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Allen & Heath Empowers a Larger Vision at Calvary Chapel

Reviews:

NDI – The Great Enabler
for Live Video Production

Out of the Box:

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Pro Convert H.26x to HDMI
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EDITORIAL NOTE

Welcome to our April issue, all you cool cats and kittens...

let's grab this tiger by the tail (as it were) and begin!

Like many of you, we fine folks at Technologies for Worship Magazine are all socially distancing, while still working hard to put together an exciting, informative and educational magazine for your consumption. Starting with this issue, we are switching the magazine to an all-digital format for the duration of this pandemic to ensure all our readers are receiving the magazine in a timely fashion straight to their inbox, instead of their church where some might not have access to their mail for a while, depending on where they live. Getting the magazine digitally will also ensure your safety, as germs cannot be transmitted over the internet but can be delivered to you on paper products. As an added bonus, any supply chain issues are eliminated!

One of the big things you will notice with this issue is the amount of editorial pages and extra video we've added to help keep you and your tech teams in the know, including articles on a recent Technology Overhaul at NOW Church in Ocala, FL, a Case Study from Shepherd of the Hills and their use of SeeSharp Visual E-Posters during worship, how to safely and properly disinfect your equipment, Color Mixing vs Color Subtracting, an overview of How Direct Boxes can Benefit Worship Environments, and so much more.

We've also been working diligently creating a repository of Continuing



MICHELLE MAKARIAK

Education opportunities on our website at www.tfwm.com/continuing-education, including webinars, online video and training articles to help hone your tech talents and learn more

about a variety of different options you can do to maximize the worship experience immediately via streaming, and in the long term when everything gets back to normal. We are also sharing all these links as we receive them on our Twitter page at <http://twitter.com/tfwm> and our Facebook page at www.facebook.com/technologiesforworshipmagazine

Further to that, we are thrilled to share with all of you our first Special Edition Streaming Guide, available for free at <http://online.tfwm.com/?issueID=45&pageID=1>. This guide shares ideas other churches have incorporated to help stay spiritually connected with their worship community, discusses how to navigate worship during a quarantine, and takes a closer look at products that could be beneficial to your streaming endeavors, so check it out and feel free to share it with anyone you think might find it interesting!

If there is anything we can do to help, please don't hesitate to reach out via Skype (michelle.makariak), phone/text 705-500-4978 or email me at mm@tfwm.com. I am always up for conversation and more than happy to try to connect you with anyone you might need as you navigate our current "new normal".

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

Michelle Makariak

TECHNOLOGIES FOR WORSHIP

PUBLISHER
Darryl Kirkland
Tel: (905) 690-4709

EDITOR
Michelle Makariak
Tel: (705) 500-4978

Art Direction & Design
Kim Hunt
kim@tfwm.com

Sales Director
Jean Anderson
Tel: (770) 434-5330

Technologies For Worship Magazine (TFWM), a division of INSPIRATION Technology Conferences, Inc., is published and printed in Canada. TFWM, 103 Niska Dr., Waterdown ON LOR 2H3. Tel: (905)690-4709 or Fax: (905)473-9928. Unsolicited articles, photographs and artwork submitted are welcome but TFWM cannot accept responsibility for their return. Contents of this publication may not be reproduced or quoted in whole or in part, by mimeograph or any other means whatsoever without the express written consent of TFWM. Although every precaution is taken to ensure accuracy, TFWM or any of its affiliates, cannot assume responsibility for the content, errors, omissions or opinions expressed in the articles or advertisements and TFWM and its affiliates hereby disclaim any liability to any party for any damages whatsoever. Canadian publication mail sales, publication agreement No. 40841587. Canadian Publication:

permit pending ISSN 1498-3184.
Return undeliverable Canadian addresses to:
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Publication Agreement #40841587

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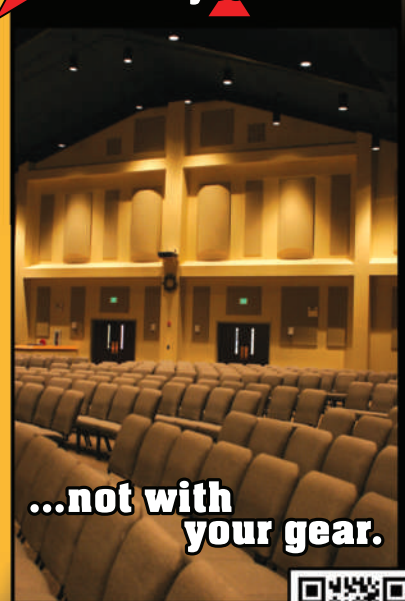


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MITCHELL HO

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The Point Source Audio Family Continues to Grow

Three new hires have helped to expand Point Source Audio’s education and customer service teams

The dedicated team at Point Source Audio has grown once again with three new additions across the education and customer service teams. Joe Cota has joined the manufacturer as Customer Education Specialist while Justin Hall becomes Key Account Manager and Mitchell Ho is named as Account Manager, Western US.

On top of a warm hug for everyone he meets, Cota brings with him a background as a worship pastor and vocalist. “I’m a professional singer and musician by trade so I can relate to many of the challenges our customers face out in the field,” he explains. “I really enjoy the education component of what I do and the ability I have to help customers solve their audio challenges.”

Self-confessed foodie Hall is a seasoned account manager with a real passion for growth. “I have serviced customers, managed projects, and dealt with international distributors for a great deal of my career,” he reflects. “I enjoy helping people, so the best thing

about dealing with my customers here is that I get to provide a solution to a problem they may be experiencing or help them with their needs.”

Ho is a self-described sponge for knowledge, immersing himself in everything from sports to cooking and music. While this is Ho’s first step into the business out from minor league baseball, he has been around professional audio his entire life. “I have grown up around Point Source and have seen the work and effort that it takes to make the reputation it has today,” he explains. “I want to continue building that reputation with every customer I meet by always putting the customers’ needs first.”

“We are delighted to welcome all three of these highly talented individuals into our Point Source Audio family,” adds James Lamb, President at Point Source Audio. “When we hire, we look less for their direct industry experience and more to see if they have the right personality to fit with our company’s customer-centric focus. Joe, Justin and Mitchell all have this in abundance and will be a real asset to our customers as well as the company.” **T**

Just Add Power Honored With 2020 TNT Award, Two Residential Systems Stellar Service Awards
Just Add Power, a leader in video-over-IP distribution, announced that the company’s VBIS-HDIP-707WP2 third-generation (3G) thin two-gang HDMI wall plate transmitter was honored with a 2020 Top New Technology (TNT) Award at ISE 2020. In addition, the company has been recognized with 2020 Residential Systems Stellar Service Awards in the Training Programs and Warranty/Return Policy/Tech Support categories.

The annual TNT Awards recognize the best in commercial and residential equipment exhibited at ISE. This year, Just Add Power’s VBIS-HDIP-707WP2 — which allows users to easily incorporate laptops and other HDMI devices as sources for their Ultra HD over IP systems — took home the prize in the Commercial Coax Video Distribution category. With a depth of only 1.5 inches, the new wall plate is ideal for the thin walls common in international installations, while providing integrators with the flexibility of table or podium mounting. In addition, the device features a field-serviceable modular design, making it easy to service with a screwdriver in the event of damage.

The Residential Systems Stellar Service Awards shine a spotlight on manufacturer and dealer programs that help customers enhance their businesses, train their employees, and save money. In the Training Programs category, Just Add Power was named a Gold Winner for its Training Days Program. Providing a relaxed, bespoke, and integrator-centered experience, the three-day training sessions cover the entire chain of use, including product tutorials, system design, installation scenarios, and troubleshooting. In the Warranty/Return Policy/Tech Support category, Just Add Power was named a Platinum Winner due to its service and support programs, including its five-year warranty for all HDMI over IP transmitters and receivers in the company’s 2GΩ/3G and 3G families, and a renowned tech support team capable of guiding installers through projects of any complexity. **T**



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Allen & Heath Empowers a Larger Vision at Calvary Chapel

Like many houses of worship, the Calvary Chapel didn't start out as a large congregation, it worked its way into becoming one. Having revitalized a site that was once a shopping center, today the church has seating for 1400 in its main sanctuary, a 600-capacity fellowship hall, and a vibrant youth ministry. Allen & Heath components including a dLive C3500, multiple SQ-5, and ME-1 mixing systems spread out across the entire campus, fulfilling the needs of audio events large and small. "By design, Allen & Heath mixing systems are truly multifaceted within this application," explains Bart Cardea of Providential Integration Concepts, the Chesapeake, Virginia-based firm tasked with developing the church's audio blueprint. "Throughout the construction phases of its campus, the

church held to a conviction that high-quality audio was something that should serve every worship space, not just the main sanctuary. When it came to the controlling end of that equation, high channel count flexibility was a very real necessity, not just an abstract concept." With installation of the Providential Integration Concepts design managed by Matt Stairs of Sunset Sound of Virginia Beach, audio signals route via Dante throughout the plan. The church's dLive C3500 control surface stands at front of house in the sanctuary, joined by a DM64 MixRack at the stage, which often hosts major faith-based musicians from around the country. The first of three SQ-5 mixers on-campus handles the sanctuary monitor mix, while the second and third are respectively deployed in the fellowship hall and youth room. A

total of eight ME-1 personal mixers reside on the sanctuary stage, used for both regular services and visiting performers. "If anything," says Calvary Chapel technical director Tony Lewis, "Allen & Heath has allowed us to expand at our own pace, growing into a future where we always can accommodate a larger sonic vision. From the speed of our workflow to our ability to configure these systems in a fashion that suits the working style of any of our own staff members and visiting engineers, there isn't seemingly anything within our audio chain that hasn't improved. We have pristine 96kHz performance. Countless compliments come our way from guest artists and engineers on the lack of coloration, and how easy it is to dial-in their sound to levels they usually only obtain in a studio setting." **T**

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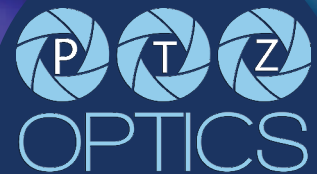
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THE WORLD'S LARGEST GOSPEL CONCERT PLACES FAITH IN OUTLINE FOR THE SEVENTH CONSECUTIVE YEAR

Several hundreds of thousands of people from all over the globe attended the fourteenth edition of The Experience annual interdenominational gospel concert held in Lagos, Nigeria, convened and hosted by the Senior Pastor of The House on The Rock, Paul Adefarasin, confirming the unique event's stellar reputation as the largest gospel concert staged in Africa and probably the world.

Since its first edition in 2006, The Experience has been nominated for several awards, and the latest was no exception, as it was nominated "Corporate Event of The Year" by Most Influential People of African Descent [MIPAD] and received The Event of Excellence Award by African Gospel Music and Media Awards (AGMMA) among others.

Staged on Friday, 6th December, 2019, from 7pm till dawn at the Tafawa Balewa Square, Onikan, Lagos. The event featured, as always, a stellar cast of top artistes, including Travis Greene, Sinach, Nathaniel Bassey, Don Moen, Donnie McClurkin, Tope Alabi, Planetshakers, Chioma Jesus, Eben,

Onos and Sammie Okposo, as well as several newcomers to The Experience stage, such as Todd Dulaney, Mercy Chinwo and Preye Odede.

For the seventh consecutive year, Lagos-based CyTech World Communication provided the huge Outline audio system that had the responsibility of delivering the message communicated by speech and music to the huge crowd.

A longstanding Outline client, CyTech's owner and MD Cyril Utomoibor deployed numerous Outline products from his large stock, including GTO, C-12 and Butterfly line array systems, LAB 21 infra-sub, DBS 18-2 and Subtech 218 sub-bass enclosures, DVS and Doppia point-source systems and H.A.R.D. 212 wedge monitors. Outline's Newton 16+8 FPGA processor was also deployed.

Rightly proud as a Nigerian of the project, Utomoibor stresses the event's huge importance, enthusing, "Outline's loudspeakers definitely outperformed all the others used at previous editions and being confirmed for the seventh consecutive year proves that we've done a great job in the past!"

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Magewell's Pro Convert H.26x to HDMI




Magewell's new Pro Convert H.26x to HDMI seamlessly brings together the worlds of IP-based streaming and baseband AV presentation equipment. This multi-protocol, SRT-compatible streaming media decodes a standard H.264 (AVC) or H.265 (HEVC) compressed video stream into a high-quality HDMI output for connection to baseband monitors, projectors and switchers. Supporting a wide range of streaming protocols for maximum source compatibility, the low-latency decoder is ideal for applications including multi-site video distribution between church campuses; remote production; digital signage and more.

"While dedicated AV-over-IP technologies get a lot of attention and are ideal for many applications when used on robust networks, a lot of customers are already generating live H.264 or H.265 streams in distribution-friendly protocols and wish to incorporate them into their presentation and display workflows," said James Liu, VP of Engineering at Magewell. "The Pro Convert H.26x to HDMI complements our NDI encoders and decoders, which are often used in conjunction with internal networks, by enabling users to leverage common streaming protocols internally or over the public internet."

The Pro Convert H.26x to HDMI is Magewell's first product to support the SRT (Secure Reliable Transport) open source protocol. Enabling secure, resilient, low-latency video delivery over unpredictable networks, SRT ensures high-quality streaming experiences even over the public internet. Magewell is a proud member of the SRT Alliance. Other supported protocols include RTSP, RTMP, UDP, RTP and HTTP streaming.

The Pro Convert H.26x to HDMI decodes streams up to 2160x1200 at 60 frames per second for output over its HDMI 2.0 interface. Built-in, FPGA-based video processing enables the device to automatically up-convert HD or 2K source streams to 4K for viewing on Ultra HD displays. The plug-and-play decoder features DHCP-based network configuration and can detect the video and audio characteristics of the target display device via EDID metadata, automatically optimizing output parameters or providing the user with a range of compatible choices. The device can be powered via an external adapter or Power over Ethernet (PoE).

Users can specify source stream URLs and control the decoder's advanced settings through a browser-based interface; wired or wireless keyboard or mouse; or using two on-device buttons that overlay an intuitive menu on the HDMI output. Eight channels of AAC or MP3 audio are supported in the input stream with user control of audio gain, sample rate, channel selection and on-screen VU metering. Additional integration features include image flip for inverted projector installations; safe area controls; and aspect ratio conversion. The decoder can be paired with Magewell's intuitive Ultra Stream encoders or third-party hardware or software encoders.

Owners of Magewell's Pro Convert for NDI to HDMI decoders can also add multi-protocol H.264 and H.265 decoding capabilities to their existing devices with a free firmware upgrade for even greater IP stream decoding versatility. 

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TASCAM Model 12 Integrated Production Suite

TASCAM introduces the Model 12 Integrated Production Suite. The Model 12 is a multitrack recording mixer for audio and multimedia creators featuring an integrated 12 track multitrack recorder, USB audio interface, 10 input mixer, MIDI connectivity, click output, and DAW controller. Combining the feel and interface of analog recording and mixing with the efficient workflow and pristine quality associated with digital production, the compact and affordable Model 12 is perfect for desktop-style audio and multimedia production, small format live performances as well as podcasting and live streaming. Applications include music production, multimedia production, songwriting, and live performance where a solo artist plays along with tracks and/or beats.

10 inputs allow connection of a range of audio sources, from microphones to instruments and/or rhythm/beat sources. Channels 1-6 feature combo XLR/1/4-inch inputs utilizing TASCAM's Ultra-HDDA (High Definition Discrete Architecture) microphone preamplifiers with 48-volt Phantom power. Stereo channels 7/8 and 9/10 feature combo XLR/1/4-inch Left channel inputs with adjoining Right channel 1/4-inch inputs. Channel 9/10 also allows portable device connection such as mobile phones and tablets with connection via a 1/8-inch TRRS mini connector or Bluetooth 5.0 connection.

The Model 12's internal 12-track multitrack recorder records WAV files (up to 48kHz/24-bit) directly to SD, SDHC and SDXC cards (up to 512 GB capacity). Basic external DAW control (Faders, Mute, Pan, Solo, Record arming, Play, Record, Stop, FF/Rew, Jog) is available using HUI/MCU protocol emulation. The internal recorder allows simultaneous recording/playback of 12 tracks (10 tracks and stereo master) to and from SD cards. Punch in/out is also available.

The Model 12 incorporates unique songwriting features and live play functionality not found in other mixers in this class. A dedicated Click Output feature facilitates streamlined operation for playing live or for recording environments when overdubbing parts. An internal metronome with TAP TEMPO is also included as a guide click.

The Model 12's built-in USB Audio Interface can send/



receive (12-in/10 out) audio data with up to 24 bit/48kHz recording quality to and from a wide range of popular DAWs, including GarageBand and more.

Via the onboard Channel Mode, an input source switch on each channel (including stereo paired channels) is selectable to live input, internal multitrack recorder (MTR) or USB for versatility. This enables mixing of live performance inputs with recorded tracks from the internal MTR or an external DAW.

Outputs include stereo MAIN (XLR) and SUB (1/4" balanced) stereo outputs, AUX1 and AUX2 (1/4" balanced) outputs and two individual 1/4-inch STEREO phones outputs. Integrated MIDI IN/OUT functionality is offered including MIDI sync and MTC, as is a dual FOOTSWITCH feature for external footswitch control of the onboard digital recorder, punch in/out and more when recording or performing live.

Each channel strip features 60MM faders with 16 TASCAM selectable and editable effects (including reverb, delay, chorus, flange), a 1-knob compressor, and a 3-band EQ with a sweepable mid-range frequency and 100Hz Low-cut Filter.

Two AUX Outputs are offered on each channel for flexibility in monitoring and effects routing. Selectable Mute, MAIN/SUB, and SOLO (PFL/In-place) switches are available on each input channel for versatile audio and signal routing options during recording or mixing.

Featuring a faux wood-paneled retro-styling that reflects its analog character and heritage in the groundbreaking TASCAM Model mixers and Portastudio, the new TASCAM Model 12 Integrated Production Suite brings dynamic new features and functionality to songwriters, artists and creators in audio, multimedia, and remix/dance music production.

For more information on TASCAM's Model 12 integrated production suite, visit TASCAM online at www.tascam.com **T**

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LEX Products LOpSter Trap™

Merging the power distribution of ‘lunch boxes’ with the data distribution of ‘opto-splitters’ into a single, compact unit, Lex Products LOpSter Trap™ is a portable power/data distribution system available with one of two (2) opto-splitter packages. The first is a wired, DMX/RDM configuration with 5-pin XLR In, Thru and five (5) Outs. The second is a wireless CRMX configuration that allows the LOpSter Trap™ to be used as a wired DMX opto-splitter, transmitter or receiver with four (4) Outs.

This exclusive design utilizes non-conductive HDPE sides to improve device ruggedness. Brightly colored duplex receptacles increase visibility in low-light situations and threaded inserts for securing mounting devices expand on the thought put into the LOpSter Trap™ design.

Taking advantage of 30 years of experience in power distribution with the proven reliability of Swisson® electronics, Lex Products combines two essential functions found on studio/location (StuLoc) shoots into

one box, greatly simplifying setups and takedowns. In addition to the five (5) NEMA 5-20 duplex receptacles found standard on a StuLoc lunch box, LOpSter Trap™ includes four (4) USB Type-A charger receptacles for convenient powering of electronics. All receptacles are protected by low-profile hydraulic-magnetic circuit breakers, which will not nuisance trip at higher temperatures.

“The lunch box has been a part of production facilities for decades. With the wide-spread use of LEDs, this venerable design has found new life. However, traditional lunch boxes cannot deliver the data LEDs require and this is where the opto-splitter becomes an invaluable part of a lighting schedule.” commented Lex Products Entertainment Market Manager, Pat O’Keefe. “Combining power and data into a single unit not only increases labor savings, it reduces storage space needs and ensures quantities of power and data distribution devices are paired equally.”

The LOpSter Trap offers a great solution for houses of worship looking for a solution that combines the

function of electrical power “lunch boxes” with the data distribution of an “opto-splitter”. Its small format, portable size also makes it a wonderful option for portable churches, who can transport, set up and strike on box as opposed to two. Its reliable DMX512/RDM Splitter/ Repeater processes communication protocols with a high degree of reliability.

Other features include:

- 4.2A 4-Port USB Type-A Outlet Charger Receptacle for convenient powering of electronics
- Hydraulic magnetic breakers will not nuisance trip at higher temperatures and are mounted flush for easy access and circuit identification
- Brightly colored receptacles increase visibility in low-light situations
- Threaded inserts for brackets provide easy mounting of C-Clamps
- Pairing with the Lex PowerData™ Cable greatly increases labor savings. ■

The LOpSter Trap is available now.

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Active Audio Ray-On PoE

Specializing in steerable column loudspeakers and technology designed to provide clear intelligible sound for worship spaces, meeting rooms, and challenging acoustic environments, Active Audio's new Ray-On PoE series adds another valuable tool to the designer's toolbox.

Building on the success of their digitally steered Step Array and passively steered Ray-On columns, this latest addition of PoE versions can significantly simplify installations while also reducing system cost. In a traditional system, loudspeakers require either external amplification and processing or internal "self-powered" amplifier modules requiring power and additional cabling to the loudspeaker. The new Ray-On PoE, or Power over Ethernet, column loudspeakers integrate an internal amplifier which can be powered over standard Ethernet wiring along with a Dante™ audio interface.

A single network cable can supply both the power and audio signal that the loudspeaker requires without the need for an additional power socket at the loudspeaker's location.

With many facilities already extensively "wired" with network infrastructure adding Ray-On columns in lobby's, meeting rooms, or overflow spaces, can be as easy as connecting them to the network, providing power via PoE, and routing Dante™ audio to them.

The vertically oriented 28" (71.12 cm) tall R70-PoE and 43" (109.22 cm) R110-PoE can be easily mounted flat to a wall and are internally steered to provide optimal coverage without having to angle the speaker from the wall. The horizontally configured B70-PoE delivers well controlled horizontal coverage perfect for mounting above a screen or for narrower spaces.

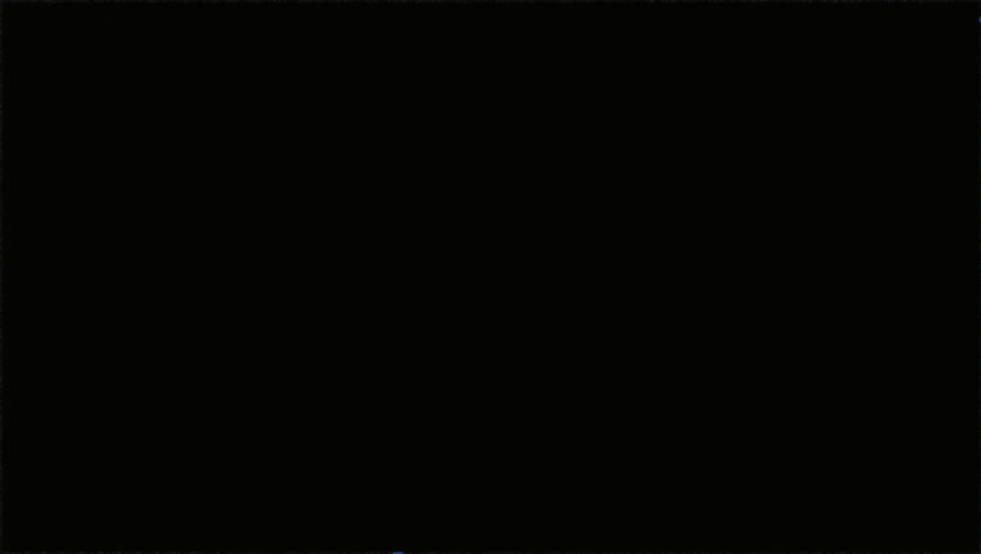
"These new columns provide a quick and easy way of adding sound to church foyers and lobbies, meeting rooms, and even to add coverage in a main sanctuary" explains Rik Kirby of Active Audio's US distributor Allied ProTech. "As they're pre-steered they're simply mounted flat to the wall and connected via a single network cable to any existing Dante™ enabled system." **T**

<http://activeaudio.fr/public-address/fr/serie-ray-on-apercu>
Available April 2020



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Equipment Disinfection

BY BRIDGET HARRINGTON



Many of you have asked us about the best way to disinfect your equipment and work safely in light of the current health situation we're all navigating.

The first things you should review prior to anything else are the CDC guidelines, which are updated as the information evolves. These are official government health guidelines and will take precedence over anything that we will tell you, now or in the future.

This situation also offers you an unplanned proving ground - a silver lining to this, if you will. If you're working right now, our wireless technology will allow you to maintain more distance from your subjects and a wider circle of personal space than you may normally need, and you will still get great sound.

Our Five Recommendations

- In general, alcohol is our friend. Bleach or Lysol solutions are not recommended, as they can be corrosive. The best solution we've made in our shop consists of 16oz. of 91% isopropyl alcohol plus 4oz. of water (which makes a 70% alcohol solution), mixed in a 32oz. spray bottle. Look for a spray bottle with a fine mist that will disperse the solution without soaking what you are spraying. You can also use 70% alcohol packaged wipes, as they are lint-free and save you from the worry of accidentally spraying or dripping solution into the equipment. Depending on the surface to be cleaned, it can be lightly sprayed, wiped or dabbed with Q-tips. Our general guidelines:
- Remove any batteries and disconnect power cords prior to cleaning.
- Wear rubber gloves when cleaning equipment and discard the gloves after use. Do not reuse the gloves, as the virus can survive for a time on many surfaces.
- Likewise, use disposable lint-free cloths/wipes/Q-tips and do not be tempted to reuse them.
- Clean in an open area with good ventilation, alone or around minimal people, observing the 6' social distancing protocols.

Once equipment is disinfected and is dry, you can keep it in Ziploc bags to ensure that it remains disinfected until you are ready to use it. Ensure that the unit is fully dry, then put it into the bag and squeeze out all of the air before closing.

Cleaning for specific equipment

Lav mics: Wipe down the cord and head with the solution and a clean cloth. If the lav has a foam head (headbasket), remove it, lightly spray it with the solution and let it dry. You can then clean the head with a Q-tip.

"Invisible" face-contacting mics: As these contact the skin and body and are in the breathing trajectory, wipe the surfaces with the solution and a clean cloth.

Cords/antennas/power supplies: Wipe down with the solution and a clean cloth.

Transmitters and receivers: Wipe down with the solution and a clean cloth. You may also carefully clean the terminals and switch areas with a Q-tip, lightly moistened with the solution. Take care not to drip liquid into any of the openings.

Carry bags: As these are a fabric-like woven material, lightly spray with the solution and allow to dry thoroughly. Do not shake bags, as this can cause any viral particles to disperse into the air.

This is good information to have handy, even after this situation resolves. Maintaining the cleanliness and safety of your equipment can be challenging, but the time you take to do this far outweighs the risks of not doing it. If you have any questions about proper disinfection of your equipment, email us reach out on our Facebook group. We have a remote crew of Fanatics monitoring the email box and Social media, available to help you in a timely manner.

Stay safe out there! 🇺🇸

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

THE DIRECT BOX:

Key Benefits for Worship Environments

BY JAY PORTER

Live sound engineers are charged with a common goal: provide the best sound possible during a performance with shifting variables while responding to unexpected challenges... easy right?

Live sound engineers in House of Worship environments face additional requirements, including multiple personnel changes during a set, guitar and bass amps that are sequestered in a distant amp isolation room, and last-minute requests to connect mobile devices or incorporate playback sources alongside the live instruments on stage.

Direct boxes and other similar stage tools are essential for navigating the challenges found within this environment, providing connectivity options to interface successfully with the PA system, while maintaining the tone of each instrument and eliminating noise and signal loss.

REDUCE SIGNAL LOSS AND EXTEND CABLE LENGTHS WITHOUT SACRIFICING SOUND QUALITY

The primary task of a direct box is to take the high-impedance, unbalanced signal from an instrument and convert it to a low-impedance, balanced signal designed to properly interface with a PA or sound system. Let's unpack that briefly.

Guitars and amplifiers are designed to work with high impedance audio signals, which allow for the exchange of relatively weak electrical signals (like those from a set of

passive instrument pickups) over short distances.

Ask any guitar player who has connected an instrument cable over 20 feet long on stage and they will tell you that long cables are not ideal with these types of signals – they can result in high frequency loss and signal degradation, which can get worse and worse as the cable length increases. This is due to the capacitance of the cable reacting with the input and output impedances, creating a high-cut filter that can substantially affect the tone of the instrument.

In addition to carrying high-impedance signals, instrument cables are also unbalanced – meaning they only use one signal conductor, making them susceptible to radio frequency interference and electromagnetic interference (RFI and EMI). This can be particularly problematic on a live stage, where power and lighting equipment are common sources of signal interference.

Balanced audio connections feature two signal conductors and employ differential inputs that effectively reject noise and interference that can plague unbalanced audio cables. The 3-pin XLR outputs found on a typical direct box and the inputs of a mixing console are examples of balanced connections – these can allow you to connect cables of up to 300 feet without signal loss or degradation.

ELIMINATE HUM AND BUZZ

Another important benefit provided by direct boxes is their ability to reduce noise caused by ground loops,

also known as the dreaded 'hum and buzz' that can occur when interfacing any two powered devices, in this case a pedalboard/guitar amplifier and the PA system.

Direct boxes can break up ground loops in one of two ways: either by employing a transformer in the audio signal path which provides galvanic isolation between the inputs and the outputs, or through the use of a ground lift switch, which typically disconnects pin-1 audio ground from the XLR connector to accomplish the same goal, allowing the instrument signal to be amplified through the sound system without bringing up substantial amounts of noise along with it.

RETAIN THE TONE OF THE INSTRUMENT

Rather than impart a particular sonic imprint on the instrument, adding a direct box to the signal path should let the natural tone shine through without additional coloration. The best passive direct boxes use high-quality transformers that leave as little distortion and phase shift as possible on the signal, providing a result that is as clean and untouched as possible. With active (powered) direct boxes, look for ones that include class-A circuitry and a wide & flat frequency response.

INTERFACE ANY ELECTRIC INSTRUMENT (OR PLAYBACK SOURCE) WITH THE PA

A quick web search will reveal that there are a wide range of DI boxes available, and while many of them share a similar feature set, they are often tailored to specific instruments or built to address unique challenges that can arise in a live sound environment.

Common variations on the standard DI are stereo and multimedia direct boxes. These allow you to interface stereo instruments such as keyboards, drum machines, and even stereo guitar pedalboards with the PA system. Multimedia DI boxes will include additional connector types to allow for CD/DVD players, mobile devices with a 3.5mm TRS jack, or other playback sources to be used as well.

With more and more digital devices being used to stream audio playback, a new category of digital direct boxes is also emerging – with options to stream Bluetooth audio to a receiver with XLR outputs for the PA, or connect a mobile device directly to the DI over USB. These newer direct boxes

still perform the important task of providing an optimized signal for the PA system, the only difference being that their inputs include digital audio streams.

REAMP PREVIOUSLY RECORDED TRACKS OR SEND INSTRUMENT SIGNALS OVER LONG DISTANCES

While direct boxes deliver signals from instruments on stage to the PA system, there are also a few related tools that can handle other common scenarios where an additional interface device is necessary. Reamp boxes work in the opposite direction of a DI, allowing you to send signals from a PA or another balanced pro-audio source into guitar pedals and amplifiers. This opens up the possibility of routing any pre-recorded track through guitar effects units and amps, creating a whole range of unique sonic textures.

Since guitar signals aren't designed to be run over long distances for the reasons mentioned above, connecting to a distant amplifier is another challenge that musicians and sound engineers face. While a direct box will balance the audio signal from an instrument and allow it to be send several hundred feet or more into the PA system, it still needs to be converted at the other end in order to properly feed the input of a guitar amplifier. Dedicated instrument line driver systems allow you to accomplish this feat easily, including both transmit and receive boxes to handle the necessary impedance and level conversion at either end of the connection.

Live sound engineers face a number of unique challenges daily, but properly interfacing and distributing instrument signals is one that can be solved by using the right tool for the job. Direct boxes and other similar devices allow the engineer to accommodate multiple connection scenarios and eliminate noise without sacrificing tone or affecting the performance, making at least one task on stage easy to accomplish. **T**



Jay Porter is product manager for Radial Engineering and has been working in the pro audio industry for over 20 years. With a passion for pursuing quality, Jay has been leading the product development towards industry standard devices and premium studio equipment.

Minimum Requirements for Maximum Sound

BY JAMES CARELESS

Because they rely on congregant contributions – not always the most predictable of cash flows! – houses of worship are careful with their money. When it comes to buying and installing loudspeakers in their halls, many would prefer to use as few as possible.

The challenge for HoW AV designers is to respect this fiscal prudence, without ‘cheaping out’ and installing fewer (and lower quality) loudspeakers than required to provide the entire hall with uniform clear, intelligible audio. The designers’ mission is thus to determine the ‘minimum requirements for maximum sound’ in each HoW space that they work with.



Here’s how the experts do it

Get an Expert!

That’s right: When it comes to accurately determining the ‘minimum requirements for maximum sound’ in a HoW, the experts we spoke with advised our readers to use an expert; namely someone who knows the science of acoustics, sound reinforcement, and choosing the right kind and number of loudspeakers for the job.

This expert can be a trusted local AV equipment dealer, manufacturer representative, or third-party AV designer/integrator. Whoever they are, this expert needs to know what they are doing to perform the next steps.

Measure the Space Precisely

Guesswork has no place in loudspeaker selection and placement. To do the job properly, whoever is doing this task needs to take accurate 3D measurements of the room and then input this data into 3D sound design software like L-Acoustics’ Soundvision. (Such measurements have to include obstructions in the space that may cause echoes and other audio distortions.)

“A lot of people try to get away with only using 2D room views for sound mapping, but the fact is that this is just not enough,” said Joshua Maichele, L-Acoustics’ Application Engineer, Install - House of Worship Specialist (USA and

Canada). “To deliver the best sound, the room must be accurately modelled in a 3D space.”

Take Materials into Account

Having a HoW space’s 3D dimensions isn’t enough. To determine how many loudspeakers are required – at what output levels and locations – the sound design software must take the room’s materials into account. “A box-shaped room with standard construction has far different needs than a glass room with vaulted ceilings,” said Ralph Heinz, Chief Technology Officer at Renkus-Heinz. “The house of worship market is filled with remarkable architectural designs, so there truly isn’t one answer to what the minimum might be.”

Content Style Counts

Okay, so you’ve mapped out the room’s dimensions and materials. Now it is time to consider what kind of audio content needs to be delivered throughout the HoW space.

The catch: Even in two rooms of identical dimensions with the same obstacles and built out of the same materials, a vast difference in audio content can require two different loudspeaker solutions.

“For instance, a quiet church with minimal music will need fewer loudspeakers since the SPL (sound pressure level) will be lower in this quieter environment,” said John



Choose the Right Loudspeaker Technology

Once all the above variables have been factored into the 3D audio design, it is time to choose the most appropriate loudspeaker technology for the HoW space.

A case in point: Ralph Heinz is a big believer in digital speakers equipped with beam steering technology, whose characteristics are taken into account through the entire Renkus-Heinz sound design process.

“During the design phase we use an acoustic modeling program, like AFMG’s EASE, to ensure we are providing the correct coverage with regard to the variables of room size, shape, construction, and use,” said Heinz. “Once we have that model developed, we use software suites such as RHAON II to allow for specific tuning and setup. RHAON II allows for the sound to be positioned perfectly in a space, and it embeds the DSP into the powered loudspeakers.”

Speaking of DSP

When it comes to making good on minimum requirements for maximum sound, DSP (Digital Signal Processing) does have a place in the process. Fortunately, “a lot of the DSP needed to tune sound systems are now part of the digital mixing consoles readily available in the marketplace,” said John Schauer. “Very accurate EQ or equalizers can be employed to maximize the performance of the system in the environment it’s in. Delay, another tool, is often available to correct when audio is arriving at different times to the congregation.”

This said, DSP cannot fix fundamental flaws in a HoW audio system. “DSP exists to electronically compensate for room anomalies, but it cannot correct poor audio design,” said Maichele.

This is why getting a HoW room’s sound design right before loudspeakers are purchased and placed is so important. You can’t turn a subcompact car into an SUV by fitting it with monster truck tires.

The Bottom Line

With conscientious sound design and planning, it is possible to provide budget-minded HoWs with excellent loudspeaker systems that cover all congregants. Anything less and you run the risk of providing the client with a cheap sound reinforcement system, rather than an affordable system that meets their needs.

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. **T**

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Schauer, Senior Technical Specialist with Yamaha Pro Audio. “A more lively congregation enjoying contemporary music will certainly want a higher sound level and full-range response in comparison. This will require more loudspeakers and other equipment.”

Cover Everywhere

Some HoWs try to save money by only installing loudspeakers where people sit most of the time. They leave underused areas – perhaps at the back of the hall, or up in the rear balcony – without sound reinforcement, rationalizing that extra speakers can be brought in for major events such as Christmas and Easter.

There are two flaws to this penny-pinching approach. First, it prevents the church’s AV system from providing intelligible audio everywhere without the expense and time required to install temporary loudspeakers. Second, it limits the church’s ability to handle growth during its regular services, as more people join the congregation. When this happens, the HoW is faced with spending additional money to provide coverage to these ignored areas, or leaving congregants in these marginal audio zones underserved and unhappy.

The takeaway: When designing to provision a HoW’s minimum requirements for maximum sound, be sure to cover the entire space.

Build in Headroom

Another way some HoWs try to reduce loudspeaker costs is by buying the fewest low-quality units possible, and then running these speakers at full power.

Again, this is false economy. Operating loudspeakers at full power repeatedly shortens their lifespans. Those that do survive often deliver distorted audio due to overdriving, which eventually leads them to burn out early as well.

“My rule of thumb is for a HoW loudspeaker system to provide 92 dBA of sound while running at about 70% of its capacity,” said Maichele. “If the church tends to run concerts at 100 dBA or more, there should be enough headroom in the system from end to end – including amplifiers – to support this without overdriving the loudspeakers.”

CAMERA ROUNDUP



Blackmagic Design Pocket Cinema Camera 4K

Pocket Cinema Camera 4K features a 4/3 image sensor with 4096 x 2160 resolution, MFT lens mount, 13 stops of dynamic range, dual native ISO up to 25,600, built in SD/UHS-II or CFast 2.0 recorders, built-in microphones, XLR input, full sized HDMI, 3D LUT support, Bluetooth and more.

www.blackmagicdesign.com

Churches using the product:

Abundant Life Family Worship Church; New Brunswick, NJ

Celebration Church; Orlando, FL

Church of Hope; Ocala, FL

The Church of God International Offices; Cleveland, TN

Canon C500 Mark II

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

www.usa.canon.com

Church of the Highlands



HITACHI KOKUSAI

Z-HD5500 Broadcast/Production Camera

Combining native 1080p acquisition, HDR and outstanding sensitivity with exceptional price/performance value, the Z-HD5500 is Hitachi Kokusai's most popular camera for houses of worship. Its global shutter CMOS sensor adapts easily to challenging lighting conditions, enabling flawless video capture in churches where LED lights and large LED displays are used.

www.hitachikokusai.com

Example Churches using the Z-HD5500

First Alliance Church – Calgary, Alberta

Westgate Church – San Jose, California

Hope City Church – Edmonton, Alberta



Ikegami's UHL-43 Multi-Purpose UHD/HD Digital Camera

is a one-piece UHD digital camera, employing the same 4K-native sensors as the UHK-430 and UHK-435 "Unicam XE" series cameras, and achieving the same performance. The UHL-43's compact one-piece form factor makes it ideal for House of Worship and broadcast ministry needs including POV, jib and Steadicam applications.



JVC Professional Video GY-HC900

JVC's GY-HC900 CONNECTED CAM broadcast camera features three 2/3-inch CMOS image sensors for full HD imagery and enhanced connectivity for a complete studio workflow. It makes Live-over-IP a reality with a streamlined workflow that's both reliable and cost effective, allowing houses of worship to live stream its services with ease.

<http://pro.jvc.com>



Marshall Electronics CV630-IP PTZ Camera

The Marshall CV630-IP PTZ Camera captures 4K UHD 3840x2160p video with support for HD 1920x1080p and 1280x720p. It features an 8.5 Megapixel image sensor along with smooth PTZ camera positioning and 30X optical zoom. It supports triple stream H.265 (HEVC), H.264 and MJPEG formats, with simultaneous Ethernet, HDMI and 3G-SDI outputs.

<http://www.marshall-usa.com/cameras/CV630-IP/>





Panasonic CineLive system with the VariCam LT camera

With Panasonic's CineLive camera system, churches can capture the cinematic look of the VariCam's Super 35mm sensor while maintaining full remote control of traditional multi-cam production. Integration with the AK-HRP1000 or HRP1005 control panel enables remote shading or cinema grading of the output image in 4K/HD and in HDR/SDR.

<https://na.panasonic.com>

Up to three churches, city and state, using the product: *Flatirons Community Church (Lafayette, CO)*; *First Assembly of God (Fort Myers, FL)*; *Elevation Church (Charlotte, NC)*.

PTZOptics 30X SDI Camera

<https://ptzoptics.com>

PTZOptics® pan, tilt, and zoom SDI cameras are high-quality, affordable broadcast cameras. Offering SDI, HDMI, and IP outputs simultaneously, these units are some of the industry's most advanced network-connected cameras. Select between 12X, 20X, and 30X zoom options, high-definition, 1080p resolution at up to 60 frames per second.

3 Churches:

Grace Anglican Church, Fairhope, Alabama

Keys Vineyard Community Church, Big Pine Key, Florida

Olivet United Methodist Church, Coatesville, Pennsylvania



Sony PXW-Z750 Shoulder Mount Camera

PXW-Z750 is the first 2/3-type shoulder camcorder to support 4K capture with a 3-chip CMOS sensor system mounted on a wide band prism to ensure detailed imagery and vivid colors, along with 4K, High Dynamic Range (HDR) and High Frame Rate (HFR) acquisition with high sensitivity and low noise.

pro.sony

COLOR

VS

Color Subtracting Fixtures

BY STEPHEN ELLISON

Since the first use of light on the stage, designers have wanted to use color. For the longest time the only source of light was always a white light source, where the designer would need to do something to create color – but how do you create color from white?

Think back to science class, when you would shine

light through a prism and the light coming out the other side was a rainbow of color. White light contains all the colors you could ever want; all you have to do is get rid of what you don't want.

When you start with white and want to only use the red portion, you place a filter in the path of the light which subtracts

or filters out all the other colors. This is what we call Subtractive mixing, and this concept has been in use for a very long time. Some fixtures can create any color by using three secondary filters (Cyan, Magenta, and Yellow). These three colors are created by combining two of the primaries.

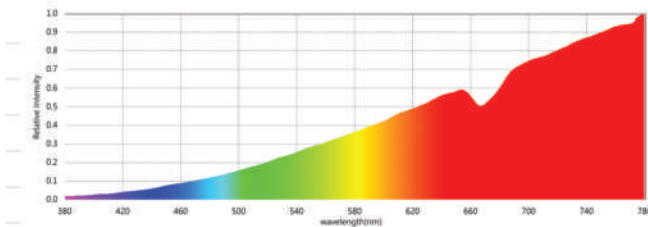
By combining different saturations of these colors,

you can create virtually any color through subtractive mixing. For example, if you combine Cyan and Magenta you are left with Blue.

*Cyan = Green + Blue
Magenta = Red + Blue
(Green + Blue) - (Red + Blue) = Blue since the Cyan blocks the Red, and the Magenta blocks the Green*

Let's talk about the color

MIXING



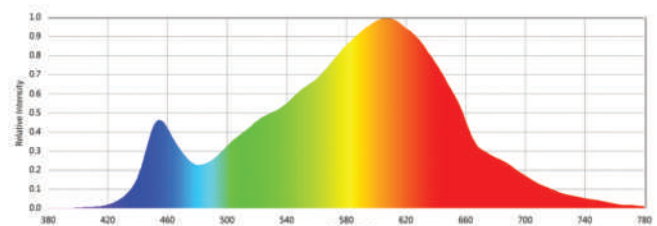
white. We have been told that white contains all colors equally, which isn't necessarily true. One way to describe white light is by its color temperature, which can be determined by referencing the location of the white along the Planckian Curve. The color temperature of a source of light can be plotted along the curve, see CIE chart. The problem with only understanding the color temperature of a source and not the SPD (Spectral Distribution Plot), is that this light also interacts with objects. While our eyes can tell us that two sources

are the same white on the Planckian Curve, the light can produce different colors on different objects. If you look at the spectrum of a tungsten halogen lamp, you will note that it is dominant in the red wavelengths and has very little of the blue wavelength. (see Tungsten SPD chart), while an LED with a matching color temperature has a very different SPD (see White LED SPD chart). This becomes important when you are working with a mixed source lighting rig and want to create matching colors.

If you start with tungsten front lights and want the LED side lights to match color, you cannot use the same gel in each. You will need to adjust the color choice based on the difference between the two SPDs and the SPD of the filter. The Rosco Laboratories website has wonderful spectrum graphs for most of their gels so you can see what colors are being transmitted, along with the transmission percentage. When you look at the graphs, take note that they are using a tungsten source, or a source with equal intensity at every

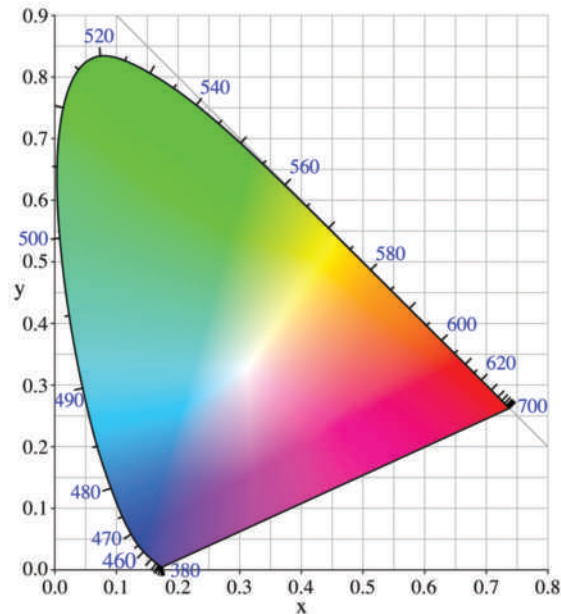
wavelength, for the white light that is being filtered to produce the graph.

So, what is a person to do to get a color match? Start with an evaluation of the object you are striking with the light. If you are lighting a white cyc, the task is easier: you can calculate what is missing from each source and find a gel that has those values. Remember, if the source is not producing a wavelength then no amount of gel will produce that wavelength. An example is the difference in the intensity of blue we can produce with tungsten compared to LEDs. As I



like to say, “We are in the age of blue.” When I was doing concert events with Par 64 fixtures, we would have 60 cans mounted on a rear truss for back light. Because tungsten fixtures have hardly any blue in them according to the spectral distribution chart, adding blue gels to these types of fixture produced little output. I could gel eight fixtures across in an amber gel and get more output than I needed, compared to adding deep Congo blue gels to 20 fixtures, and still having a barely noticeable blue. However, LED fixtures have changed all that, and can create blues that are just as intense (if not more so) than the ambers.

The real problem comes when you are projecting the light onto the set or costume. These objects will require some experimentation with the gels to achieve a good color match. The interaction between an object that only reflects some colors, unlike



the white cyc, leads to interesting hues being produced by different spectral distributions.

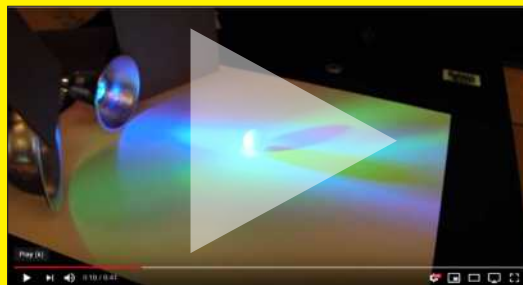
ADDITIVE COLOR MIXING

Now that you fully understand subtractive mixing let’s talk about Additive color mixing. As the title suggests it is simply the process of combining color through multiple sources. Additive color mixing has been around a long time. If you ever get really close to your TV you can see the three primary colors making up each pixel. All video screens make use of this principle to create the millions of colors you see on screen during broadcast. LED fixtures started on this same premise, with large individual color lamps in a par-like housing. The

claim was that you could get 16 million colors by mixing the three primaries together. While theoretically this is possible, when you look at the SPDs of each color and overlay them onto one chart you will find gaps between the colors. These gaps are caused because the three primary colors are pure and cover only a narrow band of the spectrum, leaving some parts that cannot be produced. That said, we still get a great range of color from them and almost all manufacturers have added additional colors to their LED fixtures (like White, Amber, Lime, etc.) to fill in the gaps and provide a full range hues and shades.

One way to solve your problem with the side light fixtures is to get a full color fixture using LEDs. If you have a fixture with white LED’s in the right color temperature along with at least red, green, and blue LEDs you can then mix to match the tungsten source. **T**

When the primary colors of light, red, green, and blue are mixed, white light is produced. By looking at the shadows cast when an object blocks one or more of these color components, one can observe both the additive and subtractive processes of color mixing. Instead of subtracting light via an absorbing pigment, the object’s shadow “removes” the component color from the “white” light. For example, the yellow shadow is the result of blocking the blue led and only allowing red and green to mix. Similarly, yellow pigment absorbs blue light and reflects red and green. The addition of red and green light makes yellow. The bluish-green shadow - CYAN - is the result of blocking the red light. Where the cyan and yellow shadow overlaps appears to be green. Why? This small shadow is where both red and blue are blocked. Likewise, when we mix cyan and yellow pigment cyan absorbs red and yellow absorbs blue. The only thing left to be reflected is green. Cyan pigment and yellow pigment both reflect green, so that’s what we see. (In white light)



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The Expanding Role of Video in Worship

BY DARREN FORDHAM

Over the past generation, video production has taken on an ever-increasing role in worship. What started out as a tool for only the largest churches has become nearly ubiquitous as the barriers to entry have been reduced or, in some cases, outright eliminated. Thirty years ago, the only distribution method for worship services was to broadcast on television using higher-end equipment, the sum of which required a massive investment and had limited opportunities and a primarily local reach. Today, internet streaming and social media, combined with a vast array of equipment options, have made it so that any church can deliver The Word not only to its homebound parishioners, but to audiences worldwide.

When considering such a sizeable and long-lasting investment, there are many factors to weigh. Will this help bring in new parishioners? How will this enable us to better connect with the existing congregation? Will we be able to see a return on our investment? How can technology help us to deepen our faith? The first question to ask is the most obvious one – why should we think about adding or upgrading video equipment?

Opening the Door

There is no faster way to expand the size and reach of your church than with engaging and exciting video, and it has never been easier to do so. The days of utilizing paid programming to get your service on a local cable channel are over. The ability to stream services over the internet opens the door to a worldwide audience, removing geographical limitations and allowing your church to grow as far as your message will take it.

To put it plainly, video is the new front door of your church. When potential parishioners are looking for a new place to call home, they are often doing so from the comfort of their living rooms. Between your website and social media channels, the content you produce does more to show them what your church is about than anything else on the page. If a picture is worth a thousand words, your videos are worth 30 pictures per second. Every charitable activity, every testimony, and every service can become more compelling and impactful when there is quality video to help tell the story.

On the plus side, the ability to reach people in their homes gives a considerable boost to the reach of your message. The downside, however, is that you're no longer competing with just the local churches in your area, you're competing with every other piece of secular content on their screen. When viewers go from watching a blockbuster film streaming in 4K on their devices to viewing a poorly lit service being captured with equipment older than the volunteers operating it, there's a strong likelihood that they won't stay engaged to hear your message. High quality video makes an impact on viewers and enables them to connect better with the message. For your elderly and homebound parishioners, the production value has the added benefit of helping to maintain their connection to the church and gives them a feeling of still being there.

Creating Stronger Bonds

A church that only interacts with its congregation on Sundays is a church that is not fully engaged with its parishioners. Your relationship with God is seven days a week, so shouldn't your relationship with your church be



the same? Social media can empower churches to maintain and strengthen their ties with parishioners and with the community as a whole.

Creating memorable content Monday through Saturday and sharing it on your social media accounts has a number of benefits, not the least of which is reinforcing the lessons of the Sunday sermon. By taking core elements of your mission and breaking them down into easily digestible video pieces, you help everyone inside and outside your congregation and community understand what your mission is truly about. Spotlighting community outreach, charitable programs, inspiring testimonial stories, or youth activities all serve to showcase how deeply

intertwined your church is with your community. Video also enables you to create a series of segments over time with a common underlying theme, which viewers can “binge” on like their favorite streaming series or follow continually.

An active video channel also enables you to provide “bonus content” to supplement Sunday services. Unless your services are several hours long, there’s always going to be things that you wanted to say and do but had to cut for time. Rather than postponing those thoughts indefinitely, you now have the ability to say, “be sure to follow us on social media to see more” and keep the lesson going throughout the coming week into the following Sunday.

Additionally, video allows you to tell your parishioners’

stories in a way that fosters a deeper sense of compassion, empathy, and community. Inspirational stories of overcoming adversity to have a better relationship with God are better seen than heard. The personal connection of meeting people where they are, showing where they came from and how they got to where they are, featuring interviews and B-roll footage, can add a color and depth to the story that simple anecdotes from the pulpit can’t capture. Videos and social posts featuring parishioners are often shared to family and friends, fostering an ever-expanding sense of community. Young congregants take pride and enjoy seeing their good works praised online, and new participants can be inspired to participate in

future activities. Each year video content is permeating the application process more and more for higher education institutions, online resumes and personal profiles. Empower your parishioners with video of their deeds that they will enjoy sharing and can help tell the story of their character and resolve.

The modern church has become an integrated part of the community and a hub of activity in the lives of its congregation. From youth activities to Bible study to outreach and everything in between, every church seeks to be a part of its congregation’s daily life. An active presence on social media helps to drive that message home, and video content can make the message that much more powerful.


Investing in the Future

One of the most important responsibilities of any church is to be good stewards of the budget. Every dollar spent must have purpose, either towards serving the congregation, serving the community, or expanding the reach of your mission. Video enables all three, while also helping to expand the size of the congregation—thus bringing in additional revenue and generating a strong return on investment. In an ideal world, the message would be the only thing that matters, but the reality is that when people are donating their hard-earned money to your church, attention must be paid both to how that money is spent, and how to raise more of it.

Going back to the prospective parishioners in their living rooms, having compelling and inspirational content is going to make them more likely to walk through your virtual front door towards your actual front door as new members of the church. Once there, they're likely to share your inspirational content with their social networks, further increasing the number of people hearing and seeing your message. This kind of content virality has brought many churches a surge in membership and viewership in relatively short periods of time. Needless to say, a sharp uptick in attendance may lead to a parallel uptick in donations.

As an added benefit, since the cost of professional-quality video equipment has dropped so sharply in recent years, your volunteer production staff has the ability to be working on state-of-the-art equipment, turning your church into a professional development course for anyone looking for a career in video production. In the previous generation, only a handful of churches were using broadcast-worthy equipment, and most churches only had the budget for consumer video cameras if they were doing any video at all. Now, young volunteers have the ability to gain experience and training on the same gear that they would be using if they were working professionals. This added attraction helps to bring in creative-minded volunteers who will bring fresh ideas to the table to help maximize the value and usage of the gear, while also generating exciting new content that speaks to their peers.

Seeing is Believing

There's no better way for you to understand the power of video than to see it for yourself. Browse through the websites and social media of places like Seacoast Church, Life Church, It Is Written, or Red Rocks Church, to name a few. Watch their services and creative content. See how you might be moved by the substance and quality of the videos, and what it makes you think about the church delivering the message. Would you be likely to join this church? Would this content make you more interested to learn more about their mission? Then, think about your own church, and the kind of messaging you could deliver if you were similarly equipped. 

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

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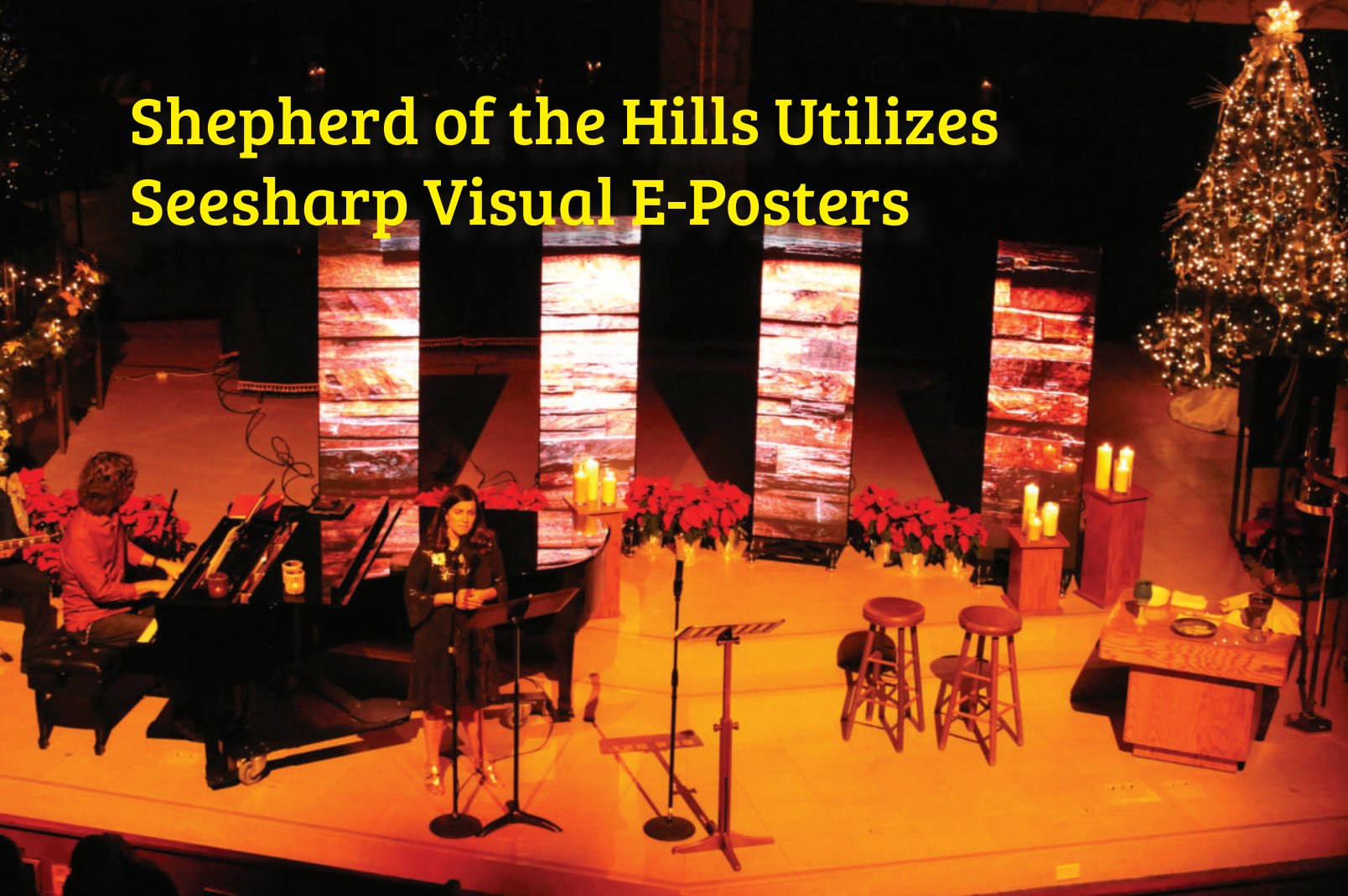
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Shepherd of the Hills Utilizes Seesharp Visual E-Posters



KARL STUCKENBERG, LEAD PASTOR, SHEPHERD OF THE HILLS

As a mainline denominational church, Shepherd of the Hills has been connecting people with Jesus and each other for over 50 years. This also means that most of our facilities were built before video screens and live bands were ever a part of the church landscape. In worship design, we face the constant challenge of bringing a modern high-tech feel to our space without losing the traditional aesthetic. Partnering with Spinitar, a Los Angeles-based AV integrator, has allowed Shepherd of the Hills to bring a more contemporary vibe to our guests, while ultimately providing them with a better experience overall. This was especially true on Christmas Eve when we had three different services to speak to three unique communities with short turn-around times. This year, however, we found a fantastic solution by using See Sharp Visual's E-Posters to enhance our worship.

E-Posters are high-resolution screens that are about two feet wide by six-feet tall. The screens can be linked together to form one giant screen or split apart in any combination. We used four E-posters to transform our space in a way that fit for each unique service on Christmas Eve.

In deciding how to integrate the screens, we chose to use them in the creation of three unique textures that would transform the space for each service. Creating space for people to experience God is at the center of our worship design philosophy and See Sharp Visual's E-Posters allowed



us to do just that. Using only a MacBook Pro and Keynote software, we created images that would spread across all four screens. This method allowed us to change the feel of each service easily and gave us the ability to use both still and motion backgrounds. Because the screens were on sturdy stands with casters, we could change their location between services quickly to transform the space.

As I said, each service is unique, so we used the E-Posters in very different ways. During our Modern service, we spaced the screens across the stage in three-foot intervals. We then used one image spread over the screens. For example, behind each scripture reading of the Christmas story, we had contemporary photos that related to the stories, including a rustic carpenter shop for Joseph, the interior of a cave looking out over a modern-day Nazareth for the annunciation to Mary, and Kansas wheat fields for the Shepherds. During the song “Peace on Earth,” we had a video taken from space of the earth slowly rotating under the stars.

In our Traditional service with choirs, lessons, and carols, we quickly paired two screens on each side of the stage. For this service, we used photographs of stained-glass windows to help tell the Christmas story. Each side featured the same window split across two screens, giving a classic feel while using contemporary technology.

Finally, for our Reflective candlelight service at 11:00 PM, we moved all four screens downstage to create one background that remained throughout the entire worship. This service was more of an “unplugged” coffee-house styled service, so we used an image of a rustic wooden wall to make the space feel a bit more intimate.

Each transition was quick and easy with Sea Sharp Visual’s E-Posters. They brought an elegant beauty appropriate to each of our services, and they were a joy to use.

STEVE RUBERY, SEESHARP VISUAL

Formed by two A/V industry veterans, Seesharp Visual has quickly grown to become a leader in LED ePosters, a niche market in the booming LED display industry. Seesharp Visual has differentiated itself by using in-house hardware and software engineering to provide a superior product that is simple to use and very reliable.

Seesharp Visual partnered with Spinitar, a premier A/V integrator, to provide Shepherd of the Hills United Methodist Church with four 1.9mm LED ePosters, which they used to provide engaging and varied content for each of their unique Christmas Eve services. The ePosters’ portability and ease of use allowed the pastor and his creative team to deliver a different ambiance for each service.


What is an ePoster one may ask? It is a stand-alone LED display that includes the LED modules, a controller, rugged housing, and built-in stands or



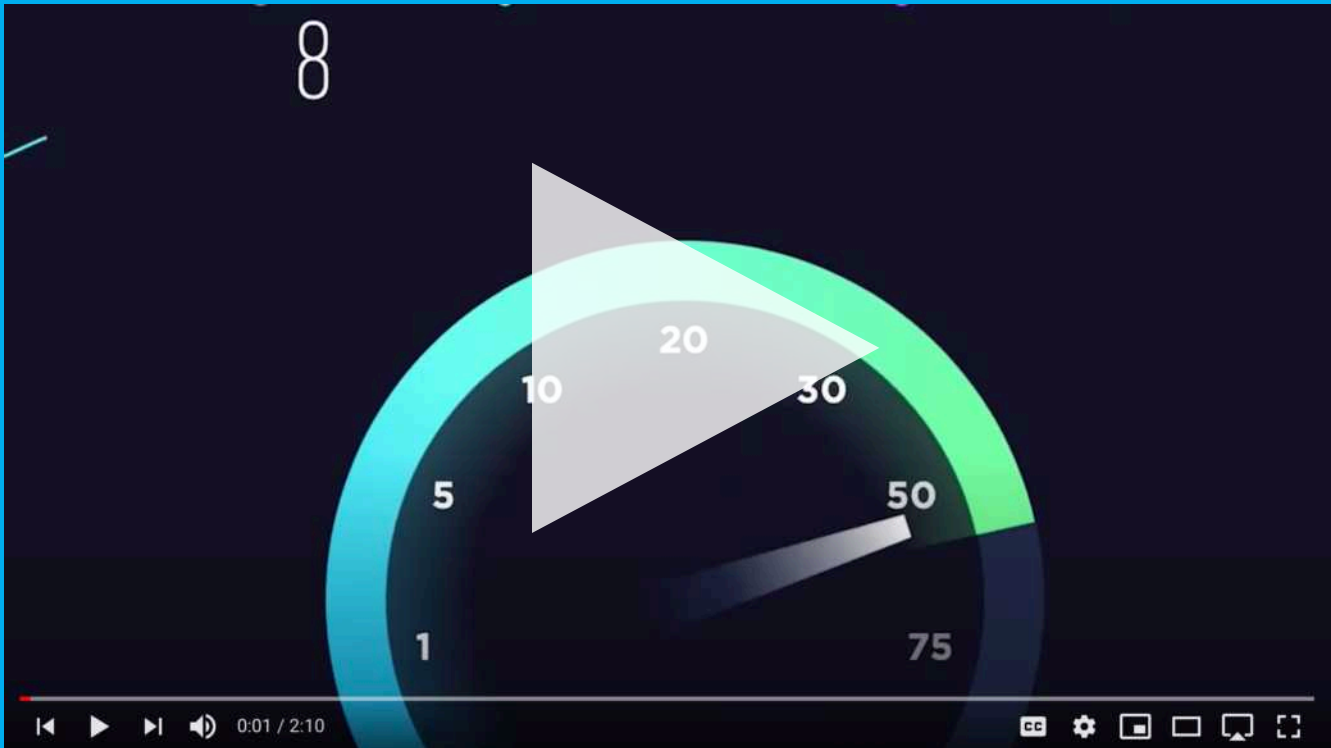
optional bases and rigging points. Seesharp Visual developed a custom software interface that quickly allows a user to upload content and set up the poster in either cascaded (multiple displays creating one large image) or independent (each display showing the same or unique content) mode. Other great features include the ability to control the ePosters via a laptop over USB or Wi-Fi, or via a smart phone.

Most of us, who are familiar with LED displays, know that they are available in various pixel pitches. Typical for use in the HOW market are LED walls with a pitch of around 3.5mm. These provide a good resolution for the distance where viewers are seated, and at a reasonable cost. When it comes to using ePoster displays, the product is usually located much closer to the intended viewer so finer pixel pitches are required. The Seesharp Visual ePosters that Shepherd of the Hills UMC used have a 1.9mm pixel pitch that provide a fantastic image from only a few feet away. The total resolution of each poster is 972h x 288w; physical dimensions are 6.25’ high and 1.9’ wide.

The HOW market can benefit greatly from the use of ePosters. Utilizing multiple units together, they can be used for services or other events where portable LED displays can enhance the activity. Separated, they can be used for digital signage and wayfinding. The flexibility, portability and usability of the ePosters provide users with endless possibilities. They can be used in any orientation, mounted on bases, or flown from truss. Because they have Wi-Fi and internal storage capability, power may be the only connection required. ePosters are truly a re-invention of LED display technology.

Seesharp Visual offers models with either 1.9mm or 2.5mm pixel pitches. A variety of accessories are available including bases, wall mounts, and ATA style flight cases for storage and transportation. Prices vary based on model and accessories. Seesharp Visual products are available through professional A/V dealers and rental staging companies. For further information email info@seesharpvisual.com or visit their website at www.seesharpvisual.com 

How Fast Should Your Internet Connection Be for *LIVE STREAMING?*



When it comes to live streaming, the performance of your Internet connection is very important. You want to make sure that your high-speed connection has a fast enough upload speed. The above video shows you how to check the rate of your connection and how to determine the speed it needs to be to stream your production successfully.

Check out more great “Tech-Tip Tuesday” videos from DataVideo at https://www.youtube.com/playlist?list=PLgV3CN8Dy_GPBW34rsvEmS57FqwQWT8OR

Mobile Device Mixing

BY TIM ADAMS

It wasn't that long ago that the idea of being able to control a mixing desk from a smartphone or tablet was looked on with skepticism, but that is where we find ourselves in 2020. Virtually every mixer manufacturer has at least a few digital audio mixer products that provide this functionality. We have even seen digital mixers with no physical controls, designed to function as a stage box with full tablet control.

There are detractors, however, that warn of issues moving to an entirely device-controlled system can introduce:

First, you are relying on a WiFi network and your device's ability to maintain a connection to your mixer, either utilizing a self-generated WiFi signal or what is generally considered the better method of using commercial-grade routers and access points.

Second, you are moving your mission-critical function of controlling a live audio system to software that is susceptible to crashing, freezing, and malfunctioning. I myself have had this exact issue on several different apps and platforms, so it's not just an iOS or Android issue, but a reliability issue with the apps themselves or the underlying operating systems they run on.

Third, when you have a software crash, the mixers are generally programmed to continue operating in the last known configuration until control is re-established from the device. This could mean that while you are struggling to get your control back online, you have muted and unmuted channels that you don't have control of. This can lead to obvious problems as it can grind your program to a halt, which is incredibly disruptive.

Fourth, trying to mix anything more than 8 channels using a device involves scrolling side to side, which can

create headaches when trying to run a soundcheck or a live program that requires lots of cues. I think back to when I was running 13 wireless mics for a Christian Youth Theater production and I cannot even imagine what that would have been like with a tablet, trying to manage muting and unmuting up to 8 mics at one time at a pace where you're averaging a script page turn every 30 seconds.

You might be getting the impression that I am against mobile device mixing, and that's not the case. While I do think there are significant odds stacked against this practice, that is not to say there are not valid use cases and environments where this could be a very useful tool to have in your back pocket.

The most obvious use for this technology is the ability to mix your monitors remotely. You could be on stage with the musicians, hearing what they are hearing and making adjustments on your device. I think with the advent of personal monitor mixers, we are seeing this capability being less utilized, but many small churches are just now starting to consider making the jump to a digital mixer, so having this ability is still fairly attractive.

I have a client who needed a solution that was only controllable via tablet due to budget and size constraints and they have had every issue listed above; however, if you know about the issues you may face ahead of time, you can prepare plans and processes for working through those situations when they occur.

So, how about some best practices to make your mobile device mixing experience more reliable and more enjoyable?

Tip 1: Use a dedicated network

I cannot stress the importance of not only having a dedicated network for your control, but to also ensure that the SSID (the wireless network name) is hidden so people

cannot see it on their devices when they enter the facility. This not only helps keep the network clear of unnecessary traffic but allows you to precisely control who does and does not have access to it. If you have a managed network, you should be able to create a VLAN for your control and it should work fine, as well. This is all about setting yourself up for success by minimizing potential failure points.

Tip 2: Use commercial-grade routers, switches and access points

Don't expect to get great results and great performance from your dedicated wireless network if you are purchasing your components at Best Buy. Look for industry standard systems, like the Ubiquiti Unifi range, for example. You will spend more, but the added reliability and coverage will be well worth that investment. You may need to find a network professional to install, configure and train someone in your church on how to manage the network, but if you want to minimize the issues you will face this is an investment you should make.

Tip 3: Develop a failure "signal"

Regardless of the size of your church, having a process in place for when your control fails (e.g. app or device freezes, crashes or goes offline), can help keep the program running along with minimal interruption. For smaller churches, there could be a hand signal to communicate to those on stage there is an issue. For larger churches, perhaps a message that could be sent to the stage display or downstage monitor that notifies them of the issue and any actions that should be taken (e.g. use the yellow mic, not the purple mic)

Tip 4: Test every app and OS update prior to a live program

We have become so accustomed to just updating our devices as soon as an update is available that we often don't think about compatibility issues with our apps. The game changes, though, when your device is being used to control a system as mission-critical as your sound. In that light, every time you decide to update either the app or the operating system, power up the entire sound system and ensure that things are still functioning properly. Best practice for updates is to wait at least a couple weeks and keep an eye on the forums and user groups on social media to hear what others are saying about the update first.

Mobile device mixing is an incredible leap in capability and represents a lot of freedom (can you say mixing from your seat in the sanctuary rather than the booth?), but you also need to be fully aware of the dangers and pitfalls with making that decision. What's right for you? Only you can answer that question, but hopefully you are better informed now so you can make a better decision. **T**

Tim Adams has served on the front-lines of church technical ministry for much of the last 20 years, working his way from audio recording and live sound to live video, lighting and projection.

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Sharing the Faith:

BY IAN SHARPE

Benefits of Video Streaming for Houses of Worship

Houses of worship around the world are tasked with uplifting their communities. But in today's digital world, the way people communicate and consume media has changed, which means reaching new and existing congregants can often be a challenge. Increasingly, it is not just our eyes, but our phones, that are windows to the soul.

With 2.38 billion people streaming or downloading video across all devices, there are ample opportunities for houses of worship to augment the way congregations practice their faith. By streaming LIVE or offering video sermons on demand, houses of worship can much more readily reach their digital congregations around the world.

Streaming is increasingly

used as a way to both expand audience reach and connect with digital congregants. With the right tools, houses of worship are able to reach audiences on the devices they are most comfortable using, facilitating moving, memorable experiences. Streaming also creates opportunities for online donations, which continues to be a meaningful source of funding for houses of worship. Even though donation revenue continues to grow, it's still essential that houses of worship adapt their strategies to shifting audience preferences.

Teaching beyond Sunday services

Today's digital world provides new ways for people to worship and learn outside of the church. By

offering live video streaming or VOD content, houses of worship can give more people access to the church experience - no matter where they are in the world. It will help spread the message to people who are further afield, including regular attendees on the move, people completing missionary work overseas, as well as those unable to physically visit the church. Maybe the pastor wants to share content online that didn't make the cut for the sermon or wants to give a youth leader the chance to lead a Bible study or prayer group.

Live streaming can be used to capture regular services or special events such as weddings, holidays, confirmations and baptisms, meaning those watching will feel more included in

the proceedings, compared to when they watch pre-recorded videos. Some houses of worship are also using their live streaming platforms as the focus point of a more general online community. In addition to watching the services, congregants are able to share their thoughts via a forum, offer advice and view more church related content with their friends and family. And of course, houses of worship hosting their own video on their own website gives them even more options to amplify their message and hold people's attention.

Engaging with the community

An emerging challenge for houses of worship is how they engage with millennials. It has been reported that millennials

are less likely to belong to a faith, and even those who did belong to a faith were less likely to attend actual church services. Tech-savvy millennials are also the largest group of consumers for live content. With 63% of people aged 18-34 watching live-streaming content

community. Houses of worship see many benefits from fostering community in this way: the interactivity not only improves the online experience but encourages recommendations to new members.

Aside from the committed congregants,

to adapt to match how congregants want to give. In 2019, online giving increased by 12.1% in the United States, while worldwide giving was up 4.1%. Offering video content with a request encouraging the viewer to make a donation or contribute to

content that congregants love, while letting them show their appreciation and contribute toward the church's efforts.

Connecting the digital congregation

Live streaming is revolutionising the way houses of worship are engaging with their communities. Every day, more and more churches are live streaming services and rapidly growing their online audiences. However, there is sometimes a reluctance from the community to use video streaming tools to communicate with congregations, perhaps because the technology is seen as unorthodox or impersonal. Ironically, it is appearing "out of touch" that distances churches in the first place. By streaming services and embracing technology, houses of worship can appeal to millennials by helping change their perceptions of the church.

Ultimately, the goal of any house of worship is to reach people, tend to the flock and share the faith. By streaming their services and other events, churches are able to take their ministry beyond the walls of the church and create a new and powerful sense of sanctity online. It means they can connect with more people than ever before, tapping into the goodwill and generosity of the community at large with online donations tools. ■

Ian Sharpe is the CEO at Promethean
www.promethean.tv



regularly, these numbers are growing fast. Compared to a year ago, 47% of millennials are watching more live videos now than ever. As a result, houses of worship should take advantage of live streaming and VOD content to engage with this large, and often untapped audience.

Of course, live streaming isn't just to help engage with millennial worshippers - it helps build connections with church members of all ages, and also helps them connect readily with one another. Because live streaming platforms allow people to comment at the same time as watching a live stream, worshippers are interacting with each other, engendering a strong and responsive

live streaming can also reach people from outside the community. There are many people who search for churches or communities online, with over 56% of millennials researching online churches before they join. This is where houses of worship can reach out to these people and help them feel connected to their faith.

Digitalising the donation process to boost giving

Traditionally, donation methods consisted of cash envelopes and offering plates during services. As consumer preferences continue to move away from paper to online payments, houses of worship need

the church's collection, is much easier for viewers as they are already engaged with the church. Therefore, streaming has improved the donation process by offering donor flexibility, as they can choose when and where to give to their church community.

According to a recent report, houses of worship that offer online tools for fundraising collect six times more than those who use offline tools. The same report also indicated that churches can expect to see a 32% uplift in donation amounts when utilising online donation solutions, further demonstrating that streaming is a great way for houses of worship to continue creating the



Streaming Tips

BY TIM ADAMS

Many churches are scrambling to jump onto the live streaming bandwagon for a host of reasons; some wish to extend their services to members who are sick, traveling or otherwise unable to attend. Some wish to expand their ministries by delivering their services to a worldwide audience.

Regardless of why you started live streaming, it's important to understand some basics to not only have appropriate expectations of your live stream audience, but to provide that audience with a quality stream that can be seen and heard clearly.

Tip 1: Streaming most likely NOT grow your membership

I can't tell you how many churches I have talked to that started live streaming thinking their membership would grow exponentially because now they could reach beyond their local walls. The obstacles facing a live streaming ministry are significant:

First, people have to be able to find your live stream and with SO many churches live streaming, that can be difficult.

Secondly, once they find your stream, the message and service has to resonate with what they are looking for.

Thirdly, most churches have not invested in quality lighting and their images are flat and have no depth or dynamic, and people have higher expectations these days.

Finally, knowing how to mix audio for a live audience is very different than mixing sound for a streaming audience—you have to understand that sound sources that are normally not mic'd must be to be heard well. Additionally, many times audio levels must be significantly higher prior to the live streaming encoding process so your viewers can hear clearly.

Tip 2: Software-based video and streaming solutions are the way to go

While they are tempting, offering high efficiency by combining several functions into an attractive package

with a relatively small footprint, potential pitfalls that you may not be aware of: what happens if the computer and/or software freeze up and need to be restarted during your livestream? Do you have an "emergency" plan for when your livestream goes down? How do you communicate this situation to your viewers? Another landmine is your operating system updates mid-week and your video and/or live stream software is not fully compatible with the latest OS version and this prevents your live stream from functioning properly, or worse, prevents it from happening at all. Know what you're getting into prior to making a final decision and regretting it.

Tip 3: YouTube and Facebook are good platforms because they are free

Yes, free is an awfully good price; however, one must consider the power a free platform has over your live stream. Too many stories have been told about how the platform has stopped the live stream during the program because of content guideline violations or some other such violation and while it gets sorted out (sometimes taking weeks), your live stream is offline. Paid live streaming can look quite expensive but having the ability to call support when a problem occurs can make all the difference for your church and your live stream audience.

Tip 4: Copyright

If you are not aware, you cannot live stream copyrighted works (audio, video, images, etc.) without proper authorization. For most music and video/film, the CCLI, CVLI and WorshipCast streaming licenses will just about cover your needs. However, research into what exactly is and is not covered by these streaming licenses can save you potential litigation and costly fines and potential prison time in the future. It makes absolutely NO difference to the FBI or the copyright holders if you are a non-profit or a church; copyright law is law and we should be examples of obeying that law by

taking the precautions and steps necessary to ensure we are not breaking the law, whether we mean to or not.

Tip 5: Punctuality

Starting your stream on-time and consistently will go a long way in helping establish a regular audience. When people know that they can rely on your live stream starting at the published time, it sets an expectation that builds trust when that expectation is met and this can help lead to new members because trust is a huge component for people looking for a church home or exploring Christianity. Remember, we can never know the experiences a viewer has had until they share their story so it's important to be upright, honest, live with integrity and be what God created us to be as often as we can.

Tip 6: Treat your live stream audience as important as your local audience

When you attend a church service, you have an expectation of interaction and engagement with other people-why should a live stream be any different? Having a live chat moderator and/or assistant pastors or elders online to help answer questions and engage with viewers is a good goal to aim for, particularly if you have a regular viewership. These are people just like your local audience that have real, meaningful

questions that deserve real, meaningful answers. There are many ways you can communicate your live stream audience's importance. On-screen graphics countdown to start time, perhaps during those times in many services where the energy dies down or for privacy reasons, the live stream needs to show other content (e.g. children's story), you can have pre-produced videos that play for your online audience only.

That is one example among a multitude. Watch other live streams, join social media groups about live streaming to see what others are doing and learn. Take what is useful, engage in these groups and make it a goal to maximize the resources you have available to you to provide the best experience possible for your live stream audience.

And don't feel badly because your live stream doesn't look amazing or you have issues when you're first starting out-it's a ministry that requires growth and learning-just keep at it and aim for excellence, not perfection. And remember to have fun! **T**

Tim Adams has served on the front-lines of church technical ministry for much of the last 20 years, working his way from audio recording and live sound to live video, lighting and projection.

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Six Days to Sunday: NOW Church's Stage Overhaul

BY RICKY PERINCHIEF



Over a decade ago, our worship pastor here at NOW Church, Lindsey Seals, was team chaplain for the University of Florida Gators Football team. Back then they were the best team in the country, winning the 2008 national championship—led by star quarterback and incredible man of God, Tim Tebow. Immediately following three morning services I had the privilege of driving Pastor Lindsey 45 minutes north to Gainesville for team chapel. My job was to setup and run all of the gear. We brought a keyboard or guitar, audio console, and a Mac running Pro Presenter so we could display

lyrics, sermon notes, and videos. We literally brought a stripped-down version of church to them every Sunday. During the week we would spend time behind-the-scenes with the coaches, staff, trainers, players, etc. A first-hand encounter of what it took to build a championship program.

Fond memories and stories from those days, but what stood out the most had to be the attention to detail, strategic planning, and personnel it took to perform at a high level each and every week. If you just watched on TV or sat in the stands on Saturday afternoons, you would have

no clue the sacrifices that were made or the amount of staff and volunteers it took to run this well-oiled machine.

As a pastor's kid, I think the same is true—especially in the local church. If people in the pews, seats, or watching online only knew the planning, the time, the amount of volunteers or staff it takes behind-the-scenes, each and every week to pull off such a strong and impactful worship experience, they would be amazed. These are the unsung heroes—especially in modern church.

My home church, NOW Church in Ocala, Florida, had been planning a massive stage overhaul for the past several months. Our stage design



and theatrical lighting had remained relatively stagnant for the past 13 years, though we could still rock that old thing! We joked that our moving lights were now teenagers and they just started rebelling at random times during services! We

were way overdue for an upgrade.

The process began with a meeting of the minds; our worship pastor, production manager, operations pastor, maintenance director and myself. We discussed our frustrations, limitations and

plans for future growth. The consensus: we needed to gut the entire stage back to the concrete slab and start over. Not only that, we had to get it done in just six days, so not one Sunday would be affected! Lofty? Yes. And it would take an army

of talented and dedicated people to pull off this feat! There were so many details that had to go into the pre-planning phase...more on that later! The ideas that came out of that meeting were then put into software so we could get a rough 3D





look at the design.

Once we had all the details broken down, we prepared a budget to submit to our senior pastors and board. A few weeks later we had approval and were ready to put it on the calendar. 2020 was going to

be a historic year for NOW Church turning 30 in May, with a conference scheduled for the last week of April and Easter just prior to that. We thought it would be a good idea to have the upgrade completed by mid-March so we'd have plenty of time

to work out the bugs and program lighting scenes.

Two weeks prior to install, our maintenance director, Jeff Wood, operations pastor, Chris Hays, along with a few experienced volunteers began pre-fabricating the

stage joists into twelve large sections in our warehouse garage. Our monthly Men vs Food connect group just-so-happened to be meeting that week and became the perfect recruiting pool! An independent contractor, electrician, carpenters,





painters, people with soldering experience, others who offered to clean provide food, etc. Our team was really starting to take shape and we were raring to go!

March was upon us and with news of the Coronavirus starting to take center stage, we proceeded with our plan cautiously. Demolition day was upon us. Following Sunday morning services, our team arrived to clear the stage, rip out old cabling, take down old light fixtures, and demolish the old stage down to bare floor!

Day two was all about getting the stage joists installed. We planned for access for maintenance or future changes by designing a small crawl space under the entire stage just 14.5" high. To keep all wiring organized below the stage, our team lined two wire troughs made from PVC gutters underneath the



stage floor. One gutter is for audio wire, and the other is for video and low voltage data. In-between the gutters is a path for the electrical conduit to avoid interference or shielding issues.

The stage construction is solid using 2x6's for the floor joists and two layers of 3/4" yellow pine for the stage floor. In addition to steps, we added two ramps on each end of the stage for easy access and for our wireless camera operator to cross the stage smoothly, providing a cool new broadcast angle.

Keeping the new stage clean and well-organized was a huge priority. We were



tired of all the spaghetti mess of cabling, so we designed custom stage pockets for each musician calling on Ace Backstage's expertise. We selected eight full-size pockets which allowed us to put one duplex electrical receptacle and eight customizable connectors for every band member. That means we could power their rig, pedal, iPad, etc; plug in their instrument via XLR connectors, connect their IEM to link personal monitor mixer via 1/4" stereo headphone connector, a Cat6a ethernet port to provide hardwired network

Lighting:

- 10x Chauvet Intimidator Hybrid 140SR 4x Colorband Pix-M
- 6x Chauvet Colorband H9 USB
- 11x Chauvet EVE F-50Z
- 18x Chauvet EVE P-100 WW
- 18x Chauvet OF625BARNDOOR
- 8x Chauvet SlimPar Pro H USB
- 1x Chauvet DATASTREAM8
- 1x Froggy's Fog Titan Hazer H4

Stage:

- 8x Ace Backstage Full-Size Stage Pockets with custom-designed audio, video, lighting, electrical and network connections.
- Audio:
- Avid Venue S3L-X-64 with Avid ProTools HDX
- 16x Pivitec E32 Personal Monitor Mixers (AVB)
- 9.2 Surround Sound Speaker System featuring Dolby SLS speakers and Fulcrum Subs
- Sennheiser Evolution G3 Wireless Mic's and IEM's
- 64x Ansmann 2850mah Rechargeable AA Batteries

Video:

- Blackmagic ATEM 2 M/E Production Studio 4K Switcher
- Blackmagic ATEM 1/ME Advanced Panel
- Blackmagic Videohub 20x20
- Blackmagic Hyperdeck Studio Mini
- Blackmagic Ultrastudio HD Mini (Pro Presenter)
- Blackmagic URSA Mini Pro 4.6K PL with B4 adapter
- 2x Blackmagic URSA Broadcast 4K Cameras
- 3x Fujinon XA20 B4 HD Lenses
- Blackmagic URSA Studio Viewfinder
- 3x Blackmagic Micro Studio 4K Cameras
- 3x Venus Optics Laowa 7.5f/2 Lenses
- DJI Ronin-M Stabilizer
- 2x Vaxis Storm 800+ Wireless HD TX and RX
- 7x Marshall CV502-MB POV Cameras
- 1x Jimmy Jib Triangle
- 1x Custom Wireless Track Camera on a Remote Control Car Chassis
- Blackmagic Multiview 4
- Unity Intercom (running on Apple iOS)



SOMETHING
SOMETHING
IN THE AT



spread fixtures/lenses for our white wash to limit the amount of light spill on the back wall and projection screen. That meant we needed more fixtures covering smaller areas. The rear wall was silver for many years with a large projection screen dead-center, but the new design called for blackout; so we decided to use matte black paint especially since our goal was to make the black disappear by hanging lights at more strategic angles and using barn doors to control excess spillage on the back wall and screen.

In total, 57 brand-new Chauvet DJ lighting fixtures: 10x Intimidator Hybrid 140SR's for our movers with six flown as backlights and four on the floor. Hybrid means it's a beam, spot,

for computer or midi devices, an HD-SDI camera input for our Marshall POV musician cams, plus DMX in and out for floor lighting or on-stage effects. Beyond that, we replaced all cabling that plugs into the pockets, using small jumpers to limit the amount of excess wires and keep things neat!

Day three was all-about laying new wire under the stage to each of the eight pockets, running electrical conduit to the receptacles, and setting up a soldering station to get all of those beautiful new pockets outfitted with our custom connectors!

Day four the flooring guys showed up and an ash black wood-grain LVP (Luxury Vinyl Plank) floor was installed. It's waterproof, highly-durable, easy to clean, and has good acoustical values. This was also a good time to double-check all of the connections were soldered correctly by line checking our stage boxes to our Avid Venue S3L-X at FOH and testing our camera feeds to our Blackmagic ATEM 2 M/E Switcher.

It wasn't until late on day four we finally started hanging lights! Early-on in the design process, I reached out to my friends at Chauvet Lighting and reviewed our lighting design with their national worship resource director, Daryl Sutton, who was a big help. We settled on fixtures from Chauvet's DJ line. Our room has some challenges: not a tall ceiling nor is the stage too deep; so we used more narrow-



and wash combined. 4x Colorband Pix-M's as blinder bars behind-stage used for crowd highlight or big worship moments, and these guys move too! 6x Colorband H9 USB's used as backlights to provide a nice color pop on the musicians and stage floor. 11x EVE F-50Z's used to spot out lead vocal positions allowing us highlight song leaders individually. 18x EVE P-100 WW's were used to light our preaching box, steps and floor areas, plus choir risers when needed. 8x SlimPar Pro H USB's provide a downward color wash on the vocalists and musicians. A DataStream8 ties all of our DMX lines together and brings them into our lighting console, Vista by Chroma-Q and runs virtually on a Mac without a

hardware console. Finally, we brought in the Froggy's Fog Titan Hazer H4 to make all of the lighting effects look amazing and smooth as silk-plus it's water-based so hypoallergenic and no oily residue on our gear!

With days five and six spent hanging and focusing lights, programming time was scarcer than we anticipated, so we kept it simple that first Sunday... which just-so-happened to be our final attended service before the Covid-19 pandemic changed the world!

Now more than ever, NOW Church's online campus is paramount in reaching outside the four walls-not only to our neighbors but being a light to the masses across

the globe who are quarantined at home. Our worship and production teams are busy on the front lines-delivering incredible content and powerful social media nuggets from our new colorful and clean stage! We just can't wait to fill the seats once again and create an atmosphere for God to move and lives to be touched in the

room as well as online. Nevertheless, we began this project with just SIX DAYS TO SUNDAY and what our team pulled off was nothing short of a miracle! **T**

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



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NDI – The Great Enabler for Live Video Production

BY JIM CAWTHON

When Rock Springs Baptist Church had to shut its doors recently due to the COVID-19 pandemic, we were thankfully pre-adapted to provide services to our congregation by streaming over the Internet, something we have been practicing for a while.

Since the outbreak, our viewership numbers quadrupled immediately and as a result, we were able to quickly ramp up our production from three live streams a week to nine.

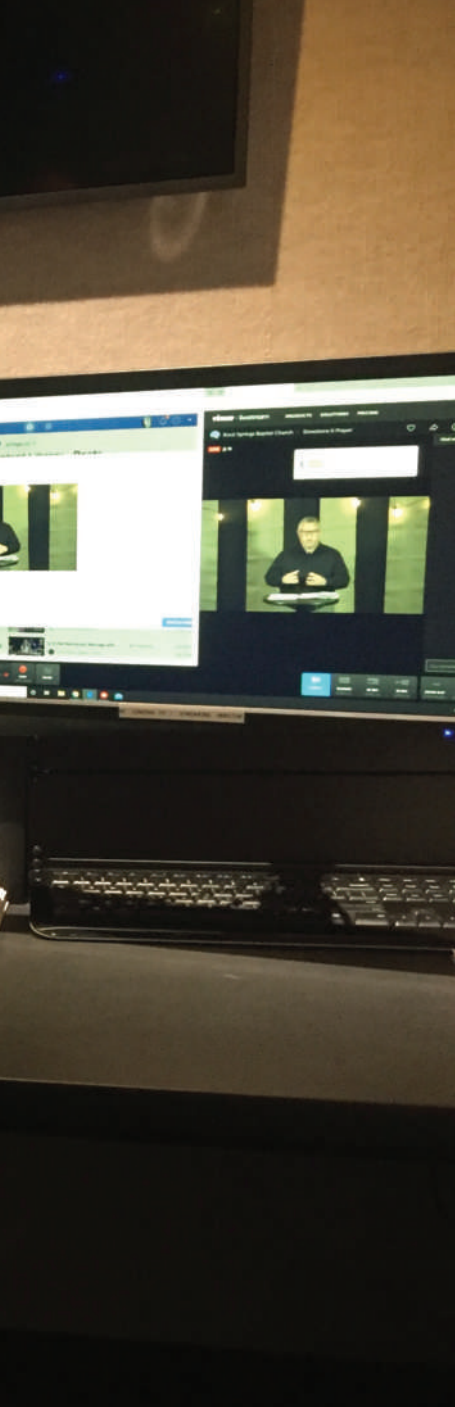
As a church congregation, we've been intrigued by live streaming technology for years and now consider ourselves on the cutting-edge thanks in part to one new technology we adopted last year called NDI.

NDI has transformed the way we create video content at Rock Springs Baptist Church. First and foremost, there is one aspect of NDI that needs to be stated as clearly as

possible: NDI is absolutely, 100 percent, free to use. Not just free for churches but to anyone to use.

NDI is simply a transport mechanism, so you'll still need to purchase cameras and other essential equipment. It was developed by NewTek, a company that makes TriCaster live video production systems which is what we use at Rock Springs. Look for cameras and other production equipment that are NDI-enabled. The main effect of implementing NDI in a live video workflow means it is easier, less time consuming, and less expensive to make multicamera video look like high-quality regular TV. It also allows us to do things we wouldn't have considered before because of the technical complexity of getting live video signals from one place to another. NDI makes it easy.

Because of NDI's ability to share video (and audio and metadata) signals across a network in real time, it has



seen adoption across the broadcast and pro AV worlds. NewTek uses it in their own products – from TriCaster live production systems to their own PTZ cameras – but many other manufacturers are utilizing NDI as well. Sony and Panasonic and other camera manufacturers make NDI-enabled PTZ cameras – we use Panasonics – and convertor boxes exist which can bring any HDMI or SDI device, like cameras, into an NDI workflow.

SO, WHAT IS NDI?

NDI is a network protocol that allows for video and audio to be transferred over standard, 1 gigabit Ethernet networks. In practical terms, that means you can send these signals over the infrastructure you are using in your building or campus right now. There is no need to build out a proprietary network nor run costly SDI cabling one channel at a time from one room to another. You simply plug your devices into the network, and you see all the NDI sources available to you. This opened up huge possibilities for us.

Further, there are a number of NDI tools that are also free to use. These allow you to bring atypical sources such as computer screens and mobile device cameras into your workflow. Yes, that means you could get a live video workflow together using just your cellular phone and a NewTek live production system.

NDI also means you can be flexible and scalable with your production. When we shut our doors due to the pandemic, we were able to quickly ramp up our production from three live streams a week to nine. We didn't need to buy any extra gear or cabling, we just plugged in the cameras to the network near our new studio setup.

The convertor boxes also deserve an additional mention here, because they allow any non-NDI camera to immediately be converted at the camera into a network signal. This means your current cameras aren't being left behind when you make the switch.

HOW TO GET STARTED WITH NDI

The onramp I suggest to people is to go with the 'system in a box' approach. We're a NewTek house and use both the NewTek TriCaster TC1 and the TriCaster Mini with Panasonic PTZ cameras. There is also the option of using NewTek PTZ cameras, but the beauty of NDI is that NewTek has made it not just free, but interoperable. You have the choice of using the gear you are most comfortable with.

But, with TriCaster you gain a few key capabilities: switching of video signals between multiple video sources, computer graphics to bring in production capabilities, and the ability to stream online to multiple sources simultaneously directly from the TriCaster. Even as we have increased our production to nine streams a week, the TriCaster still provides all we need to make each one look exactly as we envisioned it.

THE VERDICT

NDI is free to use, making the cost here a true five-out-of-five from anyone who uses it. It is a great enabler in this space.

And, as mentioned, it is also flexible and easy-to-use thanks to its true 'plug-and-play' nature. By working with your existing network, you not only save on traditional costs, but you elegantly simplify your setup and workflow.

Stability is, of course, key in a network technology. For our use over the past couple of years, we have zero complaints. A good testament to this, however, is to head to the NewTek or NDI website and see the list of clients that trust their broadcast-first brands with the NDI technology. It's so stable that businesses are staking their product on it – and when it comes to our stream, we do too. **T**

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

JIM'S REPORT

FLEXIBILITY



SCALABILITY



EASE OF USE



COST



OVERALL VALUE



The R BROAD

John Logie Baird's role in the introduction of broadcast television has earned him a prominent place in history and the number 44 slot on the list of the 100 Greatest Britons. While he was outranked by the likes of Sir Winston Churchill (#1); Diana, Princess of Wales (#3); Darwin (#4); Shakespeare (#5); and Elizabeth 1 (#7); and sandwiched somewhere between Charles Dickens (#41) and Boy George (#46), his contributions have impacted our daily lives - perhaps more than any other on that list.

Baird was one of the inventors of the mechanical television, demonstrating the first working system in 1926. Can you imagine what he'd be thinking today? No doubt he was brilliant, but did his genius allow him to envision the multitude of technology innovations, advances and downright revolutions that have brought theatrical performances into our living rooms, sporting events to devices in the palms of our hands, and church services to our PCs while we worship at home, either by choice, or now in these unprecedented days of social distancing due to the impact of the Covid-19 pandemic.

A near century's worth of improvements have replaced those first black and white blurred analog images with amazing color, we've gone from SDI to HD-SDI, and all the way through to UHD 4K pictures. And what would video be without audio? Talkies are here to stay! Audio has evolved from the small mono speakers of yesteryear, to Dolby 5.1 all around sound, to the introduction of Dolby ATMOS and object audio. No longer is the viewer just listening to audio tracks, they are now smack dab in the midst of the action, being drawn in like a participant with audio in front, behind, on either side, and even above.

TV broadcast technologies change constantly. Remember the introduction of satellite transmission? The first time you learned about cable TV? And heard about OTT streaming? Now there's Cloud technology which is only in its infancy. Users are moving cautiously toward adopting it, but don't we all know that the "Cloud" is really only a server farm somewhere in New Jersey (or some other equally familiar location).

The use of compressed video through HEVC 4K encoders and decoders provide viewers with an amazing experience. The "smart" TV has become a phenomenon with its own programmable capabilities and voice recognition. All these changes have had an extraordinary influence on everyone's daily lives. We not only take these improvements for granted, we have the audacity to reject inferior quality - on our TVs, mobile devices, or our computers - and demand better. Luckily the evolution of broadcast technology is on our side.

In his wildest dreams, Mr. Baird could not have imagined how his initial transmission has changed virtually the entire world.

Across Europe, the US and Canada, religious broadcasting has been around since the earliest days of radio. Over time, with the widespread adoption of television, formats have evolved to include a broad range of styles and approaches, and today many religious organizations record sermons and lectures, and distribute content on their own web-based IP channels. Computer capability and miniature camera quality have both improved so incredibly that remote worshippers feel as if they have a front row seat to a sermon.

Houses of Worship have benefited tremendously from technical advances. Churches are no longer limited by their physical surroundings but are leveraging streaming capabilities to grow



Thank You, John
Recent global cir
home a centu

Rise of PODCAST

BY CHRIS SHAW



Logie Baird.
Circumstances drive
necessity of change.

congregations remotely. New steaming technologies enable churches to deliver their message off-site to other campuses or to worshippers who are either too distant or unable to attend services for medical, family or social distancing reasons. Viewers can watch their favorite clergyperson via a variety of devices ranging from handheld phones and tablets, to desktop or laptop computers.

This has especially hit home since mid-March of this year when another seismic shift in tele-worshipping occurred, this time driven by the Covid-19 health crisis. Parishioners have been forced to abandon plans to attend services in the midst of the Holy Season for Christians, Jews and Muslims, and instead of visiting their favorite Houses of Worship, their favorite Houses of Worship now come to them. Easter Church services were streamed everywhere, and even Pope Francis's Easter Sunday service on April 12th was livestreamed to the world as he delivered Mass to a near empty St. Peter's Basilica in Vatican City.

And the answer to the traditional question at a Passover Seder ("Why is tonight different from all other nights?") took on a whole different meaning as Jews turned to Zoom to draw in family members from all corners of the world for virtual Seders.

In late April, Muslims are joining webinars organized by Mosques and Islamic teaching organizations for spiritual guidance during Ramadan and participating in virtual iftars (meals after sunset).

Covid-19 may have pushed the envelope for technology – or more to the point – its uses, but with all these advances (and I'm sure there's more) the thought process and workings of broadcasters have undergone radical changes. A range of streaming companies have cropped up to entice the viewing public with a vast variety of programming. AMAZON, NETFLIX, HULU and others have addressed our appetites for non-traditional entertainment and provided significant work for new production companies and members of the acting fraternity. Established entertainment companies such as Disney have had to adjust to remain competitive.

In summary, we know where we've been, but where are we going? Broadcasters have to adapt and accept change or become as obsolete as the dinosaurs. Understanding, incorporating and using the new technologies in today's world is vital for success and is keeping the world informed and connected. Many technical challenges need to be overcome, but with challenges come solutions. This is where the skills of the developers and manufacturers come into play. Investment in a workforce capable of understanding the challenges and the skill set to develop the necessary solutions is a wise investment. And just maybe, maybe that's how we got to now. Nearly 100 years after Mr. Baird unleashed his new-fangled invention on the planet, it's impacting nearly every facet of our lives, including the way we worship.

Names will change. Established companies will fall by the wayside. Corporations will merge. But the technology that drives broadcasting will never stand still. ■

Chris Shaw serves as Executive Vice President, Sales and Marketing for Cobalt Digital.

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Church Facilities Conference & Expo Launches CFX Connections



CFX Connections Podcast:

The first CFX Podcast features a conversation with author and industry leader Phil Cooke and Church Production Editor Brian Blackmore on Engagement Through Live Streaming.

The Church Facilities Conference & Expo (CFX) has created CFX Connections which consists of web-based content including new podcasts and newsletters. CFX Connections is a way for industry leaders to offer expertise and showcase opportunities for Houses of Worship to grow and connect with their congregations both during this turbulent time and as we revitalize following.

“CFX Connections podcasts offer conversations with industry leaders who provide insight and guidance to churches which is critical during times such as these. The newsletter offers original articles and features for houses of worship to utilize for improving their facilities, production and management skills,” said Ron Procopio, CFX General Manager.

Features and benefits of CFX Connections include:

- Free content for church tech, facilities and leadership teams
- Best practices and advice to sustain and grow your church
- The first CFX Podcast featuring a conversation with author and industry leader Phil Cooke and Church Production Editor Brian Blackmore on Engagement Through Live Streaming is now available.
- The first CFX newsletter will be available beginning April 23. **T**

For more information on CFX Connections visit:

<http://churchfacilitiesexpo.com/cfx-connections/>

To learn more about CFX, visit <http://churchfacilitiesexpo.com>



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Going SOLAR



What better way for houses of worship to show their commitment to 'going green' and taking care of the environment then by adding solar energy to their facility in the form of solar energy. Investing in solar energy can be a wise economic strategy, but is it the right one for your facility?

To fully understand what 'Going Solar' would mean to your ministry, there are a few important factors to look at before making an investment in solar panels and/or allowing a company to 'lease' space on your roof to generate solar energy for themselves for resale, as well as for your facility use.

First, you need to fully understand your current energy consumption, how that might increase in the future, and also explore how you might be able to lessen your energy footprint before you add solar to the mix. Are there inefficiencies in your current set-up

you can correct? Running older, non-energy efficient fixtures (think lighting and projection to start), appliances and an old HVAC system often costs more money than they're worth. It might be a more practical use of your budget to replace those first before looking at solar.

When considering solar energy for your House of Worship it is important to first examine how your House of Worship uses energy, how much it uses, and what steps can be taken that will reduce energy demand. Virtually all older buildings are inefficient in many ways.

If you are sure solar is the way to go, your next step would be to gather information – start with electric bills, gas, oil and water, going back at least a year. Know what type of HVAC system you are running and how old it is. Make a list of all your gear and all your appliances, look at their age and (if

Fully understand your current energy consumption, how that might increase in the future, and explore how you might be able to lessen your energy footprint before you add solar to the mix

you can) check out their specs on power draw. Being knowledgeable about what type of energy you will need to draw with your solar will be extremely helpful as you move forward.

There are several programs your church might qualify for when going green, so do your research. Depending on what state (or

country) you are in, there could be rebates waiting for you. A simple Google search for 'solar panel rebate programs in the United States' pulls up a plethora of links, including this one that has clickable links for every state: <https://www.wholesolar.com/solar-information/state-solar-incentives> **T**

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