what is best for the customer and letting that guide our decisions. The formation of this advisory board allows us to surround ourselves with experts in different areas who will help us ask the tough questions and provide an outside, high level perspective, so we can continue to make ourselves better," said Joshua Curlett. ▪

Custom Sound Designs (CSD) acquires Second Opinion Audio (SOA)

Today, CSD Group, Inc. announced the acquisition of Second Opinion Audio (SOA). With this strategic acquisition, the CSD team grows its nationwide network of consultants, designers and integrators, adding offices in Colorado and Florida.

The industry can expect the CSD team to build a network of strategic partners that share the vision and passion for growth. CSD continues to provide its clients with the industry's most talented and highly respected engineers throughout the United States and abroad.

"Because of their history and high-profile project portfolio, Bob Langlois and Daryl Porter both are highly respected in our market," said Doug Hood, President of CSD. "Over the past few years, I've enjoyed taking our relationship deeper as we collaborated as a team and ultimately built a friendship together. Through that friendship and a common vision to build outstanding audio/visual experiences, we saw an opportunity to partner together. I am honored and proud to welcome the entire SOA team into the CSD family."

Bob Langlois, Founder, SOA "SOA is thrilled to be a part of the CSD family. This relationship will allow our design team to expand their reach throughout more of the US. Melding the experience of SOA and the powerhouse and experience of CSD will be the cutting edge of the audio/video industry." ▪

Hitachi Cameras Enable High-Quality Streaming for Eastview Christian Church

Founded in 1955, Eastview Christian Church usually hosts over 6,000 worshippers each week across two physical campuses – its main location in Normal, Illinois and a second site in Bloomington – and its online services. As video became increasingly important for both its in-person and internet-based worship experiences, the church purchased five SK-HD1800 cameras from Hitachi Kokusai Electric America, Ltd. (Hitachi Kokusai) to elevate the quality of its productions. The resulting improvements have proven even more valuable as COVID-19 gathering restrictions drive online attendance to levels far beyond their own congregation.

As Eastview's previous cameras neared the end of their useful lifecycle, the church started looking for replacements that would bring both operational and visible benefits. "We had been running a mix of four or five professional-class cameras and smaller camcorders but only had CCUs and remote control on two of them, which made it challenging to dial them all in and rely on operators for iris and shading," said Andy McGirr, associate pastor of technical arts at Eastview Christian Church. "There was also a growing realization of the importance of what's being viewed online to the overall ministry of our church, and the significance of delivering high-quality streaming experiences."

McGirr notes that while Eastview started streaming later than many other churches, the organic growth of their online audience over the past three years made it an intrinsic part of their ministry even prior to the pandemic. "As the numbers grew, so too did the respect for the role streaming plays," he explained. "We hired an online campus pastor, and have really embraced the fact that there are many people who watch our services online not because they can't attend in person, but because it's their preferred way to attend church."

McGirr set out to purchase five broadcast-class cameras with 2/3" sensors and global shutter technology, the latter to minimize the visual artifacts often encountered when shooting LED lighting and displays with rolling-shutter cameras. Once these core criteria were met, it was a matter of selecting the vendor and model that fit the church best. "I liked Hitachi Kokusai from day one because of their partnership with Ross Video and integrated DashBoard control, and after meeting their team at the NAB Show, I felt like they were the right company for our needs."

Supplied by Indiana-based integrator Force Technology Solutions, three of the SK-HD1800s are stationed on Miller tripods in fixed positions, while one is operated handheld and the fifth is deployed on an 18-foot JonyJib2. Shading and iris adjustments are handled from the control room through Ross DashBoard or Hitachi RU-1000VR remote control panels, freeing the volunteer camera operators to concentrate on their shots. Eastview started using the new cameras in December 2019 and saw immediate quality benefits. "The difference from our old cameras was very noticeable in our final product," said McGirr. "The image was just fantastic, including richer colors and deeper blacks."

As the COVID-19 pandemic forced churches to temporarily close their doors to in-person worshipers, even more people have been viewing Eastview's newly enhanced productions. The church saw its weekly online streaming audience soar to over 10,000 – greatly exceeding its usual total attendance. "Our guess is that other small churches in the area were not set up for streaming, so people are attending our services in their place. We were fortunate to already have a robust streaming workflow in place." ▪

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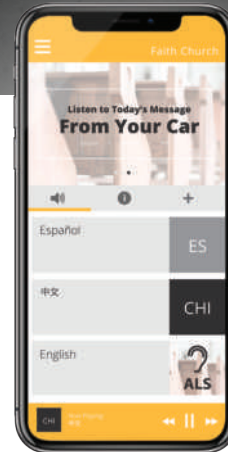
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PROBLEM

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E2i Design Selects LynTec Power Control for New Northstar Church in Tennessee

LynTec, a leading manufacturer of innovative electrical power control solutions for professional audio, video, and lighting (AVL) systems, is the chosen power solution provider for E2i Design's most recent houses of worship technology design and install, Northstar Church in Knoxville, Tennessee. Serving as the second facility and main worship center, the new facility is outfitted with a full suite of AVL components that are supported by LynTec's award-winning RPC Series comprehensive power control solutions.

"It's becoming a trend for houses of worship to be more forward-looking, and at E2i, that's something we talk organizations through. We want them to think not only beyond their needs today but also how their AVL budget and equipment can serve them well into the future," said Josh Holowicki, the founder and CEO of E2i Design. "Northstar's future vision was unique. They wanted the infrastructure to support touring Christian artists and potential video upgrades. LynTec is not just built for small houses of worship with modest AVL investment but for scalability."

The design and integration firm has relied on LynTec power control solutions as the standard for the vast majority of its AV designs and installations for houses of worship. For Northstar, E2i installed the RPC 365 master remote control breaker panel along with the RPS 385 slave panel. Built on the industry accepted G3 Powerlink™ hardware platform by Square D, the patented RPC family combines circuit protection and power management, on/off control, and power sequencing in one affordable and scalable panel. The panel was perfectly suited for Northstar's equipment requirements — from the audio to the lighting and video components — while meeting its budget. On the audio side, the panel provides customized circuit-level sequencing, which eliminates the challenges of properly powering on digital audio systems with a separate sequencer. Easy to set up, operate, and maintain, the LynTec system is also the ideal solution for Northstar's primarily volunteer technical crew. With customized sequencing step rates built into the system, the church doesn't have to worry about the proper order of turning on and off components; the system allows each circuit to be set with the exact number of seconds — anywhere between 1 and 999 — to allow digital equipment to fully boot up before the next step of the sequence fires.

The panel is also critical to protecting the church's stage and house LED lighting. The RPC panel provides remote power control down to the circuit level, providing staff with an easy-to-use system to power on and off its array of LED fixtures. It also supports Northstar's current and future video requirements. In addition to the church's two projectors and inventory of video displays throughout the building, the church is planning to add a video wall to support onstage graphics. The LynTec panel cycles off video equipment when it's not in use and properly sequences them on, protecting against damage caused by inrush.

Northstar also benefits on the installation side. Using an RPC panel instead of a separate relay panel means that there are fewer points of contact to wire during installation. The labor involved to install a LynTec panel is the same as to wire a standard breaker panel. Less equipment to install equals reduced costs.

"Many houses of worship today are thinking about their future critically and through the lens of technology and growth — what will they need, and if they will have the power control infrastructure to support it," said Mark Bishop, president of LynTec. "Our solutions are designed — first and foremost — as affordable and scalable so churches can plan for any future needs. E2i's design and installation of our panels at Northstar perfectly illustrates how facilities can create a forward-looking AVL system that is well protected and with very little investment." **T**

Photo by Peter Calvin

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SSL Live L550 console

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"We did a shootout between the SSL Live and one other console. The sonic performance of the SSL console is pretty spectacular. Without any processing, it sounded wider and deeper, like the speakers had all moved 10 feet apart. So there was a clear winner: SSL." - Travis Brockway, Nexos founder and Systems Intergrator - **Watermark Community Church, Tx**

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LCBC Church Mic Upgrade Takes Sound and Comfort to the Next Level

LCBC Church, an evangelical megachurch with 14 campuses through Central Pennsylvania, is one of the largest and most well-known churches in America. As such, its leaders expect only the best from the equipment they purchase. When DPA Microphones released the world's smallest high-end pro audio headset microphone, with a capsule that measures in at just 3 mm (0.12 in) in diameter, LCBC's audio team took notice. Among the first houses of worship to purchase DPA's award-winning 6066 CORE Subminiature Headset – one for each of its two primary communicators, the church selected the mic for its high-quality sound, sleek design, enhanced comfort and small form-factor.

"Our teaching team has been using DPA's 4066 headset mics for years," says Sean McDermott, Production Director, LCBC Church. "We have always appreciated the audio quality and reliability of that solution. When DPA introduced the 6066, we knew it was an obvious upgrade that would provide a more comfortable experience for our communicators, the classic natural DPA sound and an improved look for our broadcasts."

The capsule of the 6066 is just 3 mm (0.12 in) in diameter, but packs the same audio power of larger, award-winning DPA mics. Despite its small size, it is abundant in clarity, consistency and durability – three qualities that truly matter for any live presentation. By shrinking the company's sound into a smaller capsule powered by CORE by DPA technology, DPA ensures users don't have to compromise on clarity to focus on aesthetics.

When LCBC has in-person, it averages an attendance of 16,000, while its online audience continues to grow. Therefore, it is of upmost importance for LCBC's audio staff to mic its communicators with discreet solutions that never compromise on sound quality.

"There are no other headset mics out there that offer the same benefits as the 6066," adds McDermott. "Our communicators really appreciate the redesigned ear grips and cable management, and our video team loves how the smaller element blends in on camera. The new locking boom also ensures that the mic element is in the right place, every time! In addition, the replaceable cable is a must for headset mics. Our teaching pastors almost forget they are wearing the headset mic because it is so comfortable."

The congregation has been impressed with the quality of the 6066 CORE mics as well. "In church production, when we don't receive negative comments about the mics, we view that as a win," explains McDermott. "Upgrading to the 6066 was a seamless transition; everyone is happy with them and they sound great." **T**

CATCH THE *VISION*
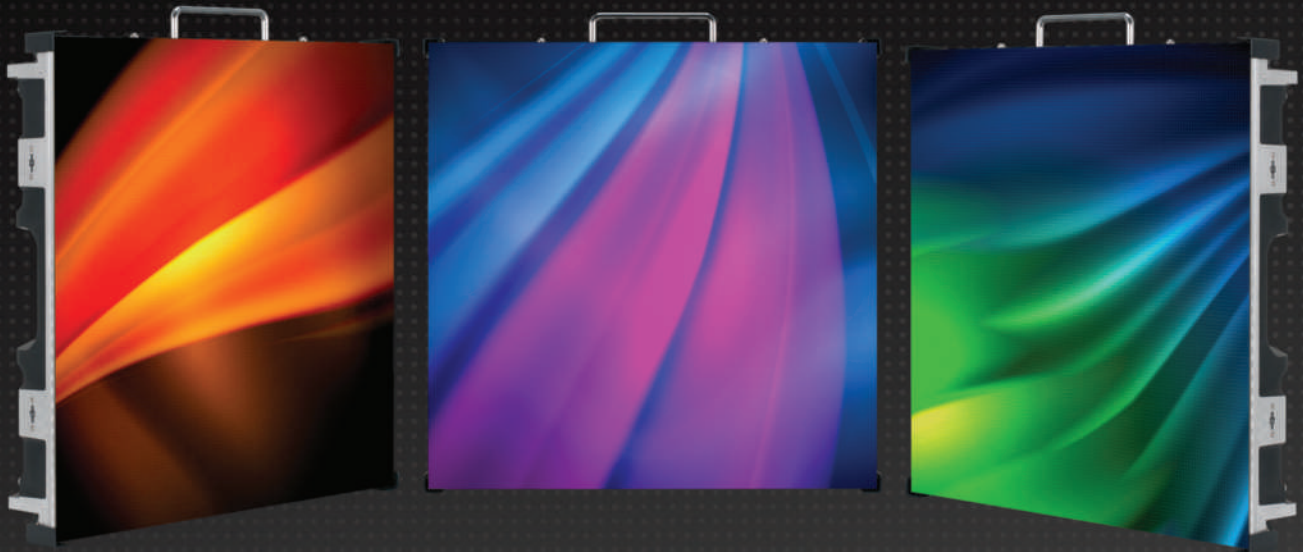
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Blackmagic Design's Video Assist 3G

The Video Assist 3G from Blackmagic Design offers lower cost models of the company's portable monitoring and recording solutions.

All Video Assist models are dominated by a large touchscreen with all controls for recording, playback of clips, viewing scopes and setting focus assist features. Both 7" models are large enough to include analog inputs for audio and two SD card slots so customers get continuous recording, with automatic recording to the second card. All models include a rear tally light, a front panel speaker for clip playback and a headphone jack, and two battery slots so batteries can be changed without interrupting recording.

With large and bright 5 and 7" touchscreens, Video Assist makes it incredibly easy to frame shots and accurately focus. The touchscreen displays critical information while users are shooting including the timecode, transport control, audio meters and a histogram for exposure.

Using commonly available SD card media, churches can record to flash memory cards that are easy to obtain. The files are small enough to allow long recordings on standard SD cards or the faster UHS-II cards. The larger Video Assist 7" models include two SD card slots so churches can swap out any full cards even during recording, allowing infinite length recording. Standard SD cards or the faster UHS-II cards are perfect for broadcast because they are small, high speed and affordable.

Houses of worship can use Video Assist to upgrade older broadcast cameras to the modern file formats used on the latest editing software, with support for all editing software including Apple ProRes and Avid DNx. HDMI and SDI inputs allow Video Assist to connect to any consumer camera, broadcast camera and even DSLR cameras.

The innovative touchscreen LCD user interface provides incredible control. On screen, there are dedicated buttons for play, stop and record, plus a mini timeline for scrolling through their recordings. The LCD includes a heads up display of timecode, video standard, media status as well as audio meters. Scopes can be enabled via the touchscreen, as well as focus and exposure assist.

There are a wide range of video and audio connections, including multi-rate SDI for SD, HD on all models and Ultra HD on the 12G-SDI models. HDMI is included for HDMI cameras and monitoring to televisions and video projectors. The 7" model features Mini XLR inputs which are provided for audio input from microphones and external audio mixers. Video Assist even includes a 12V DC power connection and the 12G models include a locking power connector.

Video Assist records using standard open file formats so customers don't have to waste time transcoding media. Files are compatible with all post-production software, and recording works in industry standard 10-bit ProRes or DNx files in all formats and from all HDMI or SDI cameras, as well as 12-bit Blackmagic RAW on the 12G-SDI HDR models when connected to supported cameras. Best of all media files work on all operating systems.

Blackmagic Video Assist includes a built-in professional audio recorder that's much better quality than the audio found in most cameras, eliminating the need to carry around extra audio equipment. When working in SDI formats, customers can record 2, 4, 8 or 16 channels of audio. For connecting microphones the 7" models have 2 XLR analog audio inputs with phantom power and high definition audio sample rates of 192 kHz at 16 and 24 bit per sample. The audio meters can even be changed between VU or PPM ballistics. **T**

Available now.

The K Plus Series from Absen

Absen Inc.'s new indoor LED solution to the market is the K Plus series, one of the most flexible, versatile, and cost-effective LED products on the market.

Available in two-pixel pitches, 2.5mm and 3.9mm, the K Plus series is a high-impact commercial display perfect for price-driven projects in house of worship sanctuaries and lobbies. The various indoor applications of K Plus allows the user to be creative in the way they deploy the product. That flexibility is a hall mark of the K Plus Series from the way the panels can be put together to the easy and flexible maintenance is what sets K Plus apart from other LED's on the market.

Made with Die Cast Aluminium, K Plus has a thickness of only 2.46 inches and weighs only 24.3-18.7lbs/panel, allowing K Plus to be lighter and thinner than traditional displays. This makes it easier and quicker to build large format video walls, which also leads to less cost on steel structures and labour. In addition, K Plus is designed with heat dissipation and power efficiency in mind to save costs with outstanding heat dissipation performance due to the quiet, fanless design of the product. This allows K Plus to be more cost effective since maintenance costs are kept down due to its design.

With multiple panel size options, the panels and modules of K Plus can be rotated to create portrait, landscape and mixture installations, offering extreme design flexibility and maintenance options. K Plus supports wall-mounting and hanging, and can also be customized for creating 90-degree corners, allowing for greater creativity for its deployment.

Whether it's a cubed digital signage column in main lobby, or a horizontal LED Screen for church congregations, K Plus's flexibility knows no bounds.

In addition, its 3840Hz high fresh rate is camera-friendly, perfect for live events and services. The large panel size of K Plus (1.64ftW by 3.28ft) makes it easy to configure to a 16ft by 9 ft wall by utilizing only 30 standard panels. With 700nits standard brightness, it gives the church a greater sense of ambiance given that indoor displays usually runs at 30%-40%.

"K Plus series is a front & rear installation and maintenance product, able to meet various installation and service requirements in indoor spaces", says Sales Engineer Manager Yuki Yu, "the fact that K Plus can be serviced from both the front and rear of the panels allows for easier repair and maintenance of the LED panels. K Plus also boasts a number of advantages including high contrast ratio between 5000:1 and 4000:1 and a bright resolution. It also has a very high refresh rate that allows for a fast, dynamic response with a clear picture".

With all of these factors combined, K Plus offers a professional video wall solution with the best balance of visual performance and price for system integrators, able to help them better meet the display needs of their customers and commercial needs of their business. **T**
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The SLX-D Digital Wireless System from Shure

Whether it's a high-school theater production, corporate meeting, or a Sunday service, live events need to deliver flawless audio and require products that are straightforward to setup and use. Wireless microphones face additional challenges in today's increasingly crowded RF environment. To help address these needs, the SLX-D Digital Wireless System is the newest addition to the Shure digital wireless portfolio. The new offering is the digital replacement of the Company's popular SLX system, complete with new mechanical designs, exceptional audio quality, more reliable RF performance, streamlined setup, and more.

The multi-faceted SLX-D Digital Wireless System provides end users with greater channel count than SLX, smart rechargeable options, and simplified ease-of-use for moments that matter most – in the classroom, Houses of Worship, corporate facilities, the hospitality sector, local governments, and more. The new system is offered in single and dual channel options. Transmitters run on standard AA batteries or an optional lithium-ion rechargeable battery solution with a dual-docking charging station. SLX-D is a state-of-the-art system with several notable features and user-friendly benefits, including:

Reliable RF—with outstanding signal quality and digital modulation, SLX-D lets users navigate crowded environments with high spectral efficiency and dependable RF. The system enables operation of up to 32 channels per frequency band without worrying about dropouts or signal fades.

Excellent Audio Quality—to ensure every performance, lecture, and speech is delivered flawlessly, SLX-D delivers crystal clear sound. With a wide dynamic range, it can handle a variety of inputs while preventing distortion – ultimately enabling clean, natural instrument and vocal sound.

Ease of Use—knowing that personnel in various institutions and facilities need a simple and straightforward solution, SLX-D is equipped with Guided Frequency Setup and a Group Scan feature that lets users set up multiple channels more efficiently by assigning frequencies to all receivers automatically via ethernet connections. Even for a 30+ channel system, the entire Group Scan can be completed within a few seconds.

"As we support customers in education, Houses of Worship, corporate facilities and theaters, we recognize the need for an easy-to-use digital wireless system with rock-solid RF performance that can scale as the needs of the venue or spectrum environment change," said Nick Wood, Senior Wireless Category Director at Shure. "With SLX-D, we can offer a solution that is both state-of-the-art and a great value." **T**
Available now.

TVU Partyline™
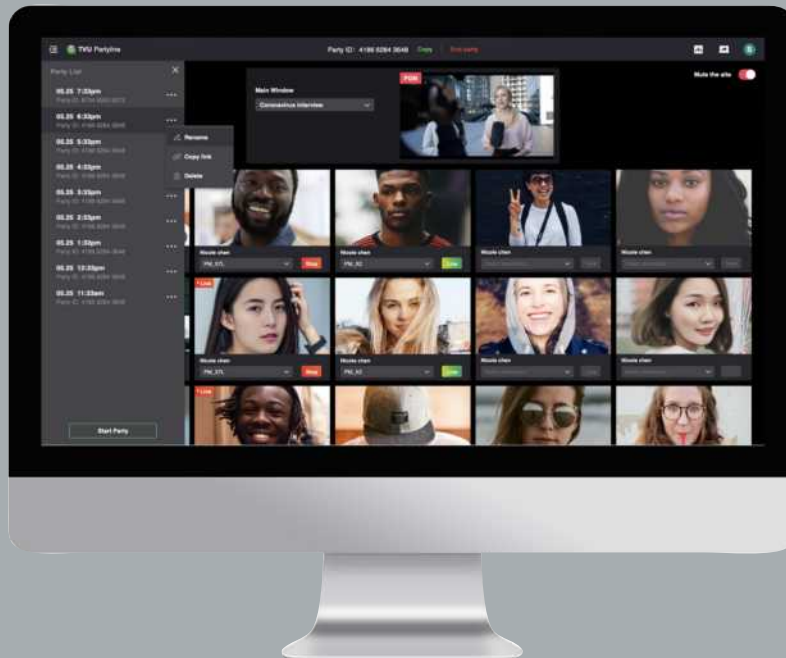
TVU's Partyline™ is a remote collaboration and conferencing tool for live video production, bringing together production crews, talent and guests from anywhere in the world to interact, discuss, control and participate virtually in a live production as if they were physically sitting next to each other.

Like most video conferencing platforms, inviting guests and fans to your live program has been made as simple as possible. Guests can join a conference room from any web browser using a simple web link or the meeting ID provided by the host, as well as from any smartphone using the TVU Anywhere mobile app. Integrating seamlessly across the TVU ecosystem and any SDI-based production system, TVU Partyline is a Real Time Interactive Layer (RTIL) that can operate with several TVU solutions using TVU's patented IS+ transmission protocol to ensure broadcast quality video and audio, as well as signal resiliency throughout a TVU Partyline session over the public internet, regardless of the number of participants.

TVU Partyline Users can easily manage a large number of participants with pre- defined profiles and assign participants to specific rooms and attribute different profiles with pre-defined parameters for the proper audio and video set-up, ie: distinguishing the crew (left channel) from the talents (stereo). It's extremely simple to screen external contributors prior to adding them to the live program through the TVU Producer cloud production platform, for example.

Designed for live video production needs, TVU Partyline provides control and management to enable and disable private communication between producer and talent without any additional IFB channel and auto-distinguish between voice from talent and production crew for an effective production. Automated Mix minus feedback elimination allows users achieve unique level of communication and interaction from remote locations, ensuring there is no feedback or echoes in the conference line - even without headphones - while being able to see the final program output in real-time.

TVU Partyline creates broadcast quality real-time collaboration in the cloud, with:
- *Undetectable video and audio delay*
- *Full HD live feeds, with perfectly synchronized audio and video using the public internet*
- *Video return accessible to all contributors to view program feeds in real-time*
- *Perfectly synchronized signals*
- *Automated tally notification*
- *Inform production teams of the latest updates on a reliable and secure platform* TVU Partyline can help grow audience engagement via its' patented IS+ technology, which enables full broadcast quality signals to be transmitted seamlessly to TVU Transceivers, TVU Grid or TV Producer cloud-based production platform for instantaneous distribution to multiple platforms simultaneously. This means you can share your live program in a secure manner in one click on TV, social media, CDNs and websites.

All major media workflows such as SDI, NDI, SRT and SMPTE 2110 are supported by TVU Partyline. **T**

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Four Quick Tips for Antenna Performance

BY BRIDGET HARRINGTON

Our friends at Lectrosonics share four quick antenna tips that every house of worship running wireless should know in this month's continuing education showcase.

The Straw Hack

Wireless signals are readily absorbed by anything containing water, which is why we advise not to let transmitter antennas touch the body or skin since this will reduce range due to the attenuated signal. What do you do in those situations where this is inevitable? Grab a straw! A regular drinking straw – opaque or clear both work - cut to the size of the antenna and slipped over it, will prevent skin contact and ensure that your signal remains strong. Another variant of this approach is to use aquarium air tubing.

Watch Where You Put It & Don't Bend It...

Wireless systems depend on the full length of their antennas to deliver the strongest signal. When placing transmitters on talent, have them move to ensure that the antenna will not be bent or caught in, say, a belt or garments. Bending the antenna, even accidentally, cuts down on its efficiency.

...But You Can Angle It

If you have two antennas that have to be close together, you can tilt them so that they are 90° angled to each other - one 45° to the left and one 45° to the right. Most diversity receivers combine both antennas either in or out of phase with each other. By angling the antennas away from each other, a greater overall spacing is achieved between them and thus each antenna "sees" more of a different set of direct and reflected signals. In many cases, the performance difference of this arrangement may not be any different than having the antennas parallel. But in some situations, this will make a greater difference.

Give It Space

We have seen receivers, particularly when used in location mixer bags, perform poorly due to the close proximity of camera hop and IFB transmitters, also located in the bag. Frequency separation helps – the more spacing you can give your hop and IFB transmitters from your receiver frequencies, the better – but physical separation or remote antennas may be required for proper operation. One nice solution for bag systems is the coax dipole, which is available for both BNC and SMA antenna connections, or you can make yourself. (https://www.lectrosonics.com/wire-lists-24-making-a-coaxial-dipole-antenna-with-6-items-in-8-easy-steps.html)

And just a word about RF amplifiers and amplified antennas – the ideal amount of gain is "just enough to overcome the loss through coax cable" and generally, passive systems with correct gain structure will out-perform active systems, especially if too much gain is applied. Often, it is better to have a bit of attenuation through the antenna system – up to 6dB, in fact, rather than unity gain, especially in high RF noise environments. **T**

Bridget Harrington *is a Marketing Specialist and Content Creator at Lectrosonics*

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The above map illustrates the approximate number of statewide certifications with each dot representing up to five. Certifications have also been issued in Costa Rica, Guam, Japan and the Netherlands.

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The Eartec HUB – Full Duplex Wireless

Eartec UltraLITE headsets provide professional full duplex communication literally right "Out of The Box". They allow production crews of up to five users to talk simultaneously just like on a wired system. The HUB is a digital repeater that expands the capacity of these full duplex wireless for larger production staffs. When clipped comfortably to the users waste this versatile mini base station moves seamlessly with your group allowing crews up to 9 to talk simultaneously within a 400-yard range.

LINKS UP TO 8 ULTRALITE WIRELESS HEADSETS

WEIGHS ONLY 9 OZ.

Two Channels of Communication

The Hub includes two channels of communication. It also features a dual power option, rechargeable Lithium battery and AC wall plug (both included). The battery charges externally and is field replaceable.

Self Contained Wireless Headsets

UltraLITE full duplex wireless headsets feature all electronics including a compact radio built inside the ear cup eliminating wires and belt packs. They include an Auto Mute Microphone Boom that pauses signal gain when set straight up.

Interfaces to Existing Wired Systems

The HUB interface is a software controlled module that plugs into a wall jack replacing a wired amplifier and allows up to 8 roaming wireless users to communicate with existing, permanently installed wired systems as if connected by a floor cable.

No Interference / No Licensing or Fees

The HUB utilizes Digital Enhance Cordless Technology in the license free 1920 - 30 MHz band. These "DECT" channels are reserved for short range voice communication so they do not cause interference with other wireless equipment in your church.

Affordable

Since 1961 the Eartec Company has been committed to building rugged, affordable intercoms along with providing courteous service.

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   We have heard the needs and we want to come along side you as you navigate all of he changes in how we do church. So, we are excited to announce **SALT 2020 Virtual!** This will be a gathering like no other and we are excited about the opportunity to engage with you this October on this virtual platform.

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Audio Solutions from Yamaha

Yamaha Professional Audio is known around the globe as a provider of innovative, top-quality solutions within the worship market. The company's lineup includes several world-standard mixing consoles, signal processors incorporating industry-leading DSP technology, power amplifiers based on energy-efficient drive technology and an extensive range of speakers suitable for any house of worship.

One of the reasons Yamaha Pro Audio gear enjoys an enviable reputation in the live sound field is the company's extensive background and know-how in musical instrument production. The company brings a deep understanding of music and musical instruments together with an awareness of the workflow and reliability required of professional live sound equipment in the worship sector.

It takes more than just technology to make great sound, and that's why the STAGEPAS 1K portable PA system and TF-RACK and RIVAGE PM5/PM3 digital mixing consoles have become industry standards. Yamaha is in touch with the needs of the industry and has the experience as well as the foresight to provide the right solutions at the right time. Explore these options to learn what Yamaha has to offer to any house of worship!

PORTABLE CHURCH

The STAGEPAS 1K is an all-in-one portable PA system that allows churches to quickly and easily transform any location into a stage. Driven by a high-frequency array speaker packed with 10 small-diameter 1.5" drivers, the STAGEPAS 1K boasts the highest standard of sound quality and sound pressure, lightweight cabinet design, professional mixing functions and simple operability. The array speaker is simply affixed to the subwoofer cabinet, requiring no cables or speaker stands, for a fast and easy setup. To provide a clearer, stronger, distortion-free low end, Yamaha added the company's own Twisted Flare Port technology to the subwoofer to effectively reduce wind noise in the bass reflex port.

The 5-channel digital mixer, located in the back of the subwoofer, features three channels of mono microphone/line inputs and stereo inputs, with two of the mono input channels fitted with Hi-Z connectivity for direct input of acoustic-electric guitars and other instruments. This PA system also offers a free STAGEPAS Editor iOS/Android app allowing users to operate their remote parameter adjustments of volume and EQ. Additionally, to enable a more efficient rehearsal and performance workflow, settings may be saved and recalled for future sessions. The mixer also comes equipped with professional-level sound engineering tools, including 1-Knob EQ that handles multi-band processing simultaneously, high-quality SPX digital reverb and an output Mode feature to adjust optimized compression settings to suit various applications, such as Speech or Music.

SMALLER CHURCH

The Yamaha TF-RACK is the powerful, compact rack-mount version of the company's acclaimed TF Series digital mixing consoles. Aimed at new users and experienced professionals looking to get working faster than ever, the TF Series brings time-saving performance capabilities, such as fast, accurate gain setup, single step compression and EQ and microphone specific presets to even the most modest sound reinforcement applications. With the TouchFlow Operation interface optimized for touch panel control, engineers will find it easier than ever to achieve the ideal mix. The 1-knob COMP™ & 1-knob EQ™ offers users one Knob to adjust parameters to dial in the ideal sound. Recallable D-PRE™ preamplifiers

support sound quality that will satisfy the most discerning professional ears, while advanced live recording features and seamless operation with high-performance I/O racks give these compact digital mixers capabilities that make them outstanding choices for a wide range of applications. Like its desktop counterparts, the TF-RACK

is compatible with TF StageMix™ for wireless Wi-Fi remote mixing via iPad, and the MonitorMix™ app for aux send mixing via most smartphones or tablet PCs. Since it is not Wi-Fi dependent, TF-RACK sets a new standard for reliability in mixing, allowing it to maintain its full functionality even if the network goes offline.

LARGER CHURCH

Yamaha recently announced new additions to the company's professional audio lineup—the RIVAGE PM5 and RIVAGE PM3 Digital Mixing Systems—featuring new CS-R5 and CS-R3 control surfaces, along with the DSP-RX and DSP-RX-EX DSP engines.

The CS-R5 control surface for RIVAGE PM5 systems features three large touch screens and a condensed selected channel section that contribute to smooth intuitive operation. The CS-R3 control surface for RIVAGE PM3 systems packs full RIVAGE PM series functionality and performance into a console that is only 45" wide, making it the most compact console in the series.

The new DSP-RX engine provides 120 inputs, 48 mix buses, and 24 matrices, while the DSP-RX-EX engine has 288 inputs, 72 mix buses, and 36 matrices. The availability of two DSP engines with different mixing capacities, along with the two new control surfaces, offers greatly expanded flexibility in designing applications of just about any scale. Both new control surfaces have the same fader configuration as the rest of the series, with three bays of 12 faders each. The combination of touch screens and selected channel controls offers functionality and operation that are familiar to RIVAGE PM Series users while also offering entry for CL and QL Series console users. **T**

Lighting Control Solutions from Pathway Connectivity

As churches expand and advance their lighting networks, they look to find reliable and easy-to-use lighting control solutions. Pathway Connectivity, a leading provider of DMX distribution networking and control products, offers Vignette™ DMX and sACN Snapshot and Zone Controller – a system of DMX512 lighting control wall stations. This scalable and comprehensive solution is versatile enough to handle a variety of networks: big and small, upgrades or new construction.

Vignette easily snapshots looks from your existing theatrical controller or can be programmed to control user defined lighting zones. The lighting looks are stored in the wall station, with no central computer processor required in the system. Vignette is offered in two wiring schemes (RS-485 or PoE) and an assortment of button and slider options. The system is available in white or black.

SMALLER CHURCH

For a small church wanting to add DMX512 controlled colored LED accent lighting, Vignette PoE (Power over Ethernet) would be an excellent choice. Vignette button or slider stations easily connect to an existing DMX512 gateway using a normal PoE Ethernet switch. The stations can either be wall mounted or set together in a moveable "consolette". Pathway's Consolette is versatile as it can be placed wherever needed: on the podium, in the choir loft, or at the sound console. Vignette wall stations are the basis of the system, and each single gang can contain 2 or 4 buttons, or 1, 2 or 3 sliders. The stations snap together without tools or additional wiring. A Consolette can hold up to 3 stations. Vignette wall mounted stations can be from 1 to 6 stations in size. This offers flexibility in choosing buttons, sliders, or both when deciding how to choose the lighting controls. Stations can mirror each other or work independently. Each station or set of station uses a "home run" wire back to the network switch. A Vignette PoE system can snapshot up to 4 universes of sACN.

MEDIUM CHURCH

Even medium sized churches need large scale control. When considering new construction or whole-scale renovations, the Vignette 485 variant is the best option. The 485 version of the wall stations have all the same button, slider and color options as the PoE Vignette system. Instead of using home runs to a PoE switch, the Vignette 485 Architectural Gateway, mounts on a Din rail in a cabinet and features 4 busses where each bus can daisy-chain up to 16 wall stations.. This Gateway facilitates the record and playback of DMX512 or sACN, and allows asynchronous fades across 4 areas of the worship space or rooms. The 485 system's four home runs supply power and control signals to the button and slider stations on the 4 walls of the church. The Vignette 485 system is also great for church retrofits, replacing end-of-life existing lighting control systems, as it is often compatible with legacy wire already in the wall. There are 4 different Vignette Gateways, offering features such as integrated DMX512 ports, 8 or 16 contact closure suitable for AV integration, and a second Ethernet port.
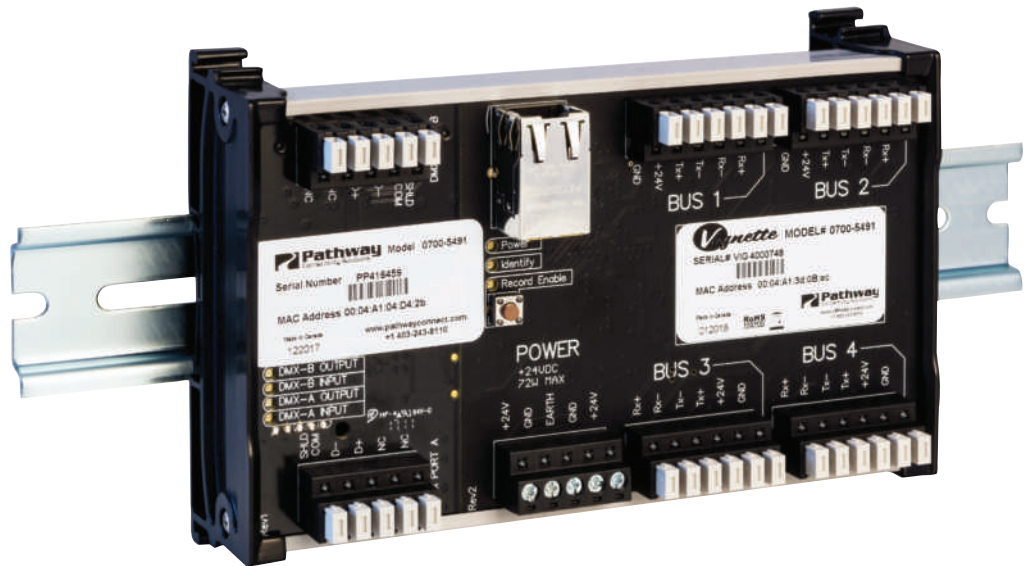
LARGE CHURCH

A great solution for a large church would include the Vignette Clock, building on all the features of the Vignette stations and Architectural Gateway as outlined in the small and medium church examples. Vignette Clock is a simple but powerful expansion device for Vignette systems, allowing you to automate playback of snapshots, zones, and other Vignette functions according to date, time, or astronomical events such as dawn, dusk, sunrise or sunset. In a church, these automated features are invaluable for triggering church façade lighting, or automated programming based on seasonal events. When programming a Vignette Clock, you can specify the hour, minute, second, year, month, day of the week, or any range of these (contiguous or non-contiguous) to trigger snapshots of Vignette functions automatically. The Vignette Clock has an internal battery that keeps the clock accurate in case of power outages. If the Clock is connected to the Internet, it can subscribe to an NTP server for exact time precision and can also connect to the SixEye system, a secure cloud based third party service for remote monitoring and playback of Vignette snapshots. SixEye allows monitoring and configuration of much of the Pathway portfolio of products, and also products from other manufacturers. Maintenance and event staff find this system particularly helpful as unexpected issues can be handled remotely. ▪

Projector Solutions from Digital Projection

From small community churches to stadium-sized prayer concerts, Digital Projection's high-quality platform of Laser projectors offers a compelling combination of value and performance for every worship space, even venues with high ambient light. Whether it is the cost effective, yet powerful E-Vision Series, the rugged and brilliantly colorful M-Vision models, or the astoundingly bright, yet surprisingly quiet TITAN line, these projectors allow you to create truly stunning images for every seat in the house. Furthermore, DP projectors offer abundant installation flexibility; enabling houses of worship to work within the challenges of sanctuary environments. Fortunately, this flexibility and brightness is complemented by lumens-per-watt efficiency that sets the bar for the projection industry. Offering up to 37,000 lumens of laser-illuminated brightness, as well as a broad range of lens options and imaging features, the E-Vision, M-Vision, and TITAN Series empower any sanctuary to shine with captivating visuals.

SMALLER CHURCH

For modest churches with tighter budgetary constraints, DP's entry-level E-Vision Series projectors provide bright and colorful images that are ideal for screen sizes up to 16ft wide. As DP's value-oriented models, these projectors are perfect for displaying scripture passages, hymnal lyrics, and inspirational images. Thoughtful design choices prioritize image quality and installation flexibility.

These small, but powerful projectors deliver a range of 5,100 to 13,000 lumens of brightness. Along with their quality optics and a fleet of precision lenses with motorized shift, zoom, and focus, these features allow for unprecedented installation flexibility. E-Vision models can be utilized in front or rear-projection, in applications with throw distances from .38 to over 8x the image width. The addition of a low-latency 3G-SDI input increases the projectors' compatibility with most video distribution systems – making them an ideal choice for IMAG presentations. This "image first" design philosophy ensures real, long-term, value for modest churches that rely on a projector to provide years of maintenance-free operation.

Integrating an E-Vision Series projector allows significantly more options for deployment and image size while keeping technology costs low. Additionally, with modern houses of worship relying on a host of other audio and video technologies to deliver their message, HDMI and HDBT/LAN connectivity are also included. This ensures the projection displays are compatible with a variety of popular control and HD video distribution systems.

MID-SIZED CHURCH

Although more contemporary, medium-sized churches may have more funds to invest, many still embrace a balance between performance and value. DP's M-Vision Series elevates and optimizes both performance and functionality with enhanced visuals. Boasting up to 21,000 lumens of laser illumination, the M-Vision Series represents the brightest single-chip DLP projector currently on the market. Capable of creating jaw-dropping images in excess of 16' wide, M-Vision is the pinnacle of DP's value vs. performance proposition.

For the medium-sized church needing larger images and quality optics, the M-Vision line produces unrivaled clarity at this price point. Furthermore, these models feature DP's proprietary ColorBoost and Direct Red Laser technology, producing an even broader color-space and delivering deep, saturated colors across the entirety of diverse worship content. For worship spaces deploying several screens within their sanctuary, these features improve color-matching across multiple images.

Built-in stacking pins and rigging points allow M-Vision projectors to be used in a variety of installation configurations, from blended images to environmental mapping. On-board advanced image correction allows for the most flexibility in less-than-ideal deployment options.

Like their smaller E-Vision counterparts, the M-Vision Series includes connectivity that makes it compatible with virtually any front-of-house control and video/camera distribution.

LARGER CHURCH

For the most discerning worship venues, ambient light and performance are major factors to consider when choosing a display. Digital Projection has accepted that challenge with the introduction of the TITAN range of projectors. Powered by up to 37,000 lumens of laser illumination, the TITAN Series sets the bar for high-end projection performance. These powerhouse solutions produce vivid images in excess of 25' wide for truly stunning displays that will engage and captivate a congregation.

Designed to deliver peak levels of performance in challenging conditions, these projectors feature IP60 sealed optics and use high-efficiency liquid cooling to maintain best-in-class reliability. From lens to light source, the optical system is completely sealed, ensuring that light output and color performance will not be degraded due to the ingress of dust – even in the most theatrical worship services alongside smoke and fog generators. Additionally, these projectors are completely filter less, minimizing maintenance and replacement costs, while maximizing performance via unrestricted airflow.

TITAN models utilize the very latest in connectivity, including DisplayPort, HDMI 2.0 and HDBaseT. The advanced electronics also bring HDR processing to the large-venue class of projectors, and features such as Constant Brightness Control and DMX Art-Net compatibility make it the ideal solution for high-profile worship events.

Regardless of your worship space or congregation size, selecting a Digital Projection solution for your services will ensure best-in-show quality visuals for years to come. ◼

Outdoor Audio Solutions from Mackie

With social distancing a part of the landscape for the foreseeable future, churches are taking advantage of the summer weather to move services outside, where attendees can maintain healthy boundaries while still enjoying worship and gathering with friends and fellow congregants.

Moving your service outside will depend on a multitude of factors, including the type of worship services you offer, the size of your congregation and the available space you have to work with. But there are a few considerations that are universal – specifically, make sure your system is portable, compact, easy to set up, and easy to use. Remember, your team will have to carry the system, set it up, operate it during the service, take it down, pack it away until next week, when it needs to happen all over again. Your system needs to not only deliver good performance but also enable you to streamline the process of using it.

The core of any live PA system is the mixer. Typically, mics and instruments are connected onstage to inputs that run through a long path to the mixing console, usually at the back of the sanctuary. For an outdoor service, that's a whole lot of setup.

Mackie's DL Series mixers put all the inputs in a compact box that sits onstage. The mix is controlled wirelessly via an iPad, enabling you to move freely and check the sound from everywhere. Up to 10 devices can access the mix, so it's easy to set up monitor mixes and run them from onstage too.

As we mentioned earlier, your loudspeaker needs will be dictated by the type of service you're conducting, the size of your congregation, and the area you have to cover. Mackie has a wide range of loudspeaker systems to handle everything from a small intimate service for a few dozen members, to a rock and roll worship experience for hundreds. Let's look at a few options.

SMALL GATHERINGS

The SRM-Flex portable PA features an ultra-lightweight design with a 10-inch LF woofer in a molded cabinet that also houses a powerful 1300W amplifier and a built-in digital mixer. Sitting atop the woofer cabinet is an easy-to-assemble 3-piece tower that's home to a wide-dispersion array with six 2-inch high performance drivers. The system is assembles in minutes, and the modular design allows you to easily change the height of the mid and high frequency drivers to match the audience's ear level.

The built-in 6-channel mixer digital mixer provides everything you need to get your sound and mix just right. Two flexible Mic/Line inputs accept microphones, instruments, and more. There is also a dedicated stereo channel with dual 1/4" line inputs and a dedicated 1/8" Aux In / Bluetooth® streaming channel. Channels 1 and 2 are equipped with individual 2-band EQs and Reverb level controls with 3 different reverbs to choose from. To tailor the entire system to your application, there are 3 voicing modes available at the push of a button. Connecting to a second SRM-Flex or house PA is easy via the professional XLR Mix Out.

The SRM-Flex is super-portable, weighing in at less than 30 pounds. Despite its diminuitive footprint, it can easily crank out enough sound to cover a small gathering or event.
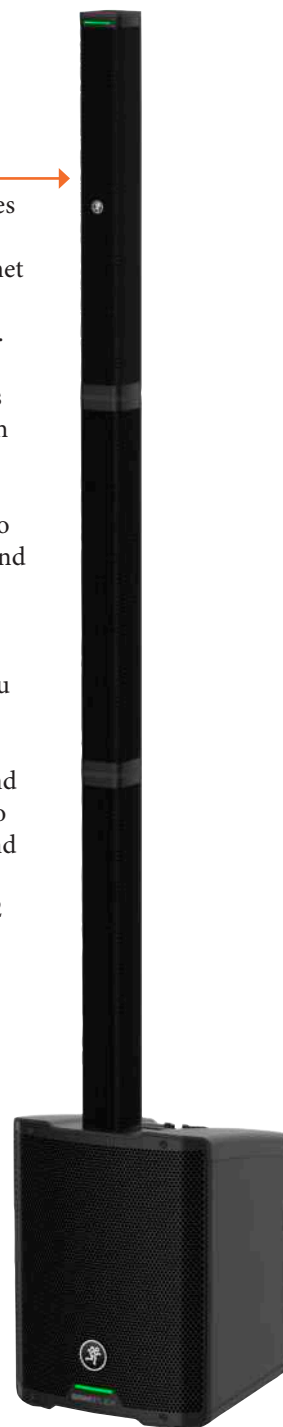
MID-SIZED CROWDS

Mackie SRM Series powered monitors have long been a standard among live musicians, DJs, performers, and live events companies, so it's a no-brainer that they will easily handle a mid-sized service or event. The 1000 Watt SRM350 and SRM450 are workhorses that provide amazing sound, great performance, and our built-like-a-tank durability.

SRM Portable series powered monitors are lightweight and easy to setup. Their integrated 2-channel mixer enables you to mix multiple sources, and they come packed with features including application-specific speaker modes and our exclusive feedback destroyer. The SRM Portable series delivers the power, features, and performance that make them the best tool for the job.

LARGER EVENTS

Mackie's flagship SRM V-Class gives you a massive 2000 Watts of power, with crystal clear highs and powerful lows that will comfortably cover a crowd, and rock solid construction that will keep dishing it out for years.

Integrated 4-channel mixers with Bluetooth mean you can easily connect multiple sources and even stream background music from your phone or tablet. Plus, you can wirelessly link two SRM V-Class speakers together for the ultimate in easy and cable-free setup. And the SRM Connect app for iOS and Android enables you to quickly access to volume, EQ, and meters to monitor two speakers from anywhere via your phone.

While we all miss gathering together, nice weather is the perfect opportunity to bring your services outdoors and create a safe place for your congregation. With a little bit of planning and some great Mackie gear, it's easy to put together a portable sound system that will help you make it happen. ∎

How to Read Microphone Specifications

BY EDDY B. BRIXEN

Reading microphone specifications can sometimes be as daunting as interpreting hieroglyphics. Add to this that specs are measured in various ways, and technical terms are used differently between brands, and it's sure to make anyone's head spin. This article breaks microphone terminology down to give audio teams a better understanding of features as they relate to a church's needs.

DECIBEL SCALE

Microphone specs indicate decibels (dB), the logarithmic way that humans hear. The dB scale is relative: positive numbers indicate an increase, negative shows a decrease and 0 dB is no change. The smallest audible change is 1 dB, 3 dB indicates a clear change, 10 dB is a doubling or halving; the highest value won't surpass 199 dB.

DIRECTIONALITY AND POLAR PATTERNS

Directionality (sound pickup pattern) is represented by a graphical polar plot, a grid of concentric circles representing dB. Polar pattern starts with 0 dB at the outer circle, with the reference point as 0º at the top of the outer circle, indicating the on-axis direction of the microphone. It is most common to measure directionality at a larger distance of 1-2m (3-6ft). Directionality is referenced according to a mic's polar pattern, examples noted in the graphic below.

Though microphones typically have just one polar pattern, frequency changes can impact directivity. Eg: omnidirectional microphones become more directional at higher frequencies due to pressure build-up at the front of the diaphragm.

SOUND PRESSURE LEVEL (SPL)

A microphone's sound pressure response is known as its sound pressure level (SPL). In many recording situations, it's practical to know a mic's maximum SPL and expected output voltage. Some brands specify max SPL as the level at which the microphone doesn't break up, but this isn't a practical measurement in pro audio.

PRINCIPLES OF OPERATION

Microphone design follows three acoustical principles. These include omnidirectional pressure microphones, which receive sound from only one side. Pressure-gradient microphones, such as figure-eight, receive sound from both sides, allowing for directivity. Cardioid, wide cardioid and super cardioid microphones are a combination of pressure and pressure-gradient. Interference tube microphones prefer on-axis sound and reject sound from the sides. Often, pressure-gradient and interference tube are combined to achieve the best-possible directivity, especially at low frequencies.

CARTRIDGE TYPE

The cartridge is the transducer that transforms sound pressure into electricity. The two main types are dynamic, which converts sound via electromagnetism, and condenser, which operates via either internal or external polarization. Typically, condenser mics require a power supply, whereas dynamics do not.
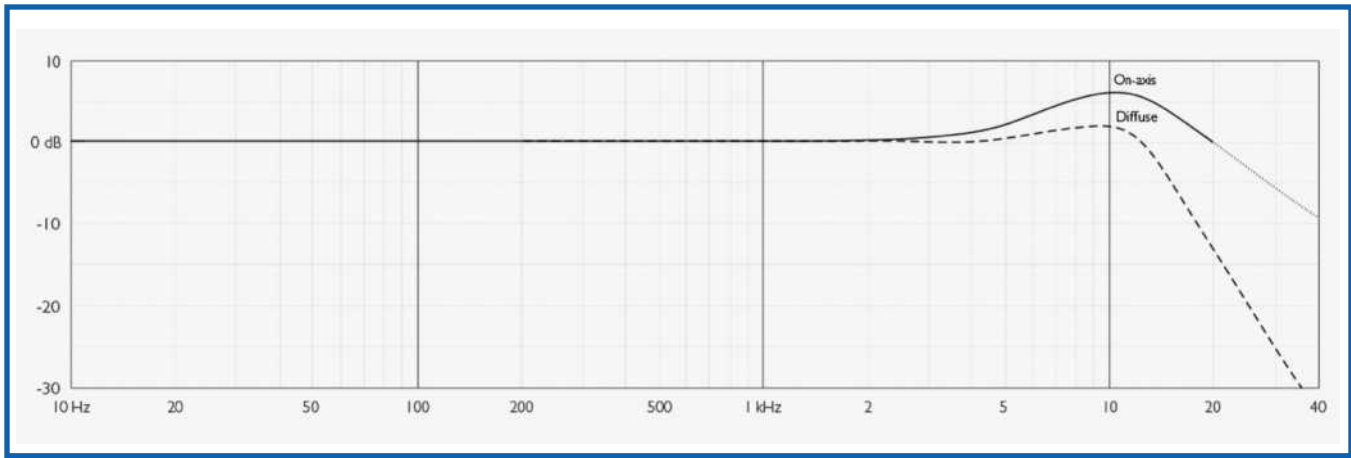
FREQUENCY RESPONSE

Frequency response expresses a complete frequency output range and responsiveness. It is generally limited to 20 Hz to 20 kHz, though most deliver outside this range. An effective range doesn't deviate by more than a specific amount from the ideal/tailored response curve. If a microphone is intended for near-field use, frequency response is measured at a shorter distance.

Manufacturers may provide more than one frequency response curve, to present how the microphone responds to sound coming from different directions or acoustic sound fields.

EFFECTIVE FREQUENCY RANGE

Perfect frequency response isn't necessarily flat, some mics have tailored responses for better intelligibility. Effective frequency range expresses this tailored and intended frequency within a narrow tolerance (i,e, ±2 dB), which may show limited response for the exact desired precision.

ON-AXIS RESPONSE

Measured in a free, undisturbed sound field, on-axis response demonstrates a microphone's reaction to sound coming directly towards its diaphragm, with an angle of incidence of 0°. Proximity effect may impact this measure for directional/gradient mics, so distance should always be stated. Measuring distance is less important for omnidirectional mics.

OFF-AXIS RESPONSES

Off-axis response represents a directional mic's response to sound coming at it from different angles, rather than directly at the diaphragm. Though off-axis response indicates reduced output, these curves must also exhibit a smooth frequency response. Otherwise, off-axis coloration is introduced.

DIFFUSE FIELD RESPONSE

The diffuse field response curve illustrates how an omnidirectional microphone will respond in a highly reverberant sound field, where all sound directions are equally probable. It also shows a roll-off in higher frequencies due to the air's absorption, lack of pressure from the sides and the microphone's housing shadowing sound from the rear.

FREE-FIELD SENSITIVITY

Sensitivity expresses how much output voltage a mic delivers under specific sound pressure. Free-field sensitivity states the voltage generated in an undisturbed 94 dB SPL sound field, where sound has only one direction. A microphone with high sensitivity won't need as much amplification as one with lower sensitivity. In applications with low sound pressure levels, a microphone with high sensitivity is required to keep the amplification noise low. For applications with extremely high SPL, a low-sensitivity microphone is appropriate.

EQUIVALENT NOISE LEVEL

All microphones generate noise due to their electrical circuitry and the movement of air around it, which affects the diaphragm and results in an electrical signal. Equivalent noise level indicates at what SPL a mic generates the same output as its electrical self-noise and dictates the lower limit of its dynamic range. Low noise level is especially desirable with low SPL. There are two common ways to specify noise:

A-weighted RMS: approximates the ear's sensitivity, filtering out low-frequency noise; ideal result <15 dB(A).

ITU-R BS.468-4: used as a comparative tool to indicate whether a condenser microphone suffers from crackling noise forms; ideal result is <25-30 dB.

DYNAMIC RANGE AND DISTORTION

Dynamic range is the difference between the microphone's self-noise and its specified THD level. Increasing SPL increases distortion, so distortion level must also be considered. In most music recording applications, RMS value indicates average SPL, not the true peak. Therefore, max SPL typically supersedes the RMS value by >20 dB.

TOTAL HARMONIC DISTORTION (THD)

Depending on microphone type, some brands specify that max SPL falls below a total harmonic distortion (THD) of <1%, the basis of its dynamic range. When comparing mics, ensure that measured THD includes both the capsule and preamplifier. Many

EXAMPLE: DPA MICROPHONES 4006 OMNIDIRECTIONAL MICROPHONE GUARANTEED FREQUENCY RANGE, ON-AXIS 10 HZ TO 20 KHZ, AS DEPICTED BY THE SOLID LINE. DOTTED LINE INDICATES THE MIC HAS AN OUTPUT OUTSIDE THE MENTIONED RANGE.
PHOTOS AND IMAGES COURTESY OF DPA

manufacturers measure only the preamp, which distorts much less than the capsule, showing more extensive range than actually available.

RATED IMPEDANCE

Microphone output impedance should be lower than the input impedance of the preamp. Condenser microphone output impedance is determined by resistors, so it's constant with frequency. Dynamic microphones have coil/magnet suspension, resulting in less-constant impedance with frequency. A Non-linear impedance may affect frequency response.

MINIMUM LOAD IMPEDANCE

Complete condenser microphones have a capsule and an internal preamplifier and can connect to an external preamplifier using a decent voltage. If input impedance is too low, it risks a reduction of the output signal. It is practical to know the minimum possible load impedance without loss of signal.

CABLE DRIVE CAPABILITY

To avoid loss of signal at high frequencies across long cable runs, some manufacturers indicate a maximum cable length, typically 100 meters (328 feet), but this is not required.

OUTPUT BALANCE PRINCIPLE

Microphone signals are weak compared to line-level signals. It is crucial to use balanced lines to minimize noise across long cables. Some brands use a principle called "Active Drive," which has balanced impedance and greatly reduces the induced electrical noise. Signal runs on just one pin, which provides a simple and clean circuit with high output.

COMMON MODE REJECTION RATIO (CMRR)

Also interpreted as Common Mode Range Rejection, CMRR measures the efficiency of the impedance balancing and a microphone's ability to suppress electrical noise. Measured in the 50

Hz to 20 kHz frequency range, CMRR is predominantly collected by the wires connecting the microphone to the preamp.

WHAT NEXT?

Though specs aren't always comparable between manufacturers, they do provide useful objectivity in a search. While microphone specifications indicate its electro-acoustic performance, there is no substitution for a true sonic experience. It is always wise to test a piece of equipment for yourself before making a purchasing decision. **T**

Eddy B. Brixen *is an Audio Specialist at DPA Microphones*

HOW TO PROPERLY USE A

Mic etiquette – we all fight it as audio operators, right? Inexperienced vocalists or speakers who engage in a wide variety of bizarre behavior when holding a microphone. Maybe it's nerves, maybe it's ignorance; most likely, a combination of the two. Whatever the reason, we find ourselves riding the fader, surfing that edge of feedback to the point of driving us mad while people shoot us dirty looks because they can't hear what's being said.

So how DO you properly use a microphone so that you can teach others? It depends on the microphone, but let's take the most common mic that we fight with, the handheld mic.

There is an adage that indicates the proper placement for a vocal microphone is no more than two finger-widths away from the mouth. This is a fantastic place to start;

however, how do we teach that to people? We can tell them, of course, but if your church has a rehearsal, I would have leadership strongly encourage (perhaps require?) everyone involved in the program or service to attend. While the worship team gets set up, you can run the other participants through proper mic etiquette, including showing them the difference it makes when the mic is being held properly versus when it is not. We are a visual and experiential species-we need to be shown and told in order for the concept to take root. This also plants a seed in their brain that if they perceive they are coming across as too quiet, they can check their mic placement themselves and/or speak louder. Either way, this helps us as operators, right?

But what about those singers who move the mic toward and away from their mouth while singing? These tend to be professional singers who have hundreds

of hours of mic use in their past that use this technique for both dramatic, and practical, effect. I would not advise trying to implement or teach this technique for your worship team or performers. Let's keep it simple and if you or the singer wishes to have a "fade out" effect to their music, that should be rehearsed ahead of time.

Before we leave the handheld mic, let's also talk about how people tend to hold the mic when they are NOT using it or are waiting for a bridge to play. I have seen (and experienced) the ear-shattering shriek of feedback when an inexperienced singer lets the head of the mic fall towards the floor while waiting to use the mic next. Unfortunately, the mic also ends up pointing directly at a floor monitor, which induces a nasty, and very noticeable, feedback loop. As an operator, we can train and demonstrate this phenomenon, as described

above, however, we must take an active part in paying attention to where our active mics are at all times. We can help avoid this feedback issue, which WILL happen, by being proactive in turning a mic down either when it's not being actively used or when we see the likelihood of it being pointed towards a speaker or the floor.

Let's talk podium mics next as these tend to be another mic that are misused all the time. When I demonstrate podium mic use, I make sure to tell users to make sure they are always pointing their mouth at the mic, regardless of where they stand at the podium. If they are on the right side, point your mouth left; on the left side, point your mouth right. The idea is to talk ACROSS the microphone rather than past it or around it. Again, it's helpful to demonstrate this technique. It's also important that people understand they don't have

MICROPHONE

BY TIM ADAMS

to adjust the mic when they step up to it unless there is a considerable height difference between users. People see this behavior in TV and film and assume this is the "right" thing to do. I try very hard to break people of this habit as any movement of a podium, or gooseneck, mic will result in handling noise that can be irritating and abrupt.

The final mics we will discuss are lapels and ear-worn mics. The lapel, while seeing a downturn in regular use, is still a popular option among many speakers. Placement of this mic is critical to quality pickup that is consistent. Many operators and speakers will clip the mic to their lapel; after all, that's what it's called, but I strongly recommend you place that mic as central in the chest area and as high as possible. If it's a guy with a button up shirt or tie, clip it to the tie or the button up seam about one or two buttons down. If it's a lady

with a dress, you'll want to clip that to the top of dress under her neck or pinch some fabric just below the neckline and clip it there. This allows for consistent sound pickup regardless of which way the person's head turns. When you clip

> **While the worship team gets set up, you can run the other participants through proper mic etiquette, including showing them the difference it makes when the mic is being held properly versus when it is not.**

the mic to one side or the other, you always lose sound level when the speaker's head turns away from the microphone and this can lead to you riding your channel fader unnecessarily. It's worth it to ensure a

central mic placement, if only for your own sanity.

Ear-worn mics are much easier to work with in that they put the mic right where they need to be. However, getting the earpiece molded properly to the speaker's ear can be an extremely

frustrating exercise. There are tricks, but it all depends on which manufacturer you're working with and the personal preferences of the speaker. The easiest trick is to use a dual-ear hook system, which is most

comfortable and secure, but some speakers don't want it. In that case, you may need to keep some "mic tape" on hand to help properly secure the mic from falling off the person's ear. Many times, you have to find your own tricks to make it work but that can be both fun and frustrating.

Using a mic properly is a huge factor in being able to provide quality and consistent sound; playing a proactive role in that can help you retain your sanity and meet the needs of your church so get to it! **T**

Tim Adams *spent over 20 years volunteering in church technical ministry and now focuses on helping small churches achieve technical excellence through equipment upgrades, training, sharing best practices and teaching leadership how to cast God-sized vision.*

BROADCAST OR CINEMA?

What Equipment to Consider When Deciding How to Outfit Your House of Worship

BY DARREN FORDHAM

So, the time has come for your Church to begin to put the time into researching and purchasing new video equipment. Perhaps all you're looking to do is a relatively straight forward upgrade of older broadcast equipment to fall in-line with the more modern resolution expectations of your parish, such as 4K or HD. Alternatively, maybe your goals are a bit more ambitious, and you want to change the "look" of your Church's content altogether. You saw a neighboring church was beginning to use cinema equipment to capture their Sunday sermon, and you said to yourself, "I want that look." At first glance, this seemingly daunting task can easily overwhelm even the best of House of Worship Chief Financial Procurement Officers. But don't fret, I am here to quell those concerns about a decision that should instead be an exciting and inspiring task to take on by saying this – it's all personal preference. That's right; there is no right or wrong answer here. It's a multiple-choice question with two options and two correct answers. Ultimately, the "right" decision for you and your parishioners comes down to a variety of factors, some more important, others less, all depending on what YOU prefer.

What "look" do you want to achieve? Like most decisions in life, money has to be taken into account, what's your budget? Do you share equipment with your church's creative services department? And from a technical perspective, what type of lenses do you need to capture content?

With all that said, if you already know what you want, I'll save you some time and let you know it's okay to turn the page and read the next article. Seriously, I won't be offended! But if you want to go on a journey with me to understand better the benefits of broadcast or cinema equipment for your church, then buckle up, read on, it's going to be a fun ride!

Budgets: let's be honest, no one likes dealing with them, but a properly

utilized budget will help to maximize the efficiency and ability of your church. There are some rare occasions when money is no object. If you're one of those cases, then enjoy your shopping spree; however, in most instances, a good steward of a church's budget can determine what a need is, and what is a want concerning new video equipment. The price tags on broadcast equipment will begin to pile up a high bill quickly. A typical broadcast chain, from the camera to lens, will cost a church over a hundred thousand dollars. Still, if you're a church that seats tens of thousands, a broadcast setup is practically a necessity to capture the entire facility. For smaller to medium size churches, the zoom range on a cinema lens in most instances will suffice, those figures are about half the price, coming in around fifty thousand

dollars. Because of that lower price tag, a church can buy more cinema equipment, allowing for a greater variety of tools in their content toolbox.

One last thing to consider while looking at your equipment budget is if your church has a creative services department. I(if not, you should also consider starting one; if so, do you need to share equipment with the department? If the answer to that question is yes, then cinema might be the better route for your church. The portability of cinema products allow for churches to make the most use of the equipment, from a Sunday sermon to other activates throughout the rest of the week. With nearly 75 percent of churches having some form of a creative services department, there is an argument to be made that an investment in cinema equipment will help to "future-proof" a church's video equipment.

LENSES

We already touched upon lenses as they pertain to cost and budget, now let's take a deeper dive on how broadcast or cinema (or maybe both) style lenses could best suit the need of your church from a functional and "look" perspective.

Right off the bat, what stands out the most about broadcast lenses is the sheer amount of them to choose from, many with excellent telephoto capabilities. A camera operator can go from very wide to uptight and close on the telephoto end, all in one lens. Depending on the size of your church, there is just no escaping the need for a broadcast lens. A box zoom lens is the only option that will allow you to go from the back of the room all the way to the stage. If you're a church that frequently zooms over a wide range, you will need some broadcast lenses. Broadcast lenses also stay in focus from the beginning to

the end of the zoom range. Operators won't need to chase focus, because their subject is already in and will stay in focus. The pure speed of broadcast lenses is another benefit that is tough to ignore, most being f/2 and below, ideal for nearly any broadcasting situation. An additional benefit of a broadcast setup is the lack of latency in broadcast cameras. The potential for latency issues shouldn't be a concern for all churches, really just those with large screens adorning the facility, but if that's you, then spending more on a broadcast setup will undoubtedly help to mitigate any concerns you might have for latency.

While broadcast has typically stood as the traditional option for churches, there is no ignoring the accelerated popularity and demand for that cinema "look" that can innately only be achieved using cinema equipment. People love the look; it's eye-catching and, once you

see it, it's nearly impossible to forget about. For camera operators to have the ability to zoom in up-close to a church leader as they deliver the sermon, having that shallow depth-of-field only a cinema camera and lens can provide is truly breathtaking. The look blurs away everything but the face and serves as a powerful image that helps to draw attention to the stage. Cinema cameras also hold one key benefit over broadcast equipment: an autofocus system. A spectacular autofocus system enables nearly anyone the ability to operate the system, even the newest of volunteer camera operators. The ability for users of all skill levels to be able to operate cinema equipment faithfully is something that cannot be understated – a practically priceless value-added benefit.

Last but not least, while there might be more traditional broadcast lenses to choose from, using a cinema camera opens up the possibilities of a plethora of

still lenses that I must say, look absolutely spectacular. Whatever the need be, a user can choose from a wide range of lenses that begins at a pancake prime and go all the way to telephoto primes and zooms. Adding to the lens selection for a cinema camera operator is the ability to put broadcast portable zoom lenses on a cinema camera. That setup will limit a user to 2K output; the images captured will still meet the needs of many churches.

Before I wrap this up, I wanted to take the time to share some thoughts from a couple of my clients who have a tremendous amount of experience using broadcast and cinema products.

Brandon Headley, the Production Director at Hunter Street Baptist Church, long-debated switching over to cinema equipment, but ultimately elected to stick with broadcast.

"There were many factors that went into why

Hunter Street chose to stay with broadcast lensing for our recent equipment upgrade. The throw distance, combined with ease of use for our current volunteer base, as well as the look of our physical room, were the determining factors in the broadcast glass. Broadcast lenses give us the ability to capture the smallest of details on an individual or item on our stage from anywhere around the room."

On the flip side, Brock Roberts, Creative Director at Quest Fellowship Church, recently upgraded his equipment from a traditional camcorder to a cinema camera and lens setup. Brock loves the results so far.

"Moving away from a traditional camcorder and into a cinema camera and lens setup has been a complete game-changer for the Quest Fellowship. The new cinema equipment has allowed us to take our productions to the next level, providing a look and feel that is exactly the

Church was searching for. I am excited to see how we can continue to use cinema equipment to enhance the quality of our worship services in the future."

We have reached the end of our little journey that I hope helped to educate you, the reader, on the benefits of both broadcast and cinema equipment for your church. Is your head ready to explode yet? I sure hope not. I promise that was never my intent. But if it is, don't worry, I'm here to remind you of a fact I laid out in the opening, there is no wrong answer to this question. At the end of the day, it all comes down to personal preference – so what are you waiting for? ▪

Darren Fordham *is the National Accounts Manager for House of Worship Sales at Canon U.S.A., Inc. He can be reached at dfordham@ cusa.canon.com.*

Overcoming House of Worship AV Challenges

BY KIM COBLENTZ

House of Worship often has unique AV challenges that don't come up in your everyday space. Aside from standard AV installation challenges such as ensuring proper displays, finding power sources as needed, and getting the equipment working right, you're also dealing with unique architecture, often mixing an assortment of donated devices having to work over large distances from the control station and the various devices being used. House of Worship AV system operators are often volunteers with various levels of experience and would greatly benefit from fast smooth switching for a live audience. HDBaseT can help overcome these challenges and create an easy to operate AV system.

What is HDBaseT?

HDBaseT is a standard for the distribution of audio, video, controls, USB and 100 watts of power over a single long-distance Cat 6 cable. HDBaseT products are certified by the HDBaseT Alliance, which helps ensure interoperability and educates installers and industries about the use of HDBaseT technology. Its benefits make it ideal for challenging complex AV installations.

Overcoming Challenges

First, let's start with unique architecture challenges. Houses of Worship often have high ceilings, lots of precious decorations and often times are older buildings. This can make cabling and installations challenging and be done with extreme care. Single Cat 6 cables and power over HDBaseT helps make installs simple and minimizes the footprint of the installation. Being able to run a single cable makes dealing with tight spaces and wiring around art installations easier. Old buildings often lack the number of power outlets

used today, so being able to get power through the cable means your devices aren't just limited to places with outlets.

Due to there being a mix of different devices, adapting them all into one AV system and making sure they all can communicate with each other is challenging. Being able to communicate to each other is vastly simplified when converting signals to HDBaseT. With HDBaseT being able to extend signals over long distances, everything can be controlled at one control desk through one single user interface. Additionally, high ceilings and having the control desk set behind the congregation is no problem with HDBaseT.

HDBaseT also greatly simplifies the AV system as it makes it easier for volunteer operators to understand and control. It also makes it easy to expand and adapt the AV system to new devices. This could lead to repeat business that is problem-free and ready for any new device to install.

The last consideration is having a live audience. Quick seamless switching through a video matrix can create a professional live experience unlike any other. This is where fast switching and control through HDBaseT can make a difference. Since HDBaseT accommodates a variety of AV control signals, switching different devices on and off or switching signals is quick and simple. This helps mitigate user error and makes switching faster, becoming a more pleasant experience for the audience.

A Real World Example

This is based upon our experience in providing HDBaseT hardware for an install at Oaks Baptist Church, Located in Grand Prairie, Texas. Oaks Baptist Church was looking to update their aging video switching system and projectors in its sanctuary. They needed a system that would be effective, functional and reliable for many years to come and overcome their current problems including an aging video switching system with a combination of analog and digital and was no longer working properly. The video outputs to the three projectors in the sanctuary were analog. In addition, there was no way to control the projectors as cabling between the control deck and the remotes had lost

Cable Type
HDMI
USB 2.0
RS-232
I^2C
IR

Maximum Range
15m (in practice)
5m (by spec)
15m (by spec)
1m @100Kbps (in practice)
>30m (in practice)

integrity. They had to use a long stick to reach up to turn on and off the projectors by hand. Finally, frequent video outages were not only affecting church services, but also affecting the video flow to the outer classrooms and hallways.

The solution we used was an HDBaseT Switch that connected three HDBaseT receiver units to projectors and one HDBaseT receiver with power over HDBaseT to power a projector in the back of the church that did not have a power outlet. The Matrix switch took input from both a camera and computer

that was connected to a multi-display adaptor as inputs and output to the four HDBaseT receivers. It also put HDMI out to an existing nine monitors and one streaming device. For this project, the audio system ran separately but HDBaseT can accommodate audio and video. After installation, the signal flow was picked up immediately and displayed on the existing projectors smoothly and effortlessly.

With our Web GUI on the matrix switch, it was an easy process to control, monitor and adjust all the projectors and monitors.

Oaks programed the three main projectors to all turn-off and on with a switch of a button. This setup also enabled close to zero second switching speed, meaning all the projectors and monitors would change almost immediately and effortlessly at the push of a button. Additionally, the HDBaseT enabled video matrix allows for expansions, which means Oaks add additional sources or output to new display endpoints in the future.

The end result was a massive upgrade for Oak Baptist Church and its congregation. No more video outages, no more

taking a stick to turn on the projectors and now they have a simple to use AV system.

In Conclusion

The true flexibility of HDBaseT is what makes it ideal for overcoming the oddities and sometimes complex existing AV systems in Houses of Worship. The fact that the HDBaseT Alliances certifies products helps ensure installations work and go smoothly after being drawn up in a connection diagram. Cabling is vastly simplified and can overcome large distances to create control stations away from the front of the church, not block the view of anyone in the congregation and avoid having to run cabling over any sacred artwork or architecture in order to be under the maximum signal distance. With a vast array of HDBaseT transmitters and receivers, existing AV systems can be integrated into an HDBaseT based AV system that is easily expandable in a House of Worship. Hopefully you will consider HDBaseT solutions for your next AV installation at a House of Worship to create a pleasing display for their congregation. **T**
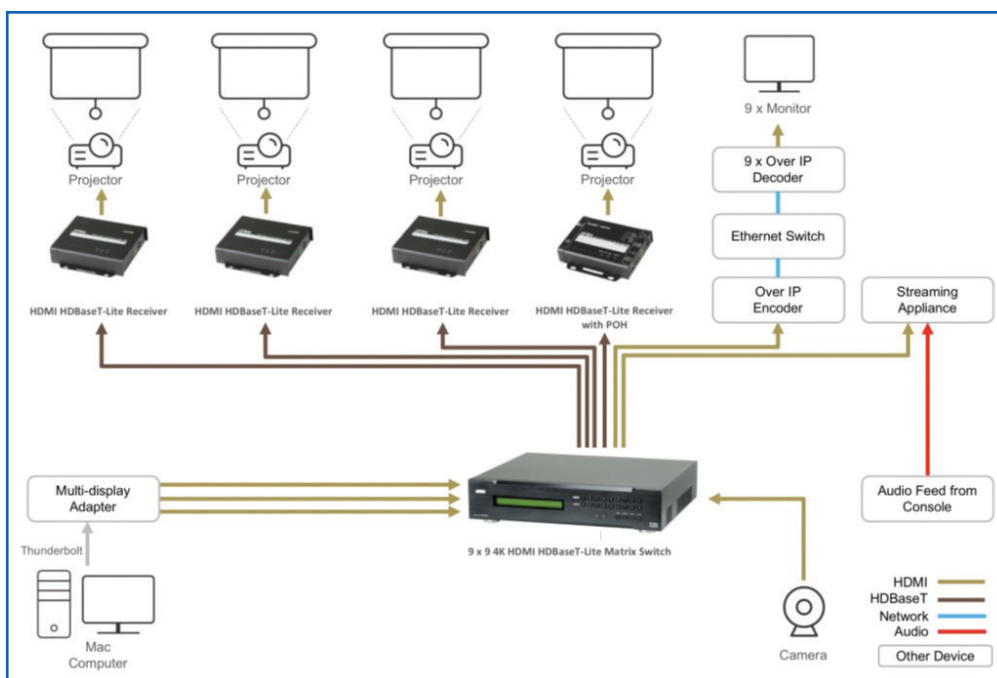
Kim Coblentz, *Pro AV Sales Engineer with ATEN Technology, brings over 20 years of experience to the AV industry and an HDBaseT Alliance trainer, helping customers achieve stability, solve complex problems, and become more efficient in their day-to-day operations.*

St. Luke's Cathedral:
Remote Production Solution
In a Live Streaming World

BY GRAHAM SHARP

I n the new normal we live in, being socially distanced and often worshipping from home, there is a huge interest in the various forms of remote communication, whether it is video conferencing systems or live streaming.

Although the technology is quite mature, it is often seen as inaccessible to the average user due to the complexity of installation and operation. A complexity which only seems to grow as users try to produce compelling content, resulting in many unanswered questions and frustration.

Fortunately, the advances in the remote and automation technologies of an integrated production system (IPS) now offer houses of worship a solution to easily produce inspiring live video without overwhelming their volunteers. A well designed IPS solution can provide everything needed to create and stream inspiring live video that can not only be easy to use, easy to operate but also affordable even for the smallest diocese, parish or ministry.

A great example is St. Luke's Cathedral in Portland, Maine, who live streams their worship services easily and effectively with their remote production solution and volunteer staff.

The historic St. Luke's Cathedral is the seat of the bishop and the chief mission church of the Diocese and people of Maine. Since holding their first service on Christmas day in 1868, St. Luke's has continued the tradition of reaching out to the city and people of Portland for almost 150 years. When looking to add a live streaming solution, they had a unique goal in mind – to provide streaming services for people who could not be present, or for people who wanted to hear the sermon again.

Setup

The setup of St. Luke's remote production workflow is very simple. The installation did not include a traditional control room but only an internet modem/router/WIFI access point, a single robotic camera and a Broadcast Pix integrated production system.

Though an internet connection of at least 15Mb/s is

recommended, St Luke's uses the local cable company's internet service. For $96 per month they receive 50Mb/s both up and down. In this application 'up' is more important than down, so watch out for cheaper, asymmetrical offerings and avoid ADSL. The Broadcast Pix IPS system's software uses adaptive bit rate technology to prevent stutter or lag. It adapts to the internet connection, the faster the connection, the better quality the streamed video.

A compact Sony robotic PTZ camera was then mounted on the back wall which provides wide-angle views of the church interior. The camera, which receives an audio feed from the church's sound system, streams the signal via IP to the integrated production system installed at Broadcast Pix headquarters in Tyngsboro, MA. From there, the service is streamed live to the church's website.

Use

St. Luke's selected the Commander control platform, which runs on a web browser from a Tablet, PC or Phone, for easy touchscreen control of their IPS solution. After connecting Commander to the Internet or WiFi, church volunteers have used the software-based interface to control the camera, add graphics, and produce the show from anywhere, using simple, single button pushes.

"There are a lot of folks who could do what we're doing; any volunteer with limited instruction can stream the service" Jack Swanton from St Luke's explained, "This is not a megachurch setup. That's a very different application. We are a very local Institution that wants to include our community even if they can't physically join us."

St. Luke's chose the Commander control interface for the automated control experience utilizing 'Macros', which streamlines complex production tasks into the push of a button. Its selection of relevant templates and pre-configured Macros allows for the creation of compelling live video instantly. Simple, single button pushes, with easy to
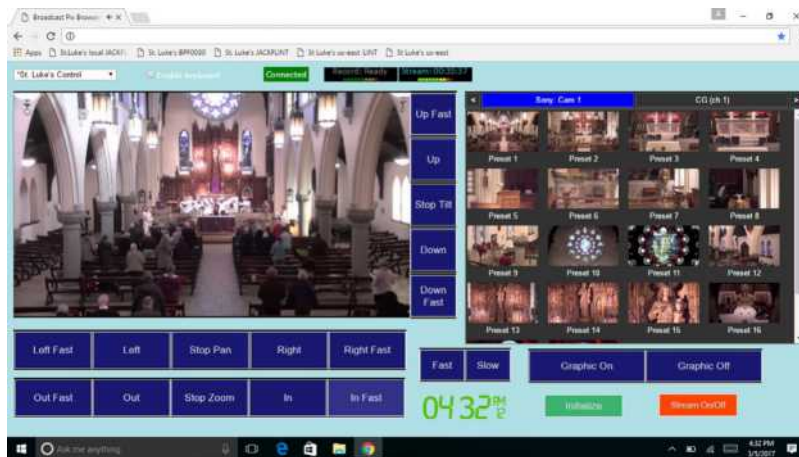
understand labels or even pictures recall Camera moves, roll graphic templates and play videos. As they continued to grow more familiar with the system, St. Luke's operators started using the Macro editor to create more sophisticated productions.

"The volunteers do a great job and produce a very professional result," said Jack Swanton.

Jack has created a number of Macros for St. Luke's worship services that change the camera positions, display graphics and controls streaming, that he can trigger from the Commander interface on his smart phone.

His favorite Macro keeps the production on schedule even when there is no volunteer available. He pushes the button exactly one hour before the service starts – the system starts to stream a few minutes before the service begins, follows the choir procession from the back to the front of the church, and locks down a semi-wide shot of the altar for the rest of the service. After 90 minutes, a credit screen is shown and the stream shuts down.

Conclusion

Years ahead of the new "stay at home" normal, St. Luke's Cathedral has been live streaming compelling worship services with a Broadcast Pix integrated production solution. Since September 2015, the church has streamed more than 300 services, ceremonies and other activities, that have been watched 22,692 times.

In summary, any church can benefit from adapting a new remote production workflow and produce inspiring live video with a well-designed, integrated production solutions. Not only are IPS solutions easy to set up and simple enough to operate for a non-trained member of a congregation but they also offer an affordable way for worship communities to stay connected through online video. ▣

Graham Sharp *is the CEO of Broadcast Pix*

How to Stream for Success from your House of Worship

BY STEVE MCGRATH

With the current pandemic causing a shifting pattern of restrictions on movements and gatherings in place, more and more Houses of Worship have been forced to look at innovative new ways to connect with their congregations. As always, the maximum impact is gained with a live event, and while live streaming to global audiences and an array of online platforms, including social media, may seem complicated at first, there are many tools that organizations can employ to simplify their live streaming workflows for an easy execution.

Capture: The Right Camera Makes It Easy

Whether streaming from a large megachurch or from a remote parish location it starts, as always, with the cameras. The good news here is that the choice for cameras is wider than ever, with numerous options available at a range of price points to suit all budgets. With 4K pretty much standard, churches looking to broadcast currently in HD will have no problems with picture resolution and are safe in the knowledge that their investment is future-proofed.

When it comes to set up, remotely operated PTZ (Pan, Tilt, Zoom) cameras can augment human controlled units, providing you with greater coverage and more available angles and are cheaply available. They can also be used in a 'set and forget' manner, allowing you to easily and quickly switch between screens and pre-defined views.

Some cameras make live streaming simple and are ready to use right out of the box with live streaming software built right into them. Other cameras use protocols such as UDP and RTMP which mean the signal is already embedded in a transport stream and can be picked up by Zixi software and others. The clue is usually the cabling; if the cameras can connect via Ethernet then the video is already in a transport stream.

Packaging: Hardware or Software-Based Encoder?

For cameras that are connected via traditional broadcast SDI cabling, the next stage is to get the video into a transport stream using either a hardware or a software encoder. Here the choices start shaping your workflow a bit more. Essentially the encoders take baseband video and package it for transport over the internet in groups of frames.

While theoretically it is possible to connect a camera directly to social streaming platforms such as YouTube and Facebook using protocols such as RTMP and RTSP, these are not great ways to transport your stream across the public internet and can result in blurry pictures and spiraling lag that gets worse as a broadcast goes on.

They also typically compress it to save bandwidth using a variety of different codecs.

Hardware encoders are built specifically for this task and are fast and reliable, though can be expensive. Software encoders are cheaper and typically run well, but their speed is often curtailed by the computer they are running on. Ideally this needs to be as highly specced as the budget can afford, wiping out some of the cost savings of the software route.

Switching: On-Prem or in the Cloud?

Switching presents another set of choices for anyone using a multi-camera set-up. There are again several hardware options that can be made here with varying levels of complexity and budgetary impact, but an increasingly popular choice is to punt this aspect of the production workflow into the cloud. Vimeo Livestream, for example, can take in multiple live feeds and output a single, mixed one, and supports up to 1080p.In other words, it provides a broadcast quality signal.

Quality Delivery Over the Public Internet is Achievable

Delivering a broadcast-quality stream is an important part of the consideration of the whole workflow; you want to give your congregation the best live feed possible. While theoretically it is possible to connect a camera directly to social streaming platforms such as YouTube and Facebook using protocols such as RTMP and RTSP, these are not great ways to transport your stream across the public internet and can result in blurry pictures and spiraling lag that gets worse as a broadcast goes on. To make the internet viable for live video, transport live streams using a protocol that is both congestion and network aware, that can ensure broadcast-quality reliability with hitless failover. Some protocols can even provide error-free video transport over IP, with high packet loss recovery and ultra-low latency delivery.

Keep Your Options Open: The Importance of Interoperability

Along with picture quality and bullet-proof reliability, interoperability is one of the key factors in setting up any streaming workflow. There are some live streaming software platforms out there that accept multiple protocols and can conduct protocol switching. This ability to take in one protocol and output another means the ultimate live streaming flexibility to provide quality video in the right format for each delivery destination.

This need for interoperability extends beyond software protocols too. For instance, some solutions may only be compatible with one cloud-provider. While it could be a good provider, being locked into one service means your options for scaling solutions are limited. This can also push you to the top end of your budgetary expectations quicker than you thought possible. To secure the best options for agility, look for a streaming solution that will work with any cloud of your choice, as well as any IP network and edge device solution etc. Interoperability leads to increased flexibility, and that is only ever a good thing.

Manage and Monitor Streams at Scale with a Cloud-Based Control Plane

When it comes to handling and configuring multiple streams at scale, a virtual control plane will make your live much easier. A cloud-based control plane will allow you to orchestrate, monitor, and manage your video supply chain from end-to-end, as well as provide telemetry into stream health so that you can check that their performance remains within targets and address any issues before they affect the quality of the stream.

Beware of Hidden Costs!

Lastly, check the running costs that the workflow you are employing is likely to incur. Some providers will charge for each and every stream they deliver; others, will only charge for the transmission of their own streams, allowing you to distribute the right content in the right formats to the endpoints of your choice with no additional costs.

Live streaming isn't the perfect solution for everyone and providing on-demand content is a deservedly popular route. But when it comes to retaining that connection forged with your congregation in the live setting of a House of Worship, there is nothing like speaking to them across the miles in real time with true low latency, broadcast quality, and crystal-clear video and audio. **T**

Steve McGrath *is a Solutions Engineer at Zixi*

Not your Grandpa's PAR Can

BY BOB MENTELE

The history behind the development and proliferation of the PAR can fixture is one of mystery and myth. Numerous theories exist regarding the fixture's adaptation into the entertainment lighting industry and the path to its existence has multiple coinciding adaptations that all seem to meld together during the 1960's. Like many early lighting fixtures, it was borrowed from another industry and used for something other than its intended purpose. The Parabolic Aluminized Reflector (PAR) lamp was developed as a sealed reflector, filament and lens assembly. This allowed for its use in multiple applications. The parabolic shaped reflector creates a high intensity, narrow beam of soft-edged light that is oval in shape. To use it how we wanted in the entertainment industry, a body or 'can' was eventually developed to enable the use of color filters and other fixture accessories. The PAR can primarily

found its home in concert lighting rigs where they would number in the 100's. They could also be found in film studios, but the theater typically preferred another type of wash fixture, the Fresnel.

All About PARs

PAR lamps come in multiple sizes, intensities and beam angles. The size of a PAR is designated by its diameter in eighths of an inch, i.e. a PAR64 lamp is 64 eighths inches in diameter (or 8"). They can also be found in multiple wattages, 500w and 1000w are most typical. Finally, it is available with various beam angles; Very Narrow Spot- VNSP (12°), Narrow Spot- NSP (14°), Medium Flood- MFL (24°) and Wide Flood- WFL (70°). To change the beam angle of a fixture a new lamp had to be installed, so a production company had to have multiple lamps on hand for each PAR fixture to allow for various uses.

The PAR fixture has been a mainstay in lighting design for generations as it is easily maintained and deployed. Because of the simplistic design, the fixtures are also relatively inexpensive. The possible uses for the fixture are almost endless and so the design of the fixture remained fairly constant throughout its existence. There were companies that designed their own versions, taking advantage of other lamp types, but the basic PAR remained the most popular. That is, until another technology revolution pushed its way into the lighting industry, LED.

The first LED fixtures developed were similar in design to a PAR fixture. They contained numerous independent through-hole mounted LED diodes attached near the front of the fixture and produced a soft edged, round beam of light. These fixtures usually contained Red, Green and Blue colored LEDs that when mixed could create numerous colors. While this was a good use of technology available at the time, the quality of light that the fixture provided was not great. These types of fixtures are still available but are typically relegated to entry-level applications, because the technology and materials to produce them are inexpensive.

Eventually, it was discovered that if you took the LED out of the independent lens assembly and placed it directly onto the circuit board, designers could then place a separate lens over the top of the emitter. These designs are referred to as single chip/ single lens fixtures. This change in design improves the quality and consistency of the light produced. It also allowed for an improved lens design that would provide different beam angles for the fixtures. Designers also began to incorporate more LED colors into the fixtures to allow for more possibilities when mixing colors. While these fixtures performed much better than the previous designs, they relied on the separate beams of light cast by each independent LED to be mixed in the air as they travel to the object the fixture is pointed at. If that distance is short, the color may not completely mix. This design can also cast multicolored shadows on objects as well. An additional issue is the aesthetic look of the lens when the fixture is on. Because of the multiple separate LED color lenses, the fixture can give a 'Lite-Brite' like appearance, which can be distracting to an audience when the fixture's lenses are in view.

The Evolution of PAR

To alleviate the multiple shortcomings of the single chip/ single lens LED design, a new method of LED placement was engineered. This new development is referred to as multi-chip LED. Instead of placing only one colored LED under each lens, the different colored LED diodes in the fixture are all located on one chip and under one single lens.

With this design, all of the color is being premixed within the fixture before it exits. This allows for a better blended, or homogenized beam of light. It also removes the issues of multi-colored shadows that single chip/ single lens fixtures can create.

The multi-chip design was first developed and released by Elation Lighting in 2007 in a three color, RGB variation. In 2009, a white LED was added to the mix to create the first quad-color multi-chip design. Because of the improved color mixing capabilities of the design and the increased output of LED diodes now available, Elation has continued to develop larger color array options in their LED fixtures. We are now able to offer a Seven color array chip in our Seven Par and Seven Batten series.

These fixtures increase the color spectrum a designer is able to use and improve the CRI and TM-30 ratings of the light output by using a Red, Green, Blue, Amber, White, Lime and UV color array.

While multi-chip LED fixtures are the most popular style of fixtures available and in use today, they still have some downfalls. One is again purely aesthetic - when placed in view of an audience, multiple lenses can be seen. In some applications, that takes a person out of the environment that is being created. As for technical shortcomings, the use of multiple lenses and chips within a fixture can create multiple shadows when a subject that is being lit is located near a wall or other surface. Multi-chip fixtures also do not allow for easy beam manipulation or control through methods common in single-sourced incandescent devices. This can make them difficult to use in theatrical, architectural or other applications that may require very precise beam control.

LED designs are constantly improving and manufacturers eventually came up with the Chip-on-Board or 'COB' LED to improve on the multi-chip LED design. In a COB LED array, instead of mounting each LED directly to a circuit board, the bare LED chip is put in direct contact with a conductive substrate. This allows for the diodes to be packed in a higher density and creates a brighter array in a smaller area. A COB LED array allows for up to 8 ½ times more LEDs to be placed in a 10mm x 10mm square array than with existing SMD LEDs. This tighter spacing also allows for better light beam uniformity.

In our application, a COB LED creates a fully

premixed, homogenized beam of light that exits the fixture through a single lens. This technology allows for the light to look reminiscent of the incandescent fixtures we are used to seeing. The aesthetics of the fixture are improved, but so is the way that the beam of light can be controlled. The single source of light allows for the use of a larger lens and reflector assembly and can create a wider beam angle than multi-chip LED designs. The beam can also be controlled very similarly to incandescent fixtures through the use of barn doors and other modifiers. Also, the issues of multiple shadows on surfaces is eliminated with these improvements.

Choices, Choices, Choices...

So, with these options available, why should one technology be used over the other? Multi-chip LED fixtures are the most prevalent and they come in numerous color array options, from one color to seven color. At this point, more development has been made on the multi-chip LED arrays as well, so fixtures that are utilizing that technology are becoming brighter than COB array fixtures. If you need a fixture with a wider color spectrum and higher output intensity, than a multi-chip LED might be best for you. Also, because the placement of the LED lenses is what dictates the fixture's beam angle shape, these types of fixtures can be designed for different applications. They can be placed in a circular array to allow for a circular beam, like in a PAR, but they can also be arranged in a linear array to provide a linear asymmetrical beam, like in a batten fixture.

COB LED fixtures are still being developed but not as quickly as multi-chip. The fixtures available are quite nice but are limited on color spectrum. Most feature only a quad-color chip, typically either an RGBW or RGBA color mix. Single color fixtures are also available and because of the space given to the single-color array, these types of COB fixtures tend to be brighter than their multi-chip single-color alternatives. If you want to have a fixture with a wide maximum beam angle and need to be able to control and manipulate the beam, like a tungsten fixture, than a COB fixture might be the best route for your application.

Whichever LED array design suits you and your venue best, there are numerous options to choose from. **T**

Bob Mentele *serves as Vertical Market Manager at Elation Professional where he provides specialized service to the growth markets of worship, theatre, broadcast and education. He has a technical background in lighting and a wealth of experience in the worship and theatre markets.*

Taking it to

BY HOLLAND DAVIS

One of the interesting challenges of the Corona Virus Pandemic are guidelines restricting indoor worship for churches in certain states, like my home state of California. These restrictions have caused a variety of reactions from church leaders. Some are protesting and meeting in defiance of state guidelines. Some are pursuing litigation. Others have cancelled in person services and are only meeting online. But one option the President gave and that has been supported by nearly every Governor is meeting outdoors. Think

about it: our government leaders are telling churches to go out into the world and worship the LORD. Sounds like the words of Jesus in the great commission. For the first time, churches are being encouraged to meet in public spaces, giving churches an incredible opportunity for the gospel. Here are some things you need to consider when meeting outdoors.

Consider an FM Transmitter

An FM Transmitter takes a feed from the audio mixer and broadcasts it on a limited number of FM Stations (that you select). This allows

attendees to listen in their cars or on a FM Radio. The benefit: it allows you to greatly reduce noise levels due to city restrictions. We purchased a Mono ACC100 FM Transmitter in Enclosure with PS & Antenna from Progressive Concepts. Cost is approximately $350 delivered. It is called a Part 15 Certified FM Transmitter, and covers 40,000 square feet or a 200-foot radius. That's about the size of a football field or a one-acre parking lot. It does require line of sight, so we raise our transmitter ten feet in the air to give us unobstructed coverage and it works

beautifully. It is important to purchase an FCC Part 15 Certified Transmitter to avoid being fined for not having a broadcast license. No license is required with the transmitter we purchased.

Consider a Power Inverter

There are several brands that will do the job at various price points. The Power Inverter we purchased provides 2000W with three AC Outlets and will power a small PA System. All you need to do is hook it up to a car battery. Our Power Inverter will allow us to hook up to two car batteries and cost around $150.

the Streets

Generators are great to use, but cities place restrictions on the use of generators in public spaces and they are noisy. Power Inverters are quiet and are highly portable.

Consider Adequate Signage

Signage is extremely important when doing an outside event with restrictions. If you are using an FM Transmitter, you will want to make the FM station you are broadcasting on clear. You will also want to include the guidelines for your particular region in a clever way. In our case we said, "Give yourself six feet

QUICK POINTS

• Meet outdoors in public spaces

• Invest in an FM Transmitter, which will allow attendees to listen in their cars or on a FM Radio Invest in a power inverter, which can be hooked up to car batteries, are portable and run quietly

• Use signs to encourage a safe worship experience and keep it fun

• Inform local (and state) authorities

• Partner with local churches for one large, outdoor event with other houses of worship helping share the tech load

• Look for large, public spaces to hold worship – parking lots, parks, beaches to parks, beaches, or any other outdoor location, where you can broadcast a worship service without a license from the FCC

of space to get your praise on... Sing loud with your mask on... Let the love of Jesus shine from inside your car!" We wanted to encourage a safe worship experience and keep it fun at the same time.

Consider Informing Local and State Authorities

We held a prayer gathering a week after a protest in our city. We informed the city council and the police department and they were thankful that we were holding our event. We were told our city needed more events of this nature, and they also made sure we had

protection in the event of protestors. In fact, we were informed the day of our event that protestors were on the way; however, they never showed up and our event proceeded without incident.

Consider Creative Places to Meet

In our city, one of the largest outdoor parking lots is privately owned by believers. We are able to hold large gatherings using our Part 15 FM Transmitter for sound amplification. This includes one of the largest in car Christian Music Festivals held in our city with four bands and various local church speakers called the Rockin'

Praise Music Festival. Partner with local churches to reach your city. A local church is providing sound, stage, LED walls, and lighting for free. We are providing the Part 15 FM Transmitter. Look for large parking lots that are willing to let you use it for an event. You can even use your Part 15 FM Transmitter to go to parks, beaches, or any other outdoor location, where you can broadcast a worship service without a license from the FCC. Instead of looking at the limitations placed on churches by local governments, look at the opportunities to do something you normally wouldn't do to reach your city with the gospel. ⊤

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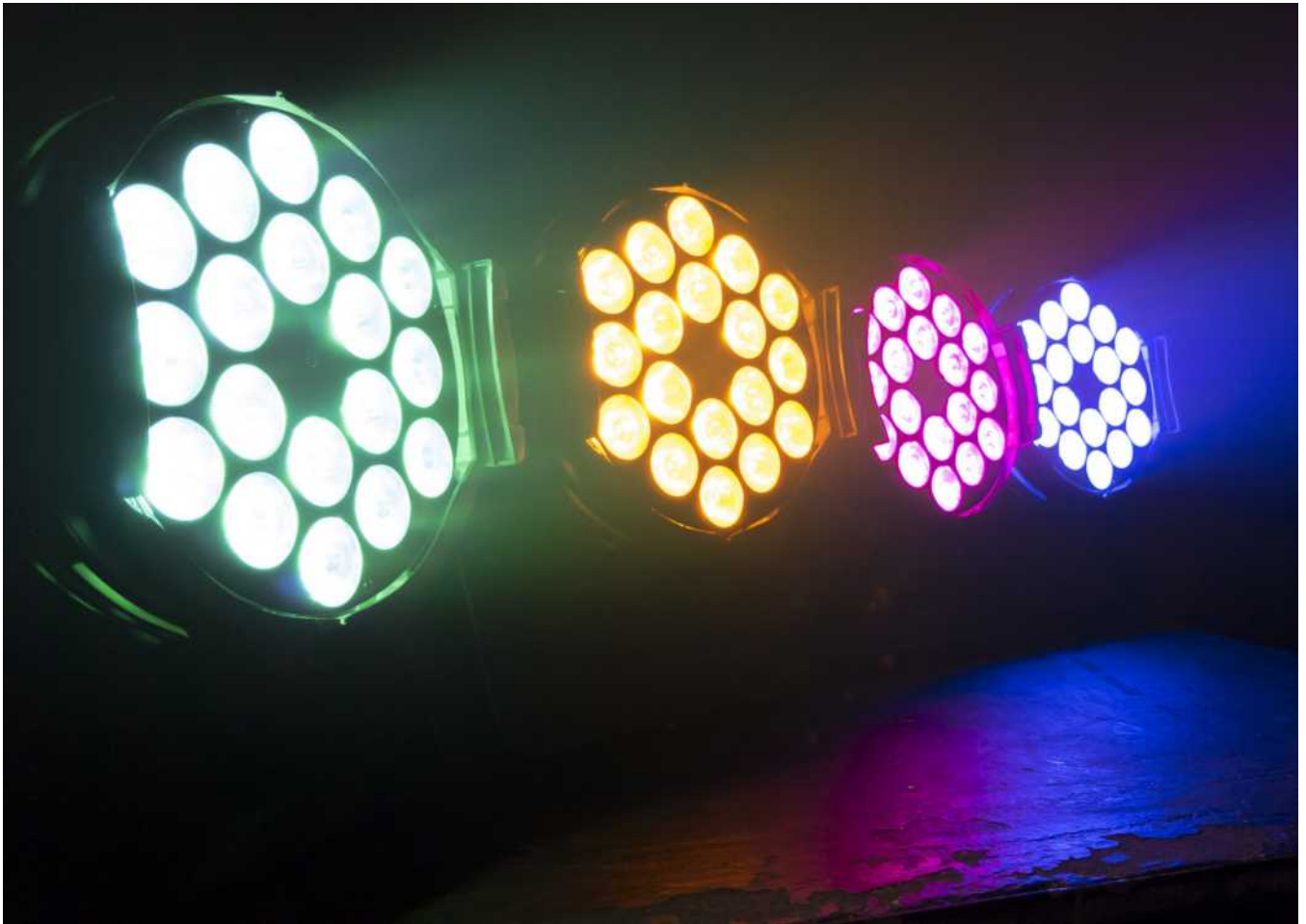
How to Read LED Specs

BY TIM ADAMS

In the world of LED lighting fixtures, there are so many options that we cannot have a useful discussion without establishing some parameters. For the purposes of this article, we'll be focusing primarily on LED fixtures that are not designed for effects, but rather for the more standard front, back, and up-lighting functions. The plethora of effect and moving head fixtures preclude me to talk about all of these within the confines of this article.

Ok, with that out of the way, we need to start by understanding that arguably one of the most important specifications of any lighting fixture is the amount of light it outputs. This is commonly measured in lux, though you may see a foot-candle measurement, as well (e.g. fc).

The trick with LED lighting measurements is to understand, and pay attention, to how quickly the light "falls off," or how quickly it diminishes in power. Many LED par lights have pretty impressive measurements within the first six feet, but then die quite quickly when that distance is doubled. You will pay more for fixtures with lenses that focus the light to help mitigate this effect, but then we run into another potential issue.

Beam angle is an area where many manufacturers will "cheat" a little by narrowing this angle to produce higher light output at greater distances. With LED ellipsoidals, this isn't a big deal as a lighting designer relies on these lenses to control or project the light beam in order to produce a beam diameter on the platform that is sufficiently large for their needs. Where you see this practice get a little shady is when you are looking at pars or strip lights with very

narrow beam angles (e.g. 8°-15°). While this might work well for uplighting a wall or set, many church techs who don't know better purchase these fixtures, which can be priced significantly cheaper than more appropriate fixtures, and only realize their mistake after the fixtures have been installed.

Color temperature can play a huge role in establishing whether your lighting looks natural for skin tones or whether you will be able to produce certain colors, such as pastels. Understanding the color abbreviations that accompany LED fixtures is important. RGB means a fixture that utilizes separate red, green and blue LEDs to achieve color mixing. RGBW adds a cool white which helps with pastel colors, while RGBAW adds an amber color, which can help produce warm white. RGBA eliminates the cool white while retaining the amber for warm whites. Finally, RGBAW+UV is what I consider the holy grail as it adds ultraviolet capabilities which can lead to some pretty awesome effects for your lighting system.

Where color temperature factors into this is when you are trying to establish the "white" you want to use for your lighting system. Do you want a cool white (people perceive cool white as "brighter," but it also carries the look and feel of an office or classroom), or do you want the softer warm white (this would be considered the lighting we often see in homes, where it is welcoming, more complementary to skin tones, and has a softer

feel)? Establishing this ahead of time will help you know what to look for in your LED fixtures. Many manufacturers will offer variable white versions of their fixtures for those that are not needing color capability but would like the flexibility of either choosing their own "white" or move between cool and warm whites, as needed.

> ## The trick with LED lighting measurements is to understand, and pay attention, to how quickly the light "falls off," or how quickly it diminishes in power.

When you are looking at a fixture, you will want to look for a section in the manual or a separate document called Photometrics, which will give you detailed measurements of how that fixture performs with light output and beam diameter over a given set of distances. This can be very helpful in establishing not only if this fixture is right for your needs, but how many fixtures you will need to meet your needs.

Another important spec to pay attention to is how many DMX channels a fixture will occupy. This can be a "gotcha" with fixtures that allow you to control the different LED colors individually. Because DMX contains 512 channels of control, it's easy

to assume that you have all the headroom you need. However, with many small churches, the limitation is the controller, which may only have 16 channels, which get occupied very quickly when you have RGBAW+UV fixtures, which take up 6 channels each. You can cheat this a little by ensuring fixtures have the same DMX address (e.g. DMX channel 1 will occupy channels 1-6) and still give you control over the red, green, blue, amber, white and UV colors and mixing. However, If you have more than two groups of fixtures that you need this level of control over, you will outgrow your controller. You may choose to look at lighting control software, including tablet apps, or you may want a larger hardware controller, which tend to be more expensive. Either way, you need to make sure you account for every fixture, how many channels you need control over for that fixture (many fixtures come with multiple channel control options such as 3- or 4-channel mode), and how many fixtures you need total. The channel count can skyrocket on you if you're

not careful.

Choosing LED fixtures doesn't have to be overly difficult, but it's quite easy to get in over your head pretty quickly, especially when you don't understand what the specs mean. The biggest single piece of advice I can provide is to not get sticker shock when evaluating lighting. The upfront cost of LED lighting is high, no doubt, but it's an investment that will easily last 10-15 years so take the upfront cost and amortize that over this kind of timeframe and you'll find it's quite affordable. When you factor in the savings on your power bill, this just adds to the lifetime value and high return on investment. But do the research and talk to professionals before you make a final decision; you don't want to spend that kind of money just to be wrong. **T**

Tim Adams *spent over 20 years volunteering in church technical ministry and now focuses on helping small churches achieve technical excellence through equipment upgrades, training, sharing best practices and teaching leadership how to cast God-sized vision.*

How To Help The Next LD

People ask me to go in and look at the lighting system and help them make better looks. The first thing I am going to ask for is the light plot and the hookup. What are they you ask, and why do I want them? A lighting rig consists of several fixtures and they are not all the same type or located in the same place in the room. So, if I point to a fixture and want that one to come on how do I know what to tell the board operator without some paperwork to guide me.
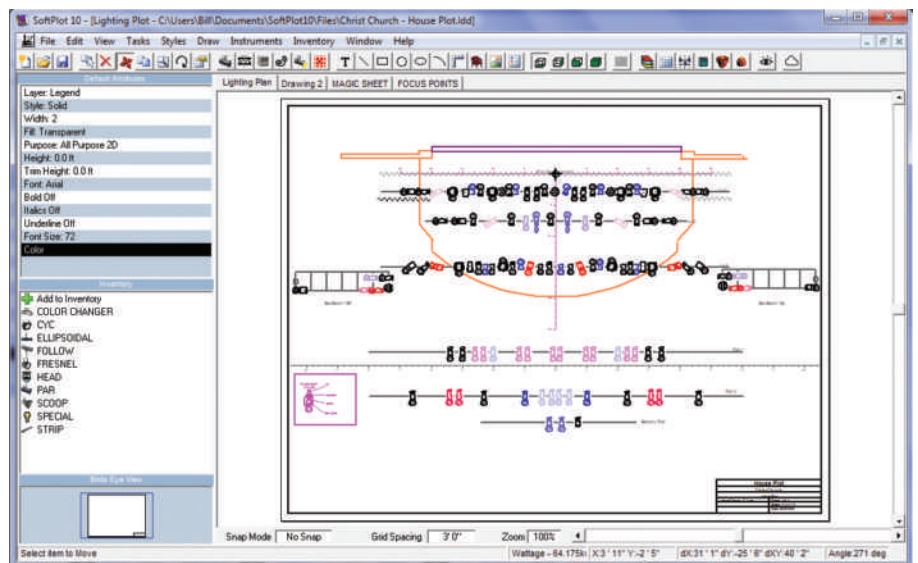
In the illustrations provided by Crescit Software there are 4 images. One is the lighting plot, the next is a blowup of one section, the next is what is called a Magic Sheet, and the last is a spreadsheet view of the rig called an Instrument Schedule. The software used to create all this paperwork is called Softplot. In the software you can layout your space and the lighting positions. When you have the space laid out you start adding your lighting fixtures. Softplot is not the only software available to create light plots, for anyone working in the construction industry you will be familiar with Autocad, or Vectorworks. Both of these programs are the powerhouse programs and are massive over kill for a simple church light plot, costing in the thousands of dollars, compared to less than a hundred.

A simple church light plot with up to around a hundred fixtures needs good documentation just not all the features of a Broadway light plot. So back to creating good documentation. Once you have finished adding your fixtures to the light plot you need to decide how to control them. In this new era of no dimmers and LED fixtures you need to understand DMX.
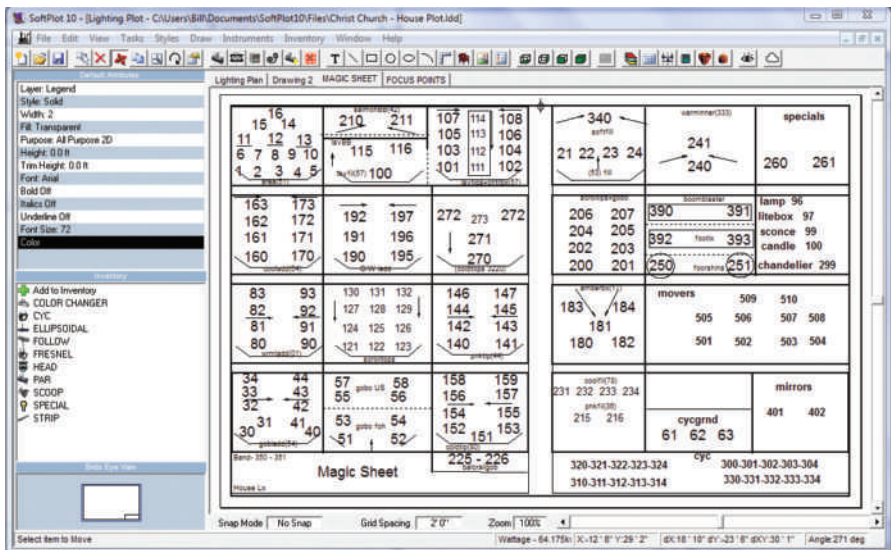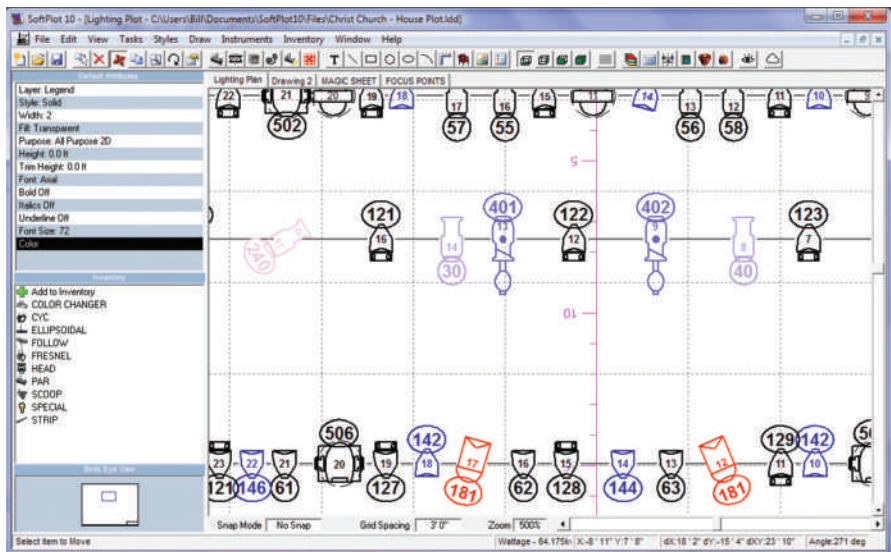
DMX512 is the formal name for the protocol that is used to talk between

the lighting controller and the fixtures. When DMX first came out, we only had dimmers, so things were easier than. A dimmer is a single device that controls the attribute of intensity of the lighting fixture. Dimmers come in racks so they are all in one place and they are numbered sequentially, so if you tell the controller that you have 48 dimmers

and they start at 1, the controller knows to address them all from 1 to 48. Fast forward to today and people are not installing dimmers in new construction. All the lighting fixtures are using LED's as the light source. These fixtures require steady power to run the electronics and a data source to tell them what to do. Now we have fixtures with multiple attributes that need to be controlled, instead of just the single attribute of intensity, we have color attributes. Also the fixtures are spread across the space not all located in a nice rack. You now have to go to each fixture and tell it when to start listening to the DMX data, meaning what address is the starting address for that fixture.

Back to the documentation to help sort this out. As part of the information about the fixture is the DMX chart, or footprint of attributes you will be controlling. A lot of fixtures offer more than one choice of mode, so you need to look at the manual and the DMX chart to decide how you want to set the fixture up. That information is then added to the documentation for your rig about that type of fixture. When you have all of this information figured out for all of the fixtures in your rig you can move to the next step, deciding what is the starting address for each fixture based on the footprint.

Before we go further into patching the fixtures, the term for assigning the DMX address, you need to understand that DMX has a limitation. You can only control 512 slots, (read address) in a run of data. When DMX first came out the limit seemed astronomical since that would a lot of dimmers. Now 1 universe (a run of 512) is easy to fill up with fixtures since what appears as a simple PAR fixture can use 12 to 17 slots. If you have 10 of these fixtures as back light you are now using up 120 to 170 slots. So, most controllers are available with the ability to talk to multiple universes of DMX.

One of the easiest way of determining what is the starting address of each fixture is to use the lighting controller to do the work of setting that value. Almost all consoles now have to be told what they are controlling so they have a patch function which allows you to choose the fixture from a library and tell the console how many, what mode they are in, and where in the DMX universe to start. Once you start patching the console will usually add fixtures to fill the universe as you choose the next type.

Once all the fixtures are patched you record that information to the lighting plot software so that you can print that information out for people when you are not available. If I were to come in I could then look at a fixture find it on the plot and see all the information about it and bring it up on the console.

Now you know why good documentation is important, others depend on it. ▣

EMERALD CITY:
A Year with JVC

Roughly a year ago, the Emerald City Seventh-day Adventist Church participated in an equipment demo and subsequent review of a number of JVC video products. The church was so impressed with the equipment, they purchased the bulk of the demo system. After a year of use, we wanted to follow up to see how their experience has been with the equipment. For reference, the church purchased 1x KM-IP4000 IP switcher, 2x GY-HM250HW cameras, 2x KY-PZ100WU PTZ cameras, 1x P2418HT 24" touchscreen monitor.

Q & A

With Robert Byrd, Jr.

TFWM: How has the JVC equipment performed over the last 12 months?

Robert Byrd, Jr.: Overall, we have few complaints. There are a few picture clarity things I'm trying to work out, probably related to the camera's positioning, lighting, or wiring, that I need more time to investigate, but I'm pretty sure it's not the cameras themselves. We had a few instances of the switcher program freezing prior to software update, but no issues since.

Do you find that you are using more capabilities of the system now than you were a year ago?

Byrd: We are; particularly, the transparency layering for computer inputs to allow us to generate and use lower thirds.

What would you like to see improved?

Byrd: It would be very helpful to have the ability to save most settings on the switcher software to maintain consistency from week to week, particularly when switching between different directors.

It would be cool to more directly use the Ingest stream in picture-in-picture modes; initially it seems to be able to be set as a camera, but it hasn't been able to read the signal that way in several months. We also find that the software's UI for adding in verbiage/wording could be easier to use; that's something the JVC team acknowledged early on as well. Lastly, having a way for the system to automatically update to the latest software would be welcome.

How easy is the system to use and how easy is it to train people to use?

Byrd: Overall, we have found it pretty straightforward to use and train. The touchscreen ability helps with this tremendously. We haven't ventured too far in training all the nuances of the program, but training on what matters most has gone well.

How has this system helped you navigate through COVID, if at all?

Byrd: The new cameras and software have been a big help, keeping people connected through this time. We'd done a few 'newish' things with the transparencies, since no one has really been in the building and we have a bit more freedom on what we do with the other computer output. On the flip-side of all that, we were largely doing these broadcasts prior to COVID.

What would you say to someone else about this system?

Byrd: It's an easy system to use to do all the most important things and having the built-in multi-streaming capability is really helpful.

We stream to YouTube and Facebook every week. If we can be given the ability to save our settings and have a place in-software to verify our software version, there wouldn't be any issues at all. We are overall extremely happy with the JVC system and it is light years ahead of where we were with our old system. **T**

Robert Byrd, Jr., *an engineer by profession, has worked within church audio/visual teams for the majority of the last ten years, and has been with Emerald City Community Seventh-day Adventist Church for the past five years.*

Church of The Nazarene Spread Words of Hope with Telestream's Wirecast

Midland Valley Community Church of the Nazarene, nestled in Graniteville, SC, a suburb of Augusta, GA, has been spreading the word of hope and faith for 82 years. Established in 1938, the church has grown considerably over the years, relocating to a brand-new building in 1990 and continuing to bring Christ and people together while expanding its Sunday sermons, special events, youth programs and more. Today, it serves more than 1,005 members of its congregation with sermons and special programs, all under the guidance of Lead Pastor Reverend David Gallimore and Executive & Worship Pastor Michael McAdory.

CHALLENGES

Always looking to inspire its congregation, as well as its community, the church was looking for ways to widen its reach. The leadership wanted to be able to extend its services to members of its congregation who may not have been able to easily travel or who were located far from the sanctuary yet still wanted to participate. The leadership was seeking a solution that would allow them to live stream their Sunday services, as well as some of their other events and programs, and take their productions to a higher level beyond the limitations and capabilities of Facebook Live. Additionally, the church had just welcomed a new lead pastor, who was leaving a full-time evangelism ministry. He had many followers from all over the world who still wanted to "attend" his services, which they were able to do through the dedicated Facebook Live streaming of the lead pastor's wife.

The congregation had spent months researching various options, but once it became aware of a global health crisis and saw that "shelter-in-place" guidelines were on the way, its quest to stream Sunday services and adhere to social distancing mandates became even more urgent. Thinking beyond the social distancing period to when live, in-person sermons would again take place, it didn't want to give up

any of its seating to allow for large cameras and associated equipment in order to stream. It needed a solution that was compact and easy to set up yet still produce professional-looking results. It also needed something simple enough so church volunteers who did not necessarily have video production or streaming experience could operate it.

SOLUTIONS

Congregation member Brian Willis, a cinematographer, volunteered to work with Pastor Michael McAdory to get the sanctuary's live streaming to a place where they would be able to reach the church's 1,000-plus member congregation at home and serve the community well in the time of social distancing — and beyond. The team spent months researching various solutions, but when the sanctuary's IT and networking tech Chris Ward became involved, he suggested Telestream's Wirecast Gear solution. Ward, who was a church volunteer and employee of the city of Aiken, SC was familiar with Wirecast Gear since it was what he was using at work to live stream council meetings from the municipal building.

The church decided on Telestream's Wirecast Gear 420 and the Wirecast X-Keys controller, along with BirdDog Eyes P200 1080p NDI PTZ cameras and a BirdDog PTZ camera keyboard, as the perfect solution.

"We were literally looking at hundreds of cameras, switchers, and encoders when Chris had said, 'let's take a look at this solution,'" explained Willis. "We started looking more and more at Telestream products and their Wirecast Gear solution and it just seemed like the right fit. It was everything we needed. We were going to have to buy computers to run the software to switch everything to encode it, so instead of buying five or six different pieces to be strung out on a table top, we decided to buy one box and have it do all the work. The Telestream Wirecast Gear system fit us really well."

"Something else we had to think about was that our church was never built to hold live cameras," added McAdory. "In 1990, when the new location for the sanctuary was complete, people weren't thinking about having cameras all over the floor or massive video productions. For us to incorporate manned cameras into the sanctuary, we would have lost real estate — about 20 to 25 seats — which is a lot for the Church of the Nazarene. That's why we decided to go with PTZ cameras. We could mount them on walls and they would take up very little real estate and they weren't in the way of the congregation."

Telestream's live video production solution, Wirecast Gear is an easy to use, turnkey, fully configured live video streaming production system. With Wirecast Pro

pre-installed inside Gear's custom-designed hardware, it's a live event production switcher, live news production system, Facebook Live and YouTube Live encoders — all in one box. Each model of Wirecast Gear comes with Xeon Server architecture, up to five HD-SDI or four HDMI professional camera inputs and all the live video streaming production features of Wirecast Pro, the Stock Media Library, NewBlue Titler Live Complete, and Switch Player, all in a compact hardware system. The Church of the Nazarene only need to plug in cameras to start producing and streaming their events.

Alongside Wirecast Gear, the sanctuary is also using X-keys for Wirecast, a custom-designed USB control surface. It's been designed to make operating Wirecast faster, simpler and more intuitive with most often used functions at the operator's fingertips.

Once the Wirecast Gear, X-keys, cameras and other gear arrived at the sanctuary, the region was going into quarantine, and Willis, Ward, and two other church volunteers worked quickly to set the system up so that the Church of the Nazarene would be able to live stream to its YouTube channel and Facebook page, bringing next Sunday's services to its congregation at home.

"Under normal circumstances, we would have been very methodical and slow and taking two, three or maybe four weeks to get the system to where we wanted it before going live with it," explained McAdory. "Our hand was forced. We didn't have a choice because we needed to be able to reach our congregation immediately. We continued to make tweaks over the following weeks and now everything is exactly where we want it to be."

RESULTS

"We've been really impressed and thrilled with the Wirecast Gear," said Willis. "Physically, it's very compact — the whole thing fits in a two-rack unit box. And when space is a premium at church, and you do not have the option of having lots of 'boxes' taking up space, it's very helpful. It's basically the size of a desktop computer and we use three monitors to display all the windows. I refer to it as 'Ground Control'. Adding in our NDI cameras, our complete system takes up little space and is very portable. If we have to move the system, we can pretty much unplug it and reconnect elsewhere, assuming we have a capable network connection to plug into."

Willis refers to the Wirecast Gear solution as an "all-in-one tool" where everything the church needs for a production is all within the system. "We can bring our camera feeds in, add in graphics, connect to our Propresenter system and go," he says. "Having the four encoders allows us to be flexible with where we send our streams."

Additionally, he said the system was easy to set up. In just a few clicks, they were able to be up and running. "Being able to save Wirecast settings is helpful as well," he said, "since we have the X-keys controller, it's easy to see what is being matched on screen. There are also the push-button production features. We are likely going to have a large number of volunteers that have no experience with video productions operating the system. With that in mind, Wirecast is simple enough, especially with X-keys. With minimal training we can have an inexperienced operator running our system with our cameras in three fixed framings within a few hours. The more complex productions which would include changing camera framings (wide to tight and back), adding graphics/videos, etc. will come in time."

McAdory is pleased that the system is allowing the Church of the Nazarene to reach more members. "We officially started streaming the next Sunday after we cancelled live services due to COVID," he said. "Previously, we were only doing Facebook Live off an iPhone. What we can say with certainty is that we have people tuning in from all over the United States — from our local church family, to West Virginia, to Oregon. Further, we have seen folks from Scotland and Africa on occasion. The numbers vary pretty drastically as far as online viewers, but we've had as many as 2,800 viewers."

The sanctuary was also able to add an additional segment, streaming live from its foyer to "welcome" its congregation to Sunday services. The goal here was to not only increase its reach but to encourage engagement. "It's been a huge success after just two weeks," said McAdory. "We are responding live when people sign on, tell us from where they are watching, and greeting one another in the chats."

LOOKING TO THE FUTURE

For now, the church will stream its services live and produce videos in HD (1080) or lower especially since streaming services will take 1080 video and stream it at 720 or even 480. However, Willis said they are watching trends and as productions move from HD to 4K, they may have to make some tweaks to what they're doing and how they're doing it.

Future plans include using the system to record special events, such as the church academy's children's plays, running the system remotely to stream from the gym, youth house, outdoors, and for special events such as teachers' conferences. The church is even looking into using the Wirecast Go mobile app to stream events such as its denomination's teen talent competition called Top Nazarene Talent.

"As we continue to grow as a church, and our media outreach continues to grow as well, we'll have to start having production meetings to discuss things like, types of shots, musicians playing, where people are going to stand, if the pastor is going to come off of the platform, so we can plan accordingly," added McAdory. "We feel confident that the Telestream Wirecast Gear will allow us to do what we need. It's been the perfect fit for us and we're looking forward to continuing to stream our Sunday sermons and add more programs beyond this social distancing period and into the future." ⊤

CONNECTION THROUGH TECHNOLOGY
at Pinelake Church

BY PHILIP HAGOOD

Fifteen-year-old speakers, failing components, and a design that no longer keeps up with modern programming – this is a familiar circumstance for many churches built in 2004 and Pinelake Church in Jackson, MS was no exception. Pinelake's Reservoir campus serves as the hub for their campuses all across Mississippi, and the aging audio system was limiting their capabilities in presenting and distributing their services and worship. Pinelake reached out to our team at InteRise for help updating and reimagining what the audio system could look like. Through an effective partnership, Pinelake and InteRise developed an innovative system that will serve the church for many years to come.

THE CHALLENGE

Pinelake's worship style is modern and high-impact but has a unique focus on creating a deep personal engagement with the congregation – therefore the audio system needed to mirror that vision. "When we first moved into this building (The Reservoir Campus), the church had just stopped using an orchestra and moved to a praise band. Now we are very contemporary in our worship style", says Kevin Hoober, Director of Worship Technology. Pinelake approached a number of systems integrators to help them address this problem and chose to partner with InteRise in Nashville, TN. When discussing the reasons why Pinelake partnered with InteRise Hoober said, "They understand

the heart of the church and they have been a pleasure to work with". Through close collaboration between myself and Kevin, we determined that the new system needed to cover the room with great audio but have minimal intrusion into the site lines of the stage. That was a significant challenge due to the height of the ceiling relative to the size of the seating areas. One major benefit of working with Pinelake is the level of expertise that exists in their worship and technical teams – we were able to immediately jump into thinking outside the box for solutions. A large distributed point-source system would not give Pinelake the localization and impact that was desired for their creative vision, but a large column of line array speakers would be an eyesore in the space and block the front-project IMAG screens. The only way we were able to find a solution that accomplished all of the goals was with the assistance of detailed 3D modeling. The InteRise design team, led by Paul Holst, used a Leica 3D laser scanner to capture and draw several million data points and then convert that into a hyper-accurate 3D model of the auditorium, catwalk, and speaker cavities. In addition to the speaker system upgrade, Pinelake wanted to upgrade from the single Yamaha CL5 at front of house. The console configuration was creating a workflow bottleneck because one console and engineer was mixing front of house, monitors, and broadcast. The CL5 capabilities were maxed out, and a larger format desk was needed. Pinelake had aging wireless microphones and in-ear systems that needed to be updated to modern technology.

THE SOLUTION

After the creation of the 3D model, the room was drawn in several different audio mapping software packages to allow for modeling of acoustical interaction and direct sound coverage of several speaker system options. Our focus at InteRise is to give several options that we feel would meet the goals and then educate the church as to the strengths and

weaknesses of each option. There is no such thing as a perfect system, and systems integrators often provide cookie cutter solutions as opposed to equipping the church with the knowledge to make the best possible decision on their own. In the case of Pinelake, we presented three different

GEARLIST

30 d&b Audiotechnik Yi12

4 d&b Audiotechnik SL-SUB

2 d&b Audiotechnik 24S

7 d&b Audiotechnik 24S-D

2 d&b Audiotechnik 8S

4 d&b Audiotechnik 5S

3 d&b Audiotechnik 21S

1 d&b Audiotechnik DS100

1 d&b Audiotechnik En-Scene software

3 d&b Audiotechnik DS10

9 d&b Audiotechnik 10D

3 d&b Audiotechnik 30D

2 d&b Audiotechnik D80

1 QSC Core 510i

1 Yamaha Rivage PM7

2 Yamaha HY144-D-SRC

4 Shure AD4QNP

3 Shure AD1

10 Shure AD2/K9B

2 Shure ADX1

3 Shure PSM1000

1 Professional Wireless UX-8

8 Shure SBC220

1 Shure SBC240

3 Shure SBC200

30 Shure SB900A

speaker system design concepts that were fairly gear agnostic. The option that quickly became the most compelling choice for Pinelake was an immersive audio system. Pinelake has numerous d&b audiotechnik systems across their campuses and had positive experiences with the performance, price, and longevity. With that in mind, a distributed d&b Y-series line array system in an immersive configuration accomplished the goals of the new system while also meeting the price point. Using d&b Soundscape technology, the system was able to cover the entire seating area while maintaining relatively short columns of speakers to protect the site lines. Pinelake was able, through the collaboration of our team at InteRise and their highly-skilled architect, to make minor modifications to the existing speaker fabric cloud and catwalk system to give ideal placement of the loudspeakers while making them nearly invisible to the congregation during a service. In addition to the small footprint of the system, Soundscape creates localization across the entire seating area, so that the system not only covers the congregation with great audio, but it pulls the listener into the experience of worship by immersing and engaging them with audio that is free of the distractions typically present in traditional speaker systems. This effect was accomplished with five hangs of six d&b Yi12 line array cabinets complimented by fifteen d&b xS-series fill speakers around the room. The consistency across the audience was further improved by utilizing d&b ArrayProcessing on the Yi-Series line arrays. This requires amplifying each cabinet individually and creation of a custom algorithm to match the specific room. The finishing touch on the system was tuning and commissioning provided by Jon Conant, Webster Tileston, and Chris Clark. They were able to tackle the system from all sides – Jon handled infrastructure and workflow, Chris tuned and calibrated the speaker system, and Webster built a front of house mix that tied the technical and

creative components together. The entire system was driven by a new Yamaha PM7 Rivage series console and Dante from end to end. "The PM7 was a game changer when it comes to capabilities for Pinelake. They now have the workspace to create all their mixes and not compromise quality", said Wade Russell, Assistant General Manager at InteRise. The PM7 feeds mixes in the house, in-ears, and broadcast sends plus having the capabilities to send stems and channels into the d&b DS100 Soundscape processor. Yamaha has taken huge leaps in their digital console offerings through the Rivage series and they continue to develop new features and models that provide a compelling solution at numerous sizes and price points. The existing equipment and familiarity that Pinelake had with Yamaha not only made the transition easy but also created cost savings through being able to repurpose some existing equipment. The need of aging wireless equipment was filled through new wireless systems from the Shure Axient Digital and PSM1000 lineups.

THE FUTURE

"With the new system, the band sounds amazing, and the vocals are easy to understand. That's so important in worship music; to be able to hear the lyrics and sing along, and the same thing is true for the message," says Hoober. "The soundscape system gives us all of those things wrapped up together." This is the key to this system and as well as all systems that InteRise designs and builds. Pinelake's vision is to see the state of Mississippi changed and we at InteRise are committed to being a partner in the mission of the local church. We can help to provide tools and resources for the Church and our vision is to empower theirs. Ultimately, technology is a tool – but a ministry that is able to make wise decisions regarding their tools and resources while also elevating their level of connection means a successful project at InteRise. The system at Pinelake is not simply speakers, amplifiers, audio consoles and cable – it is the mouthpiece for those men and women at Pinelake who are engaged every day in the spread of the gospel message. It is easy for us to sometimes think that the gear or the specifications are the end of the story, but the end of the story are the lives that will be forever changed by the ministry of Pinelake, and InteRise is grateful to be able to play a part in that story. **T**

Philip Hagood *is the General Manager at InteRise in Nashville, TN. InteRise specializes in creative and impactful solutions for churches across the country. Philip leads the InteRise team based on experience in the touring and church markets through InteRise and Morris Light and Sound. Visit www. interisesolutions.com to learn more!*
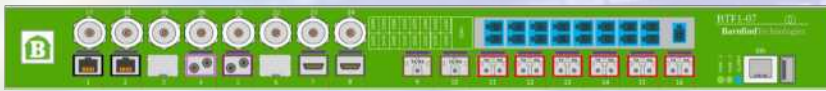
The R-121 Live

from Royer Labs

BY WARREN WHITTEN

When North Point Community Church was started 25 years ago, our founder, Andy Stanley, said that: "Atlanta does not need another church. What Atlanta does need is a safe environment where the unchurched can come and hear the life-changing truth that Jesus Christ cares for them and died for their sins." It was decided very early on that one of the ways North Point would do this was by providing great music with high production values to match what people would experience when they went to live shows.

I have been the audio director at North Point in Atlanta, Georgia for the past year, and prior to that I was at our Buckhead campus. However, I started my career as a studio engineer in Nashville and learned a lot there that I've been able to carry over to my work in live production.

I had my first exposure to Royer Microphones in Nashville. It is standard studio procedure to record electric guitars with the SM57 and Royer's

R-121, and the R-121s are instantly recognizable for the smooth, full-bodied sound they produce. For studio recordings, having the ability to capture the body of an electric guitar in addition to the aggression is very important. Ribbon mics have a rich, natural sound and are known for being able to take EQ really well without distorting the clarity and tone of the instrument, so knowing how EQ responds to ribbon mics, using the Royer R-121 is a great choice. Different mics capture different frequency curves – some mics sound brighter, some are more focused on capturing the lower frequencies, so it's important to pick the right mic for the sound and application you want.

North Point has been using Royer for years on electric guitars and when I got here it just made sense to continue the tradition. When our guitarists run an amp, they use Radial SGIs from their pedal boards to make the longer signal run from the stage to an isolated amp room; ensuring low signal loss and reducing the stage volume. If our

Microphone

guitarists are using a smaller amp or a single coil guitar with more attack, the R-121s give more body to the sound despite the lack of lower frequencies smaller speakers typically pick up.

Many of our guitarists run in stereo, using two different amps. We do this because in the worship genre, guitar tones can be really heavy with delays and reverbs, and when you run a guitar in stereo it helps clean up overtones and general muddiness in the tone a bit more. However, when a guitarist chooses to run just a single amp we always use the R-121 and a Shure SM57. These two particular mics work well together and by using them both to mic a single amp we can capture a fuller frequency spectrum. We will also usually pan them out so the audio feels wider to better mimic a stereo effect.

North Point normally chooses songs from artists like Hillsong United, Bethel Music, Jesus Culture, etc. – very modern, contemporary worship rock. We mix loud like a rock show, but we don't compromise on audio quality – our bands always

sound good.

All the musicians in the North Point Worship band tend to travel between campuses, so we have a pool of extremely talented people that just rotate through the campuses. At some of our bigger events it not uncommon to take the recorded multi-tracks from the live event to use as a live release of one of our songs, so – again – the R-121 Live mics really contribute to our sound.

Their sound reproduction is smooth and undistorted, with a well-defined low to high frequency spectrum. Outside of the way they sound, the mics themselves are built to last. They can take sound levels up to 135 decibels at 20 Hz, which means they aren't going to blow up when things get too loud. The fact that Royer offers a lifetime guarantee just shows that Royer stands behind the mic, and also adds an extra layer of confidence because we know if we ever have any issues, Royer Labs has us covered.

As an audio engineer, it's important to have tools at your disposal for different situations. I don't always

need a 121, but when I do there are few mics that will come close to a similar result. It's important for me to have relationships with the companies I work with and as an audio director that works with a lot of volunteers it's also important that those companies value educating people about their products. I can remember the old Royer demonstration CD from the early 2000s and that was a great education for me into how different two microphone capsules (or ribbons) can sound on the exact same instrument (there was basically a 30ish

track CD they put out of different sound clips of their different microphones on an acoustic guitar, then a male voice, a female voice and so on). I remember sort of having a light bulb moment in the way that I should begin thinking strategically about how to use microphones for different purposes and Royer helped provide that for me. **T**

Warren Whitten *is the audio director at North Point Community Church in Atlanta, GA*

WARREN'S REPORT

FLEXIBILITY	★★★★
QUALITY	★★★★
RELIABILITY	★★★★
COST	★★★★★
OVERALL VALUE	★★★★

SESCOM SES-IL-LPTT and SESCOM IL-19

BY DANIEL QUICK

I work at Christ Community Church in the suburbs of Chicago. We are a medium-sized church (one larger main campus, three smaller regional campuses) that puts an emphasis on excellence – especially when it comes to our weekend services. We have a full tech staff (full time lighting, video, and audio, with a technical director) and pride ourselves in getting the tech out of the way of the musicians and pastors that lead the church. This means making sure nothing is drawing attention away from what God is doing during the service. No stray lights, no distracting camera shots, and everyone can be heard every time all while providing a best-in-class worship atmosphere. Maintaining that level excellence requires access

to a lot of different tools that helps solve those weird problems that arise.

Every now and again I peak my head up above the fence (so to speak) and look around for new tools to add to my "box of tricks" to further our purpose and help build reliability and excellence; using things that have been loaned to me and come in handy in a pinch or things that will solve common problems I regularly face often. I recently received two such tools from SESCOM: the inline microphone

switch (SES-IL-LPTT) and the extreme hum killer (SES-IL-19). Both of these can solve some fairly common issues when I setup or operate church gigs.

First, the microphone switch. This seems like an odd thing to have around but let me tell you about two scenarios where this would have helped me recently. In our smaller rooms around Christ Community we don't have fully featured sound boards like we do in our

main production spaces. The talkback situation is just me yelling at the top of my lungs and praying the band hears me over their monitors. Having an inline microphone switch allows me to just plug in any mic to the board, drop the switch in and I have an easy talkback mic that can be turned on and off quickly. I know what you're thinking: some boards have a button for this in the software, and you'd be right. However, in my experience, that button is rarely easy to access. A

second common situation is the presence of band leader for worship sets. This is often a backline player tasked with calling out what part of the song will be played next. You can get microphones with switches on them but they aren't very convenient to work with. However, with the microphone switch I can locate the switch anywhere that is convenient to a musician and fits how they play.

Then we have the "Extreme Hum Killer" as SESCOM likes to call it. We are pretty fortunate in our big room at our main campus to have some very clean power, but it's a different story in other parts of the building or for our youth group when they go to camp. Many times we find ourselves running long XLR lines that cross whatever is in the way. Even balanced lines over long distances are susceptible

to interference. The hum killer solves that problem. You can use it on inputs or outputs, which makes it very useful as you can address the problem head on, right where it is an issue. I received a single hum killer but it is sold in dual channel and six channel configurations which makes it really useful for those outdoor worship nights when you are getting power from a generator or a less than ideal source. Hum shows up randomly and often unpredictably so if you don't have a way to address it already, be sure and pick up a few of these.

Both of these units are made in ABS plastic shells and feel rather sturdy. I did open them both up to find sturdy mounting and some silicon in each to keep everything in place. Both of them have a metal female XLR connector but a plastic male end. It is sturdy but under pressure might deform over time but this is only a minor concern. The switch on the inline mic

switch feels really sturdy and after some testing and fidgeting it still feels great. Both of them can be used in either direction making them able to be used whenever and wherever they are needed. These units definitely have the build quality and internal components to be worthy of your attention. They definitely made the cut to be added to my "box of tricks" and would be a worthy addition to any church tech teams arsenal. **T**

Daniel Quick is the Audio and Systems Director at Christ Community Church here in Chicago. While he specializes in the audio world his production experience has roots in lighting and video as well. He's married to his wonderful wife Amy and has two sons that keep him motivated and inspired to learn new skills and help whoever he can along the way.

DANIEL'S REPORT

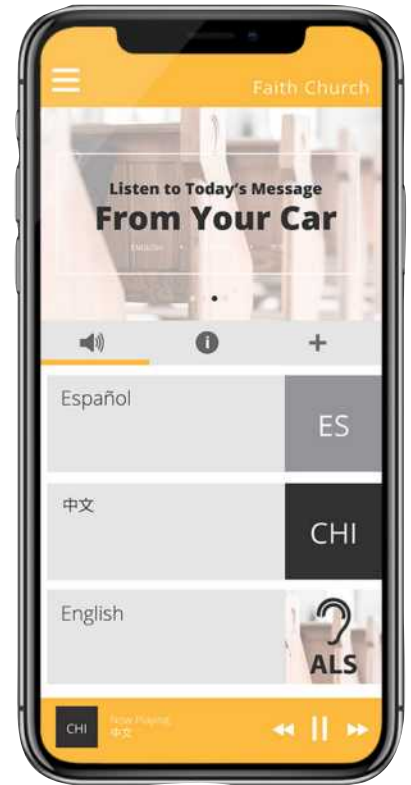|	
FLEXIBILITY	★★★★★
STABILITY	★★★★★
EASE OF USE	★★★★★
COST	★★★★
OVERALL VALUE	★★★★★

Listen EVERYWHERE

BY BOBBY RETTEW

Located in Anderson, SC, Boulevard Baptist Church was formed in 1953 by a small group of people with a dream of starting a mission-minded church. From its humble beginnings of worshipping in a college auditorium with 176 charter members, Boulevard has become a thriving church, serving both the local and international communities, from the "Corner of Boulevard and the World."

Boulevard Baptist Church is a traditional mainline church, but like many other houses of worship, it has seen a lot of flux in the demographics over the years. To keep the church vital, there has been a focus on bringing in younger families and one of the ways we are doing this is by increasing the quality of our technological output, so we can reach people wherever they are.

About a year and a half ago we decided to make an investment in live streaming, and quickly realized that streaming uncovered an issue that hadn't really been on our radar: for the first time our elderly population had the opportunity to go back and watch the stream after the fact to better hear what was going on.

We hadn't realized prior that this was an issue, but once it was brought to our attention, we knew we needed to do something that would allow people to fully hear the service. We researched several different ways we could resolve this problem within a live worship setting, and one of our congregants came to me with information about

Listen EVERYWHERE from Listen Technologies.

Listen EVERYWHERE is a hardware/software system that pairs with Boulevard's existing wireless network to run our service through Wi-Fi to a fully customizable app downloaded right onto congregants' smart phones. The software can accommodate up to 1,000 users per server – and solved our problem almost immediately.

We piloted Listen EVERYWHERE with a few different people to start, as it was important for us to make sure the audio coming through the app synced with what congregants were seeing on stage. Once we established that the audio did indeed match the movement of the lips, we decided to move forward.

Implementing Listen EVERYWHERE was very easy; once we got the router up and running it was as simple as switching the flip, downloading the app, and just going. One of the very first things we did when Listen EVERYWHERE was up and running was talk about it from the pulpit, tell people it was available and how to get it. The second thing we did was create a pamphlet that we put in all the pews to direct people on how to download and access the app, and we also put something on the website. However, we found that having a couple of influencers in the church become very

familiar with the app, and then train other people on it, really helped spread the app. Many of our younger people were also able to help the older congregants download and use the app.

In our congregation, I would say that about 60% of our people are 55 years of age and over, with a few over the age of 90. Many of our older congregants went out and purchased proper smart phones so they could download the app and hear the services better. The digital literacy of our church increased almost immediately because of Listen EVERYWHERE.

We are also able to customize the app interface, and include promos within it, to share what else we are doing in the church. The hardware needed for Listen EVERYWHERE is very portable – just two small boxes! – so it can literally be used anywhere. The price point, particularly for small to medium churches, is excellent.

Listen EVERYWHERE has become a vital part of our livestream, but there are so many other ways we can use it to strengthen our church community, even during the Covid-19 shut downs. For example, we are looking at starting a drive-in movie night at the church and using Listen EVERYWHERE to deploy the audio.

However, the biggest take away we noticed

with the introduction of Listen EVERYWHERE is how many members of Boulevard Baptist immediately embrace the technology and come back to us to say they were finally able to hear the sermon. How wonderful is that? Worship is such a personal thing – if we can't engage with it, it loses some of its meaning. What Listen EVERYWHERE has provided to so many of our congregants is a deeper way to engage with worship, and within our worship community. ◼

Bobby Rettew *is a deacon and the church communications chair at Boulevard Baptist Church, a missional church in Anderson, SC. He also is the owner of Rettew Creative, a storytelling and communications agency focused on content creation using video, podcasts, photojournalism, and most importantly storytelling.. Bobby is husband to Sarah, father to Rosebud and twin boys George and Henry.*

BOBBY'S REPORT

FUNCTIONALITY	★★★★★
FLEXIBILITY	★★★★★
EASE OF USE	★★★★
COST	★★★★★
OVERALL VALUE	★★★★★

PRODUCT SHOWCASE

1/ Audio-Technica
Limited Edition AT2020V Cardioid Condenser Microphone
www.audio-technica.com

2/ Elation Professional
Artiste Mondrian™
www.elationlighting.com

3/ Datapath
IQS4- one-in/four-out video wall splitter
www.datapath.co.uk

4/ Magewell
Pro Convert 12G SDI Plus encoder
www.magewell.com

5/ NEXO
ID14 Point Source Loudspeaker w/S108 subwoofe
www.nexo-sa.com

6/ Sescom
Sub-Miniature XLR Microphone Cable Series
www.sescom.com

7/ Sony Electronics Inc.
LA-EA5 35mm Full-frame A-mount lens adaptor
www.sony.com

8/ Waves Audio
WRC-1 WiFi Stage Router
www.waves.com

9/ Yamaha
ADECIA Audio Solution
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