

# TECHNOLOGIES FOR WORSHIP®

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INSTALL

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## EDITORIAL NOTE



MICHELLE MAKARIAK

It's hard to believe that we are in May already! I'm sure many of you will agree that 2020 has been a weird and challenging year so far, and it doesn't look like we will be getting back to normal anytime in the near future. As states start opening back up, we still have to navigate a 'new normal', where social distancing measures will need to stay in place to keep those most vulnerable to COVID-19 safe. For many of the churches I have talked to over the last few weeks, this means continuing to grow their live streaming and video on demand options.

I have been inspired by the way so many of you have not only provided spiritual nourishment for your existing community but have also guidance and understanding to those searching for meaning during this ongoing challenge. I have come to realize that in the church community, there really is no version of "When life gives you lemons..." that doesn't turn into lemon aide, lemon merengue pie and spicy lemon tarts!

For this issue, we take a look at Lincoln Berean Church and how they turned their very active ministry into a "Church in the Pocket" - building a thriving online spiritual community in the process in our Technology Spotlight. Our Case Study features LCBC (Lives Changed By Christ) and their recent switch from satellite to video over public internet with the help of Mankin Media, and our Install In-Depth looks at how Clearwing Systems helped transform ARK Encounter's Answers Center with a complete AVL solution. We share how New Life Center United Pentecostal Church is offering drive-in worship services and look at how Calvary Chapel San Clemente has started their own online TV channel - and how you

can too! We have two reviews - one for Elation Lighting's Artiste Picasso and the other for Maxell Projectors, and Out of the Box looks at products from Canon, DPA, Lectrosonics, NewTek and Vaddio. The above barely scratches the surface of all the educational articles we have packed into this issue - so be sure to read them all and let us know what you think!

The tfwm.com repository of Continuing Education opportunities continues to grow, so if you are interested in webinars, product training and education VOD, visit [www.tfwm.com/continuing-education](http://www.tfwm.com/continuing-education) and see what options are available to help hone your tech talents, and don't forget to follow us on twitter at <http://twitter.com/tfwm> and Facebook at [www.facebook.com/technologiesforworshipmagazine](http://www.facebook.com/technologiesforworshipmagazine) for up-to-the-date reminders about upcoming webinars as well.

Lastly, don't forget to check out our Special Edition Streaming Guide, available for free at <http://online.tfwm.com/?issueID=45&pageID=1>, especially as you grow your church streaming broadcasts. Chock-full of great information about how some churches have grown their live streaming and video on demand options to help keep their worship community spiritually connected, the streaming guide discusses navigating worship during the quarantine, and takes a closer look at products that could be beneficial to your streaming workflow.

If there is anything we can do to help, or if there are particular articles you would like to see from us, please don't hesitate to phone/text 705-500-4978 or email me at [mm@tfwm.com](mailto:mm@tfwm.com).

Stay safe, stay healthy, stay connected and God bless!

Michelle Makariak

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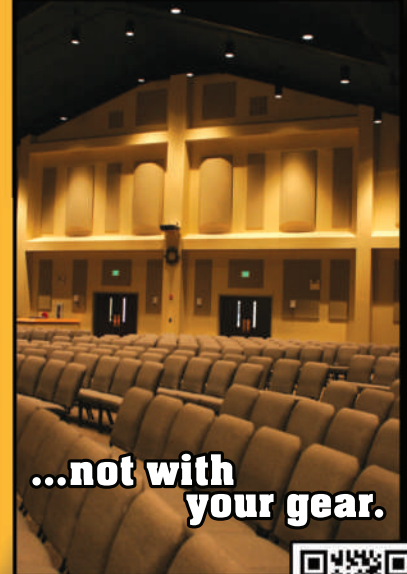


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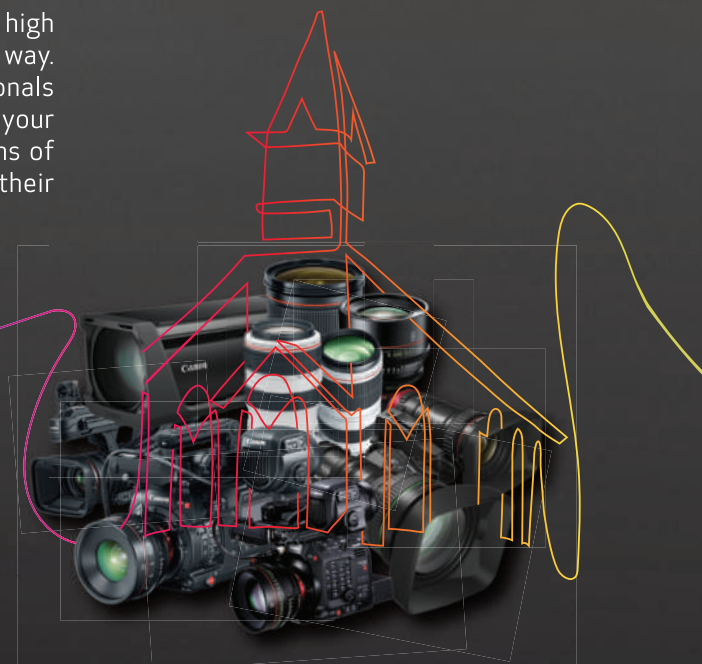


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## LynTec Strengthens Customer Service with Live, Tailored Support and Training

**L**ynTec, a leading manufacturer of innovative electrical power control solutions for professional audio, video, and lighting systems, today announced a new on-demand, tailored training and support program via live video to enhance the lines of customer communication during and beyond the COVID-19 crisis. Designed to work around customers' schedules and needs, LynTec's live video sessions provide customers with real-time information, training, and technical support for the company's leading range of electrical automation and control systems. The live sessions will take place from LynTec's new HD demo room.

"For more than 30 years, we've had a customer-first philosophy. We meet them where they're at and work to develop solutions for their needs," said Mark Bishop, president of LynTec. "This tailored customer service and training program is just another way to further that mission. With many companies unable to operate normally during the COVID-19 crisis, we want to ensure they can come out of this uncertain time with skills and knowledge that will benefit future projects and installations while accommodating their calendar and resources."

Over the winter, LynTec expanded its facilities to support its growth. The company's headquarters in Lenexa, Kansas, now includes a demo room installed with the company's most popular panels on display — including the RPC, NPAC, and XPC. Although the room was built with the goal of inviting customers to the LynTec factory for on-site training, with the onset of COVID-19, the company enhanced the training facility to provide remote and online support. The room is outfitted with HD cameras and a high-speed fiber connection to ensure sessions are broadcast with a strong video stream and in sharp detail.

"With just a call or an email, we can launch interactive online training inside the demonstration facility in a matter of minutes," Bishop said. "The setup is perfect for educating customers on our hardware, firmware, or software operation in real time. This service can be accessed anywhere — by techs in the field in need of troubleshooting support, for a pre-scheduled sales meeting, or at your desk for design and specification questions."

All of the LynTec power control solutions used in the training are functioning products that are currently available. This allows customers to see how products operate in real time, whether they're joining over LynTec's video conferencing platform or mobile apps such as FaceTime or Messenger.

Customers can schedule a customized, interactive electrical or power control training session by contacting LynTec at 913-529-2233 or [info@lyntec.com](mailto:info@lyntec.com). ■

## Shure adds Associate Vice President to Product Development Team



Shure Incorporated has announced that Mike Knappe has joined the Company as Associate Vice President of Musician and Consumer Audio Product Development. He will be responsible for all listening products and microphones sold in the retail segment as well as the Company's MOTIV™ digital microphone line.

Knappe comes to Shure from Harman, where he led its Lifestyle division's technology team for next-generation consumer and automotive audio experiences, including cloud personalization and health and wellness. He brings global experience from his positions at Nortel, Cisco, Juniper, and Fuze, where he led international development teams for security, wireless, SaaS, analytics, UX/UI, NLP, mobile apps, and device+cloud fabrics, with a balance across hardware and software development.

He has a BScEng (EE) from the University of New Brunswick and M.Eng (EE) from Carleton University in Ottawa, Canada, with research in adaptive algorithms and psycho-acoustics.

"We are pleased to welcome Mike to Shure," commented Avi Vaidya, Executive Vice President, Product Development. "His impressive background and accomplishments will enhance Shure's product development initiatives in this important category for the Company. We greatly value his expertise and look forward to his contributions to our product development team. ■

## PMC Appoints Sweetwater Sound as a Full Line US Dealer

UK Loudspeaker manufacturer PMC has appointed Sweetwater Sound as a full-line US dealer for its entire range of professional studio monitoring products.

PMC is already trusted by discerning audio professionals worldwide as the idea monitoring solution for accurate and transparent mixing and mastering. Since the release of its twotwo range of nearfield monitors and the subsequent release of its Result6 compact nearfield monitors, PMC has been searching for the right US partner to help introduce more people to its high quality professional product range.

Sweetwater sees the wide breadth of professional PMC products as a perfect fit for its expanding range of pro audio products. As well as the Result6 and twotwo Series of nearfield monitors, Sweetwater is also handling PMC's larger systems and will have these available for special order.

Sweetwater and PMC Sales Engineers will work side-by-side, making sure all pertinent details surrounding the selection of studio monitors are addressed to ensure every customer ends up with the perfect PMC system for them. ■





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## First Baptist Jackson Upgrades to HD Live Production with FOR-A

**F**irst Baptist Church of Jackson in downtown Jackson, Miss., began broadcasting its Sunday services on a local TV station in the 1950s, but had not significantly upgraded its production facilities since the 1980s. Last summer, the church made the jump to HD production and anchored its redesigned control room with a HVS490 production switcher and MFR-3000 routing switcher from FOR-A Corporation of America.

Today, First Baptist Jackson streams live 1080p video to Facebook Live, YouTube, and its own website, with local 720p replays the following Sunday on WDBD (FOX) and WLOO (MyNetworkTV) in Jackson (DMA #92). “We’ve always tried to use technology to reach others for Christ,” said Michael Bowen, minister of media and communications. “If we wanted to effectively use video for ministry, we were going to have to get current.”

According to David Roche, co-owner of Strata, the Atlanta-based system integrator for the project, the HVS-490 replaced an aging SD switcher. Installed over two weeks last summer, the HD upgrade also included new manned and PTZ cameras as well as 21-foot

Vanguard LED displays in the church, plus all new furniture in the redesigned control room and equipment room.

Any new switcher had to be “super volunteer-friendly,” Bowen said, because the church relies on more than 50 volunteers and paid staff to run its weekly production and other projects. The new HD system went live in late August and has created renewed excitement in their volunteers.

The HVS-490 has provided good value and ease of use for First Baptist Jackson. “We wanted to find something that was professional and gave us the most value for our dollar,” Bowen said. “It’s also given us a high-quality product we feel meets the standard of excellence we’re trying to achieve. We’ve been really happy with it. It’s been a good experience for everyone.”

With its rich features, the HVS-490 is ideal for live event venues. Event memory and macro functions make it easy to setup the switcher quickly for live performances. With integrated frame synchronizers and multi-viewers, the HVS-490 reduces the amount of

equipment required. Using multiple control panels, the system enables several operators to work on separate tasks. With use of optional input and output expansion cards, the HVS-490 supports 40 inputs/18 outputs, 36 inputs/20 outputs, or 32 inputs/22 outputs, including two-channel HDMI outputs. MELite™ technology eliminates the need for multiple switchers in a multi-monitor staging scenario, while FLEXaKEY™ allows a traditional AUX bus to transform into a functional Mix Effects with cuts, mix, wipes, keys, and DVE including full preview. MELite extends the switcher’s 2 M/Es to 6 M/E performance.

“We definitely got a positive reaction from TV viewers,” Bowen recalled. “It’s nice to be able to offer a product that competes with the other programming they are used to seeing.”

Beyond multiple live streaming and recording feeds, the HVS-490 provides outputs for the IMAG (image magnification) LED boards at the front of the church and digital signage in the atrium. **T**

PHOTO ABOVE: FIRST BAPTIST JACKSON USES A FOR-A HVS-490 PRODUCTION SWITCHER FOR COVERAGE OF ITS SUNDAY SERVICES. PHOTO COURTESY OF RUSHING IMAGES.



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streaming. The video is sent to your computer via USB, just like a webcam, so it works with any software. Stream live using services such as YouTube and Facebook Live using software such as Open Broadcaster or XSplit Broadcaster. It even works with Skype for professional remote presentations. Web Presenter is the easiest and most affordable way to broadcast live video on the web!



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INSTALL / COLORADO SPRINGS, CO



## Sight and Sound Technologies Upgrades The Springs Church with Martin Audio WPS

**T**he Springs Church in Colorado Springs, CO recently underwent an audio upgrade with a Martin Audio WPS system spec'd and installed by Sight and Sound Technologies, the first installation of the new system in the United States.

Asked about the project, Sight and Sound COO Kris Johnson explains: "It was basically an upgrade of their PA. They had an aging left-center-right line array system that in some respects was overkill for what they needed plus they were starting to have some problems with the speakers. They had a plan to repurpose them in another room which worked out really well timewise for us because we were able to pull the old ones down, test them out and re-install a handful

of them in another room.

"In terms of the main room or sanctuary, we had already installed the Martin Audio WPM system on multiple occasions and really liked it. Then we got to hear the new WPS system at a trade show and it was like the WPM with more beef because of the 8" drivers so we decided to look at those for the sanctuary. When we ran the projections, the system looked amazing so we moved forward with it."

Springs is a modern church with a contemporary worship service featuring an electric band and several vocalists. The sanctuary is a 2,000-seat room which gets wider from the stage towards the back corners of the room. According to Kris, the widening shape of the space "made it a bit of a challenge in terms of getting the coverage

we needed in the back. We wanted to be sure we had enough power, another reason why we chose WPS."

The system consists of six WPS enclosures a side flown off an I-beam with six CDD8 for front fill mounted across the front lip of the stage, all powered by an iK81 amp with one-box resolution for optimum coverage, impact and the extra control.

Describing the results of the new WPS system, Kris enthuses, "the coverage is amazing. There are two I-beams that run left and right from front to back in the room and they drop pretty low so we had to be under those beams otherwise we'd hit them with the top speakers. So we went ahead and mounted them under the beams. I like where the speakers ended up in the room and in a perfect

world I'd have loved to put the system about two feet higher, but we accomplished our goal: great coverage front to back with very little dB difference.

"In terms of music reproduction, WPS sounds amazing. For weeks, I was getting text messages from their audio technician raving how good and clear the system sounded. That, plus the parishioners love how the services sound with the new system. They're all smiles.

"Being able to hear what is said and sung in terms of the message is the key to any good worship service. We've heard systems that might do one or the other, but WPS absolutely does both speech and music incredibly well. Bottom line, the church is ecstatic, both the staff and the congregants, which is the most important thing." ■



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## Mount Hope Broadcasts Its Live Services Using Waves eMotion LV1 Live Mixer

**D**ave Berry, Media and Tech Associate of Mount Hope Church in Lansing, Michigan, uses the Waves eMotion LV1 Live Mixer and Waves plugins for broadcasting the church's sermons.

On choosing the eMotion LV1 Live Mixer, Berry comments, "We have two LV1 systems in use in our broadcast studio and the second in our road system. Our first LV1 rig started out for our livestream, then we pulled it to use for FOH during a long weekend statewide youth conference and then back to broadcast. Its timing back to broadcast was rather strange, since that was when the COVID-19 quarantine in Michigan began, and the LV1 has been an incredible solution during this crazy time."

"We decided that we needed a long-term, cost-effective solution that had crazy flexibility and ease of use, but with amazing sound. In addition, sound quality out of the box has to be number one, and flexibility has to be second. We only used out-of-the-box plugins and ran a full-band production with IEMs,

and it sounded amazing. The best part was that I felt so confident that the techs could run, patch, and troubleshoot any issues that I didn't feel the need to stick around. The point is that there is a younger generation that is more comfortable with two screens than they are with any large-size console. That is what the LV1 offers. Is that unique? In my opinion yes, and it's very smart on the part of Waves."

He adds, "When it comes to networking and portability the LV1 is super simple. Get a supported switch, plug in, and go! We do run a full Dante® audio network, simply because this was in place prior to the LV1. We convert using a DiGiCo Orange Box to Waves SoundGrid® and have never once had an issue. I have seen systems with very expensive switches and some, like ours, with a \$100 switch, and guess what? They sound the same. Our Waves SoundGrid Extreme Server and Orange Box are actually in our control room about 300 feet from where we mix broadcast, without issue. Another big point for networking is the ability

to remote into the system and control or troubleshoot with a mobile system. This is a key part of our 'tech in a box' solution for mobile campuses, and the ability to help a volunteer remotely and train them is priceless."

Berry's plan is "to roll out the eMotion LV1 into every one of our venues (Sanctuary, Youth, Children's, Chapel and Symposium) within our facility. We also have a goal to launch 100 campuses in the next five years, where most of them will require sound-support, and the eMotion LV1 will be part of a standard solution. My take on the LV1 is that you are only limited on sound quality based on your ability. Considering that most major touring acts and recording artists use Waves plugins on their records, it's amazing to realize that you start with a raw system that allows you to build your sound using those very same tools. It's like having an open toolbox with unlimited tools right in front of you. The Waves eMotion LV1 really is only limited to the operator's ability. Out of the box, it's next-level." **T**

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# DPA 4560 CORE Binaural Headset

**D**esigned to capture immersive audio, DPA Microphones' 4560 CORE Binaural Headset Microphone delivers superior sound quality that allows users to capture, in real time, exactly what each ear is hearing. With remote productions now quickly jumping to the forefront of a church's requirements, the ability to record sound from a specific person's perspective means worship musicians can offer a unique, surround sound experience for viewers especially in an all acoustic performance. Ideally, content recorded with DPA's 4560 mic

should be listened to via headphones, sound bar or 5.1 surround system, which lend perfectly to at-home environments.

Streamed productions and podcasts, both on the web and on platforms such as Facebook and YouTube, can use the binaural microphone techniques to provide content that is much more immersive and alive compared to traditional techniques. Those who produce filmed Additionally, when it comes to supplemental video production, the use of binaural recording techniques to gather atmospheric sound and add immersive qualities that

truly capture the viewer.

At the heart of DPA's new 4560 CORE Binaural Headset is a pair of 4060 CORE Miniature Microphones mounted on two ear hooks and sitting just outside the user's ear canal (like a pair of earbuds). This makes it possible to directly capture (1:1) the sound heard by the person making the recording. The ear hooks are attached to a flexible headset that is simple to fit, comfortable to wear and easily adjusted to suit the dimensions of each individual head. Foam screens are supplied with the microphones to secure their position and offer damping of wind noise.

In addition to being easily worn, the 4560s can attach to recording gear, such as DPA's MMA-A Digital Audio Interface, which connects to any iOS-device. This gives users a quick and convenient mobile binaural recording solution for any setting. Recordings made with DPA's 4560 CORE Binaural Headset are so accurate that listeners often turn their head looking for the source of the sound.

DPA's new 4560 CORE Binaural Headset Microphone is listed at \$1099.95 USD. **T**

For more information, please visit [www.dpamicrophones.com/4560](http://www.dpamicrophones.com/4560). *Shipping Now.*



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“Helping Your Church Live Stream” has been updated to include success stories from worship leaders around the world. Go beyond live streaming and see what makes connected churches successful.

# The TriCaster® Mini 4K from NewTek

**N**ewTek has long been a leader in providing houses of worship with solutions for video production. Using IP-based video technology – backed by the free-to-use NDI protocol developed in-house and made available to all manufacturers – the ability to live stream worship services, and make it look like regular TV, has never been easier or more affordable.

The company, part of the Vizrt Group, recently announced the latest version of one of its most effective solutions for the house of worship market: the TriCaster® Mini 4K.

What was already a complete, compact live multicamera video production system, the newly enhanced TriCaster Mini 4K adds groundbreaking features like Live Story Creator and LivePanel. These are built-in software offerings designed to make the production of network-quality shows even easier for lone producers or small teams – whether they are beginners or seasoned video professionals.

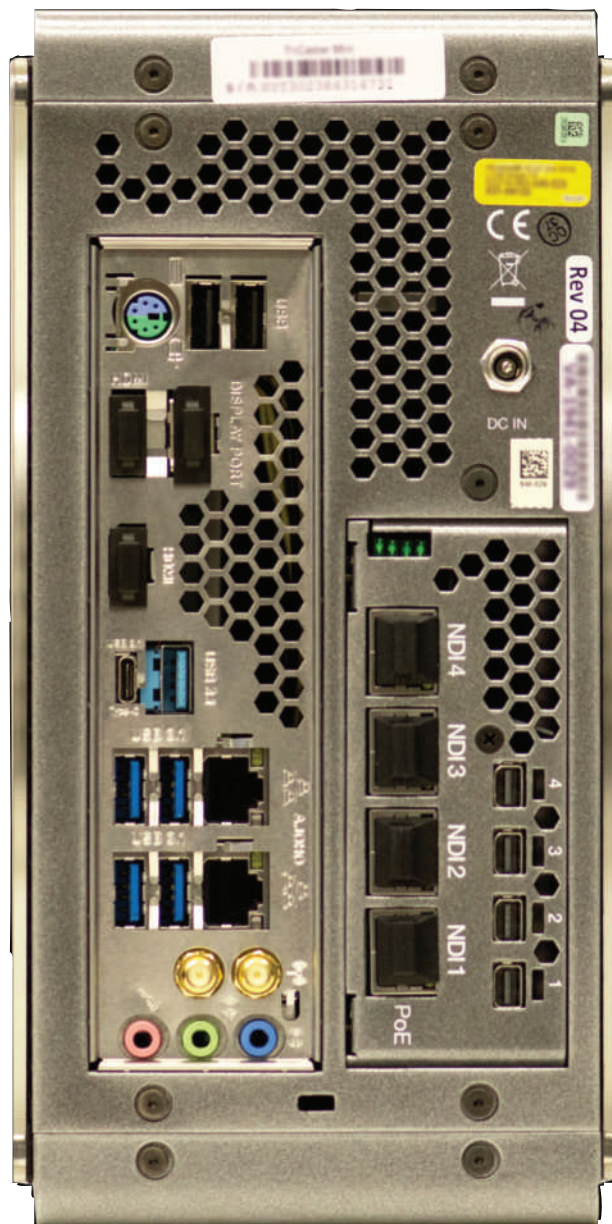
The enhanced TriCaster Mini 4K also offers easy setup with extensive live production capabilities including broadcast-quality, fully customizable virtual sets to turn any location on a church's campus into a professional studio. Stunning broadcast graphics, media playback, one touch automated control, multi-channel remote Skype video calling, integrated replay, social media integration and more are all delivered at up to full UHD p60 resolution.

The new TriCaster becomes available during a challenging time for the world – one where the need to broadcast services with small staffs is critical.

“NewTek’s mission has always been to make it possible for a single person or a small team to deliver a show that looks like real television,” said Dr. Andrew Cross, president of R&D for the Vizrt Group. “There has never been a time when this has been more relevant. The new TriCaster Mini 4K allows anyone from CEOs to ministers to teachers to create amazing shows and get them online from virtually anywhere.”

Live Story Creator allows an individual to run an entire production from a Microsoft Word® document. A script built in Microsoft Word® includes triggers actions when loaded into the TriCaster Mini 4K, allowing the storyteller to concentrate solely on delivery of the message rather than on technical setup and production.

LivePanel introduces customizable, browser-based remote control of the TriCaster Mini 4K from anywhere on the same local area network, letting anyone including the presenter control live switching, compositing, mix/effects, media playback, audio, automation and more, from devices



including tablets, smartphones and laptops. Configurable macros are now also supported, allowing routine but complex tasks and sequences to be executed at the push of a button.

Two channels of Skype input allows simultaneous guest contributors to participate from their studios, laptops or phones across the globe, all presented with broadcast graphics for titles, double box effects and more.

The TriCaster Mini 4K also ships with two recently announced Spark Plus IO 4K p60 encode/decode converters. This enables IP-based, NDI®-first workflows using existing inputs and outputs – such as the current video cameras a church might have in use.

And, with NDI technology, the cabling required is greatly reduced. The standard 1 gig networks running through most facilities today can send all audio and video signals required for a full end-to-end IP video workflow.

For more information about the TriCaster Mini 4K, visit <https://www.newtek.com/tricaster/mini/>. **T**  
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for over a decade. And they're fully recallable due to the StudioLive 64S' advanced Scene functionality.

And thanks to Flex Mixes, you'll tailor your mixing experience to the task at hand. You can even expand the band's monitoring options via AVB to include EarMix 16M personal monitor mixers.

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## STUDIOLIVE® 64S SERIES III S CONSOLE MIXER





## The EOS C300 Mark III from Canon

Adding to its robust and expansive line up of Cinema EOS digital cinema cameras, Canon has introduced the EOS C300 Mark III, the next-generation Super 35mm workhorse cinema camera. The new camera features a new Dual Gain Output (DGO) sensor and, like the full-frame EOS C500 Mark II, employs a modular design and an interchangeable lens mount that allows users to customize the camera easily. The modular nature of the C300 Mark III allows individual Houses of Worship to tailor the camera to their needs. The camera offers clean HDMI, and up to 12G-SDI output, allowing for virtually seamless connectivity with many of the compatible streaming solutions. What's more, an upcoming firmware update for the C300 Mark III (as well as its

siblings, the EOS C500 Mark II and XF705) will enable the live switching of framerates, ideal for the dynamic needs of a wide variety of HOW content production, including broadcasting.

The newly developed 4K Super 35mm DGO imaging system captures high dynamic range content by reading out each photodiode through two separate gains. It combines the two with saturation prioritizing gain for bright areas, and a lower noise prioritizing gain for darker areas. 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. The cinema camera is equipped with Canon's latest video imaging processor, the DIGIC DV 7, achieving more fluid and efficient

recording of 4K and HDR, and can process high-speed video recording, including 4K at up to 120p. The cinema camera also supports Canon's very popular Dual Pixel CMOS AF, 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.

As previously mentioned, the EOS C300 Mark III camera is an extraordinarily versatile and modular cinema camera, easily customizable to fit the needs of nearly every House of Worship. Included with the camera are 13 accessories, such as a 4.3-inch LCD monitor and the GR-V1 grip. Users 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 and their church. 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, 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 that are sold separately allow users to exchange the EF mount with an EF cinema lock mount or PL mount. In addition to the vast customization abilities of the camera, the camera is also compact and lightweight, measuring approximately 6 in (width) x 5.8 in (height) x 6.6 in (depth) with a bodyweight of approximately 3.9 lbs.

The Canon EOS C300 Mark III Cinema Camera is scheduled to be available later in 2020 for an estimated retail price of \$10,999.00. For more information you can visit, [usa.canon.com/provideo](http://usa.canon.com/provideo). **T**

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## Vaddio AV Bridge 2x1

**V**addio's simplest streaming device yet! We call our AV Bridge 2x1 the service-in-a-box solution because it enables simple distribution, production, and capture of high quality networked Dante audio, analog audio, and two HD video sources.

Two HDMI inputs allow you to connect either two cameras or a camera and PC display on a platform that easily switches between sources and delivers useful picture-in-picture (PIP) video streams. Concurrent 1080p USB 3.0, HDMI, and IP streaming allow for flexible video distribution. Use the AV Bridge 2x1 to simultaneously record to a local PC, magnify the speaker video through a room projector, and stream the service to popular online platforms – without the need for special drivers or additional applications.

Ideal for conferencing and live-event capture applications, Vaddio's AV Bridge 2x1 combines networked audio and video mixing functionality into a single device.

The AV Bridge 2x1 has robust audio mixing capabilities as well. A 4x4 Dante I/O allows for scalable networked audio to meet the needs of any application. Install the AV Bridge 2x1 in your existing sound projection designs by utilizing the 2-channel analog audio I/O and adding in new HD video sources.

Houses of worship can get professional, reliable video switching from the AV Bridge 2x1 without needing to worry about cumbersome video production applications or streaming conversion programs. Simply connecting two cameras into the AV Bridge 2x1, the line output of an existing audio system, and a reliable internet connection is all that is needed to start streaming to dozens of popular platforms. A simplified control page means that volunteers can easily control camera movements, access predetermined camera presets, switch between video feeds and insert saved graphics over the video stream. Another popular option is the side by side picture in picture feature with

leader speaking to congregation and PC content shared on the other half of the screen for viewers to follow along. With the simultaneous USB output of the AV Bridge 2x1, you can connect it to a local PC and record and save events for later editing. The HDMI output is commonly used for a confidence monitor for leaders to see what their congregation is seeing. When we see a gradual return to normal, the functionality of the AV Bridge 2x1 can flex to supporting image magnification, Dante audio inputs to support large room audio pickup and more.

### Key Features:

- Robust two HDMI input presentation switch
- 4x4 Dante Audio matrix (12x12 cross-point audio matrix)
- Simultaneous 1080p USB 3.0, HDMI, and IP Streaming Outputs
- Flexible control options with serial, telnet, trigger, Vaddio Device Controller, and web control

Experience worry-free productions with the automation features built into the AV Bridge 2x1. Connect Vaddio trigger devices like the StepVIEW Mat to recall a library of macros built into the web-based user interface. Control PIP settings, video sources, camera position presets and more with intuitive API integration for third party applications and control hardware. Store graphic overlays such as a church logo or worship leader name to add production quality to everyday events.

The AV Bridge 2x1 is the must-have device you need for simple, reliable multi-camera installations. **T**

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This video highlights how you can setup a streaming cart in just a few minutes – while a higher education setup is used as an example, the process would be the same for houses of worship.

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## Lectrosonics IFBR1B Receiver Pack and Charging System

Long a standard of the industry for IFB (Interruptible Foldback) systems for broadcast studios, live events, film sets and anywhere a foldback unit is needed, the Lectrosonics IFB T4 base station and R1a receiver are nearing the 20-year mark – almost unheard of for professional electronics in today’s world. Introduced in 2001, the R1a receiver pack set new standards for size, ruggedness, utility, and value. However, especially in today’s fast-paced production environment, the need has been rising for a new receiver pack with a new form factor. The biggest change, other than the small size, is the additional of rechargeable batteries and a modular dock charging system.

The next-generation IFBR1B receiver pack is nearly half the size and weight of the industry-standard IFBR1A receiver that it is replacing and uses a slim 3.7V LB-50 rechargeable lithium ion battery instead of the archaic 9V type. The new IFBR1B is fully compatible with the existing line of IFBT4 base-station transmitters, so that adding the convenience and new features of the IFBR1B receivers to existing Lectrosonics IFB systems is quick and easy. With a backlit LCD and membrane buttons, the new receiver is easy to set up and use, offering 10 presets which are easily programmable from the front panel.

Five tuning ranges are available for the new IFBR1B receiver: the VHF version (red knob) covers 174-216 MHz, the same as the older upper-VHF band version. In the UHF band (blue knob), The A1 version (470-537 MHz) covers Lectrosonics blocks 470, 19 and 20; the B1 (537-614 MHz) covers blocks 21, 22, and 23; and the C1 (614-692 MHz, for export markets) covers blocks 24, 25 and 26. For Part 74 license holders, the 941 Band version (black knob) covers the North American license-only 941-960 MHz



range, outside the standard TV bands.

Future firmware updates can be installed in the IFBR1B in the field via the USB jack on the bottom of the unit. The IFBR1B comes standard with a wire belt clip for light weight and easy placement. An optional “clamp” style belt clip, part number IFBR1BBCSL, is also available, and easily installed with two small screws.

The system’s new companion dock charging system, the CHSIFBR1B, is capable of charging up to four receivers or four batteries in any combination. The charging dock can be also be ganged in groups of up to four, powered by a single power supply,

allowing charging any combination of up to 16 units or 16 batteries. Charging time from full dead to fully charged is 3 hours. In one hour, the units are charged to 75% of their capacity. Run time for fully charged units is in excess of 8 hours. Since the battery can be removed, charged batteries can be easily put into units within seconds.

To maintain the familiar ruggedness from the original R1a, Lectrosonics is continuing to make the new pack from the same aluminum alloy shell, also keeping the tough knurled volume knob and knob guard. **T** Available now.



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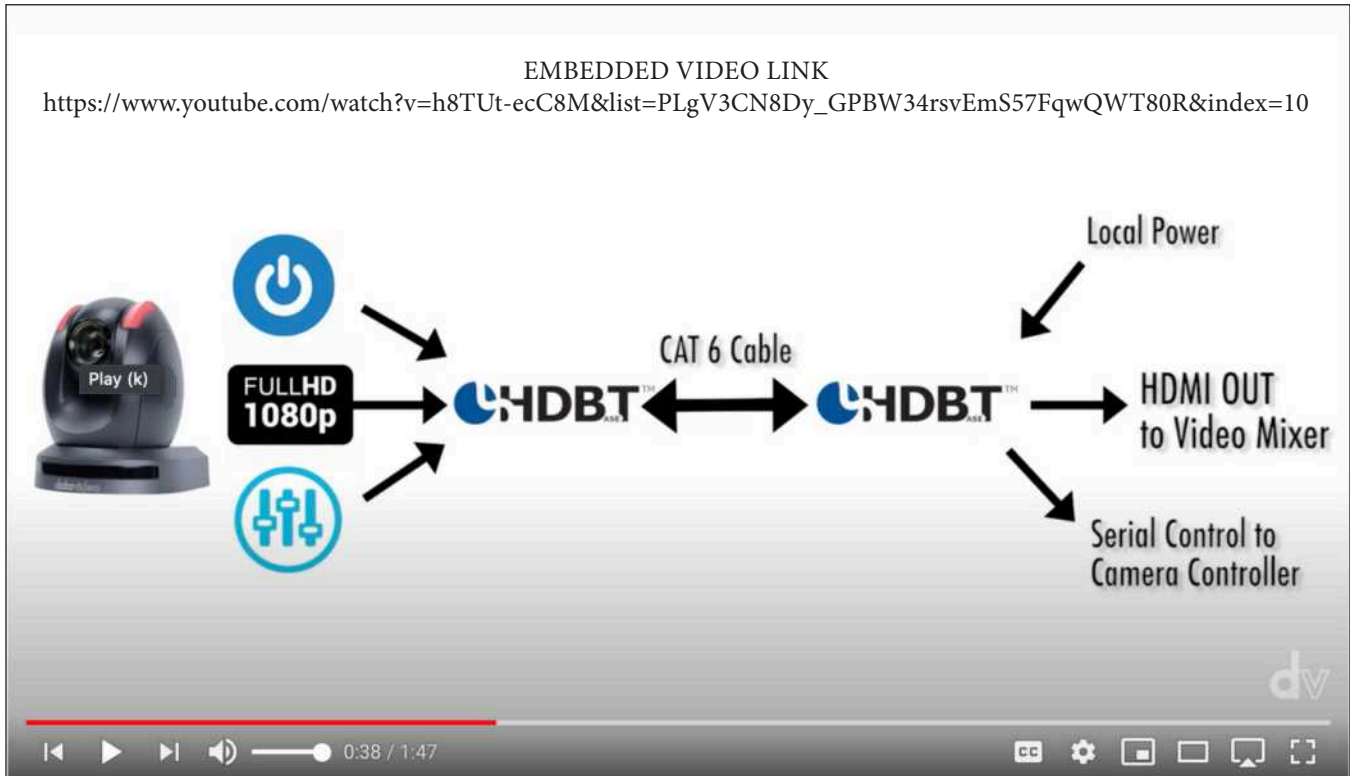
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## What is HDBaseT?



HDBaseT can be used to power and control cameras, as well as transmit video signals over long distances for many video production applications. In this episode of Tech Tip Tuesdays, we explain how you can save time and money by using HDBaseT. HDBaseT allows you to transmit video, control, tally, and power over single CAT 6 cable. This means you no longer need to run multiple cables for video, control, and power for your cameras!

Check out more great “Tech-Tip Tuesday” videos from DataVideo at;

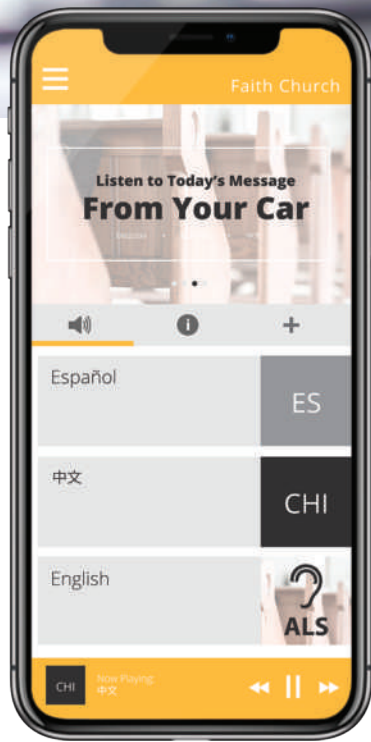


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# Live Streaming

## Five Best Practices and Tips for Creating an Online Worship Experience

BY BRIDGET HARRINGTON

**T**he times we're living in are requiring all of us to come up with new ways of doing things, particularly when it comes to group gatherings. If you are a pastor, a youth leader or one who handles the technology for your worship center, this extends to the holding of services and study groups. How can you lead your congregation remotely, particularly if you haven't done it before? Facebook Live, YouTube and even your own website can offer you a way to reach out – we'll leave the choice of platform up to you. In this list, we'll discuss the five considerations for creating a remote worship experience, regardless of platform.

### Schedule and promote your content

Think of your broadcast as an invitational event. Let your congregation know when and where to expect it, and how to participate. Forward-thinking communication and the need for connectiveness to community are huge right now and doing this will help build anticipation and an audience for your service. Your website is the obvious place to start, but you can also publish a schedule in any mailings or emails you are doing, along with sending texts and publishing reminders on Facebook, Twitter and any social platform you may use.

### Choose a location

Different situations call for different environments, so think about the needs of your congregation and what they will most connect with. Perhaps the location will be your desk in the church office. Maybe it will be in your own home. Or you might want to broadcast from your own altar or pulpit, or even somewhere in nature. Find a spot that is well-lit, with the emphasis on you. Check your background for anything that might be distracting, and either remove it or position yourself accordingly to hide it.

### Sound

Depending on how you choose to record and whether or not you are broadcasting live, there are two ways that you can approach sound:

a) Mic through computer, using the computer's camera – You will get the best sound if you use a headworn mic. Another option is a directional, shotgun/stand mic attached to your computer, positioned behind your monitor, out of view, yet facing you. In both instances, you will want to treat the camera as if it were a person and speak to it, minimizing instances where you speak to either side.

A note for live broadcasts: If you are broadcasting through your computer, turn off any notification sounds, such as those for email or Facebook. They otherwise appear randomly and are distracting. Be aware of anything in your environment that you can likewise turn off, minimize or schedule around, such as your computer's fan, pets, household noise and neighborhood noise (leaf blowers, mowers).

b) Externally, using a camera or GoPro – This option is for those who want more freedom of movement and are broadcasting in a wider area, such as a local pastor in our area did when he recorded his Easter Sunday sermon and prayers in the field outside of his church. His technical person filmed him from an appropriate distance, using lenses and angles to convey proximity. To capture his sound, the pastor used a Lectrosonics MTCR, or other similar small recording device, and a lav mic. The tech person then married the visual and the sound in post-production and made the "service" available online for later viewing.

### Music

Music is an integral part of any worship experience. When broadcasting remotely and using recorded sound, be mindful of copyrights to the music you are using. Churches often have license to use copyrighted music in their services, but at the time of this writing, this may not extend to online use. There are a variety of sources you can use that are royalty-free, and other options include having soloists appear on camera in a small-screen or including a Zoom-like choir with people performing from their own locations. We have also heard about pastors creating Spotify playlists that congregants can play on their own.

### Disinfection

Whether you are using your own equipment or gear borrowed from others, disinfecting them after use is a smart practice.

Broadcasting services online offer your worship centers many possibilities that will extend past this pandemic period, including expanding your outreach to different areas, providing on-demand Scripture studies, and making services available to the homebound or those living in remote areas. **T**

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

# Understanding FEEDBACK

BY TIM ADAMS



Feedback-if you're like me, just seeing that word creates a sense of dread in me. Live audio suffers from this phenomenon and many churches are at a loss as to how it is created.

Of course, the basic explanation is that sound going into a microphone is fed to a speaker system that emits that sound, amplified, and this amplified sound finds its way back into the originating microphone and we have a loop.

Ok, but what are the factors that can help lead to feedback other than that over-simplified explanation above?

**Room Design:** the layout of a room can have a massive effect on helping create, or defeat, feedback. Symmetrical rooms tend to bounce sound waves around in a manner that can cause those sound waves to not lessen in intensity as quickly, which means that reflected sound from walls, the ceiling and the floor can all aid in inducing feedback from an amplified sound system.

**Room Materials:** If you have a lot of hard, smooth, reflective surfaces in your room (tile, glass, concrete, etc.), the acoustical energy of the sound waves will take a much longer time to

die off than in a room filled with absorbing materials, like cloth, carpet, and padded seating). A cathedral was filled with hard surfaces to help transmit sound from the front to the back using the technology available at the time. Modern churches are built to help balance between good acoustics and good absorption.

affect your feedback issue. The polar pickup pattern is your friend-instead of using omnidirectional microphones, move to cardioid mics. This alone can help you reject off-axis sound sources, such as those coming from your speaker system while still allowing you to pickup great sound from speakers and singers.

setup correctly by ringing out the room, this can have disastrous effects. Combine this with poor mic etiquette and feedback becomes the norm, rather than the exception.

Monitors: Yep, floor monitors are on this list, as well. Generally, if you are still using floor monitors, you are fighting “stage

as immediately evident as its higher pitched cousin, it can be just as annoying.

I would combat this by not running my subwoofers off the main output and through a crossover. I generally recommend connecting the subwoofer(s) to an Aux output and, assuming it's a digital mixer, use the Aux output EQ as my crossover. This gives me fader control of the subwoofer level and I can assign the channels I want rather than sending everything to the subs. This setup can also help you control low frequency feedback because you don't have everything going into the sub, just those sources that should be sent there, like the bass guitar, keyboard, kick drum, etc.

Feedback is annoying and distracting, to say the least, but it's not impossible to overcome-if you understand what is causing it and what is contributing to it. Hopefully you have a better understanding of what those causes and contributors could be in your space. And if you continue to struggle, never under-estimate the value of a good acoustical consultant or integrator to help you defeat it once and for all. **T**

## **Feedback is annoying and distracting, but it's not impossible to overcome – if you understand what is causing it and what is contributing to it.**

**Speaker System:** Where you have your speakers placed is arguably the single, most important factor because this is where you can most directly influence whether your speaker output is going to be picked up by your microphones. Generally, you want your microphones to be located behind your speakers. This greatly minimizes the microphone's ability to pickup the sound being output from the speakers. While this may not be a silver bullet solution, it certainly is an issue I have come across in many smaller churches that it bears mentioning simply because if you are going to immediately make the move to acoustical treatments but you haven't bothered with changing your speaker locations to ensure they are in front of your microphones, we have gotten some priorities backwards.

**Microphones:** Yes, the kind of microphones you are using can also drastically

**Mic Etiquette:** this has to do with how people hold and use microphones; are they holding them at their waist and expecting good sound to result? Do they turn away from the microphone when talking? Or the worst thing, do they point the microphone at the speaker or floor monitor when they are not using it, such as when a singer is waiting through a musical interlude or bridge? Train your people how to use a microphone properly and do not stop training them until it becomes muscle memory.

**Your Mixing:** Sorry, but we have to put in the sound operator here, as well. There can be a serious lack of proper training with church sound operators and that can lead to issues such as ongoing feedback simply because the operator does not understand how sound works and how feedback is caused and thus does what they have been trained to do-move the fader up when the sound gets quiet. If the gain staging has not been

volume” all the time because people always seem to want more volume from the monitors. To help get around this, use subtractive monitor mixing vs. additive. This means that when a person asks for more of one thing in their monitor, rather than turning that one thing up, you turn everything else down. This helps you keep your monitor levels consistent while generally keeping your musicians placated.

It is important to take a moment and make a distinction between high frequency and low frequency feedback. We may all be acquainted with the high pitched squeal of feedback, but the low frequency version is also an issue, particularly with more and more small churches beginning to employ the use of subwoofers in their systems.

Low frequency feedback begins as a rumble and simply continues to get louder and louder until you turn down the offending channel or source. While not

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



# How Many Mixers Does Your Church Need?

BY TIM ADAMS

**A**s a church grows, it can be difficult for leadership to know when the purchase of a new mixer is justified and necessary. After all, as a church expands, events and ministries tend to grow in number and frequency, as well.

The answer to how many mixers your church needs is: it depends. If you're a small church (500 or less), you

can probably get away with one mixer in your sanctuary (we call it FOH for front of house) and perhaps a mobile system that can be setup in the fellowship hall or outside for the church picnic, etc.

You could also be a very dynamic church with a large vision for growth, community and technical excellence. So the same church size could have a

FOH mixer, a mixer for the live stream, a mixer for monitors and/or in-ears for the musicians, a portable sound system for events around and outside the church, a dedicated mixer for the youth room and an installed mixer in the fellowship hall.

Church size is not the only determining factor in how many mixers or how much technology you need;

your vision should be the ultimate deciding factor. Maybe a good way to think about it is that the size of your vision will determine the amount of equipment you will need. While this may not be an absolute truth, I have seen churches with weekly attendance of less than 50 do some absolutely incredible things because they had a God-size vision.

I should take a quick moment and clarify that I'm not condemning churches that don't have big visions; I am merely trying to use the size of a church's vision as a benchmark for how much equipment they will need to meet that vision.

80% of churches in America are 500 members or less, so it's safe to say that the vast majority of churches are not likely to have made massive

recycle it. This can be a great way of maximizing the value you receive from the investment you made.

Mixers are also changing shape and becoming much more use-case specific. For example, you can invest in a monitor mixing system to allow musicians to be responsible for their own monitor mixes, freeing up your FOH operator to focus on getting the best sound out of the speaker system.

as possible, because this can help leadership forecast costs for opening a new site and create a technical standard that people both on-stage and in the audience can rely on, while also allowing operators to serve at any location at any time because the equipment is the same.

Similarly, if your church is live streaming, having a dedicated audio mixer can vastly improve your audio quality because mixing for a live amplified environment is very different than mixing for a "closed" environment, such as recording and/or live streaming. This is because when an audio engineer is sitting in the sanctuary, they can hear the piano and the congregation singing around them. However, when they are watching online, they don't have that in-person experience. This means that acoustical instruments need to be miked, the congregation needs to be miked, etc. Live stream and recording needs are very different than live needs and it's important to have a mixer dedicated to these functions to provide the best quality sound possible.

In many churches, the population is aging which often means hearing issues. These issues are forcing churches to think about amplified sound systems in other areas besides the sanctuary and fellowship hall. Having a small system in every meeting room could soon become a reality for many churches. This could bring the need for small-format mixers to the fore, which will greatly increase the number of mixers the average church

needs to invest in.

How many mixers does your church need? The best suggestion I can give you as an answer is to sit down as a leadership team and write out all the current needs at your facility today. Then, based on your vision for the next five to ten years, sketch out how those needs will grow and run a tally of how many mixers will be needed to support that vision. Perhaps the answer will be the same, perhaps it will be different, but at least you will have an answer.

There is another important reason for doing this exercise; for churches and leaders that do not have a vision written out, it will provide a direction for the church, and will help volunteers better understand how what they do supports the overall vision, which increases engagement and fulfillment. This can help re-vitalize a church to get back into mission, winning souls for the Kingdom, which is something we should all be doing anyway, right?

So perhaps I will revise my earlier answer: How many mixers does your church need? As many as required to win souls for Christ. **T**

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**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.

## **A church with a multi-site focus will want to standardize on the brand and model of mixer as much as possible, because this can help leadership forecast costs for opening a new site and create a technical standard that people both on-stage and in the audience can rely on...**

investments into audio mixers. However, the needs of even a 500-member church can grow over time, even if the membership does not. I often see old analog mixers from the sanctuary being repurposed to the Youth room or a mobile system. Simply because a piece of equipment is being upgraded does not render that older equipment useless; I encourage you to find a way to repurpose that mixer rather than relegating it to the trash or trying to

These monitor mixers are inexpensive enough that the system can be built over time, or the church can save the money and get all of them at once.

If you have a large enough praise band, you may need to dedicate the resources to purchase a mixer whose sole purpose is to provide monitor mixes to your musicians.

A church with a multi-site focus will want to standardize on the brand and model of mixer as much





## THE IMPORTANCE OF ASSISTIVE LISTENING

BY TIM ADAMS

**I**magine spending years going to church, making friends, worshipping God and all the deep fulfillment that comes with that. Now imagine that you begin to disconnect due to your hearing going away. What would that feel like? How would that impact your desire to attend church and engage in church activities? Would you feel ashamed? Would you be embarrassed?

Millions of people around the world suffer from hearing loss every day and it can have a profound impact on a person's life. We, as churches, should be jumping at the opportunity to help these individuals continue to engage and enjoy our church services through the use of assistive listening technology.

These systems are not new. They have been around for years, utilizing both radio frequency (RF) and infrared (IR) technologies to broadcast live audio to individual belt packs that the user then attaches headphones, earbuds or listening loops, to. While these systems have worked fairly well over the years, complaints of static and hiss in the audio signal have led many people to stop using them. The cost has also been an issue with churches, with many basic, four user systems coming in at \$2000 and up.

However, a recent leap in technology means there are now WiFi based options that allow individuals to use their own smartphone or tablet with a free app. This has

drastically reduced the cost, with options available for under \$1000 with virtually unlimited scaling capability.

Why is offering an assistive listening system so important? First, it is important that we do what we can to not ignore a segment of our community. That's simply not how we should be doing things. Secondly, we are required by law to do so.

The Americans with Disabilities Act, passed in 1990, specifically mandates the provision of assistive listening systems: in new buildings, in alterations or renovations to buildings, and facilities of private companies providing goods or services to the public. In 2010, new standards were put in place that greatly expanded

the assistive listening requirements. Essentially, to be 100% compliant, churches will have to supply an assistive listening device (ALD) in any space that utilizes amplified sound. The number of devices is based on a calculation of 4% of the seating capacity in the given space.

And let's not forget the potential financial liabilities for not meeting these requirements, which range from \$55,000-\$150,000 – not exactly pocket change! Implementing an ALD system by comparison is a small price to pay to not incur those kinds of fines. Of course, to get on the Department of Justice's radar in the first place would likely require someone filing an official complaint with their

## Variety of Assistive Listening Applications



Combo Compliance Systems from Listen Technologies provide venues with a internationally compliant Wi-Fi assistive listening solution. Download a pdf showing all systems here: <https://www.listentech.com/wp-content...>

office, citing specific ADA violations.

Again, many churches have simply not complied with this mandate simply due to cost and/or ignorance about their need to do so. But we shouldn't need the fear of huge fines or lawsuits to motivate us to act. With multi-channel WiFi systems available, a church could route audio from several meeting spaces into one server and then, depending on the space a person is in, they can choose from the list of "channels" to select the one appropriate for that room. No more devices to check in and out, no more headphones and ear buds to maintain for good hygiene, no more batteries to charge. It's a true bring-your-own-device (BYOD) solution at a fraction of the cost.

Why is this important? Because we should be meeting the needs of those around us, and being

disabled can be incredibly isolating, particularly for those losing their hearing. Rather than become dismissive or judgmental about feedback from members or visitors about the sound being too loud or too soft, we should be attempting to understand their perspective and why they have that opinion. If it's too loud, they can benefit from ALD because it can help them control the sound to their comfort level. If it's too soft, they can benefit from ALD because it lets them bring the listening level to where they can hear it well.

I know that when we are in the midst of mixing sound, it's not always possible to take a moment to chat with someone who comes to complain or offer a suggestion but we should be paying attention to comments and feedback from our ushers, elders,

deacons, and others who regularly interface with our members and visitors alike. We often view the world through the lens of our particular perspective and regularly dismiss those whose perspectives, opinions and ideologies do not match our own. We should be learning from our differences, not separating ourselves because of them.

For those of us who work in tech, we should be always striving to learn more, better ourselves and be the best at what we do. Part of that is listening to others. Actively looking for ways to provide better experiences to our communities, like deploying an ALD solution, is a small way that we can make a significant impact for an overlooked segment of our church populations.

If you're interested in what ALD systems are available, there are many manufacturers that provide

solutions. Some of the most well-known are Williams Sound, Listen Technologies, Sennheiser, Audio-Technica and Shure.

Let's make 2020 the year that we make the commitment to address those in our communities that have legitimate needs and find out how we can best help them; not because it makes us feel better, but because that is what Christ called us to do – love one another. **T**

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**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.



ALL PHOTOS COURTESY OF THE ARK ENCOUNTERS

## Clearwing Systems Integration Transforms ARK Encounter's Answers Center

**H**ome to the life-size replica of Noah's Ark, the Ark Encounter continues to grow with the construction of the Answers Center. The 2,500-seat multipurpose venue hosts daily lectures, concerts, and video presentations in addition to large conferences and other events. The Ark Encounter once again chose Clearwing Systems Integration (CSI) to design and install complete Audio, Video, Lighting, Rigging, and Drapery systems.

### AUDIO

Inside the huge center, the rider-friendly audio system consists of 2 hangs of 12 L-Acoustics K2 line arrays with 8 KS28 subwoofers stacked under the center of the stage. X8 speakers mounted in the front of the stage provide front-fill and an additional package of X12 speakers are used for stage monitoring.

Ark Encounters requested a rider friendly system capable of reaching 110dB at the back of the room, a 150' throw. In addition, the roof load capacity for supporting the arrays

was limited. Given those parameters, a long-throw, lightweight system was needed. L'Acoustic K2 checked all the boxes. The Panflex louvers focus the energy off the walls and into the seats. K2 covers the room evenly and can easily achieve the higher SPL when needed. Clearwing Productions had previously used K2 for a temporary outdoor installation at the Ark Encounter. As a result, the venue tech staff had a good idea of what the system was capable of going into the project.

A Yamaha CL5 audio console handles mixing duties at front of house with an additional CL5 onstage as the monitor desk. The distributed Dante network handles inputs from multiple RIO stage boxes and Shure Axient Digital wireless microphones. By using Dante, stageboxes can be relocated around the venue depending on the

needs of the event. Other Dante devices can be quickly added to the network and patched into the system, making things simple for the venue staff. The Axient wireless integrate seamlessly with the Yamaha consoles for monitoring and control of the receivers directly from the console.

Redundant QSC Q-Sys Core 510i's route audio throughout the lobbies and other distributed spaces while integrating with the larger park-wide Q-Sys system. Clearwing designed and installed a massive QSys system in the Ark Encounter itself a few years back. As the park continues to expand, local QSys cores are added for the various expansion areas and networked into the larger system. Having a networked solution like QSys allows the operators to route audio between the various venues via Core to Core streaming. QSys also handles park-wide





## GEAR LIST

### Audio Equipment:

- (24) L-Acoustics K2
- (8) L-Acoustics KS28
- (8) L-Acoustics X12
- (8) L-Acoustics X8
- (12) L-Acoustics LA12X
- (1) L-Acoustics s LA4X
- (2) Yamaha CL5
- (4) Yamaha RIO1608-D2
- (1) Yamaha RI8
- (12 channels) Shure Axient Digital wireless with ADX transmitters
- (2) QSC Core 510i
- (Multiple) QSC AD and AP series distributed speakers

### Lighting Equipment:

- (36) ETC Source4 Series 2 Tungsten
- (21) ETC Selador D60 Vivid
- (8) Martin MAC Encore Performance
- (4) Martin MAC Quantum Profile
- (12) Martin MAC Quantum Wash
- (183) ChromaQ InspireXT
- (12) ChromaQ InspireMini
- (1) ETC ION Xe20
- (2) ETC Paradigm P-ACP
- (5) ETC Sensor IQ Relay Panels
- (Multiple) ETC Response Gateways

### Video Equipment:

- (1) Nanolumens 70' x 22' P4.7UR LED Video Wall
- (1) Barco E2
- (1) Barco EX
- (1) Barco EC30
- (1) Green Hippo Boreal+

### Rigging Equipment:

- (3) ETC Prodigy P1500E
- (1) ETC QuickTouch 4

### Soft Goods:

- Bellatex Stage Curtains

announcements and paging to over 250 discrete zones.

R&R Cases provided custom-built desks for the front of house and monitor positions allowing easy adjustability and maneuverability depending on room configuration.

Reliability, flexibility, and expandability are the main requirements of the Answers Center staff and the products installed meet all expectations.

## LIGHTING

Because the Answers Center records and streams the majority of their events, lighting for camera was the number one priority. In addition, the fixtures chosen needed sufficient output so as not to be overshadowed by the massive upstage video wall. The stage lighting system consists of ETC Source 4 LED Series 2 Tungsten HD ellipsoidals and Selador D60 Vivid fixtures providing a full-stage, camera-friendly wash. Supplementing the camera lighting is a moving light package containing Martin MAC Quantum, Quantum Wash, and Encore Performance fixtures provide versatility for concerts and other events. The fixtures are hung on ETC Prodigy hoists for easy adjustment, serviceability, and adaptability - catering to any type of event.

Because the space can be rearranged to accommodate exhibits, dinners, and other events, a flexible houselight system was needed. Nearly 200 ChromaQ Inspire pendant fixtures were installed in the auditorium and outer lobby to provide full RGBW color in the audience areas while achieving output of 60-foot candles at floor level. The Inspire fixtures provide high output, beautiful color mixing and smooth dimming unmatched by any other houselight product currently on the market. An ETC IONXe console controls the theatrical fixtures while ETC Paradigm controls the architectural lighting for the remainder of the building. ETC Sensor IQ breaker panels and a distributed ETC Net3 network provide flexible lighting control throughout the building.

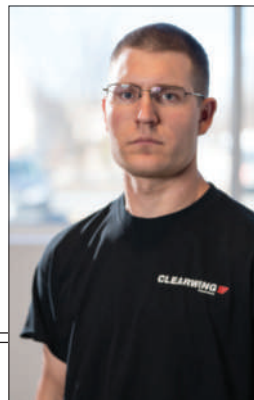
## VIDEO

One of the focal points of the venue is the Nanolumens Performance P4.7UR LED wall. Measuring a massive 70' wide by 22' tall, the versatile display is used for daily movies, presentations, and iMag while also serving as an upstage backdrop for the 80' wide stage. With a screen resolution of 4480 x 1408 pixels, the screen processing is handled by a Barco E2, controlling

content from a Green Hippo Boreal+ media server, ProPresenter, and iMag camera feeds. Operators control the E2, Ex, and an ImagePro4K via an EC-30 control surface located at front of house.

As a full-service integrator, Clearwing also provided all rigging, drapery, acoustic panels, Lex company switches, and building-wide AV networking. ■

## Q&A with Mike Jonas, Operations Manager, Clearwing Systems Integration



### TFWM: Explain Clearwing's relationship with the client. What else have we done with them and to what extent?

**MIKE:** Clearwing has worked with Ark Encounter/Answers in Genesis on a variety of projects beginning with the construction of the Ark Encounter itself. Clearwing designed and installed the audio and video systems for the Ark. In addition, Clearwing has provided audio and lighting systems for several projects at the nearby Creation Museum. Clearwing Productions was contracted to provide production support for the Encounter the Wonder, a projected multimedia experience on the exterior of the Ark.

### What is the key purpose of using the technology/components in terms of audience/crowd engagement? What makes it better than a "basic" system?

**MIKE:** It is important that the AVL systems work together to provide an impressive yet unobtrusive guest experience. When done correctly, the audience member can clearly see and hear the message while not being distracted by a poorly designed or deployed system.

### What is the importance of working with an integrator?

**MIKE:** CSI not only understands how to put these systems together but also how the systems will actually be used. Many times systems are specified or designed by a consultant who never actually has to answer for their design or make it work in the real world. Architects and engineers are often unaware of the unique needs of the theatrical systems. When they are brought in early enough in the process, a skilled integrator can partner with a client to guide the process from before there is even a hole in the ground. They coordinate structural needs for arrays and rigging, centralized control of lighting systems, and real-world needs to help the client achieve their goals. ■



# Understanding Audio Zones and DSPs

BY JAMES CARELESS

**I**n a perfect world, a house of worship (HOW) would simply set up a single loudspeaker at the front of the hall and be done with it. Everyone would be able to hear what was being said or played in perfect clarity; no matter where they were seated and what obstacles (like overhanging balconies) were in the way. You wouldn't have to blast the front rows with too much volume in order to reach the back. The sound level would be the same throughout.

Unfortunately, HOW audio occurs in the real world; one where the speed of sound (767 mph/1235 kph) causes audio delays for listeners seated far from loudspeakers. Add in the audio echoes and distortion that can be caused by reflective surfaces (walls, balconies, and angles) plus the degradation of sound waves the further they travel from their originating loudspeakers, and providing clear, consistent audio reproduction throughout the hall can be a real challenge.

This is why house of worship AV people (and everybody else) need to understand the concepts of Audio Zones and Digital Sound Processing



(DSP) to synchronize their loudspeaker systems, so that everyone in the room has access to the same audio experience.

## Why Audio Zones Matter

Clearly, it is not practical to serve a medium-to-large sized hall with a single loudspeaker. Instead, a more sensible approach is to divide the room into ‘audio zones’ where each area has its own loudspeaker(s) in relatively close proximity to the people in that zone. “All of these speakers can be kept at a volume that is comfortable for the attendees, providing the same clarity across the venue, and minimizing the unwanted artifacts associated with high SPL (sound pressure level),” said Jim Schwenzer, director of technical support and service for Ashly Audio.

A number of factors determine how many audio zones a house of worship needs. For instance, one factor is the size of the room: The bigger it is, the more zones will be needed to ensure that the audio is visually synced with what is being

seen on stage, as well as being played at a level that doesn’t overpower the listeners.

Another factor is the number of sound-affecting obstacles like balconies, walls, and other surfaces that affect sound quality from distant loudspeakers. Managing these troublesome areas by making them into separate audio zones with their own dedicated loudspeakers can minimize the problem.

Worth noting: The sound bleeding from these audio zones have to be time-delayed with respect to each other, so that the sound throughout the overall room is synchronized and intelligible. “If not, then the effect can be like standing on a high school football field when someone talks on the loudspeakers, and the overlapping audio has so many echoes and conflicts that you can’t make sense of what is being spoken,” said Jon Taylor, Head of Sales for PreSonus’ Commercial Division. “In a house of worship where hearing the message clearly is all-important, you can’t tolerate this kind of audio distortion.”





## Proper Speaker Placement is Key

Once audio zones have been established, it is time to select, mount, and connect loudspeakers for each of these ones; and then to synchronize them so that the overall sound delivery is clear and clean everywhere.

Unless the house of worship has access to an in-house audio expert, this is a job best left to an audio professional – because making mistakes in this process can doom the audience to an ongoing audio nightmare.

“One good option is to contact someone local that you trust who does speaker installations for a living,” said Taylor. “Get them to come out and see the hall, to understand what you are up against. Once that expert comes up with a loudspeaker recommendation, see if they can loop in the manufacturer to help with the project, so that you get the best solution possible.”

The key word here is ‘possible’: Even in a simple rectangular hall, the limits imposed by the speed of sound,

signal degradation/decay, and the reflective/absorptive properties of walls, windows, and attendees is going to affect the audio quality.

“Getting the best sound in a house of worship is a game of compromises,” said David Ellis, CEO/Owner of Ellis Pro Media. “Using a central point in the room as a reference point, you try to make every seat hear the audio as best as you can. But even then, it is not possible to deliver perfect sound.”

## Digital Signal Processing

The task of synchronizing loudspeakers throughout a hall requires the audio output to be time-delayed in some speakers, to compensate for the speed of sound’s speed limits. Although there are a few ways to do this, the most popular method these days is ‘Digital Signal Processing’; namely using a digital signal processor (DSP) within the audio chain to fix problems.

“A digital signal processor is a marvel of modern

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technology, providing the capability to manipulate analog audio signals from the real world (a person's voice or a musical instrument) in the digital domain," said Schwenzer. "In addition to equalization, bandwidth limitation, and dynamic compression, one of the things easily accomplished with digital technology is delay: The speakers at the rear of the hall can be delayed such that they align with the signal coming from both the front and mid-room speakers." A DSP can also correct "specific room anomalies" audio zones under balconies and other similar spaces.

This said, a DSP cannot correct fundamental errors in speaker selection, positioning, and output. "As well, the more digital processing you impose on a sound wave, the more distortion you add to it," said Ellis. "So the first step in providing clear audio is making sure that your sound design is right for the space, and that you've done as much right as you physically can before turning to a DSP."

## Another Option: Digitally Steered Arrays

There is another way to deliver clear audio in large spaces with acoustical anomalies, and that is by using digitally steered phase arrays. These are vertical columnar arrays of loudspeakers – sometimes flown above the floor – that send out individual feeds of time-delayed audio to different parts of the room. The timing of each feed depends on the distance and audio issues it has to overcome. The result is a consistent audio feed throughout the space from one or more central points; minimizing or even eliminating the need to mount speakers in other locations.

"If you want an analogy, a digitally steered array is akin to one or more spotlights — each beam can be aimed at a specific area you want to cover, and each beam can be adjusted for tighter or wider focus," said Daniel Keller, CEO of Get It In Writing, Inc.\*. "With a steered array, you can focus audio to the parts of the room where it's needed (the audience), and away from walls, windows, and other reflective surfaces that can decrease intelligibility."

## Again, Get a Pro

If the details above sound daunting – or even if they don't – a wise house of worship AV manager knows that calling a pro offers the best chance at optimal speaker synchronization.

After all, people go to a church, synagogue, mosque, or temple to hear what the spiritual leader has to say. If they can't understand these words due to poor audio reproduction, then they may not come back. **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 produced the ecumenical radio show "Daybreak" at CHEX-AM radio in Peterborough, Ontario.



# Mod Scenes Switches Their Manufacturing to Create PPEs



Our friends at Mod Scenes typically provide the highest-rated stage designs to churches across the US, but have recently shifted their efforts to serve front line workers. The team at Mod Scenes started changing their production in mid-March, creating much needed Personal Protective Equipment (PPE) for hospitals and those struggling to acquire it, producing nearly 2,000 face shields a day since early April to better serve their communities during these interesting times.

When the team at Mod Scenes first started brainstorming how they could best serve others during this pandemic, they quickly focused on what PPE was needed most for hospitals and what could be quickly manufactured and deployed. Their entire team began working on prototypes for clear protective face shields.

After two days of design and refinement, the team landed on a design that consisted of a Clear PETG shield, a closed cell foam headrest, and an elastic band. Mod Scenes

utilized their state-of-the-art CNC machines to cut the clear plastic to shape. Simultaneously, the team cut and prepared foam and elastic for the shields. Once the shields were cut, they were cleaned and quality checked. Next, the manufacturing team applied a segment of closed cell foam to the clear plastic shield. During the next stage, an elastic band was fitted to each shield. Once all of the components were attached, the shield went through a final cleaning and QC before being individually sealed in a bag.

The face shields Mod Scenes have created are being used across the country. Thousands have been provided to hospitals in desperate need of PPE including hospitals in Chicago, Seattle, and the Oklahoma City Metro. The shields are also in use in nursing homes, care facilities, grocery stores, and



food processing plants.

More recently, Mod Scenes has started manufacturing reusable fabric face masks for churches and individuals as well. These masks are made

from a tight woven stretch fabric that easily contours to an individual's face while being comfortable to wear all day. In true Mod Scenes style, the masks come in multiple beautiful colors

including black. Each mask is individually packaged to ensure cleanliness.

In an effort to make reopening easy for churches, Mod Scenes has also created a web store for churches needing safety supplies. You can view this store at [Modscenes.com/Serve](https://Modscenes.com/Serve). The products on their site are kept in stock and have the quick shipping that Mod Scenes is known for. Along with the Face Shields and Fabric Masks, Mod Scenes are also providing disposable masks, sanitizer, gloves, and other cleaning supplies. As churches reopen, they are also still providing their award-winning scenic products to help in creating welcoming atmospheres to help share the gospel! 📖



*More information can be found at Mod Scenes website: [Modscenes.com](https://Modscenes.com) or by calling 530-723-6421*

# Stay Connected with Drive-in Worship Services

BY CARRIE KEELE

**O**n Easter Sunday, members of the New Life Center United Pentecostal Church in West Valley City, Utah, pulled into the parking lot. With their cars spaced six feet apart, they rolled down their windows and listened to their pastor deliver his Easter message via loudspeaker, and they honked instead of shouting, “amen!” The choir also spread out for safe social distancing, sang, and played instruments. For these church members, it was an opportunity to get out of the house and hear an important Sunday sermon.

“At least (we get to) see each other,” said church member Jonathan Haag. “It’s kind of nice to just see faces and not just our own family.”

The New Life Center United Pentecostal Church isn’t alone in holding drive-in worship services during the COVID-19 pandemic. Clanton First United Methodist Church in Alabama is holding regular services the same way, with congregants parked in cars with their windows rolled down to hear the weekly inspirational message.

These churches are trying to adapt to a new (temporary) normal, where



people are being asked to stay home as much as possible or stay at least six feet away from each other. Some houses of worship are meeting congregants’ needs by hosting live-streamed services via Zoom or other meeting platforms. Others are posting videos online that members can watch anytime for inspiration.

Meeting or watching videos online isn’t the same as seeing fellow church members in person, which is

why holding drive-in worship services is an attractive option. However, audio can be a problem—not everyone will be able to hear, even with their windows down and a loudspeaker blaring. There is a better way to do a drive-in worship service: Using audio streamed via Wi-Fi straight to personal devices or to Bluetooth-enabled car stereos. It’s like an old-fashioned drive-in movie theater, but with better, more reliable sound.

## Benefits of Streaming Audio via Wi-Fi

The COVID-19 pandemic is precisely the time when worship congregations need each other the most, crave connections, and yearn to hear inspirational messages. Providing streaming audio over Wi-Fi during a drive-in worship service helps accomplish all of those things.

Audio streamed over Wi-Fi provides crystal-clear sound directly to



**They may not be able to sit together, shake hands, or hug, but they can see each other and hear an inspirational message. Parishioners will feel less alone, even while self-isolating.**

parishioners' smartphones and tablets with virtually zero latency. Congregants can hear the inspirational message live and in-person, even during this time of social distancing and stay-at-home orders. They may not be able to sit together, shake hands, or hug, but they can see each other and hear an inspirational message. Parishioners will feel less alone, even while self-isolating.

Many systems are affordable, scalable, and simple to set up—only requiring an existing Wi-Fi server. Once a house of worship has the system plugged in, users simply download an app to stream audio. Parishioners will be able to stream the sermon as far as the Wi-Fi can reach.

If your chosen system features multiple channel

options, you also have the ability to broadcast in multiple languages or transmit an adult service at the same time as a youth service. Congregants can also broadcast the sermon to their car stereo or headphones via Bluetooth. Some streaming apps on the market offer customizable features, allowing space for announcements (you don't want to miss any birthdays!), hymns, and more.

### **Better Than Using FM**

Do you remember the FM-based sound set-up at old-fashioned drive-in movie theaters? Users would simply tune in the audio using their car stereo.

It's tempting to try an FM-based system because it's familiar. However, do you remember how unreliable the sound was? Or the static involved, even when you

found the right station? Theaters had to provide speakers that mounted on car windows just to account for all the audio mishaps. With that in mind, realizing Wi-Fi's advantages over FM is simple:

- *No static interference*
- *Fully digital, crystal-clear, MP3-quality audio*
- *No infection risk because users provide their own equipment*
- *Ability to broadcast multiple channels simultaneously*
- *A long-term solution for audio broadcasting*
- *Still Relevant in Post-COVID-19 World*

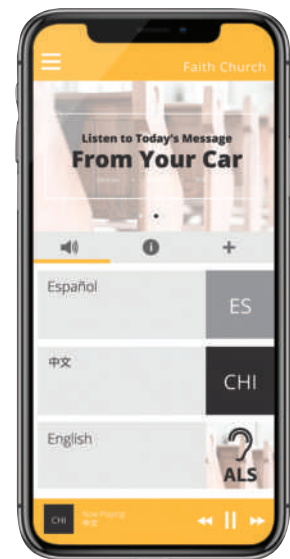
Sometime in the (hopefully) near future, the COVID-19 pandemic will be over, and life will go back to normal. People will be able to leave their houses without fear of exposure, children will return to school, and houses of worship will be filled with congregants who want to hear weekly services.

However, a streaming audio system will be useful in any house of worship long after the pandemic is over. As anyone who has attended a popular worship service knows, having everyone gathered in a chapel isn't always possible.

With a streaming system, churches can deliver audio to parishioners in the lobby and parents with small children in cry rooms. They can broadcast sermons to a parking lot, where people are sitting in cars with their babies asleep in car seats. They can offer sermons in several languages simultaneously. Even the hard of hearing can be included, tapping

into sermons with hearing aids and canceling out the ambient noise around them.

The COVID-19 pandemic has temporarily interrupted our lives, but it doesn't have to stop people from connecting with their faith and their religious communities. Providing parishioners the option of a drive-in worship service featuring streaming, crystal-clear audio will help everyone stay connected during this time of uncertainty. It's also a perfect way to ensure congregants can hear clearly even after COVID-19 is a thing of the past. 📱



**Carrie Keele** is channel marketing manager at Listen Technologies. Listen Technologies is a wireless audio manufacturer that provides solutions in assistive listening, language interpretation, soundfield, tour group and conference. [www.listentech.com](http://www.listentech.com)

# Understanding Live Production Terminology

BY TIM ADAMS

**L**ive production can be hectic – let’s be honest, when you have a worship set that features dynamic music choices, you could be cutting between your cameras every few seconds for one song and then making smooth dissolves for a slow song a few minutes later. Then you have the message, which has one subject and slides which generally requires your attention in a completely different way.

It is critically important for a video team to understand the terminology, the vernacular, that will be used over the intercom to communicate. In the midst of calling camera shots, a technical director is thrown out of their groove when a camera operator jumps on the line and asks, “How do I pan again?”

To help combat this from happening, let’s go over the basics of terminology and what all these words mean. While you don’t have to adopt all of these words or phrases, it is important that the verbiage you do choose to use is consistent across your entire team; your efficiency and productivity will suffer greatly if one director uses one set of terms and another has their own they prefer to use. Standardization is key.

These are the basics; your team, over time, will likely develop their own terms using these as a base. I remember in my own team, we had things like “the foot shot” where we wanted to show the pianist’s feet moving the pedals, or “the candy shot” which was a release for the camera operator to go find a great shot that was not one of our regulars. It earned its nickname due to the fact we always kept snacks and candy in

TERM	DEFINITION
Pan Left/Right:	moving the camera left/right while in a fixed position.
Tilt Up/Down:	moving the camera up/down while in a fixed position.
Truck Left/Right:	moving the camera and tripod left/right while on wheels
Dolly In/Out:	moving the camera and tripod in/out while on wheels
Pedestal Up/Down:	moving the camera up/down on a pneumatic central column
Zoom In/Out:	Change your shot from wide to telephoto or reverse
Push In/Out:	A slow zoom in/out
Focus Up:	Make sure you are in sharp focus
Ready Camera #:	Ensure you are ready for director to take your camera live
Take Camera #:	Cut to camera
Dissolve Camera #:	Dissolve to camera
Wide Shot:	Zoom all the way out, get as much into your frame as possible
Medium Shot:	Usually about halfway between a wide and close-up, head to foot
Close-Up:	Head and shoulders



#### GREASE LIVE! CONTROL ROOM SPLIT SCREEN

THE ABOVE VIDEO IS A MESMERIZING LOOK AT THE CADENCE AND CAMERA CALLS FROM GREASE LIVE, VIA A SPLIT SCREEN SHOWING THE ON-SCREEN ACTION AGAINST WHAT'S HAPPENING IN THE CONTROL ROOM. WHILE YOUR HOW CAMERA CALLS ARE PROBABLY NOT NEARLY AS INTENSE, THIS GIVES YOU A GOOD IDEA OF WHAT (CAN) HAPPENS BEHIND THE SCENES.

the booth as a reward for our camera operators doing a great job.

Often, you will hear combinations of these words and phrases stacked together and used interchangeable because when a director is working on the fly, they are focused on the shots and program in front of them, not necessarily what they are saying. For example, "Camera Two, zoom out for a wide shot and get ready to push into a medium shot." The cadence that directors talk at is pretty impressive, as well, particularly during fast moving events, like an up-tempo praise song. It can sound like the longest run-on sentence you've ever heard, "Ok, Camera One, setup on a close-up of the guitar hands and set for a push out, framing on the right. Camera Four, setup on a wide shot with a tilt down and Camera Two, be ready for a medium pan, left to right. Ok, Camera One, start your move and take Camera One, ready Camera Four and take Camera Four, Camera One get back to a wide shot and be ready to push in, ok, good, Camera Four, ready Camera Two, start your pan, and dissolve Camera Two." On and on it goes and it is pretty impressive.

Of course, you may not have a large multi-camera system or operate at this level and that's ok. You may get to that point and you may not-it has to do with your church vision and goals, but even if you only have two cameras, one static wide and one with an operator, why not adopt the best practices and standardize on the terminology and practice you will use? I remember when we had to resort to hand drawn signs when our intercom failed just to let the camera operators know which camera was live because we didn't have a tally system to tell the operators which camera was live.

While I have provided some foundational understanding of the terms used in live production, how you and your team will define those terms is up to you. Sometimes people get pan and tilt mixed up or use them interchangeably-it happens all the time. Just make sure you are giving the right direction (e.g. up/down, left/right) and that will help in those situations. A close up to one church may be a medium shot to another-ultimately, you will have to determine what those terms mean for you and then train your people on that. Within your team, though, there needs to be a standard and everyone is trained

to that standard. Because we did not have tally, which is a system that lights a red light on whichever camera is being taken live by the switcher, we had to communicate which camera was live. We chose to say "on" instead of "live," or "hot," but you just have to find what makes sense in your particular situation.

Live production can be very stressful and is heavily dependent on clear communication; having your team trained to one standard set of terms and phrases will greatly help ease the load carried by everyone and can lead to better programs and better team rapport, as well. I encourage you to sit down and hammer out what your team terminology will be and begin to employ it and see what difference it can make! **T**

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**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.





# LCBC – Lives Changed by Christ



**P**roduction technology has experienced a seismic shift over the past 10 years. From analog to digital, SD to HD, from DVD distribution to online streaming platforms, and from having to physically be on-site to diagnose a problem to remote IP Based systems management. As more and more churches upgrade and install new gear, the ability to stream, access, and evaluate gear remotely has become crucial. Remotely working on equipment is more important than ever before. These advances in technology have expanded the message of churches. Yet those advances come with a cost.

When LCBC (Lives Changed By Christ) in Central Pennsylvania, looked to navigate these waters, they chose to work with Mankin Media Systems to replace their satellite system with VideoFlow DVP packet recovery appliances to send video over the public internet. They also utilized Mankin Media Systems managed services, Guardian By Mankin, to help monitor their appliances.

LCBC started as a small group of people who gathered

in a garage in Marietta, PA, to dream about a new kind of church. Today, LCBC is one church with multiple locations spread throughout Pennsylvania. Each location features the same unified experience of music and a message from a communicator that is broadcast, in real-time, to each location.

LCBC was utilizing satellite to deliver video in real-time to their 14 campuses. The significant expense of satellite was no longer palatable compared to more cost effective video over IP.

LCBC decided to replace their costly satellite and move to video over the open internet. With satellite, they were giving their content over to the provider to get it from point A to B. However, by utilizing the internet they are now able to build their own managed network they need to “feed and water”



themselves. While the team at LCBC is clever, savvy, and have the expertise to manage their systems, they felt they still required a way to remotely monitor and manage the network of VideoFlow appliances. And

because they knew they need to be proactive with fixes, they chose Guardian By Mankin's Protect line to get notifications and see in real-time all of their VideoFlow appliances.

The LCBC team can

now get notifications when packet loss is occurring and log in to troubleshoot. They no longer have to rely on volunteers or staff to send a text to someone back at their main network operations center to alert them. On a single monitor, Guardian Protect allows the LCBC team to see and monitor the health of their equipment at the campuses. Gone is the need to login to many different webpages and navigate to hundreds of IP addresses to look at equipment. The LCBC team can make critical decisions on how video traffic gets routed and head off issues before they become distracting in a church service. **T**

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**Jon Ackerman** is the Communications Director & Solutions Advocate at Mankin Media Systems - [MankinMedia.com](http://MankinMedia.com), or [GuardianByMankin.com](http://GuardianByMankin.com)



# CHANGE HAPPENS

This has become very apparent in our world these days

**T**he thing that is interesting about change is that you really can't prepare for it exactly. Take the Covid-19 situation we find ourselves in. I'm sure we could have done some things differently to prepare had we known it was coming, but the exact nature of the change has taken many of us by surprise.

I'm not just talking about how I wasn't prepared for hoarding toilet paper. For a group of technical artists in the local church, this has reinvented how church happens. Given the level of skepticism of "Online Church" just a few short months ago, none of us could have imagined that churches around the world would be holding services virtually.

While the specifics of change might be difficult to prepare for, getting used to the fact that things change and then dealing with change is a muscle that many of us have been building for years.

For those of us doing production in the local church, change is what we do. Or at least what we should have gotten used to by now. Think of any weekend. When did everything go as planned? Basically never. There is always something changing for one reason or another, completely outside of our control.

A team member calls in sick. A song gets cut. A song gets added. Then that song gets cut. The pastor has a last-minute tweak to the sermon. The fire alarm goes off. And by the way, we now need to start streaming our services because no one is allowed in the building.

When change happens, how have we learned to deal with it? What is your automatic response like when things change? Is it a positive one? Or is it dragging you and the people around you down?

So much about managing change involves our mindset; how we think





about change.

There are two types of change. One that comes from lack of planning and poor systems. Fixing these feels easy (especially compared to where we see ourselves today). Building processes and systems to manage information is a key factor in making our services the best they can be. Do that. Eliminate the change that can be solved earlier in the week.

Even after all the work to improve your systems and processes to eliminate

change, the fact remains that things will still change.

The other kind of change I'm talking about is more about the unexpected; one that is outside of our control.

How you handle change every week has either set you up for success in today's reality, or you are currently taking a crash course in change management right now.

What are some ways that we can learn quickly to handle change?

You don't have to have all

the answers.

Relax. You aren't the only one that is trying to figure this whole thing out. We all are. Cut yourself some slack.

One of my favorite parts about so many churches learning how to stop meeting in person and continue online, is that everyone is learning together. This is a change for all of us. We are all trying to figure out what's going on.

For the worship leader, how do you lead worship in front of an empty room? For the senior pastor who's used to working off the energy from the congregation, he is probably floundering and figuring out a new reality. On some levels, many of you are ahead of this curve because you were asked to figure out how to stream a long time ago. Not to prepare for this exact moment, but maybe just because the church down the street was doing it and we need to keep up. Not a great reason, but much of the technical side of streaming your services might have already been figured out.

One of the reasons that change can be so difficult is that we all want to do great work, and when change rolls in, we're not totally sure how to make it happen. This might show everyone that in fact, I don't know what I'm doing.

In a world that is so polarized, where it seems like we have to have an answer right away, or a solid opinion on everything, this can make handling change difficult. In our current example of changing, nobody knows what they're doing. You're not alone!

Your pastor is learning a new way to give a sermon. The worship leader is

trying to figure out how to lead worship to a virtual congregation. This is all new territory for the other teams of people you work with. You can use all your capacity for handling change to help solve the challenges of doing church fully online. It is now your chance to shine.

As a technical artist in the local church, your congregation has needed your skills and abilities every week before now. The difference now is that everyone knows they can't do it without you. Rise to the challenge with confidence and with humility. You still don't have all the answers, but you know your way around this whole streaming thing. Use that knowledge to help make your church's services as effective they can be in this new reality. **S**



**Todd Elliott** is a writer, speaker, technical artist in the local church and founder of FILO. Formerly the Technical Arts Director at Willow Creek Community Church, he started FILO in 2015 to help other technical artists become more effective so that the local church can be more effective. Todd and his wife, Bissy, reside near Chicago. They have three kids and a dog... none of whom are into production.

## FILO Pivot

I lead the FILO Conference, which has traditionally been a two-day event that happens twice a year. Once in Southern California in the fall and once in Chicago in May. Well, since many of us are in shelter-in-place these days, we've had to take some of the advice from the above article and figure out how to still gather in May without actually being physically with each other.

We've been calling it the FILO Pivot. Change is difficult, but like you, we've been training every weekend for pivoting. We're looking at new ways to achieve the same FILO goals and translate them into a virtual experience.

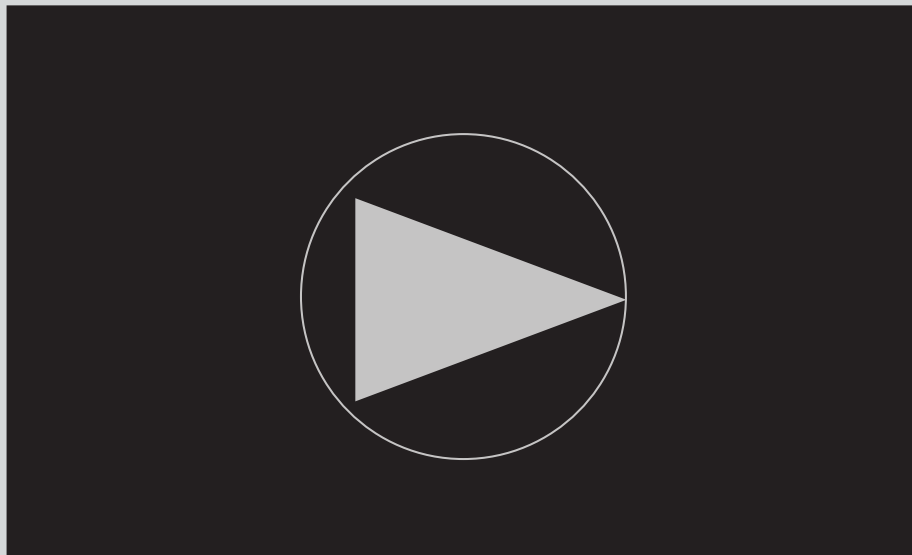
The FILO Conference is all about skill development, community and inspiration. That is all still very true. Just because we aren't all in the same together, doesn't mean we can still experience all those things. We can't have the event in the exact same way we've always done it, but we can have the same outcome: technical artists from around the world becoming more effective so that their churches can be more effective.

The new version of this event runs May 19-20. Check out [FILO.org](http://FILO.org) for all the information, and see how you can get involved for FILO in the fall – whether it's in person or online, we can all still stay connected!

## ONLINE TRAINING

For those of you interested in upgrading your skill set, there is ample opportunity online. Take advantage of all the great webinars and video-on-demand sessions making their way on to the intertoobz and see what you've been missing.

### For the Lighting Technician



## ONYX 101 Video Training from Elation Professional

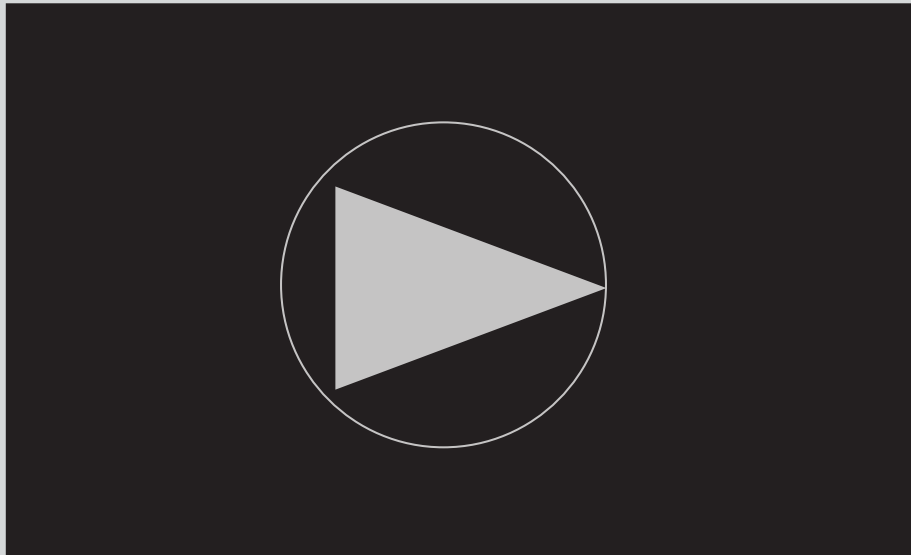
Obsidian has been offering free weekly training sessions covering the ONYX control platform and new NETRON data distribution range. These classes will

be hosted online and are available globally for anyone interested in learning more about Obsidian's advanced yet intuitive lighting control products.

ONYX 101 introduces the basics of the ONYX platform from patching to fixture control to writing basic cues and effects in one comprehensive 3 hour webinar.

Other training videos, including an Introduction to Netron, are available at [https://obsidiancontrol.com/training\\_videos](https://obsidiancontrol.com/training_videos)

# For the Audio Technician



Spoken and sung words should be intelligible. Unfortunately, it can be technically challenging to retain intelligibility, when recording or amplifying the voice. In this video, DPA presents some facts on speech intelligibility and, most importantly, how to retain it.

## Ensuring Speech Intelligibility with Proper Audio Techniques from DPA

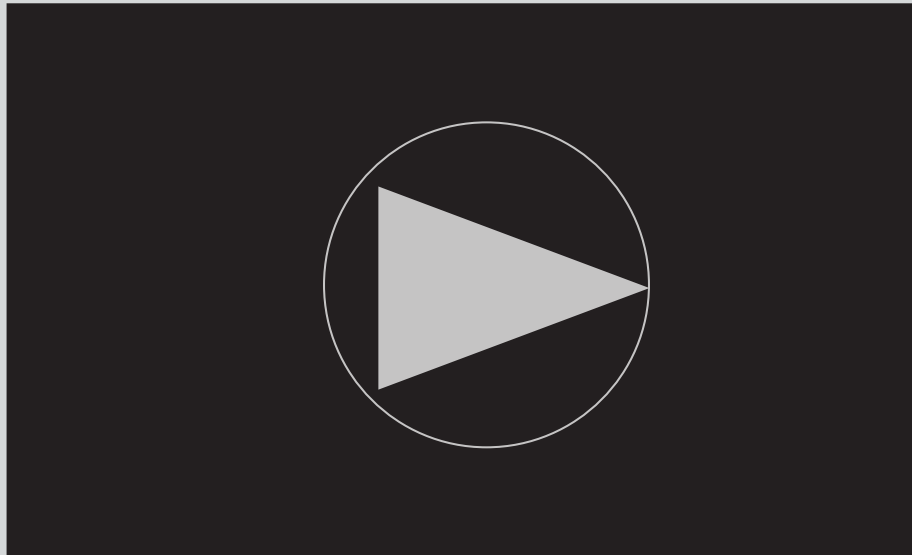
**L**anguage comes from the spoken word. When recording the voice, you should always consider speech intelligibility. Air passes the vocal cords and creates sound. By controlling the vocal cords the level and the pitch of the voice can vary. By affecting the cavities above the vocal cords (pharyngeal, oral, nasal), filtering is added to the voice spectrum. Changing the vocal effort changes both level and frequency spectrum of the voice sound. Even the pitch

of the voice changes with vocal effort. Shouting sounds different from talking with a casual voice. When recording, you will find that the peaks of the acoustical signal are much higher than then the RMS or average level. Be sure that all peaks survive through the recording chain. In non-tonal languages the consonants are important. The consonants (k, p, s, t, etc.) are predominantly found in the frequency range above 500 Hz. More specifically, in the 2 kHz-4 kHz frequency range.

We perceive the voice as natural and with the highest intelligibility when we are approximately 1 meter in front of the person talking. Standing to the side or behind the person reduces the naturalness and intelligibility. Actually, the voice changes spectrum in almost any other position than when we approach the speaking person with our ear – or microphone. Each position on the head or the chest has its' own sound color – or timbre. For instance, the spectrum

of speech recorded on the chest of a person normally lacks frequencies in the important range of 2-4 kHz. This results in reduced speech intelligibility. If the microphone does not compensate for this you should make corrections with an equalizer. When placing a microphone be aware of these issues. Be ready to pick the right microphone designed for use in the position you are placing it. Otherwise be prepared to compensate (equalize) to obtain the correct sound.

# For the Worship Team



Audio-Technica's "Basic Recording Techniques" Tutorials Teach Users the Fundamentals of Professional Recording

## Basic Recording Techniques From Audio Technica

As part of Audio-Technica's ongoing series of resources that help users adjust to the circumstances brought about by the health crisis, the company offers its video tutorial series "Basic Recording Techniques" on YouTube, which features 20 different videos covering the basics of recording solo vocals, acoustic guitar, electric guitar, piano, saxes and more. The videos are short and engaging, easy to follow and filled with useful info.

In the clip "Basic

Recording Techniques: Solo Vocals," different microphones are compared for different singers, ranges and deliveries. Several videos outline recording techniques for different types of guitars – acoustic guitar, electric guitar, electric guitar (multi-microphone), and electric bass – with different microphones and recording approaches demonstrated. "Basic Recording Techniques: The Piano" is another highlight, with a grand piano captured with a number of different

microphone configurations contrasted. Saxophones get their own dedicated video, with the popular sizes/ranges of saxes matched with the particular types of microphones that are suited to their unique timbres.

Autoplay the entire playlist above. The full playlist is available at <https://bit.ly/3dhOTMX>



# What Service Looks Like During Pandemic Restrictions

BY JIM CAWTHON, MINISTER OF MEDIA AT ROCK SPRINGS BAPTIST CHURCH

**R**ock Springs Baptist Church has been live streaming its three Sunday services each week for the past few years. That means that before the world changed for us in Easley, South Carolina, our church was prepared to continue serving our congregation.

Before I get into the specifics, however, I want to stress that this guide should not deter anyone who currently does not have a system. I spoke to one of the key manufacturers in this article before writing it and they are still shipping the “system in a box” I discuss below. Our world may be changed, but solutions are still available. Your house of worship can use this guide to quickly expand or introduce digital services.

## TECHNOLOGY ENABLING CONNECTIONS

There is no one reading this who isn’t aware of the state of things since COVID-19 required remarkable changes be made in our lives. For churches, the obvious change has been that we have had to shut our doors. We believe this is a necessary action to keep our community safe – but it is also one of the most troubling things a church can do. Our work

is to serve the congregation, particularly in times of greatest need – like now. When the doors shut, there can be a feeling that we won’t achieve our purpose.

At Rock Springs Baptist Church we refused to let that feeling linger. Instead, we moved swiftly to action. We asked ourselves, critically, what could be done if we threw every bit of energy we had at the challenge ahead? The answer sat firmly in utilizing technology to continue our service.

Here is what our congregation has done with technology to continue worship services on a day-to-day basis.

## LIVE VIDEO SERVICES

We immediately moved from three streamed services to four services weekly. Currently we stream three times on Sunday – twice in the morning, and once in the evening – and now once on Wednesday.

In terms of content, our pastor treats the empty church as if it were a standard day for worship: we bring the full service – or as much as possible – to those watching from home. We ask folks to use their Bible at home and to sing along with us, wherever they may be.





To date, this appears to be working. Our viewer numbers have jumped from around 270 viewers to more than 1,400 viewers for a single service. (And if you feel that is a large jump, keep reading!)

Our digital workflow is uncomplicated and can be quickly replicated by any house of worship. We utilize Panasonic PTZ cameras and a combination of headset and handheld wireless microphones as the media capture. The signals from these devices are either NDI native or utilize an NDI converter to bring the signal direct to our live production system.

NDI is a key component to this workflow. It is a free-to-use network protocol that allows video signals to be sent over a network. This means no extra cabling – reducing complexity and cost – and allows for flexibility for where we place our cameras. Setting up an NDI workflow means simply plugging into the Ethernet cabling we already have installed in our facilities.

Finally, our live production system is a NewTek TriCaster TC1. NewTek is also the inventor of NDI, meaning everything works elegantly out of the box. We don't

complicate things more than they need to be – which has proven critical as we only have a small staff of four working during services – and do all live switching, production components, and graphics on the TC1. The TC1 is also the device that streams the production to viewers online. We are truly an example of using the “system in a box” solution.

## DAILY VIDEO

It is our belief that right now, four services are not enough to meet the needs of our church community. These times call for additional ways to connect with folks who may feel increasingly isolated or troubled about forces well outside of their control. Thus, we introduced a daily devotional at 11 a.m. each week day. The goal is to engage with our community and give folks a message of hope. The results

EMPTY CHURCH: PHOTOS OF THE CONGREGATION ADORN THE PEWS. STANDING: BIBLE STUDIES AND FELLOWSHIP HOURS ARE ALSO BEING BROADCAST FOR ALL TO ATTEND. SITTING: LIVE CHAT, EMAIL AND PHONE CALLS ALL WORK FOR PRAYER REQUESTS  
PHOTOS COURTESY OF ROCK SPRINGS BAPTIST CHURCH



have been spectacular.

Our first live devotional took place on a Monday morning. It was distributed via Facebook and our website and was made available as a recording after the live stream occurred. Within 24 hours we had reached just more than 6,500 views on the video. For context, our weekly combined attendance for all our services – including the babies – is about 2,200.

For this setup it is truly just two people in the room. The director and the member of the ministry team speaking. We use a single Panasonic PTZ camera and a NewTek TriCaster Mini. Again, it is a single cable running NDI over the network. The result is our message connecting with not just our congregation, but with folks who are seeking out some hope during this time.

The key here was to do it live each day. We believe this not only helps with the algorithms of social media, but also provides a true service or genuine connection to our community by utilizing

the direct immediate chat capabilities of the medium.

### ONLINE LEARNING

Our youth and college services have also moved online. There are a few print outs we provide in a digital library for the young kids – cut outs, coloring, activity sheets, and the like – but largely we are using video here as well.

Our youth and college worship spaces are equipped with TriCaster Minis and allow for streaming services as well. Again, the same workflow is used here, with one alteration.

We do some pre-recorded video, which we then edit in Final Cut, and integrate easily into the live feed. This isn't something that is necessary by any means, but it is another option for those seeking ideas during this time – and it is an option made possible in the workflow we use.

### ONLINE GIVING

We utilize the Online Giving application from Our Sunday Visitor Inc. to allow online tithing. We are blessed with a generous

congregation, and we have heard from them that they want to continue to give during these unusual times.

Not only does this allow us to provide our worship services, but also allows us to ramp up our community outreach. We are working to help provide meals to those in need during this time, and we view that as a critical component of our service.

### REMEMBER THE "LOW" TECH

In addition to live chat during these videos, we are utilizing email and phones to take live prayer requests during our services. It seems funny to think of this as a "low" tech solution, because it is so incredibly effective. We have six members of our ministry team working the phones during these times from their offices, and they can offer support, counseling or prayer during these calls. We also work to bring prayer requests onto the live stream.

We have also printed photographs of our

membership taken from our church directory and taped them to the pews so as to provide an audience in an otherwise empty room and make the teaching to faces as realistic as possible.

### REACT NOW

As I mentioned before, the technologies above can be purchased and received right now. You can have a system up and running in the coming weeks. In turn, you can provide services for as long as this atypical moment in human history continues.

Don't worry about the doors being closed. Don't worry about not having the setup required. And don't think you need to follow every step as outlined. Just commit to doing all you can to serve your congregation and community in a safe way throughout this crisis. **T**

**Jim Cawthon** is the Minister of Media at Rock Springs Baptist Church

PHOTO: THE MAIN CONTROL ROOM HANDLES THE LARGER SERVICES, WHILE MOBILE SYSTEMS ARE MOVED AROUND THE CHURCH CAMPUS FOR SMALLER PRODUCTIONS.

# How To Start Your Own TV Channel For Free

BY HOLLAND DAVIS



One of my favorite sayings is “If it’s FREE it’s for ME.” As a small church, one of my challenges is to offer the same quality of services that a big church can offer without a big church budget. This keeps me constantly seeking new technologies to do a better and more efficient job at a better price point. It also forces me to look at existing technologies and how I can maximize the use of something that was designed for one purpose and use it for other purposes. One such product is the Church Online Platform that is part of the Life.Church Open Network, a network of FREE resources offered by Craig Groeschel’s ministry. This is the same ministry that brings us the YouVersion Bible App, the Church Metrics App and the Bible App for Kids.

Initially, the Church Online Platform was designed to provide an interactive experience while people were watching a live worship service. One of the strengths of this platform is the ability to give access to volunteers to act as prayer counselors via chat. As people are watching a service they can interact, ask questions, respond to questions and bring a more robust experience to the viewer. You can also take notes and follow along with the YouVersion Bible App. Those who like to provide notes for messages can provide them as part of the Notes Section that is unique to each program. You can also customize links that point back to the church website. Our links include Calvary At Home (instructions for people

watching at home during the Corona Virus Pandemic), Calvary Kids at Home (Sunday School lessons for parents to do at home), Past Messages (message archives), Online Bulletin (subscription form for Mail Chimp) and social media links. We also have a customized link for giving that links back to the Planning Center Giving Module that we use.

However, during the Corona Virus Pandemic I decided that, since we are in a digital format, we shouldn’t have to be restricted by the physical limitations of being present for services. So, we added additional service times to our livestream, rebroadcasting the original live service throughout the day or week. For example, on Sunday, we broadcast our morning service every two hours and make up the difference with worship. We also re-broadcast our Midweek Study every morning at 8:00 am and evening at 7:00 pm, although we may be changing that to make room

**You might want to check out how these ministries are using the Church Online Platform.**  
**Harvest Christian Fellowship:**  
<https://bit.ly/3525yRI>  
**Life.Church:** <https://bit.ly/3bBuWjV>  
**To see what we are doing at Calvary Chapel San Clemente visit:**  
<http://tv.calvarysancllemente.org>

for additional studies we've launched during that time slot on other days. I also began to realize, since we can schedule programs... why not schedule previous message series, radio and television interviews, teaching series from respects teaches in our movement and Christian movies. The Church Online Platform will play the next program at the scheduled time automatically. This is when the idea of launching a television channel for our church became a reality and [tv.calvarysancllemente.org](http://tv.calvarysancllemente.org) was born.

## FIRST, YOU NEED CONTENT

You need to have video content online to link into the Church Online Platform. Our videos are on Vimeo and YouTube. If you're just starting out and don't have a lot of content, that's okay. The beauty of this platform is it can grow with your ministry so you can add content as your either upload existing content online or create new programs to broadcast.

**One of the strengths of this platform is the ability to give access to volunteers to act as prayer counselors via chat. As people are watching a service they can interact, ask questions, respond to questions and bring a more robust experience to the viewer.**

## SECOND, CREATE A SCHEDULE

Schedule programs by creating an event. When you create an event, you will be asked for a title, name of the speaker, a short description and the event duration. Once you create the event, you will have access to other tabs such as slides (which I'll explain in a moment), times (when the program will broadcast) and Videos (the actual links to the video you're scheduling). I first go to the video tab and copy the link from YouTube and copy it into the Main Event Video. Make sure you're in simulated streaming mode in order for the programs to play automatically. Otherwise, the program will have to be physically started in order to play. It gives you the option to at a Post-Event video embed code and we use that to embed a photo that shows a graphic letting people know the program has ended and where to go for more information. There is also an offline video embed code that lets you embed a playlist from YouTube to fill time once a program ends until the next program begins. This playlist will have to be started manually but will end automatically when the next program begins.

## THIRD, PLAN THOUGHTFULLY

Once you embed the video, schedule the day and time the program will air. This is where it's important to get out a spreadsheet and create a plan. Our schedule runs Sunday through Saturday from 12:00 am to 11:59 pm. Monday through Friday we offer primarily Bible Studies series. We run an archived "Through The Bible" series and an archived

Sunday Sermon series. Our current Sunday morning and midweek series are run multiple times throughout the week to give people a variety of times to catch up on services they've missed. We also run series from Pastor Chuck Smith (the founder of Calvary Chapel Ministries) and my Pastor David Rosales from Calvary Chapel of the Chino Valley. On the weekend we primarily focus on worship and Christian documentaries from the Calvary Chapel Movement. I look for worship sets or concerts that fit the time frame that I need to fill, and then add in radio and television interview programs that I've done over the years to fill in the gaps. I also "program" worship songs so they will play automatically if I want to create a seamless programming schedule. Because the purpose is to highlight the ministry of our local church, we primarily focus on worship songs and programs that originate from our church or from people who attend our church, like Live With Ryan Ries and The Sessions with Cynthia Garrett.

Another important feature is the slides feature. This allows you to program "advertisements" below the video that can link to various services. For instance, we have a slide that links to prayer and gives our audience a way to send their prayer requests to us. We have slides that link to giving. You can have slides that link to the gospel story or promote an event. You can also set times for each slide to play during the program and they will automatically change.

What about customization? Under the themes tab, you have the option to fully customize the look of the site. If you are knowledgeable with HTML code, you can program a totally customized look. If you're like me, the options provided are adequate enough to give the site your vibe. Under the settings tab you can customize social media links, set up google analytics or create a custom tab that will show up on the video play page. We use our custom tab to give options for families with kids.

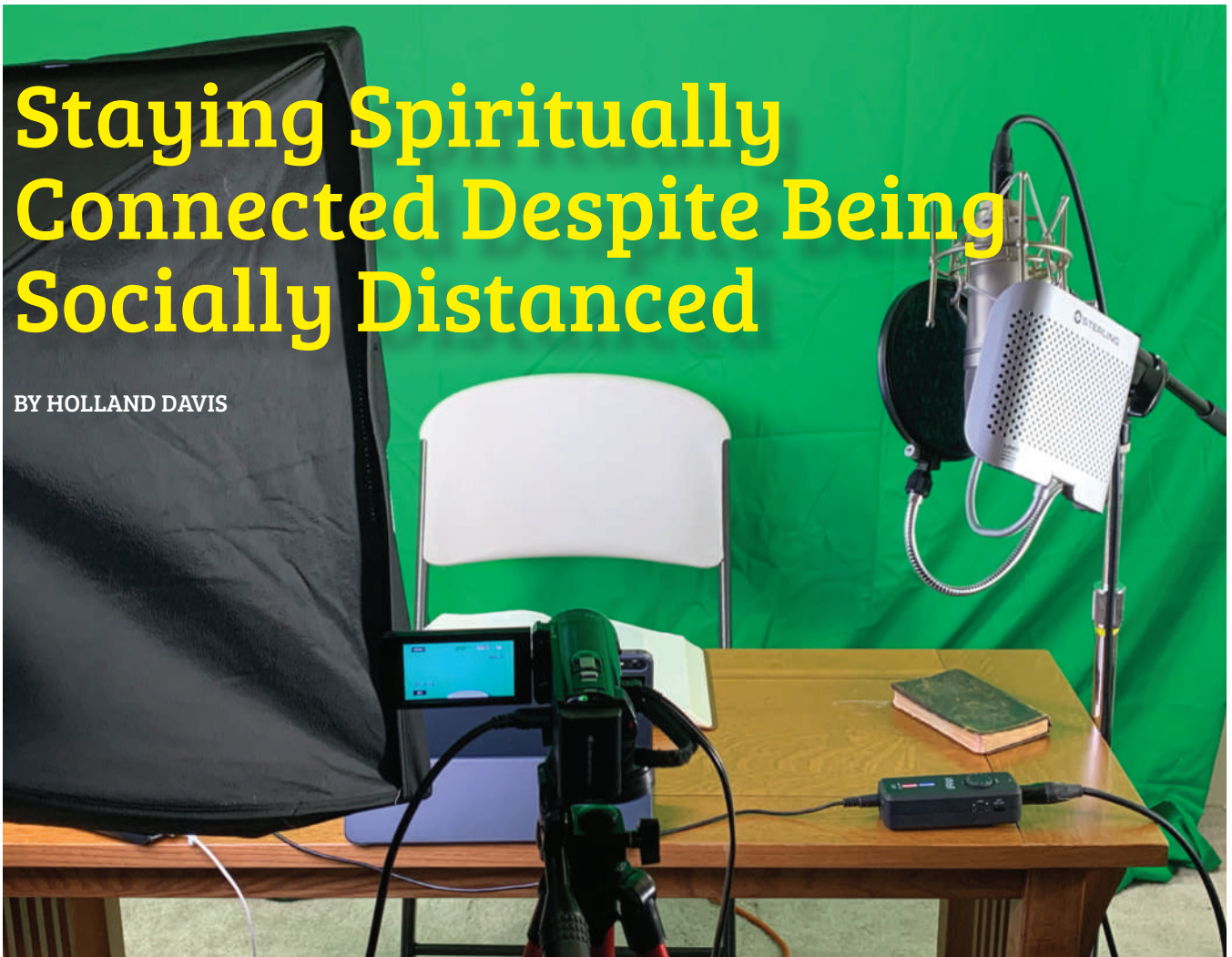
Does it work? YES! We've seen a definite increase in views since launching our "Television Channel." But best of all... it's completely FREE and the only limitation is your creativity. 📺

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**Holland Davis** is a teaching pastor, veteran worship leader, composer and author. He is the Senior Pastor of Calvary Chapel San Clemente and CEO of [worshipsong.com](http://worshipsong.com). You can follow him on twitter or Instagram @hollanddavis

# Staying Spiritually Connected Despite Being Socially Distanced

BY HOLLAND DAVIS



**T**he Corona Virus has changed the way we live, the way we work and the way we do church. Public assemblies are being ordered to cancel forcing churches to hold services with empty auditoriums or remote locations. The number one need has become understanding and implementing a way to broadcast services online quickly and cost effectively? Here is my solution.

## What do you need?

The simplest solution is a smart phone and a Facebook Account. It's a no brainer, no frills, easy way to start streaming your worship services; however, it's not the best for audio quality or video presentation. You can upgrade the audio quality by using the iRig PRO, which allows you to plug in a separate mic or take an audio feed from the sound board and plug directly into your iOS Device. This is how I began what I called my Daily Prayer LIVING STREAM (instead of LIVE STREAM). Because backgrounds can be distracting I shot it in front of a green screen, but I've seen many people shoot in front of their fireplace, in their

kitchen, outside... whatever communicates the feel you want for your service.

If you want to take it up a notch and do something with a little higher production value, I suggest an online solution called StreamYard. The beauty of StreamYard is it is easy to get it up and running in minutes. It will broadcast to YouTube and Facebook at the same time (with the purchase of their basic plan – broadcasting to YouTube only is no extra cost) and you can utilize the green screen capabilities to change your background. If you want to include your logo or block out their logo, you have to purchase an upgraded plan. In addition, you can create banners, have streaming text and use opening and closing videos. In my opinion, you will not find a better product for the value you get.

## What equipment do you need?

Let me layout the signal chain for you in sequential fashion. [PHOTO 2, NEXT PAGE – COMPLETE SET UP]

First, I have a very basic Sony Handycam. I take the video signal out via HDMI to a Magewell USB to HDMI Capture device directly into my computer.

Second, I use a very nice mic (Neumann U-87) but a Shure SM-58 is great too. Bono uses one in the studio. There are a variety of great Audio Digital Interfaces. My set-up consists of a Focusrite Scarlett 2i2, Steinberg UR 22 and a Presonus Audiobox USB. For my streaming set up I am using the iRig PRO direct to my laptop via USB. The iRig PRO is small but powerful and works with 48v mics. I use a Sterling Audio Vocal Shield and a basic pop shield. It's placed around two feet away from me.

Third, I have a basic plan with StreamYard. You have to set up the audio and video capture device. StreamYard easily recognizes the iRig PRO and the USB-HDMI Capture. You will need to

set the camera resolution to 720p in most cases. Currently StreamYard doesn't handle 1081i or p, but neither does Facebook. There too many features to mention here, but they are definitely worth checking out.

Fourth, I use a green screen. You can use whatever background you want, but I've found a green screen is great for places, like my office, where one doesn't have the luxury of cinematic locations. The only caution I have is you don't want it to look too cheesy and distract from your message. At this point StreamYard doesn't support moving backgrounds, but I've suggested it to them

Fifth, lighting. Lighting is important. I purchased some inexpensive lighting kits from Amazon. If you're using a green screen, the green screen needs to be well lit. If not, then all you need it a good light with a softbox for your face.

Using this simple set up can get you going for under \$ 1000.00 (iOS device and laptop not included). But once you have it, what do you do with it? Here are some suggestions:

1. Be Creative. Utilize the gifts and talents of those around you and get their ideas.

2. Don't just do a "normal" service. Simplify. Unless it's well mixed, music doesn't translate over the internet. Consider a shorter service with a more personally directed message. It's okay to be casual. People are not expecting a full production. However, if you are known for that, keep on keepin' on. This is a moment in time where multi-campus churches have a head start in this department.

3. Consider using ZOOM for small group discussion and prayer meetings. We are using ZOOM for our Women's Ministry and Men's Prayer.

4. Start a daily online program. You could do a daily prayer and devotion or a time of worship and prayer from



your office.

5. Pick one destination point for communication. We tell people to go to our website, where they can sign up for our online bulletin for regular updates or go to our "Calvary At Home" page for step by step instructions on how they can have a worship service at home. They can get information on downloading the Church Center App and get connected to the various events that are being live streamed by our church. They can get information on how they can continue to support the church during this crisis.

6. Communicate regularly. We are communicating daily in one way or another. We're not overwhelming people with a barrage of emails and invitations, but we are very focused on a daily means of communication that keeps us all connected.

7. Dress up for broadcast. Showing up in sweats and a t-shirt like you rolled out of bed is a no-no, and people will turn off your stream and potentially your church. It's doesn't have to be a fashion show but you want to put your best foot forward.

I hope this helps give some solutions to help you jump in and start your own LIVING STREAM to spread the Good News of Hope in Jesus to the world. I'd love to hear what you're doing. Email me at [holland@hollanddavis.com](mailto:holland@hollanddavis.com). 

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**Holland Davis** is a teaching pastor, veteran worship leader, composer and author. He is the Senior Pastor of Calvary Chapel San Clemente and CEO of [worshipsong.com](http://worshipsong.com). You can follow him on twitter or Instagram @hollanddavis

# LINCOLN BEREAN

## How a Megachurch Became a “Church in Your Pocket”

BY CHRIS FOREMAN

This is a story of a large and thriving church caught in a rapidly-growing, world-wide crisis that no one predicted and no one was truly prepared to meet. Like most churches, Berean has shut its doors temporarily and “the church”, as a congregation of people, is unable to worship in Berean’s auditorium. Yet, this seemingly dark story is actually a story of hope because Berean hasn’t just adapted to the crisis. They’ve put their talented team to work, using modern technology in creative ways to bring “a church dispersed,” as Senior Pastor Bryan Clark described it, back together for streaming worship that feels live while becoming the very personal experience that worship was meant to be. Berean has become a “church in your pocket.”

### Beyond the Cassette Ministry

Berean has been streaming its services since soon after its new auditorium was completed in 2007 but the roots of streaming can be traced back to what many churches called their “cassette ministry” where worship services were recorded on audio cassettes, CDs or video DVDs for those who were unable to attend in person. Berean continues to

offer these recordings in its publications center for those who may not have access to a computer and for its prison ministry.

Streaming brings modern technology to this practice. But streaming is more than just a new version of the cassette ministry because it allows people to participate in a church’s worship service in real time. Streaming may even be interactive with chat windows imparting a sense of worshiping with your congregation, no matter where you may be.

### Bringing a Church Dispersed Together for Worship

The weekend of March 15, 2020 was the first where, because of the crisis, Berean would hold its worship services exclusively via streaming. The church’s leadership and tech team discussed how best to meet this challenge during several planning meetings.

For this first streaming-only service, Berean continued to operate as if the auditorium was occupied. The team used the church’s broadcast video cameras, located near the back of

the auditorium and some team members and their families filled the seats nearest the stage to give the worship team and the pastor the feel of a church full of people. This plan worked well as a starting point.

For the following weekend, the team dismissed the small audience. The resulting empty auditorium offered opportunities to enhance the streaming service. Because there was no concern about sightlines, the tech team stopped using the large broadcast cameras in the rear of the auditorium and set up smaller digital SLR cameras on the lip of the stage. The result was much like a television broadcast studio with no live audience. Also, Technical Director Tim Watson placed the church's theatrical fog machine in an aisle near the stage. "It diffuses the light and adds a glow that makes your light pop a little bit more," he said. Together, these changes brought the viewer closer to the worship team, softened the lighting and allowed additional camera angles during post-production.



## Berean's Easter 2020 Streaming Worship

Berean had begun planning Easter well before the crisis and its theme, "This Changes Everything" suddenly had new meaning. Jon Sauer, Berean's Interim Director of Worship Arts and Technical Director says, "We had to find a way to connect with people where they were, in their living rooms. And, since we were in our living rooms too, these became our studios."

On the theme of "the studio is wherever we are," members of the worship team recorded songs in their homes accompanied by family members. For the Easter message, Directional Pastor Josh Luse spoke from his living room and offered prayers surrounded by his family.

Worship music was recorded on team members' phones by family members. Some used separate microphones and an audio interface to their phones. Pastor Josh's prayer and Easter message (sermon) were also recorded using a phone. Bill Gripenstroh, Berean's Video Production Director, commented, "I think small churches may be more equipped than they realize. Even if you don't have lots of fancy toys, you still probably have a tool in your pocket that can do the job of reaching your congregation."

You can view two of Berean's Easter worship team songs on Vimeo here:

"Glorious Day" by the Olesen Family: <https://vimeo.com/406375191>

"Living Hope" by the Roesch Family: <https://vimeo.com/407350533>

Although simple in concept, these home studio segments blended well into an uplifting worship service that delivered the message, "This Changes Everything" at just the right moment. You can view the entire Berean Easter service, including Pastor Josh's message, on the church's website [www.lincolnberean.org](http://www.lincolnberean.org), its Facebook or YouTube page or on Vimeo here:

Berean 2020 Easter Service: <https://vimeo.com/406042820>

Virtual Choir Easter Finale

## Berean Church Gear List

### VIDEO RECORDING GEAR

Panasonic AG-HPX370 P2 HD Camcorder  
 2 Canon EOS 5D Mark IV DSLR Camera  
 Canon EOS C200 Cinema Camera (EF-Mount)  
 Canon EOS R Mirrorless Digital Camera  
 Canon EF 70-200mm f/2.8L IS III USM Lens  
 Canon EF 85mm f/1.2L II USM Lens  
 Two Quasar Science X-Crossfade Linear LED Lamps  
 Atomos SUMO19 Monitor / Recorder  
 EyeDirect® 4 Main Camera  
 Edelkrone SliderPLUS with HeadPLUS module for moving wide shot

### FINAL VIDEO & STREAMING PRODUCTION GEAR

Adobe Premiere and Adobe After Effects  
 A PC that has enough power to run that software  
 Card reader for the footage  
 External hard drive to back up footage  
 VPN network access for smaller file transfer

### AUDIO GEAR

Allen & Heath dLive S7000 console with MADI card (normally used for FOH)  
 Mac mini-computer with Reaper DAW software for tracking  
 Shure SM7B vocal mics  
 Radial Direct Boxes  
 Shure Axient Wireless Packs  
 Sennheiser MKE2 Gold Lavalier Mics for pastors/speakers  
 Pro Tools 11  
 PreSonus Studio 24c audio interface  
 Focal Twin 6 Monitors  
 Various Waves and Izotope audio plugins  
 Allen & Heath dLive s7000 with DM64 MixRack for in-ear monitors  
 Shure PSM900 wireless in-ear receivers  
 Alclair Custom IEMs

### LIGHTING

ETC Source Four and Altman Shakespeare  
 ETC Sensor SR48+ Dimmers for conventional control  
 Chauvet Lighting SlimPar PRO RGBA  
 Chauvet Lighting COLORdash Par Quad 7  
 Chauvet Lighting COLORdash Batten Quad 6  
 Chauvet Lighting COLORado 1 IP  
 Chauvet Lighting Rogue R2 Spots  
 Martin Mac 101 RGB  
 ReelEFX DF-50 Hazer  
 Obsidian Control Systems ONYX NX4

*\*The LED strip lighting used as a set for the current services was custom made at Berean with generic RGB LED tape lighting and s ONYX NX4 from Elation*





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large video screens, theatrical lighting and a tech booth in the center of the auditorium.

It's important to note that, while most churches now utilize technology in their worship services, technology has always been in a supporting role. It enables the worship while remaining in a "back stage" position.

Now, during the crisis, technology has been thrust up onto the stage. Yet, Berean Storyteller Dan Roesch emphasized, "This isn't Netflix." And Berean's experience during the crisis shows that new technology can continue in its supporting role while bringing a dispersed congregation back together for worship, inspiring creativity for holiday celebrations and adding fun to youth services.

This forecasts a bright future where church auditoriums are once again full of people worshipping together yet those who may be away on business or vacation or may be sick or caring for others can worship remotely while, more than ever, truly being part of the church and its worship service. No matter where you are, you can carry the church in your pocket. **T**

The final music for Berean's Easter service was a virtual choir presentation of "In Christ Alone," by Keith Getty and Stuart Townend. Beginning with a single member of the worship team on her piano, the song builds to a powerful finale featuring dozens of Berean choir members singing from their homes. Choir members recorded their voices on a phone while listening to a master recording (note ear buds in the video link). Then, Gripenstroh and Berean Storyteller Dan Roesch sync'd the recordings into a final video with help from "Shooter Pluraleyes" software from Red Giant.

You can view this virtual choir presentation on Vimeo here: ***Berean 2020 Easter Virtual Choir Finale: <https://vimeo.com/406861572>***

After Easter, Berean moved back into its auditorium to take advantage of the audio, video and lighting systems located there.

### **Youth Ministry and Streaming**

A separate building on the Berean campus houses the church's active youth program which has been streaming for several years. The youth ministry uses a small studio in its building to stream its weekly live service which includes games, contests and honest discussions about youth issues from a biblical perspective.

You can view a recent Berean Youth service here: ***<https://www.youtube.com/watch?v=9DnRM7PeEBY>***

### **How Berean's Experience Forecasts the Future of Technology in Worship**

Bill Gripenstroh remarked, "I think the gospel never changes but the tools to tell it are always changing." Those changes having witnessed the progression from a time when visible microphones were not allowed to today's churches with

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**Chris Foreman** is a Partner at SpeakAV, a content marketing and consulting group. Foreman has held engineering, marketing and management positions at several pro audio companies and is widely published. He co-authored "Audio Engineering for Sound Reinforcement" with consultant John Eargle.

# About Lincoln Berean



**L**ocated in Nebraska's capital city, Lincoln Berean Church moved into its new 2500-seat auditorium in 2007 and celebrated its 50th anniversary in 2012. The church hosts three worship services, a Spanish-language "Iglesia Berea" service, bible studies and other programs each week and numerous special events during the year. A separate Youth Complex hosts worship services and events for Berean's active youth ministry. [www.lincolnberean.org](http://www.lincolnberean.org)

Berean's auditorium includes a modern audio system, broadcast-grade video and projection system and a large stage with theatrical lighting (see gear list). And, while primarily designed for live worship, these systems also supply multi-track audio and professional video for recording and streaming.

## Streaming Equipment and Services

Berean uses "Living as One" and "ChurchStreaming.tv" online services to distribute the church's streaming worship to the Berean website and its Facebook and YouTube accounts. Technical Director Tim Watson recommends the latter service for smaller churches.

In the studio used for its Youth Center services, Berean uses Blackmagic's "Web Presenter" which takes any HDMI or SDI source and makes it look like a USB webcam. This,

along with a pair of video cameras, an HDMI switcher and a laptop make an effective, low-cost streaming platform that could also work for smaller churches.

## Post-Easter Equipment and Setup

For its live services, Berean uses Panasonic AG-HPX370 cameras with Cannon lenses located in the rear of the auditorium. These were used for the first streaming-only service as well. After that, digital SLRs (see gear list) were placed on stage in a style reminiscent of a TV production. Because they're in stationary positions, worship team members can use wired microphones but continue to use their wireless in-ear monitor system.

To support the worship team, a computer with Pro Presenter feeds confidence monitors and an Allen & Heath dLive S7000 mixes in-ear feeds at stage right.

Dan Roesch added an EyeDirect device to help Berean pastors present to the camera in an empty auditorium. [www.eyedirect.tv](http://www.eyedirect.tv)

## Lighting Equipment

Berean has a theatrical lighting system for its live worship services, concerts and special events (see gear list). During the crisis, the church uses on-stage near-field lighting that

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offers uniform lighting of the worship team and the pastor. Tim Watson added a ReelEFX DF-50 Hazer theatrical fog machine. “It diffuses the light and adds a glow that makes your light pop a little bit more,” he said.

### Audio Equipment

Berean uses multiple Shure Axiem wireless microphones with KSM9 capsules for its live services. During the crisis, since worship team members were in fixed positions on the stage, Jon Sauer used a mix of SM7B and other wired microphones. The worship team continued to use its Shure in-ear monitors. Senior Pastor Bryan Clark used a Sennheiser E12 lavalier microphone.

Audio from the stage feeds an Allen & Heath dLive S7000 with DM64 MixRack. The MixRack feeds another dLive S7000 at the church’s FOH tech booth to mix live services. For streaming-only services, Sauer recorded microphones and other audio feeds from this system into a Mac Mini computer equipped with Reaper DAW software. Later, he mixed to stereo on a computer equipped with Pro Tools software using Waves plugins for compression, EQ, level and a touch of reverb. When recording audio from a worship leader’s home on their phones, Sauer asked them to turn off any reverb or other effects.

For the Easter service virtual choir finale, Sauer sent each choir member an audio file with a click track. The choir members sang while listening to this file, recorded with their phones and uploaded their recordings to a cloud folder. Griepenstroh and Roesch added each of these stems to the mix with help from Shooter Pluraleyes synchronizing software.

### Berean Youth Studio

A separate building on the Berean campus houses the church’s active youth program. The youth ministry uses this studio to record its weekly service. The equipment setup in this smaller studio, based around laptop PCs, simple cameras, an older audio mixer and basic microphones is much like smaller churches might use to stream their worship services. **T**

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# Artiste Picasso™ from Elation Professional

BY BOBBY TAYLOR

Olive Baptist Church has been serving the Pensacola, FL area for 126 years, growing from an original group of 12 people to a thriving worship community with an average attendance of over 3,300. With a goal of leading people to encounter the greatness and presence of the Creator, the worship experience at Olive Baptist is designed to leave people wanting more and moving them into a deeper relationship with God.

Every aspect of the technology used at Olive Baptist plays an important role in building the overall experience, and a recent LED lighting rig upgrade was meticulously planned to augment the majesty of the message. While the entire lighting rig was designed to augment every aspect of worship, the addition of four Artiste Picasso's from Elation Lighting has been a revelation for our church.

When we first started looking at what we wanted our new lighting rig to do, we quickly decided that Elation fixtures were our best choice. We also wanted to add high-energy movers with great built-in effects that would be bright enough to transform our stage and create evocative atmospheres that would impact the environment we wanted to create each week. These fixtures would need to be very

bright, very quiet and extremely versatile – and we quickly settled on the Artiste Picassos to meet these requirements.

We hung our four Artiste Picassos on a 60' truss over the auditorium and use the fixtures' framing shutters to cut along the wall edges to keep the lighting crisply focused on the stage, without any peripheral bleed off the edges. I often use two of the Picassos to build saturated wall color, with the fixtures' built-in gobos creating unique atmospheres on the walls and stage floor. The other two Picasso's are typically used for spots, creating very crisp, narrow beams or wider, softer beams, as needed.

The Picassos are incredibly bright, which allows me to zoom out and cover a large area, while still having brightness left, allowing me to use the residual light like a flood even when I am using it as a spot. The fixture maintains its brightness even when zoomed out to its full 55 degrees.

When using the fixtures for spots, I typically highlight specific elements of the stage. For example, I can highlight the pianist or the harpist before quickly switching to an acoustic guitar or to showcase a vocalist. The speed and reaction time of the Artiste Picassos allow me to change up the lighting on the fly; adding movement and colors to feature other elements of the stage. They are also super quiet,


so don't make a lot of noise which would distract during worship.

We also have four Artiste DaVinci fixtures – the 'little brother' of the Picassos – which we use for accent lighting, to fan out and cut through the haze, and for beam effects. Both these fixtures play very well with the rest of our Elation rig, easily syncing color temperature and color matching for a fully cohesive lighting design.

When designing our rig, I also needed to make sure any fixture we added would look good on broadcast, providing flicker-free light that would easily meet the job required. For example, when we want a wall of color, that wall needs to be consistent and without shadow or hot spots, while also providing deep, saturated or pastel colors and bright whites that translate well to the video screen. The Picassos ably exceed our expectations in this regard. We also wanted to make sure we had fixtures that could provide smooth, stutter-free dimming, allowing us to flow from 100% brightness to 10% brightness, for example, without giving the audience visual whiplash.

Instead of using DMX, our entire rig is run via sACN (streaming Architecture for Control Networks). sACN basically allows for ethernet control of the fixture with two-way communication between the control board and the fixture. Having an sACN network established allows me to monitor all our fixtures in real time via a computer language; the fixtures can tell me if there's a problem, when it's completed a task, etc. I would recommend for any house of worship just building a facility or looking to replace their lighting system that they implement an sACN infrastructure; in my opinion, this is the future of lighting. Churches can implement a hybrid of DMX/streamingACN and slowly convert to the streamingACN – the platform is very stable.

Our Artiste Picassos have become an integral part to the worship experience at Olive Baptist Church.

Bobby Taylor Director of Communications Olive Baptist Church, Pensacola, FL 

**Bobby** has over 25 years of experience as a leader in the AVL industry while helping churches around the country.

### Just the Facts: Artiste Picasso™

620W 6,800K Cool White LED engine

advanced optics with over 23,000 total lumen output

7° to 55° zoom

full CMY color mixing system

linear CTO color correction

6 dichroic colors including a high 87 CRI filter

7 rotating/indexing glass

7 static-stamped metal interchangeable gobos

4 rotating full blackout framing blades with +/- 45° individual blade rotation

full 360° bi-directional animation wheel

4-facet and linear rotating prisms

2 frost filters

motorized iris with variable pulse effects

motorized focus and auto-focus feature

16-bit pan, tilt, and dimming control with variable dimming curve modes

high speed electronic shutter and strobe

adjustable LED refresh rate and gamma brightness for flicker free operation

## BOBBY'S REPORT

FLEXIBILITY



EASE-OF-USE



RELIABILITY



VERSATILITY



OVERALL VALUE



# The Maxell WU5603 3LCD WUXGA Laser Projector

By Camron Ware

I've been doing projection mapping for churches and events for almost 15 years now, and when a new projector comes out from one of my favorite manufacturers, I can't wait to give it a test-drive.

We use this projector in our rental inventory when we need a smaller, light-weight projector to hang on a theatrical set piece for projection mapping, but still need all the features of a higher end model.

The Maxell WU5603 is a great work-horse projector that would serve many churches for their main worship space projectors, portable churches, churches who can't access their projectors easily, and travelling ministries that need to carry a projector from venue to venue.

This model has a 1.7x zoom lens, 1.4 - 2.4 throw ratio. This means if you have a 12-foot-wide screen (16:9 aspect ratio), the projector can be placed between 16' 10" and 28' 10" away from the screen. That's a great throw range and should work for most standard-throw projector mounting locations.

Of course, you can ceiling mount it and invert

the image within the projector, and using Maxell's PerfectFit2 feature, you can corner-pin (or 4-way keystone) the image to fit your screen perfectly if the projector is not shooting perpendicular to your screen.

There is a horizontal and vertical lens shift knob on the projector as well, but they are not motorized. You'll have to turn them by hand, but once they are set, they are set.

At 6000 ANSI lumens of brightness, it will look great in worship spaces with even some light from windows. I have used it on a 20-foot-wide screen, and it looks great, but remember that your stage lighting and

ambient lighting plays a huge factor in how this or any projector will look. (That's why if you are looking to replace projectors, I always recommend getting someone to do a live demo in YOUR worship space first)

This has a 1,500,000:1 dynamic contrast ratio High Dynamic Contrast Range (HDCR2) setting which gives better shadow detail and color saturation to keep images from being washed out in bright ambient light.

The color engine uses 3 LCD panels to create rich colors, no 'rainbow' effects, and delivers the same white brightness AND color brightness lumen rating.

This is the something I am very strict on when

using projectors: I don't like single-chip DLP projectors. They cannot reproduce the same color accuracy as 3-LCD (or 3-DLP) projectors.

When looking at a spec sheet for a projector, the lumen rating can be misleading. A 3-LCD or 3-DLP projector will have the same number of lumens in both white AND color tests. A 1-DLP projector might list "5000 lumens", but when showing colors, that rating drops significantly because single-chip DLP cannot reproduce as much brightness in colors. A good resource to learn more about this is found at [www.colorlightoutput.com](http://www.colorlightoutput.com)

The 1920x1200 resolution







means that it has plenty of pixel density to give you high-definition images from a computer, or live video feeds. The projector is native 16:10 aspect ratio (computer-sized aspect ratio) but will accept and display 1920x1080 (video/camera/media aspect ratio) just beautifully.

Of course, the best feature about this projector is that it has a laser-phosphor light source. This means you do NOT have to change any lamps! It's perfect for churches who have hard-to-access projector locations, or if you have the headaches of people accidentally leaving the projector on. (That never happens...right?)

However, a laser-

source projector does NOT mean the image quality is inherently better, it simply means almost no maintenance and a consistent image over the years. The laser-source is rated at 20,000 hours in full-brightness mode, which, if you used the projector for only 10 hours a week, the light source will last decades.

With a laser-source, this also means that the projector turns on within about 10-15 seconds from when you push the power button. No more waiting for a few minutes to see an image on your screen, so this is a great feature for portable churches.

That, coupled with the size, durability, and flexibility

of this unit, and I would highly recommend it to portable churches that need to setup and tear-down their worship experience quickly.

The other helpful maintenance topic is the filter rated at up to 20,000 hours, so yet again another perfect solution for churches who have hard-to-reach projectors.

Lastly, Maxell has a great 5-year/20,000-hour limited warranty on this projector, and I'll say that it gives me great peace-of-mind to know that if something happens, I can ship it out without hassles.

I really love this projector. It's just a solid workhorse

with enough features to cover most small to midsized churches, portable churches, and those that need a portable projector for travelling ministries. If you need help finding a trusted source for this or any other projector, feel free to contact me. [✉](mailto:camron@lightwarelabs.com)

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**Camron Ware** is owner/operator of *Visual Worshiper and Lightware Labs* which brings projection mapping experiences to churches and events all over the country. [VisualWorshiper.com](http://VisualWorshiper.com) / [Lightwarelabs.com](http://Lightwarelabs.com)

## CAMRON'S REPORT

**FLEXIBILITY**



**RELIABILITY**



**EASE OF USE**



**COST**



**OVERALL VALUE**



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## Case Studies from CFX

As we move closer to its inaugural show, CFX will be offering case studies and white papers showcasing what your peers are doing to grow their churches. These case studies will focus on tips and best practices for you to take away and instill at your church. Below, we are excited to share the first two of many!

### LED Video Wall Design, A Viable Option for Your Church?

By Doug Hood

With more options than ever before, it's more cost effective now for more churches to look at LED as a viable option.

If the culture of your church uses house lights on full, or if you have gorgeous large windows that pour in the natural light powered by the blazing sun, LED is for you.

With an LED wall, since there is no light source out front, you can position people wherever you need them, without any concern over creating shadows.

*Read the rest: <https://churchfacilitiesexpo.com/LED-video-wall-design/>*

### Virtually Engaging Your Church Community, Techniques for High Value Digital Connections

By Alison Istnick

While we witness our government, businesses, family members and friends struggle to effectively function in our new version of normal, the local church has found itself in a unique position to minister during this chaos. Being forced to shift standard ministry paradigms, they are operating in uncharted waters, an experience both exhilarating and unnerving for ministry leadership. What many are discovering, is that while people are in isolation, the church's impact has become significantly larger. Houses of worship, whether new to streaming or not, are reaching new audiences well beyond brick and mortar confines, and are finding that the world, along with their local community, is watching.

*Read the rest: <https://churchfacilitiesexpo.com/virtually-engaging/>*

# PRODUCT SHOWCASE



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Focus Spot 5Z LED-powered moving head spot luminaire  
[www.adj.com](http://www.adj.com)

## 2/ BenQ

LH710 Laser Projector  
[www.benq.com](http://www.benq.com)

## 3/ Canon

CJ18ex7.6B KASE S UHDgc Portable Zoom Lens  
[www.usa.canon.com](http://www.usa.canon.com)

## 4/ Extron

TLP Pro 300M 3.5" portrait wall mount TouchLink Pro Touchpanel  
<https://extron.com>

## 5/ Lectrosonics

DPR Digital Plug-on Transmitter  
[www.lectrosonics.com](http://www.lectrosonics.com)

## 6/ Magmatic Atmospheric Effects

Prisma™ UV LED lighting series  
[www.elationlighting.com](http://www.elationlighting.com)

## 7/ Radial Engineering

HDI Direct Box  
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