TECHNOLOGIES
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INSTALL

GT Church Upgrades Live Streaming with Adorama Business Solutions

Review
THE M-VISION LASER 18K PROJECTOR FROM DIGITAL PROJECTION

Out of the Box:

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EDITORIAL NOTE

TIM ADAMS

Greetings all! What a past few months it has been! A whirlwind for many of us, whether you are a church, a tech, a pastor or an integrator, it's been incredibly busy with so many scrambling to get live streaming capabilities up and running.

I'm your guest editor for this month, and a long-time contributing author to the magazine, typically writing at least one article per issue on a variety of topics, all related to church AV. The TFWM staff and myself have been working hard for months getting this issue as good as it can be, and it's given me a new appreciation for just how hard Michelle, Darryl and the others work to bring these issues together every month.

If 2020 has shown us anything thus far, it's the importance of having a support system that can help you answer questions, evaluate equipment and be able to respond to rapidly changing conditions. This month's issue is all about the importance of having an ongoing connection to an integrator, but also the value that integrators bring to the table.

Many churches do not work with integrators because they believe it will cost them money they do not have, and many churches simply don't know that integrators exist. Either way, most of the time an integrator will gladly provide guidance and recommendations for little to no cost because they understand the long-term value of the relationship.

To find out more in-depth how integrators help churches of all sizes, check out our "Integrator Q&A". A collection of integrators from around the country provide insight into the value they bring, situations where they have had to save a church from making the decision to upgrade their own systems and much more.

The Tech Spotlight this month is about a small Christian K-12 school in Oregon that needed a mobile sound system and were able to realize that dream through the use of an integrator and a generous donor. It's a great reminder that even small systems can make a big impact in the lives of many people.

We have many more articles ranging throughout the AVL spectrum, so make sure to read everything! It's important to know what you don't know and to research to fill in your gaps or surround yourself with people that do know so you can learn from and lean on them.

Personally, I'm hoping that the rest of this year can see a return to some kind of normalcy and a general calming down so we can all take a breath. My company, Timato Systems, has seen a huge increase in calls for help from churches all across the US and even internationally. Remember, we're all in this together and we all need to stay close to and walk with God as we are sure to face more challenges, obstacles and difficulties in the future before we get to go Home.
Regards,
Tim Adams

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Audio-Technica U.S. Announces Two Appointments to Its Product Management Team

As part of the company's efforts to position itself to work more effectively and efficiently in global product development activities Audio-Technica U.S. announces two appointments to its Product Management team.

Kurt Van Scoy has been appointed to the position of Executive Director of Product Management for ATUS. In this position, Van Scoy will be responsible for directing the product development /management efforts at ATUS. In addition, Kurt will oversee the ATUS quality control department. Van Scoy is returning to the ATUS team, after four years serving A-T as Global Product Manager, based in Japan.

Gary Dixon has been promoted to the position of Product Manager for ATUS. With Dixon's broad knowledge of the professional audio market and years of experience in the installation segment, he brings a new level of depth and understanding to the product management team. In his previous position as Sales Engineer, Installed Sound, Dixon served as a technical resource for the Audio-Technica sales channel in the broad contractor market (installed sound contractors, consultants and architects), where he helped ensure the proper and successful implementation of A-T products and technology in the marketplace while determining the application needs of customers. **T**

Magewell Becomes the Newest AIMS Member

The Alliance for IP Media Solutions (AIMS) today introduced its newest member: Magewell. The company joins AIMS as adoption of SMPTE ST 2110 continues to accelerate in the broadcast market and the alliance's new Internet Protocol Media Experience (IPMX) set of open standards and specifications gains momentum in the Pro AV industry.

"One of our key strategic initiatives is making the transition to IP workflows practical and affordable for our customers," said Nick Ma, CEO and CTO of Magewell. "We are committed to helping our customers leverage open standards, including SMPTE ST 2110, to achieve these objectives, and joining AIMS is an important milestone in this mission. AIMS' recent introduction of the IPMX specifications for AV over IP further reinforces AIMS' alignment with our goals, as we develop products for both the broadcast and professional AV markets. We look forward to working with the alliance and other AIMS members."

IPMX addresses the Pro AV industry's need for a single set of common, ubiquitous standards-based protocols that ensure interoperability for AV over IP. Implementing a standards-based approach based on SMPTE ST 2110, IPMX proposed open standards and specifications are designed to enable carriage of compressed and uncompressed video, audio, and data over IP networks. IPMX features tailored to Pro AV installations include AMWA NMOS IS-04 and IS-05 for discovery and registration, as well as connection management, and specifications for copy protection and security.

More information about AIMS and its work is available at www. aimsalliance.org **T**

Pliant® Technologies Expands Reach with Three New Manufacturer's Reps

Pliant Technologies has added three additional firms as part of its expanded manufacturer's representatives initiative, with the appointment of Audio Biz, Mainline Marketing, and Pro Tech Marketing. By signing new manufacturer's reps, Pliant has increased its scope of coverage and can offer its range of high-quality intercom solutions, including its CrewCom and MicroCom wireless systems, as well as its complete line of SmartBoom headsets to additional regions within the U.S.

Audio Biz, Mainline Marketing, and Pro Tech Marketing have successfully introduced Pliant's intercom solutions to industry professionals across the nation who require high-performing, reliable intercom solutions in a variety of applications. These new manufacturer's reps are excited and prepared to supply Pliant's intercom and headset solutions for live events as they make their post-pandemic return. **T**

Royer Ribbons for The Tabernacle Choir and Orchestra at Temple Square

The Tabernacle Choir and Orchestra at Temple Square (formerly known as The Mormon Tabernacle Choir) uses a wide variety of Royer ribbon microphones to capture its performances for recording and worldwide broadcast. Broadcast Audio Engineer Jason Graham recently talked about his use of Royer microphones on the Tabernacle Choir and on choir and orchestra performances by the Millennial Choirs and Orchestras.

"When capturing the sound of a choir and orchestra, I want to stay as real as possible to the actual source," Graham states. "Using Royers, I can help build a real connection with the musicians and the listener. Royer ribbons do an amazing job at fulfilling this desire for an organic, real sound. Their ability to capture an enormous dynamic range and still be quiet and subtle is really appealing to me. The stereo SF-24V is one of my favorite mics for this type of application. You can literally put it on anything from solo stringed instruments to a massive pipe organ and it'll give you that pure sound you're trying to capture."

With the Tabernacle Choir, Jason's microphone preferences include hanging four SF-2 ribbons over the choir loft. Graham comments, "We're dealing with the human voice and, with so many different nuances that you want to pick up, I don't think there's a more delicate instrument. When we first tried Royers on the choir and the orchestra years ago, they really shined for us." Graham makes special reference to the Royer SF-24V vacuum tube stereo ribbon mic, which he uses for surrounds in the Later Day Saints' Salt Lake City conference hall. "The concert venue is a huge, 21,000-seat hall that has a massive and extremely powerful pipe organ. The SF-24V is permanently suspended in the hall and it does an incredible job—not only capturing the overall room sound, but also the pipe organ."

In the orchestra, two Royer R-122V vacuum tube ribbon microphones are used left and right of the conductor's podium to capture the overall string sound while an R-121 is used to capture the harp and twelve Royer Labs dBooster In-Line Signal Boosters are used with a variety of mics. "In my experience," says Graham, "the dBooster makes any dynamic and ribbon mics shine—and not just Royer ribbons. At Temple Square, we use them on Beyerdynamic 160s and 260s. The dBooster enables those mics to just open up and come alive while still maintaining their unique ability to listen to a tight polar pattern. The dBooster beautifully enhances the sound of the woodwind section."

Graham records a large Millennial Choirs and Orchestras performance each year. As with the Tabernacle Choir, Jason uses SF-2s across the choir, plus three SF-24 Phantom Powered Stereo Ribbon Microphones for capturing strings. Summing up his experience with this combination of Royer microphones on a recent Millennial Choirs recording, Graham notes, "Royer mics were used to acquire the overall sound of the performance and were augmented by a variety of other microphones. The Royer ribbons captured a beautiful organic sound of the ensemble.

In summing up his experience using Royer Labs' microphones, Graham offered these parting thoughts. "I'm a believer that things do not happen by chance. I'm also a believer that music has the power to change the human soul. For me, meeting John and implementing Royer mics into the sound design at Tabernacle Choir and Orchestra at Temple Square as well as the Millennial Choirs and Orchestras was not by chance. And it has resulted in beautiful music, performed by masterful musicians to uplift and inspire many listeners the world over. I consider it to be a great blessing to be part of that." **T**

TO WATCH A "RECORDING CHOIR AND ORCHESTRA," FEATURING JASON GRAHAM ON RECORDING THE TABERNACLE CHOIR AND MILLENNIAL CHOIRS & ORCHESTRAS CLICK
https://youtu.be/zH5ka4RjCIc

Introducing the World's Fastest Editor
DaVinci Resolve 16s new cut page and editor keyboard let you work faster than ever!

The new cut page in DaVinci Resolve 16 is the first major innovation in professional video editing in over 20 years! Designed for short quick turn around projects, the cut page is all about speed. Featuring a streamlined interface with intelligent new "smart" tools, the cut page and DaVinci Resolve Editor Keyboard are designed to save you hours of time on each job.

Work Faster with Dual Timelines

The cut page features dual timelines so you never have to zoom in or out again. The upper timeline shows the entire program while the lower timeline shows the area in which you're working. With the dual timelines you'll always know where you are because you always have a zoomed in timeline that's ideal for trimming and fine tuning your edits using the contextual tools.

Use Source Tape to Quickly Find Shots

Finding the right clip in a bin with hundreds of files is slow. With source tape you no longer have to waste time hunting through bins to find the clip you need. Source tape makes all of the clips in your bin appear in the viewer as a single long "tape." This makes it easy to scrub through all of your shots, find the parts you want, and quickly edit them to the timeline!

Instantly Edit Between Angles with Sync Bin

The sync bin completely revolutionizes multi camera editing! It displays all of the shots from different cameras that are in sync with the current shot in the timeline. You'll see the angles stacked as film strips in the bin, along with a multi-view display in the viewer so you can instantly choose a different angle and make perfectly synced cut aways.

DaVinci Resolve Editor Keyboard

The DaVinci Resolve Editor Keyboard lets you edit with both hands, dramatically speeding up your workflow! It's a professional keyboard with transport controls on the right side and edit functions on the left side. You can use the search dial and source tape buttons with your right hand to locate shots, while simultaneously marking in and out points, performing edits and live trimming with your left hand.

DaVinci Resolve 16 .... **Free**
DaVinci Resolve Studio 16 .... **$299**
DaVinci Resolve Editor Keyboard **$995**

The VC-100UHD 4K Video Scaler with Ultra Scaler Technology

Roland's new VC-100UHD 4K Video Scaler is a next-generation A/V signal management solution for live events, fixed installations, and streaming applications. Equipped with Roland's acclaimed Ultra Scaler™ processing technology, the VC-100UHD allows users to input 4K and 1080p video sources and distribute them to multiple destinations at one time, including 4K LED walls, HD displays, and USB 3.0 livestreams. High frame rates up to 240 Hz are also supported, delivering smooth motion for esports, animated displays, and more.

Built on a reliable hardware platform for mission-critical applications, the powerhouse VC-100UHD combines multiple single-task technologies in a compact and flexible half-rack design. Backed by a lightning-fast processing engine, the VC-100UHD's Ultra Scaler provides premium quality conversion for perfectly synchronized big-screen IMAG and precise dot-by-dot scaling for LED wall displays.

With an ultra-high-definition source signal connected to the 12G-SDI or HDMI 2.0 video inputs, the VC-100UHD will automatically process and convert it to different resolutions, ready for distribution at 12G-SDI, HDMI, and USB 3.0 rear-panel outputs. Thanks to Ultra Scaler technology, system designers can simultaneously deliver 1080p video at rates up to 240 Hz for a gaming monitor, 59.94/50 Hz for an HD video system and LED displays, and 59.94/50 Hz for an HD livestream broadcast.

The VC-100UHD also includes built-in visual effects, allowing users to rotate, flip, trim, and mirror images on each output. And with Frame Synchronizer and Genlock features, video images can be re-clocked and stabilized as needed.

Via a plug-and-play USB 3.0 webcam output, VC-100UHD users can reach a worldwide audience and broadcast uncompressed 1080p video at 59.94/50 Hz on popular streaming platforms. Roland also offers free VR Capture software, which records HD livestreams in ProRes 422 (Mac) or MP4 (Windows) formats for later editing and distribution.

Along with video, the VC-100UHD can process embedded digital audio from its 12G-SDI and HDMI 2.0 inputs. Analog I/O is provided as well, with balanced audio on a 25-pin D-sub connector for installations and line-level stereo audio on RCA jacks for prosumer video gear. The advanced audio patching system lets users route and embed/de-embed up to 16 input channels and output up to 8 channels. An adjustable delay is also provided on each output to correct lip sync issues.

The VC-100UHD works as a portable processor for grab-and-go productions or can be installed in a rack for use in larger systems and fixed installations. The unit's rich integration capabilities include custom EDID on HDMI, 24 video test patterns, an audio test tone generator, system backup via USB memory and remote control support over LAN. **T**
Available: November

BenQ's LU and LH Filter-Free Laser Projectors

B enQ has expanded its BlueCore laser projector lineup with the launch of new 4,000- and 5,000-lumen models. The LU710 and LU930 offer WUXGA resolution while the LH710 and LH930 boast 1080p resolution, allowing houses of worship to update their meeting rooms with state-of-the-art BlueCore laser technology that fits the budget. Furthering the value of the LU and LH series, they eliminate the cost of replacing lamps used by lamp-based projectors, as well as the time spent cleaning filters with an IP5X-sealed and certified filter-free chassis that protects against dust.

BenQ's LU710, LU930, LH710, and LH930 all feature BenQ's renowned BlueCore IP5X-certified, dustproof, filter-free laser engine for long-lasting brightness, durability, and precise color that boosts productivity and efficiency. Each projector features BenQ's precision-aligned high-output laser source, which is guaranteed for 20,000 hours of maintenance-free operation, saving costs for lamp replacement and maintenance. Based on the average brightness cutoff of typical long-life lamps, BlueCores's value exceeds that of ten lamp replacements over the life of the projector. The projector's DLP chip is hermetically sealed so that it can resist heat for over 100,000 hours without degradation. In addition, the engine has earned an international dustproof protection rating of IP5X, ensuring dust doesn't damage the projector.

The new BlueCore laser projectors also feature Rec. 709 color coverage. By increasing color ratios, they dramatically enhance color saturation to ensure superior presentation quality. The laser-enabled high contrast furthers color performance, creating strikingly clear images for true deep blacks, vividly rich colors, and fine subtle details.

It's a well-known fact that light helps keep meeting participants alert and attentive. With the LU710 (WUXGA) and LH710 (1080p) offering 4,000 ANSI lumen brightness and the LU930 (WUXGA) and LH930 (1080p) delivering 5,000 ANSI lumens of brightness, these projectors are capable of producing clear images in both dark and well-lit spaces. Further enhancing presentations is BenQ's new LumiExpertTM technology, which automatically detects the ambient light conditions of the room and adjusts the projector's brightness to maximize clarity and comfort.

In addition, colorful presentations with abundant visual aids help retain content up to 82% more effectively, while text that's clearly legible can boost focus and increase attention spans. This is why each projector features an advanced Infographic Mode that's perfect for enlivening the graphics and stylish text used in modern presentations. Infographic Mode offers enhanced brightness and better color gradation for eye-friendly presentations that are guaranteed to make idea-sharing more precise. Meanwhile, the Vivid Mode is a great choice for emphasizing colorful imagery when displaying video or photos. The BlueCore laser projectors power up in half the time and with less power consumption versus lamp-based projectors. The signal power-on feature turns the projector on automatically once an input signal from VGA or HDMI is detected. Users don't have to wait around and can get started right away.

Compatible with BenQ's InstaShow wireless presentation system, organizations can also instantly turn any room into a wireless-friendly environment for everyone to collaborate onscreen. BenQ's InstaShow is a plug-and-play, zero-software solution that allows up to 32 participants to present from any device — PC, Mac, iOS, Android, and more, making it ideal for small group lessons. InstaShow also supports both the 128-bit Advanced Encryption Standard (AES) and WPA2 authentication protocol to ensure that corporate intellectual property remains private and safe from tampering or unintended disclosure.

With BenQ's exclusive centralized control software, tech directors can remotely manage an entire network of projectors from a single centralized location via the local network. Offering powerful scheduling and configuration features and remote on/off capabilities, BenQ's centralized control software makes it easy to monitor and control the projectors as a group or individually. They're also compatible with an assortment of control systems, including AMX, Creston, Extron, and PJ Link. This makes it easy to integrate each of these projectors into existing systems and ensure they're running smoothly. T

Available Now

datavideo

4K Multi-Channel Touch Screen Region of Interest Switcher

Stream your production using one 4K camera, which creates four regions of interest, but gives you six channels for live switching. The six channel buttons incorporated into the lower right corner allow easy access to each region of interest, including two allocated for full screen mode and computer output.

Key 1

Key 2

Key 3

Key 4

Key 5 (Full Screen)

"BUT THE LORD STOOD WITH ME AND GAVE ME STRENGTH"

Key 6 (Computer Output)

KMU-200 will allow you to switch from the various regions of interest in real-time with features including:

- Supports 4K UHD Resolution Input
- Easy Touch-Screen Operation
- 6 Channels for Live switching
- XLR, TRS, and RCA Combination Inputs
- Stream Directly to YouTube or Facebook

KMU-200
MSRP - $3,199

Presidor™ DMX 512 Controller from Johnson Systems, Inc.

For 30 years Johnson Systems (JSI) has been widely known for its design and manufacture of incredibly reliable retrofit lighting solutions with installations in hundreds of churches. After almost a decade of development the skunkworks team at JSI is proud to announce the arrival of the Presidor™ Wall Station, a front end lighting control system unlike anything on the market. Presidor is a capacitive touch, 70 preset, DMX512 lighting controller that can also function as an independent lighting console.

Using their knowledge and expertise in retrofit lighting solutions, Presidor has been designed to fit in almost any installation with most existing wiring infrastructures. The wall station is compact – fitting in a single gang electrical back box. The patent pending design incorporates color matching ergonomic face plates with a 'screwless' design that is impervious to dust and easy to clean. Each room can support up to 15 Wall Stations that can be daisy-chain wired together for use in the largest of Sanctuaries.

Presidor offers various security features including both User and Administrative password access. This allows multiple users to choose between limited menus. Using the admin password will allow your tech team advanced features such as programing up to 70 presets to snapshot the perfect lighting scenario from your DMX console for any type of event.

The Presidor Wall Station can also be used in a multi-room environment with the addition of the Presidor Room Linker/Combiner and the optional Presidor Remote Display Unit. This is perfect for the multi-purpose room where you can control every zone/room independently or link any combination of zones/rooms together. Easily link up to 25 zones/rooms per DMX universe.

From a practical standpoint, Presidor will allow each of your individual ministries to have unique lighting scenarios in your Sanctuary at the press of a button – no more messing with the lighting console! Your tech team will love the unlimited versatility and flexibility of Presidor while restricting users to a few key menus. Your multipurpose rooms will greatly benefit from Presidor and its room linking capabilities. From gymnatoriums to banquet halls and conference rooms, Presidor makes multi-room lighting a breeze. Link from 2 to 25 zones in any combination seamlessly with the addition of the Room Linker Combiner. Need different lighting for regularly scheduled church events? Activate your lighting presets via Presidor's schedule/timing function to have it automatically cycle ON or OFF at the appropriate times.

Holding true to the retrofit history of Johnson Systems, Presidor also comes in a retrofit version that can utilize virtually any existing wiring. **T**
www.johnsonsystems.com
Now Shipping.

A **REVOLUTION** in Projector Technology...
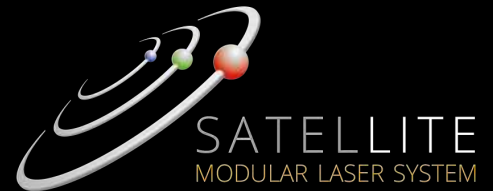
Datavideo KMU-200, a 4K Multi-Channel Touch Screen Region of Interest Switcher

The KMU-200 is a 4K Multi-Channel Touch Screen Region of Interest Switcher with built-in streaming and recording, and the latest addition to Datavideo's KMU Series based on the award winning KMU-100, 4K Multi-channel Processor. The KMU series provides region of interest switching based on a 4K camera signal. Datavideo KMU-200 transforms this new market category with Multi-Channel Touch Screen, Streaming & Recording all-in-one switcher. The KMU-200's all-in-one design is similar to the Datavideo Hand Carried Mobile Cast Studio line of switchers bringing switching, audio mixing, recording and streaming into a compact, portable system. It makes it easy to take it on the go. Since it is an all-inclusive unit, you don't need to lug around multiple video production equipment. KMU-200 does it all in its compact form. Popular social media platforms are best viewed and highest engagement in vertical mode using smart phones. The KMU-200's workflow has both horizontal (16:9) and vertical (9:16) switching modes. Horizontal streaming is the current norm, however vertical video content is growing in popularity due to smart phones where most content is consumed in portrait mode. The KMU-200 provides professional and engaging vertical video productions with multiple camera angles and high-quality audio. The built-in encoder streams directly to popular CDN platforms such as Facebook, YouTube or Instagram in vertical or horizontal modes, giving you an option to open up your live stream to more social platforms. Record your live events or weekly sermons with a built-in SD card recorder. You no longer need to add an external recorder or encoder for streaming or recording your production.

A single 4K camera can be utilized to obtain four cut outs or regions of interest and the full screen view, plus another HDMI input for an additional camera or computer. This concept simplifies your workflow since you do not need to have multiple cameras in your workflow to obtain multiple shots. KMU-200 has a touch screen panel for multi-touch control, so you can easily set up your shots or bring up a menu with the touch of your fingertips. One person can control the camera shots, switch, monitor, record, and stream your production. You do not have to rely on multiple volunteers to come in to do your church production. "The KMU-200 is perfect for smaller houses of worship applications or panel interview applications. With Social distancing becoming a new norm, the KMU-200 reduces the need to have multiple crew members to produce and stream your production," says Craig Moffat, Managing Director of Datavideo US. KMU-200 MSRP price is $3,199. **T**

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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 "

" **Your warehouse guys are fantastic!** They are so *helpful* and a great face for your company!
-Satisfied Customer "

Scan me

" **I've been working with the SP team for 20 years.** Jon Sheets is *always* my first call anytime I have a need related to pro audio.
- A.R. "

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Q&A with Mike Wells
President, XSF

XSF is bringing the fight against COVID-19 directly to your church, with their new Sanitizer Cabinets. We took the opportunity to speak with Mike Wells, President of XSF, to learn more.

TFWM: Tell us about XSF Truss and how has COVID-19 affected your industry?

Mike Wells: Xtreme Structures & Fabrication (XSF) is a manufacturing company based out of Sulphur Springs, Texas that provides aluminum structures for the entertainment industry. In an effort to be part of the fight against Covid-19 – and considering that the gig industry is currently on hold - XSF has transitioned from manufacturing aluminum truss to stainless steel Sanitization and Disinfection Cabinets. We are excited to be part of the solution in fighting the Coronavirus epidemic here in the United States.

Tell us more about the idea for the XSF Sanitizer Cabinet?

Mike: The XSF Sanitizer Cabinet is a portable cabinet equipped with UV-C lights that kills up to 99.9% of bacteria and germs including Staph infection, the common flu, and Pneumonia on any items placed in the chamber in just 5 minutes. Recent studies by 4 different Universities have shown that UV-C light kills known forms of the Coronavirus

including SARS and will most likely kill Covid-19 once they are given an opportunity to test it. The cabinet includes hanger bars and hooks to suspend items for full 360-degree disinfecting of a wide variety of items including masks, cell phones, tablets, utensils, toys, handheld radios, handheld mics, headsets, intercoms, etc.

How many items can a Sanitizer Cabinet disinfect at any one time?

Mike: The stainless steel XSF Sanitizer Cabinets come in three different models, the UVSD-40, UVSD-20, and UVSD-04. The UVSD-40 has 40 cubic feet of available space and can sanitize up to 72 items or masks at a time. The UVSD-20 has 20 cubic feet of available space and can sanitize up to 36 items or masks at a time. The UVSD-04 is a countertop model with 4 cubic feet of available space and can easily sanitize 8 items the size of a mask at a time.

Can you give us some examples of how houses of worship can use the Sanitizer Cabinet throughout their facility?

Mike: The UV Sanitizer Cabinets can be used in high traffic areas like Sunday School classrooms where toys, books, tablets, laptops or other classroom items would need to be sanitized between services or classes. The corporate office of large facilities with more employees could use the cabinet to disinfect office items or masks on a daily basis.

Anything else you would like to add?

Mike: UV-C sterilization has become a widely accepted means of quickly disinfecting items or areas like hospital rooms, subway cars, CPAP masks and cell phones. The enclosed space of the UVSD Cabinets uses the same technology in a confined space with reflective walls to ensure that the items within the cabinet are disinfected properly. T

GT Church Upgrades Live Streaming Equipment and Processes with Adorama Business Solutions

The Multi-Site Church Now Offers its Congregation High-Quality Footage of Services and Events In-Person and Online

GT Church, a multisite church with two locations in Pennsylvania, recently enlisted Adorama Business Solutions, the premier technology resource for corporate, educational, and government institutions, to upgrade its production equipment and processes to enable High Definition (HD) live streaming and recorded broadcasts of its services. Eager to make dynamic, engaging, and artful videos for its congregation, GT Church wanted to upgrade its increasingly outdated Standard Definition (SD) cameras and streamline its operational processes and equipment.

In addition to the physical upgrades of cameras and equipment, GT Church needed to ensure that the footage always maintained a consistent look and feel. This was a major challenge for the camera crew and production team, as it required its current cameras to be set up individually. Working with the cameras separately limited the scope and range of their filming abilities, wasted time and resources to set up and execute, and burdened the filming of live events with disruptive transitions between cameras.

GT Church worked with Adorama Business Solutions to identify and purchase the perfect production set-up to upgrade its SD capabilities to wireless HD. Selected equipment included: Canon EOS C300 Mark II Cinema

Camera Body, Canon Cinema Zoom CN-E30-300mm T2.95-3.7 L S (EF Mount) Lens, and Cartoni Focus 18 Fluid Head System: Carbon Fiber & mart Lock ML Spreader.

Wireless cameras with modern technologies gave the staff greater levels of flexibility, enabling them to easily film anywhere in the congregation and film more discreetly and with enhanced freedom on stage. Additionally, Adorama simplified the process of creating a unified look and coherent aesthetic throughout the footage by being able to save the settings from one camera to an SD card, which could then be easily copied to all other cameras on the system. For the GT Church production team, this was revolutionary.

"Adorama's knowledge and experience helped identify and solve problems I wouldn't have known about until the gear was delivered, which would have cost us valuable time," said Andrew Donohue, Visual Producer at GT Church. "All of our services and events can now be shot using HD technologies, bringing our congregation high-quality live streams and more engaging recorded broadcasts. During recent stay-at-home orders, our ability to connect with our community through live streams on our website has been indispensable."

Through a collaborative sales process with Adorama Business Solutions, GT Church completely upgraded its production equipment and processes, empowering its production team to deliver first-rate coverage and footage of events to its congregation, both in-person and online. **T**

About GT Church

It is GT Church's desire and responsibility (Matthew 28:19-20) to invite as many people as possible to experience the life-giving message of the Gospel and to join a community of believers. Together, they are striving to be more like Jesus and to live out His purpose in the world. GT Church feels the hope and power and redemption found in Jesus is too good to keep to themselves. And so they strive to grow, not for the sake of numbers alone, but because more people means more lives reached, restored, and transformed.

The services at GT are designed to be powerful and inspiring, incorporating multimedia with heartfelt worship to complement the biblical message. Church leadership talks about the real stuff people face every day and connect God's wisdom and Word to life experiences. There is a place for everyone and their mission is to make church a creative, relevant and life-changing experience, with services that challenge and inspire growth in your relationship with Christ.

Check out their services Sundays @ 9 & 11 AM on GT Live (https://gtlive.churchonline.org/) and Facebook (https://www.facebook.com/gtchurchonline/)

Belmont Church Offers Service Loud and Clear Through d&b A-Series

Right in the heart of Music Row in Nashville, the non-denominational Belmont Church, now streaming through Belmont. TV due to COVID-19, was recently outfitted with new d&b audiotechnik A-Series augmented arrays thanks to the installation talents of Spectrum Sound, Nashville.

From its humble beginnings in 1911 as a revival tent meeting hall, the church officially broke ground in 1915, and 100+ years later they are still at the same location. The 900-seat contemporary church underwent a complete audio system renovation to the church's main sanctuary sound reinforcement system, recording studio, and broadcast audio-for-video infrastructure. The new A-Series forms the heart of the sound reinforcement system for the main sanctuary.

"The last time Belmont Church's main worship space sound system was renovated was nearly 20 years ago, so it was time," states Ken DeBelius, System Integration Sales Manager, Spectrum Sound. "As far as the room and interior design of the space, although it feels small, it does have a nice intimate setting. The geometric room layout posed significant challenges for a loudspeaker system design that would provide appropriate coverage uniformity to all the seating planes. The main concerns of the room were the asymmetric layout of the main floor seating around the stage, and a large, steep raked balcony, which not only shadowed significant portions of the main floor, but the balcony area itself is also asymmetric. A line array solution was out of the question; the room wasn't nearly large enough to justify, and line arrays would create unacceptable sightline issues. That left a point source loudspeaker solution, still not ideal, particularly with obtaining the considerable vertical coverage needed, and how it would look overall rigging-wise."

Considering the coverage challenges of the room, during the time while a working point source design was still on the drawing board, DeBelius had the opportunity to audition the A-Series augmented array. "I'd actually been waiting for d&b to come up with this kind of product for a long time. Having heard it and knowing that this kind of loudspeaker product perfectly bridges the gap between point source and line array, it became an "Ah Ha" moment that this was going to be a great solution for Belmont Church as it checked all the desired design goals. d&b's ArrayCalc software verified it would not only cover the room appropriately but would easily meet the SPL requirements while minimizing the impact to sightlines."

Once home to Amy Grant and Michael W. Smith (and considered The Birthplace of Contemporary Christian Music) Belmont Church certainly fits the artists' contemporary style of worship. "The bar for sonic expectations of this upgrade were high, and the church wanted a system that would cleanly reproduce everything both in speech and music," DeBelius said.

David A. Terry co-founder of the music production company, Sodium Glow LLC, is a music producer, mix

engineer, mastering engineer, and oversees all technical aspects of the church as well as co-leads the Worship and Arts department at the church. "Before I became a full-time studio guy, I did a lot of live sound for various artists, from small venues to 20,000 seat arenas," says Terry who has attended Belmont Church since 1992. I was heavily involved in the PA install in 1998 and again in 2020. "The old PA at the church was clinging to its dying breath. I had to use gaffer's tape, tin foil, and paper clips to keep it functional for a couple years while we researched different options for the upgrade."

Terry has had a professional relationship with Spectrum for many years and is occasionally hired as a consultant/trainer by Spectrum to assist in some of the company's other projects. "It was a natural fit to call them when it came time to upgrade. The decision to use Spectrum was based on their system design, attention to the needs of the church, and our mutual relationship."

Terry said, "My 'must have' list included even coverage in all seating positions across the frequency spectrum, excellent sound quality, and integration into our existing recording/broadcast studio and streaming system."

The design included the use of ArrayProcessing, which delivers optimization of an array's tonal balance and level distribution over the entire defined coverage area, front to back.

Terry added, "I absolutely love the d&b design philosophy and the sound of their loudspeakers. Because we have line of sight challenges in some seating areas, we wanted to use a speaker with as small a vertical footprint as possible. The A-Series was perfect for our application both in physical size and desired coverage. After I looked over the specs, we agreed with Spectrum's recommendation to go with the A-Series."

Terry also noted that because of the coronavirus pandemic, the church has not had a live service with a congregation since the install was completed but has put the loudspeaker system through its paces with a small ensemble as well as pre-recorded music for its streaming service. "The coverage and sound quality are fantastic!"

The A-Series system is comprised of 4 Main flown clusters, each consisting of 2 x ALi60 and 1 x ALi90 cabinets for a total of 12 boxes. 2 x Yi-SUBs center flown cardioid subwoofers, 2 x 21S under stage floor subwoofers, 8 x 5S front fills, 8 x 5S under balcony fills, and 10D and 30D amplifiers round out the d&b system. **T**

Remote Locations Are No Problem for Zixi

Gospel Ministries International, Inc. (GMI) is a faith-based, volunteer-driven organization that leverages technology to advance its mission work around the world.

GMI operates orphanage projects, educational and prison programs, and evangelical and medical aviation services, GMI has a large network of television and radio channels broadcasting in various languages around the world. The programming provided by this network of channels includes children's shows, music videos, healthy lifestyle and cooking programs, documentaries and Biblical preaching.

GMI also live-streams events, including two regular monthly live shows from the Spanish Network studio in Bolivia. and up to three larger live events per year from various locations in South, Central and North America. These events usually last three to four days, presenting Biblical topics to a local audience live on two or three channels. GMI turned to Zixi to help ensure reliable and stable streams for these events over the public internet.

Zixi provides a cloud based and on-premise Software-Defined Video Platform that enables reliable broadcast-quality video delivery over any IP network, any protocol, any cloud provider and any edge device.

The Zixi Platform makes it easy and economical for media companies to source, manage, localize, and distribute live linear and live event channels in broadcast QoS, securely and at scale, using any form of IP network or Hybrid IP environments.

"We often don't have control over the location chosen for the events, as we go where we are invited by a church or ministry. Often they prefer the event to be held on their property or choose a location that they can afford, which sometimes means that the event is held in remote locations or places with weak internet connections. Because of this we

"Zixi's sales and support team sent through all the information that we needed and offered to help with the installation, configuration and setup. We never needed to take them up on that offer! Zixi has easily integrated 100% with our capture, playout and live broadcasting solutions," Solomon noted.

Since the Zixi installation was completed in December 2017, GMI has been enjoying the benefits of the system.

"We have really pushed Zixi to the limit, with a number of live events located a distance outside the nearest city, streamed over some very weak, non-dedicated wireless, LTE and other

knew we had to find a very reliable and robust solution," said Derek Solomon, Systems Engineer, GMI. "We wanted a solution that could ensure packet delivery of our main IP broadcast stream during live events, and which also offered real-time feedback."

GMI's satellite service provider, MX1, was using Zixi to deliver the broadcast stream from GMI's playout computer to MX1's satellite uplink facility over public internet, so Solomon already knew that it worked well.

"It made sense for us to test out Zixi, since MX1 was happy with it – and it turned out to be a perfect fit for our workflow," said Solomon.

To set up the ideal workflow, GMI utilized two Zixi software components, the Zixi Feeder and Zixi Broadcaster. The Zixi Feeder software, a light weight application embedded in GMI's broadcasting encoder hardware, resides at the point of signal acquisition or is deployed at cloud edges as origin servers. It wraps the input into the Zixi protocol for transport to the Zixi Broadcaster, the central component of the Zixi software that serves as a central hub for the management, processing and distribution of live video content in various formats. The Zixi Broadcaster Platform is available as a service running on-premise on an

appliance or as a CloudService (SaaS). It accepts encoded video from the Zixi Feeder, allowing users to manage, store, re-format and route video to various targets, including Zixi Receiver, embedded partner hardware or software, CDNs, or PCs, Tablets, and Mobile Devices with the Zixi Receiver built in. Zixi can also transcode and deliver RTMP or HLS in various bit rates and protocols. When used together, the Zixi Feeder and Broadcaster Platform provide congestion-aware error correction, bandwidth shaping, and real-time feedback of streaming status enabling content producers to economically transmit HD video over commodity internet connections with six-nines of availability.

"All we need in order to broadcast a live event is a laptop computer loaded with our capture software and Zixi Feeder", said Solomon. "On the receiving end we have installed Zixi Broadcaster on the same computer that we use to receive and manage our live input streams. It was very simple and very cost-effective, with no need to buy any extra hardware for either the sending or receiving side, which kept our travelling kit inventory down."

The installation process was equally straightforward for the GMI team.

GEAR LIST:

Sling Studio

AJA IO XT

HP Z-Book using Cinegy Air SOLO

Zixi feeder

Zixi broadcaster

poor connections. Every time, Zixi has provided reliable packet delivery, as well as outstanding packet recovery and real time feedback, with no or very little noticeable result to the viewers," said Derek. "We can monitor the packet loss and recovery on a graph in real time and prepare to react to possible stream interruptions, and we can also inform the production team at the live location about the packet loss so that they can find and eliminate all non-essential bandwidth users before the stream gets interrupted. It's a very efficient way of working."

"Zixi's support team are a great asset for us as well - there have been a few times when we have needed support just before a live event, and the support team have jumped in and helped us in time to start the event. That immediate service is really invaluable to us on a live production," Derek added.

With Zixi, no matter where they are, GMI's people no longer need to worry about poor internet connections. Instead, they can focus 100% on spreading their message of hope and warning to the people of Planet Earth. ▪

PHOTO: PUERTORICO: VOLUNTEERS IN PUERTO RICO USES ZIXI TECHNOLOGY TO DELIVER BROADCASTS ACROSS MULTIPLE LOCATIONS THROUGHOUT THE REGION.
PHOTO COURTESY OF ZIXI

LOUDSPEAKER SOLUTIONS
from Renkus-Heinz

Renkus-Heinz has been a leader in digitally steerable loudspeakers since it debuted its Iconyx line in 2004. Since then, the company – still family-owned and with manufacturing in California – has worked to not just improve the steerable technology, but also make it more accessible.

What is beam steering? It is a technology that allows for specific and precise positioning of audio coming out of a loudspeaker. Because the process is done digitally, beam steering allows you to hang loudspeaker arrays where they will look best in the facility – and put sound where you want it: on your congregation.

This is a critical consideration in the house of worship world. Worship facilities often introduce large rooms, unique architectural elements such as wooden pews, and reverberant surfaces such as glass. By keeping audio away from these components – and from bouncing off the walls or ceilings – the intelligibility of the spoken word is improved immediately. They also offer the best audio in their class across live performances.

Renkus-Heinz recently introduced three new product lines – each looking at different sized installations. They also come with supporting technologies to support congregations of all sizes – from mobile applications to software suites, and even on-site support and installation from the Renkus-Heinz team.

Take a look at the following options now being offered to houses of worship of all sizes and shapes!

MALL

mall venues can still benefit from sound being placed exactly where you want it most: on your audience. The first product in the Directivity Control Series, the DC12/2 ultra-compact, steerable self-powered column array brings the clarity, intelligibility, and control synonymous with Renkus-Heinz legendary digitally steered line arrays to smaller spaces.

The DC12/2 is also the first digitally steered array with control via smartphone or tablet. This means installers can install quickly and strategically, then use several pre-defined presets through an iOS or Android device to tailor the system for the specific environment. By providing multiple directivity options in the app, Renkus-Heinz is making it possible for everyone to deliver consistent coverage that dramatically outshines a typical point source or column loudspeaker.

Easily installed with the included wall mount, the DC12/2 requires no vertical aiming and is the perfect choice for smaller venues, as well as for covering balconies, transepts, and overflow spaces.

With 12 full-range, two-inch drivers powered by twelve channels amplification, the DC12/2 is the perfect choice for any application requiring tight control and nearly invisible aesthetics.

MEDIUM

The Iconyx Compact series – and specifically the ICC12/3 – brings the ultimate flexibility of the Iconyx to a smaller footprint array. An all-new twelve-channel digital amplifier powers twelve, 3"/ 7 7 mm full-range, high sensitivity, treated paper cone drivers. With an amplifier and DSP channel for each driver, the flexibility of Iconyx is now available in a package nearly 40 percent smaller than the classic Iconyx.

While the package is smaller the performance is not. Full RHAON II beam-steering with the latest U.R.G.O beam algorithms, a movable acoustic center, multiple beam opening angles and high-pass filtering of individual beams. All with the fidelity and musicality expected of a Renkus-Heinz product.

The Iconyx Compact series brings the performance and directivity of Iconyx to spaces where even the classic Iconyx arrays are too large. The very narrow cabinet will disappear into nearly any venue, while the exceptional vertical directivity can help penetrate even the most challenging acoustics, making the exceptional performance of beam-steered line arrays to the most architecturally sensitive spaces.

LARGE

No matter how large your congregation is, you can still ensure everyone hears your message by placing sound exactly where you want it with Renkus-Heinz' new, combinable loudspeaker series: the ICLive X. The ICLive X series is a complete system, designed from the ground up, consisting of two freely combinable, steerable-array modules, the ICLX and ICLXL, and a matching subwoofer, the ICLX-118S.

The culmination of over a decade of experience in steerable line arrays, the ICLive X Series is the latest evolution of the medium-format, steerable line array. The ICLive X module can be arrayed up to 12 tall, making it perfect for jobs of all size in the house of worship market.

New for the ICLive X Series is Renkus-Heinz's exclusive Acoustic Source Multiplier (ASM) waveguide. The ASM allows the HF section to be coaxially mounted in front of the LF section. The coaxial driver arrangement delivers a consistent and symmetrical array of both high and low frequencies along the entire length of the array, allowing the freedom to choose any acoustic center available. In addition, the ASM reduces inter-driver spacing to its absolute minimum, ensuring gradient-lobe free performance to very high frequencies. ▣
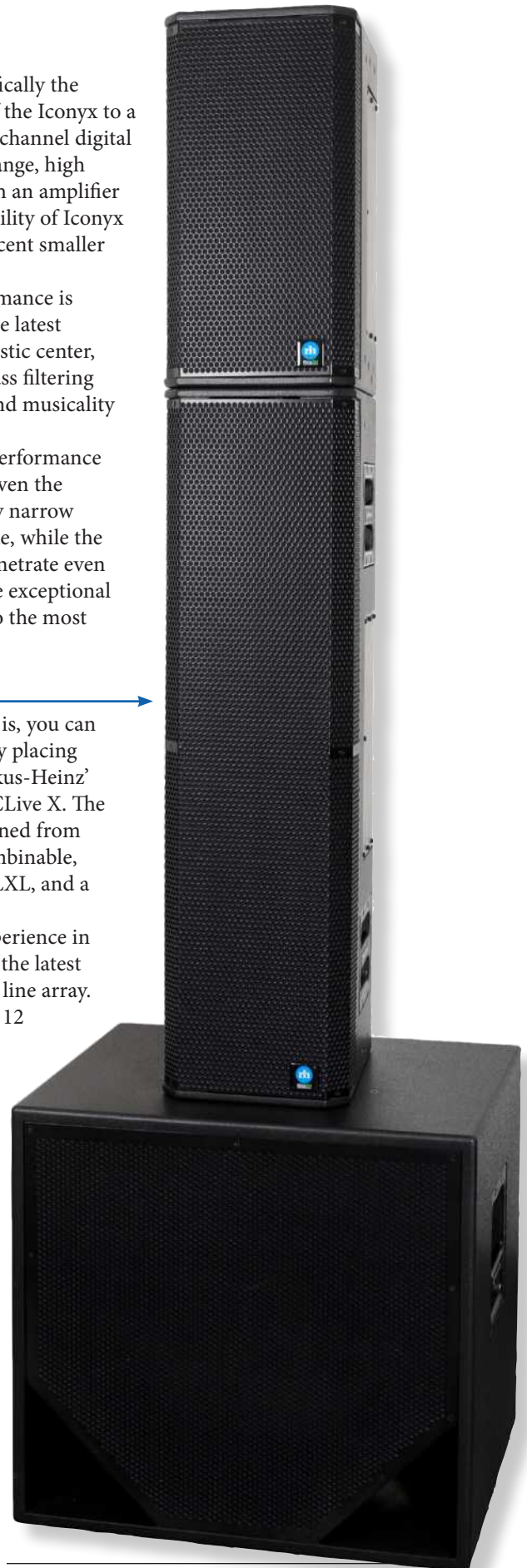
Best In Show features product solutions for Houses of Worship of every size and budget range

Camera Solutions from Canon

SMALLER CHURCH

Caon's XF705 camcorder features 4K (3840 x 2160) video shooting enabling users to record high-image quality at 60p/4:2:2/10-bit/HDR video to on-board SD cards. Ideal for broadcast and video production applications in addition to capturing worship events and concerts, the 4K camcorder meets the needs of smaller churches who require high-quality video capture and more efficient video production workflows.

The XF705 features an L-Series 15x optical zoom lens (35 mm film equivalent: 25.5 mm–382.5 mm), 1.0-inch CMOS sensor and a Dual DIGIC DV 6 image-processor providing greater image quality and performance. In addition, houses of worship can easily choose between two HDR formats—Hybrid Log-Gamma (HLG), ideal for such scenarios as broadcasting and live video transmission and Perceptual Quantization (PQ), which is well-suited during web transmission and film production. The camcorder features Canon's newly developed XF-HEVC video format

that enables users to record HDR video to SD cards while delivering a high compression ratio. It also allows HDR (internal SD card) and SDR (external recorder) simultaneous recording. Delivering smaller file sizes allows for more efficient workflows across various stages of the production process, from shooting to editing.

When shooting 4K video, focusing precision is vital, the XF705, featuring Canon's revolutionary Dual Pixel CMOS AF, enables church broadcast teams to maintain smooth autofocus operation through enhanced touch-panel operations. The XF705 meets a wide range of professional demands, with Canon Log 3, 12G-SDI, Built-in Wi-Fi, 4-channel audio, 3 density ND filter and 5 axis image stabilization for its 15x optical zoom lens. It is also compatible with the current leading non-linear editing software, as well as Canon XF Utility, a software that supports the new XF-HEVC video format, as well as XF-AVC and XF-MPEG, and is used for import, playing back and managing video data as well as cropping still-image data.

MEDIUM-SIZED CHURCHES

The C300Mark III is Canon's next-generation Super 35mm workhorse featuring a new Dual Gain Output (DGO) sensor. Like the full-frame EOS C500 Mark II digital cinema camera, it employs a modular design and an interchangeable lens mount optional accessory that allows houses of worship to easily customize the camera according to the needs of each project, making it an ideal tool for a wide range of

video content production. The introduction of C300 Mark III, alongside the already announced C500 Mark II, signal Canon's equal and high attention to the two important constituencies of Super 35mm and full-frame content creation.

The newly developed 4K Super 35mm DGO imaging system generates high dynamic range and maintains low

noise levels by reading out each photodiode with two different gains. One gain prioritizes saturation in highlight areas while the other suppresses noise in the shadows. The result is an image with up to 16+ stops of dynamic range, clean rich shadows and vibrant highlights in up to 4K/60p. In 2K recording mode, the EOS C300 Mark III camera features recording speeds up to 180p. Equipped with Canon's latest video imaging processor, the DIGIC DV 7, the camera achieves more fluid and efficient recording of 4K and HDR and can process high-speed video recording, including 4K at up to 120p.

The EOS C300 Mark III camera utilizes Cinema RAW Light, a very powerful and useful tool for helping to cut the data size of a file to about one-third to one-fifth of a similar Cinema RAW file, without losing grading flexibility. In addition to being able to record 4K and 2K RAW data internally without using an external recorder, the camera also supports XF-AVC (with a choice of Intra or LongGOP), offering flexible options in recording durations.

The EOS C300 Mark III camera is modular and customizable, just like the EOS C500 Mark II camera. Included with the camera are 13 accessories, such as a 4.3-inch LCD monitor and the GR-V1 grip. Churchs can also choose from a wide range of additional optional accessories that allow them to configure the EOS C300 Mark III camera to their preferences. Optional accessories include the EVF-V70 electronic viewfinder, SU-15 shoulder support unit and EU-V1 and EU-V2 expansion units. The EU-V1 expansion unit allows for gen-lock, sync out, remote use and ethernet connection; while EU-V2 expansion unit features those functions plus a V-mount battery connection, two analog XLR audio ports and 24v DC Out. Additionally, the mount kits (sold separately) allow users to exchange the EF mount with an EF cinema lock mount or PL mount.

LARGER CHURCHES

With its modular design, competitive price point and new features such as a 5.9K Full Frame CMOS sensor, user-changeable lens mounts, electronic image stabilization, internal cinema RAW light recording and the new DIGIC DV 7 Image Processor, the EOS C500 Mark II represents a bold leap forward for Canon's Cinema EOS system line. The variety of assembly and lensing options help to make this camera ideal for a broad range of filming projects, including live broadcasts.

The EOS C500 Mark II features a 5.9K full-frame sensor with 60p recording 5.9K and 4K (2K recording at 120p) and 15 stops of dynamic range. In addition, the newly introduced DIGIC DV 7 image processor allows for more fluid and efficient recording of 4K and HDR. Cinema Raw Light, first introduced in the popular EOS C200 cinema camera, helps to cut data size to about one-third to one-fifth of a Cinema RAW file, without losing grading flexibility.

Houses of Worship are able to change the lens mount themselves without assistance from a Canon service center and can purchase the EOS C500 Mark II with a standard EF mount and then have the option to purchase either EF-lock or PL mounts. This feature provides churches with the creative freedom to pair the camera with the lenses that will provide the desired look for each project they work on.

In addition to the changeable mounts, the new camera's body is quite modular. Included are 13 accessories, such as a 4.3-inch LCD monitor and the GR-V1 grip, and houses of worship can choose from a wide range of additional accessories that allow them to configure the EOS C500 Mark II to their preferences. Optional accessories include the EVF-V70 electronic viewfinder, SU-15 shoulder support unit and EU-V1 and EU-V2 expansion units. The EU-V1 expansion unit allows for gen-lock, sync out, remote use and ethernet connection, while EU-V2 expansion unit features those functions plus a V-mount battery connection, two analog XLR audio ports and 24v DC Out. T

Live Production Solutions
from Vizrt Group (NewTek & NDI)

NewTek's mission to democratize broadcast-grade technologies has been ongoing for decades now – and during that time, houses of worship have always been at the forefront. The live production systems it has built over the years have been more than entry points to production for worship facilities across the world – they have served as a way to increase congregation connectiveness and inspire creativity in delivering the message.

The company's NDI technology – now its own brand under the Vizrt Group, which includes Vizrt, NewTek and NDI – was instrumental in lowering the cost of production both for onsite video and live streaming capabilities. When combined with its first version of the TriCaster Mini live production system, NDI and NewTek welcomed in many small- and medium-sized houses of worship, offering them effective and affordable avenues to use live video.

ince those first steps toward making broadcast-quality streaming more affordable, NewTek has worked to make the entire live video workflow IP-based – from camera to stream. What this means for churches is the most versatile solution to live video ever – an entirely networked-based offering that requires no additional cable runs. Further, by leveraging that simplicity in workflow, solutions now exist that allow for small teams – and even a single person – to run an entire show. Here are some of NewTek's newest offerings for congregations of all sizes.

SMALLER CHURCH

The entry point for a live production system has never been more accessible nor more powerful than right now. The TriCaster Mini 4K is the most complete, compact live multicamera video production system on the market. It also comes with groundbreaking features like Live Story Creator and LivePanel - software designed to make the production of network-quality shows elegantly easy for lone producers or small teams – whether they are beginners or seasoned video professionals.

The enhanced TriCaster Mini 4K offers easy setup with extensive live production capabilities including broadcast-quality, fully customizable virtual sets to turn any living room, garage, or basement into a professional studio reflecting the identity or brand of any business, house of worship, school or agency. Stunning broadcast graphics, media playback, one touch automated control, multi-channel remote Skype video calling, integrated replay, social media integration and more are all delivered at up to full UHD p60 resolution.

TriCaster Mini 4K will also ship with two recently announced Spark Plus IO 4Kp60 encode/decode converters, enabling IP-based, NDI®-first workflows using existing inputs and outputs. NDI functionality is key in live video workflows, as it allows for a drastic reduction in cabling and cost.

MID-SIZED CHURCH

For medium sized churches that already have a live production system powered by NDI in place, the next step is to add additional pan, tilt and zoom (PTZ) cameras.

The NDI PTZUHD Camera is the first pan-tilt-zoom camera that transmits full 4Kp60 video directly to NDI®-compatible receiving devices across a standard network. The NDI PTZUHD camera allows content creators to capture and deliver superior quality UHD video with native support for resolutions up to 2160p60 using a 30X optical zoom lens, and a high-quality Sony CMOS sensor.

The NDI PTZUHD camera represents state-of-the-art NDI®|HX implementation. The result is reduced latency output at low bandwidth which puts less strain on the network. The NDI PTZUHD is a perfect broadcast-quality camera solution for NDI-powered video production workflows. The 4Kp60 camera is a clear choice to future-proof broadcast and sports workflows. Additionally, professional audio-visual producers will find it to be the best quality and easiest solution for delivering critical stories and content.

Requiring only a single Ethernet connection for setup, power, operation and signal flow, digital media producers and content creators can explore new ways to evolve their productions into 4K. The camera pairs perfectly with the TriCaster Mini 4K and TriCaster TC1 for a configuration-free NDI experience with a better than broadcast feel.

LARGER CHURCH

The most complete production system available today, TriCaster TC1 represents the continued innovation of the iconic product that defined an industry. Designed with hundreds of advanced production capabilities, it has everything you need to do video your way today—and tomorrow.

TriCaster TC1 allows you to present your audience with an immersive viewing experience defined by amazing clarity and incredible detail. Produce programs, performances, and events in true 4K UHD (Ultra High Definition) resolution with support for native 2160p video at 60 frames per second. Unlike other products that promise 4K UHD, only TriCaster TC1 allows you to switch, stream and record 4K UHD video without compromising the frame rate or the number of available inputs. You can also conduct live Skype video calls with any remote guest, anywhere in the world.

Capture all the angles, record multiple channels of full-resolution video to QuickTime or H.264 files. From archiving the master cut for your content library, to ingesting the raw camera footage for post-production, to caching production extras and presentation materials for on-demand, TriCaster TC1 easily handles the work of multiple professional decks without the added expense.

You can also stream live to your choice of new media platforms, including user-friendly presets for Facebook Live, Microsoft® Azure®, Periscope, Twitch, YouTube™ Live, and more. ■

Different Types of Mics & Their Uses

BY TIM ADAMS

There are a dizzying array of microphone options on the market today and it seems every quarter, manufacturers are dropping new models onto the market. How do you determine which ones are worth your time and which ones are simply re-hashing what has come before?

First, we need to understand how microphones are divided and classified, what criteria is used in that dividing process, and how that affects which microphones you choose to invest in.

POLAR/PICKUP PATTERNS

There is so much informational and educational material readily available online that I won't spend too much time here. While it is important to understand these patterns and how they affect your choice in microphone, I will only provide a cursory explanation of each and their most common uses.

Omnidirectional/ Omni: Picks up sound equally in a 360° sphere around the mic head. Often used for generic spoken word and some basic vocal and instrumentation, though these latter two use cases are not ideally suited for these microphones in most cases.

Cardioid: Noted for a slight elongation of the pickup pattern directly overhead of the mic head, the roughly heart-shaped pickup pattern is most often used in vocals and spoken words as the mic does not necessarily have to held close to the mouth for good sound to be realized.

Super-Cardioid/ Hyper-Cardioid: While purists will argue with me about the nuanced differences between hyper- and super-cardioid microphones, they are close enough in performance and features that I have categorized them together. While you can find handheld microphones with this pickup pattern, they are most often seen in shotgun microphones, often used in video production and filmmaking to pickup sound at a distance, usually mounted on the end of a boom pole.

Figure 8/Bi-Directional: Essentially a double-side cardioid microphone, it can pickup sound equally on both sides of the microphone. You will find these most often in use in live sound when two singers must share a microphone or in very specific situations where sound must be picked up from sources located 180° apart.

Now that we have a rough understanding of pickup patterns, we can move on to styles of microphones, one of my favorite things to talk about and arguably where most of the potential for controversy lies.

I say this because people, especially musicians, tend to get very particular about the microphones they like. Similar to how a guitar player likes a specific amp for how it makes the guitar sound, singers tend to gravitate towards microphones that help them sound their best. This can be anything from a specific make and model of microphone to a style of microphone.

Microphone styles are roughly broken up into the following categories: handheld, lapel, earset/ headset, studio diaphragm, instrument. These are held in two broader categories of dynamic and condenser.

Dynamic: A dynamic microphone is a passive device that relies on the energy in sound waves to vibrate a small diaphragm that converts those vibrations into electrical energy using a coil that moves over a magnet, producing electrical current. These tend to be less expensive and far more prevalent because of it. Popular mics like the Shure SM58 and Sennheiser e835 handheld mics are dynamic microphones. They are also able to handle higher sound pressure levels than condenser mics.

For more information: www.mediacollege.com/ audio/microphones/ dynamic.html

Condenser: The condenser uses a capacitor that utilizes two thin plates (one of these acts as the diaphragm) with a voltage between them. When the diaphragm vibrates, it changes the distance between the two plates and thus changes the capacitance, thus creating the electrical current. Because the capacitor requires power to provide the voltage between the two plates, it requires that power to come from either a battery stored somewhere inside the microphone, or power from the audio mixer in the form of +48v phantom power.

For more information: www.mediacollege.com/ audio/microphones/ condenser.html

Ok, you might be thinking that's all fine and good, but how do I know what kind of microphone to use for a given instrument and where do I put the mic in relation to that instrument or sound source?

Again, there are myriad of sources to check online for this kind of information, but some of the most common solutions are here:

For guitar amps or cabinets: a Shure SM57 mounted directly in the center or just off-center to the speaker face will provide the best sound. Of course, if you can "dog house" the amps and cabs (place them in a separate space from the stage and mic them there), that would

How do I know what kind of microphone to use for a given instrument and where do I put the mic in relation to that instrument or sound source?

be ideal. However, guitar players are pretty protective of their gear and prefer to have it close by. You can get around this by having a solid monitoring solution for these musicians but be prepared to compromise. If an amp or cab must be on stage, I will firmly request or suggest that we face the speaker in front of the player, aimed back at them rather than facing the audience from behind them. This helps control stage volume, which can be a real hassle at times.

Vocalist/Singer: I approach this two different ways-if the singer is a professional, then I will ask them if they have their own microphone or have a preference out of the selection I have available. Often, they will simply take what I give them, but it's a nice touch to ask and shows respect for their professionalism and also demonstrates that you are aware and care about their needs. If they are not a professional, I will try to give them the best mic I have available (e.g. Shure Beta58 vs. a Shure SM58). Of course, your ability to EQ their sound will go a LONG way into ensuring that you are getting good sound. Coaching singers in how to employ good mic etiquette (mics should be no further than two fingers width away from the mouth when being used) will help you, as well!

Instruments: This is where you will arguably spend most of your head-scratching time. Pianos have dedicated solutions that would be wise to invest in; trying to DIY something

often ends in tears and frustration. Similarly, drum kits have mic packages that are built for the purpose and you are better off investing in one of those rather than trying to make what you have on-hand work. String instruments are notoriously difficult, with upright bass and violins being some of the most annoying. My experience has been that for violin solos, using a wireless earset/headset mic actually produces amazing sound! And even better if the soloist wishes to speak, the mic is already there.

For mic'ing instruments at a distance, you might have to resort to a supercardioid condenser, but be wary as these can induce feedback quite easily. The basic recipe for mic'ing any source is to get the mic as close as possible to the source of sound (not always where you think it is, such as a flute could be near the mouth rather than the end of the instrument). Of course, you cannot impede the movement or ability to play of the musician, which can lead to the aforementioned head scratching.

I love the challenge of finding a new way to mic a difficult source and often times, we church techs have to settle for "good enough" given the usual time constraints. However, making sure that you learn from every such situation and what you see works for others can help you know which solution is right for every situation in the future. As always-if you have the chance to experiment outside of a live event, do it! Rehearsals are great times to try something new just to see how it works! **T**

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Why Audio is the Next Upgrade for Worship Spaces

BY GARRISON PARKIN

As houses of worship look at the potential of safely retuning to on-site service in the coming months – or, in some places, where they have already returned to on-site service – there is a discussion occurring on what expectations will exist upon reopening.

At the beginning of the pandemic, there was largely a push to move toward online video solutions. Technologies for Worship magazine covered this move expertly – noting that solutions now exist not just for the largest of churches, but for the medium- and small-sized houses of worship as well. That democratization of technology – the movement of more effective and efficient solutions being made available to all – is likely to open many parishioners' eyes now that they've seen the capabilities of their ministerial team.

After all, if professional grade live video is being made available to all, what other types of tech can be affordably put in place once people return to the church in person?

The expectations of what a church is capable of have likely been raised quite a bit as a result of the ingenuity applied to distance worship!

This is not a hypothetical question. It is being asked to integrators with increasing frequency at the moment. What types of elegant solutions can be added to the on-site AV in a worship space?

The obvious upgrade – and the reason integrators remain busy right now in the worship market – is audio.

WHY INTEGRATION WORKS NOW

It is likely we will see changes upon returning to our worship spaces. More distance is likely to be put between individuals. Overflow rooms may be created to ensure all can worship with peace of mind. Thankfully, there are solutions that allow for this type of setup to take place without sacrificing the quality of a message.

Because of advancements in technology – both in the

WHY AUDIO IS THE RIGHT INSTALL RIGHT NOW

So, with the question of "if" possibly answered, the next obvious consideration is what to upgrade.

The reality is, that upon return, not everyone is going to be sitting toward the front of the worship space – and they may not even be in the main hall. However, everyone should be able to hear the service clearly and without issue.

OVERFLOW LOCATIONS

Let's split this up a bit. First, let's look at the overflow spaces.

Those that have moved to online services will be ahead by just a bit during the transition back to on-site services. They will be able to more quickly route video signals internally thanks to the fact that live streaming solutions often provide a bit of an inherent AV offering. But don't panic if you're not there yet! There are still plenty of effective and affordable solutions that support a video feed into secondary locations. It is as simple as a discussion with your local integrator.

However, the audio layer of this should be improved with the installation of loudspeakers that bring a high level of clarity and intelligibility. It is through this installation that you can ensure no one will feel like they're listening through a television – or, as it has been for many over the past months, through a laptop speaker!

There are a few key technologies that will allow individuals to feel as if they are still receiving the very best service available. Key among them is digitally steerable line arrays.

Digitally steerable loudspeakers allow the worship team to place sound exactly where you most want it: directly on the audience. So no matter the size, shape or construction of the rooms you are putting people in, you can ensure they are hearing the service with crystal clear audio.

For many years the belief was that digitally steerable loudspeakers were unaffordable. However, just as we discussed earlier, technology has become democratized.

Ultra-compact, steerable self-powered column arrays are now being manufactured specifically for smaller rooms. These arrays are typically quite quick to install. Supporting technologies – such as mobile applications that can utilize room presets – allow for swift and effective integrations.

Custom colors can typically be crafted allowing for loudspeakers to blend into the architecture of a space, and because digitally steerable speakers require no vertical aiming, they can be placed in nearly any location – allowing for more flexible options where you can locate individuals.

Beyond the overflow space, these smaller units make sense for improving audio in unique locations such as balconies and transepts – locations which are each common in worship spaces.

MAIN WORSHIP SPACES

Beam steering technologies make an equal amount of sense in the main worship space. That said, it is likely you'll

audio tech itself and the supporting services – it is possible to swiftly, effectively and cost-efficiently upgrade the audio in your house of worship.

Further, integrators are able to safely do this on-site right now. Many solutions have been designed to allow for integration by one individual. The install is, quite simply, no longer an obtrusive nor cumbersome affair.

Also important: there remains a number of brands that continue to manufacture in North America – a critical component as shipping delays are unlikely to affect those looking to install within the coming months. An important aspect of this local support: engineers are still working to remotely design systems and fabrication plants can still custom design orders.

PHOTO: CAN YOU SPOT THE COLUMN ARRAYS AT CHURCH OF THE HOLY FAMILY, NOVI, MI? DON'T WORRY – WE'LL WAIT. PHOTO COURTESY OF RENKUS-HEINZ

be looking for a larger form factor loudspeaker. But even as the size of the device changes, the benefits remain: digitally steerable audio allows you to ensure audio is placed precisely on everyone in attendance.

The benefit here is to ensure that no matter where someone sits in a worship space – front, back, or far to the side – that you have planned for it and are ensuring every individual in the congregation feels like they're sitting in the prime position.

And while digitally steerable audio allows for a premium audio experience in every environment, it is of particular interest in atypically designed locations.

Main worship spaces often – but not always – come with additional acoustic considerations. The most ornate of churches are likely to suffer from audio reflection off of unique architectural construction. Larger spaces commonly suffer from audio delay issues. And nearly every church has endured some type of audio issue as a result of the many different types of surfaces used in the construction of the space – from beautiful glass installations to the challenge of sound bouncing off multiple wooden pews.

With digitally steerable audio, those issues are a thing of the past. And, using the same custom color and installation benefits mentioned before, you can place them wherever you desire in the space – allowing them to become a visual afterthought.

PARTNERSHIPS

Bottom line: high quality audio remains relevant today. It's a refrain stated over and over again, but it's worth the repetition as it's true: audio matters! When people return to church, it is simply the most immediate and impressive upgrade you can make.

To be successful in this upgrade, however, requires a partnership with integration firms that will support you long term. It was mentioned earlier that video will still be a consideration for some – but not to worry, as that can be addressed with the right integration partner. In fact, if you have a creative ask, it will be these integrators who will help you realize it!

But most of all, they will be there to support your technology workflow if things change again – be it a simple troubleshooting question, or another alteration in the way we worship. And that's important, because the one thing the religious community proved during the pandemic is its resiliency, creativity, and ability to utilize technology to continue the message. **T**

Garrison Parkin *is the Southwestern Territory Sales Manager at Renkus-Heinz*

Designing Cohesive Systems That Perform

An audio system may seem like a random collection of parts that are connected together to produce sound and while this may be an accurate definition, it is a crude one and, unfortunately, too often accurate for the sound systems in our churches. There is not a unifying design or purpose behind how the system has been assembled and this has led to no end of headaches

and nightmares for those who have to operate these systems and those who have to endure listening to these systems.

However, while audio may seem like a mystical and confusing art or science, it's really not as confusing as you may think. Often times, solving issues you are having is a matter of making small changes and ensuring users and operators are better educated in best practices and WHY those best

practices are in place.

As with any system, when designing it is important that we first look at the use case. Designing a system for a traditional church will likely not involve as much work as for a dynamic service where there are many more sources to manage and flexibility to build in.

For basic sound reinforcement where the bulk of sources will be the spoken word, we can then look at room design,

acoustics, any changes wished to the acoustics (either to boost for a more "live" or reverberant sound or to "deaden" for a more controlled sound) and other considerations like aesthetics, audio mixer location, etc. Once we have this information, we look at everything else: sources needed, the quantity, where those sources will be located on the platform, how signal gets from the platform to the audio mixer, what functions

and capabilities the mixer needs to have, where the speakers need to be placed and what kind of average volume level needs to be achieved. While this is not an exhaustive list, it should be enough of a starter to get your internal conversations going. Many techs and pastors know the sound they like but are not sure how (or even if) they can, achieve it in their spaces.

For dynamic services, there are additional considerations, such as max volume level (or sound pressure level-SPL), ensuring that SPL is even front to back and left to right, so everyone can experience the energy from the worship team in the same way, subwoofers for low-end support and sometimes, larger churches will want or need to ensure the sound system can meet the needs of touring artists and groups. This allows the church to offer their facilities to these Christian bands and artists as a performance venue, which can help not only save the tour a lot of money but gains good exposure in the community for the church.

A cohesive audio system is all about matching the needs of the church, the realities of the acoustics of the space to the capabilities of the equipment in the system. This combining of equipment can certainly become very confusing, very quickly; especially with terms like phase coherence, reverb time, splay angles, etc. For this reason, it is a good idea to find and develop a relationship with an integrator that can walk you through things you need to consider, questions you

need to answer and traps to avoid in your journey in designing a system that is matched to your space. Integrators often will provide this information and coaching at no cost and

pockets, amplifiers, wiring, connectors and interfaces tend to be either forgotten or just not included in the overall design process. This is why it is important to draw out your system,

IT IS A GOOD IDEA TO FIND AND DEVELOP A RELATIONSHIP WITH AN INTEGRATOR THAT CAN WALK YOU THROUGH THINGS YOU NEED TO CONSIDER, QUESTIONS YOU NEED TO ANSWER AND TRAPS TO AVOID IN YOUR JOURNEY IN DESIGNING A SYSTEM THAT IS MATCHED TO YOUR SPACE.

there are thousands across the US that stand ready and willing to help you out. Trust me, it's a much more comfortable process when you have someone leading you along the right path rather than trying to figure it out on your own.

Designing an audio system does require a lot of moving parts, and often times these parts are where techs and pastors fall into traps; things like floor

including every input and source, every wire, every connection, all the way through the signal chain to the speakers, monitors,

hallways speakers, etc. This can help you identify missing pieces in your system and help you back-check your design to make sure you are not forgetting anything.

If you are going to go it on your own or you wish to create an initial design

to run it by an integrator later, it is important that you consult with "stake holders" that will be using this system, from worship leaders, musicians, to your pastor and even some of your members who may have complained about the system in the past. Understanding what issues people have with the system can help you find solutions to those issues; of course, you have to weigh those complaints against reality, budget and priorities. If someone is just hard of hearing, you deal with that complaint with an assisted listening system. You don't design a system to address the complaints of one person but rather try to address the most complaints you can-aim for the average to find the sweet spot to try and please everyone as much as possible.

The final thing I will say is that it is generally better to address the entire system at once, or in large chunks, rather than piecemeal. The reasons are two: first, it will make a much larger impact on your members, thus increases the likelihood that continued offerings and funding will pour in and two, there are pieces that are just designed to work together and need to be replaced at the same time. For example, I would hesitate to replace speakers but keep old amplifiers and wiring; these are pieces that should be paired and installed together. A digital mixer could be installed on its own without too much issue, as an example of the opposite situation. Of course, if you can replace the entire system at once, that is the best option. **T**

Now is the Time to Broadcast Your Services

BY DAN CHUNG

With the ongoing coronavirus outbreak causing huge pain and disruption across many communities, it is becoming more vital than ever for ministries to be able to care for their congregations. But with varying social

distancing rules in operation that have closed many church and chapel doors for large-scale worship around the world, that is becoming an ever more difficult task.

Happily, there is an answer. Video technology has evolved massively over recent years to the point where an entire easy-to-use

and broadcast-quality set up can be made possible at budgets that once upon a time would unlikely to have been able to buy a single camera. It might seem that video's natural home

in House of Worship is in the huge mega-churches in the USA and elsewhere; institutions able to fund broadcast operations that are close to being full TV studios inside churches

with production galleries and permanent staff to look after them. But the good news is that newer technology allows almost anybody to stream a service with multiple camera angles in high quality live on the internet (or saved it for further editing in the case of ceremonies such as weddings or funerals) at low cost, with little or no

to switch between different cameras or video sources.

For example, with this sort of multi-purpose device at the heart of your ministry's set-up you could install four relatively cheap High Definition POV cameras in different places in your church to capture different aspects of the services within it. These are then connected by

optionally the switched output as well. This is perfect for ceremonies that are being recorded for posterity, such as weddings. An editor can take the video feeds and re-edit at a later stage before the completed record is then distributed in the manner of your choice.

And this is an important point as competition between the likes of YouTube

viable broadcast-quality multi-camera set-up can be installed for around about $5,000. That includes a monitor/recorder, a computer to livestream and edit videos, cabling, and four good quality POV cameras.

It might sound like a lot of money but it's not only a sound investment to keep your congregation engaged and provide a proper service for weddings and funerals while the current coronavirus outbreak is ongoing, it's also going to help to plot a route through the confusing period as lockdown restrictions are relaxed or lifted. Behaviors that have adjusted to life under lockdown will take a while to adjust to its lifting, and while some may choose to attend in-person, others (especially the most vunerable) may still prefer to participate from the safety of their own homes. I expect this will be the new normal for quite some time to come.

Video is a powerful way to reach people, both current members of your congregation to keep them engaged and new people who might be searching for wisdom and comfort in these difficult times. Getting a system installed and running that can deliver it to them across social media, YouTube and more in broadcast quality is now easier than ever. And thanks to the high-powered low-cost kit that has been released in recent years, it does not have to break the bank either. **T**

VIDEO TECHNOLOGY HAS EVOLVED MASSIVELY OVER RECENT YEARS TO THE POINT WHERE AN ENTIRE EASY-TO-USE AND BROADCAST-QUALITY SET UP CAN BE MADE POSSIBLE AT BUDGETS THAT ONCE UPON A TIME WOULD UNLIKELY TO HAVE BEEN ABLE TO BUY A SINGLE CAMERA

staff and with little or no training.

The key lies in the sort of monitor/recorders which have revolutionized the broadcast industry in recent years and made high quality television programs easier to produce than ever. In many respects they are the Swiss Army knife of modern low-cost video production in that they monitor the video, record the video (sometimes in higher quality for archive purposes and/or later editing), and allow the user

SDI cables to the monitor/recorder (these are better than using HDMI cables whose signal degrades rapidly with longer cable runs). Once a service is underway, a user then simply has to tap on one of the streams on the screen of the device to switch to it as the 'program' output. This feeds the live stream, directing the broadcast as they would a football match or a live concert.

The system can record every camera angle, plus

and Facebook has meant that the learning curve of distributing video has been flattened considerably over recent years. Whether for live broadcast or for later consumption, more and more events that would once have been out of the reach of modest budgets can now be broadcast to audience son a local, national, and even global scale.

o, how much are we talking about here? We've looked at the numbers, and we estimate that a

Dan Chung *is the CMO of Atomos*

How Acoustical Design Affects Church Audio:

PART TWO

BY JAMES CARELESS

In Part One of "How Acoustical Design Affects Church Audio: Part One", Technologies for Worship Magazine explained what acoustical design is, why it matters to churches, and why ignoring acoustical design can literally make listeners sick.

In Part Two, we consider the relationship between audio equipment and acoustical design; why after-the-fact audio fixes can fail, and where churches can get help to get and execute their own acoustical designs.

A Quick Refresher

Acoustical design is aimed at building/renovating a church's interior to optimize the delivery of clear, intelligible sound to everyone inside.

"The goal of acoustical design is to overcome the inherent acoustical issues within a space," said Daryl Little, Solution Manager with Mankin Media Systems. "That means evaluating all surfaces: floor, ceiling, walls; where are the parallel reflection points; what materials are being used in the construction of the room like drywall, concrete, wood; and what elements in the room will increase or decrease reflections such as padded chairs vs. wood pews. You then use those variables to evaluate how to design the entire space to create an acoustical design package. The space, contents and number of people in the room all work together in order to impact the acoustics."

"I can explain why this matters in a very simple way," said Jon Taylor, Presonus Audio's Technical Sales Lead. "When a church's acoustical design is good, people are happy because they can hear. When it's bad, people are unhappy because they can't hear."

How Acoustical Design and Audio Equipment Relate to Each Other

The relationship between a church's acoustical design and the audio equipment chosen for it is extremely tight. This is because a room's acoustical properties influence what kind of amplification and sound reinforcement is required for the space; including how much (or how little) audio amplification has to be delivered by its loudspeakers.

Acoustical properties also determine the "proper location and placement of loudspeakers,," said Garrison Parkin, Southwestern Territory Sales Manager at Renkus-Heinz. "When we use loudspeakers equipped with digital beam steering, we have the ability to ask 'where are the people going to be sitting?' We can then steer the sound exactly to where people's ears are. We have ultimate flexibility with beam steering, when the loudspeakers are placed properly."

This said, "amplifiers and mixing boards really don't have a lot to do with the acoustical design process if it's done been correctly," said Taylor. The reason? "Effective acoustical design ensures that the room is already prepared for optimal sound delivery," he explained, "without the need to 'compensate' for any shortfalls through specific equipment choices."

The notion that amplifiers, mixers and indeed speakers

don't matter in a church with excellent acoustical design does come with a caveat attached: If the audio equipment is low quality, then the room's audio quality will be poor as well. As they say in the computer industry with respect to poor input data leading to poor output results, 'garbage in, garbage out'.

"Loudspeakers, amplifiers and mixing boards produce the initial sound waves," said Little. "Their quality, or lack of quality, determines how great or poor the room can sound. As an example of this, compare a low quality and a superior

DSP cannot 'fix' a room with poor/ nonexistent acoustical design, any more than putting racing tires and a spoiler on a lemon can turn it into a race car

quality set of headphones and you will realize a difference in the experience. The superior set enhances the sound, opening up sound elements you may have not even noticed before. Meanwhile, the low-quality headphones can create muddiness in the mix and can lead to ear fatigue much sooner."

Inevitably, cheap audio equipment makes life difficult for the church that installs it. "When you utilize low quality components to your sound system, you often spend your time and resources fixing sound and frequency issues," Little told TFWM. "You then compound those issues when you don't have a quality acoustical design. In contrast, high quality systems combined with a solid acoustical design means you get more time to develop volunteers and staff."

You Can't 'Fix' Poor Acoustics with DSP

With its ability to boost/reduce specific audio frequencies and compensate for time delivery delays, Digital Signal Processing (DSP) is a godsend. It really can help churches

improve the clarity, intelligibility, and overall listenability of their reinforced sound; ensuring that parishioners have a more enjoyable audio experience.

At the same time, DSP cannot 'fix' a room with poor/nonexistent acoustical design, any more than putting racing tires and a spoiler on a Chevy Chevette can turn it into a race car.

"It is not possible to correct acoustical properties of a room electronically," said David Ellis, President of Ellis Pro Media. "The only thing that can be done electronically is to use EQ to pull down excess reverberant energy originating from the PA."

"Digital signal processing can overcome some issues, but it isn't a magic bullet to fix the acoustics of the room," Little agreed. "Some issues can be fixed, like reducing errant frequencies, but you are distorting the end result. The more you have to chisel away frequencies, the more you move away from a natural sounding system. And there are issues that you can't fix with a DSP; for example, the reverb time of the room."

This brings us back to the importance of starting with a good acoustical design before any equipment is purchased. The church's interior has to be built/renovated to optimize acoustics first, in order for any audio equipment to do its job properly. Anything less just won't cut it.

Getting Help

How can a church AV person get help on acoustical design if they need it? "By using an acoustical consultant, the correct integrator, or by learning the variables and relevant physics involved," replied Ellis.

For those churches not wanting to learn physics nor hire an acoustical consultant, "you should find a trustworthy integrator." said Little. "An integrator can evaluate your audio system and room, then develop a plan for an acoustical design."

Once the acoustical design has been settled, it is important to buy the right audio equipment from reputable sources. "Authorized dealers are imperative," said Parkin. "Many offer complimentary system design from the loudspeaker point of view."

The bottom line: If they don't personally have the know-how, church AV people need to take advantage of these and other expert resources to ensure that their building's acoustical design is done right. This will ensure that the congregation and church leaders get the clear, intelligible sound reinforcement they need throughout the room each and every service; year in and year out. **T**

James Careless *is an experienced freelance writer with credits at The Toronto Star, National Post, and Globe and Mail newspapers. He is also a broadcaster/podcaster and has produced the ecumenical radio show "Daybreak" at CHEX-AM radio in Peterborough, Ontario.*

LIGHTING
for Video

BY TIM ADAMS

Our eyes are amazing creations; able to endlessly adapt to a huge variety of lighting conditions, they are arguably one of our most important senses that help us navigate our environments.

However, because they are so adaptable, they also lie to our brains. How? They adapt so readily to low light conditions we often don't understand why cameras do not provide the same images that our eyes deliver to our brains. This has caused no end of consternation to pastors, AV leaders and volunteer techs as they struggle to understand why the camera they just bought seems to struggle with what their eyes are telling them is adequate lighting.

Lighting for video can be tricky; how much is enough light? Where do I put the lights? How do I control those lights? How far away do they have to be from the stage? Are some angles and lighting positions better than others? A to these questions lead to a whole line of new questions because you must now consider the needs of field production, studio production, green screen and filmmaking.

Lighting is deceptively complex, but it doesn't have to be. There are four basic lighting setups that we need to understand. After we have that foundation, we can borrow from these setups to provide the right amount of lighting, when and where you need it.

One-point lighting: as you might imagine, this setup requires just one light. Where you place that light can have a dramatic impact on how your final image looks. Generally, this will be a light from somewhere in front of your subject within about a 120° arc so you are lighting their face. While this can be sufficient for many uses, it's not ideal for video as it tends to produce a flat image.

ONE-POINT
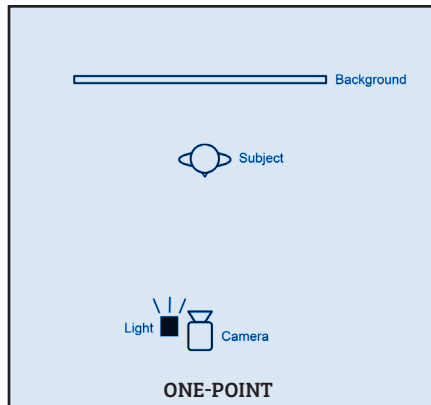
Two-point lighting: adding another light to the single light from the first setup allows you have a back light, or hair light. This is meant to shine down on your subject's head and shoulders, creating an outline that separates them from the background. This depth helps add realism and a 3D effect in that it focuses the viewer on the subject.

TWO-POINT
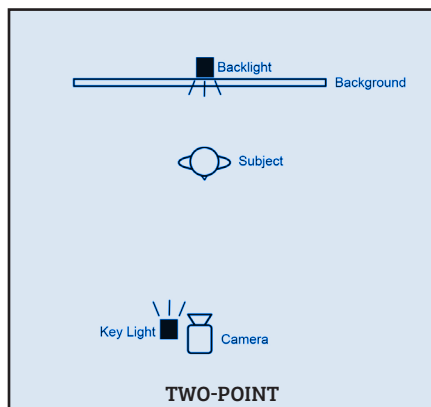
Three-point lighting: we can now add a third light source to the mix. At this point, it's time to start using names for our lights in order to differentiate them. The light from the first setup is the "key" light as this provides the bulk of the front illumination on the subject. The second light from the 2-point setup is the back light. The third light that we are adding is a "fill" light, as the key light tends to create shadows on one side of the face or the other and the fill light is meant to fill in those shadows. Generally, a key light will be placed on one side or the other of a subject; you can, of course, light from the center, but this has a tendency to create flat lighting and shadows, even if they are slight and very soft, can create visual interest for the viewer.

THREE-POINT

Four-point lighting: this may not be one you have come across before, and I generally save this setup for live events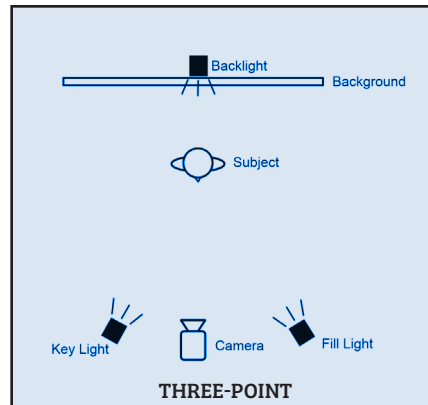 because it's somewhat specific to that use case. I use two key lights from 45° left and right with about a 45° down angle onto the stage. I then use two back lights, as well, to create even back lighting across the stage or "zone" I am lighting. I am a big fan of "zone lighting," which is something I picked up from theatrical lighting. Being able to have zones of light give you some interesting capabilities for live events. You can dim lighting on stage left with full light on stage right. This lets stage hands or musicians exit while focusing attention to the next cue on the program.

But you can also turn on all zones to create your stage wash. It's a really nice, flexible system, but one that does tend to require more lighting fixtures, and thus more cost. You will also need to ensure your lighting operator is dedicated to that position and has been properly trained in how to operate the lighting system to truly take full advantage of a zoned lighting system.

Now that we have talked about the different setups, we need to talk about the importance of soft lighting. Many theatrical lighting fixtures and even many LED panel lights built for video use are inherently not soft enough to provide soft shadows and soft light that flatters. What you will end up with are harsh, hard-edged shadows falling all over your subject, which looks neither flattering or attractive. By adding some diffusion material in front of your fixtures, you can greatly increase the softness of the light; however, there is a trade-off. The more diffuse your light, the more wattage you need to push the light rays all the way to where you need them.

Many small churches will have 15'-30' throw distances (distance between a lighting fixture and the subject/area to be lit) and even a mild diffusion can reduce lighting intensity by nearly 50%. Soft light is not necessary (I hardly run with it at all, but ensure that lighting is even on the faces as that is of primary importance), but it can certainly help your people look their best. But if you go down this route, understand that you will need more fixtures to compensate for the loss of intensity with diffusion material.

Ok, what about field production or filmmaking? We can utilize the same principles as above, but you need mobile solutions that include things like the ability to be powered by rechargeable batteries, warm white/cool white selectable color temperature, durability, light weight, and perhaps even app control. The good news is that many solutions exist that provide all of these features and you can get some great results without breaking the bank. It used to be that only a small handful of options were available but there are a huge number of options available at all price points.

Lighting doesn't have to be scary or intimidating, but you do need to understand the basics of how lighting works, especially how LED lighting works over distance, before you can expect to obtain good or great results. As with anything, research, watch tutorials and get out and experiment! As the saying goes, there is no greater teacher than experience! ▣

Designing a Lighting System

BY TIM ADAMS

Every church, regardless of geographic location, environment or size, will need a lighting system of some kind and this has led many churches into some unique solutions to this problem.
Let's look at the basic components that go into deciding what your lighting needs are.

FRONT LIGHTING

The most important purpose of your lighting system is to provide proper illumination of what is happening on your platform or stage. This is often some form of white lighting that will serve to help your on-site congregation see what is happening. Ideally, your lighting system can do this while providing even lighting across the width and depth of your platform area. This not only benefits any cameras that you may have in use for recording or live streaming, but it also helps to establish a consistency for the in-person congregation, as well.

Many techs will assume that lighting from the center, in front of the platform, is the obvious way to go. However, experience has taught me that we need to offset lighting fixtures, in equal numbers, 45° off center left AND right is the way to go. This allows for even lighting that fills in shadows and provides illumination, even when people on the platform turn to the side. If you light from the center only and your subject turns to the side, the side of their face that is away from the lighting is in shadow, which is neither pleasant or appropriate for a church environment. By offsetting fixtures left and right, we can continue to light faces when they turn.

BACK LIGHTING

This can be referred to as hair light, back light or top light-it's all the same. The purpose is to light the edges of a subject in order to separate that subject from the background. When you see back lighting that is well done, it makes a huge impact for anyone watching, either through a video camera or in-person. One other trick I've learned is that if you light from the front with warm white and back light with cool white, you don't need as many fixtures for your backlighting; the difference in color temperature helps separate it from the front lighting.

The trick with backlighting is that you need a steep enough down angle to avoid sending your back light into the eyes of your front rows, but a shallow enough angle that you can light the subject's back from head to feet. And backlighting should be behind your subject, not on top of them. This can easily lead to what I call "raccoon eyes," where the backlight is hitting the forehead and eyebrows, casting the subject's eyes into shadow. No bueno!

COLORED EFFECT LIGHTING

Once these basics of your lighting system are squared away, you can start to look at colored accent lighting, if that is something you want to use to "spice" up your platform. Up lighting can create some amazing effects on your walls and any props or set pieces you have in use; however, be aware that these fixtures are very bright and you may need to ensure you are protecting people on the platform from being blinded by these fixtures as they sit on the floor and it's very easy to catch someone's eyes who may be standing nearby or walking by the fixtures.

Perhaps you are interested in having "air effects," where you have visible light beams in the air to help boost the energy in the room or to use that for a particular effect during the service.

These are generally handled by "moving head" fixtures that can move and be controlled remotely by the lighting controller. They have many features on-board that can provide some pretty incredible effects and impact. It's impossible to run

through every feature of every fixture, but suffice to say that it's worth looking into if you need maximum flexibility from your lighting system with a minimum number of fixtures.

Lighting Controller:

Obsidian Control Systems' ONYX™ NX 2™

Ok, you have your fixtures, how do you control them? Modern lighting systems can use a variety of control protocols, but the most basic and common is DMX. Without getting into too much detail, DMX allows you to control various parameters, from 0-100% intensity to all of the attributes of a moving head fixture. Each of these attributes takes up a "channel," and DMX allows you to control up to 512 channels in a "universe." You can have multiple universes with thousands of channels, but for most churches, a single universe provides more than enough control capability for their lighting system. Controllers come in both hardware and software options, though software generally tends to be easier to learn and use.

Let's finish by discussing the types of fixtures available and where they are best utilized; please bear in mind that this is not meant to be an exhaustive list but rather cover the very basics.

Par Can:

Color One 100X™ from Chroma-Q

the simplest and most basic lighting fixture on the market, described as a "car headlight in a coffee can." Has minimal controls for shaping and controlling the light beam. Modern LED par cans can be super cheap or can be more on the expensive side, but you get what you pay for. Good for front and back lighting.

Ellipsoidal/Leko:

ETC: S4LED Series2 Lusrr Amber

The workhorse of lighting systems, these provide incredible control over your light beam. Interchangeable lenses control the size and spread of your light, while integrated "shutters" can shape the light beam to what you need. Finally, a moveable lens tube allows control over the beam edge sharpness, which greatly aids in blending multiple fixtures together. Great for front and back lighting.

Fresnel:

impression FR1 from GLP

Designed primarily for studio use, these can be expensive and the lighting intensity dies quickly at distance. The light source can move internally, allowing you to spot or flood your light beam, as needed. Good for close lighting, either front or back.

Strip/Linear Light:

Motif™ Atelier 16FX by Blizzard

Long and narrow, these are designed to uplight walls and other surfaces for accent and effect lighting. Color changing capability helps provide endless flexibility. Good for effects and color wash lighting.

Moving Head/Mover:

Chauvet Pro Maverick MK3 Profile CX LED

With remote pan and tilt control, color changing, zoom, focus and a host of other features, these are the go-to effects fixtures for both projecting patterns, colors and "air effects." **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.*

Blending LED With Traditional Lighting

BY TIM ADAMS

Small churches simply do not have the resources available that their larger brethren do, and thus it is not often that they are able to fully replace their current lighting system with LEDs. Given the significant upfront cost for LED fixtures, upgrading to an all-LED lighting system can represent a fairly major capital improvement project.

Because of this, many churches opt for a phased integration approach, adding LEDs as they can afford, over a period of time. This can lead to some unintended effects, such as mismatched color temperature and unpleasant skin tones, etc. Why?

Ignorance about LED technology, lighting in general, mounting positions, diffusion and color temperature can all be contributing factors, but let's start with the most obvious: color temperature.

We're not going to get into the weeds of how color temperature came about, but it is important to understand that, when we are dealing with white light, there are significant differences between "warm" whites and "cool" whites, particularly when it comes to lighting for video. To properly understand these terms, we need to understand that we measure white from the low end of the scale, which tend towards red/orange, all the way to the high end of the spectrum, with whites that tend towards blue/violet. If it helps, it runs from infrared to ultraviolet. For reference, warm whites are 2700°-3200° Kelvin whereas cool whites and sunlight range from 5500° - 6500° Kelvin.

With the consumer market starting to adopt (and indeed create) their own versions and labels for different color temperature white, confusion has crept into what used to be a fairly cut and dry lighting industry. Cool white, bright white, natural white, warm white, and more designators and labels can lead many down the wrong path. For example, "bright" white leads one to the assumption that it will provide brighter

white than other options. There is also a perception issue where people tend to perceive that cooler whites are "brighter," which isn't necessarily true.

To make this much easier, most older incandescent/halogen lamps operate in the warm white spectrum (2700°-3200° K) and this generally can provide the most realistic and visually pleasing skin tones, both in person and for cameras. Of course, cameras generally have the ability to change their white balance setting to adapt to how different colors appear under different white light, but my personal preference is warm white because it's naturally more pleasing, but this is also a preference. You may feel the opposite, but it's also important to talk with your key stakeholders, perhaps arrange a demo so they can understand and be able to see the differences between warm and cool white lighting fixtures.

But this brings up the next point; if you are trying to blend new LED fixtures with older incandescent/halogen fixtures, you are likely to be locked into using warm white fixtures, unless you have the ability to "gel" your old lighting to change their white to a cooler white. Gel is used often in theatrical lighting (less and less with the advent of adjustable color LED fixtures) and is a translucent plastic that comes in a huge variety of different colors. What you would be looking for is called CTB (color temperature blue). Of course, if you are currently using fluorescent lighting, trying to match LEDs to

that lighting will likely be a much more frustrating exercise as fluorescent tubes can come in a wide variety of color temperatures and tend towards blue or green. My suggestion here is to try and buy enough LED fixtures to simply replace your fluorescent fixtures completely. If you can't, then my next suggestion is to purchase LED fixtures that have variable white

If you can't buy enough LED fixtures to simply replace your fluorescent fixtures completely, then my next suggestion is to purchase LED fixtures that have variable white capability to let you adjust the white color temperature to suit your particular needs

capability that lets you adjust the white color temperature to suit your particular needs.

Sometimes your current lighting was installed in the wrong locations and adding new LED fixtures gives you a chance to remedy that, even if you are just supplementing for now. I have often walked into a small church and noticed the fixtures are mounted at extremely steep down angles, which leads to shadows over the eyes.

Adding LEDs can help fill in those shadows so the effect isn't as extreme and over time, as more and more fixtures are replaced, you can simply remove the offending fixtures until your lighting is doing exactly what it should because it's located properly. Again, being able to replace all the fixtures at once will provide the most dramatic visual impact, but if you have to piecemeal it, then make sure your fixtures are in the correct locations.

When you are planning your lighting system, it's best to start with your most ideal plan, and this means you need to decide if you want a generic stage wash or if you want to divide your lighting into "zones." Think of stage left, stage center, stage right as basic examples. You can turn on all zones and achieve your wash, or you can use your lighting to direct the eyes of your

members to where you want them to look, which can help eliminate distractions while musicians get into place in other parts of the stage, etc. It's up to you; however, having that plan from the beginning will help you not only figure out how many fixtures you need in total, but where your new LED fixtures should be placed as they are installed. And don't forget three-point lighting should be the standard you are using. Light from 45° off center from both left and right with a 45° down angle or as close as you can achieve to that. This gets the light under the eyebrows without casting shadows and also continues to light the face when people turn to the side. The third point of light is from the back light, also called a top light or hair light. This provides depth and helps separate your subject from the background.

Blending LED with traditional lighting doesn't have to be a nightmare, but the best way to avoid it becoming a nightmare is educating yourself so that you can make better decisions and have more meaningful conversations with your leadership and stakeholders. ▪

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.*

The Value of a System Integrator

What, exactly, does an integrator do and how can they benefit houses of worship? This month, we offer a Q&A that focuses on what an integrator brings to the table and why it's important to work with one in order to save money. Our integrators also share some experiences where a church tried to do it on their own.

OUR SYSTEM INTEGRATORS INCLUDE:

Brian Poole, a former church technical director at Elevation Church where, over the course of 9 years, he helped launch 18 campuses, designed a broadcast location and worked alongside several integrators. He currently works for Ellis Pro Media just south of Seattle, Washington.

Ricky Perinchief is a 2-time Emmy® winner with 20+ years in broadcast television, consulting and systems integration; and oversees technology for his father at NOW Church in Ocala, FL. His company, Proton Global Media Group, is committed to helping ministries of all sizes achieve technical excellence, affordably.

With over a decade of church technical leadership and production experience, **Marcus Hammond** has served as Church Relations Director with Stark Raving Solutions since 2014. He's passionate about helping local churches connect with their congregation and helping church technical teams reach new levels of success. Marcus lives in Kansas City with his wife, Jill, and enjoys travel, Hi-Fi audio, and KC BBQ!

TFWM: Why is it important to build a good relationship with an integrator?

BP: Once a church finds an integrator they trust and enjoy working with, that integrator can quickly become a lifeline and a critical piece to keeping things running. Ask any tech director in any church and you'll quickly find that there is nothing more valuable or comforting than knowing someone has your back and can help you find a solution to work around whatever piece of gear may randomly fail or whatever unique challenge may be presented to you by leadership. This relationship, built on trust and collaboration, also helps the church feel comfortable knowing that their integrator has the church's best interest at heart and isn't just trying to sell them the newest, fanciest things on the market.

RP: Why try to reinvent the wheel with the potential of wasting time and money? A good integrator can not only provide solid answers and creative solutions that will help solve problems, maximize workflows, and help you become more efficient; but can also ask the right questions, reveal blind spots, fill in the gaps, and – most-importantly – be a good listener to deliver a system and design that fits the clients' needs and budget. For us, it's all about relationship as we want to be involved in all aspects of your technology and upgrades, to ensure things are playing nicely together and you are working smarter and not harder. Getting to know our clients' specific needs and knowing their challenges allows us to better provide the right solution.

MH: Tech Directors at churches are often busy enough. They need a partner in their corner they can rely on to solve the tough challenges and help them reach their goals. Having a good relationship with an integrator helps the church know they have someone they can count on, as a partner, to make great experiences happen.

What is a memorable experience of being called in after a church tried their own upgrade?

RP: We have been called so many times over the years from churches who already bought their gear from big box stores or large online retailers, who were given bad advice. Or maybe the church had a guy who knew a guy who could get a steal of a deal, only to find out they were getting ripped off or sold inadequate gear. I literally just returned home

> " There's an intangible element of partnership and understanding that happens with key partners. Having a church integrator that realizes you're doing "church" with these systems, and not just another secular event, makes a huge difference.
> -Marcus Hammond

from a large church job where two weeks ago they shipped in gear from a popular online retailer, only to realize some items would not meet their needs. One call to us and we were not only able to provide the right gear, but we beat the big box stores prices so they sent back the order. We provided crucial on-site integration and training that they otherwise would not have had. Plus, we are there for on-going support and future upgrade paths.

MH: Improper rigging standards, bad wiring, thinking analog in a digital world... these are all things we experience weekly in church AVL system integration. The most typical and memorable is when things look

or sound bad at a church but no one knows why – and they stay the same for years by just band-aiding the problem. Standards, adequate infrastructure, and the right products are always the solution for these situations. Money is always an issue and there's a "guy" who thinks he can do what is needed for cheap. In the world of quality AVL, you get what you pay for.

BP: When I worked at a church, it wasn't uncommon for us to quickly throw something together or re-wire a rack out of necessity. Once things calmed down and we were able to get our heads on straight, we would call an integrator in to straighten things out, dress out the racks and label all of the cables. This would help create a more reliable operating environment, as well as a better troubleshooting scenario if problems were to arise in the future. Another benefit to leaning on an integrator for even small upgrades is their ability to generate as-built drawings and documents showing how they installed and wired everything, should questions come up in the future or something fail that needed to be remedied quickly.

How have you saved a church a lot of money and/or headache on a project?

BP: On a recent project I was able to partner with a church and act as their liaison in the integration process. The church told me their budget and their functional needs and expectations within each space. I worked with our engineering team to vet the budget and expectations to make sure they aligned and then simply assured the church that we were good to go. From there we followed our normal design and build process but I effectively served as the client from an internal standpoint and worked to protect their best interest. At the end of the day we actually ended up giving the client a credit because the entirety of the budget wasn't needed. This sort of arrangement only works if you have

complete trust in your integration partner, but it saved this particular church a lot of time, headache, and some money at the end of the day.

RP: We encounter this all the time, but I was recently consulting a large church where they gave us a tour and showed us several boxes of unused gear they bought in previous tech upgrades where greedy dealers took advantage of them by selling them extra or unnecessary gear – all to make a quick buck. In our experience, if you add value to someone or help support them

> " Another benefit to leaning on an integrator for even small upgrades is their ability to generate as-built drawings and documents showing how they installed and wired everything, should questions come up in the future or something fail that needed to be remedied quickly.
> -Brian Poole

in projects big and small, they will come back time and time again. That's one of our most exciting achievements, when you finish a building design and install, sometimes over a couple year period, and months or years down the road, they are still so happy and trust you enough to invite you in to help with their next upgrade.

Aside from time and money, how does an integrator help a church? What are some benefits that are not immediately evident or obvious?

BP: A partnership with the right integrator can almost feel like an extension of your church staff –

having someone to lean on and call when you just need to bounce an idea off of someone in a "Will this work?" scenario. On top of that, knowing that someone has your back and is ready to drop everything to support you when something isn't working right or you have a last minute need pop up and you aren't alone in the technical trenches is simply invaluable.

MH: Tech folks at churches really want someone they can just text or call when they have a question or issue. There's almost an intangible element of partnership and understanding that happens with key partners. Having a church integrator that realizes you're doing "church" with these systems, and not just another secular event, makes a huge difference. An understanding of the "why" goes a long way.

RP: A good integrator helps you avoid costly mistakes and constantly studies industry-trends to weed out fads. We are students of culture, technology and personnel, constantly striving to hone our craft and sharpen our skills in order to help our clients into the future; keeping it affordable and providing a service that will stand the test of time. We truly wake up every day with a passion for the local church, and a deep desire to see them step up and step out! We don't believe in a one-size-fits-all approach to Church tech.

The candid answers above outline the core need that churches have for a reliable relationship with an integrator. It's important to note that integrators are not just luxuries that only larger churches can afford. While it's always a good idea to do your research to find an integrator whose mission and values aligns well with your own, there are hundreds of integrators available to work with smaller churches, as well.

One note I did want to bring up is that free advice found on social media groups and forums is great, but you have to understand that often times, the advice comes from people whose experience is with their particular setup in their particular space with their own particular needs and goals,

which may not work for your needs and goals. One of the greatest hidden values integrators bring is their experience in many different spaces with many different combinations of equipment that are meant to accomplish many different types of goals and meet different needs.

This is critically important because, as Ricky points out above, there is no "one-size-fits-all" solution that will work everywhere. You have to consider growth (what will your needs be in five years?), reliability and long-term value. And above all,

> " A good integrator can provide solid answers and creative solutions that will help solve problems, maximize workflows, and help you become more efficient; and can also ask the right questions, reveal blind spots, fill in the gaps, and be a good listener to deliver a system and design that fits the clients' needs and budget.
> -Ricky Perinchief

you need to know what you don't know. That simply means know when to admit that you don't know the answer and while a cheap option may exist, that likely won't be the right solution.

Integrators want to help and often enough won't charge you anything for chatting; we love to talk shop and are passionate about bringing the right solution before a church! But do your research and be wary of those promising cheap solutions, because as Marcus said above, you get what you pay for. If you don't pay a lot, don't expect a lot. **T**

Don't Forget
YOUR SCREEN!

When faced with the sheer cost of getting a projection system up and running, I know a lot of churches simply project directly onto a wall. It makes sense because the wall is something they already own and have paid for. Many times the wall is already painted white or some other light color and they make do.

However, projection has always been comprised of two parts, the projector and the screen. When properly configured and implemented, these two pieces work together to create projected images that not only help visually communicate but cannot stand as an obstacle in that communication through dim, fuzzy, or otherwise difficult to see/read images or text.

Do you need an actual projection screen to get awesome images? No, but if you are not going to invest in a projection screen that is built for the purpose, you need to understand and establish a viable plan for how you are going to still provide great imagery and easy to see and read text for your members.

Part of this is to ensure that your screen is large enough for your space. The simple way of doing this is to measure the distance between the screen(s) and the furthest viewing seat from the screen. Take this measurement and divide by 8; this provides you with the ideal screen height. Assuming you are going to be projecting in a 16:9 widescreen aspect ratio (native for high definition content) then you multiply that number by 1.78 and this will give you your screen

width. There are other ways of calculating the correct screen size, but this is the one that has worked for me quite well.

With the size calculated correctly, you will then need to figure out where your projector needs to be located to provide the size image you need. It can be important that you try and position your projector as close to the screen as possible, using the widest zoom the projector has, and still providing the correct for your needs.

Projection systems are one of many areas where establishing a good relationship with an integrator can pay long dividends because your church likely can't afford to make mistakes when buying equipment – it needs to work the first time and it's very easy to not calculate something properly or buy an under-powered projector.

An integrator can help you identify issues such as high ambient lighting, glare manufactured screens so should not be dismissed out of hand.

With the screen surface figured out, now you have to figure out the brightness you need out of your projector. The brightness of reflected light is measured in foot-Lamberts, or fL for short. This is calculated by dividing your projector's brightness (in lumens) by the screen's square footage (or square meters) then multiplying by the screen gain number (this information your projectors and overall system.

Equally important is the understanding that in order to get a great projection system with awesome results, there will be some investment necessary, but that doesn't mean you necessarily have to spend tens of thousands of dollars to get it. A proper understanding of how to establish your needs, and then how to meet those needs with the equipment and a reasonable budget

Don't let the budget be the restriction that forces your techs to try and jury rig solutions that won't work-find the right solution first, then go find the money for it, even if you have to fundraise for a few months

image size. This helps provide the brightest image possible without losing brightness by zooming the image in because it's too large. There are many resources available online that can help you figure out what your throw distance should be for your particular projector.

Once you have all of this figured out, you can move on to what kind of paint or screen surface you will utilize. Even with manufactured screens, there are a multitude of options to choose from; some offer ambient-light rejection capabilities, while others can help boost the overall brightness of your projected images. If you are unsure of what surface would work best, contact a system integrator as they can help you figure out what's right or bounce coming from lighting fixtures or your stage (light colored stage coverings have a tendency to bounce light all over the place that can negatively impact your projection system). The surface or screen solution you end up with needs to account for your particular room and lighting characteristics. If you are looking at a projection screen paint solution, bear in mind that you have a number of options available to you, from a matte white to some pretty intense ambient-light rejecting solutions. With any ALR solution, you will lose some of your white brightness, but the gain in contrast can be well worth that sacrifice; if in question, it's always best to try a small sample first. However, these paint options can help you save hundreds of dollars on should be available by the screen manufacturer or paint supplier). This resulting number is your fL measurement. Movie theaters, for reference, are often around 16fL; however, I would caution about having a measurement below 60fL. Remember how controlled the ambient lighting is inside a theater and how controlled the room lighting is in your church; there is likely a stark difference.

For this reason, I aim for at least a 60fL measurement because I know the images are going to look great regardless of the screen that is being used.

Your screen plays a critically important part of your projection system and that is why so much care must be taken to ensure that it is the right fit for goes a long way in achieving that goal without breaking the bank.

A final word to pastors, who are often the main catalysts for tech system upgrades; it's important that you understand the importance of the paragraph you just read. Don't let the budget be the restriction that forces your techs to try and jury rig solutions that won't work – find the right solution first, then go find the money for it, even if you have to fundraise for a few months. It's better to do it right the first time rather than try to reinvent the wheel. Trust me, it's been tried and there is a reason why we integrators go through this process: because it works. Do what we do, and you will experience success as we do. Simple, right? **T**

Starting with the Basics

This past spring saw an incredible scramble across the globe as churches found themselves in need of live streaming solutions, often with little to no notice. The solutions ran the gamut from simple smartphones simply going live to Facebook to installed multi-camera systems being re- located from church facilities to the pastors' homes.

The solutions themselves involved a healthy mix of churches and tech teams using software like OBS (Open Broadcaster Software) and Zoom while others focused on hardware encoders from Vidiu, Magewell, Blackmagic Design and others.

But now that we've all had a moment to catch up and take a breath, what are the basic components needed for a live streaming system and should you go with a software or hardware solution?

Let's focus on the components first: you need something to capture audio and video with. This can be a smartphone, tablet, webcam, DSLR or a video camera. Those audio and video signals then need to be encoded and sent either directly to your live streaming host (e.g.

YouTube, Facebook, Livestream, streamingchurch.tv, etc.) or you can send your stream to a content delivery network (CDN) that can re-distribute your stream to any number of platforms, including your website, for a fee. This is the most basic explanation of streaming I can come up with.

Now we dive into the particulars and complications of what is really involved in live streaming. The easiest way to go is certainly directly to Facebook or YouTube from a smartphone or tablet. Of course, there are limitations to this method: first, getting quality audio into your device can be a challenge and the quality of your on-board camera sensor simply cannot compete with the larger sensors to be found in larger cameras, like DSLRs and video cameras. You are also generally locked into a wider shot than you might otherwise want, though the most recent smartphones are helping to solve this issue with multiple cameras and lens options onboard.

Finally, you also have issues with needing good lighting, particularly

with these smaller sensors.

The advantages of using this method is that it is fairly simple and easy so non-tech people can be taught how to do this with relative ease. Reliability has not been a huge issue, from what I've researched and read, though Facebook and Zoom in particular struggled initially due to the huge influx of new users and the huge spike in bandwidth being consumed.

The second most common method involves an external camera with a small external audio mixer feeding into a variety of USB interface boxes to feed OBS software, which is free. OBS can, given the right computer specs, function as a video switcher, recorder and live streaming encoder- all simultaneously. There are many churches using OBS every week with few issues, though it is recommended that things like automatic Windows Updates be turned off as these can render your entire system useless given a driver incompatibility with the new update, etc.

While this may seem like an attractive option, bear in mind that up keeping a system like this can be a headache and if you want multiple inputs, you need an interface for every input, even with the newer NDI (network device interface) technology becoming more prevalent. You will always be limited by the specs of your computer and that means to get a multi-camera system functioning reliably, you will need a higher end computer, which can run well over $1000. At this point, I have to ask whether or not a hardware switcher and encoder would suit your

needs better or not.

There are other software all-in-one solutions on the market, albeit requiring financial investment, such as vMix, Wirecast, mimoLive, and others. There is even a category of live production software, like Cinemaker, that allows you to ingest videos from iOS devices along with IP and HDMI/SDI cameras and switch between them. It's really

to a hardware encoder. This encoder sends the stream to a CDN, such as restream. io or castr.io who can then distribute that stream to the platforms you choose (e.g. Facebook, YouTube, website, etc.).

While this tends to cost more than the other options, you tend to achieve the highest reliability and longevity because you are using equipment

> **Just because you are a church does not mean you are exempt from or can legally circumvent copyright law; do the right thing and obtain a license if you need or wish to stream your entire service, including music or images/videos.**

a matter of finding what solution is right for you and your budget. While it might seem free is the best value, it is important to understand what you are getting for that; is there a support team you can contact to help you out or is it just a community forum? What capabilities are you getting for the money they are asking from you? Do you have a monthly cost or can you buy the software outright?

Finally, we reach my preferred system setup, which involves external cameras, a separate audio mixer that feeds into a hardware video switcher, which then outputs

that is being used for the exact function it was built for, rather than trying to conform a computer into serving a variety of functions that can seriously tax its system resources.

While we are also on the topic of streaming, let's discuss other things you may not immediately consider:

Your choice of streaming platform, such as Facebook, can actually limit your audience in that viewers must have a Facebook account in order to access the stream. While it may sound strange, there are an increasing number of people that either never

had a Facebook account or that are leaving Facebook, much like what happened to MySpace in the last 2000s. Choosing a platform that doesn't require an account can help your viewers have a better experience with more reliability.

Live streaming music or copyrighted images/videos requires an appropriate license from the likes of CCLI and/or Christian Copyright Solutions. It is important to understand that neither Google/YouTube or Facebook currently provide the ability to input a streaming license into their platforms and reserve the right to remove your live streaming privileges for copyright infringements, often times in the middle of your live stream.

For this reason, it is even more important to use a CDN service to ensure that even if one of your platforms kills your live stream, viewers are able to visit one of your other platforms to continue watching.

Finally, just because you are a church does not mean you are exempt from or can legally circumvent copyright law; do the right thing and obtain a license if you need or wish to stream your entire service, including music or images/videos. And it might be a good time to inform your pastor that images found on Google are not "public domain" and do not fall under "fair use."

Live streaming is an awesome technology, but it is important that we follow the law and set a good example so that we can continue to share God's love and message of hope in eternity with our world! ◼

Keeping the Faith Alive, Virtually

BY DREW APPOLONI

Part 1: Basics for Livestreaming a Service

With the abrupt shutdown of all churches, mosques, temples, and other houses of worship as a result of the current global health pandemic, religious congregations have had to transition to reaching their members online, in a time when spirituality, connection and togetherness is most crucial.

Now more than ever, individuals, businesses, and non-profit organizations are refining their online presence by offering engaging, informative, and quality content immediately to their audiences. While many houses of worship were already streaming services before the health crisis, many are trying to increase the production value and make the service more engaging and interactive; and for those that weren't yet streaming, they are having to adapt fast. Content can come from anywhere in real time nowadays and to connect to lots of people at once, livestreaming is the answer. Over the last few years content creators have embraced livestreaming like never before. What was once only achievable in studios and newsrooms with professional quality broadcast equipment and gear, is now attainable for anyone with the right tools and a desire to deliver quality content. Livestreaming can be a complex process, especially for a beginner, but once the need has been established, the process can be simplified.

Livestreaming begins with essentially three main components – a camera, an internet connection, and a platform for reaching an audience.

The first step in performing an effective livestream should be ensuring a reliable internet connection with relatively high upload speeds. Going live on platforms like YouTube, Facebook Live, Twitch, and Zoom make it easy to

with a clean video output will suffice in helping you succeed. Instead, the more important consideration is how you actually get the video content online. There are two general types of equipment that will get your video feed online for your

worship director, with the simple push of a button. In this scenario, your three main components stayed the same, the only thing that changed was how you got your video feed online.

If you don't have a laptop handy, or you need to take

maximize the quality of your live service. It is important to note that encoders do require a significant amount of time to set up beforehand compared to converters. It's also important to note that hardwiring is always a safer bet than relying exclusively on WiFi. Your livestream success is always directly linked to the strength and consistency of your WiFi signal.

start a stream straight from a laptop or smart phone. The problem is the built-in camera in these devices gives off an immediately recognizable amateur look and feel and provides almost no versatility when setting up the shot or your scene.

If you'd like to step your livestream up a notch, you'll want to consider incorporating a better camera and lens combination. There is no one "best" camera or lens for successful livestreaming because, as is the case with all video, it's all about the right tool for the right shot, so depending on what you're shooting, whether it be a Sunday service prayer, or song sung by a choir, some equipment combinations will be better for achieving your intended vision. When it comes to the actual ability to livestream a worship service, anything

broadcast – a capture card: also known as a converter, and an encoder. If you can keep a laptop or computer nearby, grab a converter and make two simple hardwired connections: camera to converter and converter to computer. You've now essentially turned the far more capable camera into your computer's webcam, giving you greater production quality and versatility, while still maintaining the simplicity of setting a livestream from your laptop. Depending on the converter, you can even up the production quality by adding in a second camera. Now, you no longer have to choose one shot for the audience. By adding in the second camera, you'll be able to stream the prayer, but you can also switch to a second camera for close up shots of the choir or to incorporate some messages from the

your livestream to another location, maybe outside as churches begin adapting to drive-in services amidst Coronavirus relief plans, you'll need to ensure your setup allows for mobility. While converters are simple, they can't offer that level of flexibility. In this case, you will need something that can allow you to take your livestream wherever it needs to go which is where encoders come in. Encoders allow you to maintain your internet connection without being bound to a computer. If incorporating an encoder to your stream, you would need to set yourself up on your platform of choice ahead of time and then use the encoder to connect to the stream and go live when you're ready. Encoders are more sophisticated than converters so in addition to mobility they will usually give you more options to

As we learn to accept and adapt to new customs in all aspects of our lives, while still honoring our faith and keeping morale high, we find ourselves feeling fortunate to live and work in this digital-first age. By embracing the endless opportunities offered to them on a virtual level, places of worship are able to connect with their members in ways they would never have deemed possible decades ago, and thus maintain some level of normality among their fellowship community.

In the coming months, I'll be sharing more tips and tricks for the best ways to stream religious services. We'll be taking a look at how to create a green screen in your garage if you're wanting to take your service to the next level, how to incorporate multicamera feeds into the live stream, and the best tips for using pre-recorded content mixed with live content in a seamless way. Many of these best practices can be done without any specialized equipment. **T**

Drew Appolonia *is the Video Manager at BorrowLenses - www. borrowlenses.com*

LIVINGSTONE ADVENTIST ACADEMY

BY KATRINA KOCH

Outside the Oregon state capital of Salem lies a small private K-12 school called Livingstone Adventist Academy. The school was founded in 1898 and remains an important option to parents looking for a high-quality Christian education in the area. This Tech Spotlight focuses on how even the smallest system can make a huge difference.

Livingstone Adventist Academy has had a general choir for many years, and we had a vision to create a small select singing group. This group would be for students who really want to challenge themselves musically and perform music with tight harmonies together.

We knew that in order to accomplish this, we needed to have a sound system that would help bring our sound to churches of all different sizes and give our students experience using professional microphones. We knew we needed eight wireless microphones for a vocal octet, with a subwoofer to boost bass sound. We also needed the capacity to run the system ourselves, get our levels all set, and then plug into a local system. We were looking for something that could be run on a digital mixer, from a tablet, so our sound tech could walk around the performance space as we were doing a sound check and adjust things as needed.

Amazingly, a donor stepped forward with $6000 just as we were dreaming about the need and starting to prepare some singers

PHOTO: LIVINGSTONE'S GENERAL CHOIR, CHORALEO, PERFORMS AT A CHURCH IN SALEM

GEAR LIST

1 Behringer XR18 with Rack Ears

1 TurboSound IP82 8" Passive Speaker

1 TurboSound IP12B 12" Active Subwoofer

1 Ultimate TS-90B TeleLock Speaker Stand

1 Juice Goose JG Junior 1RU Power Distributor

4 Audio-Technica ATW-1322 2.4GHz Dual Wireless Handheld Microphones

2 Audio-Technica PRO45 Choir Microphone

2 Behringer F1220D 12" 2-way Active Floor Monitor

1 Audio-Technica ATH-M30X Headphones

1 Technical Pro DRW3U 3RU Rack Drawer

2 Navepoint 2RU Rack Drawer

1 Seismic Audio SAMCR-12 Road Case

2 OnStage MS7701B Mic Stand

3 25' Mic Cables

to work together in this way. Our donor was well acquainted with Tim Adams' work (Timato Systems) and suggested we enlist his help in selecting all the pieces of our sound system. Tim not only talked us through the different systems and options we had, he was able to explain why he was recommending each different piece of equipment and how all of it would work together to provide us exactly what we wanted.

The system uses a Behringer XR18 digital mixer as the central hub, with a Juice Goose JG power conditioner/distributor to handle power needs and

protect the components. For the main choir, a pair of Audio-Technica Pro45 choir microphones provides clear pickup, while a select group of vocalists use Audio-Technica System 10 Pro wireless handheld microphones when they sing.

The mixer outputs to a TurboSound IP12B powered subwoofer, which in turn plays both crossover and amplifier to send mid and high frequencies to a pair of TurboSound IP82 8" passive speakers mounted on Ultimate TS-90B TeleLock speaker stands.

A Seismic Audio SAMCR-12 road case keeps everything locked away and

protected during transport, including a pair of Gator GRW-DRWWRLSS rack drawers that have pre-cut foam to keep 4 wireless handheld microphones protected. This product was a surprising, but welcome addition to the overall system and helps keep our investment protected and ensures the long-term longevity of the system as a whole. The system also provides 2 floor wedges for the select vocal group, microphone stands to hold the choir mics in place, two general storage rack drawers and the cables necessary to connect everything together. We can usually

We needed to have a sound system that would help bring our sound to churches of all different sizes and give our students experience using professional microphones

get all the equipment loaded and unloaded with one or two trips from the vehicle and we have discovered that we can use the rolling rack as a rolling transportation platform for the other equipment that doesn't store well, like the mic stands, speaker stands, and floor wedges. For being such a small system, it can fill even a medium sized church sanctuary quite well and when we perform in churches too large for

our system, we can simply output sound from out system into the church's installed system and still retain control of our mix.

We are pleased with the results. Tim delivered the system in person and provided a tutorial session on how to use the system itself and the mixer app on an iPad. Given his lack of proximity to our area, it was logistically difficult for Tim to provide more than this rudimentary teaching

session to go over the very basics of the system and its operation.

After several months of experimenting, we had a church performance where we tried some reverb. It was pretty muddy, and we were plugged into another sound system. Several things didn't work, but one great thing came out of the experience.

As the performance ended, an individual at my church approached me and asked if he could help. He has run sound at our church for years and has a heart for young people. He has trained dozens of kids to run sound competently and confidently and when he offered, I was overjoyed. For several weeks before

PHOTO: OSSIA, LIVINGSTONE'S SMALL VOCAL GROUP, PERFORMS ON THE SCHOOL CAMPUS DURING THE SCHOOL DAY. A STUDENT MONITORS THEIR SOUND RIGHT BEHIND THEM

the schools were shut down in Oregon because of COVID-19, he came to our rehearsals and worked with two of my student sound technicians which freed me up to work with the singers completely! The students started hearing a more natural sound and started to really click! We had several performances scheduled for the rest of the year, so we are eager to get back to making music in the fall!

The level of professionalism of our vocal octet improved after acquiring this system, but it also improved, by extension, the professionalism of our general choir and elementary groups. The bar has been raised, in a sense, because we hear ourselves immediately. We are more aware of how our sound and musical messages are being portrayed. This year in general choir we worked more on memorization and facial expression than ever before, and I think we'll continue to improve that as the years pass.

Exposing the vocal octet to this technology has also empowered them in their musicianship. By the time our in-person time at school ended (mid-March) I saw student leaders taking more responsibility and eagerly suggesting projects that they knew we could tackle using this system. When the tools are high-quality, the learners expand their ideas of what is possible musically. I'm eager to see where we go next with this system to support us. ▪

Katrina Koch is the music teacher for all grades at Livingstone Livingstone Adventist Academy

Q&A with
Katrina Koch

TFWM: WHAT WERE SOME OF THE CHALLENGES YOU FACED WITH IMPLEMENTING THIS SYSTEM?

Katrina: One challenge I expected was a learning curve with running the system and finding dedicated student sound technicians to run it. I figured I would need to learn a lot in order to effectively teach students and others how to use it. My job as a teacher is plenty busy, so I was not sure where I would find time to train these individuals.

I spent time watching videos about the system, learning all I could. We ran into issues with our tablet and the wireless signal, and I did research to make the connection better. We played with reverb a little bit, and made a general mess of things, but we learned how to use the mixer software in the process, and my sound techs got more comfortable replacing batteries and manipulating sounds on the mixer.

WHAT WERE YOU WORRIED ABOUT REGARDING ACQUIRING THIS SYSTEM AND USING IT?

Katrina: I was worried about my students becoming overly focused on their "microphone sound" at the expense of their musicianship. It's important that the singers develop strong breath support and sing confidently. I've seen many singers back off on their breath production and overall volume when they first start using a microphone, for fear of feedback or

"sounding bad" because they aren't used to hearing themselves through a speaker.

I also worried that my student sound techs might not follow through and be enough support for the group to be successful. This was a new venture for our students, so I wasn't sure how dedicated they would be, or even if they fully understood what they were getting into.

DESCRIBE THE LEARNING PROCESS AND HOW THE STUDENTS LEARNED ADAPTED TO SINGING WITH AN AMPLIFIED SYSTEM.

Katrina: Our vocal group began the school year without the system, so they spent some good time listening to each other as they sang. Once the system arrived, they had an adjustment period, as did the sound techs. We had a few rehearsals where I spent more time with the sound techs than the singers, but in time, the sound techs learned what they needed to set up and keep charged batteries in the mics.

The students responded positively to coaching on the mics, and quickly learned how to hold the mics close enough to be effective, and what mic angles to use. They learned not to point mics at speakers, and to never tap the mic or blow into it. They also learned to trust their sound tech.

A big growth came for us after our first live performance with the mics. The students realized how coordinated they needed to be with raising and lowering the mics, to add to the visual aspect of the performance. ▪

QuadHed
from Matr

Go big or go home. There is no reason to continue using undersized video displays in sanctuaries when we have a huge variety of video source and control technology to manage lots of cameras, ProPresenter shows and supporting graphics. Even with video projectors dropping in price to compete with the influx of LED video walls, the choice was still limited to finding a big enough light cannon with a big enough lens to make a

big image in a rather bright sanctuary. Unfortunately, that was still a pretty hefty investment considering that by the time you found a unit with enough brightness to rival LED, you were also rivalling the price. The big monster projectors don't have much of a future when small, super-bright projectors are becoming extremely reasonable in price, providing you can combine them to make a bigger image.

There is even less reason to stick with the standard

16:9 or 16:10 aspect ratios that form every rectangular screen since the birth of HD. Why not exercise your creativity in image layout? With Matrox's new QuadHead2Go, you can take four inexpensive projectors and mount them, so the images are side by side, creating a stunning panorama of imagery. I'm not talking about 4 different images, rather a single image that spans across all 4 screens with precise alignment, delivering an image that is 7680 x

1080 pixels. Actually, the QuadHead2Go will allow any combination of two, three or four projectors (or TV monitors for that matter) in a 1x2, 1x3, 1x4 or 2x2 to create a conventional large screen, either horizontally or vertically. If you just use one QuadHead2Go.

That would be enough, but with Matrox PowerWall software, you can create artistic layouts, such as two projectors or monitors mounted horizontally (landscape), and the other two on their sides (portrait),

...ud2Go

...rox

BY DEREK LEE

press the front panel buttons to adjust the settings. The default setting will try to output to a 2x2 array of 1080P60 displays as long as it has any valid video input. Note that the QuadHead2Go is available either as an external appliance, or as a PCi card to plug into a PC's expansion slot.

The QuadHead2Go has a grand total of 3 buttons. Press button one and the menu pops up on all of the screens, allowing you to cycle through a logo, a nature scene, bezel adjustment geometric grid, and red, green, blue and gray gradient full field screens. The next button allows you to select from 15 different screen combinations and layouts. The third button provides information and status so you can identify the screen ID's, input and output resolutions IP address, MAC, serial and firmware overviews.

Ideally, you will want to start with source equipment that can output 4K images (3840x2160 pixels) although the QuadHead2Go is capable of handling 8K sources. The output is divided into 4 x 1080P60 signals. Want to get really big? Use 16 QuadHead2Go units with 64 displays or projectors. Why not?

I tested the QuadHead2Go with four LED TV's and with two projectors side by side (because I only had two identical projectors in stock to play with). The QuadHead2Go detected my MacBook Pro's 4K output instantly. It took me all of 30 seconds to set up the array of screens using the three buttons. Next I plugged into the two Panasonic

Laser projectors, and with a couple of button presses, the image was correct. It was especially handy having the built-in convergence grid which allowed me to adjust the projectors so the transition between screens was seamless.

But how will it work in a church you ask? A static 4K image from the MacBook Pro looked amazing, but the next test was to see how it handled ProPresenter 7, which is the primary church presentation software. With Pro 7, I added the dual projector wide landscape array, which Pro 7 easily identified as a single screen. That took all of 60 seconds, not because I have experience—this was my first time using the new release of ProPresenter 7.

When ordering, you have a choice between HDMI and full-size DisplayPort input connections on the outboard appliance, while the PCi card has HDMI and Mini DisplayPort inputs. The outputs are conventional HDMI on both. Even though the popular consumer grade HDMI connector is the most unreliable connector since battery clamps, Matrox

added threaded receptacles for locking HDMI connectors. This is a good compromise to keep the product as widely useable as possible while correcting the shortcomings of HDMI. After all, a church service is a "mission critical" event.

If you are using flat screen displays, some simple calibration will give you a uniform image across all of the displays. However, if you are using projectors, (this applies to any product driving multiple projectors), you will want to use identical projectors all with the same amount of past usage and lamp hours to ensure that your whole image is uniform. The goal of the QuadHead2Go is to make several display devices look like a single pure image. I am putting the QuadHead2Go at the top of my recommended products list. ◘

Derek Lee *is the Technical Director at Cedarview Church, and also owns the AV-integration company Media Dynamics.*

still properly displaying the full image spanning the total area of the screens. If you happen to use big flat screen TV's instead of projectors, the PowerWall software for QuadHead2Go will allow for compensation of the bezels. You are not limited to using four identical displays, since the QuadHead2Go can crop and scale to create a totally unique video experience.

...etup is extremely easy. Just plug in your source, and two, three, or four output devices like projectors or TV monitors. Power it up and

DEREK'S REPORT

FLEXIBILITY	★★★★★
...TABILITY	★★★★★
EASE OF USE	★★★★★
COST	★★★★★
OVERALL VALUE	★★★★★

The M-Vision Laser 18K Proje

BY JONATHAN BARLOW

At Grace Polaris Church, we had an interesting conundrum. We had been planning on doing a full renovation and complete overhaul of our AVL equipment (with a heavy focus on the "V" component), but our initial schedule had to be postponed by a year due to budgeting. However, our old projection system was definitely on its last legs, having been in use for over twenty years. We had first introduced IMAG to our church in the late 80s to showcase a Christmas production,

and then started building our broadcast system from bits and pieces we were able to acquire — often second-hand. It was cutting-edge at the time, but we knew the SD analog equipment couldn't last forever. For the longest time, we were holding our entire broadcast workflow together with spit, prayer, and the hard work of a lot of dedicated volunteers.

Because the projection and image quality of our old system was so poor, we felt we couldn't continue another year without doing something. Interise, our integrator, told us that the

Digital Projection (DP) projectors they had already spec'd for us could easily bridge the gap between the old equipment and the new, so we made the decision to move ahead with adding two DP M-Vision Laser 18K projectors in advance of the rest of our AVL upgrade.

First, Interise also had to figure out an effective, yet inexpensive, way to hang the projectors for the year, all while knowing that any changes made would be redundant when the renovations were completed the following year and the rest of our new equipment was added.

Another issue we had to contend with right out of the gate was the fact that the M-Vision projectors are digital HD, and we needed to make them work with what we had. We were able to convert our content from analog to digital using an AJA HD10AVA, with a Decimator MD-HX cross-converter upscaling the SD digital to HD for our projection to display. Using the crop-settings on the projectors, we were able to 'letterbox' the display, and the difference in what we had been seeing versus the new projected images was incredible. Even with

only a 30-year-old signal to drive them, everything was remarkably brighter and cleaner. The congregation's response to our faux-HD setup was very positive.

The DP M-Vision Laser 18K projectors are 18,000 lumens each — very bright — which was a necessity. That power ensures that our IMAG and graphical content is easily viewable from any of the 1400 seats in our renovated auditorium. The room itself is wedge-shaped with two screens inset into angled walls on either side of the stage. This layout allows a congregant seated anywhere in the room to have an unobstructed, direct view of the screens, which adds to the viewing experience.

An additional benefit of the M-Vision's brightness is that it allows us increased flexibility with how we use our stage. Our services often feature our full choir and orchestra in addition to the standard worship band, meaning that there's a lot of both ambient and effect lighting in the rooms. With a peak brightness of 18,000 lumens, the M-Visions are able to produce a crystal-clear image regardless of room conditions, exhibiting near-LCD levels of contrast. We

never have to worry about washed-out visuals again.

My favorite thing about the projectors is that, being laser-driven, they are essentially zero maintenance. Our older projectors were lamp-based and, given their age, seemingly always in need of a replacement. This could lead to frustrating and intense moments, such as when we had to replace a lamp mere minutes before a Christmas concert — after the doors had opened and people were already seated. Luckily, we had a vertical lift we could use to make the change, but I can't imagine what we would have done if we didn't have that luxury. The M-Vision Laser 18K projectors remove that worry completely, allowing our team to focus on producing the best worship experience we can for every service.

Now that we've fully completed our renovation process and made the change over to an HD digital system, I can't believe what we made do with for so long. The difference is truly night and day. We had already noticed a huge change in the look of our services when we were simply upconverting from old equipment

to the new projectors, but when our workflow switched over entirely to new HD equipment and we added all-new cabling infrastructure, we were just blown away. With the difference in color contrasts — the way black is now black, and our whites are now white — it feels almost like we're looking at an emissive screen instead of something reflected.

In short, the DP M-Vision Laser 18K has changed my expectation for what can be done with a projector. With profound contrast, tack-sharp clarity, and vibrant colors, our video production has never looked so good. Additional features, like its quick start-

up time, quiet operation, and full control over IP, also make it very easy to use. The DP M-Vision Laser 18K is a powerhouse of projection that, for a surprisingly affordable price, can provide instant front-end improvement to any live production pipeline. **T**

Jonathan Barlow *is the Creative & Live Video Producer at Grace Polaris Church in Columbus, Ohio. He oversees weekly service live production, as well as planning large creative events throughout the year and supervising the recent AVL upgrade.*

JONATHAN'S REPORT

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

PRODUCT SHOWCASE

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Vizi Beam 12RX
www.adj.com

2/ AJA Video Systems
12G-AMA 4-channel analog audio embedder/disembedder
www.ajavideo.com

3/ AUDAC
AMP203 Dante Mini Stereo Amplifier
www.acpromedia.com

4/ Ayrton
Karif-LT 300W LED Beam-spot
www.ayrton.eu

5/ Canon
PT-RZ990 Series 1-Chip DLP® SOLID SHINE Laser Projector
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6/ DPA
4097 CORE Micro Shotgun Microphone
http://dpamicrophones.com

7/ Extron
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