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**'He came down to earth from heaven,  
Who is God and Lord of all,  
And his shelter was a stable,  
And his cradle was a stall;  
With the poor, and mean, and lowly,  
Lived on earth our Savior holy.'**



**Merry Christmas and Happy New Year!**

Michelle, Darryl, Kim, Jean

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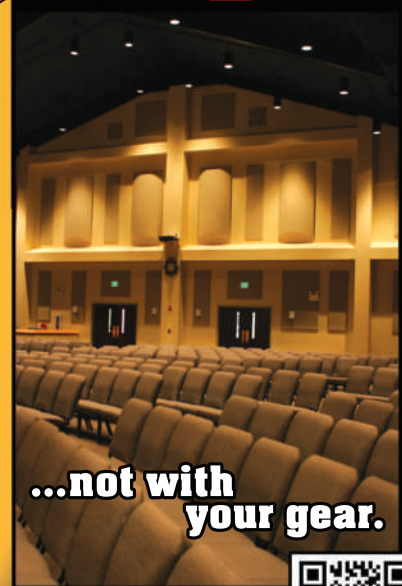
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# PRESONUS SPHERE



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# SMALL FORM FACTOR BIG IMPACT

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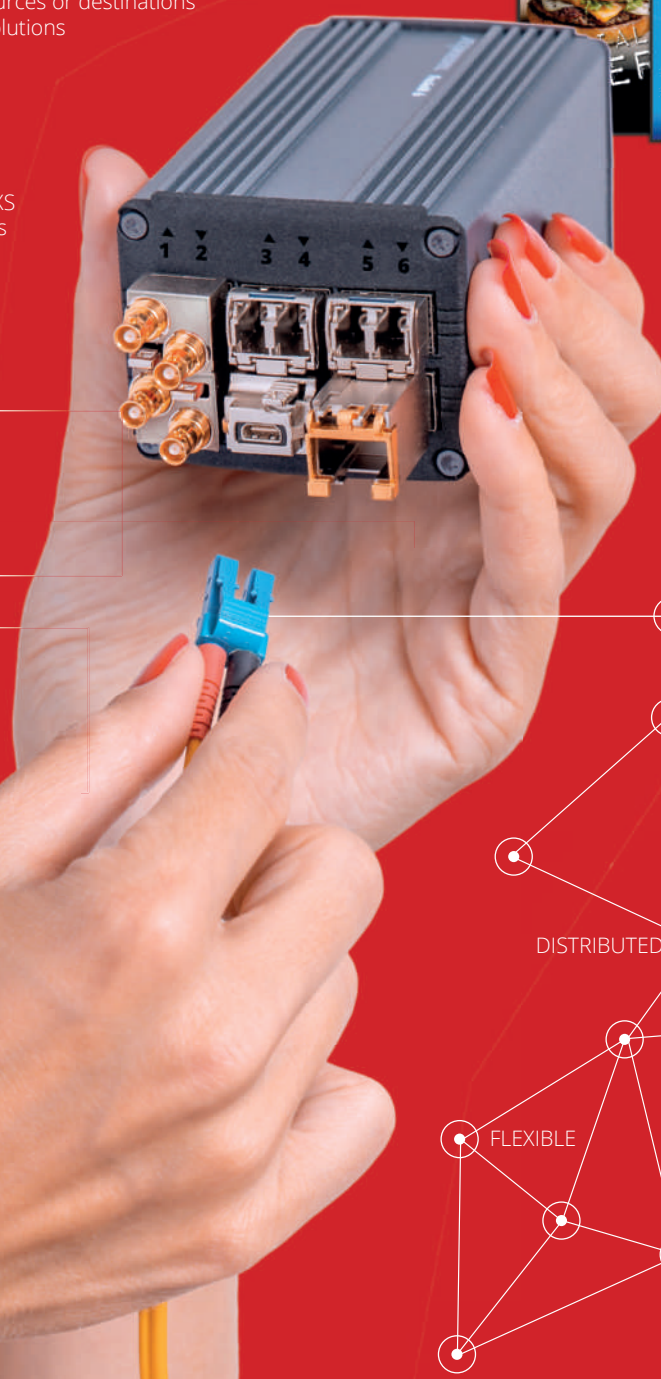
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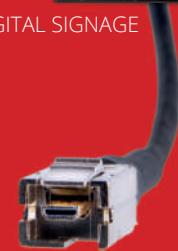
### FUSION 6



### FUSION 3



DIGITAL SIGNAGE



### CONNECTIVITY

- HDMI
- ETHERNET
- FIBER
- SDI

### IP VIDEO



## ELATION PROFESSIONAL MOURNS LOSS OF FRIEND AND COLLEAGUE JOE ADAMS

**I**t is with deep sadness and the heaviest of hearts that Elation Professional and the ADJ Group



of Companies announces the sudden passing of our friend and colleague Joe Adams on Saturday, November 14, 2020.

An esteemed and beloved colleague, Adams, 53, worked as a regional sales rep for Elation Professional from 2017. He began in the lighting industry in 1998 with his own company as an American DJ dealer and came to the Elation family from manufacturers rep firm PSLP. Most recently, he operated his own firm Epic Pro Sales. In total, he proudly represented the ADJ Group of Companies' products for over 20 years.

"On behalf of Elation Professional and everyone at the ADJ Group of Companies, we express our sincerest condolences to the Adams family as we keep his wife Kim and their three children in our thoughts and prayers," said Eric Loader, Elation Director of Sales & Marketing. "Like so many others, we are heartbroken. Joe was a positive, genuinely kind-hearted person and a much-loved member of the Elation and ADJ family. Joe had a passion for life and work that was infectious and inspiring and he always found something to smile about. He was a true beacon of light in life and in our industry and he will be sorely missed. We are thankful for the time we had with Joe and the memories we made together with him." **T**

## FULL COMPASS ADDS FOUR INDUSTRY VETERANS TO NATIONAL SALES TEAM

**A**fter a nationwide search, Full Compass is proud to announce that four leading industry professionals have joined their National Sales Team. This new group brings an average of 24 years of experience in the Pro Audio, Video and Lighting industries from the manufacturer side of the industry and from Independent Rep firms. The new additions come positioned with extensive product knowledge and will be generating immediate contributions to Full Compass' continued growth.

Parker Bradley is a former National Sales Manager from beyerdynamic, having also spent time at Mackie/Loud Audio as a Regional Sales Manager, and at Guitar Center as a District Manager in the Austin, TX market. But Parker describes his most accurate position title as Sales Leader / People Leader / Dad.

Lin Buck is a veteran of the Pro A/V industry. He was most recently the Director of Sales at MSE Audio. Prior to MSE, Lin was the Sr. Manager for Harman's Live Entertainment Sales Division. Prior to Harman, he worked at Electro-Voice/Bosch Security for several years as their Regional Sales Manager.

Ricardo Hurtado is a singer/songwriter, stand-up comedian, and works in photography and video production. Back in March of 2019, he decided to try something new outside of the industry, but has since been successfully brought back into the world of Pro A/V/L. Ricardo has experience as a Manufacturer's Sales Rep and has recently worked at McFadden Sales representing brands such as Shure, Atlas IED, Williams, Vanguard and more. Prior to McFadden Sales, he worked at Techrep Marketing, which represents Sennheiser, Presonus, UA, Genelec, Phillips, QSC and other premier lines, with extensive experience as a liaison to the integration market.

Daniel Bostick decided to leave Nashville behind and move to Colorado in 2019. Prior to his relocation, he worked at Full Scale AV/Techrep Marketing for several years directing their Inside Sales Support Team and Distribution Operations, as well as managing their North American Field Sales Force. Prior to Techrep Marketing, Dan was with AKG/Harman out of Nashville as a Key Accounts Manager and at Mackie Designs in Washington as their Technical Sales Trainer. **T**

## STREAMS AND STREAMGUYS PARTNER

**S**treamS and StreamGuys announce an alliance for providing next-generation, high-performance live audio streaming using fully compliant standards-based CMAF HLS for low-latency, adaptive-bitrate HTTP Live Streaming (HLS). Together, both provide a complete end-to-end streaming solution that is reliable, scales to rapidly growing large audiences, and reaches more modern devices with stunning audio quality.

CMAF HLS is the same successful technology that is fueling the "cord-cutting" that video content providers currently enjoy for OTT and other Direct-To-Consumer (DTC) services. By leveraging the standardized container of the Common Media Application Format (CMAF), content providers can reach a broader diversity of devices with a single file set, which results in more efficient content delivery, reduced streaming costs, and increased audience.

StreamS and StreamGuys will partner to bring these same benefits to audio content providers, including DTC services and radio broadcasters looking to expand their streaming presence. Using CMAF HLS, these customers can scale with greater strength and cost-efficiency than with older-generation streaming protocols, and leverage the latest high-efficiency codecs, such as xHE-AAC and the broader AAC family, to cover everything from high-quality voice to high-quality 7.1 surround. **T**





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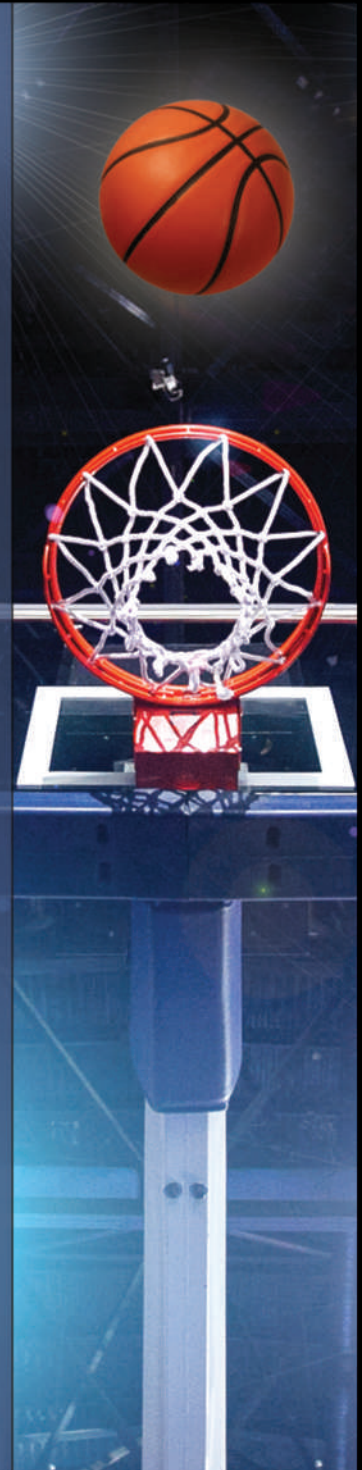


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Installation at Mackintosh Academy, Littleton, Colorado

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## dB Integrations Lights Present and Future Church with CHAUVET Professional

Planning ahead isn't a luxury, it's a necessity that no church can do without, especially one that's on a tight budget. Brad Lyons and the team at dB Integrations proved the wisdom of this statement recently when they completed installation on a new construction project for Northridge Church.

Until recently, Northridge held Sunday services at a community arts center, setting up and tearing down its worship space each week. When the church decided to design its own building, its leaders initially planned on purchasing and installing all equipment themselves, before realizing they needed a professionally engineered plan. They called dB Integrations, which helped them create a lighting system that could meet their needs now and in the future with help from CHAUVET Professional fixtures.

"As is the case with many smaller churches, budget was an issue," said Lyons. "Working with the church, we showed them how to stretch their lighting investment, while at the same time invest in an infrastructure that would allow them to expand later. Our engineering team of Bill Johnson, David Clark and Victor Puddy were all key in helping the church balance current and future needs, not just with lighting, but with AV as well."

Northridge's new church building had three light poles about 25' over the stage for key lighting. Lyons and his team installed six Ovation E-160WW ellipsoidal fixtures with 26° lenses over the center pole. They also installed four additional Ovation units on each of the two outside poles. Each of the poles also had an independent 20-amp circuit installed to provide power for additional lights, such as

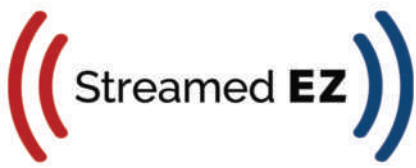
moving fixtures and stationary color washes in the future.

"Originally, we thought of going with 19° lenses, which would have required more fixtures for an even spread of key lighting. But in the design process, using advanced software analysis, it was determined that we could use fewer fixtures if we went with 26° lenses and get more than enough lighting for broadcast standards, while also saving the church money so that other needs could be addressed," said Lyons. "The Ovation fixtures have proven every time on every project that they are of the highest quality performance, incredibly efficient in terms of cost and power."

dB Integrations also installed 10 SlimPAR Q12 USB fixtures from CHAUVET DJ above the back of the stage for color washing. Initial plans called for the installation of 20 SlimPARs, including eight that the church owned and used for its temporary services at the community art center.

"We scaled back the number of pars used because of budget," said Lyons. "However, the versatility of the SlimPARs allowed us to do this without losing a great deal. We could do things like use the fixtures' amber color mixing to get a warm white to eliminate shadows for live streaming. We also installed another 20-amp circuit on the stage just for future lighting, and we added a dedicated DMX port into one of the floor pockets.

"The idea of this project in general was to provide the church with great lighting today," said Lyons, "but also to invest so it could expand that lighting tomorrow as it grows and its needs change without having to ask the question, 'Will our infrastructure support it,' because YES, YES IT WILL." ■



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# Mill Plain UMC Taps Timato Systems for New Video System

It was a cold, frost laden morning in March when the pastoral team at Mill Plain United Methodist Church in Vancouver, Washington received word that indoor gatherings would be reduced to fewer than 50 persons while maintaining 6 feet of distance. As with many churches with small gathering spaces, this reduced the actual number to fewer than 25 to maintain compliance. While wanting to keep the church community going, and without a single piece of church owned video equipment, this sent the pastoral team to hastily respond with a single smartphone streaming a modified, speaking-only service over Facebook.

One church volunteer, Chris Bauman, suggested that a video service that more represented a “normal” church service for Mill Plain UMC would be best accomplished by moving toward a pre-recorded video service,

assembled using video and audio clips into iMovie on his home Apple laptop. While this allowed for increased capability, it required no fewer than 40 volunteer hours each week and increased technical support to have parishioners and lay leaders provide quality video and audio recordings. Since this was not a sustainable solution, nor did it prepare Mill Plain UMC for a post COVID-19 era, the ministry team assembled a Future of Worship team to strategize on a sustainable way forward to engage their existing congregation and continue to reach new families moving into their ever-growing geography.

As the primary technology lead of the new Future of Worship team, Chris Bauman reached out to the Live Streaming Technology Help Facebook group, where he connected with Tim Adams of Timato Systems who was local to him in Vancouver,

Washington. After several online discussions about Mill Plain UMC’s goals for live streaming, a quick on-site visit helped illustrate both the needs and potential technology solutions. Tim recommended a two PTZ camera setup running through a switcher and into a hardware encoder for live streaming.

While a four-channel switch was all that was needed at that point in time (camera one, camera two, presentation, lower 3rds/props) it was decided that a switcher with room to grow would be preferred as a way to somewhat future-proof the hardware investment. The live stream system designed, and eventually installed, is comprised of two PTZOptics 20x SDI PTZ cameras, controlled by the PTZOptics Gen 3 IP joystick, and a Roland V-8HD 8-channel HDMI switcher.

A new Windows 10 laptop runs ProPresenter 7 with two discrete outputs; Output one sends full screen slides and imagery to the switcher while Output two sends only the Props layer which is used for lower third graphics. The Program bus of the switcher controls what the live stream and recording sees while the on-board Auxiliary bus feeds the in-room projection system. A Magewell Ultra Stream HDMI provides recording and live streaming capability. Tim connected the switcher Multiview output to one 24” TV, and the Program output runs to the Magewell, whose HDMI output connects to a 2nd 24” TV as a confidence monitor.

Tim also provided two different training events for a new crop of tech volunteers, covering topics like camera composition and signal flow theory, as well as hardware and software specific practical application.

A stage lighting upgrade is also in the works through a different vendor that will help further boost the live stream image quality.

The church is thrilled to have improved their live streaming quality and capabilities, while meeting their ministry team’s goals, and is looking forward to exploring more functionality with both ProPresenter7 and the Roland V-8HD. **T**



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INSTALL / LEESBURG, VA



## Cornerstone Chapel embraces AoIP with Lawo mc²56 Console

A new 32-fader Lawo mc²56 audio production console has been installed by Cornerstone Chapel in Leesburg, VA, for their front-of-house audio system, greatly expanding their mixing capacity and completing their transition to IP networking.

The new Lawo console, based on RAVENNA / AES67 IP technology, handles both live performances and broadcast tasks, providing a wide range of new options to help Cornerstone prepare for the future.

The installation includes a Lawo A\_\_UHD Core providing 512 DSP

channels, two Compact I/O stageboxes, a Nova73 router capable of routing 8092x8092 mono channels, and Dante integration to feed the facility's Yamaha CL5 monitor console and other Dante equipment. The mc²56 also includes a WAVES Super Rack integration and smart GPIO settings to change the DSP presets of the BSS audio processor.

Cornerstone's Audio Director, Joey Burdette, along with his production team, decided that investing in an IP audio system was a prudent investment in future technology. "This Lawo solution provides Cornerstone with features

that will cover our FOH needs for the foreseeable future, as well as providing expandability for future projects. Because the A\_\_UHD Core can be a pooled resource for up to four consoles, we can easily expand our capabilities just by adding additional surfaces and stageboxes around the campus. Connecting everything with an IP network makes growing the system very easy."

Joey previously worked at McLean Bible Church at Tysons Campus in Washington, D.C., which was upgraded in 2018 with an mc²56 at FOH and an mc²36 at monitor position, so he was already

intimately familiar with the performance and features of Lawo consoles. After discussions between Cornerstone and Lawo in February 2020, the order for the new Lawo audio infrastructure was placed in late July, and the project completed according to plan in October 2020.

This mc²56 is now being used for FOH in Cornerstone's sanctuary for mid-week and Sunday services, as well as young adult services and other larger church gatherings.

"The relationship we have with Lawo is unlike any other," says Burdette. "Lawo goes above and beyond to discuss features and solutions that are tailored to exactly what the customer needs. We really value the integrity of the company."

For Joey, flexibility is important, especially considering how often the console is used and how many different operators, each with their own workflows, work on the mc²56. "The flexibility, workflow, reliability, and expandability of our mc²56 are things no other console offers. And the audio quality is beyond anything else on the market. Our operators love how user-friendly it is and how fast it is to work on; the console adapts to their workflows instead of the other way around!"

Cornerstone already has plans for expanding their new Lawo IP system. "We're already looking to add more Lawo audio consoles to our facilities, and we're looking at Lawo video infrastructure products too," Burdette says. "With Lawo, we're prepared to handle whatever the future brings us." ■

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From small country chapels to medium (and larger) sanctuaries, SLX-D has a lot to offer. Take advantage of up to 32 compatible wireless systems per 44 MHz band of handheld, lavalier, headset, and instrument microphones. Whether

you're simply mic'ing up the pastor with a single-channel headset or lavalier, the worship team with multiple handhelds, or the whole stage with a couple of dozen bodypacks and lavaliers for the youth play, SLX-D can grow with you as your worship needs grow.

Wireless systems can be quite a mystery for many volunteer and newer audio technicians. SLX-D demystifies wireless audio with simple-to-set-up RF scan and IR sync so you're ready to go at the push of a button. Shure also included a guided frequency setup tool in every SLX-D receiver and manual frequency selection for additional control. What's more, technology teams can manage multiple system group scans,

firmware updates, and local setup and control from just one receiver by connecting all receivers via ethernet.

In front of the congregation, message clarity is essential. There's no reason you can't have clarity and the freedom wireless offers at the same time. SLX-D provides crystal-clear 24-bit digital audio quality and no dropouts so every nuanced word is understood and felt exactly as the pastor intends without having to be tied down by a cumbersome cable.

SLX-D handheld and bodypack transmitters are good for up to 8 hours of use from 2 AA batteries (included). Additionally, Shure also offers eco-friendly choices that save a good deal of money

over time by way of optional smart lithium-ion rechargeable batteries and single and dual charging stations.

Shure has been an industry leader in wireless technology for decades and their newest entry seems to tick a lot of boxes. It's easy to set up and use, simple to scale as needs grow, offers 24-bit digital clarity and solid RF performance, and is available in single half-rack and dual full-rack receivers with handheld and bodypack transmitter options with industry standard Shure microphones, such as the venerable SM58 capsule.

Go to [www.shure.com/slx-d](http://www.shure.com/slx-d) to discover which SLX-D configuration is right for you. **T**

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# Audix TM2 Integrated Acoustic Coupler for In-Ear Monitors

The TM2 provides a simple and affordable way for church sound engineers to test in-ear monitors reliably and easily before and after services. Audix, who continue their legacy of innovation, addressed this ongoing scenario with their latest product release – The TM2, an integrated acoustic coupler for in-ear monitors (IEMs).

The TM2 is the perfect tool for house of worship live sound engineers, who want a simple and effective way to test IEM performance and specifications.

“We saw a need for a tool that didn’t really exist, and instead of waiting for one to come along, we just built it,” says Steve Young, Director of US Sales at Audix. “Along with our new line of studio headphones and two new large-diaphragm studio microphones - the A131 and A133 - the TM2 is just another example of how innovation is alive and well at Audix.”

The TM2 incorporates the functionality of lab-type IEM testing equipment into a patent-pending,

compact and easy-to-use tool that was specifically designed for the requirements of the sound professional.

Sound engineers are often faced with questions from performers regarding the functionality of their IEMs with no reliably consistent way to test them. With the TM2 and commonly available test-and-measurement software, a monitor engineer can easily confirm the functionality of each performer’s IEMs before every performance. If issues do arise, troubleshooting is simplified using an easy-to-follow process.

By pairing the TM2 with 3rd-party PC or iOS-based test and measurement software, which includes transfer function capability, along with the associated audio interface (mic input and headphone output), an IEM’s magnitude and phase “trace” can be generated and compared to previous measurements of the same device. Doing so will highlight any frequency or phase changes due to device damage or degradation over time. Comparing the performance of the left and right

earpieces can also help to identify potential issues.

Let’s say a church is using IEMs for their praise band and want to ensure they are working correctly. The sound engineer would simply run a trace on the IEM to get a base measurement prior to service and if one of the musicians finds that the sound is not quite right in their IEM after that initial sweep, the sound engineer can do a quick test of the IEM and compare it to the initial trace and know within seconds if there is an issue with the IEM or if the musician is simply having an off day.

The TM2 can also measure dB and SPL levels on an IEM, so a sound engineer can set the IEM to a specific dB level, ensuring they stay under that ceiling, which can help with hearing safety.

To learn more about the TM2, including setup and tutorial videos and pricing, head over to the newly redesigned [audixusa.com](http://audixusa.com). **T**

**Available now.**



# THE LIGHT SOURCE<sup>INC</sup>



[thelightsource.com](http://thelightsource.com)

704-504-8399

There is nothing like coming in on a cold, dark night to the vibrant, crisp white of The Light Source LED fixtures. Scintillating RGB colors and a variety of styles will warm your heart. The sturdy, convection cooled fixtures are manufactured in the USA and come with a 10 year guarantee. With a maximum of 12,641 lumens, The Light Source fixtures can certainly light up your winter.

# Pliant Technologies MicroCom XR Digital Wireless Intercom

With unmatched performance, outstanding simplicity, and value, Pliant Technologies' MicroCom XR digital wireless intercom provides full-duplex, multi-user communication for applications where high-quality audio, extended range, ease of use, and affordability are essential. As the first wireless intercom solution of this feature set to be available at this price point, MicroCom XR offers exceptional sound quality and range, providing more features and performance to users with modest budgets.

## Specifications

### Radio Frequency Type

- ISM 902-928 MHz
- ISM 2400-2483 MHz

### Radio Transmission Type

- GFSK with FHSS (Frequency Hopping Spread Spectrum)
- RF Output Power
- 400 mW (EIRP)

2 Intercom Channels

Detachable Helical Antenna (1dBi of Gain)

OLED Display

### Environmental

- IP67-Rated

### Users

- 10 Full-Duplex Users
- Unlimited Shared Users
- Unlimited Listen-Only Users

### Charge Type and Battery

- USB Micro; 5 V 1-2A / Drop-In Contact
- Rechargeable 3.7 V; 2,000 mA Li-ion field-replaceable battery
- Battery Life of approx. 12 hours
- Battery Charge Time of 3.5 hours (USB cable) or
- 6.5 hours (Drop-In charger)

### Dimensions and Weight

- 4.83 in. (H) × 2.64 in. (W) × 1.22 in. (D, with belt clip)
- [122.7 mm (H) x 67 mm (W) x 31 mm (D, with belt clip)]
- 6.35 oz. (180 g)





## **FIVE KEY FEATURES FOR HOUSES OF WORSHIP**

### **Flexibility**

MicroCom XR features a two-channel intercom system that allows up to 10 full-duplex users. The beltpack also features a range of operation modes including a “Shared User” mode, which allows up to nine full-duplex users plus unlimited push-to-talk users (Shared) that can have one talker at a time. MicroCom XR can also have an unlimited number of users in “Listen-Only” mode.

### **Ease of Use**

Without the need for a base station, MicroCom XR offers a flexible solution for a range of applications. The system is simple to set up and easy to operate, which is especially beneficial for house of worship facilities that often employ less-technical staff and volunteers.

### **Durability and Battery Life**

The system’s rugged, small, water-resistant (IP67 rated), lightweight beltpacks have been built to endure the wear and tear of everyday use as well as the extremes of outdoor environments. Additionally, a 12-hour (field-replaceable) battery life, and optional drop-in charger provides users with a dependable solution that is always ready for production use.

### **Headset Options**

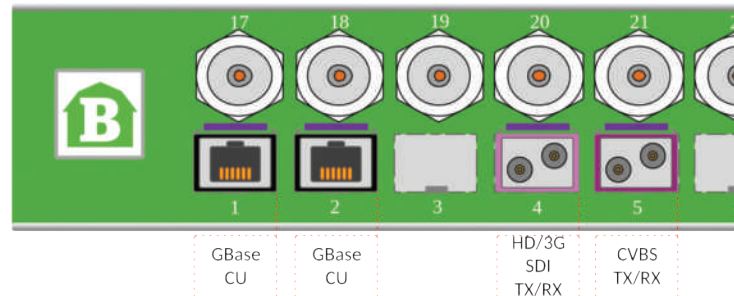
MicroCom XR is compatible with a wide range of professional headsets, including SmartBoom LITE and SmartBoom PRO. For house of worship applications where budget and quality are critical, MicroCom XR, paired with a SmartBoom headset, is an extremely effective intercom solution.

### **Coverage**

MicroCom XR is available in 900MHz (North America) and 2.4GHz for worldwide use. Providing superior range and performance, MicroCom XR customers across the globe can get coverage where they need it.

# Barnfind's BTF1-07

Maximize the use of your studio, production and presentation equipment and connect your cameras, video and audio sources, playback systems and large displays to your control panels. The BTF1-07 provides all of the fiber transport, multiplexing, routing, conversion and distribution features to interconnect your presentation tools to your control rooms and is available with eight or 16-channel multiplexer included.



## SPECIFICATIONS

### Electrical ports

- 8x bi-directional BNC ports
- 75 OHM BNC connector
- SMPTE 259M, 292M, 372M, 424M, DVB-ASI
- Multi-rate re-clocking of outputs 270Mbps – 3Gbps
- Automatic cable EQ (Belden 1694A) 270Mbps-250m, 1.5Gbps-140m, 3Gbps-80m

### SFP ports

- 16x SFP ports (small formfactor pluggable) for transceivers, MSA compliant, up to 3Gbps
- SMPTE 259M, 292M, 372M, 424M, 297M, DVB-ASI
- SFP modules are hot pluggable/swappable
- Single-mode, multi-mode or media-converter SFP modules
- Multi-rate re-clocking of outputs 270Mbps – 3Gbps

### CWDM Mux & Demux

- 8/16 optical channels
- Center wavelengths according to ITU-T G.694.2
- Channel center wavelength 1290~1590 nm

- Channel clear passband ITU +/- 7 nm
- Insertion loss 8ch-2.5dBm, 16ch-3.5dBm (max)
- Passband ripple 0.5dBm (max)
- Adjacent channel isolation 30dBm (min)
- Non-adjacent channel isolation 45dBm (min)
- Return loss 45dBm (min)
- Directivity 45dBm (min)
- Polarization dependent loss 0.1dBm (max)
- Operating temperature range -20C to +70C (optional -40C to +85C)
- Storage temperature handling – 40 to + 85C
- Maximum power handling 300mW

### Power supply

- 12V DC 120W power supply included
- Redundant power supply optional

### Physical size

- 445mm x 280mm x 43,5mm (17.5" x 11" x 1.7")
- 3.8 kg

**Includes BTF1-07 mainframe, power supply 12V DC**



## FIVE KEY FEATURES FOR HOUSES OF WORSHIP

### A Full 32 x 32 Router to Send any Source to any Destination

Route SDI, AES, MADI, HDMI, camera control, intercom and Ethernet from any source to any destination at the push of a button; maximize the use of your equipment and increase the efficiency and effectiveness of your production.

### Convert any Source to the Signal Type You Need

From SDI to HDMI and VoIP, you can seamlessly convert and transport a multitude of signals all in a 1 RU device. SDI, AES and telco formats are supported including KVM, SDTI (e.g. EVS), SMPTE 2022-6, MADI, SDI to IP, Ethernet, 4K 60p workflows, HDMI, DVI, Serial, GPI/O, CVBS, CAM-CCU (including video, audio, tally, intercom, RCP) etc.

### Built-in Multiplexer Combines 16 Signals to One Fiber Strand

Combine all of your signals – regardless of direction – onto one single fiber. Up to 16 signals can be combined and carried onto one single fiber strand (32 is possible with special BARNFIND-USA technology).

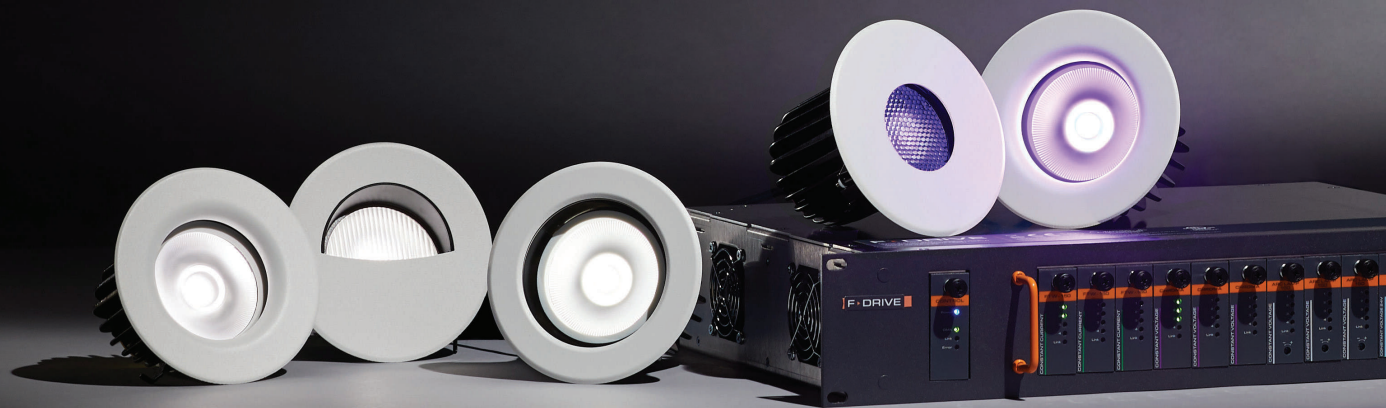
### Advanced Signal Redundancy with Auto-Switch to any Chosen Input

Avoid any and all signal failures; the BTF1-07 monitors all inputs and can auto-switch to another working input (defined by the user) in case of failure.

**BARNFIND provides its own software for controlling the unit;** as well, the unit is compatible with all popular router control software including Ross openGear/DashBoard, Skyline/Dataminer, ScheduALL, LAW0/VSM, BFE/KSC, DNF Control, TSL, RASCULAR, Black Magic, Axon Cerebrum, SAM SW-P-08 etc.

# ETC ArcSystem Navis & F-Drive System

ArcSystem Navis is a line of modular luminaires prioritizing versatility and user customization. Whether you require fixed white, Fade to Warm, or full color, Navis has the engine, optic, trim, and mounting option you need. When combined with the F-Drive system, you add the simplicity of low voltage lighting from a centralized, modular distribution system.



## SPECIFICATIONS

### Navis 100 specs

- High-grade, field-changeable TIR optics and accessories
- Stepless smooth dimming
- Fan-free, silent operation
- Multiple color-temperatures (2700-5000 K) and Fade to Warm
- RGBW color-mixing option
- 15°, 25°, 40°, and 60° beam angle options
- Centralized driver for improved accessibility
- Variable ceiling-thickness mounting mechanism
- Locking 360° rotation and 30° tilt
- Variety of Trim styles and colors: Black, white, primed, or custom
- Height: 98 mm / 3.86 in
- Width: 127 mm / 5 in
- Depth: 127 mm / 5 in

### F-Drive R12 specs

- Rack-mounted driver system with twelve hot-swappable output cards,
- Drivers for Fade to Warm, Constant Current, Constant Voltage, Chroma, and ArcLamp luminaires
- Versatile RJ45 or Terminal wiring system
- Modular output connectors for higher gauge/existing wire (Max 14 AWG / 2.0 mm<sup>2</sup>)
- Precise and robust control via DMX512/RDM
- 48 VDC Input (via separate power supply)
- Dry contact panic input for remote triggering of output channels
- 48 VDC pass-through for connection to downstream sense equipment
- Finish: Black, fine-textured, scratch-resistant powder coat paint
- Product weight: 4.18 kg / 9.22 lb
- Height: 88 mm / 3.46 in
- Width: 483 mm / 19 in
- Depth: 321 mm / 12.63 in





## FIVE KEY FEATURES FOR HOUSES OF WORSHIP

### HIGHLY CUSTOMIZABLE

Twist-and-click beam angle optics, magnetic trim plates, and clip-in optical accessories make your bespoke LED system easy to build. Navis' modular format invites design configuration in a snap.

### PRISTINE LIGHT

Navis packs pristine, bright optics in a small form factor. Optional Fade to Warm technology beautifully mimics incandescent red-shift for a traditional look. Or, select the full-color option with ETC's legendary Color Integrity standard.

### EASY INSTALLATION

Install new or retrofit Navis luminaires into a range of ceiling thicknesses, with full room side directional adjustment and locking. For wiring, the F-Drive RJ45 effortlessly connects multiple luminaires on a single Cat6 cable.

### ACCESSIBLE CONTROL

F-Drive's intuitive design makes it easy to service the critical components controlling your luminaires from the convenience of an electrical room, rather than the confines of a ceiling.

### SMOOTH INTEGRATION

F-Drive is designed for Navis luminaires and compatible with many third-party LED fixtures. Choose F-Drive R12 rack or W1 wall-mount depending on your needs.

# FOR-A HVS-490 Production Switcher

Designed for I-MAG within the church and live streaming for remote worshippers, the 2-6 M/E HVS-490 3G/4K live production switcher delivers professional results with volunteer crews. The HVS-490 provides houses of worship with the power, flexibility, and ease of use they need to engage their off-site congregations. It's the perfect solution for facilities that have limited space but need unlimited possibilities. The HVS-490 includes a three-year parts and labor warranty. Starting at \$26,900, including control panel.

## 4K MODE SPECIFICATIONS

4K UHD signal: 3840 x 2160/59.94p, 50p  
3G-SDI (Level-A) x 4 (quad link), 2SI or SQD  
3840 x 2160/29.97p, 25p, 24p, 23.98p  
3G-SDI (Level-B-DS) x 2 (dual link), 2SI  
HD-SDI x 4 (quad link), SQD  
3840 x 2160/59.94i, 50i, 29.97PsF, 25PsF, 24PsF, 23.98PsF  
HD SDI x 4 (quad link), SQD  
HDMI output: 2 outputs, 4K UHDTV (3840p)  
Processing: 4 : 2 : 2, 3G-SDI, 10 bit  
Transitions: Same as in regular mode  
2.5D DVE : 2SI: Standard: 4 (2\*), Max.: 5 (4\*)  
(\*at 3840 x 2160/59.94p, 50p) SQD: Not supported  
Keyer: 2 channels: luminance keyer, full keyer,  
bus keyer, box mask  
FLEXaKEY: 1 channel: luminance keyer, full keyer,  
bus keyer; output to M/E, MELite, or AUX  
Color corrector: 1  
Still/clip store: 1  
Multi viewer: 3 lines of multi viewer output  
(some layout restrictions)  
2SI  
Split display: 2/4/5/7/9/10/11/14/15/16 windows  
Audio level meter, border, tally, clock displays  
SQD  
Split display: 1/2/4, clock display  
Genlock input  
System phase adjustment (Same as in regular mode)  
Video I/O delay



# FIVE KEY SPECS FOR HOUSES OF WORSHIP:

## MELite™

With MELite technology, you can transform traditional AUX buses into fully functional M/Es. Unlike other virtual M/Es, MELite allows you to preview transitions. Add to the complexity of your live productions without adding cost.

## FLEXaKEY™

As the name implies, these are flexible keys that work separately from the standard keys of full M/E buses. You can reassign these keys to any output or M/E bus – even in the middle of a live production – to add extra key layers where and when you need them.

## DVEs

The HVS-490 includes 100 wipe patterns and 16 2.5D DVE wipes (including rotate, perspective, and reposition) for additional creativity. It also features mosaic, posterization, pseudo color, and defocus effects, so it's easy to create unique backgrounds and other graphics.

## Three integrated multi-viewers

The HVS-490's integrated multi-viewer supports up to 16 sources on one display providing HDMI 2.0b connectivity. With more than 10 screen layouts available, it's easy to customize what you see and how you want to see it.

## Tight integration for increased production resources

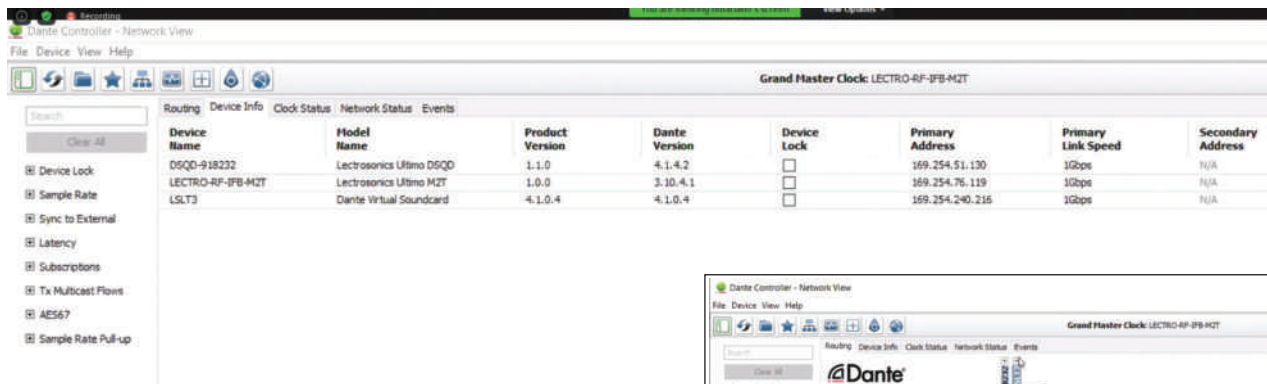
Users can add the Insight Production Server to record the service, playback clips and more. Add the FA-9600 multi-channel signal processor for color correction, video/audio delay along with other video and audio processing corrections. For dynamic graphics, include a package from ClassX, such as the LiveBoard Mini to play any clip or image as picture-in-picture or full screen.



# Distancing with Dante

For many houses of worship, “covid compliance” requires that all staff working on a production to be distanced, including locating the sound personnel and production staff in other rooms or parts of the facility.

BY BRIDGET HARRINGTON



So, what do you do when you have to plan to work at a distance from the talent? Enter Dante.

Dante is the protocol for transferring audio over the network cable. It is “plug and play” and is so reliable that many companies, including Lectrosonics, have made it a standard built into their equipment. In the past, if the engineer had to be far from the talent, the only solution was either to run audio cable - one line for each channel or a multipair snake - or, to run long antenna lines. As you can imagine in a standard production environment, this can be unwieldy and unsafe with cables snaked everywhere, but also potentially unreliable, depending on how far you had to bridge. If you had to run a long length of line, say, to an antenna, the signal suffered as well. The main advantage to Dante is that you can send as many as 500 channels (audio and video) over a single fiberoptic cable. Depending on the type of cable (CAT 5e or greater) you’re using, you can achieve distances of 300+ feet and even more with the help of a booster. Many sets and professional buildings have network ports built into the walls that you can easily plug into, using the building’s network. The building’s or set’s IT personnel can advise you of the IP address and access credentials.

Dante has its own Network Controller that allows you to monitor the devices connected to it.

An example of how you can use Dante would be:

- Arrive on set with a 300-foot length of Cat5e, Cat 6 or fiber cable (converter boxes required for fiber). That length will cover most situations. Use a rack case for your equipment and place it in the same general area as the talent.
- Plug into the available network.
- Use Wireless Designer (which can map not only Lectrosonics equipment, but can include units from other vendors via custom channels) to set up your system, and the Dante interface to see all of your connected devices and set your outputs and links

The Dante network can then be the bridge between your department and others on set via IFBs or Duet IEMs. This will enable you to distance while at the same time delivering good sound to all the stakeholders. **T**

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



# Maxell's MA-XL1 Lecture Capture Collaboration Station

As we continue to see Houses of Worship adopt a hybrid model of in-person and virtual services as the new “normal” for their congregations, the ability to capture a live service and stream it with accompanying visuals is a powerful capability for a House of Worship facility of any size.

**P**roviding worshipers with engaging and community building services wherever they feel safest, whether that be in person, in their own homes or across the country, is an increasing main priority for many House of Worship leaders. Recording, streaming and saving services, along with the supplementary visuals, is easy with Maxell's Lecture Capture Collaboration Station. The MA-XL1 simplifies the work so more time can be spent on what matters most: planning each service and worshipping with the congregation.

## Up to Three Simultaneous Inputs

The MA-XL1 has the capacity to source up to ten different types of video sources and multiple audio inputs and can share up to three AV sources simultaneously during a single recording/streaming session. Inputs such as HDMI, SDI, RGB and LAN ports are very common, and are often compatible with third party equipment including computers, tablets, cameras and smartphones to make creating an immersive environment for all worshipers easily achievable. Additionally, the MA-XL1 supports TCP/IP, RS232C control

commands, USB ports for external storage and HID mouse devices, Bluetooth speaker-microphones, mini-pin audio and phoenix audio in/out so many House of Worship teams are able to use their already existing equipment without having to worry about compatibility. Worship leaders can stream their service, lead the congregation with visual slides and connect to their phone or tablet to share music all at the same time, providing a next-to-normal service for those who are not able to attend in person.

without having to purchase or revamp their already existing AV systems.

## Record-Stream-Upload

The record-stream-upload capabilities on the MA-XL1 allow worship leaders to not only live-stream their services to those in the congregation who are not able to attend in person but also allow for content to be uploaded so services are kept online for future viewing. For those who can't attend (virtually or in-person) due to health

from both locations. Building up the sense of community with those near and far and allowing for the exchanging of ideas and insights.

## Video Replay while Recording

With indexed video playback, even while you record, the MA-XL1 gives worship leaders the opportunity to re-play earlier parts of the service while still continuing on with the lecture. Replaying sections of the service for emphasis allows worship leaders to note the



## Pastor Friendly

The integration of technology into any size House of Worship facility should not require additional personnel such as IT managers or teams. Easy to maneuver features on the MA-XL1 allow worship leaders to spend less time on technical difficulties and more time on their service and congregation— plug in to begin streaming to the preferred platform or present live for those in attendance. An intuitive on-screen menu minimizes the need for training, with quick select tools to toggle between inputs, splitting the screen to best showcase the service. Maxell's MA-XL1 is designed with every type of House of Worship facility in mind, making it easy for small to medium size churches to function

risks, scheduling conflicts or time zone complications, the ability to upload your service as it happened allows the community to continue to feel engaged. Using the MA-XL1 as a one-stop-shop to keep technology as simple as possible, RTMP streaming protocol supports widely used third-party streaming platforms such as YouTube and Facebook Live in addition to FTP/SFTP supported LCS cloud services like Kaltura.

## Interactive, Remote Classrooms

To promote community between Houses of Worship in the same area, or across the country, the interactive remote capabilities of the MA-XL1 allow worship leaders to connect in real-time and share the screen

importance of passages and verses with ease.

## Let Your Congregation Grow, Un-interrupted

As House of Worship facilities continue to grow and adapt to the changing landscape, adopting new technologies, such as the MA-XL1, provides benefits now and in the future. Helping worship leaders connect with their existing congregation in person and virtually while times are still uncertain is of immediate importance. Growing into the future, House of Worship facilities are no longer bound by location and time but can now widen and strengthen their congregations and communities to include those all over the world. **T**

# PTZ Solutions from Panasonic

As the demand for digital content and streaming continues to grow, houses of worship are increasingly turning to technology to provide congregants with an immersive experience during services. This was true even before the pandemic hit in early 2020, and even more important now as many houses of worship seek different ways to reach their congregation with social distancing measures in place. When it comes to remote viewing, the goal is to provide quality experiences that feel near in person. For churches still welcoming congregants in person, the goal is to deliver even more engaging experiences. Key to delivering on the expectations of guests is technology that is easy to deploy and use. This is where pan/tilt/zoom (PTZ) cameras – which can be mounted throughout a church and operated remotely – play a big role.

## SMALLER CHURCHES

### AW-HE38H

The goal for any church looking to incorporate streamed content into their services is exceptional video image quality – whether they're broadcasting a Sunday service or special event. The AW-HE38 camera is designed to produce great results in a variety of applications that require high-quality video and precise control like streaming services. With a 22X optical zoom lens, a wide field of view, smooth PTZ movements and exceptional image quality, church teams can capture quality content, whether they're remote or on the ground at the church.

Church AV teams are typically limited in size and experience, especially smaller houses of worship. This makes easy setup and management a top priority. With IP-Preview transmission and control, and support for PoE+, which allows power to be supplied via a LAN cable, the HE38 offers the flexibility needed for easy installation and management.

The HE38 is also a perfect way for AV teams to incorporate PTZ technology into their AV offerings that go well beyond standard features. To elevate the experience even further, the HE38 incorporates an innovative High Dynamic Range (HDR) mode



to produce high-quality video even in extreme contrast and lighting conditions. As many churches take advantage of natural light in their facility, this feature ensures congregants always have the best view, despite fluctuating conditions.

## MEDIUM CHURCHES

### AW-UE100

The AW-UE100 is one of the most versatile PTZ cameras when it comes to streaming, making it a perfect option for medium-sized churches. It's the industry's first 4K/60P PTZ camera to support such a wide variety of IP transmission protocols, including high-bandwidth NDI, high efficiency NDI|HX and Secure Reliable Transport (SRT), which maintains stability when transmitting high-quality video, even in unstable network environments. The RTMP/RTMPS function provides direct streaming to live broadcasting services such as YouTube Live and Facebook Live from the camera. All of this means that church officials have added flexibility in how they capture and deliver content and the peace of mind that what they are capturing will be high quality, so congregants can expect an immersive and visually-exciting experience.



Church architecture can be somewhat atypical and varies based on the size and scope of the venue, making it a challenge for AV professionals on where to mount cameras. With a wide angle lens with a horizontal view of 74.1 degrees, content can be captured of a wide area. Added to that, a 24x optical zoom means high-quality imagery even when the camera is located in back of the sanctuary.

The purpose of a PTZ camera is to capture content that could involve movement, but not all of them deliver smooth images, which can be noticeable to the viewer and distract away from the service. The UE100 features a newly-designed direct drive motor for smooth pan and tilt movement and ultra-quiet operation, so there's no distractions, lag, or harsh movements.

## LARGER CHURCHES

### AW-UE150

The AW-UE150 enables large churches to take their services to the next level. The camera features a large 1" MOS sensor, which supports high sensitivity shooting with low noise, perfect for large churches. The sensor also includes a light-capturing area that is about four times larger than typical sensors to guarantee a wide dynamic range and high sensitivity. Combined with intelligent imaging functions, the UE150 delivers exceptional image quality.

The UE150 also delivers the widest viewing angle in its class - 75.1 degrees, horizontal. With an HDR mode, support of various 4K interfaces and simultaneous 4K/HD output, the UE150 is the perfect remote camera to deliver a high-end production for large-scale houses of worship.

The UE150 is the first robotic PTZ camera to incorporate support for V-LOG video output, a key feature of



high-end cinema cameras sought after by churches implementing a cinema-style look to their productions. For higher production value, the ability to track the pastor's movements on the altar or stage is important and the UE150 is compatible

with Panasonic's advanced auto tracking software. Utilizing sophisticated facial, body recognition and deep-learning technologies, the automated robotic camera control solution allows for accurate, precise tracking, ultimately delivering a more dynamic service to congregants. **T**



# Wireless Mic Solutions from Lectrosonics

The use of wireless microphone systems has expanded dramatically during the past 20 years, with new technology, better value, and convenient features that make these systems easier to use and in most cases, more reliable than ever. Yet, the challenges have increased as well with RF spectrum loss, a higher radio noise floor, and increased expectations from audiences and system operators. Lectrosonics has long been a revered name for wireless mic and IFB foldback systems used in broadcast, film & TV production roles. And, in the past decade, performers, theaters, and churches have started adopting the Lectrosonics technology for wireless microphones, in-ear systems and instrument wireless due to the robust construction, superb sound quality, and radio reliability.



## SMALLER CHURCH R400a Single-Channel Diversity Receiver

For small channel counts, the R400a single-channel diversity receiver is an excellent choice, offering 256 frequency choices across 25 MHz, and six different “block” choices for use in North America. With Digital Hybrid Wireless technology, The R400a works with a wide variety of transmitters including handheld, belt pack, miniature, and watertight. And, with backward compatibility, even older Lectrosonics transmitters, and some units from other manufacturers can be used with this receiver. Audio outputs are via XLR or ¼” jack – each with a separate level control. Sound quality of this receiver is superb – good enough that the unit is

part of the TM400 system for calibrated measurement and alignment of sound reinforcement systems. The R400a can be rack mounted with optional accessories.

Even though the R400a is powerful and flexible, the menu structure is intuitive and easy to use. The SmartTune feature makes choosing the best frequency of operation a snap, by automatically running a local frequency scan and choosing the channel with the lowest RF noise. Gain setting is equally easy with +1 dB steps on transmitter inputs and on receiver outputs. The range, sound quality, and radio reliability of this system is unparalleled for anything in this price range.



## MEDIUM SIZED CHURCH Venue 2 Rack Receiver System

The core of the Lectrosonics rack receiver systems for the past decade have been based around the Venue platform – a modular receiver system with up to six channels in 1RU. The Venue 2 takes this concept further, with USB and Ethernet connectivity and included Wireless Designer software. The Venue 2 is like having six R400a receivers in a single rack, with even better RF filtering designed for use in medium- and high-channel count wireless systems. The RF signals can also be cascaded through to additional Venue 2 frames for up to 24 channels from a single pair of antennas and no additional hardware. The Venue 2 offers antenna bias power as well, for churches where long antenna cable runs necessitate the use of amplified/filtered antennas such as the ALP690 directional active filtered “paddle” units. Like the R400a, the Venue 2 receiver platform uses the award-winning Digital Hybrid Wireless technology for increased operating range, superb sound quality, and industry-leading flexibility.

## LARGER CHURCH DSQD Rack Receiver System

The latest rack receiver system from Lectrosonics takes everything in the Venue 2 and adds digital receiving modes, Dante outputs, and the ability to pack 8 channels into 1RU for even greater space savings. The DSQD digital receiver also features a full-color display for ease of system monitoring at the rack, for instance when receivers are located at front-of-house. Wireless Designer software gives an even more comprehensive way to monitor the system, scan the local RF, and choose channels with these receivers, using industry-leading frequency coordination calculations. And, the sound quality is even better, with ultra-flat audio frequency and phase response, ultra-low latency of 1.2 ms, and an astoundingly low noise floor. As part of the D Squared digital platform, the compliment of digital transmitters includes the DHu digital handheld transmitter with standard capsule threads, the DPR digital plug-on unit for converting any microphone to a wireless transmitter, and the DBU belt-pack transmitter for lav or headset microphones. With all the wonderful mic capsules for handhelds and lav mics available today, the D Squared system gives you precisely the sound you expect – as if these microphones were hard wired. This is perfect compliment to the tremendous productions currently mounted in today’s cutting-edge worship environment.





# Digital Signs Build Community Inside and Outside Houses of Worship

BY CAROL WADE

**V**ibrant and engaged congregations often have a lot going on both inside houses of worship as well as in the community. Streamlining communications to congregants about all these activities and ministries can be a challenge, and community outreach via broadcast or print media can be expensive.

For this reason houses of worship have been steadily increasing their use of digital signage over the last decade, as congregations imagine new ways to get their messages out. The keys to crafting messages that get results is to target messages based on the location of the signs, the people who will view them and the kind of information they need.

## FROM WORSHIP TO WAY-FINDING

Interior digital signs are modernizing how congregations communicate and worship together. Upon entering a facility, displays can provide vital information about upcoming events and ministries that need support, as well as introduce new practices, staff and service times.

The signs also can help reach congregants with pleas for help or support, such as the need for volunteers or food pantry donations, and to provide real-time updates to stewardship campaigns.

Larger campuses can also program signs to include way-finding information for events such as lectures, childcare, blood drives, and funeral services. These signs almost always can be updated quicker than other forms of communication, such as email and take-home bulletins, and can be put to use immediately as needed.

These signs also can help build community by welcoming new members, recognizing birthdays and anniversaries, and congratulating congregants on weddings, baptisms, confirmations and other milestones.

Inside the worship space, digital signs and video boards can broadcast information to enhance services, including the order of service, responses, readings, song lyrics and inspirational messages. Large facilities can even use digital signs to show what's taking place in the sanctuary, or to simulcast services to overflow



**The keys to crafting messages that get results is to target messages based on the location of the signs, the people who will view them and the kind of information they need.**

locations.

At Otter Creek Assembly of God in Little Rock, Ark., digital signage has added to the quality of worship. “Not only does the congregation love it, all our pastors do too because it makes their sermons more engaging,” said Sandra Tracy, pastor.

## REACHING THE COMMUNITY

Exterior digital signs can immediately reach the community with important information about ministries, as well as updates about services.

When incorporated into landmark signage,

digital signs can be an eye-catching way to make a house of worship more visible to the community and showcase outreach activities, like AA meetings and food banks, as well as advertise fundraisers, such as wreath sales.

First Baptist Church in Woodstock, Ga., uses its digital sign to post full-color, attention-grabbing graphics for its many ministries and events, and has had great success reaching the community. Its Celebrate Recovery sobriety group gained 10 new participants after the group was promoted on the digital sign.

Outdoor signs can also be used to showcase good works and community involvement, and to advertise for volunteers for ministries that benefit the community. All this positively raises the profile of houses of worship and provides great exposure for people looking for a new worship community. **T**

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*About the author:*  
**Carol Wade** is senior director of marketing at Watchfire Signs, a leading manufacturer of exterior and interior LED signs.



# STAGING & SET DESIGN

BY TIM ADAMS



**W**hile this might not be a relevant topic for more conservative churches, this has become a category of immense creativity, resourcefulness and need, that it bears discussion.

Where do you start with a stage or set design? The first step is to determine whether you need a more permanent design or something that can flex and be changed out on a fairly regular basis. Stage design would be a more permanent design whereas a set design is more temporary and can fit within a stage design. A stage design could be to black out everything on the stage and then use different “sets” for monthly or quarterly message series or for holidays and the like.

Black provides the ultimate in flexibility in terms of set design; after all, it’s been a part of theater stage and set design for decades. However, this isn’t feasible for many churches for many reasons so what are some other ideas?

If you’re looking to work within a specific design motif or some elements that are static, such as a rock wall, wood panels, etc. then your options are far more limited, but you still have some room to play.

I look at things like overall room shape, angles, materials, etc. Am I looking at a room with hard angles, gentle curves, wood, stone, brick, etc? What are the dominant colors and or design elements? Sometimes you have to work outside of these static elements with the plan of removing or covering them completely; as long as the church body is ok with the aesthetic implications of that decision.

ChurchStageDesignIdeas.com is an amazing collection of designs that other churches have accomplished and can serve as a huge source of inspiration for your project. Materials that have been used include screen door material, paper plates, Coroplast, string, and many more unique and readily available re-purposed items. I cannot stress how important it is to not pre-judge any of your ideas-write them all down, sketch them out, work in Photoshop to work

mock-ups. These processes will serve as your process of elimination as you begin to visualize what will and will not work. Maybe you can visualize it, but the logistics of making it happen are just too difficult, too expensive, or some other obstacle...these will reveal themselves during this process, but if you don't go through the process, you won't be aware of those issues until it's too late.

If your church has a video or live streaming system, your design needs to include design elements that allow your side cameras to shoot "into" something; essentially, your stage design needs to look cohesive and connected, regardless of which camera the viewer is seeing. This extends into your lighting design, as well. Your entire design should be cohesive, anyway, but often novice designers only design in the center and forget about the sides, to the detriment of those seated on the sides of the room.

Once you have a solid design, it's important that you also plan out how to actually accomplish it logistically-where are you sourcing materials? Who is doing the install and labor? What is the lighting plan, if you have one? What is the total outlay of money that will be needed? What is the timeframe, start to finish?

## Design should be a collaborative process and borrowing other people's creativity, thoughts, perspective and experiences generally leads to better and more solid designs.

Stage and set design is much more than just throwing random elements together to see what happens; the stage designs I've been a part of in the past have generally been for events with an overall theme that we tried to support through the design and great inspiration can be found in looking to themes. For example, if your church name has rock or some other element in its name, can you incorporate that into your design to subtly support that name or concept? For example, Christ the Rock Church could utilize a design with rock as the foundation, with maybe wood panels on top of that. This provides textured surfaces that up lighting looks awesome on.

Another idea is to use common design principles, such as pattern, symmetry, perspective, composition, etc., to form your overall design. The principles of design are fundamental for a reason; because over human history, human culture and nature have contributed to the concepts that work and moved away from those that do not. It would be foolish to go against these "rules" of design without good reason. However, it's also important to venture outside of your comfort zone to push yourself into new and exciting designs.

The final piece of advice I can give is to include others in your design process; after all, design should be a collaborative process and borrowing other people's creativity, thoughts, perspective and experiences generally leads to better and more solid designs. There may be considerations to be made you were not aware of, or questions that need answers. For example, what if your design blocks down lighting so musicians can no longer see their music? Or maybe your temporary set is going to partially block a projection screen. These conversations often reveal potential issues that allow you to find solutions before you're in the midst of construction! There is also the added benefit of people liking to be included in projects that will impact them, either directly or indirectly. 📌

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



# With Many Projection Mapping Options, Find The Right Tools to Succeed

BY ANDRES CAAMANO • PHOTOS COURTESY OF CAMRON WARE, VISUAL WORSHIPER

**W**ith Christmas almost upon us, it won't be too long before houses of worship start planning how to incorporate creative elements for Easter, beyond a typical worship service.

For churches already using projectors during weekly services, stepping up to implement projection mapping during the holidays is within reach. When displaying animation, pictures or video on complex internal or external surfaces, it serves as an impactful and worthwhile step.

One such example how to effectively project imagery in a worship space, was noted by Camron Ware, owner of Lightware Labs and founder of Visual Worshiper. "We helped a church do projection mapping, where they had eight (basic) columns. We projected real stone columns, as from the Roman times, onto them."

## Planning First Before Buying

Before a church aims to dive into projection mapping, though, one key aspect must be answered. "That one is looking to add, and not detract, from the worship experience," explained Kirk O'Connor, owner of CYA Productions and former lighting director for Calvary Orlando Church in Winter Park, Florida. "How creative do you want to be in your worship?"

Furthering that point of view, Toby Bohl, president of TG Productions, and formerly with CSD Group asked, "Will it be used in an illustrative way, to support something in the sermon? Is it telling the story as a piece that fits? Does it enhance what's going on? Or is it distracting, or even taking something away?"

Upon confirming that such a move will add to the





worship experience, the heavy lifting then begins. How can a church successfully incorporate projection mapping into an Easter production? With Easter Sunday being about three months away, it's best to start simple.

As tempting as it might be to immediately try complex projection mapping, one risks taking the “focus off the stage,” explained media production manager Debbie Keough, of Water of Life Community Church in Fontana, California. “You can go hog wild, using multiple colors and backgrounds ... less is more, so to speak.”

### Avoid Trying to Do Too Much Too Soon

Despite projection mapping having become easier in recent years, it would still be wise to build off success. “You don't want to start off with something that you can't accomplish well,” said Bohl. “Don't have it be a negative experience for your congregation.”

To emphasize the value of where to begin, O'Connor said, “When it comes to projection mapping, start with the basics.” Those initial steps include ensuring that the installed projector is level, and square to the screen. Software can certainly fix such issues, but as O'Connor explained, “The more you do at the software level, the more you will have to work, to make it all play nice.”

As described by Liam Monroe, creative producer for Bethel Production, “I was taught that you start with a solid source. Start with your projector lining up as straight on, where the projector area is not at an angle.”

### Budgeting A Key Factor

For a church looking to invest in video technology, and soon after start projection mapping, advice focused on planning first, then to buy.

For starters, Keough said, “Determine what you need and set a budget. Then find a similar church of a comparable size

and make friends with them. Learn about their mistakes, so you can avoid making the same ones.” Bohl concurred about setting up such parameters, adding, “One needs to develop a budget. Then one can see what one is going to spend. Quite honestly, you can get really crazy, really quick.

In the midst of budgetary planning, don't leave the church's management in the dark. “Certainly don't surprise leadership,” warned Keough. “Always make sure that leadership is on board with such things. Show what you think went well with your testing, whether they like what you did, or want something else.”

While viable projection mapping alternatives exist, the most logical one, LED walls, typically exceed small- or mid-sized churches budgetary constraints. As enticing as LED technology might be, Ware noted that courtesy of the freedom of projection mapping's canvas, churches can typically utilize whole walls of the sanctuary. “In 2020, an LED wall will not replace whole walls,” he added.

### For Worship, Projection Mapping Software Options Abound

In getting a jump into projection mapping, one of the most useful tools is ProPresenter 7 by Renewed Vision. Fortunately, for most churches, they are already using the software, typically for its lyrics and graphics capabilities. Without an added expense, O'Connor said, “It allows a small church to be creative. The guys at Renewed Vision have changed the landscape, allowing any vision of the



pastor, to come to life.”

And when it comes to a pastor's vision, having such tools, is crucial while keeping the corresponding budget within check. “What are the expectations of what the churches wants it to look like? It needs to match their budget,” said Ware. “If you have the budget of a 100-member church, your







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expectations should not be that of Disney World.”

Not that spending money for the sake of spending money is a requirement to achieve success.

“I’ve worked with churches that initially think they have to spend \$50,000 (to meet their expectations),” Ware said. “Instead, they end up spending \$10,000, and it looks amazing.”

In discussing the various software tools on the market, Bohl spoke approvingly of ProPresenter 7, in particular, about the software’s projection mapping abilities.

“ProPresenter is a great tool. You can have multiple outputs, and mapping can be done, in a relatively inexpensive way,” Bohl said.

ProPresenter, though, isn’t the only beneficial software tool for churches, O’Connor noted.

“The easiest would be PVP3 (also by Renewed Vision). It is designed to deal with any surface and any source, and is designed for volunteers,” said O’Connor.

In addition to PVP3 and ProPresenter, O’Connor mentioned Resolume Arena 7 as helpful in projection mapping. “All three get you into projection mapping as a tool - at less than \$1,000 - for software,” but then added, “The learning curve is a little bit higher with Resolume.”

For Ware, aside from ProPresenter, PVP3 and Resolume, he suggested MadMapper among his preferred software options.

And from that group of four options, Monroe pointed to the benefits of both MadMapper and Resolume.

“With MadMapper, you can take different sources, like a source from a computer, or you can feed the same computer,” said Monroe. “Resolume Arena can be used as a playback software to fire your video clips, and create content and visuals. Built into Resolume Arena is the ability to map out your outputs, for use with projection mapping.”

## Once Software Is Chosen, Lean On Creativity

Projection mapping options, though, go well beyond just software. Among the resourceful options to consider, might be to include a drape behind a drummer, seeing how a projected image will look like on the walls of the church.

For churches looking to “put a toe in the water (for projection mapping), they can begin with a piece of material or an actual wall,” Bohl explained. “Then you can use that surface and project onto that with a soft-focused animation graphic, using a moving color or a moving breakup pattern.”

As Ware explained, “You have to see it live, though. You

have to see it in your own church.”

There is a strong benefit to also seeing things set up live in a room. Whether a certain piece of gear is right for one’s worship space should include that step, added Ware.

“A reason to test before you buy and design in place, is to avoid hanging a projector that will cast a shadow from your ceiling fans, for example,” said Ware. “Placement is crucial so you don’t have distracting shadows.”

Beyond just projecting on walls, projection mapping can be ideally suited with various shapes. “For starting out, things like cubes or flat surfaces will be easiest, such as a pyramid or triangle,” Monroe said. If one were to build a cube for projection mapping, noted O’Connor, one can spread a king-sized bed sheet “across a wooden cube, to make it look like the cube was part of the show.”

Beyond a cube, O’Connor suggested working with a “stretchy material on something shaped as a triangle, which was big for youth groups at one time. One can project on those sails, serving as a good starting point.”

When thinking about what color the projection surface should be, Keough discussed well-suited colors, while citing which color should be avoided. “Much like a movie theater, any matte sort of finishes work well. We also found that black theater curtains certainly didn’t work, as they soaked up the lighting.”

For houses of worship that approach projection mapping in such a way, it serves as “the most common use for projection mapping by churches,” added Monroe. “When crafting a scenic background, one has to really have a creative element, to build looks and to help just come alongside worship and the environment of the church.”

In addition to determining the right colors and shapes to use for projection mapping, figuring out the magic number of projectors to effectively achieve projection mapping was discussed. Between O’Connor, Ware, Keough, Monroe and Bohl, the consensus was ... it depends.

As noted by Keough, “The ideal number (of projectors) is what covers your room,” with O’Connor adding, “That all depends on the project, how big the surface is.” **T**

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**Andres Caamano** is a writer and editor with nearly 20 years’ experience, including over four years bringing attention to the latest news in audio, video and lighting technology for houses of worship.



# Creative Services: Engaging and Growing Your Congregation Seven Days a Week

BY DARREN FORDHAM

**F**or worship video professionals and Christians, Sunday is and will always be the most important day of the week.

The Sunday service is what connects the congregation, but it is the creative services department that holds and further solidifies that connection the other days of the week. In today's media environment, if you are only reaching your congregation one day a week, you're losing them. We have the power literally in the palm of our hands to be connected at all times, and a good church needs to foster that connection through a steady cadence of content. Through the various content created for social media and the church's website, the creative services department helps to turn a church into a community. In addition, much of the department's content throughout the week helps to build the narrative and connect the dots that eventually turns into the core and essence of the message for the

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weekly worship service.

Now that we've squared away the importance of the creative services department at your church, let us talk quality. In the ever-growing and always competitive House of Worship landscape, being good isn't good enough anymore. Not only must the content that's being created be engaging and compelling, but the quality must be up to snuff.

The days of recording a video on a cellphone and uploading it to a church's social media page are a thing of the past. More than ever, quality is paramount. Quality is the secret sauce that leads to engagement, more clicks, and longer watch times on the content created by your church's creative services department. The main ingredient in the recipe: high quality, professional-grade imaging equipment that develops content with excellent image quality, helping your church stand out from the crowd.

When deciding on what equipment to use, versatility is key, and the choices of the styles of cameras and lenses to use are abundant. Like most creative endeavors, personal preference reigns supreme as the pivotal deciding factor of what equipment is ultimately selected and how those tools are used by a respective church's creative services department.

The creative services department often has a wide variety of cameras to choose from, all offering their unique imaging, usability, and production benefits. These cameras

can range from a traditional DSLR or newer mirrorless cameras all the way up and through cinema cameras. Included in the selection pool are some recently announced cinema cameras that have the look and feel of a traditional DSLR, but are packed full of cinema features. A feature that stands out for cameras like this is the ability to shoot 16x9 vertical video. This size format not only makes it easier to edit and upload videos to social media because they don't need to be cropped, but it also allows the user to see the final product as it is being captured. Users don't need to play the guessing game of how the image will look when cropped because it is already in a 16x9 size format. Cinema cameras like this and even some traditional DSLR or mirrorless cameras feature a set of video specs that punch way above their weight class. These versatile choices sit at the intersection of value and features, providing users with what is often considered the best price for performance ratio.

When selecting what cameras to purchase for your creative services department, other important criteria to consider are who is using the equipment and their level of skill. For a department composed of a full-time veteran staff, a complex camera may not scare them away, but for a creative services department that often uses a "green" crew of volunteers, the easier the equipment is to use, the better the end result. One particular benefit to consider when selecting equipment for the less

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seasoned staff is what type of autofocus system is featured in the camera. The quicker and more advanced the AF system, the likelier it is they

is the best and the correct tool for the job. In that case, I would advise spending the money on a conventional cinema camera while

creative services department to pick from is far greater. Unlike the live broadcast of a worship service that is on the fly, where there is

pick and choose what lens is ideal for each particular scene or shot of the content being created. This leads to even greater levels of choice,

**“Cinema cameras and lenses help to provide my desired level of creative control in the field. High dynamic range, lightweight and ergonomic, reliability, and fantastic low light performance are some of the reasons why high-performing professional pieces of digital imaging equipment are my first choice when shooting for the church’s creative services department.”**

— John David Wright, video producer, Church of the Highlands

will get the shot right on their first or second attempt.

With all that being said, even with the video advancements of DSLR cameras, there are some situations where a traditional cinema camera

also ensuring the staff is adequately trained in operating the camera.

The variety and diversity of equipment choices are not just held uniquely by cameras. In fact, the selection of lenses for a

no option to call out, cut, and run it back again, the creative services department has the time and freedom to treat their work more like a television or movie production. With that freedom comes the ability to

allowing the department to use lenses that range from traditional primes and zooms to servo lenses and cinema prime lenses. The use of cinema prime lenses is particularly crucial to departments looking to

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elevate their content quality. While zoom lenses are still spectacular and can get the job done, there is something to be said for being able to use the exact prime lens desired for each individual moment of the production. Benefits like cinematic quality and style found through shallow depth of field and enhanced bokeh help to further tell the story of the production in a way only cinema lenses can.

Any discussion about equipment for a church's creative services department would be left incomplete if I failed to mention budget. When considering budget, a church needs to factor in how and when the equipment is being used. Is this equipment only for the creative services department? Alternatively, many churches find themselves using the equipment during worship services as well, providing a dual-use case for these tools. Ultimately, like many financial decisions for a church, the budget boils down to the goals they have for the equipment and determining what type of monetary commitment, large or small, best suits their church.

Before I begin to wrap this up, I wanted to take the time to share some thoughts from John David Wright, a video producer for the Church of the Highlands, who has a tremendous amount of experience using professional digital imaging products in church's creative services department.

"Cinema cameras and lenses help to provide my

desired level of creative control in the field. High dynamic range, lightweight and ergonomic, reliability, and fantastic low light performance are some of the reasons why high-performing professional pieces of digital imaging equipment are my first choice when shooting for the church's creative services department. The image quality, depth-of-field, and bit rate choices really make footage from cinema cameras shine during the color grade. It's impressive how far you can push the image.

The wide variety of cinema lenses that render fantastic images is also impressive. The highlight falloff and depth-of-field are amazing, and they truly offer a crisp, clean image that looks great in a variety of applications."

I leave you with a message that I've often mentioned throughout this series of articles: Whatever equipment you decide on for your church's creative services department, remember, there is no wrong answer. It all comes down to personal preference. What matters most is that you have decided to either start or further grow your creative services department. Even if the department is composed of a single person, doing something is better than doing nothing. Good luck on this journey, and if you ever have any questions, you know where to reach me. **T**

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# Are Analog Mixers Still a Viable Option?

BY TIM ADAMS

**I**t seems that the only way to upgrade your analog mixer is to go digital and it's true that digital mixers provide a huge leap in capabilities and features; however, there are downsides as well.

Motorized faders, for example, can exasperate volunteers, as can having to learn how to mix on multiple layers. Moving to

a digital mixer can actually lead to a decrease in quality while your volunteers and techs learn how to navigate a completely new interface and mixing style.

Then there is the main issue of whether digital is really the right move for you or not. This might seem like a strange statement, especially for larger churches who moved to digital many

years ago and have never looked back, but bear in mind that the use case may not ultimately demand even half the functionality of a digital mixer, and if you're not getting half of the benefit, are you really getting a good ROI?

My short answer to the viability of analog is yes, they are still very much a viable choice, particularly

for smaller churches. However, they can also serve very well at larger churches, especially for operators or tech directors that like the “warmth” of sound that analog tends to provide. There are many other factors that affect overall sound and digital mixers can “emulate” this warmth pretty well these days, but for some purists, analog is still the only way to go.

Let’s focus, though, on why analog remains a viable choice apart from

you tend to get with digital mixers, but again, you must base your decision on more than bells and whistles—any upgrade needs to match your use case for the next 3-5 years, if not longer. There should be a significant need for the features digital will provide to justify the expense.

I often see churches go down one of two paths when upgrading their mixer—it’s a stand-alone purchase to fix a specific need or set of needs or it’s part of an

explain what each step down the path does to the signal. With digital, you often have a large section dedicated to EQ and dynamics that is not as easily connected to signal path. While you can demonstrate how changes in this area affect what is heard, you’re also somewhat limited that you can’t adjust two channels simultaneously and you have that pesky “Select” button that can really mess with your head if you forget to press it before making adjustments!

you are now and where you anticipate being in the next five to ten years.

One final word about mixers – regardless of whether you have analog or digital, make sure you maintain your mixer. This means regular cleanings, ensuring there are funds and a plan in place should you need to send the mixer in for repair or replacement. I’ve seen many churches caught short when their mixer suddenly dies and they have no plan in place for what to

## Is a digital mixer really the right move for your church or not? Bear in mind that the use case may not ultimately demand even half the functionality of a digital mixer, and if you’re not getting half of the benefit, are you really getting a good ROI?

the tonality it provides. Many volunteers who have served for more than a few years likely learned to operate sound on an analog mixer and there is a level of comfort that comes with a familiar workspace. Smaller churches also tend to not have the need for larger channel counts, sophisticated EQ and effects capabilities or the more than a couple aux sends for monitors and maybe a nursery/mother’s room speaker. The truth is that for many small churches, going digital is a waste of money, particularly when you factor in that they have likely invested in outboard gear like EQs and effects processors that may still be perfectly functional.

Yes, analog mixers require outboard gear that can take up valuable space in the booth, and they lack the input/output quantities

overall system upgrade that likely includes a new speaker system, new digital snake, floor pockets, etc.

Analog can have a host of issues but moving to digital won’t necessarily fix these problems. Ground loops, interference and random hums can still happen with a digital system and thus the source of those issues should be addressed and not the symptoms—otherwise, they will continue to be present, regardless of your mixer.

Analog mixers can be easier to teach, depending on the generation of who you’re trying to teach. You get the ability to mentally match physical controls to auditory changes, something that may or may not happen as easily with a digital mixer. And there is the advantage of a “top to bottom” signal path you can show people on a single channel strip to help

All said, analog is very much still alive and well and has a place in our churches...but it does need to answer the needs you have in a solid way, not just because you want to save money by not purchasing a new mixer when you desperately need one. Digital mixers provide a huge amount of capability and should not be dismissed out of hand due to cost alone.

Ultimately, you should end up with the mixer that best meets your needs, while giving you space to grow in capability and/or available channels. While you’ll likely never have a mixer that can meet every need you may ever have, it’s nice to establish what those needs are at the outset and start researching options until you begin narrowing them down to establish which one is the ultimate winner for where

do. Establish a relationship with another church that might lend you a mixer they aren’t using, purchase a used analog mixer, find a local rental company that keeps mixers in stock—whatever your solution, make sure to check on the viability of that plan at least once a year. Equipment will fail on you, but if you have a plan for that, analog or digital doesn’t matter—as long as it does what you need, you’ll be good to go. **T**

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



# Why DANs Make Sense for Churches

BY JAMES CARELESS

**T**he time has come for churches to adopt digital audio networks (DANs) to transport their audio signals. Compared to analog audio networks, DANs combine ease of installation and configuration with reliable sound quality, network scalability and deployment flexibility.

As well, DANs use the same IP-based networking infrastructure used to link computers together. This makes their operation and management easy to master by volunteers, and comfortably familiar to AV professionals.

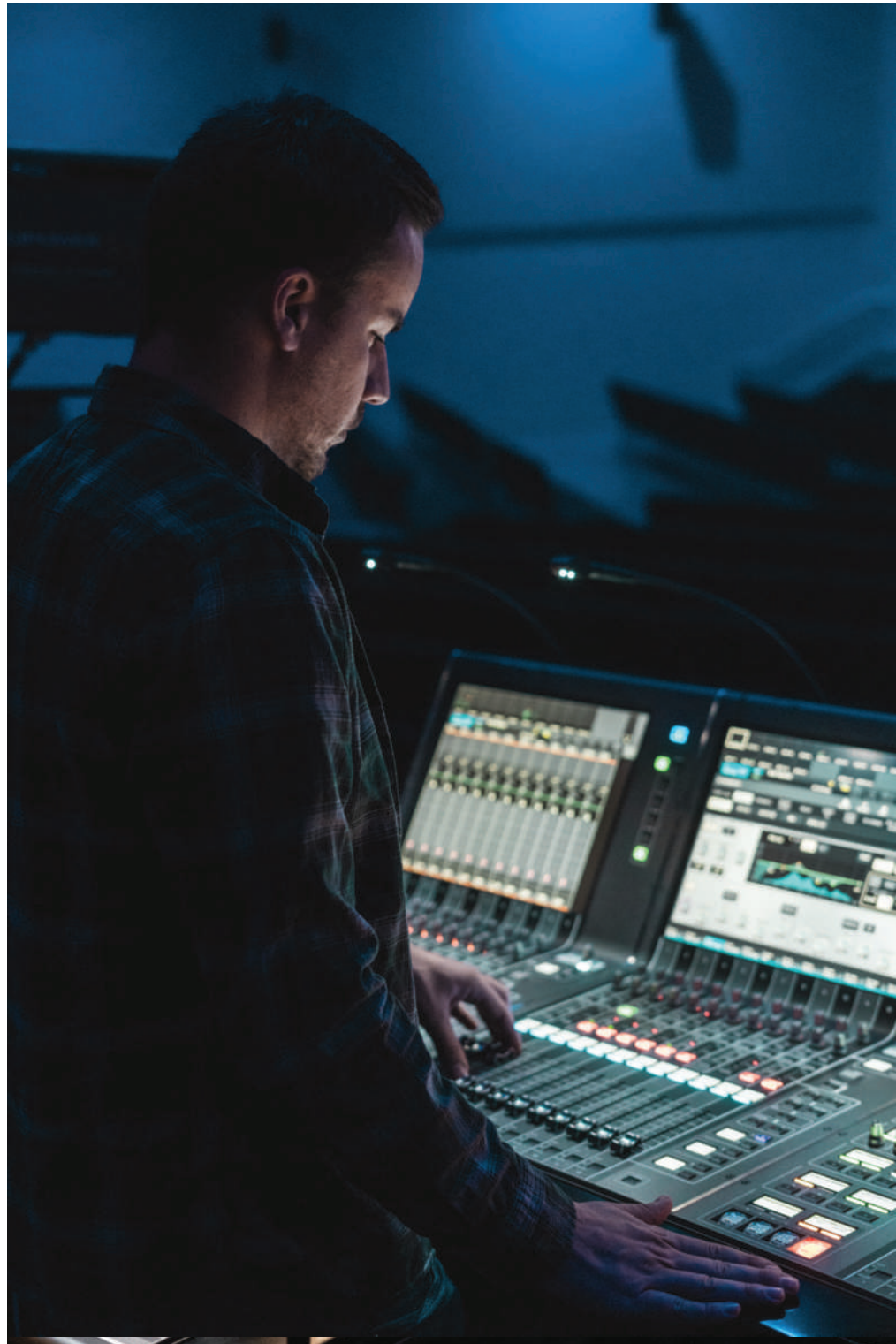
In this story, TFWM will examine the nuts-and-bolts of DANs with the help of AV design/integration experts.

## The DAN Defined

Understanding what a DAN has to offer churches begins with defining what a DAN is and what it does.

In the first instance, “a digital audio network is usually an infrastructure system for audio connectivity between digital devices via interconnected digital devices, said Phil Hagood, General Manager at the AV design/integration firm InteRise. “Typically we would see these operating on an IP backbone and having the ability to coexist and coordinate with typical computer networking infrastructure.”

In the second, “a digital audio network provides transport of multi-channel audio from multiple sources to multiple destinations,” said Daryl Porter, Operations Manager and Principal Designer with the AV designer/integrator CSD’s Colorado Office. The audio is packaged and transported as digital data files, which are not subject to the interference issues that can degrade analog signals.



**“Using a DAN can eliminate the ‘buzzes’ or ‘ums’ caused by analog (copper) cabling in an improperly grounded electrical system. This is a common problem when attempting to transport audio to several destinations around a large facility.”**

— Daryl Porter, Operations Manager and Principal Designer, CSD’s Colorado Office



## What DANs Have to Offer

Because they are data-based, digital audio networks are superior to analog networks in many respects.

A case in point: “Using a DAN can eliminate the ‘buzzes’ or ‘ums’ caused by analog (copper) cabling in an improperly grounded electrical system,” said Porter. “This is a common problem when attempting to transport audio to several destinations around a large facility.”

A DAN can transport a large number of audio channels over a single cable. In contrast, analog audio networks need dedicated wires for each channel.

As a result, “Scalability is a major benefit of DANs,” Hagood said. “We can now carry hundreds of channels of audio via one cable versus having to handle large numbers of mic cables and snakes.”

“Digital networks also allow us to transport audio over unbelievable

distances nearly instantaneously,” he added. “We can move 256 channels of digital audio across the country with minimal latency and utilizing available infrastructure in the modern world.”

## Three Common DAN Options

According to CSD’s Daryl Porter, the three most common DAN platforms for performance audio are Dante, AVB and MADI.



Short for Digital Audio Network Through Ethernet, the Dante digital audio platform uses standard Ethernet technology and network protocols such as 100 meter maximum cable runs. “It easily provides the ability to distribute high channel counts of content to multiple locations over Category cable with low latency,” said Porter. Manufacturers have to purchase a Dante license to build products using this standard.

In contrast to Dante, Audio Video Bridging (AVB) is an open standard that dedicates network bandwidth for audio and video signals. “The size of the network is pretty much unlimited, but unlike Dante, which can utilize almost any standard ethernet switch that has QOS (Quality of Service), AVB networks require a specific AVB network switch,” he said.

Then there’s Multichannel Audio Digital Interface (MADI). To date

MADI has been mainly used to transport multichannel audio from remote stage boxes to the FOH mixing console using one-way audio cables. According to Daryl Porter, MADI doesn’t function as a DAN on its own, “but conversion devices enable it to be incorporated into those networks,” he told TFWM.

## Which DAN to Choose?

How does a church decide which DAN to choose? Well, if you are comfortable committing your church to a proprietary DAN standard licensed by many manufacturers, then Dante is a viable option.

“Dante has created a nearly universal language that almost all live and studio equipment can speak,” said Hagood. “Basic setup and configuration of Dante is relatively simple if you have some basic knowledge of computers and networking. Even if you don’t, there are so many great resources available online to learn and grow knowledge of setup and operation.”

On the other hand, adopting an open standard like AVB gives churches access to a DAN architecture that is constantly being expanded by software developers. As well, the fact that AVB manufacturers do not have to pay licence fees (as Dante manufacturers do) could lead to lower-priced products for end users.

A third option is to see what new highly capable DAN platforms are becoming available and adopt one of them instead. This process requires research but can ensure that your church’s DAN is reasonably future-proof.

“There are new protocols coming into the industry that will create new standards for interoperability,” said Hagood. “A perfect example of this is the Milan protocol that is being developed via cooperation between companies like Meyer Sound, Avid, d&b Audiotechnik, and Adamson. One of the weaknesses of Dante is the control and licensing by the owners and original creators of the protocol. Platforms like Milan are being built to be an open standard that will allow for more collaboration and development across the industry.”



**“Scalability is a major benefit of DANs. We can now carry hundreds of channels of audio via one cable versus having to handle large numbers of mic cables and snakes. Digital networks also allow us to transport audio over unbelievable distances nearly instantaneously. We can move 256 channels of digital audio across the country with minimal latency and utilizing available infrastructure in the modern world.”**

— Phil Hagood, General Manager, InteRise

## Proper Planning Matters

When designed and deployed properly, a DAN can simplify audio signal routing and transportation for churches. “Once a DAN is set up and configured, generally it will not require user interface unless a change in routing or additional destinations are desired,” said Porter

“The caveat is proper deployment,” Hagood cautioned. “Many of these systems are not overly complicated but they also are not plug-and-play in a pure sense. There are infrastructure and use considerations that have to be made when equipment is purchased and specified. Wise counsel prior to purchase and installation will save many hours of frustration and heartache and possibly wasted money.”

## A Word to the Wise

If there is a downside to DAN, it is that they are vulnerable to tampering by human operators.

“The danger lies in the DAN’s programming, specifically in the hands of an under-trained or over-zealous technician; be they volunteer or professional,” said Adam Henderson, CSD’s Client Advocate and church tech volunteer. “We have received many late-in-the-week frenzied phone calls from techs with a system that doesn’t work after a few ‘tweaks’ were made earlier in the week. Some resolutions have required minor ‘un-tweaking’ while other have turned into major reconstructions.” **T**

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



# Lighting for Video

BY BOB MENTELE

**W**hile traditionally most of us have attended church services in person, and the need for a video system was therefore less pressing, things have obviously changed. We have had to adapt quickly to a new normal and investing in a video system so that the services can be streamed to the congregation has become a necessity. Now that

the initial rush to install a solution to share our worship service is over, many facilities are asking how they can improve the quality of the video that they are creating. We must first be mindful of the limitations a camera has when compared to our body's optical system. One of the key differences is the ability that we have to distinguish and process variances in levels of brightness or intensity

of illumination between two objects in our field of vision. Our eyes have a broad dynamic range, and that allows us to process and clearly visualize two objects in great definition even if one is lit brightly and the other is in shadow. We will still perceive the difference in illumination, but we are able to see a high level of detail in both objects. Camera sensors do not have this capability.

If adjusted to capture the brightest object correctly, the dim object may turn to a simple shadow. Adjust the settings to expose the dim object correctly and the bright object will be blown out and distorted. So, when considering the lighting for your space, you will want to ensure to carefully balance the illumination level across the entire space that you may want to cover with your camera system.

Another advantage that our eyes allow us over a camera is the ability to distinguish an object's color when presented in different color temperatures of light. Or how 'warm' or 'cool' the light is that a source creates. A camera has to be told

## CONSIDER OTHER NON-NATURAL LIGHT SOURCES YOU MAY HAVE PRESENT IN YOUR CAMERA'S VIEW, LIKE VIDEO DISPLAYS, LED VIDEO WALLS OR MONITORS, AS THESE DEVICES ADD ADDITIONAL LIGHT TO THE SPACE.

what color temperature it should be set to, and even then, all of the lighting within the camera's field of view needs to match that set point. Incorrectly setting a color temperature can make objects look too blue,

or orange, depending on the chosen setting and light provided. We also need to make sure that all of the light sources covering an area are of the same temperature. Having two different sources will cause issues with the camera's color recognition as well. Again, we need to look at what sources we have in our control and make sure they all match. If we have windows that allow daylight to hit the chancel, we will want to make sure all of our added lighting is also set or corrected to a daylight color temperature. If that isn't possible and the lighting system in your facility features warm light sources, we may want to have the windows covered to block that light from hitting the area in our field of view.

We also need to be aware of challenges our facility's design may present. If the space has windows that allow natural lighting to enter, we need to take that into account. Does the daylight hit the area we need to cover with our camera shot? If it does, does the lighting we have set in that area evenly blend with the added brightness of the natural light? If not, we will want to look at covering the windows with shades or fabric. It doesn't have to be to a level to black out all light from entering, but it should be enough to reduce the added intensity from the light bleed.

You will also need to consider other non-natural light sources you may have present in your camera's view. Such as any video displays, LED video walls or monitors, all of these devices add additional light to the space. When those

types of displays are located on stage you will want to control the brightness level that they are set to so that they do not become overexposed on the camera or create any unwanted light bleed onto the subjects of focus. One display type that can be negatively affected by a lighting system is a projection screen. Any light bleed that is allowed on the screen can cause the image to become washed out. You will want to make sure to set a balance between the sources you can control to ensure all objects are being presented to the camera in similar illumination level.

Something that often comes up when setting up for video capture is the lack of depth or variance between the subject and the background. One option for alleviating this is to ensure that you add back or top light to your area of focus. What this lighting position does is create a frame, or rim of light around a subject. Adding in that contrast will help to define the subject's frame and enhance the variance between their structure and details in the background. Another option that we have with lighting is to add fixtures to illuminate the objects in the background in a contrasting color. Even if the background is a flat wall, washing it with a saturated color will add in the effect and help to 'pull' the viewers focus to the subject. Combining both backlight and background lighting will enhance the effect, and to further the feeling of depth, choosing to use complimentary colors in the two sources will multiply its benefit.

With all of this, we need to make sure we remember the main purpose of the lighting is to ensure that the subject is clearly illuminated so that the camera can properly and accurately capture their form. We are tasked with helping to create a quality image for our congregation so that they can focus all of their attention on the message that is being delivered to them. Making them feel close to the congregation even as we remain physically distant. **T**

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**Bob Mentele** is the worship market manager at Elation Professional



# How to Update Your Lighting Without BREAKING YOUR BUDGET

BY TIM ADAMS

**L**ighting is one of those areas in tech that is very easy to give in the temptation to go cheap because quality lighting fixtures tend to be quite pricey in comparison with their conventional cousins.

Make no mistake, though; the extra cost is

worth it. While there are more budget-friendly options, if you find yourselves seeking out stage lighting options in the \$50-\$500 range, you will likely be disappointed with what you get.

Issues abound when going with non-name brand gear, particularly from sources that are not typically

known for their rigorous quality (pretty much any alternative marketplace based on sources in Asia).

Even with the higher cost of quality lighting, there are ways you can keep your cost down, but it requires dedication and discipline to a single goal—better lighting. You can get by with purchasing one or two

fixtures at a time, as money becomes available. This approach will ensure you are able to only purchase what you can afford, but it will take longer, depending on how large an area you need to light.

You can also take the design approach that I utilize, which is zoned lighting. I create zones

of light (e.g. stage left, stage center, stage right, baptistery, etc.) to create greater flexibility in the lighting system. If you just need a wash, turn on all zones. If you want to help direct attention, use one or two zones at a time. This is something I learned in theatrical lighting but bear in mind that it may not be appropriate to your worship style, space, or needs. Many churches just need to bring the overall lighting intensity level up for their new live streaming camera systems. Base your purchases on what your actual needs are.

be purchasing any lighting equipment as it could likely lead to wasting money as what you're buying doesn't fit into an overall strategy or plan.

Lighting is a long-term investment, with systems and components generally lasting 15-20 years (this assumes you are buying quality gear), and so while the up-front cost can lead to sticker shock, when you amortize it over that time frame, the yearly cost is quite low and this is an important point to not only bear in mind for yourself, but to also

money appears rather than waiting for the money and then figuring out what can be upgraded. This helps you have a ready answer when people come up and ask if you have any needs they can donate towards. Without a plan, you would be frantically searching for an answer to that question, whereas with a plan, you can answer with what your next planned upgrade is. People like knowing there is a plan and that helps them feel much more comfortable donating.

My final recommendation is to make

effect lighting and fixture quantities so make sure you talk with all the people that have a stake in how the platform is lit-musicians, leadership, and even members who have been vocal about poor lighting. All of these stakeholders can lend valuable perspectives that can help you strike the right balance between the various needs, wants and desires of everyone. But also remember that you'll never please everyone, but if you can focus on meeting the needs of as many as possible, you'll have that much more support in fundraising and

## Create an upgrade plan for when money appears rather than waiting for the money and then figuring out what can be upgraded.

If you do take the zone approach, you can start with the center zone as this tends to be where pastors or the bulk of "action" tends to happen and thus is more important to get good lighting first, with other zones following as funds allow. But don't forget that you need to have an overall vision and master plan for not only what the lighting needs to accomplish, but lighting positions, wiring plans, any electrical changes that need to be made, how you will control the new lights, and if you are planning to integrate your house lighting into your stage lighting, you generally must have two wall controls at entrances to the sanctuary to meet with code. If you have not generated this information, you should not

communicate regularly with your leadership. A \$10,000-\$30,000 investment is a lot easier to swallow when you break it down into yearly cost over 15-20 years.

Granted, your small church may not need to spend even \$10,000, but half that amount is still a sizable chunk for a small church to come up with.

The other approach is to do what you can for now, taking the pain and critique until you have the funding available to upgrade the entire system at once. Use complaints and critique as fuel for requesting donations to upgrade the system-funds can quite miraculously appear when the issue directly affects your parishioners. I'm a strong proponent of creating an upgrade plan for when

sure leadership is part of the planning and strategy discussions because this not only helps ensure they have skin in the game, but they can then champion and support the plan from the front to the church at large. It's so much easier to get the financial support you need when leadership is casting the vision to the church. You can go it alone, but you will likely never have the influence that the pastor does with church members and thus your fundraising will take longer and you will have to work harder in order to accomplish the goal.

Lighting is a very visual part of church technology and great lighting makes a huge difference, but it needs to be appropriate to your space, style and mission. It's easy to "go crazy" with

the final product.

If you're not sure of where to start with a lighting upgrade, reach out to me or another system integrator near you because it's very easy to get it wrong with lighting and we would rather help you get the right gear and overall system rather than seeing you continue to struggle with poor lighting. **T**

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



# Easiest Scalers for Volunteers to Use

BY TIM ADAMS



Scalers are both wonderful and terrible things; shocked you a bit with that one, eh? Allow me to explain: originally conceived as a way to take multiple analog inputs and scale them to one common resolution, they have now brought digital inputs into the game, which can greatly complicate things. While the general function of the scaler has remained the same, the functionality has increased exponentially. They now also route audio, can perform mixing and picture-in-picture and a host of other specialty functions that can create some big headaches for your tech team.

I ran into a situation the other day where an older scaler could not supply a newer laser projector with a compatible signal, even though the specs of both units indicated they should be compatible. The issue, I suspect, is down to a different color space spec being sent from the scaler to the projector. And this highlights one of the big issues with scalers: they are often overlooked in a display system upgrade. This can have unforeseen results, such as brand new projectors, TVs or LED video walls that cannot receive a signal because the scaler is not compatible with the newer, higher resolution required by the new gear. Of course, working with an experienced and qualified integrator can help you avoid this massive headache.

Secondly, budget-friendly scalers tend to not include features like seamless switching or fade-through-black for a more pleasant viewer experience. This may seem like a trivial thing but remember that expectations are changing rapidly and having source transitions that kick your display system

to a “No Signal” screen before flickering back into life with the new source is a big interruption and source of annoyance and distraction for your church members.

There are scalers that have smoother transition capability, but you’ll spend as much on those as you would for a video switcher. I’ve found it best to establish a common resolution for all equipment (computers, cameras, switchers, etc.) and

computer connected to the same network as the scaler. This makes the menu easier to see and navigate; often times, this is the only viable solution as the menu is too small to see from the AV booth on the front screens and downright impossible if you’re in a side room with no window to the sanctuary.

You may not have the budget for a scaler with smooth transitions, and that’s ok – not ideal, but

is to make VGA a no-go as early as possible. This can help you save money by simply not supporting an aging and obsolete display standard and helps prepare you for the future now, rather than later.

While some might scoff or object to this, HDMI has been included on computers and laptops for the last three or four years and if someone is using an older computer than that, you run the risk of having some pretty serious issues moving into the future; not only with compatibility, but the ability to run current software, unless they are intent on sticking with PowerPoint for the foreseeable future. But even PowerPoint is moving into higher resolutions and thus, you need to be prepared to keep up.

Similarly, you should start phasing out cassettes and VHS support as these formats will not scale well to 1080p HD and I would argue that even DVDs should at the least be “ripped” into a digital file so you can play them directly from your presentation software rather than having to “cue” the disc to the right spot and hope it stays there until you’re ready to play it. This might seem to create more work, but it can go much faster once you get the hang of it.

Other features to look for—clearly marked labels for sources, backlit buttons, audio input and output and after-purchase support. Beware cheap, “knock-off” brands from non-brand name manufacturers—not only are they likely to have a lot of issues but getting support from them after the fact could be an exercise in poor English at best to

absolutely no support, at worst.

Established brand names are the go-to solution here—they are established in this industry for a reason, not least of which is good support, and yes, it’s THAT important of a consideration!

The easiest scalers for volunteers to use are those that provide the functionality that is needed, with a user interface that is clearly read and marked (this also involves ensuring your inputs are labeled clearly on the front panel), combined with good, solid training protocols. It’s not all about the equipment, but how your AV ministry is setting up your volunteers to succeed so make sure you invest the resources to establish these protocols, as well. We’re all in this together, after all! ■

Scalers are often overlooked in a display system upgrade. This can have unforeseen results, such as brand new projectors, TVs or LED video walls that cannot receive a signal because the scaler is not compatible with the newer, higher resolution required by the new gear.

just use a video switcher to handle your display system transitions. Another solution is to use a display software, such as ProPresenter, Proclaim or MediaShout, to handle any content for your display system.

However, there will always be a need in many churches for a scaler and as such, finding one that is easy to use is important. There are many confusing and complicated features and settings in a scaler menu and unfortunately, there really is no way around this, though finding a scale with a LAN connection can help you navigate those menus much easier by allowing you to login from a browser with a

budget is often the king of decisions in small churches. Any new scaler should be evaluated for not only the ability to be compatible with your current display solution, but also future proof it as much as possible. If you see the need to move to 4K display in the next five years, get one that can handle that resolution. If 1080p is as high as you need to go with resolution, look for that capability. Also evaluate your current inputs and any planned video or computer upgrades in the next five years. This often means planning to move from VGA (analog) to HDMI (digital), etc. My STRONG recommendation

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



# Top Four Myths around Remote Broadcast

BY NICHOLAS SMITH

**M**edia professionals and technologists in our churches are needed now more than ever. Because so many churches had to shutter their buildings, due to “it which shall not be named”, many had to move services online for the first time - to record, stream and podcast. When the pandemic first started, the hotline at my office almost caught on fire. Clients were calling from churches all over the country needing help with the same problem – “My church is shutting down due to the pandemic and we need to be streaming by Saturday.” Mind you, these calls typically happened on Thursdays.

Throughout these calls, it became clear that there are four enduring and persistent myths around remote broadcast that I would like to address here.

*It must be 4K*

*My network is good enough*

*It needs to be exactly like an in-person service, only at home*

*We have to be “Live”*

## Myth #1: Does that come in 4K?

Clients are constantly asking about buying 4K gear. While I am a big proponent of putting in technology that will outlive its purpose, churches’ tech budgets are typically slim, so buying the best you can afford has always been the mantra. 4K or “UHD” - as it’s called at Best Buy - is the number of pixels on the video’s horizontal plane. While more is always better - at least with cookies - we have to look at the impact to the infrastructure and video streaming in moving to 4K. When adding new gear to the system, you have to ask these questions.

- How does this effect the device it’s plugged into?
- Does our video switcher support it?
- Does our network have the capacity?
- How do we control it?

First, 4K video does not use the same video cables as the old camera. 4K video has four times the number of pixels as HD, and eight times that of SD video. This requires video cabling infrastructure that can handle the bandwidth - which can be very time consuming and costly to replace. HDMI extenders, network encoders, or cameras with technology like NDI® built in are your best options if 4K is your only option. In case you are wondering, NDI® is a video protocol that uses the ethernet network to move video.

IMAG and streaming are impacted in moving to 4K. IMAG presents two problems:

*Does your projector support 4K?*

*Does the signal path to the projector support high bandwidth video?*

The biggest hurdle can be streaming to a CDN (Content Delivery Network – i.e. YouTube, Vimeo, Facebook). Yes, 4K video looks amazing on web streams, but remember, the bandwidth dilemma of moving 4K in house. Streaming 4K video to the web, on average, takes about 4 times the bandwidth of HD. Currently, YouTube recommends upload bandwidth of between 5Mbps and 9Mbps for HD, but 20MBps to 50 Mbps for 4K. While you probably have a connection that supports it at your church, keep in mind your audience may not. Most people have, or are getting, 4K or UHD TVs in their homes, but they may not have the bandwidth needed to watch in 4K. More importantly - what’s the cost? If you are using a



paid CDN, find out what the added costs of moving to 4K are going to be before you get the “buyer’s remorse” bill.

Of course, there are times when you should upgrade to 4K: cameras. 4K cameras have larger sensors, better low light performance, and typically better lenses than that of their HD predecessors. The current crop of 4K PTZ cameras out there are surprisingly affordable and most of them have one great feature that will allow you to use them now in your current infrastructure: downscaling. While the lens and the optics capture like a 4K champ, the transmission from the camera to the rest of your gear can be in HD. This allows you to use the better camera, capture better imagery, and be prepared for the future. Eventually, you will upgrade the rest of the gear. You just won’t have to upgrade the cameras.

### **Myth #2: My current network is good enough. Right?**

Clients often ask, “Can’t we use in-house WIFI for connecting video cameras and our other production gear together?” Typically, it comes down to this. Would you go on the freeway in the little donut tire that came with your car - the one marked “use in case of emergency”? Not unless it was an emergency. Most WIFI networks we find in churches are consumer grade technology. They have limited bandwidth, limited number or concurrent devices, and overall limitations. Plus, your audience is also using them at the same time.

I often hear, “Well, Netflix looks fine on my WIFI” - and, and it does. Netflix, like all CDNs, is constantly changing the bitrate without you even knowing it. It’s constantly testing the network and making sure you have the appropriate stream for your bandwidth, and occasionally, it stutters when it gets it wrong. Your video camera doesn’t have the ability, or the time,

to make those decisions. It gets one shot at creating the best image and sending it on its way. There are no retakes in “live”. So, do you really want to send it on that spare tire?

The network is your best tool for upgrading your infrastructure. The network - thanks to NDI®, Dante, Visca, and so many other standards - can now be the entire backbone of your content creation plan. The network is not just about pushing content to Facebook and pulling down new backgrounds for Pro Presenter. With NDI® video, every network port in the building is a source and destination. Want to shoot from the pastor’s office? Do it, and control the PTZ camera with Visca over IP, on the network. Want to add an overflow room on the patio? Do it and use Dante to move the audio through the nearest Cat5 port. Here is the one time you should be selfish and not share. Don’t share your network. Create two - one for the audience with their handheld WIFI devices and one for your Live Production Network. Treat your network like it’s a content-only router and ensure it always has your content prioritized over all other traffic. A good network switch is like a lens for a camera - you will keep that lens long after the camera is gone; besides, it was only there to hold the lens up anyway.

### **Myth 3: I want my audience to feel like they are here in the auditorium.**

Let’s be clear. Your audience is a bit distracted - their dog hasn’t been fed and their kids’ service hasn’t started. So, no. You may not be able to deliver the same at-home experience they would get by being on site. However, to work towards that goal, you can make a few changes.

Shoot the service like you are watching it on your phone. Use more closeups to bring the pastor and worship staff

closer to the at-home audience, so they can see and feel the emotion being poured into the live stream. Much of the communication is being conveyed through gestures that can get lost at a distance - so get the close up.

Make sure graphics, like lyrics and sermon notes, can be easily read on your phone. This may mean changing the font size and type. Think like a broadcaster and use broadcast fonts like Helvetica and Proxima which can be easily read on all screens. Get rid of the ones that look edgy - they are just a distraction.

Get an audio for video mix. Your sound technician has been mixing based on the sound in a room with people in it. Instruments, like drums, don't need a lot of lift based on the room acoustics. When you listen to that mix in headphones, equivalent to what your home audience is hearing, you may be surprised to not hear everything. A second soundboard will allow you to create a mix that the at-home audience needs.

#### **Myth 4: It needs to be live?**

I am going to shout out to my friends at Bridgeway Church in Roseville CA. Jeff and the team there decided early in the pandemic to shift to a delayed broadcast workflow. The concern was over pastors getting sick with "it which shall not be named" and not being able to complete a sermon series. They began to shoot the whole sermon series in advance - giving them time to edit and ensure they had it in the can - so it was ready to play back on the day it was to air. This was a great move during a period when audiences weren't allowed on-site. This isn't to say that all churches should shift to this method. However, if you don't have the

gear to stream or the staff to support it, get a camera and record your sermons. Then, release them on demand - one at a time. It will allow you to stay connected to your audiences and begin the process of becoming an online church. It takes time to build a video ministry, so start simple - giving the team time to grow and develop alongside your audience.

My first tech job out of college was at a church. It was a 3,000-seat auditorium with a multi-camera, broadcast production system and army of volunteers producing six services a weekend. Streaming wasn't new, but it wasn't cheap either. And, we didn't have the audience to warrant it - DVDs were our largest distribution format at the time. It was there that I got my start before moving on to work as a designer and integrator for TV studios and production facilities for other people. Almost 20 years later, in my current job, I am still consulting and talking to churches almost daily, but it was at that first job where I learned this hard truth - just because you can, doesn't mean you should. Don't buy or upgrade technology just because you have the budget. For every tech decision, you need to ask yourself one last question before you buy. This is the question to ask for every piece of gear - whether a light, a camera, or a new graphic. Does this bring people to the throne or distract them from it? **T**

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**Nicholas Smith** is the Vice President of Technology at JB&A Distribution. JB&A is a leader in the field of Video, Broadcast, Production, and Pro AV. To learn more about JB&A and see more articles and videos from Nick, visit <https://jbanda.com>



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# The Perfect Reference for Streaming and Broadcast

BY JOSH MAICHELE

Over the years, the church market has moved into a more dynamic approach as technology has become more accessible to church tech teams at every level. Production within the church is now leading the industry with creativity and forward-thinking, influencing the arts as it did within biblical times. And as congregations grow, there is that quest to maintain the connection from the stage to audience, and audience to the stage. Over the past decade, I've seen pastors pushing their stages farther and farther into the audience in an attempt to help them feel more connected to their congregation. They have effectively broken down the wall between the worship team and worshippers, allowing the congregation to feel more connected and focused on the message. The unfortunate negative side effect is that a subset of the congregation is now directly to

the side or even behind the pastor and worship team, which tends to drive those people to watch the screen, not the live individual, potentially breaking the very connection the worship team is seeking to build.

Along with many other businesses and live event productions, churches were forced to shutter doors this year due to the pandemic, which motivated houses of worship to create new and inventive ways to connect with and serve their congregations. Most live services have now switched to the online format of live streaming or broadcast and pre-recorded events. Some churches have managed to hold outdoor services, depending on local regulations. Other churches continue to hold in-person services, but the trade-off is a reduced capacity of 30% or less in some instances. The challenge for houses of worship in navigating this patchwork of solutions is maintaining that connection to their congregation.

So how do we truly create a

PHOTO: A10 CABINET FROM L-ACOUSTICS

connection for the congregation, both virtually and in-person?

For starters, your loudspeakers need to be as transparent as possible when it comes to your sound system, which means that what you put in is what you get out. Not a version of what was put in, but a true reference monitor quality. This quality inspires musicians and worship teams to perform at their best. Personally, I believe that audio is a critical tool for pushing the church to be at the forefront of creativity and the arts. An added benefit of a transparent

carrying the message needs that total transparency. The sound deployment must align with the ministry's vision and help elevate the worship experience by clearly reproducing what is happening from the stage or service - spoken word and music alike. The message is the central focus of the service, and it is crucial that your message is heard and understood clearly. The audio system is the vehicle that drives that message. It's the direct connection from the worship team and pastor to the congregation.

Taking technology one step further, binaural mixing

by people singing the same song or connecting with the spoken word. Object-based mixing and the immersive tools currently available to worship teams allow them to recreate this immersive energy, even with fewer people in the room.

Well-conceived and installed object-based audio solutions impart more consistent sound coverage. Now that we are forced to social distance, many seats will remain empty. It's pivotal that every seat sounds the same and gets the same experience as an unused or compromised seat would. The right audio will

this year will continue to be a long-term part of our lives. Anticipating your congregation's needs helps you choose the right system for you today, and that can expand with you as your needs grow. Choosing a system that allows for true transparency, with the tools to offer both in-person and remote immersion will allow the connection between the stage and the congregation to be more natural and accomplish the ultimate goal: that the word is heard clearly and consistently while allowing room for emotion and authentic connection. **T**

## In the post-pandemic world, church services' new reality will likely include a mixture of both in-person attendance and remote attendance. The face of live events and large gatherings has changed and will continue to change, and many of the ways that we have learned to adapt this year will continue to be a long-term part of our lives.

speaker system is that it will translate better to any web recording application. In contrast, a speaker system that is very colored would cause things to be done on the mixing console that would not represent the true source.

Another consequence of the new patchwork of church service formats is that people watch these services via different tech forms: their phones, a streaming TV, or desktop, laptop, or tablet computer. Either people listen through each device's built-in speakers or their headphones or personal sound system. To fully translate the sound of a broadcast service as transparently as possible, the original sound system

for broadcast allows us to transmit the audio to the audience in a way that connects what they see to what they hear. It offers a more natural, transparent, and immersive experience. When the technology at the source follows through to the end user's technology, we allow for a deeper connection between the congregation and pastor or worship leader.

For churches conducting in-person services, a room with an audience of a diminished capacity leads to a vastly different worship and speaking experience. Anyone who has been at a packed concert or worship service understands the importance of the immersive energy of being surrounded

maintain and increase the impact of those services.

Choosing the right reference sound system future-proofs a church's audio success. Churches that approach a new system only with today's needs in mind are essentially choosing a stop-gap and run the risk of replacing the system as needs overtake system capabilities when in-person services are allowed to resume. In the post-pandemic world, church services' new reality will likely include a mixture of both in-person attendance and remote attendance. The face of live events and large gatherings has changed and will continue to change, and many of the ways that we have learned to adapt



**Josh Maichele** has been an FOH and Monitor Engineer, production manager, and tour manager for various clients, including some of the nation's largest churches and congregations. He currently serves as the primary frontline contact for Houses of Worship for L-Acoustics.





# Pastor Victor Abraham Makes Remote Worship Effortless

BY VICTOR ABRAHAM

I have always made an effort to create an interactive and engaging experience for my congregation, but the traditional presentation tools I was using left me limited to linear slides and static imagery. Efforts to include multimedia content often required coordination with my A/V team and needed on-site support during sermons to ensure everything worked properly. When the pandemic suddenly forced me to deliver sermons virtually, without any on-site support,

either from my home or the church, I immediately found that moving through a set of fullscreen slides felt impersonal and completely detached me from my audience.

I needed to create a dynamic and engaging experience for my congregation, where they could feel connected to me and the story in my sermon, all while remaining socially distanced.

After looking for a solution, I learned about Vizetto's Reactiv SUITE, which has fundamentally changed the way I share my

message, transforming a simple mix of slides, images, and videos into a bold, visual story. This new ability to show multimedia content without support from my A/V team has opened up new opportunities for visual storytelling. Adding the ability to draw and write on screen allows me to illustrate my ideas in an organic, personal way, bringing the audience deeper into the sermon's story as it unfolds before them.

My public speaking style relies on visual elements to play a central role in my stories, offering a uniquely

engaging and memorable experience.

When I am in my church, I move across the whole stage while I speak, making my way back to my Interactive Whiteboard (IWB) when I'm ready to move to the next piece of content. Without an A/V team managing my visuals from behind the scenes, my congregation connects with me as I write, draw, and swipe my way through the sermon.

Where traditional presentation tools create a sudden flash of new content with the push of an invisible button, I am able to subtly let my congregation know when to watch the main screen and when to look back at me, guiding them through the sermon.

I design my sermon to be a simple, but deeply engaging experience for my audience, filled with energy and interactive elements to help the congregation connect with the message. Therefore, it is important that I be able to create this type of environment wherever I am speaking from, whether it's the mainstage of my church or my home-studio.

When I speak from home, I continue to use Reactiv SUITE to create the same sense of engagement and energy I do at church. Reactiv SUITE allows me to abandon the fullscreen slides that disconnect me from my audience, and instead create a dynamic, engaging experience for my congregation as they join me from the comfort of their homes. A fundamental part of my storytelling involves interacting with my content, such as highlighting



important phrases and drawing connections between objects, as well as adding drawings and diagrams. This allows me to use a small amount of pre-made content that I build upon over the course of the sermon to create a visually memorable experience.

I often bring my audience into SCRIBBLE, the infinite canvas app in Reactiv SUITE, where I draw diagrams and animations, pausing at each step to explain how the different elements of my message fit together and build upon each other. This ability to show the evolution of an idea from scratch, in real-time, has allowed me to adopt a more engaging and interactive style of storytelling than traditional, static presentation tools allowed in the past.

With STAGE, the digital table in Reactiv SUITE, I can bring together existing slides, images, and videos on

screen to create an engaging and interactive storytelling experience, and fluidly open all my multimedia content without any third-party applications or changing formats of the original files.

**Where traditional presentation tools create a sudden flash of new content with the push of an invisible button, I am able to subtly let my congregation know when to watch the main screen and when to look back at me, guiding them through the sermon**

Being able to showcase this content natively, without the use of slides to display media, has significantly reduced the amount of time I spend preparing my presentation material, while

also allowing me to expand the amount of visual aids I use during sermons.

With a simple swipe I can choose to mirror my second display, or have it showcase an object in fullscreen,

giving me seamless control over my content without interrupting the flow of the sermon.

I often use social media to illustrate a part of my story. With Reactiv SUITE, I

can instantly cast my mobile device screen into my presentation using Airplay, so the audience can watch on the main screen while I navigate through my phone and continue the sermon without interruption or any support from the A/V team.

Vizetto's Reactiv SUITE provided the solution I needed to better incorporate my teaching style into an exciting, interactive and cohesive presentation that moves seamlessly throughout to draw my audience into the lesson. **T**

**Victor Abraham** is a Senior Pastor at the Jakarta Harvest Community Church, Good Shepherd Christian Church, and the Social Media Church, based out of Jakarta, Indonesia, with over 265,000 followers on TikTok and more than 53,000 followers on Instagram.



# Wedgwood Baptist Church

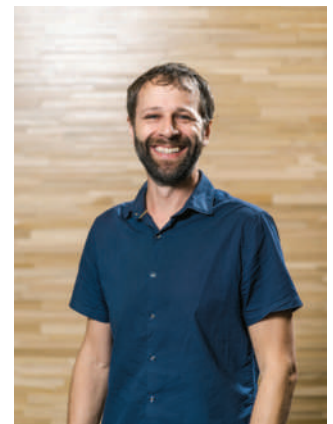
BY JON ACKERMAN

**W**edgwood Baptist Church was founded over 60 years ago and is located in the southwest Ft. Worth, TX area. The founding members of the church and the Southern Baptist Convention decided that planting a church in a residential area would be beneficial and Wedgwood Baptist Church was born. The Wedgwood neighborhood is home to hundreds of homes and directly across the street from the church is Bruce Shulkey Elementary School and the church community has developed a missional focus on serving those in and around their church property.

Their current facility was filled with legacy equipment that when installed in 1991 functioned well. Over time, many small-scale upgrades, and years' worth of small decisions, they were left with an AVL system made up of many individual sub-systems that didn't work well together. The space felt old and tired and needed a completely new outlook. The makeup of their band, choir, and worship service programming has changed since the building was built.

The challenge for Wedgwood was that their services had a modern worship band with a choir most weekends and their technology was getting in the way of their volunteers. Everything lived on a stage with cables running between band member locations, poor monitoring for their choir. The mix of legacy gear and small choices over time added up to disparate gear in multiple locations that didn't talk to each other, or function seamlessly.

In the end the church knew a complete renovation of their audio, video, and lighting systems in their sanctuary was needed and they looked to Mankin Media Systems as their long term partner.



As the team at Wedgwood eyed an entire sanctuary space overhaul, Mankin Media Systems helped uncover their dreams for the future. Mankin's 4D process helped them think through not only today's challenges but how they wanted the system to perform for many years to come. Major construction on the facility began in May of 2020. In the midst of the pandemic, their much needed project kicked into high gear.

## Priorities

With any AVL retrofit of any existing building, priorities are an essential part of the integration process. Everyone has a budget and to effectively prioritize the needs of the organization with the requirements of the staff and volunteers, Mankin was there all along the way. Through strategic conversations with staff and key volunteers, the audio experience was identified as the highest priority. They wanted each person who walked into the space and participated in worship to be able to hear each worship team member, understand each verse shared and hear every word of the message without distractions. The shape of the room, depth of the seating under the balcony and rake of the balcony stairs were unique challenges.

Volunteers audio teams needed to know that the mix they are creating and hearing in their mix position was accurate to what every seat in the room was hearing. Having that knowledge would allow them to build confidence in their mix and to ensure that the entire worship service was free from distractions.



**AUDIO****L-Acoustics**

- 2 KS21 Subs
- 4 A15 Main Array
- 6 X12 Front Fills
- 8 LA4X Amp
- 14 5XT 2-Way Passive Coaxial Speaker
- 6 X4i 2-Way Passive Coaxial Speaker
- 15 X8 2-Way Passive Coaxial Speaker

**Yamaha**

- 1 QL5 FOH Desk
- 1 M7 Repurposed for Broadcast audio suite

**RFVenue**

- 1 Combine4 Wireless IEM Combiner
- 1 Distro4 RF & DC antenna distribution

**Shure**

- 2 UA87AUS Antennas
- 5 ULXD 1, 2, 4 Wireless Bodypacks

**VIDEO****Ross**

- 1 CUF-124 Carbonite Ultra Engine
- 1 CB1-Panel Carbonite Black Panel 1/ME Switcher surface
- 1 OpenGear Frame & Redundant Power Supply

**Harris**

- 1 72x72 Video Router
- 1 Video Routing Control Panel

**Panasonic**

- 3 UE70 4K PTZ Cameras
- 1 RP60 PTZ Controllor

**42 Lamp Technologies GN 3.9mm pitch LED Wall****1 Novastar VX4S LED Wall Scaler & Controller****LIGHTING****The Light Source**

- 21 LV Pendants
- 20 LV Mini-Pendants
- 5 LV Micro-Pendants
- 34 Micro-Recessed Fixtures

**Applied Electronics Box Truss (100 feet+)****CM Motors**

- 6 HST-CMF-50
- 4 HST-CM-Prostar 50

**1 Skjonberg Control PIM10 Motor Control System****Chauvet Lighting**

- 14 COLORado Batten 72X
- 8 Rogue R1 Beamwash
- 6 Rogue R2X Spot
- 17 Rogue R2X Wash
- 1 AMHAZE Whisper Hazer

**1 ETC Ion Xe 20**

With a major focus on the entire audio system, Wedgwood chose an L-Acoustics PA system. A15 top boxes in two arrays are flown with KS21 Subs. Choosing to fly the subs enabled the cost of stage reconstruction to a minimum. The two arrays are compact, even with two subs per side and kept excellent sight lines for even the top rows of the balcony to the stage and video display.

Most rooms with a balcony don't have 1/3 of the

Originally, the view to the ceiling was an unobstructed 54' view to the roof deck. The clouds cut that view down to 34'. Additionally, the space between the clouds allowed over 40 The Light Source LED pendant fixtures to be hung.

Worship Pastor Phil Beck wanted to ensure that any legacy gear that still had life left would be repurposed. Part of Mankin's job was to raise the level of cohesiveness in all of their AVL systems but provide onramps for legacy gear. We

**Mankin was able to use the funds that would have been spent on replacing all of the existing gear toward more important areas of the project, namely updating the aging & failing lighting fixtures**

seating under the balcony. The seating capacity for the sanctuary is over 950. Almost 300 of those seats are under a balcony with a ceiling height of 8' 10". With that low of a ceiling, Mankin chose to install a matrix of L-Acoustics X4i, X8, and 5XT speakers. The entire sound system is powered by eight L-Acoustics LA4X-US amps.

Acoustically, the room needed a myriad of treatment to reverse the effects of the physical shape of the room. The room suffered from flutter echo in some significant ways. To help remove these distracting audio issues that impacted audio intelligibility, large clouds were flown in the space, along with over additional material on the walls. The clouds also help to draw the congregants' eyes to stage.

recommended the church repurpose their existing Yamaha M7 to the broadcast audio suite, updated the ETC Ion lighting console to better suit the volunteers workflow, tied in the Digital signage system into the new video plant, and updated the existing Aviom system to work closer to the way the band needed. In the end, Mankin was able to use the funds that would have been spent on replacing all of the existing gear toward more important areas of the project, namely updating the aging & failing lighting fixtures.

**Flexibility a Requirement**

A core principle for Wedgwood's team was the ability to access all of their technology from a standing height. At one point, the maintenance crew had

**The Mankin Media team installed 17 Chauvet Rogue R2X Wash variable white fixtures to provide all of their broadcast white lighting. Now when the band needs to change, even between services, the lighting volunteers can quickly and efficiently update the fixture positions**



given up on replacing house lighting bulbs because it was too difficult and expensive to rent a lift every time their aging fixtures burnt out a bulb. Not only were the house lights difficult to replace, but their theatrical lighting was a mixture of static fixtures mounted on vertical poles at positions in the balcony.

To ensure that they could arrange the choir and band to best suit their needs, they chose to have all of their flowing lighting elements on motorized trussing. Mankin installed ten CM Loadstar chain motors, all controlled by a Skjonberg Controls motor control system.

The lighting rig consists of one stage left and one stage right trusses, along

with two lengths of truss over the audience. Because flexibility was important, all of their flown theatrical fixtures are motorized. Eight Chauvet Rogue R1 Beamwash fixtures and six Chauvet Rogue R2X Spot fixtures allow the team to paint the air and stage in washes of color. A Chauvet AMHaze can quickly fill the space with haze to showcase beams and washes of color.

The Wedgwood worship band and choir change their programming often. In order to provide the needed adaptability, the Mankin Media team installed 17 Chauvet Rogue R2X Wash variable white fixtures to provide all of their broadcast white lighting. Now when the band needs

to change, even between services, the lighting volunteers can quickly and efficiently update the fixture positions. Gone are the days when the band layout on the stage was constrained to where their white lights were positioned.

As a Baptist church, the baptismal is centered in the upstage wall. This created a unique challenge with site lights to both the baptismal and a center video display. To help maintain sight lines, and celebrating life change through baptisms, the LED wall is also motorized. The same Skjonberg Controls motor control system allows one operator the ability to raise and lower any or all of their flow technology from one location.

## What's Next

After all was installed, commissioned and training was completed, Phil and the team at Wedgwood got to work training volunteers and learning their new system. As with anything new and complex they still wanted access to Mankin's knowledge experts and entrusted the Guardian by Mankin team through their technology to remotely monitor, support and respond to needs each weekend. Guardian GameFilm allows Phil and the executive staff to leave feedback in an online platform for the volunteers to read and see at the moment it happens in a service. Guardian Lifeline give volunteers and staff



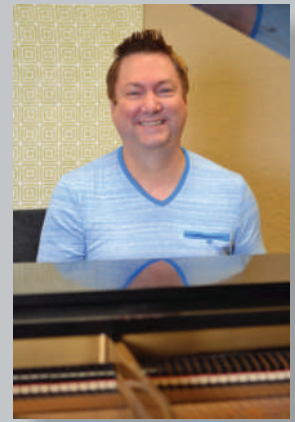
the ability to push a button any weekend and talk to industry experts at Mankin's Network Operations center in Franklin, TN. Guardian Protect provides proactive monitoring and reaction to issues that pop up the instant it happens, not when the Wedgwood team discovers the issues. Guardian supports Wedgwood staff and volunteers each weekend service and allows the team to focus on raising up new volunteers, discipling others and crafting life changing services to share the Gospel! 📺

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**Jon Ackerman** is the Communications & Solutions Advocate for Mankin Media

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## Q&A with Phil Beck, Worship Pastor, Wedgwood



Knew that the team needed a complete renovation of their audio, video, and lighting systems in their sanctuary and they looked to Mankin Media Systems as their long term partner.

### TFWM: Why did you choose Mankin Media to do this job for you?

**Phil:** The first time I met the team from Mankin they asked what makes us tick and what the mission and purpose of our church is. I could tell that it wasn't just words to them. It wasn't about the gear. It was about our organization and how they could help. That first meeting was nine hours, but it resulted in the team spending many hours after that meeting designing three packages of gear. The next day we had another meeting with Mankin to discuss what was best for us. Another reason we chose them is that they worked within our budget to supply us the system we need now and ways to expand it for years into the future.

### TFWM: Why was it important to you that legacy gear that still worked well be repurposed?

**Phil:** We just purchased several high end pieces of gear that literally would have been wasted unless they were integrated into the system we now have. For instance, an 11,000 lighting board, 4 Shure wireless mics, and also several other pieces of gear that is not only expensive, but very hard to resale.

### TFWM: You wanted to be able to access your technology from a standing height – can you walk us through the reasons for that?

**Phil:** We have all sizes of people in a volunteer situation. We are always running into desks being short or tall for the person. We now have adjustable desks that can be tailored at the push of a button to fit any volunteer. The safety aspect of this control we now have can give us the safest approach to the equipment.

### TFWM: How has the congregation responded to the new design?

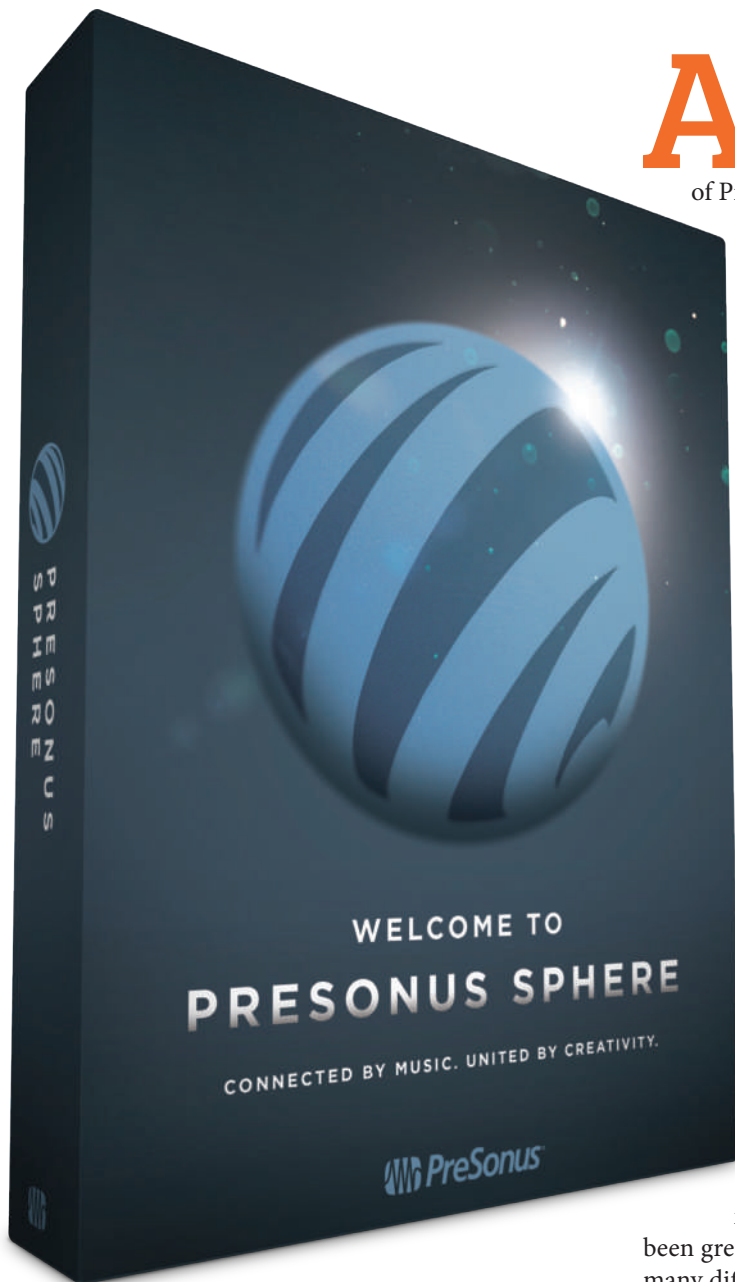
**Phil:** We have had nothing but positive feedback. The intelligibility of the new equipment gives a very clear and clean sound. In fact, for those that understand decibels and how they work are truly excited we can run 10 decibels less than we used to even using acoustic drums that are not behind a drum shield or in an enclosure. This is due to the design of the acoustic panels that are on the walls and the acoustical clouds from the ceiling.

### TFWM: How was your overall experience working with Mankin Media?

**Phil:** Knowing that the Mankin team is there when we need them, each and every weekend, was important to us. Guardian is like On-Star for our AVL system and it gives me the full confidence when I'm leading worship, that the production team has experts there on-demand and not waiting for a call back on Monday or a response to an email sometime next week.

# PreSonus Sphere

BY COLLIN MAKARIAK



**A**s someone who has studied and is passionate about music composition, I was excited to be given the chance to review PreSonus Sphere. Sphere members enjoy access to a variety of PreSonus' top products from its flagship DAW StudioOne, to its notation software Notion, to dozens of plug-ins and libraries for each. In addition, members are offered several other benefits such as software upgrades, upgradeable cloud storage and access to collaborative workspaces. I am happy to tell you I had a great time working as a member of Sphere and was truly impressed with many aspects of it.

Before starting to work with with PreSonus Sphere, I had never used their software before. However, I did have experience with other notational software and DAWs so had at least some knowledge that was helpful to me. I was impressed with Notion and StudioOne within minutes of starting, as both felt intuitive and approachable. The layout of each made sense, and I was able to figure out how to input the exact sounds I wanted with ease. Many DAWs and notational software I have worked with in the past either suffered from having a slow workflow or felt limiting in what you could achieve. Although I had an initial learning curve to overcome, once I learned where settings were and understood the fundamentals, I found myself breezing through my work. It was obvious PreSonus had the user and their experience in mind when designing this software. I was also pleased with the quality of the instrument samples. I felt like I could accomplish anything I imagined with Notion or StudioOne and both were perfect for my needs. The experience I had would have already been great, but as a Sphere member I also got to enjoy using many different sound libraries, plug-ins and add-ons for free.





When you subscribe to Sphere, the benefits you receive extend far beyond being able to use PreSonus' flagship products. Members of Sphere will find new content every month ranging from plug-ins that are available, exclusive offers and even gifts just for being members. Anyone who has a subscription has access to PreSonus Sphere's online community. Those of us who are first timers to StudioOne can communicate with experts through chat and also have access to a significant amount of online training and support for the software is available. On top of this, there are exclusive events for and online workspaces for members to collaborate on projects together. Collaboration is the name of the game when it comes to Sphere and the transition to StudioOne and Notion was made even easier for me as a result. It was clear that PreSonus was mindful of how scary approaching new notational software and DAWs can be, especially for those of us who have had little to no experience using either. Because of all of these features, along with PreSonus having collaborative work at the forefront, there is no reason anyone should feel left behind.

I can't think of anything negative to say about PreSonus Sphere. The sense of community I felt as a member is a great perk to go along with licenses for top-notch software. I encourage you to take advantage of the training opportunities and to talk with the seasoned experts of StudioOne during your transition into the program. Every member is entitled to 30GB of cloud storage, with the option of upgrading to 100 GB for a low monthly fee. Having access to PreSonus' catalogue of add-ons and plug-ins for both Notion and StudioOne was the cherry on top of the cake, especially when the exceptional quality of the sound libraries are taken into consideration. I had total control of the atmosphere I wanted to make in my music, whether I wanted to recreate the intimacy of smaller rooms or simulate the scope and power of the acoustics in a cathedral.

Although I found the package being offered by PreSonus to be of immense value, it is important to be mindful that this is a subscription-based service. All of the features of Sphere, along with the license to use Notion and StudioOne,

are dependent on being a paying member. The idea of not owning the software could be something that might scare people away from trying PreSonus Sphere for themselves. If you want to fully take advantage of everything that Sphere has to offer, you should be someone who loves the creative process behind composing music. Whether the subscription is worth it to you will come down to how many of the features you plan to use. For me, the price of under \$20 monthly is a small price to pay for access to such outstanding products. The fact that Sphere is subscription-based will open the door to people who don't want to commit to spending thousands of dollars on software and accompanying plug-ins. I highly recommend people to give Sphere a try. Notion and StudioOne are truly magnificent products and the value is top-notch. I know I will be maintaining my membership for a long time to come. **T**

**Collin Makariak** is a recent composition graduate from Acadia University and is currently working on his Bachelor of Education, with his long-term goal being to become a Professor of Music and continue to compose original orchestrations and chorals.

## COLLIN'S REPORT

FUNCTIONALITY:



STABILITY:



EASE OF USE :

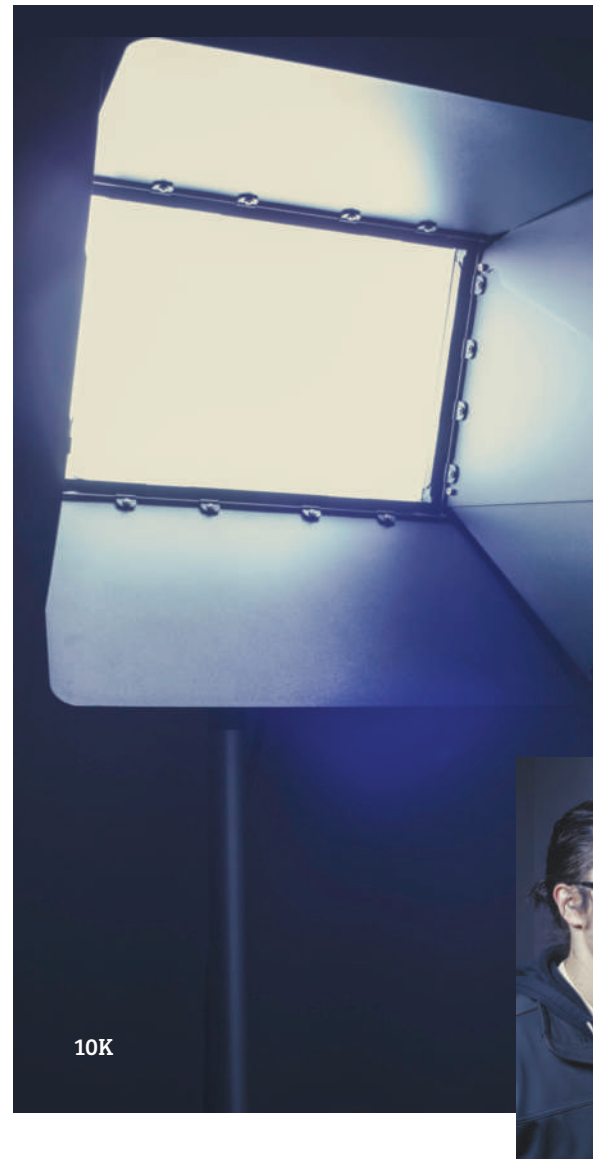


COST:



OVERALL VALUE:





# ELATION KL PANEL

BY FRANK SCHABELL

**I**f you have been in church production during 2020, I'm sure you have heard the word "pivot" used quite frequently. You may have heard it thrown around in meetings, amongst other production staff/volunteers, and from the pulpit to describe the monumental shift from the status quo to our new norm.

It's obvious when I say this season has forced many of us to stretch ourselves in fields that might not be our natural inclination.

Back in April, our church made the hard decision to shut down our in-person gatherings and make the shift to online only broadcasts. This season has allowed me the opportunity to stretch myself to learn

more of the video minded side of lighting vs live service programming and operation. Even though I was forced to move out of my comfort zone, this hard shift to lighting for video has made me into a more well-rounded lighting designer.

When I was presented the opportunity to review Elation's KL Panel, I was very excited! Our Production

and Communications Departments are very deep in preparations for Christmas with a large component of it being video content for our in-person Christmas services and online broadcasts. We have a long list of video projects on the docket; so getting the opportunity to supplement our current lighting and test the KL Panel for some of



these shoots was a God send!

Our current lighting for video recording is pretty standard at best. Our equipment list consists of “softboxes” and more traditional Fresnel fixtures for our video shoots. A common problem that we have encountered in past shoots are that these lights do not give the exact softness and color temp we desire. We have had to get crafty to achieve the lighting we are looking for during our online only season. Needless to say, with the frustrations of past shoots with our current gear, our videographer was overjoyed to test out the KL Panel with me.

The KL Panel is a LED fixture that produces a beautiful yet powerful, soft light. Along with its soft light, it is able to produce color temperatures of 2000k to 10000k. It also features a RGBWLC LED array for color mixing. The KL is able to dim the light to the desired intensity very smoothly. It has 16 bit dimming, which allows for very smooth dimming all the way from 100 to 0% intensity and has adjustable refresh rates from 900 to 23kHz. The box it came in included the KL Panel, Barn Door, True 1 Power Cable, Safety Cable and Hardware for mounting the light onto a stand or securing it from a lighting grid. The front of the fixture has a diffusion screen that softens the light it produces. The fixture is made out of powdered coated black steel making it very sturdy, perfect for big video shoots on the road. The tradeoff is the extra weight it has for ruggedness. I was surprised by the weight of the fixture. Not that it is obscenely heavy, but the look of the fixture made me believe it would be lighter.

For control, the KL has three encoder knobs on the rear of the fixture. The encoders control intensity, color temp and the green/magenta. Along with being able to control the fixture in a standalone mode, you can utilize DMX, ArtNet/sAcn or Elation’s “E-Fly” for wireless control. As I said before, the fixture takes

True One for power and has a loop out for power if you wanted to daisy chain several KL Panels together. Since the fixture is LED, it does not consume a lot of power, which is an issue I ran into a lot with our traditional lighting for video recordings. The KL has an integrated 4-pin XLR 24-36 VDC battery input for remote power situations. This was a feature I was not able to test unfortunately.

In my testing I used my personal MA3onPC Console. The KL Panel has nine different DMX mode settings that give different levels of control of the fixture. I used it in dim, standard, extended and then RGBWLC mode. In dim mode you are able to simply adjust intensity of the fixture, which is a very simple way to operate the fixture from a control surface. I then tried standard and extended modes. Standard and extended modes allowed for more in-depth control over the dimming curve, color temperatures while RGBWLC mode gave control over color mixing. The KL Panel’s powerful RGBWLC mode could be used for music videos or other creative video shoots. These modes allowed for quick and easy control of the KL without having to touch

the knobs on the fixture. This fixture would work great in a permanent studio setting for tv or film. If your church had a studio dedicated to video shoots, this could be installed in a variety of ways for the desired angle for the shoot.

Our videographer and I experimented with the KL to create beautiful lighting we needed for our shoot. In the video shoot part of my test, we used the KL Panel to help create a very softly lit stage for a stop motion video for our Christmas services. It took a fraction of the time to set up the KL Panel for the shoot than it would have to dial in our current gear. We loved the versatility of the KL Panel for this particular shoot. We found ourselves having to use a warmer color temp due to the fact that our other video lighting equipment wasn’t able to match the KL. For another test, we took some time to take photos to see what looks and atmosphere we could achieve using it. We tried a few different angles, color temperatures and virtual gel colors for different looks. We really loved the 10k color temp. We were able to achieve some very cool looks.

Overall, we were very pleased by the KL Panel. The quality of light, versatility, and price point makes it a great light for churches trying to upgrade their video shooting equipment. With the current Covid reality we are all facing, we are forced to rely more on broadcast vs the live environment. This light would certainly help bring any church’s video production to another level. It would do extremely well in a more permanent environment like a studio, but it may be a little heavy for mobile video shoots.

After our experience using the KL, we could definitely see two to three of these fixtures becoming a part of our video equipment in the near future. Simply put if you are in the looking for great lighting fixture for video, look no further than the KL Panel. 📺

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**Frank Schabell** is Lighting Director at @thechapelchicagoland and Freelance Lighting Designer. He is passionate about using art and technology to tell the greatest story ever told. Check him out on [frankschabell.com](http://frankschabell.com) or follow him @frankschabell

## FRANK’S REPORT

**FLEXIBILITY**



**STABILITY**



**EASE OF USE**



**COST**



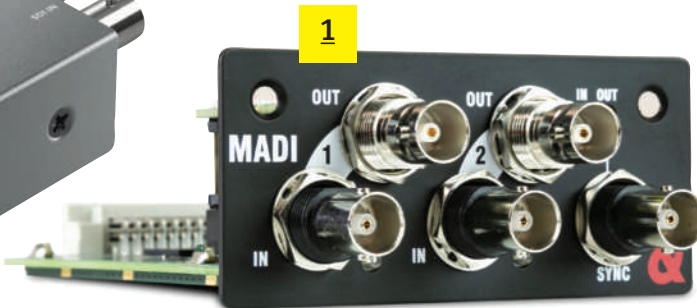
**OVERALL VALUE**



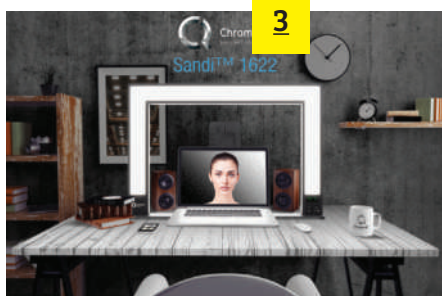
# PRODUCT SHOWCASE



2



1



3



4



5



7



6



9



8



**1/ Allen & Heath**  
SQ MADI card  
[www.allen-heath.com](http://www.allen-heath.com)

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Micro Converter 3G Models  
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Key Light  
[www.chroma-q.com](http://www.chroma-q.com)

**4/ Electro-Voice**

RE20-BLACK Broadcast Mic  
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**5/ ETC**  
High End Systems  
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**6/ Magewell**  
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converters  
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**7/ Magmatic Atmospheric Effects**  
Crisp Max™ Snow Machine  
[www.elationlighting.com](http://www.elationlighting.com)

**8/ Matrox**  
Monarch EDGE 4K/multi-HD  
encoder and decoder pair  
[www.matrox.com](http://www.matrox.com)

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WEEK JANUARY 2021



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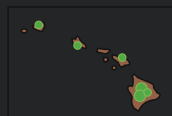
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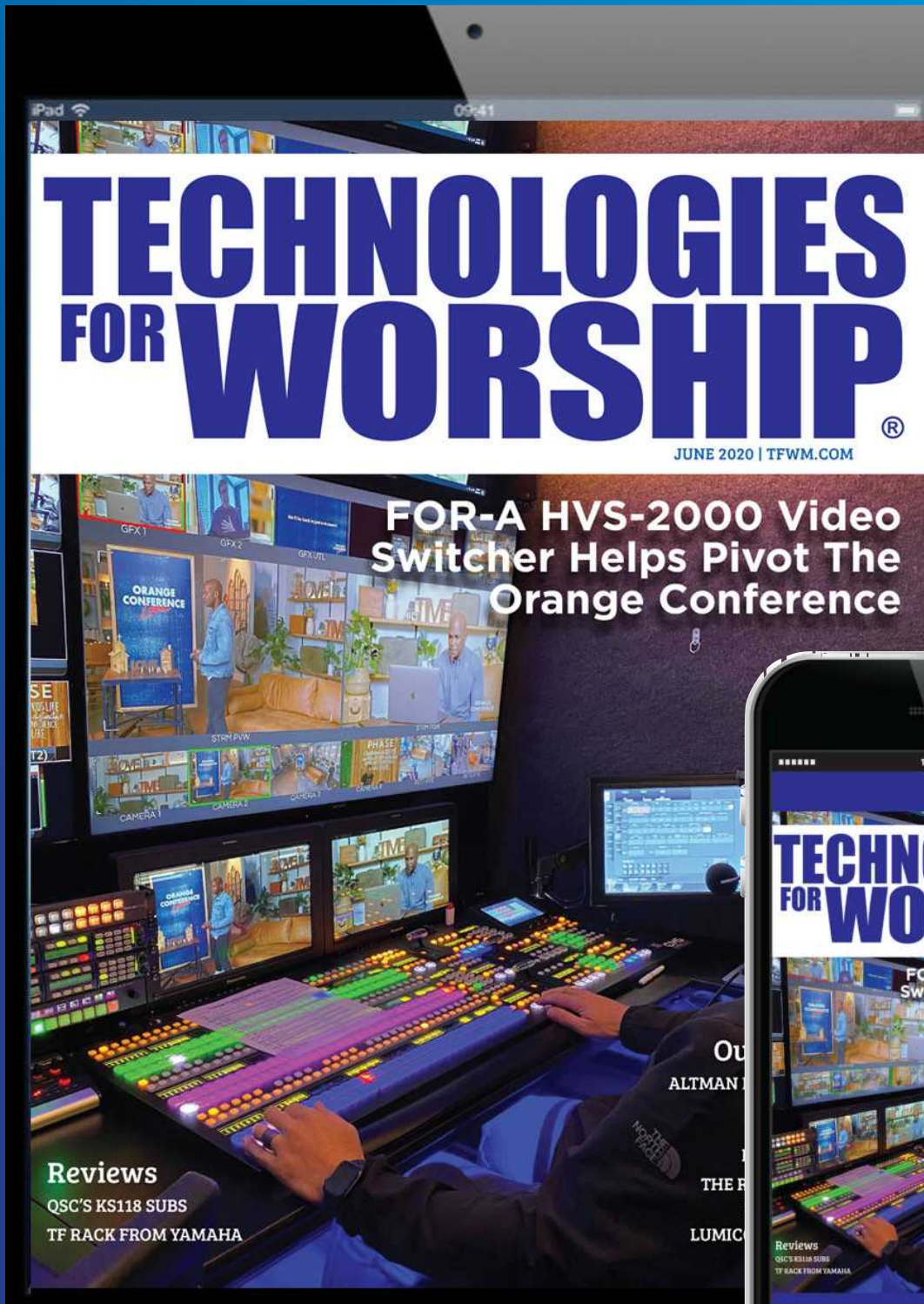
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