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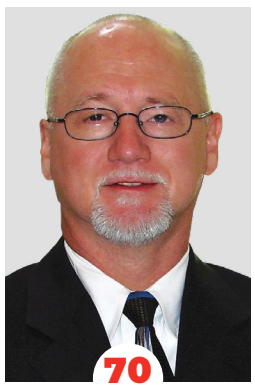

INDUSTRY INSIDERS

30 Blueprint for Success
Julian Phillips makes his case for chief artificial intelligence officers.

70 DMS: Next-Gen KVM
IHSE USA's Dan Holland talks display management systems.

74 Viewpoint
Rob Voorhees shares five ways to develop business in 2024.

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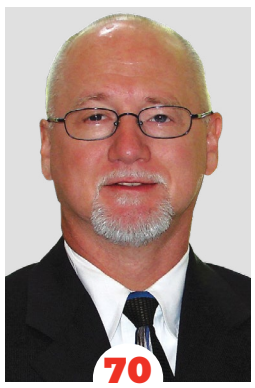

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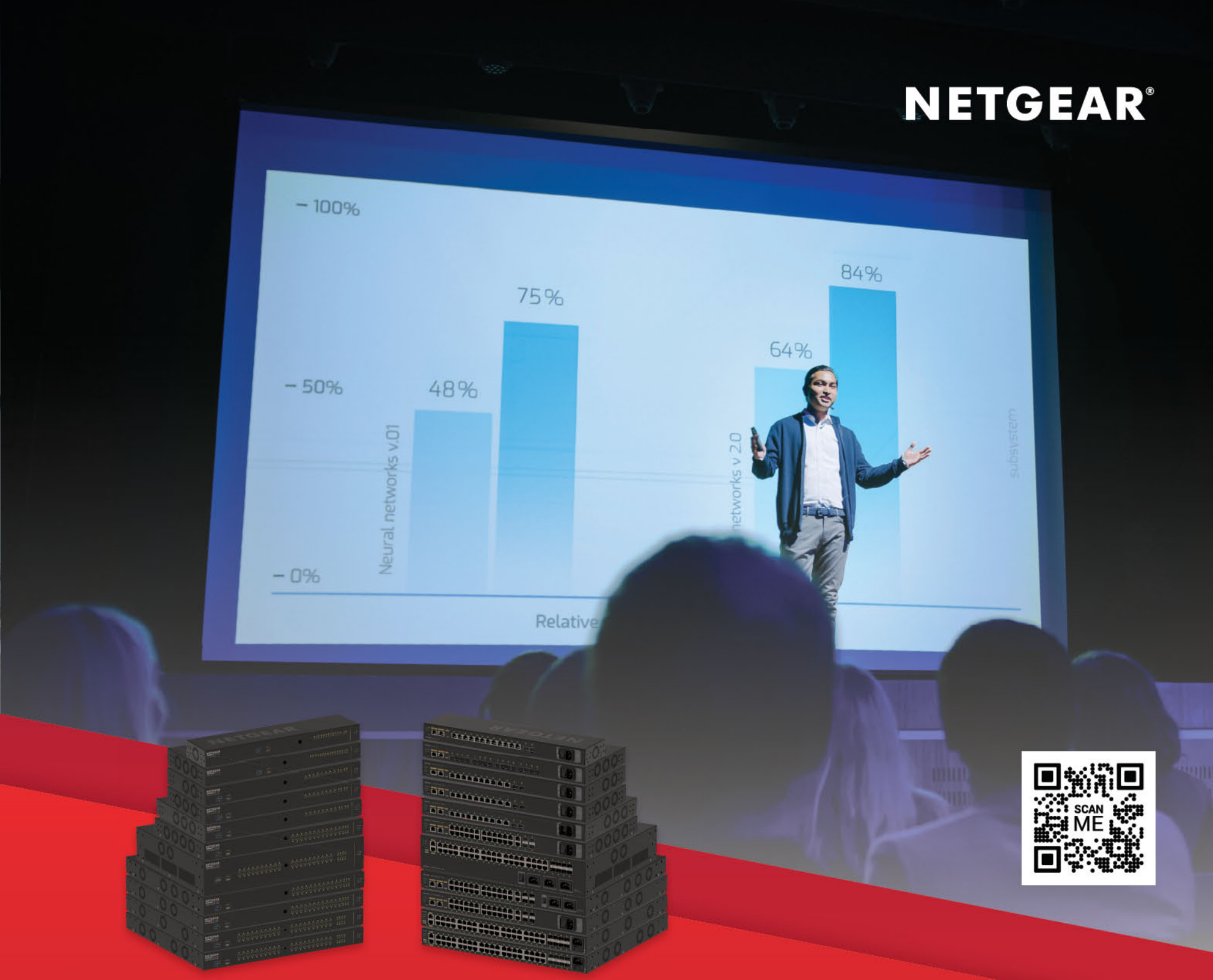

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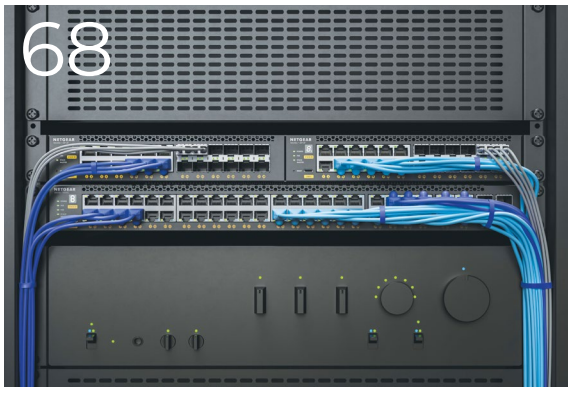

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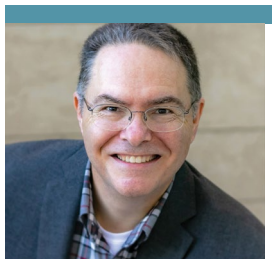

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Celebrate Your Corporate Rituals

"Do you mind if I play a song?"

It was an odd question. Our company produces the Show Daily for several trade shows. I was in the onsite office a little earlier than the rest of the team; I wanted to get a jumpstart on the day's activities so I would have a little extra time to spend in my natural habitat, the exhibition hall.

Our show photographer, whom I have known for years, came in a few minutes later. I was already deep into editing content when he asked his question. Of course, I answered him with my usual level of grace, professionalism, and understanding.

"What?" (I can be quite the wordsmith at 8 a.m.)

He persisted: "Do you mind if I play a song? Just one song."

At this point, it's probably important to mention that I'm one of those people who prefers a quiet environment when I write or edit. I'm fine with nature sounds or pink noise—but play something with a beat, and I'm suddenly far more interested in the woman who is "dressed to kill and lookin' dynamite" than whether one of our writers has properly used a semicolon.

"Sure," I replied. After all, I had plenty of other non-editing tasks to do, and it was just one song.

I spent the next four-and-a-half minutes listening to "Gimme Shelter" by the Rolling Stones. Loudly, as is right and proper.

When it was done, he thanked me for indulging him, explaining that he plays that song at the start of each day when he's on a job. "No problem," I said. "It's your ritual."

Many people equate rituals with religious ceremonies, but I think they can be found far beyond the confines of an altar. We all have our rituals, and I contend they are different from habits. Brushing your teeth: That's a *habit* (and it's a good one, too, kids), and hopefully it's part of your overall personal wellness *routine*.

But a *ritual*? That's important. It's specific. It has purpose.

Our photographer could have listened to "Gimme Shelter" on headphones, and I would have never been the wiser. But he was better served by hearing it fill the room, not just having the song spit out through a couple of pellets in his ears.

A ribbon cutting is a ritual. Most trade shows I've attended have had one to conclude their opening ceremonies, and it tends to draw a crowd. The ribbon itself—usually some variation of a 12-foot piece of thin fabric that's 4 feet off the ground—isn't much of a deterrent to stop you from gaining access to the show floor (though the oversized scissors might give you pause). But that's not really the point, is it? The ritual of cutting the ribbon symbolizes the beginning of the event.

Some car dealerships have their own ritual. Buy a car and you ring a bell or bang a gong or something. Oh, you may think it's trivial, but how did you feel the first time you bought a new car, and the sales manager directed you toward that shiny, noisy item in the back of the showroom? How proud were you to grab that mallet and have at it?

Rituals like ribbon cutting ceremonies are more important than you may think.

Rituals are important.

We don't sell cars in our industry (though some of us customize production vehicles), so there's no gong waiting with your new keys. But that doesn't mean your business can't have or shouldn't have rituals.

They may not be solemn, but I assure you that people take rituals very seriously, even ones that may seem silly on the surface, because they signify and celebrate the achievements of your employees and/or your customers. If you don't have any rituals as part of your corporate culture, maybe 2024 is a good time to start one. Gong not required. Happy New Year!

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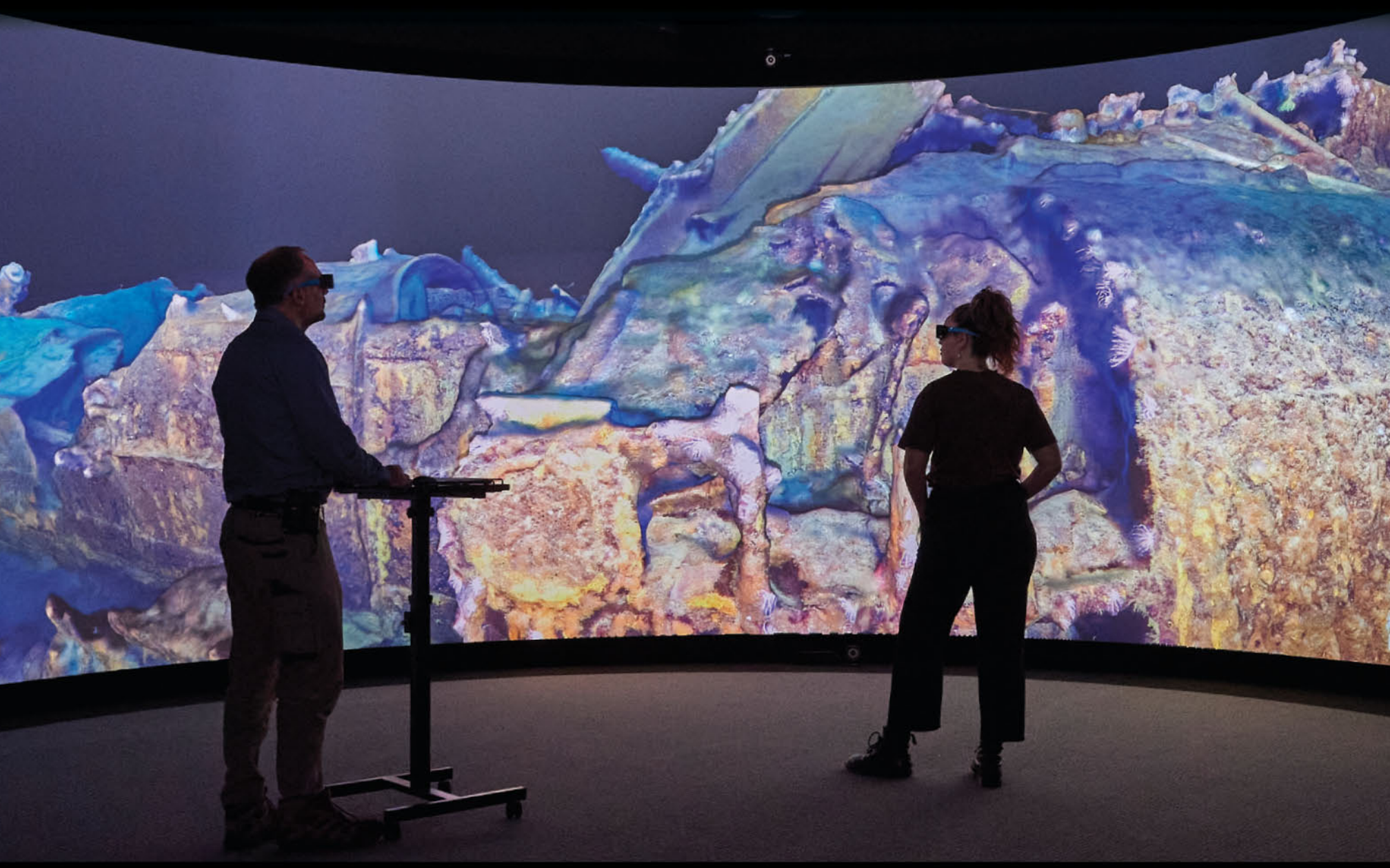

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The new Kennedy Entry Experience features a 98-foot-long LED dipslay to greet visitors to the Kennedy Space Center Visitor Complex.

Massive New LED Display Greets Kennedy Space Center Visitors

SNA Displays has built a ground-level LED screen for the entrance to the Kennedy Space Center Visitor Complex in Merritt Island, FL. The 3,000-square-foot video display, which debuted in mid-October, greets guests with custom content designed to enhance visitor experience and stimulate interest in space exploration. Known as the Kennedy Entry Experience, the 6.6 mm EMPIRE Exterior LED display tells the story of NASA's past, present, and future.

The freestanding screen is designed to create 3D illusions from a certain vantage point.

The freestanding screen is 30 feet tall and 98 feet long, featuring a seamless curve with a tight 5-foot radius. The Kennedy Entry Experience contains more than 6 million pixels and is optimally designed for anamorphic content, creating 3D illusions from a certain vantage point. Along with presenting immersive content, live video, and event messaging, the screen is also integrated into the emergency system to alert park guests of inclement weather events.

The display is built with a steel structure designed to withstand 150 mph winds and includes a lightning protection system that provides overcurrent protection during storms. Additional storm proofing includes drainage considerations within the display structure as well as proper runoff.

In addition to building the video display technology, SNA Displays is the exclusive sponsor of the Kennedy Entry Experience. Eastern Sign Tech provided installation services while Ivey's Construction provided general contracting services. SNA Displays has also provided 3.9 mm EMPIRE Exterior LED kiosks to welcome guests to the Visitor Complex, and will be providing a 2.5 mm BOLD Interior LED video wall for the park's Trailblazers exhibit.

AVIXA to Offer Microsoft Teams Rooms Training

AVIXA has signed an agreement with Microsoft to offer Microsoft Teams Rooms training to Pro AV professionals. Technical training to deploy, configure, and manage Microsoft Teams Rooms is now available for free through AVIXA's training catalog.

The Microsoft Teams Rooms Training provides technical knowledge and resources using the Microsoft Teams Admin Center, PowerShell, and the Microsoft Teams Rooms Pro Management. Training begins with a technical introduction to Microsoft Teams Rooms, covers the importance of room design and ensuring network readiness, and details the process of creating the resource account. Individuals who complete the Microsoft Teams Rooms Training and 50-question test are eligible to receive 10 CTS renewal units.

"Employees want to have a high-level communication and collaboration experience, whether they're working from their home office or in a meeting room at headquarters, and Pro AV professionals play a major role in creating that hybrid workplace of the future," said Pam Taggart, AVIXA's VP of content creation. "The addition of Microsoft Teams Rooms Training to our training catalog is a huge benefit to AV professionals—they can now layer product-specific education on top of AVIXA's foundational training. This training also brings together the distinct skills of AV and IT—professionals from both fields will broaden their knowledge and career potential."

SAVe Announces SAVe 2024 Global Conference

Sustainability in AV (SAVe), an industry-wide, U.S.-based organization established to bring stakeholders in the AV field to take concerted action to achieve the 2030 Sustainable Development Goals (SDGs), has announced the inaugural SAVe 2024 Global Conference for Sustainability in AV in Los Angeles at UCLA Luskin Conference Center March 14-15, 2024. Reflecting the importance of building an organization capable of advancing meaningful change, the conference theme is "A Call for Leaders."

"Across our industry, there is a tremendous amount of interest in taking action to achieve a sustainable future," said Christina De Bono, SAVe founder and president. "A principal objective of SAVe 2024 is to tap that energy and channel it into a concerted movement. People are the most powerful resource for change and SAVe 2024 is a clarion call for members of our industry to take up the challenge before us."

SAVe 2024 will provide educational forums, workshops, and planning sessions. Stakeholders will gather to share ideas on how to make substantial progress in areas related to responsible waste management, life cycle carbon emission reduction, and reduced energy usage. Best practices will be shared on reuse, reduction, recycling and proper disposal of AV equipment at the end of its useful life. The SAVe leadership team will also be conducting SAVe Certification workshops that result in the development of an actionable sustainability program and official SAVe Certification.

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disguise Brings U2 Vegas Sphere Residency to Life

RICH FURY

16K video is split across 23 disguise gx 3 servers, each with 30 TB of storage, to play content at a moment's notice inside the Vegas Sphere.

By Wayne Cavadi

The Vegas Sphere has been the talk of the Pro AV world since it lit up the Las Vegas Strip on July 4. U2 opened its residency on Sept. 29, and visitors inside the MSG Sphere have been going bonkers ever since. The venue's massive 16Kx16K display presents breathtaking imagery and makes every performance much more than just a concert.

To immerse the concertgoers in frighteningly realistic real-time content, U2 turned to disguise media servers and software. The match was a no-brainer, as disguise solutions have been used by the band since its 2005 Vertigo tour. It was then that disguise founder, Ash Nehru, wrote code to help them pre-visualize the content on massive LED displays, and disguise's Designer software was born.

The show isn't just pretty images—it brings the audience into the show. Peter Kirkup, disguise's solutions and innovation director, referenced a real-time rendered moment in the show where lightning is crashing into the ocean and multiple 4K video streams of U2 are reflected into the waters, all rendered in native 16K resolution, at 60fps.

"Our software works in beats and bars because that's how music works," explained Kirkup. "And we understand very musically how the production is going to be built, as well as technically how to drive all those pixels. There are layers of real-time content happening there—some of them very subtle, some of them a little bit more in your face. But there are moments where we render the entire 16Kx16K canvas using a real-time engine [Notch] rather than just playback of pre-rendered video."

From concept to showtime, the Vegas Sphere show took roughly a year to create. That disguise Designer software was used to split and distribute 16K video across 23 disguise gx 3 servers, each loaded with 30 TB of storage and used to play content at a moment's notice.

As Kirkup explained, Willie Williams is the creative director for the show, and he engaged with the content team at Treatment to make his vision a reality. Different artists—like the renowned Industrial Light & Magic (ILM)—created different portions of the show. From subtle "easter eggs" to 3D illusions that make attendees wonder what is real and what is digitalized, disguise helps make the experience a memorable one.

"It's something quite amazing to stand in that space," Kirkup said. "It's a little bit like the first moment when you wear VR goggles and you're suddenly like, 'Oh, there is this other world.' This is a little bit like that but without the goggles, because it takes over your entire periphery, and they have all the tools at the disposal to do that and to bring you right into the center of the content. But then you can look to your side, and you can see your friends and neighbors having the same experience, which you can't do with VR since it's very isolating."

What's next for disguise inside the Vegas Sphere when U2's residency ends in February? Kirkup hopes future artists for the Sphere realize that disguise is the right solution for the space. But it isn't simply the Vegas Strip that could use disguise's expertise—it's trending everywhere in new venues and location-based events.

"Ramping up recently is this trend of moving toward venues being built for AV technology," Kirkup observed. "Bono actually spoke about how musicians have been playing second fiddle to sports venues. Acoustics and lighting are difficult, the screens are far away, and now, none of that is true. This space was built for performance, and therefore the performance is first and foremost, making the experience of the audience very different than ever before."

PMC's team in its new Detroit metro area facility includes (from left) Bob Lustig, Meredith Hurford, and Kyle Rochfort.

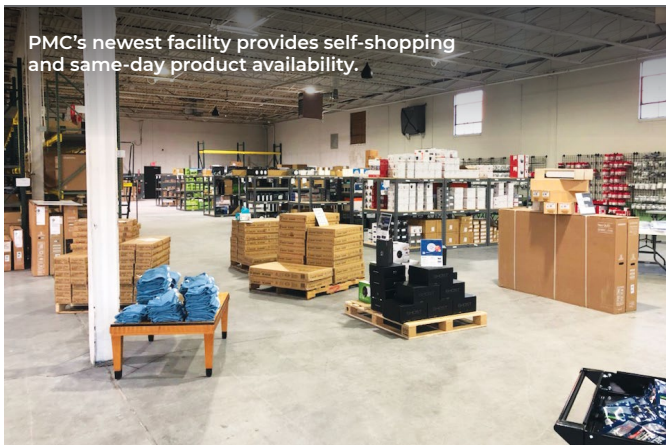
PMC Opens New Michigan Location

PMC has opened a new location in Madison Heights, MI, which is in the Detroit metro area. The new facility features self-shopping, 24-hour pickup, and a training facility that can accommodate more than 50 attendees. Founded in 1869, PMC now operates with eight locations dedicated to supporting custom integration dealers in the Midwest.

"This opening brings with it very unique excitement," explained Alec Haight, PMC CEO and sixth-generation owner. "The local team, led by seasoned professional Meredith Hurford, is one of the best we've put together. Additionally, the local feedback has been phenomenal, and we're eager to bring our value-added services to the Detroit market."

PMC's newest facility provides local dealers flexible logistics support and same-day product availability in an open shopping format where customers can freely browse aisles of products. The location is complete with a 24-hour will call room and an indoor loading area to make sure Michigan weather never stands in the way of business. Local dealers will also benefit from PMC's self-service app, communications service, and live-inventory website with bill payment.

"PMC's growth continues to be propelled by the collaborative relationships we have with our vendor partners," Haigh added. "With their continued support, we know the expansion into this new market will drive forward our value-add strategy for the custom integration channel."



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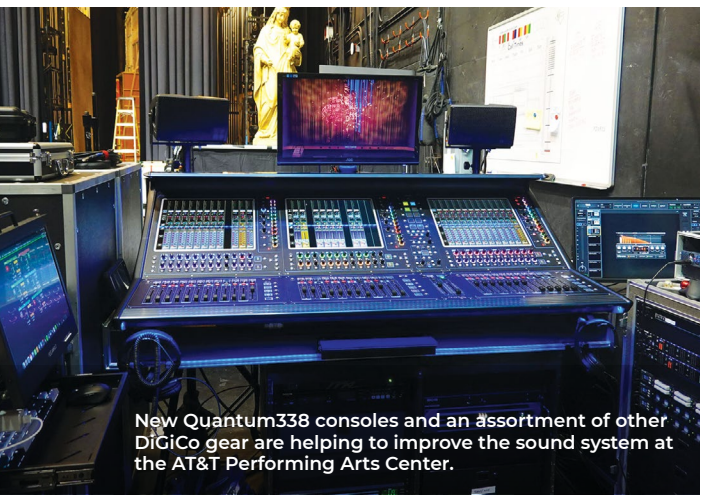
DiGiCo Helps Performing Arts Center Get Connected

The nonprofit AT&T Performing Arts Center in Dallas will observe its 15th anniversary next year, and the five performance venues on its campus—the 2,200-seat Margot and Bill Winspear Opera House, the 547-capacity Dee and Charles Wyly Theatre, two highly-utilized black box theater spaces, and the outdoor Annette Strauss Square with a lawn that can hold up to 2,200 people—have geared up to celebrate. New sound systems, including an array of DiGiCo products, will greatly enhance the sonic capabilities of all five venues in the $360 million facility.

The new systems, including a new d&b audiotechnik PA, were designed mainly for use in the Margaret McDermott Hall in the Winspear Opera House, which is home to the Dallas Opera and Texas Ballet Theater. However, all the DiGiCo systems will be available for use in any of the venues as needed. "Flexibility was the main feature we looked for," said Jace Hershberger, head audio for the AT&T Performing Arts Center.


New Quantum338 consoles and an assortment of other DiGiCo gear are helping to improve the sound system at the AT&T Performing Arts Center.

In addition to ballet and opera, the Center presents a range of programming in the Winspear Opera House, including touring Broadway productions, comedy, modern dance, and concerts. Keb'Mo' and Boz Scaggs were among this summer's headliners.

The new systems include two Quantum338 consoles, plus a compact SD11 desk, 4REA4 processing engine, Purple Box CAT5/MADI to optical converter, four SD-MiNi Racks, two SD-Nano Racks, and a pair of SD-Racks fully outfitted with 32-bit Stadius Mic/Line cards. DMI-Dante cards were also specified for the consoles, in addition to Optocore connectivity, as well as a dual-redundant Dante IT network that was implemented to connect the system drivelines to drive the new PA.

"The Quantum338 consoles and SD11 desk, along with the stage racks, are basically set up as portable floater consoles to do either FOH or monitor applications wherever is needed between the three venues," explained Ken DeBelius, system integration sales manager at Nashville's Spectrum Sound. "The two Quantum338 and the stage racks are completely portable and able to be used freely in any of the three main venues. The 4REA4 is permanently installed in the amplifier rack and is doing processing/routing for the system drivelines in the Winspear. Also, they expect use the SD11 for simple events in their smaller spaces, such as the Wyly Studio Theatre."

According to DeBelius, Spectrum had worked with the AT&T Performing Arts Center over the last eight years to upgrade several of their portable audio systems, as well as implement a new house loudspeaker system for the Wyly black box theater. "This latest project was quite a long-overdue major renovation for the audio system in the Winspear," he noted. "It was basically ground up, including a new fiber optic infrastructure to support the DiGiCo Optocore transport network. The new complement of DiGiCo worksurfaces and other hardware will allow them the needed flexibility to meet the varied demands of all types of shows that come through the performing arts center."

Hershberger said DiGiCo's broad acceptance in the touring and installed-sound markets was a major factor in the decision-making process. As an engineer familiar with the consoles, he's also a fan of their sound quality and operation. But the capability to address the needs of a wide variety of venues under one roof was the key criterion.

"That really great flexibility, combined with DiGiCo's sonic capabilities and its broad contract-rider acceptability, made it the obvious choice," he added. "Control-wise, the consoles and systems let us basically do whatever we want and put anything anywhere. The consoles' layers are completely customizable and really work well for no matter what we're doing, from just a single presenter to a full band. And we have an entire file base of snapshots of all of the possible configurations for any console in any location ready to go."

JVC Enhances XFL Coaching

Brad Campbell spent two decades in the NFL as a video director that embraced innovative solutions to enhance the overall fan experience. Now senior director of football technology for the XFL—a spring football league that was relaunched in 2023 and is considering a merger with the USFL at the time of publication—Campbell has seamlessly integrated JVC's GY-HC500SPCU CONNECTED CAM handheld sports production cameras with the league's Catapult analytics system for streamlined video management and efficient data transfer for each team's video manager.

"The JVC GY-HC500SPCU cameras blow others out of the water; they have delivered fantastic results for us," said Campbell. "The ease of use, fast operation, and compatibility of the cameras with our existing systems have significantly enhanced our video operations. They are perfect for a startup league—the price point is fantastic and the quality really matches everything that I have used in professional broadcasting."

For Campbell, one of the standout features of the video production system is the camcorder's unique ODK (Offense/Defense/Kicks) metadata tagging, which allows users to mark the phases and camera angles of the game or practice for faster and more accurate editing. "It aligns seamlessly with the XFL's data-driven approach," he added. "We have a much smaller staff than other professional leagues, so we need a way to integrate and access the footage quickly. The GY-HC500SPCU cameras in combination with the Catapult coaching software system allow us to have efficient categorization and retrieval of critical footage for player scouting and performance analysis."

With two cameras being deployed for each team, the league's video managers are tasked with collecting player data, player footage, and cut-ups of the players in action. This content then gets shared with the league's directors of player personnel, who use it for a variety of playback scenarios. "With the JVC GY-HC500SPCU, we're able to capture crucial game footage, offer dynamic replay angles, and even provide supplementary coverage to our broadcast partners," continued Campbell. "It's nice to have every team utilizing the same camera."

Campbell also notes that the XFL gives his team creative control over the techniques they can use on the field. "Our league's agility allows us to experiment with technology and push the boundaries of what's possible," he said. "We do things a little differently on game day in that we share services … our teams share their content, which makes it a lot more efficient for our video team who work on a tight staffing schedule."

The XFL is using JVC cameras to collect footage for player scouting and performance analysis.

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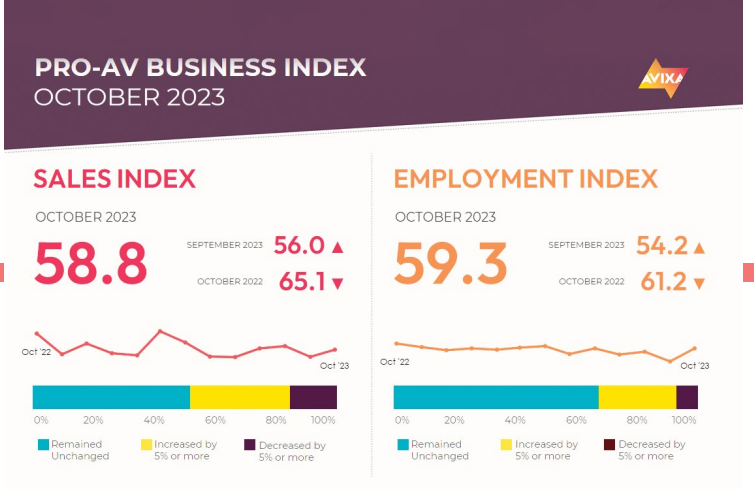

Sales Growth Rebounds as U.S. GDP Stuns

By Peter Hansen

After a disappointing September, the October AV Sales Index (AVI-S) rebounded a few points to 58.8. This level is exactly in line with the average AVI-S this year and represents moderate growth that would be a little lower than was normal during the pre-pandemic era. As such, it should be seen as solid but unspectacular expansion.

While supply chains are improving, comments from survey respondents underscore that this remains a thorn in the side of many businesses. Broader economic factors also impact businesses, with uncertainty one of the leading challenges. Most companies are caught up on hiring after a burst due to the record revenue growth in 2022. However, those still hiring this year face challenges depending on location, role, and compensation structure.

"It's enough to knock me over with a feather." This was the view of a lead U.S. economist in response to the shocking third-quarter U.S. GDP report, which showed an annualized rate of 4.9%. This is exceptionally high, especially in what was supposed to be a down year. Add in that the first two quarters saw rates just over 2% (a normal, healthy rate for the United States), and 2023 looks likely to be an overall strong year.

The United States is not the only area with good GDP news. After China issued a $137 billion bond issue to support local governments and bolster the economy, the IMF significantly increased its growth outlook for 2023 and 2024 (both increased by 0.4 percentage points). Uncertainty remains going forward, and there is consensus for weaker U.S. GDP growth in 2024, but these gains are a major positive for the global economy and Pro AV.

The rebound in the AV Employment Index (AVI-E) was even stronger than that in the AVI-S. The AVI-E accelerated 5.1 points from 54.2 to 59.3. That puts the AVI-E higher than the AVI-S and puts its growth rate at a level that would be perfectly normal in pre-pandemic times. By illustration, this month's score is the same as the full-year average AVI-E in 2017. Such a high level may be hard to sustain in the coming months, as the AVI-E has stayed at or below 59.3 since April, and the AVI-S, while solid, suggests slower payroll expansion than the rate observed in October.

A look at the U.S. economy overall reveals continued strength. The unemployment rate ticked up to 3.9%, but the increase reflects increased labor force participation rather than a slowing job market. In terms of total jobs, the economy nominally added 150,000 jobs. However, a more realistic figure is 195,000, as 45,000 jobs were temporarily off the books in October due to the UAW strike. 195,000 is a strong expansion consistent with a healthy, growing economy.

The Pro AV Business Index report is derived from a monthly survey of the AVIXA Insights Community, a research community of industry members that tracks business trends in commercial AV. For more information about joining the AVIXA Insights Community, visit www.avixa.org/AVIP.

Peter Hansen is an economist at AVIXA.

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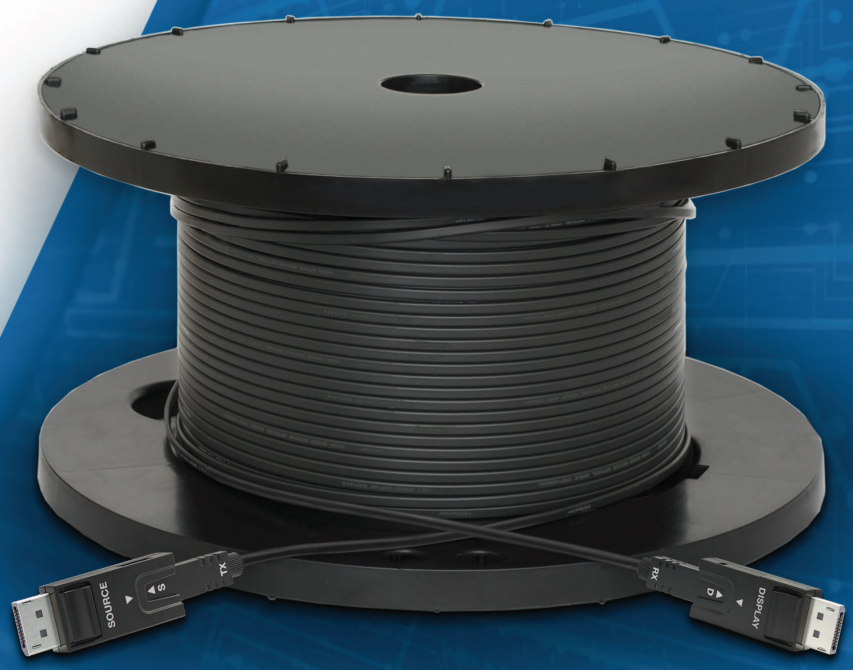

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Under the Radar

EvertzAV VP Francisco Ready to Grow Company's Pro AV Presence

By Mark J. Pescatore

QUICKBIO

Paulo Francisco
Position: Vice President of Engineering
Company: EvertzAV

SCN: How long have you been with this company, and what are your responsibilities?
Paulo Francisco: I have been with EvertzAV for just over seven years. I am responsible for the Pro AV side of the business, including product development and service.

SCN: When I think Evertz, I immediately think routers. What features are important in a good router?
PF: Today, Evertz is much more than routers but, yes, we also design and manufacture world-class routers. A good router is purpose built and designed to be non-blocking, resilient, scalable, and fast switching to deliver breathtaking results for mission-critical applications. Whether baseband or IP, our routers/switches are the result of decades of experience in this space.

The other key factor for any router/switch (SDI or IP) is the orchestration and control software. The size and complexity of facilities has grown significantly, thus increasing the need for a comprehensive orchestration, control, monitoring, and analytics software tool. In our case, this is MAGNUM-OS, which manages the largest media facilities in the world, as well our large-scale Pro AV facilities with our MMA10G technology.

SCN: There are plenty of standards out there, so what was the thinking behind EvertzAV's support of IPMX?
PF: IPMX is an emerging open standard for Pro AV, aiming to simplify the landscape, drive multi-vendor interoperability, and make it easier for end users and system integrators to choose solutions for basic AV applications. We embrace and are supportive of this goal.

It is a natural progression for us, given our broadcast leadership and success in the introduction of IP routing and the subsequent introduction and evolution to SMPTE ST 2110. With IPMX sharing many of the same characteristics of SMPTE ST 2110, the transition to IPMX in the Pro AV domain is a very natural fit for EvertzAV.

SCN: What makes the NUCLEUS solution unique in the AV-over-IP space?
PF: NUCLEUS was designed from the ground up to deliver an extensive feature set, large ecosystem of encode/decode endpoints, and ease of deployment, use, and maintenance. It is fully interoperable with standard consumer off the shelf (COTS) managed switches, securely delivering low-latency, pristine video quality over your choice of 1G, 2.5G, or 10G copper or fiber. NUCLEUS was architected to be easily deployed by IT teams using standard practices common to large-scale deployments of technologies such as VoIP and Unified Collaboration (UC).

SCN: We can't really talk live event production without talking DreamCatcher. How has the platform evolved over the years?
PF: BRAVO Studio is the latest evolution of the DreamCatcher platform. It brings a cost-effective, collaborative, cloud-based suite of tools to handle any kind of live event. BRAVO Studio allows for more stories to be created from anywhere in the world. For the Pro AV space, BRAVO Studio allows Fortune 500 companies, university/colleges, medical institutions, and governments to produce live events that are broadcast quality from anywhere in the world with small teams of varying skillsets. BRAVO Studios brings the highest quality production with lower costs.

EvertzAV MMA10G-TRS4K-2-N 4K/UHD HDMI Gateway

SCN: What advice do you have for integrators pitching IP-based production solutions?
PF: Tough question—it really depends on what is being pitched and at what point of the conversation. The path to a happy customer is fully understanding their requirements and not overpromising a technology or solution. So, pitching based on reinforced deployment experience is the path to success.

For newer products, have a great working relationship with the vendor and bring them into the discussion to help with the pitch as needed. No one knows the product and technology better than the folks that designed it. EvertzAV provides complimentary Solutions Engineering design services to integrators and provides a full design, with detailed notes, along with the system quote—our goal being to empower our system integrators and consultants with the knowledge and information they need to succeed.

SCN: Evertz acquired Studer back in 2021. How is Evertz celebrating the brand's 75th anniversary?
PF: The integration of the Studer audio mixing consoles into the Evertz ecosystem has been a success. We're now developing new Studer products including the Infinity ST Core for IP audio, Vista BRAVO a 12-fader mixing console, plus we're adding Studer controls into VUE for remote production. All these activities honor the Studer tradition of quality and innovation. That is the best way to celebrate 75 years!

SCN: Evertz is known for a number of different product categories, but in your opinion, what Evertz solution flies under the radar?
PF: EvertzAV is the one that flies under the radar. Evertz is a recognized leader in the broadcast space. In the Pro AV space, we're considered a smaller player. To address this, Evertz is taking the decades of experience in the broadcast media space and bringing it to the Pro AV market. Today's Pro AV space is demanding higher quality and resilient solutions and technology as the industry matures. Evertz continues to grow its presence in the Pro AV space by supporting efforts that include IPMX and other proven technologies.

SCN: What new initiatives are we likely to see from your company?
PF: In short, continued innovation and lots of new products, features, and capabilities with a continued commitment to IPMX. SCN

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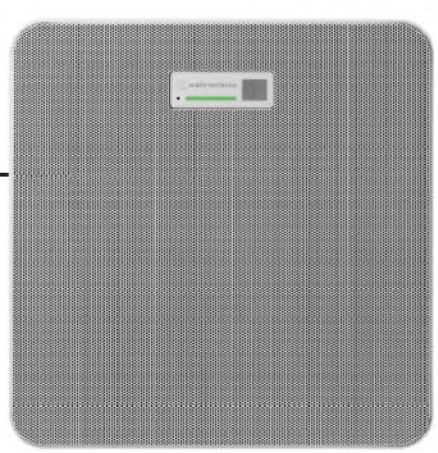

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Display Innovations

Peerless-AV's Belcore Offers Update on Kiosks, Mounting System Solutions

By Mark J. Pescatore

QUICKBIO

Nick Belcore

Position: Executive Vice President

Company: Peerless-AV

Overtime: Personal time is paramount, and I spend as much time as possible with my family. My kids are at the age where I can positively assist them both academically and athletically, so I plan to seize on that finite opportunity while it is available.

SCN: How long have you been with this company, and what are your responsibilities?

Nick Belcore: I joined the AV industry from life sciences and healthcare in 2006, a sector that was changing substantially at the time and greatly restricted the ability to disseminate information and add value. When the opportunity presented itself to come over to the AV world, this offered me the chance to lead a national sales team in a way I deemed best for the long-term benefit of the company, while simultaneously adding substantial value to our customers and partners.

In my role, I have both a personal and business responsibility to take Peerless-AV in a direction that benefits the planet. Renewable and alternative energy excites not only me but everyone on the global board at Peerless-AV.

SCN: Earlier this year, Peerless-AV updated its Smart City Kiosks. How healthy is the kiosk business?

NB: Our kiosk business is doing extremely well—and I'm speaking from a global perspective. We've shipped some significantly sized orders of indoor and outdoor displays from our facilities in the U.K. and Aurora. Seeing them all lined up in the warehouse is always a sight to behold.

As you rightly call out, our Smart City Kiosks were updated earlier in the year. Key upgrades facilitate a simplified installation for running power and data cabling while offering an environmentally protected dedicated storage space for media components. The dual-sided model is new to the range, offering increased screen space and opportunities for revenue-generating digital advertising and wayfinding. Both single and dual-sided models are proving very popular, especially for government, transportation, and visitor attractions.

SCN: What is some advice you would give to companies considering outdoor locations for displays like kiosks or digital menu boards?

NB: The primary consideration is to correctly ascertain traffic, both foot and vehicular, to get the best return on your investment. Once determined, especially in an outdoor setting, it is imperative to understand the conditions that will be encountered by the technology you are deploying. Is the screen facing west and will it take a solar beating? If so, the most thermodynamically robust display needs to be used to give you the most reliable performance. Are you deploying in an area where moisture, insects, or circulating dust particles are likely to ingress into the display? The highest ingress protection rating will provide you with your best countermeasure to these potentially damaging variables. All of Peerless-AV's outdoor solutions are all-weather certified and are among the highest operating temperature range and ingress protection solutions available on the market, making them a durable, high-quality viewing experience, no matter where the solution is placed.

SCN: You showed the SEAMLESS Kitted Series Universal dvLED Mounting System at InfoComm. What makes it different from other mounting solutions?

NB: Seeing is believing in this product because of its simplicity. Lack of standardization has been a barrier to easier dvLED deployments. What makes the DS-LEDUNV mount truly universal are the unique quick connect clamps, which remove the need for dedicated adaptors. These clamps are fundamental for quick and easy latching of the dvLED cabinets along the mount frame, and they also include Y-axis (height) adjustment to make the whole process uncomplicated. Z-axis (depth) adjustment is important when mounting to imperfect wall surfaces, and the DS-LEDUNV offers an industry-leading 3/4 inch or 20mm (+/- 10mm). The X-axis (width) determines the horizontal movement of the cabinets, so that when hanging to the frame, they can be adjusted to latch softly to each other to ensure no damage to pixels.

SCN: What advice would you give to a potential customer if they can't decide between a single-panel display or a dvLED solution?

NB: Both dvLED and LCD panels can provide great results, but each has key characteristics that can affect the overall results. The decision all comes down to your unique design, budget considerations, and overall goal for the displays—from distance to content, type of venue, and whether touch-based interactivity or rotating images and content are required. Both dvLED and LCD video walls are well suited for large-scale deployments, but dvLED allows for virtually infinite size options as well as more shape and configuration possibilities that extend beyond LCD's form limitations. dvLED solutions also provide seamless image quality in larger form factors, removing the visual breaks so often associated with LCD video walls.

The Jackie Robinson Museum features a dvLED video wall with a custom SEAMLESS Bespoke Mounting System.

However, installations of dvLED solutions still tend to be more expensive, despite price decreases and increased availability in the channel over the past few years, while LCD has made its large-format displays of 86 inches and above significantly more affordable. Today, for very close viewing distances, LCD still has the upper hand, but dvLED is gaining on LCD as a technology. LCD still leads the market from an up-close touch and interactivity standpoint, making it an ideal solution for many K-12 classroom and corporate boardroom settings.

SCN: What's one of Peerless-AV's more recent and unique dvLED installations?

NB: In collaboration with Ideum, Gensler, and the Jackie Robinson Museum, Peerless-AV designed and engineered a custom SEAMLESS Bespoke Mounting System to support the dvLED video wall backdrop that provides attendees with a look into the life and history of Jackie Robinson. The installation, a central media delivery tool for the museum, provides an immersive way for attendees to view snippets of Jackie's career achievements, and offers a space for people to come together to appreciate each other's humanity and diverse experiences.

SCN: Where do you see displays for the Pro AV industry heading in the next few years?

NB: The emergence of machine learning and artificial intelligence is going to accelerate at a geometric rate—and will become resident in products and in the data that drives technology and hardware development. Displays for Pro AV will evolve to make use of this new data and machine learning to create a seamless interface between the user and technology. SCN

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Carl-Johan Sköld

CARL-JOHAN SKÖLD has joined ASTERA as Group CEO. Having acted as a consultant for the German-based lighting firm for some time, Sköld is ready to advise and lead Astera into a period of strategic growth, bringing with him an extensive background in business consultancy, M&A advisory services, and strategic development, with a particular focus on the East Asian market. Since 2012, he had been a founding partner of Stenvall Skoeld & Company. Sköld's analytical ability will facilitate an end-to-end evaluation of existing operations, from product design to manufacturing, plus internal processes, accounting, reporting and finance, and global strategy.

Paul Kelly

PAUL KELLY was recently appointed by AVI-SPL as its new general manager for Ireland. Most recently with global technology company Ingram Micro, Kelly is passionate about helping organizations realize the promise of digital transformation through innovative technology solutions and services. He also brings a proven track record of driving company growth and building exceptional teams.

Michael Kosla

LG BUSINESS SOLUTIONS has appointed longtime hospitality sales leader **MICHAEL KOSLA** to senior vice president of sales to drive customer engagement, accelerate growth, and maximize synergies across the business. Kosla is a seasoned leader with three decades of sales experience that helped further develop the cruise ship, hospitality, and fitness business segments. His expanded role now also encompasses digital signage and IT solutions for a broad range of vertical markets, as well as robots and EV charging stations.

Chester De Castro

MAXHUB appointed **CHESTER DE CASTRO**, CTS, to the newly created position of technical support specialist. In his new role, De Castro will be providing level 1 technical support, serve as a product demonstrator at tradeshows and related industry events, and will assume a pivotal role in the company's warehouse and inventory control operations. Prior to joining MAXHUB, he served as a media support technician for Sutter Health, with stops at Legion Audiovisual Solutions, Production Strategies, and Sight & Sound Audio Visual.

PLANAR appointed **SHAUN O'BRIEN** as its new director of sales for the Western United States. He will oversee Planar's sales efforts spanning the West Coast to the Rockies. O'Brien brings more than 20 years of experience in the AV industry and sales, and thrived in his previous role as a regional sales manager for more than five years. The company also appointed **ROBERT DETWILER** to senior director of product management and training.

Shaun O'Brien

Robert Detwiler

He will lead the development and training efforts for the company's display solutions. His new role follows six years of product management positions at Planar, most recently serving as director of LED products. Additionally, the Planar Consultants, Architects and Designers Group welcomed industry veteran **FRED CAIN** as a senior business development manager who will cover the Central United States. Cain has been an innovative technology advocate for more than 35 years.

Fred Cain

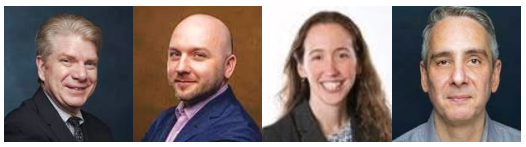
Siddarth Gopal

PPDS has invested in a dedicated in-house PPDS Software Development team. Located in Ghent, Belgium and scaling to Bangalore, India, the team is led by experienced software director, **SIDDARTH GOPAL**, who has worked at PPDS' parent company, TPV, since 2013. Additionally, **SIAN REES**, who spearheaded the development and launch of PPDS' Wave secure cloud platform and the ProStore ecosystem, has been promoted to join the PPDS Business Development team, assuming the newly created position of business development director, Wave and software partnerships. Rees will now focus on Wave's go-to-market, scale-up, and future vision, working with strategic solution partners and expanding the PPDS ProStore marketplace.

Sian Rees

Landon Lovett

SOLOTECH has appointed **LANDON LOVETT** as global market leader, Sales and Systems Integration Division. Lovett's newly created position will focus on areas in which he has previously held impactful roles. An industry veteran with more than 20 years in senior leadership, he has been a key player in developing business practices, expanding into new markets, and maintaining consultant engagement and major client relationships.



From Left: Tom Doran, Mike Maselbas, Erin Mollohan, and Eduardo Vives

Shure Promotes Four Associate VPs

SHURE has promoted four company leaders to associate vice president and named officers at the company. **TOM DORAN** has been named associate vice president of credit and treasury. He has been with Shure since 2017 and has built a strong team, influential in credit policy and best practices, managing cash, investments, debt, foreign currency risk, and treasury operations worldwide. **MIKE MASELBAS** was named associate vice president within the finance division. He joined Shure in 2011 and is responsible for its corporate accounting function, month-end and year-end closing processes, global audits, plant and cost accounting, and payroll. **ERIN MOLLOHAN** has been promoted to associate vice president of global security. Since joining Shure in 2019, she has developed the company's security program, including a global strategy and multiyear roadmap. **EDUARDO VIVES** has been promoted to associate vice president of corporate quality. Vives joined Shure in 2015 as director of corporate quality engineering and reliability and was later promoted to senior director. Vives implemented the Shure Quality Planning (SQP) philosophy and led the reliability engineering team.

Lincoln Biederbeck

Jared Hogrefe

USSI GLOBAL has welcomed **LINCOLN BIEDERBECK** as vice president of business development and **JARED HOGREFE** as the new vice president of accounting and finance to its executive team. Throughout his career, Biederbeck's industry knowledge has guided his support for early adoption of several technologies including digital signage, digital music, and broadcast and streaming video. He has provided sales support to major broadcasters, national retailers, government agencies, enterprise customers, and professional sports leagues. Hogrefe is responsible for the company's day-to-day accounting and finance operations. SCN

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Hybrid work strategies, as well as better experiences for employees in the office, will continue to be important topics in the coming year.

Pro AV 2024: Now Trending

What to Watch in the Coming Year, According to Industry Experts

By Carolyn Heinze

With 2024, nearly upon us, *SCN* reached out to integrators and manufacturers across the industry to learn about the trends that will play out in 2024. Unsurprisingly, AI and hybrid were on the tips of everyone's tongues. There are also exciting possibilities in BYOD, immersive solutions, and more. Here are some perspectives to consider as you strategize for the coming New Year.

Defining (and Deploying) Hybrid

Coming out of the pandemic, the industry was saturated with headlines about how companies were—or weren't—developing their hybrid work strategies. Many organizations are still struggling to arrive at what their definition of hybrid is.

"We have a number of customers that were very proactive during the pandemic that began to plan forward, that invested in hybrid meeting technology, that got it into place and now are very well-prepared," said John Bailey, senior vice president of technology and innovation at AVI-SPL, an AV/UCC integrator and digital solutions provider headquartered in Tampa, FL. However, other organizations have yet to make significant investments in this new way of working.

That said, the waiting period will soon come to an end, according to Julian Phillips, senior vice president of global workplace solutions and managing director of XTG (Experience Technology Group) at AVI-SPL. "We need to get some certainty in the market so people can reinvest and plan again," he said.

In many cases, organizations that have rolled out hybrid work strategies have settled on requiring employees to be in the office three days a week. "If that certainty is three days a week," Phillips observed, "let's at least get that out there so people can start moving forward."

One of the reasons many companies are grappling with hybrid work is that it's much less structured than the traditional work model, where employees were in the office five days a week. The asynchronous nature of hybrid work demands flexibility; even the "three-day rule" may prove too restrictive.

Ideally, a hybrid model has employees performing heads-down work remotely, and coming to the office when they need to collaborate with colleagues and clients. If they don't really need to be in the office, it doesn't make sense for them to be there. "The challenge with that is designing for real estate and designing the facilities to support people," Phillips said. "If you don't know when people are coming in, how do you build capacity and the services to support them?"

This is where organizations can leverage workplace management systems that facilitate a more dynamic work environment. In measuring occupancy levels—how many people are on site, who they are, when and where they're present, and what activities they're engaged in while there—companies can offer a better work experience.

AV companies can play a significant role in helping organizations with this, Phillips offered. "Why? Because we've been supporting people and the activities that people do—that's our business model, effectively," he said.

Corporate Decision Makers

Phillips noted a shift in the decision-making process for corporate AV deployments. Years ago, it was facilities departments that drove AV decision-making. As the tech moved to the network, IT took over that role. These days, he says that corporate real estate professionals are getting involved, because corporate office space must be capable of supporting hybrid work.

"The reality is they can no longer prove the value of a building [based on] how much it costs per square foot," he explained. "They have to now provide that the

From Left: Julian Phillips, Rich Ventura, and John Bailey

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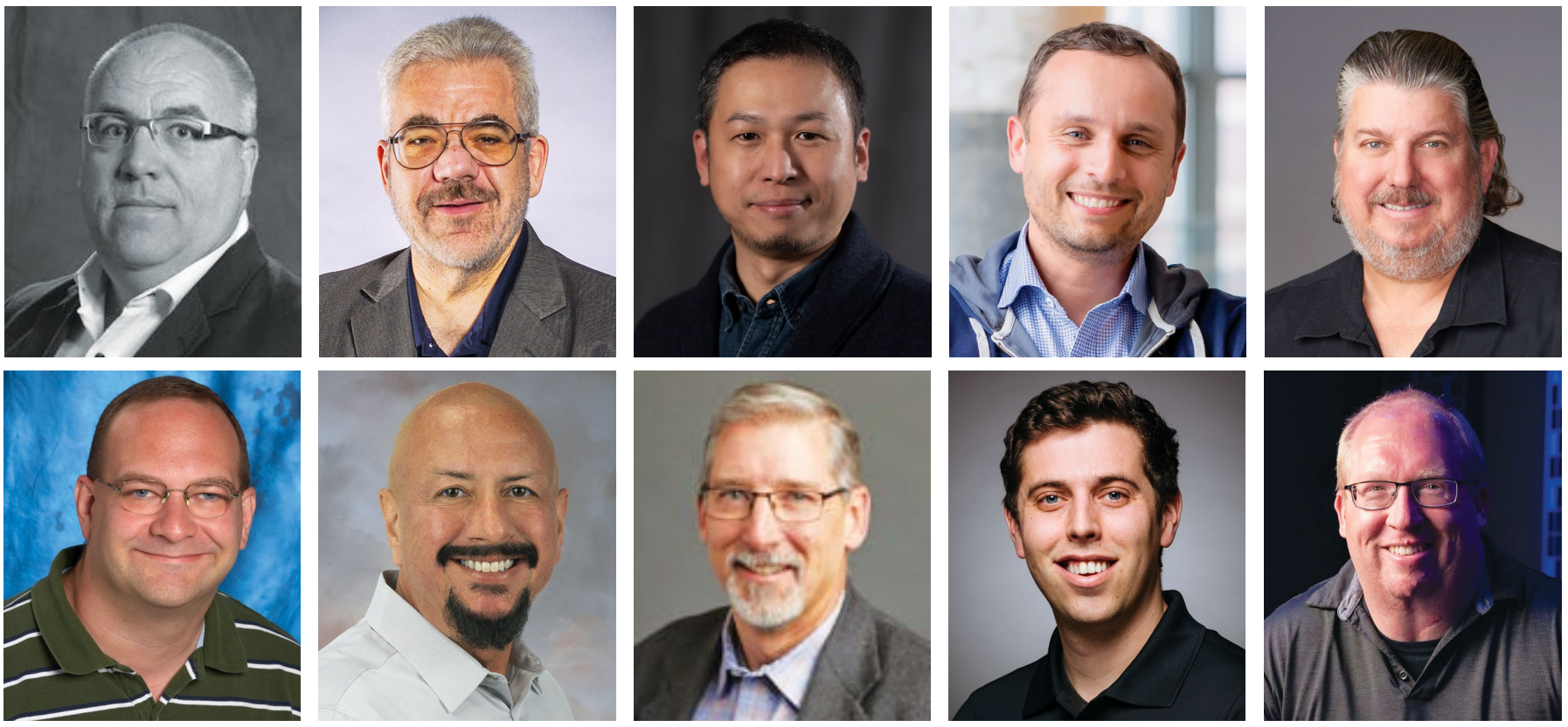

From Top Left: Troy Jensen, David Danto, Ken Kobayashi, Max Makeev, Mark Bonifacio, Eric Farkas, Joe da Silva, Tom Bingham, Tom Petershack, and Paul Henderson

environment creates collaboration and productivity. They have no option other than to adopt technology as a way to help support that hybrid value proposition."

That's not to say IT is no longer a driving force behind AV technology deployments. "IT is still going to be very much involved because of standards and security and a whole range of other things," Phillips said. "But I do believe that we're going to see a greater influence of people that are responsible for space and how it's utilized."

The need for flexibility in the built work environment should drive demand for more flexible consumption models, Bailey estimated. "We haven't seen a lot of adoption of [as-a-Service] models, but I think we will because they lend themselves to this faster pace of acceleration and deployment," he said. To benefit from this, AV professionals must reexamine how they execute projects. "It requires the entire industry to rethink some of these old modes we are stuck in, of complexity equals value, or we need to spend four months in planning before we can actually begin doing anything. We need to move to more simple and rapidly deployable models."

Rich Ventura, vice president of B2B at Sony Electronics, agreed that simplicity is what clients are seeking. "Over-developed, over-designed conference rooms are going away," he said. "We're bringing the technology to the level of how people actually use it."

It's also a good model for the integrator's bottom line, Ventura argued. "We shouldn't be customizing every single room we go into because that isn't profitable," he noted. Standardized designs are less labor intensive.

Meeting Equity Concerns

Last summer, Shure sponsored a report conducted by market research firm IDC, "The Hidden Influencer: Rethinking Audio Could Impact Your Organization Today, Tomorrow, and Forever." The research showed that 98% of respondents understand the important role hybrid meetings play in driving collaboration. How this is playing out on a practical level is producing mixed results.

"While most businesses understand that hybrid meetings remain essential for collaboration, we see clear differences in the outcomes for those that embrace and prioritize quality hybrid working models and those that seek quick-fix solutions," said Troy Jensen, senior manager of global accounts at Shure. "Our research found that businesses with higher maturity levels are more likely to have invested in high-quality audio equipment that is standardized across the organization, resulting in an enhanced hybrid working experience for their employees."

Video also plays a crucial role in providing an engaging hybrid meeting experience. "If there were areas [within video] that I had to point to, I would say that it's video technology both in the cloud, in devices, and intelligent edge devices," Bailey said.

Hybrid also presents integrators with the opportunity to reexamine how they design AV for meeting spaces. "More cameras in conference rooms—let's get away from this idea that there's only going to be one and it's right up there with the screen. We can have cameras all around the room, or in the middle of the room," Bailey offered. "The AI can see [an individual] from three different angles, and it can pick the best one to represent them in a hybrid call."

As anyone who has participated remotely in a hybrid call knows, it's difficult to achieve meeting equity when the onsite participants are in a traditional conference room. Ventura noted that 21:9 aspect ratios and features like Front Row—which unifies the backgrounds of both onsite and remote participants to make it appear as if everyone is in the same space on Microsoft Teams Rooms calls—are creating the equity that everyone is seeking. "It's breaking down the distance between people," he said.

AI Applications

Leveraging AI-driven virtual reality, AV integrators can expedite the design process and remove some of the costs associated with the back-and-forth that traditionally occurs when developing systems. At AVI-SPL, design teams utilize AI-driven VR to help clients visualize what their environments will look and sound like in real life. Phillips said that when a firm can invite clients to sit in the virtual environment and raise any concerns, it enables AV designers to make adjustments quickly, accelerating the design process significantly.

AI also has the potential to facilitate equipment specification in common scenarios, said David Danto, director of emerging technologies at the Interactive Multimedia & Collaborative Communications Alliance (IMCCA), headquartered in Syosset, NY. For example, if a designer is using AutoCAD and pinpoints where meeting participants will be situated in a room, theoretically, well-programmed AI should be able to determine the best microphones and speakers for the application, as well as their positioning. The same could apply to lighting.

While Danto concedes that design requires both the skill and art of trained AV professionals, AI has the potential to help designers make better use of their time. "I'd love to see AI pick the displays, the locations, and the sizes based on rules we all know, and then pass it over to a senior engineer to edit and

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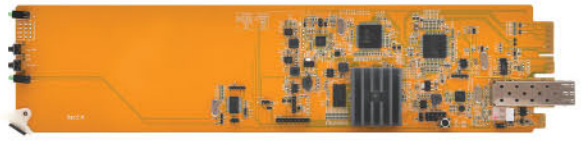

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make sure the finishing touches are there," he said. "The same thing for room setups: Have the professional go in at the end and make sure it's tuned and signed off on and everything views correctly."

Ken Kobayashi, business manager at Sony, noted that the AI that drives features like auto-tracking in its PTZ cameras removes the need for operators in certain applications. "It requires less human interaction and provides more outcome," he said. He added that these tools also allow people to be more focused on meetings and collaboration without the distraction of operating equipment as well.

The application of AI in gaming and AR/VR offers some exciting possibilities, according to Max Makeev, chief development officer and co-founder of Owl Labs. "AI can have a big effect on not just video and audio quality, but picking up movements and specific facial expressions," he said. "I think this is one of the most creative fields where we see AI becoming very relevant."

AI can also assist AV integrators in streamlining their back-office functions. Phillips noted that supply chain is one area where this technology can reap significant benefits. In particular, AI may be able to remodel the supply chain so AV integrators remain resilient the next time a disruption occurs.

"One of the biggest challenges we have is supply chain, not only [because of] the massive disruption during the pandemic, but we've had to rethink supply chain as a direct result of that," he said. "AI tools are now starting to be used to help us to accelerate the change of the way we think about what has been a very traditional, dysfunctional, and very complicated—and costly—distribution and supply chain process."

BYOD and Beyond

Products that perform multiple tasks in one unit are popular among end users because they reduce potential points of failure. Integrators benefit from these solutions as well, since they're sourcing fewer SKUs, argued Mark Bonifacio, director of business management at Sony.

He pointed to Sony's SRG Series of PTZ cameras, with auto-tracking features that don't require subjects to wear additional hardware for the camera to follow them. "We're using AI and doing multiple points of detection of the [subject] to identify who it's supposed to track and follow them," Bonifacio explained. "This has enabled us to track very smoothly and also frame and zoom to the person's face."

Years ago, many IT managers discouraged people from using their own devices at work because of the associated security risks. In the hybrid work model, though, BYOD is largely unavoidable.

Eric Farkas, senior product engineer at Black Box, noted that the company's MediaCento and 10G MCX AVoIP solutions offer flexibility in the hybrid BYOD environment. "They [deliver] connectivity options that allow for BYOD AV inputs and multiple USB connections for webcams, speakers, and microphones while utilizing Ethernet connectivity that allows hardware to be unobtrusively located where it's needed," he said. These solutions are expandable and can be networked to extend outside of the conference room to power digital signage systems and video walls.

> "AI can have a big effect on not just video and audio quality, but picking up movements and specific facial expressions. I think this is one of the most creative fields where we see AI becoming very relevant."
>
> Max Makeev, Owl Labs

Joe da Silva, vice president of marketing at Extron, noted that conferencing participants are demanding user-friendly connectivity, and Extron's UCS 303 three-input presentation switcher is a potential tool for achieving this. "Our customers want to not only use their laptops to connect with a meeting room's display and UC systems to share content with local and remote users, but also connect with the room's resources, such as cameras and microphones, for an improved collaborative presentation experience," he said.

The hybrid work model also requires organizations to communicate to their employees more than they ever have. To engage people, video communications must boast a high production value. Developing this messaging can become cost-prohibitive if each communications campaign must be outsourced to an agency. This has led an increasing number of companies to deploy their own in-house facilities, including production studios and VR stages.

"They're investing in architecture to produce, stream, and distribute [these communications] across their organizations," Phillips said. "They're almost becoming their own mini-broadcasters."

Immersive Invades Corporate

Immersive environments in corporate offices can help to draw employees back into the office and keep them there, according to Tom Bingham, senior manager of vertical sales at LG. "Thoughtfully designed immersive environments have an impact on employee morale—being in a modern, technologically advanced space reflects well on employers, cultivating a sense of pride in employees," he said.

Bingham added that these facilities are also cross-functional, producing a high ROI. "A high-quality immersive environment with dvLED and OLED displays can not only be used for digital signage and hybrid conferencing," he offered, "but can be transformed into a production space as well."

There is also an aesthetic argument for deploying an immersive environment to draw visitors or alter how a space looks and feels. "This is true of lobbies as well as corporate boardrooms, meeting rooms, and lounges for customers and employees," said Tom Petershack, director of media and special projects at Planar. "With today's LED technology supporting more creative applications, customers can cover nearly any surface, including columns, curves, floors, ceilings, and more." He added that organizations are starting to take this outdoors as well, positioning 3D forced perspective screens on buildings.

But can immersive technologies be deployed affordably in corporate facilities? According to Petershack, it's possible.

"Today, LED display technology offers more affordable options, and while pixel pitches grow finer, it's important to realize that many immersive, 3D environments can be achieved with coarser pixel pitches, which can help cut down on cost even more," he said. "When experiences are designed to be viewed at a distance, a finer pixel pitch may not be necessary."

Immersive Audio

Aside from conference rooms built specifically for immersive audio, most of the audio experiences in meeting spaces is either in mono or stereo. Dr. Paul Henderson, vice president of software and immersive at Fulcrum Acoustic, encourages the industry to promote the application of immersive audio conferencing for a better experience. (Fulcrum Immersive, operating under Fulcrum Acoustic, develops a number of immersive audio solutions.)

"We're designed to exist in a spatialized environment," Henderson said. "Outside of the stereo world, we're listening to cues and things that are happening all over." These include such sounds as the air conditioner that's running in the background or the clicks of a hard drive.

"You're used to separating information because of its spatial content," he continued. "The more we can do that in the virtual world and the immersive world, the easier it is to bridge those two together. You start to forget that you're in the virtual world because the environment starts to fuse with the real world."

Henderson predicted binaural audio or personal audio blended with immersive technology is going to become more prevalent, even for one-on-one video calls, pointing to consumer headphones as an example. "I think we're going to start to see a lot more spatial audio subtly put into these technologies," he added. SCN

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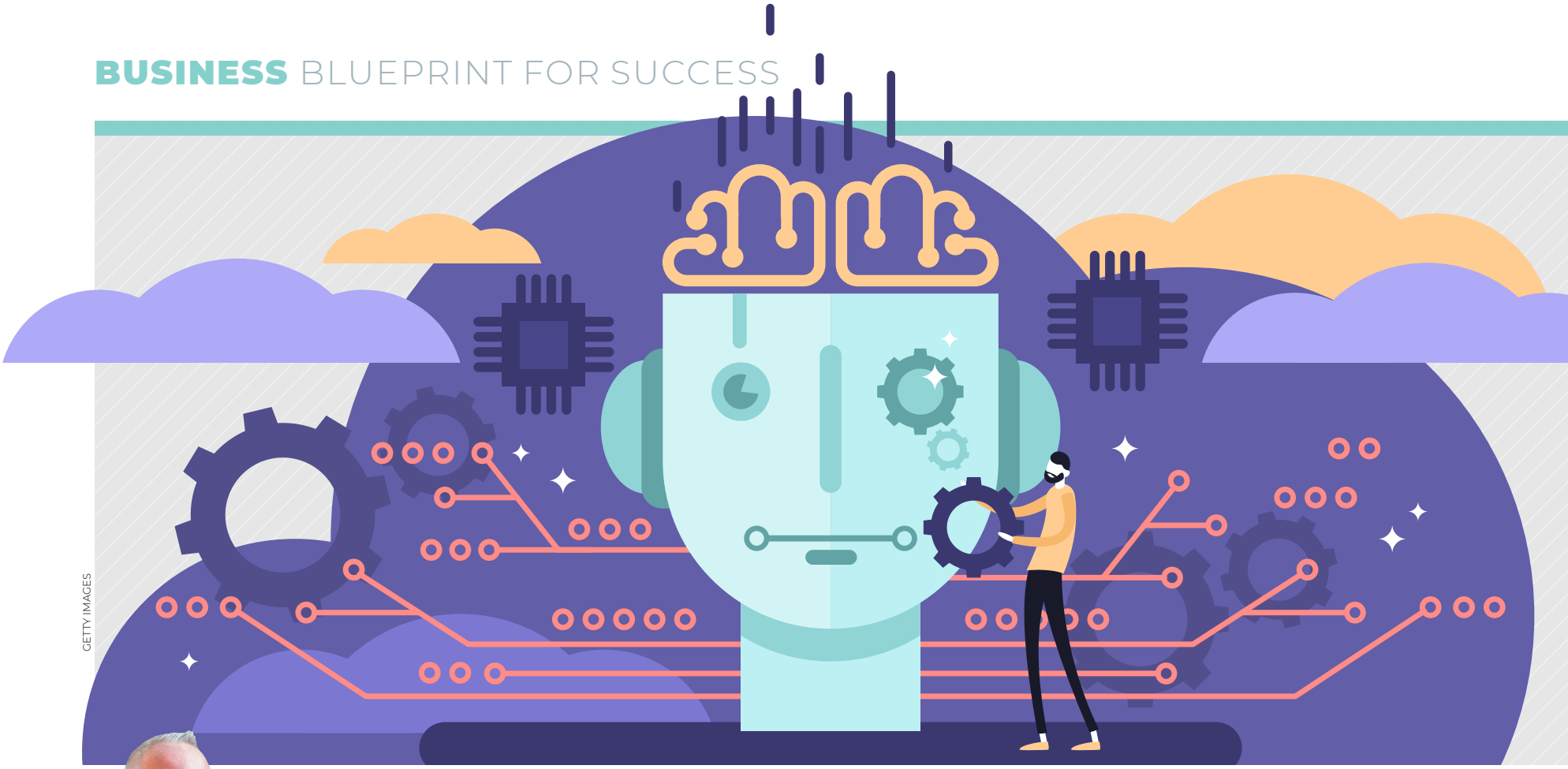

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CAIO and Arrivederci

Why Every Pro AV Company Needs a Chief Artificial Intelligence Officer

By Julian Phillips

Even the casual Italian linguist will be bemused by my misspelling of the informal greeting "ciao," especially given that the AI engine in my Grammarly account should have auto-corrected my faux pas. However, CAIO is an acronym for Chief Artificial Intelligence Officer—and in the same way that most companies have good reasons for CEOs and CFOs, I strongly recommend the adoption of a CAIO to leadership teams, especially in the Pro AV industry.

My reasoning is clear and unequivocal; AI has the greatest capacity to assist and accelerate change in our economic fortunes, long-term viability, and sustainability more than any innovation in the preceding generation. And the Pro AV industry is supremely positioned to take advantage of AI for both its customers and its own business transformation.

A Pivotal Year

In years to come, the history books will attest that 2023 was the birth year for AI in the consciousness of the global populace (which, according to my AI-assisted Alexa portal, is currently at 8.01 billion). But a year, just like the sport played mostly with a foot and a ball, is a game of two halves. In the New Year, very few people had heard of ChatGPT, and although there was awareness that AI had been around for a while, the first half was bejeweled with curiosity, a lot of researching, experimenting, and blundering.

The second half has been riddled with FUD (fear, uncertainty, and doubt). Neuroscientists have classified this as an "amygdala response." The amygdala is almond-sized region in our brains that regulates our "fight or flight" reflexes. In the case of AI, these are fear of losing control, concern over our privacy, and (most of all) our heightened panic that AI will devalue human skills, resulting in us being replaced by computers and machines.

The amygdala acts like a fire alarm; it's a warning that something might be dangerous, but it does not dictate the eventual outcome. Instead, it crucially gives us time to gather more information and act fast to avoid disaster. To that end, let's be crystal clear: AI is already here. And according to PWC's recent study, it could add $15.7 trillion to global GDP by 2030. That's a 14% boost in productivity, an unprecedented opportunity that cannot be achieved by any other technological advancement.

At InfoComm in June (just after the halftime whistle), I shared a drink and animated conversation with the CEO of a global leader in the AV industry. He confided that in a recent strategic review, AI was the headline feature in their growth plans over the next three years.

"Well then," I mused, making something up on the spot, "you will need a CAIO then." After describing what I meant, he concluded, "Well, maybe you're right. Perhaps I do." By September, I had my first evidence that a CAIO was a real thing with my alma mater, Dell Technologies, appointing Jeff Boudreau to the eponymous post.

Defining the Role

If leaders in the Pro AV industry are already seeing the opportunity, and adjacent sectors are already making the move, what would this CAIO look like and what should we empower them to do? Here are my five "must haves" for the role—and some of them might surprise you.

Although they must understand technology, the CAIO probably won't be a technologist. It's entirely possible a CIO would be a great candidate, but we must remember that AI is a tool to drive business transformation and enhance human productivity. It could be that someone from sales, marketing, supply chain, finance, or especially human resources might make a better choice. After all, we exist in an economy where human capital is our greatest asset and knowledge our currency.

The CAIO must focus on the "sell side" as well as the "inside." There are numerous ways that AV companies can find dramatic improvements in internal efficiency and drive out redundant costs through AI, but we must also remember our customers are seeking these benefits too, and we have a lot to offer.

We already have AI-assisted hardware and software for cameras and audio for conference rooms, but just look at what Microsoft is doing with Copilot for Microsoft Teams and Office 365, delivering incredible advancements in productivity, especially in our new hybrid workplace reality. For those of us involved in "experiential" technology, the impact that AI is having on content creation, visualization, and immersion is truly breathtaking, and creates huge opportunities for growth in markets as diverse as healthcare, education,

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Next, the CAIO should be a cross-functional team player and actor. It's entirely possible that your company may have a powerful CRM such as Salesforce or Microsoft Dynamics, which offers amazing AI-assisted tools for data analysis, customer insight, and sales automation. But if your fulfilment engine is relying on people performing manual, mind numbing, error-prone tasks, then you risk setting high expectations of excellence with one hand and snatching away the illusion of victory with the other. Once you commit to AI, you need to commit the whole company and act together at speed.

The CAIO probably needs to be a psychologist—or at the very least, an amateur one. To overcome the organizational amygdala reflex, they must understand the role that AI could have in paralyzing employees with fear and potentially luddite resistance.

As Brian Merchant pointed out in his book, *Blood in the Machine*, the "luddites" of the textile industry in the 19th century were not against the machines per se. They saw the benefits but were against the consequences, including displacement with child labor, lower wages, and negotiating power. Fast forward to today, the actions of the Screen Actors Guild and the United Auto Workers are a warning that any significant technological change needs to be carefully handled with the very people needed to take the journey of transformation.

Finally, the CAIO needs to be a great leader— and I mean from the Simon Sinek book of great leaders that have "a vision of the world that does not yet exist and the ability to communicate that vision clearly." Just because you hold a leadership position does not necessarily mean you are great leader.

It's fair to say the Pro AV industry has many who hold leadership positions specifically to maintain the status quo and, therefore, could be silent killers of wonderful AI initiatives brought forward by the CAIO. And according to Sinek, the greatest attribute of leadership is neither vision nor charisma (although these help immensely). It is courage: courage to tackle difficult tasks, courage to disrupt, and courage to be held accountable when there is always the risk of making mistakes along the way. The CAIO must have the heart of a lion and the ability of a lioness to get stuff done.

One Year-End Prediction

This is the time of the year when people like to make predictions for the year ahead. This just happens to be an era where it seems exceptionally difficult to predict anything.

Not known to be the shy, retiring type, let me make this one prediction. The Pro AV companies with the brightest futures, the most engaged employees, and the highest market value within the next three years will be those who are embracing AI with open arms and all it has to offer (and also those taking care with it). It's perfectly OK to bring in policy and regulation, as long your goal is not to suppress it and stifle those willing to experiment. This is a time for leadership and courage—and perhaps the very moment you need a CAIO, too.

I started with a "ciao" and it's time to end with an arrivederci. Over the past year, I have thoroughly enjoyed sharing my thoughts on the exciting future we share together in the Pro AV industry. There were history lessons, family weddings, darts with Ted Lasso, and some dancing in the rain to boot. Throughout, there have been repeated references to the potential power of AI. Like you, I see "darkness," but I mostly see light with some patches of shade.

Until we meet again. SCN

Julian Phillips is the managing director of XTG, the AVI-SPL Experience Technology Group, and was named a member of the SCN Hall of Fame in 2019.

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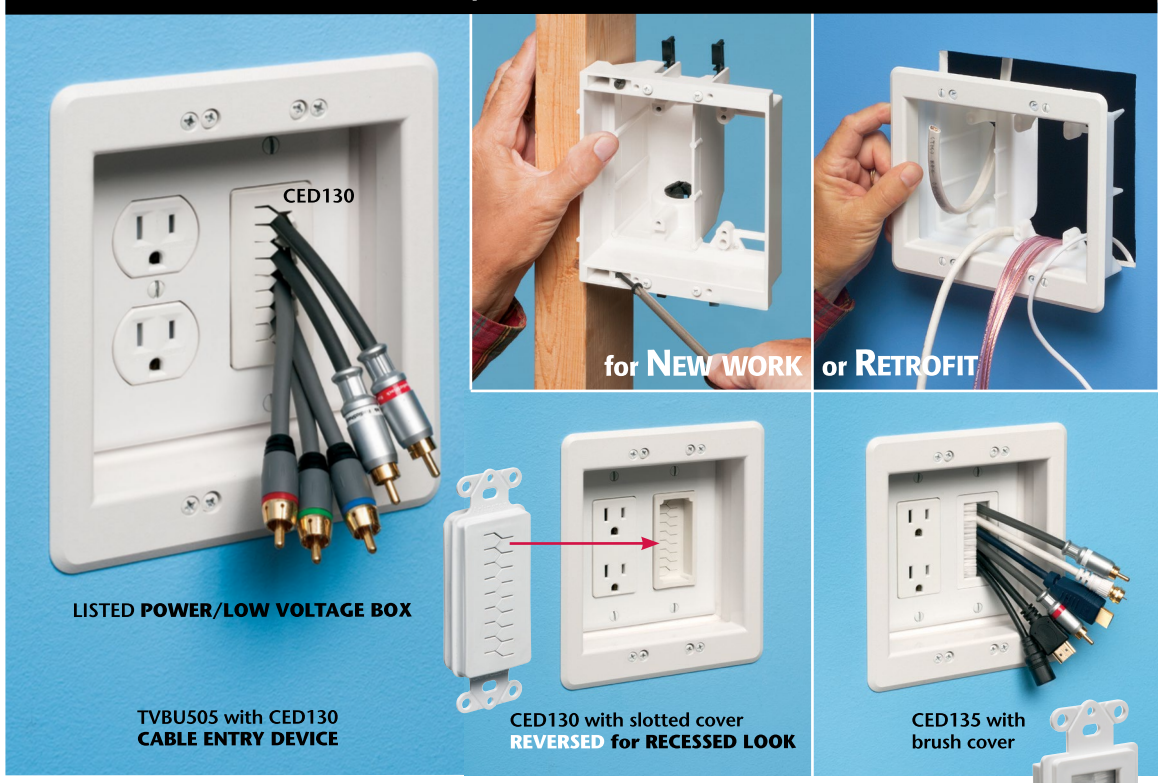

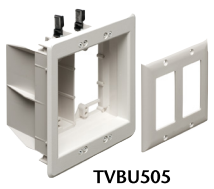
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Supply Chain Lessons Learned

How the Pandemic-Induced Crisis Has Changed the Pro AV Industry

By Mark J. Pescatore and Anthony Savona

The COVID-19 pandemic brought with it panic, confusion, and economic strife around the world. A catastrophic fire at a semiconductor chip factory in Japan in late 2020 didn't help matters, nor did a giant container ship that blocked the Suez Canal for almost a week in early 2021. The resulting supply chain issues cast a long shadow across the Pro AV industry for years, with product shortages, back orders, and unusually long lead times resulting in delayed, re-engineered, and even cancelled projects.

In other words, the supply chain disruption cost Pro AV integrators, dealers, and manufacturers, as well as their customers, a lot of time. And money.

Supply chain talk has quieted in the last few months, but according to Drew Novelli, purchasing manager for Verrex, an integrator headquartered in Mountainside, NJ, the problems are not completely in the past. "There are always going to be issues with the supply chain," he explained. "Of course, it's not as severe now as when the pandemic started. Whether it's a worldwide chip shortage, a surprise price increase on copper wire, or a brand-new piece of equipment that is simply in high demand, we will always need to be aware of the supply chain."

SONY ELECTRONICS

Warehouses are stocked these days, but supply chain issues wreaked havoc on Pro AV inventories over the past few years.

While many manufacturers are back to business as usual, there are still lingering issues, according to Jeremy Caldera, executive vice president of Pearl Technology, an integrator based in Peoria Heights, IL. "The most hard hit currently still continue to be control systems, wireless microphones, as well as certain types of amplifiers and speakers," he noted.

Sony's Rich Ventura, vice president, professional display solutions, also expects to see continued concerns. "While it has gotten a lot better, there is still a backlog on gear—but also a backlog on installations due to a lack of labor," he said. "Because of the ongoing issues over the last few years, many manufacturers overcompensated and now find themselves with excess inventory."

All Eyes on Crestron

While many companies were affected by supply chain issues, Crestron's troubles seemed to garner the most attention, which makes sense, as the manufacturer is a huge supplier of equipment to both residential and commercial integrators. Crestron also drew the spotlight upon themselves by communicating openly with their dealers about the situation, even hosting a town hall on the subject and inviting members of the press.

"In an effort to be a good partner—and to be transparent—we talked about the challenges we faced, and we enlisted our customers and our dealers in coming together to navigate through this crisis," recalled Brad Hintze, executive vice president of marketing, Crestron. "That kind of transparency and trying to focus on partnership really put us out there."

In addition to communicating directly with their dealers, Crestron was also communicating publicly in an effort to take some of the heat off their dealers. "It was really important for us to make public statements, even though it was difficult," Hintze explained. "Updating dealers and partners during this time period was like trying to hit a moving target; there were times that we would provide an update and then something would shift underneath us that would impact what we had just said. Crestron has always prioritized the customer, and being forthcoming about the state of the supply chain helped provide cover for our dealers as they were speaking to their end customers."

Course Corrections

Josh Rush, chief marketing officer, Audinate, reported the company's supply chain issues have largely subsided, but that doesn't mean the company didn't learn a thing or two. "One of the big lessons we all learned was that the AV industry as a whole is still pretty small when fighting for allocation of scarce parts against large consumer electronics companies, EV manufacturers, military contractors, and the like," he admitted. "Hearing that some of the largest companies in the AV market had a hard time getting chip suppliers to even take their calls put that in perspective. As a result, our industry had to get creative."

Audinate developed three main strategies to navigate these challenges. "First, we used the power of all of our 500-plus OEM licensees to negotiate for a larger allocation of in-demand parts," Rush explained. "Second, we redesigned key products in our portfolio to use more readily available parts. And lastly, we accelerated the shift toward software-based Dante solutions that run on standard, off-the-shelf computing platforms."

While Audinate predominantly sells to manufacturers, Rush said the company tried to be "open and honest" to the entire Pro AV industry about the steps it was taking to get the supply of Dante parts back in the hands of its OEMs—and in turn to their customers—so they could make informed decisions about their installations.

There were plenty of lessons to go around resulting from the recent supply chain issues. "As AV integrators, we need to provide project registrations and equipment forecasts as early as possible to the manufacturers and vendors so they can plan ahead and stock up accordingly," Novelli said. "On the other hand, the vendors and manufacturers must provide realistic lead times that integrators can trust and schedule a project around. Additionally, the vendors and manufacturers need to offer alternative solutions when an item won't arrive in time. Without proactively offering another solution, the integrator is forced to move on to a different vendor to meet project timelines."

"We have learned to set expectations early in the sales process for delivery," Caldera explained. "This has lost us some jobs; however, I would rather be up front with our clients about expectations and delivery. Another lesson learned is to plan for the unexpected. Some manufacturers may say they have something in stock—but once a PO is issued, that has magically changed. Always have a plan B and expect pricing variances."

"While globalization unlocks new markets, it also underscores the immense interdependence between markets, highlighting that regional issues can have a global ripple effect," observed Julian Arcila, product marketing manager for Seneca's Visual Media portfolio. "Although the recent supply chain disruptions did not significantly alter our

internal processes, thanks to the robust global supplying network of our parent company, Arrow Electronics, it did prompt a review of our contingency measures, which we do regularly."

Even industry cornerstone companies like Sony had takeaways, such as looking at "how software solutions can help bridge hardware solution gaps," Ventura observed. "Another critical lesson was the need for transparent alignment with suppliers. All of this allows for stronger abilities to deliver complete solutions."

According to Ventura, Sony's commitment to being agile and flexible served the company well during the worst of the crisis. "We've reinforced the value of aggressive planning, working closely with our customers and factories and using data to better understand our business," he added. "Supply chain issues have given us the perspective to look at our business differently, and many of those lessons will continue to inform and transform our approach."

Applied Knowledge

If you're looking for a silver lining, it could be argued that the supply chain crisis helped speed the adoption of software-based solutions from Audinate and other manufacturers. "We learned that having software options for our parts allows for much greater choice and flexibility for our OEM customers implementing Dante," Rush said, "and that is something that will be key to our product strategy moving forward."

Supply chain issues also impacted internal policies within Pearl Technology—in a good way. "Delays have caused us to focus on efficiency and improved design processes," Caldera explained. "We also now have standards in place for things like alternative production selection. And our operations team has changed our delivery process, which has yielded better communication with our clients and better long-term results."

Crestron, which expects to be fully caught up by the end of 2023, implemented new strategies to quicken the recovery and help a repeat from occurring, including improving its own internal processes. "One of the ways we sought to tackle that was by sorting through those orders and getting a better understanding of when the dealer actually needed the gear," Hintze said. "We continue to develop more sophistication into our order processing and demand planning to contemplate that kind of a world—where we're building to actual demand rather than building to build inventory."

Moving forward, do integrators need to continue to plan for the worst and hope for the best? For Verrex, the pandemic-induced supply chain disruption illustrated a need for better communication with vendors. "Although it may not be an official policy, the supply chain issues reminded our team that we must confirm lead times before committing to a specific product," Novelli said. "We can't sell an item to a client if we can't purchase it."

"A cardinal rule for integrators is to exercise due diligence," advised Arcila. "Thoroughly vetting vendors, understanding their resource capacities, and evaluating the technical support they offer during challenging periods is paramount."

"The best advice I can give integrators is to plan, diversify, and align with your partners," Ventura added. "Also, have strong levels of alignment with your customers to define success—and use those metrics to deliver the right solution to solve their pain points. Supply chain issues can always happen. Better planning and communication will help decrease the impact to business." SCN

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SCN TOP 50 SYSTEMS INTEGRATORS

By Mark J. Pescatore

The SCN Top 50 Systems Integrators list provides an annual snapshot of the industry, showcasing some of the top companies that deliver solutions for various vertical markets and around the world. Our rankings are based on the projected revenue from commercial AV systems installations for the current year—but things are a little different this time, because we changed the rules.

Acknowledging the differences in the way some companies and organizations are structured, we added a rule that all businesses included in the tally of one entry should be owned by a single entity. As a result, alliances are not eligible to enter as a single entity.

With the new rule in place, AVI-SPL moved back to the top spot. The company saw a significant jump in installation revenues and added more than 500 full-time employees this year. Congratulations are also in order for Diversified, which joined the billion-dollar club with its projected installation revenues for 2023. Ricoh rounded out the top three—the information management and digital services giant brought in an estimated $550 million from commercial AV projects from Cenero (which has appeared regularly on this list and was purchased by Ricoh last year) and its other companies.

A quick comparison with last year's numbers showed a mixed bag for integrators. Pavion, for example, held its position but reported $50 million more in projected revenues. Washington Professional Systems gained revenue as well, despite dropping a few spots on our list. However, some companies, such as Level 3 Audiovisual and IVCI, had years with lower revenues from installations.

As always, Top 50 submissions are voluntary, and all information comes directly from participating companies. We work on the honor system here; I'm friendly with plenty of integrators, but not friendly enough to get an invite to click around their bookkeeping software (probably a smart policy). That said, the fact that dozens of companies are willing to publicly share their financials speaks to how important this list is to the industry. We appreciate their participation and hope this list helps you better understand the current size and scope of the Pro AV landscape.

Ones to Watch

The SCN Top 50 Systems Integrators list doesn't have room for everyone. But there are lots of other integrators out there and several just missed our list, including some that have been listed recently. Here are seven such companies that are well positioned to challenge for their own spot in the Top 50 in 2024.

- Applied Global Technologies, Kennesaw, GA
- Cal Coast Telecom, San Jose, CA
- DMS, Dallas, TX
- HS Solutions, Washington, DC
- Interstate Electronic Systems, New Orleans, LA
- PIVIUM, Phoenix, AZ
- Technical Services Group, Baton Rouge, LA

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SCN TOP 50

PROJECTED 2023 REVENUE FROM COMMERCIAL AV SYSTEMS INSTALLATIONS IN MILLIONS/ NUMBER OF 2023 INSTALLATIONS	2022 REVENUE FROM COMMERCIAL AV SYSTEMS IN MILLIONS	FULL-TIME EMPLOYEES/ COMPANY LOCATIONS/ YEARS IN BUSINESS	PRIMARY SERVICES OFFERED
1 AVI-SPL **Tampa, FL | (813) 884-7168 | www.avispl.com**			
$1,520.00 12,300 Installations	$1,380.00	4,331 Employees 69 Locations 44 Years in Business	AVI-SPL is a digital enablement solutions provider that transforms how people and technology connect to elevate experiences, create new value, and enable organizations to thrive and grow. The company helps customers of all sizes and industries worldwide, and is the largest global provider of AV, UC, and collaboration technology solutions, including managed services.
2 DIVERSIFIED **Kenilworth, NJ | (908) 245-4833 | onediversified.com**			
$1,000.00 2,500 Installations	$974.00	2,500 Employees 40 Locations 30 Years in Business	Diversified leverages the best in technology and ongoing advisory services to transform businesses. From AV and digital signage to IT and media production, its solutions integrate and enhance experiences across organizations, including workplace, immersive, and operator experiences; security and compliance; and media production, media supply chain, digital distribution, and digital experiences.
3 RICOH **Exton, PA | (610) 296-8000 | www.ricoh-usa.com**			
$550.00 10,350 Installations	$465.00	81,000 Employees 240 Locations 87 Years in Business	Ricoh offers AV and UCC design, integration, and managed services through AV company Cenero and other programs worldwide.
4 AVI SYSTEMS **Minneapolis, MN | (855) 521-0050 | www.avisystems.com**			
$428.20 25,638 Installations	$1,395.90	6,047 Employees 172 Locations 49 Years in Business	AVI Systems | GPA is a global technology solutions provider with $1.6 billion in global revenues and more than 6,000 global employees in 51 countries and 172 city locations. Connecting the dots between people, space, and technology, the company works with customers of all sizes, offering AV systems integration, managed services, Microsoft consulting, and digital streaming globally. With its unique business structure, AVI Systems | GPA can deliver in more than 50 countries, providing a standardized delivery model and global managed services.

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SCN TOP 50

PROJECTED 2023 REVENUE FROM COMMERCIAL AV SYSTEMS INSTALLATIONS IN MILLIONS/ NUMBER OF 2023 INSTALLATIONS	2022 REVENUE FROM COMMERCIAL AV SYSTEMS IN MILLIONS	FULL-TIME EMPLOYEES/ COMPANY LOCATIONS/ YEARS IN BUSINESS	PRIMARY SERVICES OFFERED
5 (TIE) SOLOTECH Montreal, Canada, and Los Angeles, CA | (514) 526-7721 | www.solotech.com			
$260.00 2,500 Installations	$260.00	800 Employees 20 Locations 46 Years in Business	Solotech is the single source for audio, video, lighting, rigging, soft goods, control, and collaboration solutions and services. The company is internationally recognized for its expertise in live productions and systems integration in various markets, namely music, sports, business, culture, and education. Clients can also benefit from its service center, online store, and virtual technology know-how.
5 (TIE) SOLUTIONZ Pacific Palisades, CA | (888) 815-6128 | www.solutionzinc.com			
$260.00 2,500 Installations	$260.00	500 Employees 17 Locations 21 Years in Business	Solutionz offers audiovisual systems design, integration, and prime call professional services, including remote monitoring and management, integrated maintenance and cybersecurity. Solutionz also offers grant and adoption services and visual learning solutions for the K-12 market.
7 PAVION Chantilly, VA | (866) 572-8466 | www.pavion.com			
$254.50 3,600 Installations	$168.80	2,209 Employees 63 Locations 54 Years in Business	Pavion connects and protects by providing design, installation, maintenance, management, monitoring, and support to customers in more than 63 U.S. locations and 22 countries, delivering critical communications, audiovisual, integration, fire, and security solutions.
8 KINLY Netherlands | +31 88 652 6565 | www.kinly.com			
$224.30 3,309 Installations	$207.72	1,100 Employees 19 Locations 33 Years in Business	Kinly provides audiovisual and unified communication solutions, as well as a globally trusted technology advisor to world-class organizations. The company designs, engineers, integrates, and supports complex AV solutions.

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SCN TOP 50

PROJECTED 2023 REVENUE FROM COMMERCIAL AV SYSTEMS INSTALLATIONS IN MILLIONS/ NUMBER OF 2023 INSTALLATIONS	2022 REVENUE FROM COMMERCIAL AV SYSTEMS IN MILLIONS	FULL-TIME EMPLOYEES/ COMPANY LOCATIONS/ YEARS IN BUSINESS	PRIMARY SERVICES OFFERED
9 CCS PRESENTATION SYSTEMS Mesa, AZ | (480) 273-8230 | ccsprojects.com			
$185.00 4,879 Installations	$169.90	345 Employees 29 Locations 32 Years in Business	CCS Presentation Systems provides design, integration, installation, training, and maintenance of AV equipment to businesses, schools, and government clients. Its solutions include dvLED walls, room control systems, AV-over-IP distribution systems, UC communication tools, interactive collaboration boards, digital projectors, audio systems, digital signage, esports labs, and more.
10 AVIDEX Cary, NC | (800) 999-8590 | www.avidex.com			
$174.00 2,340 Installations	$162.00	435 Employees 11 Locations 19 Years in Business	Avidex provides collaborative audiovisual solutions as a global Pro AV integrator delivering design, build, and service excellence. Avidex specializes in creating unparalleled client experiences, serving a variety of markets including corporate, healthcare, education, government, hospitality, banking, entertainment, and houses of worship. Avidex is a subsidiary of ITOCHU Corporation, a Fortune Global 500 company.
11 FORD AUDIO-VIDEO Oklahoma City, OK | (405) 946-9966 | www.fordav.com			
$171.20 658 Installations	$166.0	530 Employees 16 Locations 50 Years in Business	Ford Audio-Video provides engineering, design, programming, project management, field supervision, installation, service, customer on-site support, and training for professional and commercial sound, video, lighting, broadcast, and digital signage systems.
12 IES COMMUNICATIONS Tempe, AZ | (480) 379-6200 | www.iescomm.com			
$150.00 896 Installations	$139.00	9,025 Employees 92 Locations 39 Years in Business	IES goes beyond technology by redefining experiences, spearheading technological innovations to revolutionize how customers live, play, communicate, and work with AV design and integration solutions. Its comprehensive suite of services encompasses room automation, immersive video collaboration, dynamic digital media experiences, and pristine sound solutions. The company builds robust AV infrastructures, handles commissioning and calibration, and specializes in control system programming.

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- Sound Masking
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- IP Conferencing
- AV Collaboration
- Room Schedulers
- Asset Tracking

COMMERCIAL AV SOLUTIONS

- Huddle Spaces
- Training Rooms
- Telepresence
- Corporate Boardrooms
- Network Operations Centers
- Presentation & Performance Venues

ADDITONAL SERVICES

- AV Design Consulting
- Sound System Commissioning & Calibration
- Digital Signage Content Development
- Control System Programming

PROJECTED 2023 REVENUE FROM COMMERCIAL AV SYSTEMS INSTALLATIONS IN MILLIONS/ NUMBER OF 2023 INSTALLATIONS	2022 REVENUE FROM COMMERCIAL AV SYSTEMS IN MILLIONS	FULL-TIME EMPLOYEES/ COMPANY LOCATIONS/ YEARS IN BUSINESS	PRIMARY SERVICES OFFERED

13 AVDG/GC PRO Westlake Village, CA | (631) 379-3636 | avdg.com

$104.50 500 Installations	$88.00	237 Employees 55 Locations 26 Years in Business	AVDG offers an array of commercial AV solutions designed to elevate workplaces. From digital workplace setups and advanced meeting solutions to dynamic digital signage, it caters to its clients' diverse needs. The company's expertise extends to academic environments, design-build projects, and specialized solutions for sports and entertainment venues. AV-as-a-Service, healthcare, and esports integration augment its comprehensive suite of services, ensuring businesses thrive with seamless AV technology.

14 ADVANCED SYSTEMS GROUP Emeryville, CA | (510) 654-8300 | www.asgllc.com

$95.20 91 Installations	$73.00	501 Employees 8 Locations 26 Years in Business	Advanced Systems Group (ASG) is a services provider for professional video, audio, high-speed data, CCTV/surveillance, and other systems design, installation, and maintenance on-premises and in public cloud, along with managed services that enable sophisticated, high-impact communications. From presentation spaces to broadcast and recording studios to high-speed media storage and cloud workflows, ASG brings the best in experience and value.

15 ELECTROSONIC Orlando, FL | (407) 839-1154 | www.electrosonic.com

$90.00 586 Installations	$80.00	400 Employees 11 Locations 59 Years in Business	Electrosonic is an experiential technology company providing a full suite of professional services that create memorable experiences by fusing architecture, storytelling, and technology. Electrosonic offers design consulting, project management, engineering and programming, build and system integration, and support and managed services.

16 YORKTEL Eatontown, NJ | (617) 594-5190 | www.yorktel.com

$86.00 11,400 Installations	$74.00	426 Employees 10 Locations 38 Years in Business	Yorktel is a global managed collaboration services company with a particular focus on AV, IT, and voice. It designs, consolidates, installs, manages, and secures collaboration estates, increasing productivity and elevating the user experience. The company leverages its experience through industry partnerships with Cisco, Microsoft, Poly, Zoom, and others for desktop, video, voice, monitoring/management/reporting, help desk, virtual, and in-person live events, as well as security solutions.

What vertical market has shown the most growth for you in 2023?

Jeff Davis, CEO, Avidex

While all of the vertical markets we serve experienced substantial growth this year, our state and local government business has shown the most dramatic increase in 2023. Looking ahead to next year, we anticipate continued opportunity for growth across all vertical markets. We expect healthcare to really shine with the onset and intersection of AI and virtual care, which will drive wider adoption of AV solutions in hospital and clinical settings, building on our recently announced partnership with Artisight.

Eric Hutto, CEO, Diversified

Diversified's Sports & Live Events team absolutely hit it out of the park this year. The award-winning work we did with Fox Sports to implement an innovative new broadcast system that could easily be transported via airplane and rapidly deployed with cutting-edge flexibility helped bring some of the year's most anticipated sporting events—including the 2022 World Cup and Super Bowl LVII—to millions of fans. Fox Sports partnered with us to validate the technical and financial feasibility of their concept, then trusted us to develop and test the dual first-of-their-kind 2110 flypack broadcast systems.

Brad Righi, President, Constant Technologies

In 2023, the government sector—encompassing federal, state, and local municipalities—has proven to be our most robust growth sector. This is due to the escalation of global geopolitical risks and domestic issues affecting our communities, and the need to monitor, predict, and respond to threats. Additionally, recruiting continues to decline for policing and the armed forces, requiring those to utilize technology and operations centers to accomplish more with fewer resources.

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17 (TIE) EOS IT SOLUTIONS — Austin, TX | (408) 907-9145 | www.eosits.com

$85.00 12,000 Installations	$275.00	1,900 Employees 23 Locations 15 Years in Business	EOS IT Solutions is a global IT supply chain and global logistics provider. This includes all IT design, supply, logistics, installations and deployments, and post-installation support, together with a full managed services strategy with an experienced staff offering a dedicated staffing solution for any type of overlay service requirement.

17 (TIE) KEY CODE MEDIA — Burbank, CA | (818) 303-3900 | www.keycodemedia.com

$85.00 2,100 Installations	$60.00	200 Employees 12 Locations 22 Years in Business	For more than 20 years, Key Code Media has been a trusted provider of integrated solutions to businesses nationwide, including Austin PBS, City of LA, Google, and UC Davis. Its expertise spans council chambers, TV studios, classrooms, meeting spaces, and more. With more than 400 reseller partnerships, Key Code Media offers preferred pricing and certified engineers for brands like Crestron, Extron, Planar, Barco, Shure, and Panasonic.

19 TRITECH COMMUNICATIONS — New York, NY | (631) 254-4500 | www.tritechcomm.com

$75.00 220 Installations	$75.00	300 Employees 5 Locations 21 Years in Business	TRITECH provides audiovisual design, systems integration, and managed services.

20 WASHINGTON PROFESSIONAL SYSTEMS — Wheaton, MD | (301) 942-6800 | www.wpsproav.com

$74.30 97 Installations	$71.00	57 Employees 3 Locations 38 Years in Business	WPS designs and installs audiovisual solutions that help connect people, elevate experiences, and transform spaces into collaboration powerhouses. The company offers expertly engineered broadcasting, audio, lighting, videoconferencing, and control systems for organizations of all sizes. From the nation's largest airports and stadiums to multi-campus universities and government agencies, WPS has the experience and capabilities to solve the most challenging technology problems.

What is the biggest Pro AV buzzword heading into 2024, and how are you addressing it?

Jeffrey Mele, CTO, Metinteractive

Licensing. More and more manufacturers are competing on the concept of licensing rather than perpetual purchase. The understanding of total cost of ownership is harder to calculate, and many end users don't want to be encumbered with year-over-year operating costs. It's hard to say whether there is any equity in buying a widget last year outright and buying the widget shell this year and needing to include, say, three years of licensing. As this grows, it'll only take a few players to disrupt the model.

Paul Wells, Sales Manager, CCS Southwest

Hybrid work and meeting equity seem to be the big things moving into next year. Some businesses are still struggling with a portion of their staff working remotely. Now they need to provide the far side with the same quality experience that those in the office receive. Intelligent video systems are playing a large role in offering that equitable solution.

Vero Tabares, Marketing Director, WPS | Washington Professional Systems

Immersive experiences, frictionless collaboration, and artificial intelligence (AI) are the phrases we're hearing most often. To address these needs and provide guidance to our customers, we're constantly working with product managers from a variety of manufacturers to communicate pain points and use-case scenarios. This feedback model allows our team to recommend the newest, most innovative solutions at the earliest stages of a system design.

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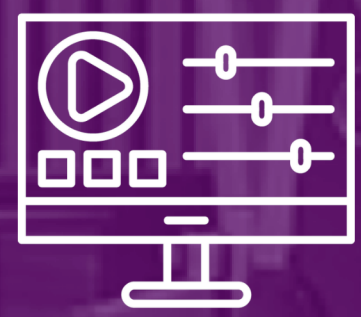

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SCN TOP 50

PROJECTED 2023 REVENUE FROM COMMERCIAL AV SYSTEMS INSTALLATIONS IN MILLIONS/ NUMBER OF 2023 INSTALLATIONS	2022 REVENUE FROM COMMERCIAL AV SYSTEMS IN MILLIONS	FULL-TIME EMPLOYEES/ COMPANY LOCATIONS/ YEARS IN BUSINESS	PRIMARY SERVICES OFFERED

21 ARCHKEY TECHNOLOGIES

Plymouth, MN | (612) 381-6530 | www.archkey.com

$72.80 1,000 Installations	$80.50	360 Employees 8 Locations 42 Years in Business	ArchKey Technologies provides integrated technology solutions from conception through design, installation, commissioning, and maintenance. The firm specializes in commercial audiovisual, broadcast, network, wireless, fire/life safety, and security systems.

22 PALADIN TECHNOLOGIES

New York, NY | (855) 296-3199 | www.PaladinTechnologies.com

$67.00 3,500 Installations	$63.00	1,500 Employees 34 Locations 25 Years in Business	Paladin Technologies designs and installs technology solutions for companies requiring audiovisual, network cabling, data center, OSP, security, and network services. From the basic conference room to enterprise-wide videoconferencing deployments, Paladin handles all aspects of a project, from design to implementation to post-installation maintenance. Paladin's team consists of in-house programmers, engineers, project managers, and technicians certified to support a wide range of commercial equipment.

23 (TIE) MCA COMMUNICATIONS

Houston, TX | (281) 591-2434 | www.mcacom.com

$60.00 500 Installations	$50.00	300 Employees 5 Locations 40 Years in Business	MCA Communications is a nationwide design build technology integrator and provider of IT, AV, and security solutions.

23 (TIE) MATRIX VIDEO COMMUNICATIONS CORP.

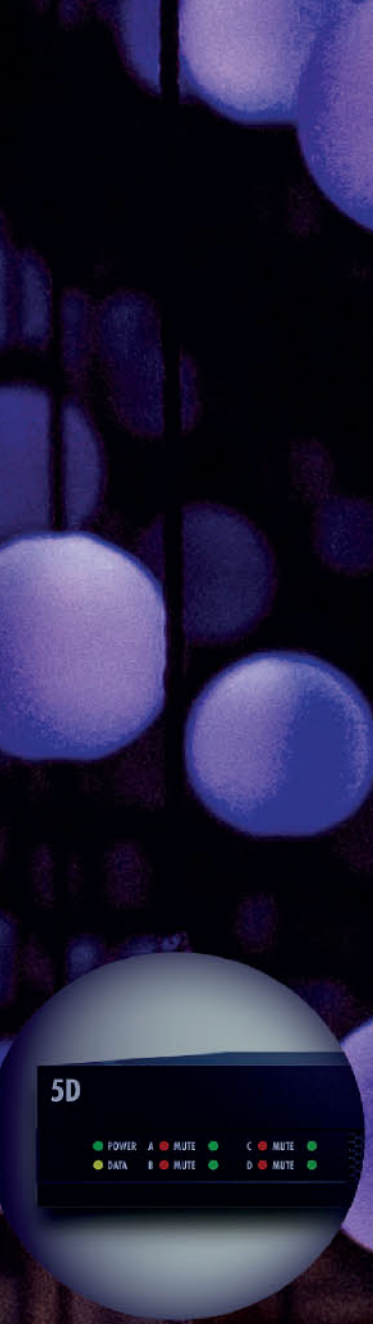
Calgary, Alberta, Canada | (403) 850-9786 | www.mvcc.ca

$60.00 2,000 Installations	$47.00	115 Employees 12 Locations 29 Years in Business	MVCC offers design, consultation, supply, installation, integration, related services, and managed services of audio, video, and broadcast systems.

23 (TIE) CONSTANT TECHNOLOGIES

North Kingstown, RI | (401) 294-7171 | www.constanttech.com

$60.00 130 Installations	$55.00	90 Employees 3 Locations 41 Years in Business	Constant Technologies focuses exclusively on mission-critical projects, with a depth of experience to consistently deliver high-performing command center video wall systems.



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Photos: Thomas Peham (background), Alexander Popov, Benjamin Child, Donny Jiang, Hulki Okan Tabak, Marcos Luiz, Pablo Merchan-Montes, Rodan Can, William White (all unsplash)

SCN TOP 50

PROJECTED 2023 REVENUE FROM COMMERCIAL AV SYSTEMS INSTALLATIONS IN MILLIONS/ NUMBER OF 2023 INSTALLATIONS	2022 REVENUE FROM COMMERCIAL AV SYSTEMS IN MILLIONS	FULL-TIME EMPLOYEES/ COMPANY LOCATIONS/ YEARS IN BUSINESS	PRIMARY SERVICES OFFERED
26 RED THREAD SPACES	**Boston, MA | (617) 439-4900 | www.red-thread.com**		
$55.00 1,300 Installations	$51.00	490 Employees 6 Locations 60 Years in Business	Red Thread Spaces provides fully integrated interiors that leverage research from its parent organization, Steelcase, allowing its clients to maximize their people, space, and technology to meet their business goals.
27 INTER TECHNOLOGIES CORPORATION	**Mishawaka, IN | (800) 254-0506 | intertech.tv**		
$52.20 1,800 Installations	$41.80	130 Employees 25 Locations 23 Years in Business	ITC provides complete audiovisual services and solutions, including design, project management, equipment, installation, and support.
28 EKC ENTERPRISES	**Fresno, CA | (559) 438-0330 | www.ekccorp.com**		
$51.00 1,200 Installations	$39.00	290 Employees 10 Locations 20 Years in Business	EKC Enterprises focuses on the client experience while designing, estimating, and completing installations across the country. The company provides all low-voltage systems across 10 offices.
29 DGI COMMUNICATIONS	**North Billerica, MA | (978) 495-3800 | www.dgicommunications.com**		
$49.00 620 Installations	$51.00	155 Employees 3 Locations 29 Years in Business	DGI Communications is an AV integration firm specializing in seamless integration, installation services, UCaaS, immersive LED video walls, and acoustics solutions. It transforms spaces into collaborative and visually stunning environments, providing technology and sound design expertise.

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How challenging is hiring and retaining talent these days?

Jessica Hair, HR/People Operations Manager, CCS Southwest
Positions that require more experience with a specific AV industry-related skillset are generally tougher to fill. More entry-level positions are a bit easier, but we spend time and resources training techs. As far as retaining talent goes, that is directly attributed to the culture and ongoing training program within the organization. CCS has a fantastic culture, and we are consistently expanding our training and certification programs.

Kevin Lyons, VP, Sales and Marketing, Inter Technologies Corporation
Our company has great success retaining talent. The challenge is finding new talent or investing time into further skills development.

Lance Bowers, COO, Avidex
Hiring and retaining talent continues to be one of our biggest challenges. For Avidex, the “right” talent is someone who combines technical skill with a customer-first disposition and mindset to fit comfortably into our customer-first company culture. We’ve really focused on this in recent years, making investments to improve our onboarding and ongoing training programs, which not only helps us better serve our customers, but has proven to boost employee satisfaction and support talent retention.

Jeffrey Mele, CTO, Metinteractive
We’d always like to meet more folks, but it’s going quite well. For example, one person said during an interview they want to be here so “I can say that I work for Metinteractive.” That’s quite the heartening statement. That said, we’re not perfect and always trying to be better.

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What are some of the hybrid office system challenges you encounter on a regular basis?

Mathew Newfield, President, Diversified

One of the most common client challenges we help overcome is how to leverage technology in the right way to ensure that all employees have the same experience no matter where they are performing their work. Whether they are in the office, a coffee shop, or their home office, we help clients provide their teams with an "experience parity" that emphasizes employee value and enables a more fulfilling professional life. It's a competitive job market out there, so it's imperative that we make the job attractive and obstacle-free for employees. Otherwise, they will leave to find an employer who does.

Lance Bowers, COO, Avidex

Today's hybrid workplace necessitates a new approach, as the technology needs of most organizations are expanding rapidly. In-person spaces need to be thoughtfully adapted for our new hybrid landscape. Not fully auditing your technology needs and planning for that adaptation with an experienced integrator will likely result in frustration and challenges. Integrating not just videoconferencing but also content presentation and sharing, room scheduling, automation, hot desking solutions, and standardized control all play a massive role in making a workspace efficient for users. Not starting with a solid plan can create the need for costly modifications, user frustration, poor adoption, and interoperability challenges down the road.

Vero Tabares, Marketing Director, WPS | Washington Professional Systems

When we speak with managers and end users, a chief complaint we encounter is the high barrier to collaboration. This includes device incompatibility when presenting content, slow system readiness, inconsistent videoconferencing experiences like audio drop-off or video stuttering, and desk/room scheduling.

Paul Wells, Sales Manager, CCS Southwest

One of the major issues we have is acoustics. Whether it be an existing room not originally intended for videoconferencing or a new space where designers didn't take AV into account over aesthetics, poor sound quality, and echo are a big problem. Another issue is trying to balance functionality with ease of use for end users. The Teams vs. Zoom debate. Not every system is agnostic yet.

Brad Righi, President, Constant Technologies

In the post-pandemic world, where many work environments are still undergoing changes, brick-and-mortar operations centers remain a best practice. When security and swift response are paramount, organizations continue to depend on meticulously designed facilities equipped with display wall technology engineered for round-the-clock, 24/7 usage.

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	Fernandez Holdings, Inc.		TAILWIND CAPITAL	GEMINI INVESTORS	ARES

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SCN TOP 50

PROJECTED 2023 REVENUE FROM COMMERCIAL AV SYSTEMS INSTALLATIONS IN MILLIONS/ NUMBER OF 2023 INSTALLATIONS	2022 REVENUE FROM COMMERCIAL AV SYSTEMS IN MILLIONS	FULL-TIME EMPLOYEES/ COMPANY LOCATIONS/ YEARS IN BUSINESS	PRIMARY SERVICES OFFERED

30 VISTACOM INC. Allentown, PA | (610) 791-9081 | www.vistacominc.com

$46.00 240 Installations	$48.00	99 Employees 1 Locations 69 Years in Business	Vistacom delivers audiovisual system integration, command center and control room technology stretch solutions, unified communications and collaboration, digital signage, managed services, clinical healthcare communication solutions, and hybrid and virtual classroom technology solutions.

31 DATA PROJECTIONS Houston, TX | (713) 781-1999 | www.dataprojections.com

$43.20 1,432 Installations	$35.10	82 Employees 4 Locations 36 Years in Business	Data Projections is an audiovisual systems designer and integrator providing advanced collaborative technology solutions and support services. Its solutions include AV systems, AV conferencing/collaboration, unified communications, content management/delivery, interactive technology, and managed services.

32 VERREX Mountainside, NJ | (908) 232-7000 | www.verrex.com

$42.00 196 Installations	$28.50	100 Employees 7 Locations 76 Years in Business	Verrex's primary services include AV Integration, LVC cabling, sound masking, digital signage, VTC, service, design consultation, and onsite infrastructure. The company designs, integrates, services, and supports conferencing and collaboration systems globally that allow companies to communicate and collaborate through videoconferencing, digital media, and other networked audiovisual technologies.

33 IMMEDIA Scottsdale, AZ | (480) 483-3399 | www.immedia-tech.com

$38.00 420 Installations	$30.80	85 Employees 1 Locations 19 Years in Business	Immedia provides design, engineering, installation, service, and support for enterprise-level workplace technology.

34 TSI GLOBAL COMPANIES St. Charles, MO | (636) 949-8889 | www.tsi-global.com

$37.00 700 Installations	$36.00	130 Employees 3 Locations 36 Years in Business	TSI provides design and build services for audiovisual, low-voltage systems, security systems, and infrastructure cabling.

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From a Pro AV perspective, what is the secret to achieving meeting equity?

Mary Landis, VP of Enterprise Sales, Avidex

At its core, meeting equity is about seeing and hearing well, yes, but it's also about fostering higher-level connection through AV technology that promotes eye contact and personal acknowledgement between in-person and far-end participants. Cracking the code of meeting equity means creating an environment that supports one-to-one and one-to-many collaboration through personal interactions. With AI advancements in camera, audio, and processing, we're seeing a focus on this to support a richer content and participant connection for in-person and remote attendees alike.

Kevin Lyons, VP, Sales and Marketing, Inter Technologies Corporation

Ultimately, the secret to meeting equity lies on the facilitator invoking participation. The requirement, however, is to have the technology in place that provides a platform for a group of people to share information and deliver ideas with one another from anywhere at any time. Provide an environment that offers an opportunity for participants to be heard in the room and online.

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PROJECTED 2023 REVENUE FROM COMMERCIAL AV SYSTEMS INSTALLATIONS IN MILLIONS/ NUMBER OF 2023 INSTALLATIONS	2022 REVENUE FROM COMMERCIAL AV SYSTEMS IN MILLIONS	FULL-TIME EMPLOYEES/ COMPANY LOCATIONS/ YEARS IN BUSINESS	PRIMARY SERVICES OFFERED

35 USIS AV

Pearl River, NY | (845) 358-7755 | usisAV.net

$33.00 300 Installations	$32.40	67 Employees 4 Locations 11 Years in Business	USIS AV is part of USIS, a third-generation, privately owned technology, design, build, and professional services firm with roots dating to 1924. The company specializes in providing cross-functional design, engineering, and integration of AV, security, infrastructure, and other built environment tech solutions.

36 ACP CREATIVIT (CAMERA CORNER CONNECTING POINT)

Buffalo Grove, IL | (847) 541-6333 | acpcreativit.com

$32.00 525 Installations	$35.00	350 Employees 5 Locations 70 Years in Business	ACP CreativIT and Camera Corner Connecting Point provide IT and AV expertise across many verticals.

37 LINX MULTIMEDIA

Denver, CO | (303) 574-1552 | www.teamlinx.com

$27.80 1,003 Installations	$31.30	118 Employees 5 Locations 20 Years in Business	LINX Multimedia works with its clients through intelligent designs, installation, and support of technology that enables a modern hybrid workplace. Some solutions LINX delivers include hybrid meeting-ready boardrooms, conference rooms, training rooms, digital signage, telemedicine, video walls, distance learning, hospitality, large venue, and performing arts integrations.

38 VISION TECHNOLOGIES

Glen Burnie, MD | (866) 746-1122 | www.visiontechnologies.com

$26.70 5,250 Installations	$25.40	600 Employees 3 Locations 23 Years in Business	As a network integrator, Vision Technologies provides IT services and solutions by designing, installing, and supporting IP-converged technologies for AV, security, wireless, enterprise cabling, and data centers. Vision offers a range of presentation and interactive visual communication solutions, from collaborative huddle solutions to boardrooms, video walls, and unified communications. Its Professional Services staff provides day-two support and managed services.

39 ITI SYSTEMS

Glen Burnie, MD | (855) 805-4484 | www.itisystems.com

$26.20 625 Installations	$20.10	29 Employees 4 Locations 16 Years in Business	ITI Systems delivers AV design, integration, programming, maintenance, and managed services.

40 PTG

Wixom, MI | (248) 668-3100 | www.promotion.tech

$26.10 3,625 Installations	$21.90	51 Employees 2 Locations 21 Years in Business	PTG is a global AV integrator that transforms environments to elevate the customer experience through sight, sound, and touch. As a certified women-owned business, PTG provides a full spectrum of system design, custom integration, installation, and technical service and support.

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All of this is held up by an award winning performance culture, with impeccable financial strength. At PTG, we believe that the journey is just as important as the destination. Our culture revolves around a relentless pursuit of excellence, refusing to settle for anything less than the best. We proudly embrace being a woman-owned enterprise, showcasing our financial stability, and continuing to build on our debt-free foundation.

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PROJECTED 2023 REVENUE FROM COMMERCIAL AV SYSTEMS INSTALLATIONS IN MILLIONS/ NUMBER OF 2023 INSTALLATIONS	2022 REVENUE FROM COMMERCIAL AV SYSTEMS IN MILLIONS	FULL-TIME EMPLOYEES/ COMPANY LOCATIONS/ YEARS IN BUSINESS	PRIMARY SERVICES OFFERED

41 ECC Lincoln, NE | (800) 366-5320 | eccoinc.com

$24.00 214 Installations	$19.50	125 Employees 5 Locations 65 Years in Business	Empowering through technology, ECC is a full-service design-build integration firm that connects businesses to better experiences using audio/visual/lighting (AVL), communication, electronic security, fire safety, healthcare, and managed services technology solutions.

42 JKL TECHNOLOGIES Newbury Park, CA | (805) 375-5820 | www.cos-jkl.com

$23.60 577 Installations	$21.00	73 Employees 5 Locations 19 Years in Business	JKL Technologies is an information technology solutions firm helping businesses manage, improve, and integrate their entire technology infrastructure. JKL provides a single source of expertise in network infrastructure, structured cabling, deskside services, technology relocations, audiovisual design, installation, maintenance, and onsite support services.

43 LIGHTWERKS COMMUNICATIONS SYSTEMS Carson, CA | (888) 454-4489 | www.lightwerks.com

$22.50 750 Installations	$23.80	53 Employees 6 Locations 27 Years in Business	The experienced professionals of the LightWerks team represent the best in the audiovisual industry and serve corporations, educational institutions, and healthcare organizations across the West Coast and nationwide. The company specializes in AV system design, installation, and support and maintenance—and are experts in Microsoft Teams and Zoom videoconferencing solutions, video walls, and audio solutions.

44 LEVEL 3 AUDIOVISUAL Mesa, AZ | (480) 892-1071 | www.level3av.com

$22.00 350 Installations	$31.80	105 Employees 1 Locations 28 Years in Business	Level 3 Audiovisual strategizes, designs, deploys, and supports.

What vertical market has shown the most growth for you in 2023?

Paul Wells, Sales Manager, CCS Southwest

I'd say that K-12 education has seen the biggest jump for us this year. COVID relief funds have allowed schools to invest in district-wide classroom refreshes of interactive flat panels and sound reinforcement for the classroom.

Kevin Lyons, VP, Sales and Marketing, Inter Technologies Corporation

Higher education has shown significant growth. Schools are updating traditional room technology with modern solutions for hybrid learning experiences (like USB cameras and UCC solutions) and better display technology.

Jeffrey Mele, CTO, Metinteractive

In terms of project vertical it would be sports. We continue to grow our sports projects with the holistic approach of program management, integration, workflow/training, and managed services/creative. Just walked out of a major pre-bid where I was the only one focused on workflow and training. The holistic approach works. For technology verticals I'd say audio, but specifically because broadcast and signage had already grown substantially in past years.

Vero Tabares, Marketing Director, WPS | Washington Professional Systems

Now that we're entering a post-COVID world, we've noticed significant investments from our clients in the higher education, transportation, and entertainment industries looking to respond to outsized consumer demand, which grew suddenly following the widespread reopening of the economy.

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JKL TECHNOLOGIES

What do you expect to be the biggest challenges for your company in 2024?

Jessica Hair, HR/People Operations Manager, CCS Southwest

Growth has been our biggest challenge. We have a huge backlog and continue to grow quickly, so hiring more talent is a high priority. We need to have enough quality resources available to do the work efficiently and accurately while working with our customers to manage their expectations for job completion.

Jeff Davis, CEO, Avidex

As we propel our organization forward to fuel rapid growth, an enduring challenge remains the identification and retention of top-tier talent. We recognize that our people are the lifeblood of our culture and our most valuable investment. We're fundamentally focused on providing attractive benefits, a thoughtful approach to onboarding, and unwavering commitment to ongoing growth and training. Moreover, we're actively working to foster employee engagement through satisfaction surveys, employee committees, interactive town halls, and supporting the ongoing exchange of ideas for company innovation and improvement. These initiatives bolster our company culture and enhance our ability to serve our customers—and hopefully help us attract the next generation of top talent.

Brad Righi, President, Constant Technologies

Given the unsettled economic climate and corporate spending fluctuations, forecasting in the private sector will prove to be a challenge in 2024. Due to the extended sales cycles and potential project budget delays of many projects, uncertain forecasting can disrupt resource scaling that has been rather predictable within the private sector for several years.

Eric Hutto, CEO, Diversified

Staying ahead of the latest technologies can be a challenge. However, over the last year, Diversified has continued to remain curious, create a culture of innovation, and execute our strategy that emphasizes a deeper understanding of our clients' business challenges in order to foster partnerships that will stand the test of time. By understanding our clients' unique pain points and their respective markets, we can ensure that we are providing and supporting the solutions and services they need in order to remain relevant and thrive.

Vero Tabares, Marketing Director, WPS | Washington Professional Systems

High labor costs and talent acquisition will continue to be challenges going into 2024. With uncertainty around the economy, we also expect that organizations will make budget cuts and scale down system designs, compressing margins even further.

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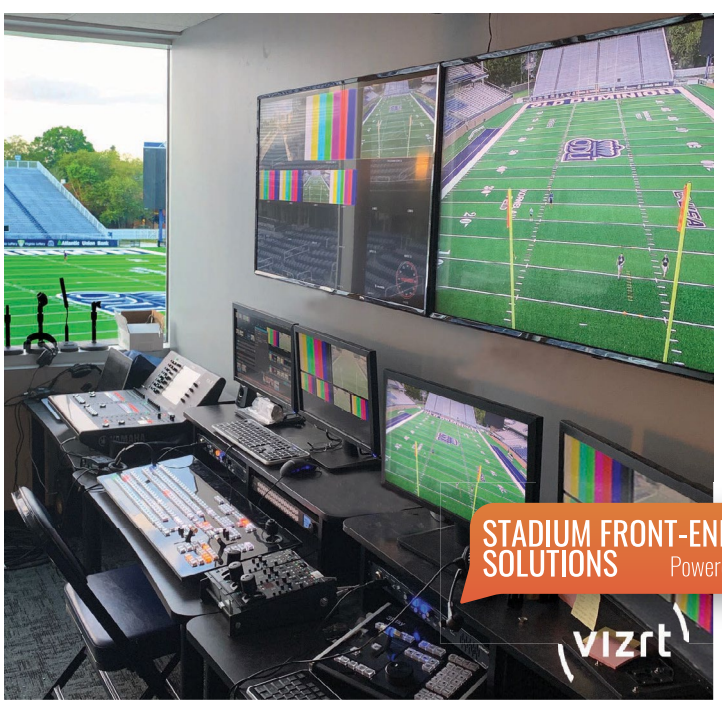
PROJECTED 2023 REVENUE FROM COMMERCIAL AV SYSTEMS INSTALLATIONS IN MILLIONS/ NUMBER OF 2023 INSTALLATIONS	2022 REVENUE FROM COMMERCIAL AV SYSTEMS IN MILLIONS	FULL-TIME EMPLOYEES/ COMPANY LOCATIONS/ YEARS IN BUSINESS	PRIMARY SERVICES OFFERED
45 GOLDEN STAR TECHNOLOGY Cerritos, CA | (562) 345-8711 | www.gstinc.com			
$21.50 160 Installations	$19.00	142 Employees 5 Locations 38 Years in Business	GST offers full end-to-end AV and IT solutions and services. GST offers pre-sales design, BOM creation, BOM validation, installation, configuration, programming, post-project support, and maintenance support.
46 IVCI Hauppauge, NY | (631) 273-5800 | www.ivci.com			
$20.00 721 Installations	$29.00	92 Employees 2 Locations 28 Years in Business	IVCi specializes in videoconferencing and audiovisual systems integration, as well as developing and delivering standardized, scalable solutions backed by industry leading managed services. Its process includes identifying, deploying, and managing the ideal technology mix to create outstanding user experiences and deliver a clear return on investment. Its programs also include an AVaaS solution, training, and user adoption and support.
47 IMS TECHNOLOGY SERVICES Garnet Valley, PA | (610) 361-1870 | www.imsts.com			
$19.40 242 Installations	$16.60	128 Employees 3 Locations 28 Years in Business	The core goal at IMS is to provide the best value in audiovisual systems integration, event staging, project management, and AV managed services for the companies and organizations served.
48 APPLIED VIDEO TECHNOLOGY Kimberton, PA | (610) 407-0776 | www.appliedvideo.com			
$17.90 170 Installations	$16.00	39 Employees 1 Locations 27 Years in Business	Applied Video Technology (AVT) has been an AV systems integrator in the Philadelphia area since 1996. It assists its customers in the design, installation, training, and support of customer digital media AV and IT solutions. The team is CTS certified and trained representatives for hundreds of AV manufacturers, striving to find the right technical mix of products and price points to ensure customers receive the best overall value for their investment.
49 SPORT VIEW TELEVISION (SVT) Brighton, MI | (800) 521-4188 | www.gosvt.com			
$17.00 200 Installations	$16.00	85 Employees 2 Locations 67 Years in Business	SVT delivers commerical audiovisual and collaboration emergency communication.
50 METROPOLITAN INTERACTIVE Oxford, CT | (800) 951-8407 | www.metinteractive.com			
$16.50 19 Installations	$16.10	33 Employees 6 Locations 11 Years in Business	Metinteractive provides systems design and integration, experience design and development, UX/UI strategy design and information architecture, creative services, content development, AV design, operations, hosting, and administration with metrics and analytics.



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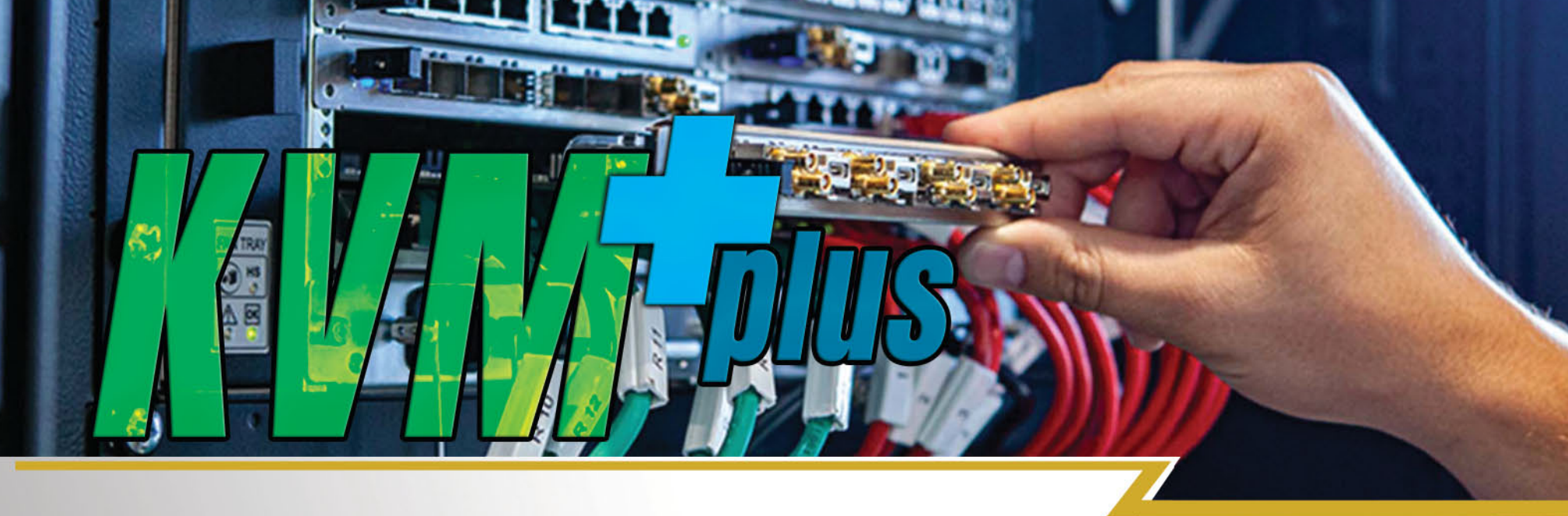

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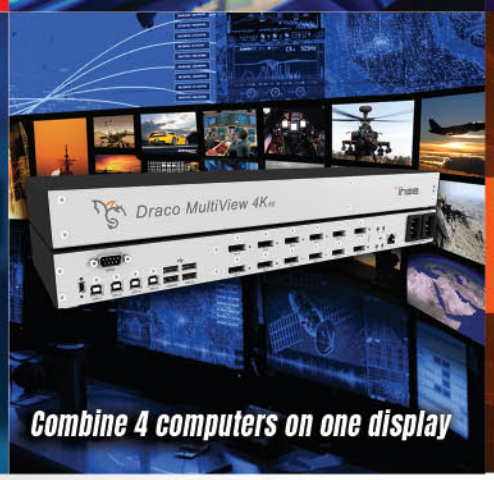

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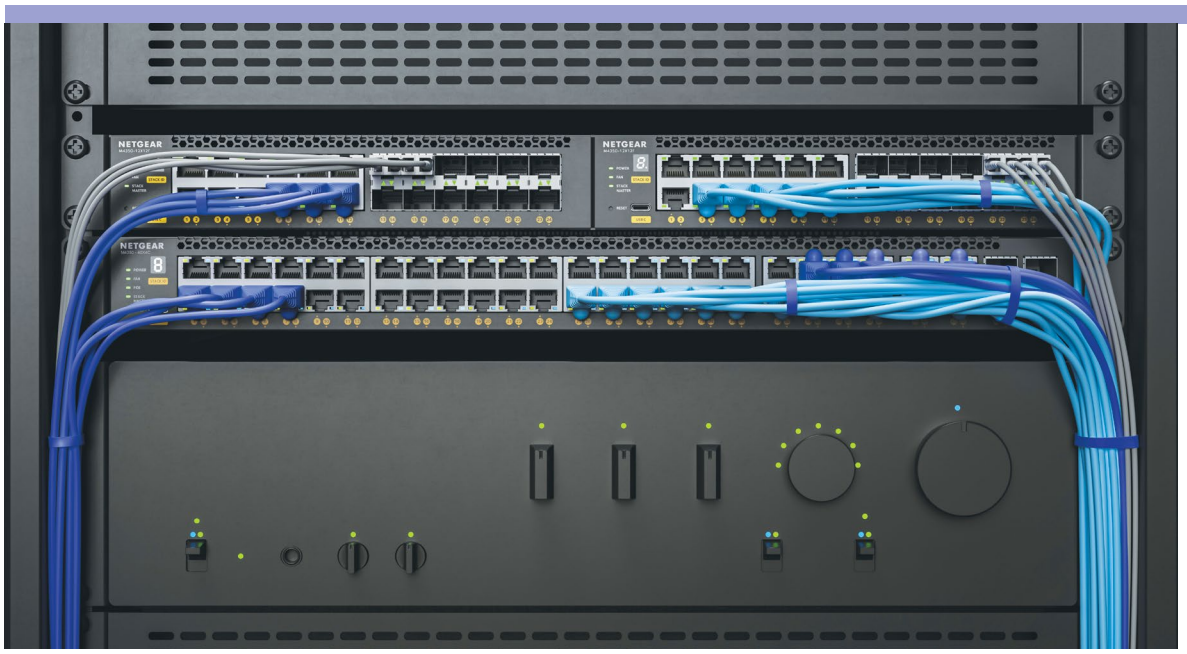

Solutions like NETGEAR switches (pictured) help simplify AV-over-IP transport.

The ABCs of AVoIP

Choose the Right Codec for Your Pro AV Application

By Pete Putman, CTS

Part 2

Last month, we began our discussion of the basics of AV-over-IP. We explained the concept of sending data over IT networks in packets, which have headers known as protocols that explain what type of data is in each packet. For video and audio, those packets are created with a codec. But which codec is right for your Pro AV application?

High Efficiency, High Latency

The first type of codec (high efficiency with high latency) is based on standards developed by the Moving Picture Experts Group (MPEG). MPEG-based codecs have been around for more than 30 years and continue to evolve. While we don't use the first MPEG codec (MPEG-1) anymore, we still rely on its audio compression standard (MP3) to distribute files.

MPEG codecs ingest streams of video, analyze them, and break them into groups of pictures (GOPs). Each GOP has a full frame with all image detail at the start and finish (intracoded or I-frames), plus frames that copy and repeat information that doesn't change from frame to frame (redundancy), as well as frames that look forward to predict changes (P-frames) and backward and forward (B-frames) or inter-frame coding. Obviously, none of this can happen in real time, which is why latency is introduced.

Any efficiency is realized by copying and repeating information in each frame, rather than steaming each complete video frame. The receiving codec puts everything back together, hopefully in a lossless manner, for delivery. The length of each group of pictures also affects efficiency: The longer the GOP, the greater the compression (and latency). A 90-frame GOP is common for video streaming, equal to about 1.5 seconds of delay. YouTube GOPs are even longer—up to 20 seconds of latency for live streams.

Newer versions of the MPEG codec, including the High Efficiency Video Codec (HEVC or H.265) and Versatile Video Codec (VVC) can perform even larger and faster analyses and computations, breaking each frame into Coding Tree Blocks and even smaller segments called Transform Units, a process known as intra-frame coding. That's a must for compressing and transporting 4K video and video with high dynamic range, both of which require considerable bandwidth over 1080p video.

Low Efficiency, Low Latency

The second type of video codec (low efficiency with low latency) is based on standards developed by the Joint Photographic Experts Group (JPEG), starting in 1992. The JPEG codec was introduced to lightly compress still images for storage, copying, and transport across networks, but it works equally well in compressing streams of video.

Unlike MPEG-based codecs, JPEG codecs only analyze and compress each frame in a video stream. They don't look at previous or subsequent frames, nor do they perform motion prediction. (Think of a series of still frames making a flip movie.) As a result, the files and streams generated are substantially larger than those of MPEG streams. And the corresponding bit rates for JPEG-based compressed video streams are much higher, too.

Here's a comparison. A 4K video stream with high dynamic range can be delivered to the home using HEVC compression at bit rates as low as 25–30 Mbps. In contrast, a 4K video stream with a refresh rate of 30 frames per second (fps) using JPEG compression might require 8.9 Gbps, which is almost the full bandwidth of a 10 Gbps network.

There are newer, more efficient versions of JPEG codecs optimized for video. One popular version is JPEG-XS, a so-called "mezzanine" codec that can compress video streams by as much as 10:1 without noticeable picture deterioration. (In comparison, MPEG-based compression can routinely achieve 50:1.)

One problem with JPEG-based compression is that individual video packets can't fit into a standard (IEEE) frame of 1,500 bytes to travel through conventional network switches. So larger, "jumbo" packet frames as large as 9,000 bytes must be created and transported through compatible network switches. Some gigabit network switches are already available to the Pro AV market, incorporating both HDMI inputs and JPEG encoders to simplify installation.

Codec Enhancements

Deciding on a codec is a simple job. If you are streaming video content across multiple networks or the playback is not in real time, then you'll want to use an MPEG-based codec for greatest efficiency. But if you need real-time streaming, then a JPEG-based codec is the way to go.

Of course, you can use both codecs if you are live streaming within the facility of the event while also sending a stream to remote viewers. But keep in mind you can't stream JPEG-based video across multiple networks at present because of the jumbo frame and other bandwidth limitations.

Advanced MPEG codecs bring some very useful features to the table. Today's codecs don't apply the same amount of compression to every frame, a process known as constant bit rate (CBR) encoding. Rather, they use variable bit rate encoding (VBR), depending on what's changing from frame to frame and scene to scene. A pair of talking heads sitting at a table will get high levels of compression, but scenes with lots of motion will receive much lighter compression.

These codecs can also simultaneously create different streams at different bit rates for different viewers. The bit rate for a video you watch on your smartphone will be much lower than that for someone watching on their 65-inch 4K television or on their 15-inch laptop. Specialized codecs can also adjust the bit rate and video resolution, depending on available network bandwidth (Adaptive Bitrate Encoding and Dynamic Stream Shaping). The effect is rarely noticeable by the viewer and can change back and forth quickly, depending on available bandwidth.

JPEG codecs, on the other hand, are still "plain vanilla." They compress at a constant bit rate and are used for transport within a network and not across switches like MPEG codecs. A good example of a

Peavey Commercial Audio: Over Three Decades of Innovation Shaping Audio Landscapes

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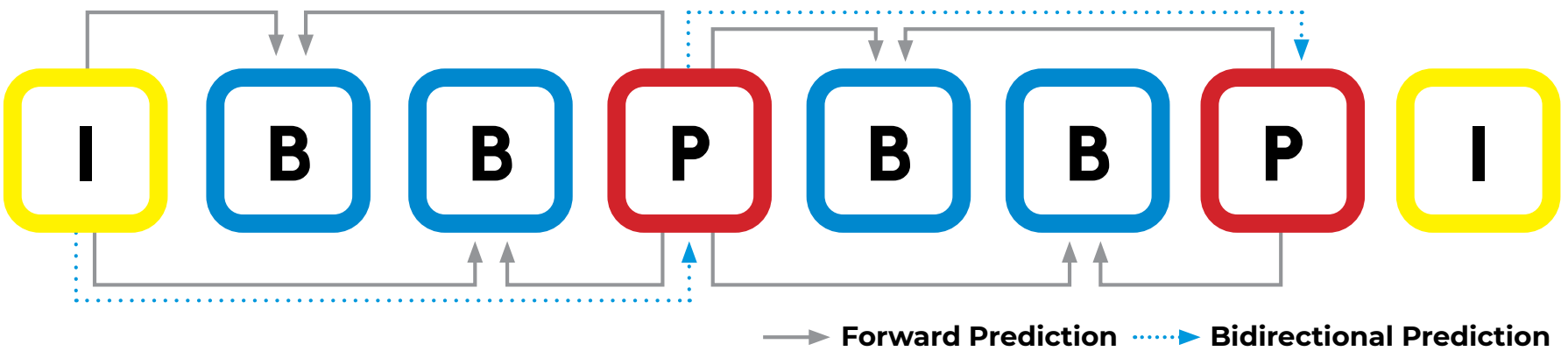

JPEG-based video network might be within an office or campus building, where all nodes are connected to the same switch and server.

Cutting the Cord?

For many years, it was considered unwise to rely on wireless (802.1) networks to stream video content. Many of us have not-so-fond memories of watching a movie through a streaming service, only to have it interrupted by a network issue (Buffering! Buffering!) or drop out altogether because of a lost Wi-Fi connection.

Those days are long in the past. While it's still considered a best practice to deliver video and audio over wired Ethernet connections, the newest Wi-Fi protocol (802.11ax) does a pretty good job using both the 2.4 and 5 GHz Wi-Fi bands to stream content to mobile devices. Adaptive bitrate systems can also work with wireless connections, measuring sustained and average bandwidth and encoding the video accordingly. However, it should be noted that this is only true with MPEG-based video streams, and *not* JPEG-based streams.

The introduction of affordable, fast network switches represented a tipping point. While HDMI-based signal management gear is still being sold (along with hybrid category wire/HDMI extenders), the Pro AV industry is slowly moving from complex, hardware-based switching systems to software-based systems.

A 10 Gbps multiport switch can fit into a 1 RU or 2 RU space, whereas an equivalent HDMI switch would require much more room. Cat 6 Ethernet cables are generally much cheaper than HDMI cables and don't have a length restriction. As for HDMI signal extenders, transporting video and audio over IT networks still offers an advantage in the number of ports that can be switched simultaneously. And while signal extenders use a proprietary encoding format, AVoIP systems are based on codec formats that are widely supported and Internet protocols that everyone uses.

Under Control

Ingesting video and audio, compressing it, and transforming it into packets is just one part of an AVoIP system. Control signals may also be required to travel alongside, allowing remote operation of AV hardware connected to the same network.

Today's control systems are in the process of migrating to an "app" approach, downloading drivers as needed from a cloud database to configure and control a wide range of products. Since these control systems also use networks to communicate back and forth, it's a simple matter to combine control packets with video and audio streams, as control packets are short and bursty by nature.

One popular, proprietary architecture for AVoIP uses a codec based on Display Stream Compression (DSC). While this "everything-in-one-package" platform is attractive, it does have a limitation. DSC, originally developed in 2014 to compress display signals, can only attain a 2:1 compression ratio at present.

This low-latency codec can compress an Ultra HD signal (3,840x2,160 pixels) with a 60 fps refresh rate and 8-bit RGB color just enough to pass through a 10 Gbps switch. However, some display applications call for 120 fps refresh rates or 10-bit and 12-bit color. Plus, although there isn't a lot of demand for it yet, 8K video is available now, along with complimentary displays. The JPEG-XS standard codec mentioned earlier has been demonstrated transporting 8K video through a 10G switch, using 6:1 compression with no visible picture artifacts.

While this has been a brief overview, we hope it has provided a foundation for understanding the migration to AVoIP for audio and video signal distribution. Now, you can focus less on questions about acronyms and instead ask manufacturers and vendors better questions about your hardware and software options. SCN

Ingesting video and audio, compressing it, and transforming it into packets is just one part of an AVoIP system.

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USB flash drives can create significant security issues, but many DMS switching products feature security protocols and VPN capabilities.

DMS: Next-Gen KVM

Display Management Systems Allow for Easy and Secure Data Sharing

DMS KVM extenders help to streamline the in-venue presentation and broadcast transmission workflows of esports.

By Dan Holland

KVM (keyboard, video, mouse) switchers were originally a simple switch box that connected a few computers at the user's workstation, allowing the user to switch between the computers via a single keyboard, video monitor, and mouse. A user could put two or more physical computers at the same desktop and switch among them using a pushbutton on a switch box, or use a special keyboard macro (hotkey) to change from one computer system to the next.

Over the years, technology advancements allowed efficient ways to streamline operations via a web browser interface, KVM over physical IP networks, or simple on-screen display (OSD) selections from direct-connect peripheral extender boxes. This allowed remote access to hundreds of computer systems either directly or using an IP network. KVM systems allowed universal compatibility with any operating system—such as Windows, Mac, and Linux—because it only transmitted similar USB-HID or VESA-based graphic card resolutions.

Today, a new breed of KVM switches have been designed that allow users to easily control and configure computers at the desktop that manage what is seen on the display and what can operate via the keyboard and mouse. As many IT departments are operating at downsized levels and employees are being asked to manage more equipment with fewer resources, the ability to remotely manage and maintain performance of computer equipment has become an essential part of the Pro AV business model. Not only does the end user need to manage access to computers, but they also need to manage things like USB peripherals, multi-display settings, network settings, resource sharing, and security login access.

The legacy KVM switch was designed to basically be managed by an IT department professional, but today's KVM systems have been simplified to allow nontechnical users the ability to access information they want pushed to the display with such things as simple touchpanel interfaces or keyboard commands. The new, user-friendly KVM systems are more focused on helping with display management at the desktop than just getting computer access.

DMS Defined

Like legacy KVM systems, KVM display management systems (DMS) provide the bridge that allows users to control and switch between multiple PCs or servers via a single keyboard and mouse. They can also utilize multiple video monitors and share remote video sources from the local desktop.

The main difference is that a DMS can be configured to support multiple monitors, multiviewers, or wall processors as well as support configurable Extended Display Identification Data (EDID), add multiple layers of security, and manage resolution compatibility to maintain image consistency across different types of display connectors. The key success of any DMS is the EDID. EDID is a metadata format for display devices to describe their capabilities to a video source, such as a graphics card or STB, and is one of the most critical issues when setting up a DMS in Pro AV and broadcast facilities that have multiple computer systems to manage.

For example, in most budgetary cases, facilities purchase equipment at different times and cannot ensure that every monitor or computer operates as the same resolution or within the same operating system. Many facilities have mixed HDMI and DisplayPort graphic cards—and in some cases still use VGA. DMS offers integrated EDID management to make sure dissimilar computer systems can operate seamlessly between user stations.

Currently, businesses and government organizations seek to prevent network cyberattacks by physically isolating the IP networks via private or secure network protocols. Mission-critical control systems and those that carry commercially sensitive data must be secure from external access by unauthorized agents. Any system that relies on an IP network is likely to have exposed entry points and will require extensive firewall and isolation procedures to prevent attack.

Because USB flash drives and USB storage devices are such a dominant method of storing work files for remote work, it creates a significant issue for security and network administrators when these drives are connected to a home network. For network login administrators, this requires a full 256-bit encryption and VPN access requirement. DMS switching products like those offered by IHSE include the highest level of security protocols and VPN capabilities.

There are two active trends for next-gen DMS. Primarily, there is the requirement for latency-free remote access using 4K60 and beyond computer systems. Most network systems are still at 4K30, so as facilities start a refresh build or a new greenfield setup, the demand for full 4K60 is on the bid specification.

It's hard to believe that KVM was once viewed as nothing more than a backroom access point for IT departments to fix computer connection problems from a centralized location.

Second, many larger facilities are looking to support multi-head 4K60 displays over fiber. As many facilities allow work-at-home setups, it is important to make operations between remote or local computer access as transparent as possible.

Streamlined Data for Esports

The ability to obtain, gather, process, and distribute information effectively is key to gaining operational superiority. Many system designers have found DMS switching to be an effective means to streamline data access while maintaining an important level of security and data quality.

System designers moving toward UHD video are depending on standards bodies to reduce the confusion surrounding the latest 4K and 8K technologies. Emerging markets are taking advantage of DMS as well, including esports for tournament production.

Attended by thousands of spectators in large venues and watched by millions online, these live events combine two production workflows: in-venue presentation and broadcast transmission. DMS KVM extenders and switches streamline both by controlling, switching, managing, converting, and delivering video and audio signals. In the venue presentation workflow, extenders provide the interconnection between player monitors and remotely located gaming computers, offering visually lossless video and instant interactive response to deliver the level of performance players' demand.

For observers, DMS switches allow operators to instantly choose between live and recorded content for playout on massive screens above the players' stage. In the broadcast workflow, switches enable production teams to create programming of the highest quality throughout the event, while extenders perform the vital function of translating between computer and broadcast frame rates, ensuring that live content is transmitted and replayed in pristine quality.

Moving Forward

DMS technology will continue to play a pivotal role in both commercial and government control room applications. For both work-at-home and facility locations, systems must be designed to be interoperable with broadcast and AV standards such as SMPTE ST-2110, NDI, IPMX, and others being developed for video and data transmission over a LAN/WAN system.

Latency and 4K60 will continue to be leading issues for manufacturers to solve for their customer base as systems migrate away from traditional analog or coaxial-type systems. The Pro AV market is evolving rapidly and moving to a network-centric, cloud-based infrastructure. DMS will also evolve, and this is something that is being addressed with HFR extenders for gaming, HDR for quality image processing, and lower latency for 4K60 production studios.

It's hard to believe that KVM was once viewed as nothing more than a backroom access point for IT departments to fix computer connection problems from a centralized location. From these humble beginnings, it evolved into an integral part of almost any workflow at the desktop.

The KVM-to-DMS concept is growing in popularity among both commercial and government organizations as an effective tool to expand accessibility of a physical computer remotely over a traditional network infrastructure. Utilizing advanced security protocols and regardless of operating systems, the DMS design allows users to easily control sources remotely while benefiting system administrators for remote maintenance, support, and failure recovery. SCN

Dan Holland is the marketing manager for IHSE USA.

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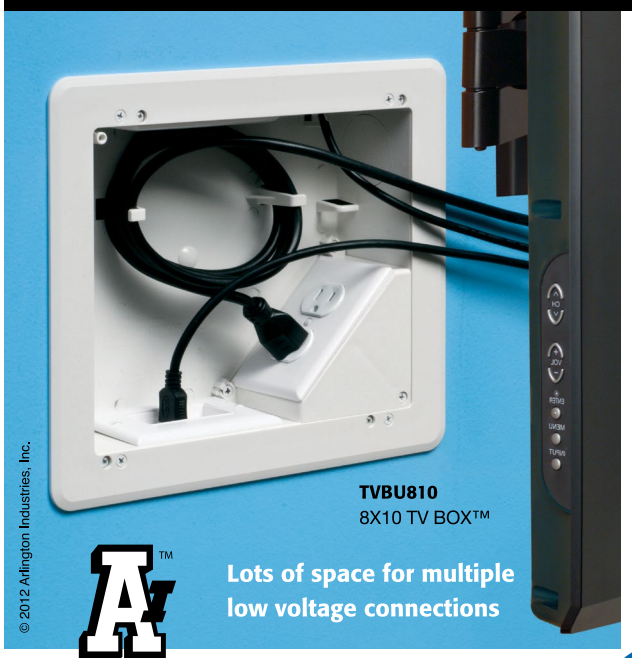

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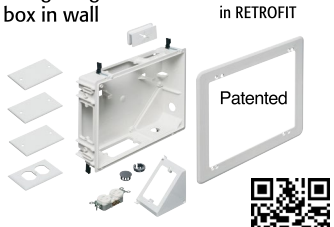

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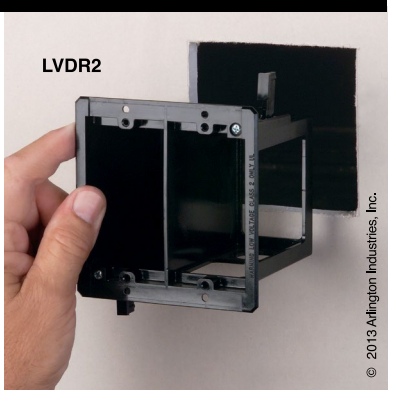

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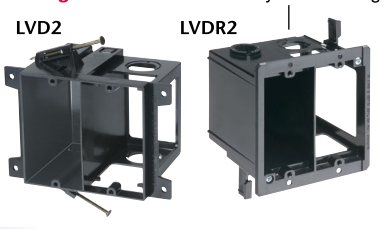

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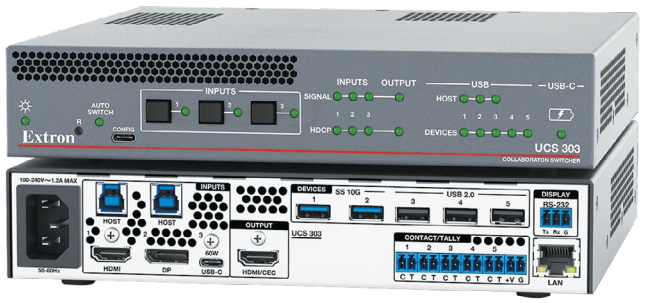


Extron UCS 303

The UCS 303 is a powerful collaboration and presentation switcher designed to meet the unique needs of UC meeting spaces. Three inputs support connection of USB, HDMI, and DisplayPort sources, while five USB device ports connect to peripherals such as USB cameras and microphones. The USB-C input provides video/audio, USB, and 60W of power to charge a user's laptop computer. With the UCS 303, meeting spaces can integrate a room's USB cameras and microphones with users' portable laptops into Teams or Zoom meetings. The UCS 303 offers intuitive collaboration with auto switching that can prioritize inputs, providing natural switching and minimal user interaction with AV hardware. The UCS 303 makes it easy to integrate AV sources and USB cameras for Teams and Zoom meetings, into huddle, meeting, and collaboration spaces.

Christie 4K860-iS/4K13-HS

Christie has launched two 1DLP laser projectors, the 4K860-iS and the 4K13-HS. They are compact and flexible projection solutions for venues including classrooms, boardrooms, and houses of worship. Weighing only 33 pounds, the Inspire Series 4K860-iS is easy to move and install, plus offers 8,500 lumens in 4K UHD resolution. Built-in Christie Twist and optional Mystique software provide warping and blending capabilities and camera-based alignment, respectively. Christie's newest HS Series projector, the 4K13-HS delivers 14,800 lumens for projects that require a high-brightness projection solution without compromising form factor. Both projectors are compatible with the new Christie Intelligent Camera (CIC) accessory that makes it faster and easier to achieve the desired image quality. Operators can use it to calibrate projector color, trigger autofocus, and, when combined with Christie's complimentary Mystique Lite software, automate warping and blending of up to three projectors.

Blackmagic Design Blackmagic Micro Studio Camera 4K G2

The new Blackmagic Micro Studio Camera 4K G2 retains the compact design of the original model, but is upgraded with a 4K digital film sensor with 13 stops of dynamic range and dual native ISO up to 25,600 for incredible low-light performance. It also adds 12G-SDI, as well as network control via Ethernet adapters and a USB-C port for recording Blackmagic RAW to external disks. HDMI connectivity supports video, tally, control, and record trigger for a broadcast-style workflow using a single cable. Ideal for sets where users don't have space for regular-sized cameras, the Blackmagic Micro Studio Camera 4K G2 includes the popular MFT lens mount, so it's compatible with a wide range of affordable lenses. It also features a magnesium alloy core in a body that's not much larger than the lens mount itself.

WyreStorm NHD-124-TX

WyreStorm has added the NHD-124-TX quad encoder to its NetworkHD 120 series AV-over-IP lineup. It is intended for use with 120 series decoders to provide a complete end-to-end video distribution system. When used in conjunction with the NHD-CTL-PRO system controller, complete control integration is simplified. The new encoder is a four-input AV-over-IP transmitter for use over a 1 GbE network utilizing H.264/H.265 encoding technology and AES 128-bit encryption. By combining four transmitters into one solution, users can have the same functionality in a space-saving 1 RU footprint, in addition to saving on the cost of buying four separate encoders. Tailored for multiple markets, it effortlessly transitions from digital signage to content distribution, establishing a seamless communication channel. Plus, the addition of powerful video wall support for up to 16×16 makes it an ideal solution for commercial AV installations.

Lawo Power Core Rev3

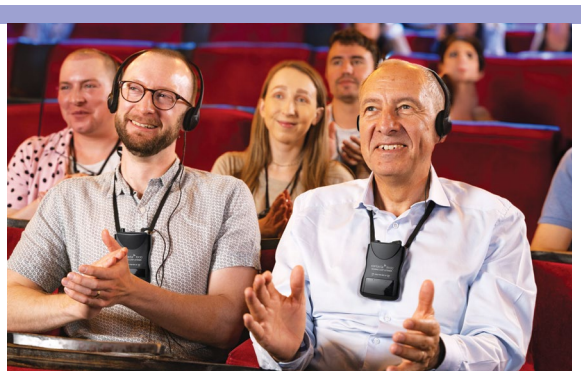
Building on the success of its predecessors, the Power Core Rev3 is a software-defined DSP mixing engine and I/O gateway that transcends traditional boundaries. With its scalable license model, the 1 RU Power Core Rev3 offers a cost-effective solution for a single Lawo diamond mixing console as well as providing comprehensive I/O gateway services for an entire broadcast or live performance facility. Using industry-standard RAVENNA/AES67 networking, AoIP setups powered by the Power Core Rev3 can seamlessly scale, boasting thousands of analog and digital audio channels. The versatile platform offers full routing capabilities, facility-wide DSP bus, and input audio processing. Power Core is also a console mixing engine like no other—not only can it power traditional consoles, it can also provide mixing services for as many as four independent control surfaces simultaneously, reducing the engine-to-console ratio by up to 75%.

PPDS Philips Professional Soundbar

Philips has launched the Philips Professional Soundbar HAL5023 with built-in subwoofer. When combined with Philips MediaSuite dedicated hotel TV, it helps deliver immersive cinematic experiences to hotel guest rooms. Designed and built in collaboration with TP Vision's Philips sound team, the HAL5023 features a professional 2.1 channel setup. The freestanding or wall mountable (brackets included) Philips Professional Soundbar can be easily configured using the professional setup menu on the Philips MediaSuite TV. All related settings can be quickly and efficiently copied and transferred to the entire TV fleet remotely through cloning via PPDS CMND, saving significant installation times and costs. Conforming with Philips MediaSuite's near cable-free presentation, the Philips Professional Soundbar also includes a custom-designed power cable adapter, enabling it to be powered via a single power socket shared with the TV. An anti-theft cable is also included.

RGB Spectrum IPX Series

The Quadview IPX and SuperView IPX multiviewers increase flexibility by addressing both local and remote video sources by their ability to access both local HDMI and remote IP signals. The QuadView IPX is a high-performance 4K multiviewer that allows users to display up to four video signals in customizable layouts on a single screen. The SuperView IPX offers similar capabilities, enabling users to display up to seven video signals on a single screen. The QuadView IPX and SuperView IPX provide users the flexibility to mix and match input resolutions, scale any input up to 4K resolution, and route any input to any window in customizable layouts. The new multiviewers can display a combination of local baseband and remote IP video, with access over HDMI and LAN/WAN connections. They are ideal for 24/7 operations where reliability, security, and ruggedness are paramount.



Contacta RX-30

The new RX-30 rechargeable loop listener offers theatergoers, worshippers, and students enhanced access to sound. It is a complete wireless receiver designed to help people with hearing loss who don't use a hearing aid or cochlear implant. The pocket-sized, rechargeable receiver picks up signals transmitted by existing hearing loop systems, fitted in millions of venues worldwide. Created by Contacta's in-house design team, the RX-30 offers up to 50 hours of battery life and comes with a range of charging options, with base stations to accommodate one, five, 10, 15, or 20 receivers. The new RX-30 features a bass cut filter, flat frequency response, and adjustable volume control—and includes headphones, enabling users to access clear sound comfortably and easily.

MSolutions MS-63U1C

The MS-63U1C extender set provides the additional bandwidth required for reliable transport of USB Type C supporting USB 3.2 over 333 feet (100 meters) with zero latency inside meeting and learning spaces. The MS-63U1C, which includes a Host and Device, offers a base capacity of 5 Gbps bandwidth for USB 3.1 transport with an option for 10 Gbps transport of USB 3.2 signals. The devices provide a cleaner alternative to bulky active cables for reliable transport of signals acquired from very high-resolution cameras, as well as recording devices used for lecture capture purposes. Under the hood, the MS-63U1C can cleanly support multiple USB bandwidth consumers without interrupting each other, including isochronous transfers for high-data volumes associated with streaming media applications alongside lower volume data transfer needs, including KVM connections. The MS-63U1C is fully backward compatible with USB 2.0 and lower.

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5 Ways to Develop Business in 2024

Avoid the 'Comfort Zone' and Challenge Yourself

By Rob Voorhees

What does it mean to "develop" business? Do all business development managers do the same thing? Is there some sort of secret code to being successful in a sales/marketing/business development role?

I am here to tell you that these roles, much like others, are what you make of them—and they also bring me back to a familiar friend: the Comfort Zone. Given what we already know about our careers, we could look at the job description that our companies provide and get a vague understanding of how to do the job. However, I think that's just scratching the surface. To really understand what it means to differentiate yourself from others, I submit to you five ways you can develop business in the New Year.

Never Settle

I start with this because it is more of a behavioral change that needs to be adopted before anything else is considered. The concept of "settling" has been debated for years, and it's one that I try my hardest to avoid. The job descriptions I referenced earlier are a great way to highlight this point.

To me, a job description provides a framework of the core responsibilities of any given role. Communicating with the sales team, client visits, proficiency with Excel—those are typical elements in a job description. To develop new business means to search outside this proverbial box. Why settle for the job description when you can find greater success?

All those elements I listed are essential to my role, but I don't view them as *my role*. Thus, I never settle for that. I find ways to evolve my role and develop it in a way that can be adaptable with time and other variables.

Don't Remain Calm

No, that isn't an error—I really mean do *not* remain calm. I have found that the calmer things are, the easier it is to fall into the trap of settling.

Think about that when you find yourself going through the motions each day, answering emails, making calls, and working on reports. You are absolutely getting work done and being productive, but are you maximizing the day and setting yourself up stronger for the future? If 2023 has taught me anything, it's that the more irons I have in the fire, the bigger the payoff has been.

Certainly, we need to remain calm in the face of adversity or obstacles, but outside of my play on words, I am a big proponent of "creating the crazy." This means manufacture your own opportunities. It's OK to feel like your head is spinning, so long as you know how to attack it in the proper way to achieve the desired results.

Find Comfort in the Uncomfortable

One of the best ways to develop new business I've found is to come up with new ways each month to challenge myself. One personal example is constantly being on camera. Whether it's daily videoconferences or contributing to media blogs or video posts, I was not as comfortable in front of the camera as others.

I credit a good friend of mine, James Calandrillo, for helping me overcome this. He shared a video on LinkedIn helping to drive awareness of an upcoming event, and I was really drawn to the ease with which he spoke. It dawned on me that the more authentic you are on camera, the better the results will be. From there, the idea of doing frequent short videos where I share ideas and thoughts was born.

If 2023 has taught me anything, it's that the more irons I have in the fire, the bigger the payoff has been.

Another example of this could be prospecting for new business opportunities. I worked with a salesperson in Fall 2022, and she told me she was not comfortable about the lighting category. I recommended that she identify a handful of her customers that focused on the house-of-worship vertical and "remind" them she could help with a lighting manufacturer. Literally within 12 minutes, she received a reply asking for several SKUs—and by end of the day, she closed the sale. I give that salesperson a ton of credit because she closed a new opportunity by moving away from her Comfort Zone.

More Reps = Success

Take it from a die-hard Philadelphia sports fan: A player needs reps to find their groove. If you have a batter in baseball who typically sits on the bench and never swings the bat or gets in the game, how can you expect them to succeed when they finally get to the plate?

Developing and closing new business is no different. To peel back the proverbial curtain, I'll admit that any given video I record and share normally requires me to go through at least 5-10 practice takes. These practice takes allow me to attempt to perfect the piece.

Whether your reps involve video takes, new marketing/media pieces, or cold calling prospective clients, don't be worried about hitting a home run on your first attempt. Practice every part of your process, so by the time you have several attempts under your belt, you will come off so natural and confident that your chances of success will increase.

No Bad Days

My final suggestion is a "no bad days" mantra. At the end of the day, when it is time to recharge, hang your hat on the work you've done and make plans to improve on that the following day.

To me, there is *always* a way to improve. If you close a $100,000 display project, I'm sure you will be celebrating (and rightfully so). However, ask yourself what you could have done to win the audio portion of the project as well. This question would cause me to reexamine the ways I managed my opportunity and find ways to include audio in the conversation, potentially leading to new opportunities in the short and long term.

Another way could be to take an actual "bad" day and learn from it. Very early on in my Pro AV career, I worked with an ISP to supply internet bandwidth to a particular job site. The job went sideways due to the amount of construction that was required. While there was no way of determining that in advance, it fell on my shoulders to come up with a solution.

While the day itself seemed bad, I worked through the process and came up with a viable backup plan for the customer. In the end, I learned steps to take to hopefully avoid those cases in the future. Again, no bad days does not mean be perfect and watch jobs come flying in. It is the mindset that you can learn from adversity and improve for the future. SCN

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