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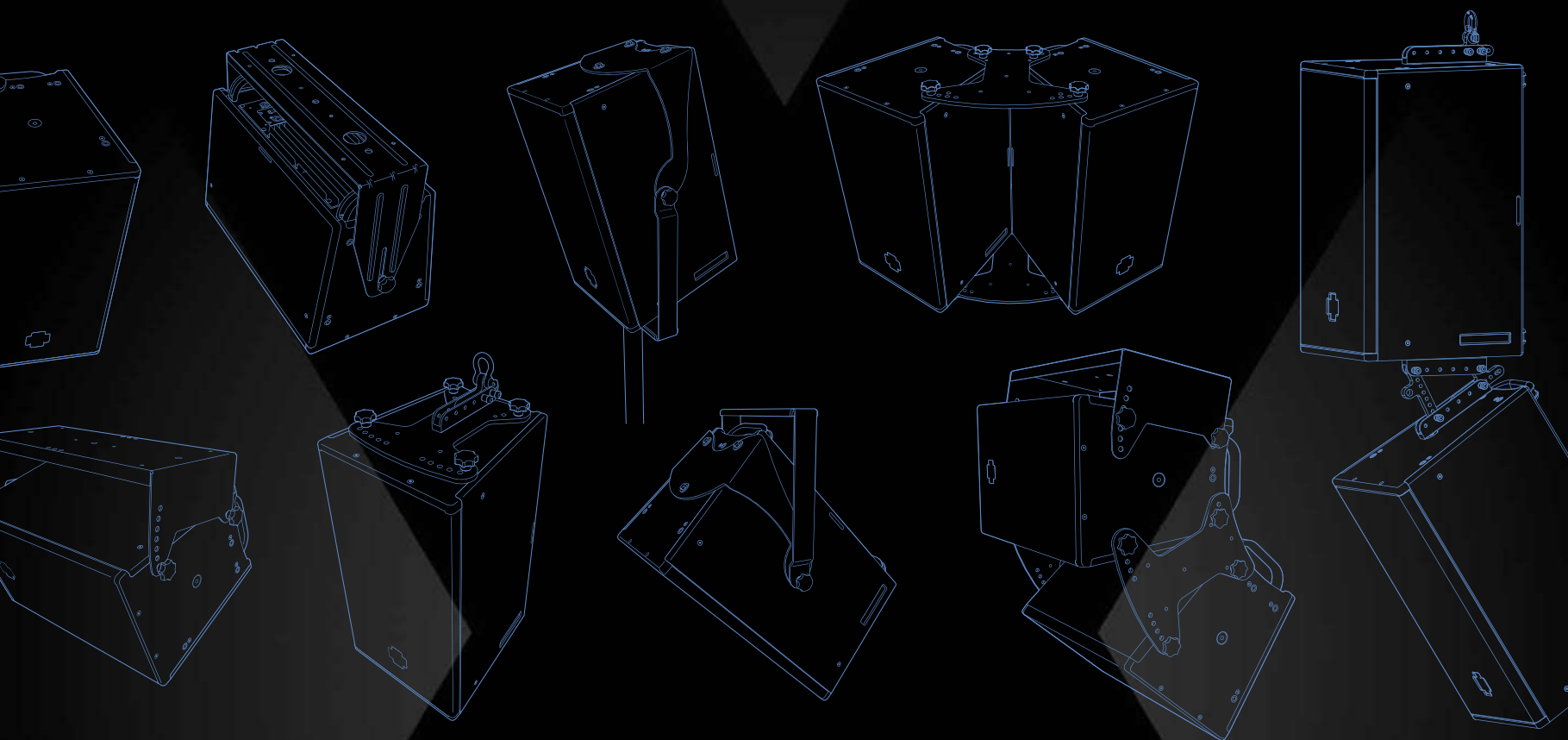
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February 2020

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Photo: Todd Moffses

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What's Next.



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Happy February all and thank you for joining us again this month. I agree with David Barbour; we had a great time at The NAMM Show in sunny Anaheim, California in January. Some fantastic networking and brainstorming with so many of you. Congratulations to the entire NAMM team—such an impressive, creative, and helpful group of professionals! Mark your calendars for NAMM 2021, January 21 – 24, 2021, <https://www.namm.org/thenammshow/2021>.

Our February lineup is a good reflection of the range of the ever-changing entertainment technology world out there. Touring, theatre architecture, an impressive new sports arena, performance art, and a neat immersive projection experience. Plus, some cool new toys in lighting, pro audio, and imaging and staging products.

Congratulations to City Theatrical's Gary Fails on his 2020 Wally Russell Award that was recently announced; well-deserved. Gary will be officially crowned at USITT in Houston in April, <https://www.usittshow.com/>. Our team will be at both USITT and the important Prolight+Sound show in Frankfurt, <https://pls.messefrankfurt.com/frankfurt/en.html>; both are great gatherings, but are the same week this year. Smooth, safe, and fun travels all. See you along the way.

Jacqueline Tien,
Publisher/General Manager
jackie.tien@plasa.org



The lady on the cover needs no introduction. Celine Dion, whom we haven't covered since 2011, is currently out on the *Courage World Tour*. It's a momentous event, being her first tour since the death of her husband and manager René Angélil, and the designer Yves Aucoin, who has a long history with the star, has come up with a stunner of production. Note the clean, elegant lines on display in every photo in the layout. It's well worth a look, and Sharon Stancavage fills in the details.

Sharon also reports on Chicago's United Center, which recently got a remarkably flexible new scoreboard, along with new lighting and sound systems, courtesy of Crossfade Design. The scoreboard is a true sign of the times, able to handle whatever sport or entertainment event takes place in the building.

On the West Coast, we take a look at the new Conrad Prebys Performing Arts Center, the latest adornment of the Village of La Jolla. A top team of architects and consultants have come up with a striking building that is highly suitable for a variety of events. Also: We report on two new events that take entertainment in new directions. SPLNTR is an eye-catching exercise in immersive video and *Cosmos Within Us* is an original hybrid of live performance and virtual reality.

Also, Mark Johnson test-drives Meyer Sound's ULTRA-X40 loudspeaker. Richard Cadena looks at the ticking data bomb, which, despite the humorous photo in the layout, is no joke: Your lighting system could be hacked. Richard also discusses job skills for the future in video, at the moment the most burgeoning part of the industry.

We had a great time at NAMM, thank you. Check out our trade show report, running as part of the digital edition of this issue, along with a report on the new Metropolitan Opera production of *Wozzeck*, with its startling scenic and projection concept. See you next month.

David Barbour,
Editor-in-Chief,
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NAMM

Joins World Entertainment Technology Federation

NAMM, the National Association of Music Merchants, has joined World-ETF, the World Entertainment Technology Federation. The organization joins fellow international industry associations, Entertainment Services and Technology Association (ESTA), Professional Lighting and Sound Association (PLASA), and VPLT, the German entertainment technology association, who cocreated the federation to debate and examine the role of entertainment technology around the world.

"The worlds of entertainment technology, musical instruments, and pro audio products are deeply connected, each depending on the other to play their part in creating magical live events for audiences around the world," says Joe Lamond, NAMM president and CEO. "We are honored to join this respected group and hope to be able to contribute in some small way as we share information, training, and best practices."

PLASA managing director Peter Heath comments, "We are delighted that NAMM has become a part of the World-

ETF. Their historical importance as an association and expertise in the industry will contribute greatly to the federation, enabling us to tackle more industry challenges and form a more cohesive and influential presence on behalf of our members."

Erin Grabe, ESTA executive director, adds, "NAMM is the perfect addition to the World-ETF. Their involvement strengthens our partnership and greatly adds to our global voice."

The World-ETF aims to promote the interests of the entertainment technology industry in the global marketplace and encourage international cooperation. Together, the associations communicate mutual challenges and opportunities on behalf of their respective members.

The World-ETF meets regularly at key industry trade shows such as the PLASA Show in London, NAMM in California, and Prolight+Sound in Frankfurt, represented by key personnel and elected executives.

"There has never been a more urgent time to increase multilateral cooperation of the associations in our industry and NAMM will certainly strengthen the World-ETF, enabling us to better represent the interests of the companies and individuals who are our members," affirms Randell Greenlee, director of international affairs at VPLT.

To learn more about the World-ETF, and the associations represented, go to <http://world-etf.org/>.

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Prolight+Sound Guangzhou 2020 Postponed

The 2020 edition of Prolight+Sound Guangzhou, a major date on the annual trade show calendar, has been postponed, because of the ongoing coronavirus pandemic.

According to an official statement, "To support the government's efforts in controlling the novel coronavirus outbreak in China, the Prolight+Sound Guangzhou organizers have decided to postpone the 2020 fair, originally scheduled to be held on February 19 – 22 at Area A and B China Import and Export Fair Complex, Guangzhou. The new show dates will be further announced by the show's organizers Messe Frankfurt and Guangdong International Science & Technology Exhibition Company (STE).

"On January 24, 2020, the Department of Commerce for the Guangdong Province released a notice regarding the outbreak of the novel coronavirus. To strengthen the epidemic prevention efforts, the Office for the Novel Coronavirus Control and Prevention Unit in Guangdong has requested to suspend all large-scale trade and economic events until further notice.

"Judy Cheung, deputy general manager of Messe Frankfurt (HK) Ltd, said: 'The health of our show attendees is our primary concern. We believe this decision is the best arrangement under the current circumstances. We are communicating closely with our partner, STE, and will announce the new show date as soon as it is confirmed'."

The show was expected to attract 85,000 buyers, with 1,500 exhibitors, showcasing an extended and versatile product range, covering audio, lighting, theatre and stage technology, AV media technology, communication and systems integration. Exhibits were to be spread out over 16 themed halls; new this year was to be an introduction of the Digital Media Lab, which aimed to explore how culture and technology can collaborate to drive audience engagement.

The show is produced by Messe Frankfurt, which is also responsible for Prolight+Sound, to held March 31 – April 3 in Frankfurt, Germany; Prolight+Sound NAMM Russia, to be held September 17 – 19 in Moscow; Prolight+Sound Shanghai, to be held October 28 – 30; and Prolight+Sound Middle East, to be held January 24 – 26, 2021, in Dubai.

As we go to press, thousands have been infected with the coronavirus, with more than 1,100 dying of the disease. 🦠

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LRLR Raffle and BTS Boutique to Benefit Behind the Scenes at USITT

The Long Reach Long Riders and Behind the Scenes will host their annual fundraising raffle at the USITT Conference, April 2 — 4 in Houston. This year's raffle will celebrate the 17th anniversary of the Long Reach Long Riders annual charity motorcycle ride. The Riders, who have raised over half a million dollars for charity in their years of touring, will be riding June 20 — 27 on the A River Runs Through It Tour through four states around the upper Midwest, with route highlights in and around the area known as "the Driftless."

The Behind the Scenes Boutique will also be open for business during the show, featuring an assortment of swag and Long Reach Long Rider T-shirts and kazoos.

Tickets for the raffle are \$5 each or five for \$20 and can be purchased at the Behind the Scenes booth (#222) throughout the show. Winning tickets for nine regular prizes and one grand prize will be drawn at 1pm on Saturday, the final day of Stage Expo.

Prizes include Spotlight with Renderworks software from Vectorworks (grand prize), a Ghostlight from Altman Rentals, a

SpotFX unit with battery pack and gobos from Apollo Design, an American Express gift card from Barbizon; an Event Safety Summit 2020 registration from the Event Safety Alliance; a Nespresso CitiZ espresso machine with Aeroccino milk frother from IA Stage; a \$250 gift certificate to musson.com from Musson Theatrical; a \$250 gift certificate from Sapsis Rigging; ProPlus rope access harness from Showtech Australia, and a USITT 2021 full conference registration from USITT.

Also being auctioned off will be handcrafted items created especially for BTS and donated by Shan and Trish Ayers.

All proceeds from the raffle and boutique sales benefit Behind the Scenes, which provides financial assistance to entertainment technology professionals who are seriously ill or injured.

For additional information about Behind the Scenes, visit www.behindthescenescharity.org or call 212-244-1421. For more information about the Long Reach Long Riders, visit www.lrlr.org.

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Speaker Lineup Announced

for 2020 New World Rigging Symposium

Some of the rigging world's foremost experts will speak at the 2020 New World Rigging Symposium. The third annual NWRS will take place March 31 — April 1 in Houston, in conjunction with the USITT Conference and Stage Expo. The event provides an opportunity to learn from those at the top of their field, to network with their peers and discuss current issues and new technologies. A complete schedule, session descriptions, and a link to register are available at www.esta.org/nwrs.

Jeanette Farmer kicks off the symposium with the keynote address. Her career spans more than three decades of professional theatre technical support, show production, concert/theatre lighting design, theatre design consult-

ing, and themed entertainment project management. The symposium will then delve into one of the hot topics of today's rigging world, video wall rigging, featuring three speakers with extensive experience in this area: Joe Clayton of Stage Rigging, Tony Galuppi of PRG, and Stefan Pries of Creative Technology.

Three experts on performer flying will focus on emergency response and rescue plans: Fred Caron from Cirque du Soleil, Stu Cox of Sapsis Rigging, and Jim Shumway from TAIT. Joe Champelli of Entertainment Projects, Pete Svitavsky of Wenger/JR Clancy, and Nils Becker of ETC will discuss the differences between automation and motorization. Attendees will have the unique opportunity to put their

most pressing questions to four of the industry's most respected engineers: Tim Franklin of Theta Consulting, Bill Gorlin of McLaren Engineering, Miriam Paschetto of Geiger Engineers, and Jeff Reder of Clark Reder Engineering.

The symposium will provide 10 ETCP education renewal credits for recertification.

Sponsors of the 2020 New World Rigging Symposium include: Stage Rigging (platinum); ETC and JR Clancy (gold); Certex, Geiger Engineers, Kish Rigging, and TAIT (silver); CM-ET, H&H Specialties, The Light Source, Motion Labs, Reed Rigging, Reliable Design, Texas Scenic Company, and To the Moon Rigging (bronze). 🌟



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Announces Technical Standards Program's Above & Beyond Award Recipients

ESTA's Technical Standards Program (TSP) announces the 2019 recipients of the annual Above & Beyond Awards. The awards are peer-to-peer, designed to allow Technical Standards Program volunteers to recognize other outstanding volunteers.

The 2019 Above & Beyond Awards were presented to the following TSP members at The NAMM Show 2020:

Joseph Jeremy, co-chair of the Stage Machinery Working Group, was cited for having been the principal author of the controls section of *ANSI E1.42 — Entertainment Technology—Design, Installation, and Use of Orchestra Pit Lifts* —and for making significant contributions to a new standard currently in development: *BSR E1.64—Stage Machinery Motion Control*.

Chris Schmidt was lauded for having kept the Event Safety Rigging Task Group on track through many challenging tasks. Event safety rigging is a complicated subject that

needs to distill down numerous technical requirements to the widest variety of event safety standard readers. The subject is highly important, yet elusive, to many event promoters and planners and it has been the task of the group to find the precise wording in order to assure the reader's comprehension of it.

Peter Willis has been an active member of the Controls Protocol Working Group for almost 20 years and has contributed significantly to many of its control standards. He has also provided exceptional leadership in gathering various manufacturers equipment that use CPWG control standards to demonstrate the compatibility and usefulness of these protocols to the attendees of various conferences, trade shows, and interoperability plugfests in the United States and Europe.

The awards celebrate those volunteers that have made a significant contribution or effort that advances the Technical Standards Program. The TSP exists because hundreds of individuals from across the industry volunteer their expertise and significant amounts of time throughout the year to write standards that increase safety, provide interoperability between different manufacturers, solve problems, and make life easier. These awards are particularly meaningful to the recipients because the nominations are made by their peers in the Technical Standards Program. 🏆

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Bill Sapsis, director of the North American Theatre Engineering and Architecture Conference (NATEAC), announces that ADC (Automatic Devices Company) has joined as a platinum sponsor. ADC general manager Kevin O'Grady notes, "ADC is expanding into a company that sells much more than just standard curtain track. Our focus is innovation and NATEAC provides us with the perfect platform to reach those who'd be most receptive to our message: the forward-thinking architects, engineers and designers of our industry."

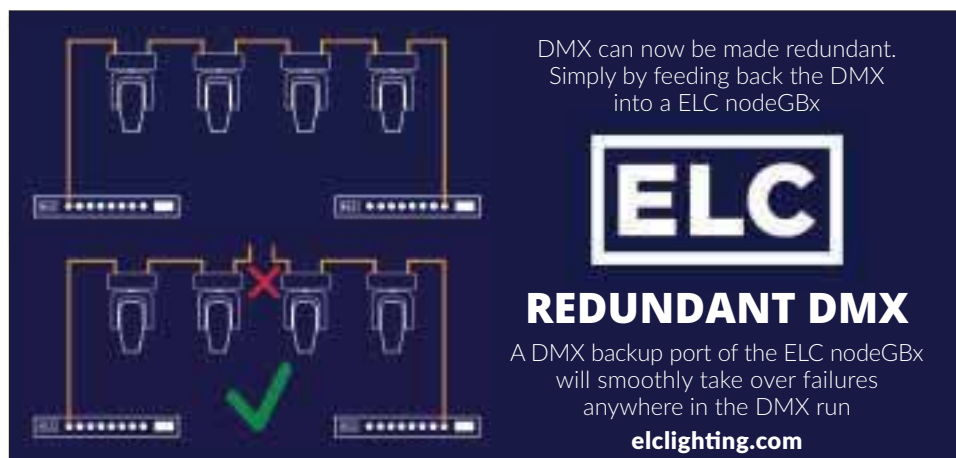
Sapsis adds, "We're very grateful for the ADC sponsorship. Their commitment helps NATEAC achieve its goals of promoting and facilitating communication between the design professionals responsible for performance spaces and the owners/end users of those facilities."

NATEAC has attracted over 300 industry professionals, venue owners, and end users from 12 countries on four continents. The conference offers a forum for the exchange of ideas and experiences between all of the interested parties, ultimately creating a community for professionals to connect and engage in valuable, face-to-face conversations, offering opportunities not otherwise available. Networking continues to be an important and enjoyable aspect of the conference, which includes panel sessions, the traditional harbor cruise, a conference dinner at Sardi's, and a conference closing cocktail party.

NATEAC will be held July 19 – 20 in New York City. Additional sponsors include TAIT (platinum); ESTA, Wenger/JR Clancy, Candela Controls, and Westview (gold); McLaren, Fisher Dachs Associates, Niscon, Geiger Engineers, Rose Brand, ETC, The Shalleck Collaborative, Hudson Scenic Studio, and Theatre Consultants

Collaborative (silver); and Triple E, Gala Systems, Schuler Shook, Texas Scenic Company, Charcoalblue, ASTC, H&H Specialties, PSAV, EPS, ACT Lighting, Serapid, and InCord Safety Netting (bronze). The conference dinner sponsor is Altman Lighting, with wine by USITT. The cocktail party sponsors are Harlequin Floors and iWeiss. The har-

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Behind the Scenes Wins at Rock Lititz Battle of the Bands

The fifth annual Rock Lititz Community Battle of the Bands featured six bands, three stellar judges, two food trucks, and almost 600 attendees. At least half of each band consisted of members of the Rock Lititz community and the attendees consisted of community members and their family and friends. (Rock Lititz is the one-of-a-kind production community designed to serve live events.) Behind the Scenes was the big winner of the evening, receiving the entry fee, half of the 50/50 raffle, donations, and proceeds from swag sales which totaled over \$4,500 for the charity.

Greg Zittle, senior sourcing manager at TAIT, explains, "The Rock Lititz Community Fun Club gets the opportunity to put on a variety of events for the community, to enjoy each other's company and escape the typical fast-paced environment of the live event industry. The Behind the Scenes charity was selected as the beneficiary for the 2019 Battle of the Bands based on the great response from our community members to the recent survey regarding mental health. The event showcased a variety of talents within the Rock Lititz community, and using those talents to have fun and support organizations we believe in is the main goal of the Fun Club!"

Rock Lititz general manager Andrea Shirk comments, "The Rock Lititz community is dedicated to supporting the live event industry, through work, trainings, building relationships, and creating a support structure for one another. The effort Behind the Scenes leads regarding mental health is unparalleled, and we are grateful for the opportunity to donate to such an important cause."

"We are so grateful to the Rock Lititz Community for selecting Behind the Scenes as their beneficiary and for community members providing such a warm welcome at the event," says Lori Rubinstein, executive director of Behind the Scenes. "We are just beginning our work in developing the mental health and suicide prevention initiative and it means a great deal to us to have the participation and support of the Rock Lititz Community in this endeavor."

For more information about BTS, to donate, or to apply for a grant, visit www.behindthescenescharity.org.

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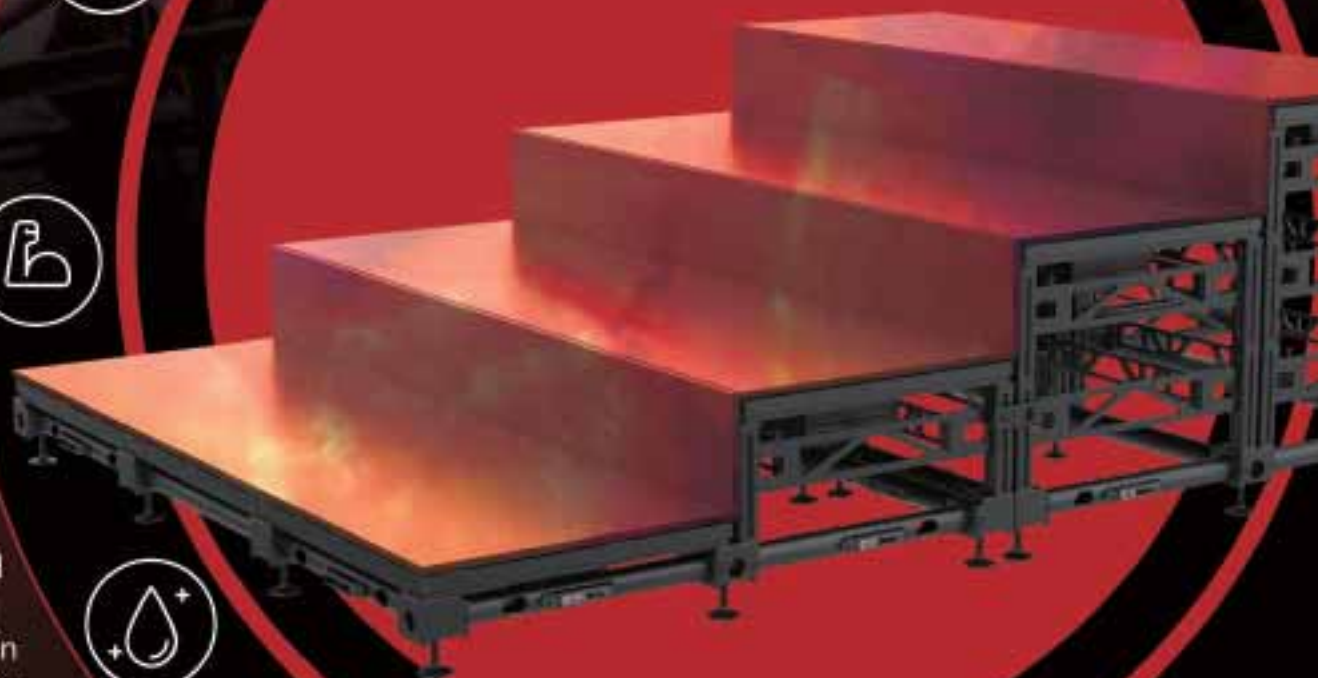
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Liteup Supplies Light to Björk's *Cornucopia Tour*

Southampton, UK-based lighting rental specialist Liteup supplied lighting, video server, and control plus rigging—136 points including Kinesys automation—equipment for all technical departments for the recent UK and European leg of Björk's ongoing *Cornucopia Tour*, for which the dramatic lighting was a codesign by Bruno Poet and Richard White.

The starting point for lighting design was the video content created by artist and designer Tobias Gremmler—with whom Björk has worked previously—together with Chiara Stephenson's intricate set designs.

Poet and White both also really enjoyed working with show director, award-winning Argentinian filmmaker Lucrecia Martel whose influence brought a cinematic perspective and its own distinctive spirit and rhythm to the show.

Liteup's account manager was Marc Callaghan, supported by project manager Dan Bunn.

Callaghan says, "We were extremely proud to be part of a groundbreaking production like this. The show looked fantastic and absolutely blew me away when I saw it. The production was very detailed and precise with all the elements both physically and artistically linked."

Björk is heavily involved in all aspects of her live show productions and she wanted all of the visual elements to look and feel organic and to have a fluid synergy. The stage floor was modeled on mushroom heads, complete with their complex gill structures on the underside, and opening/closing string curtains stage left, right, and upstage center, together with a LED screen at the back, all added perspective and texture.

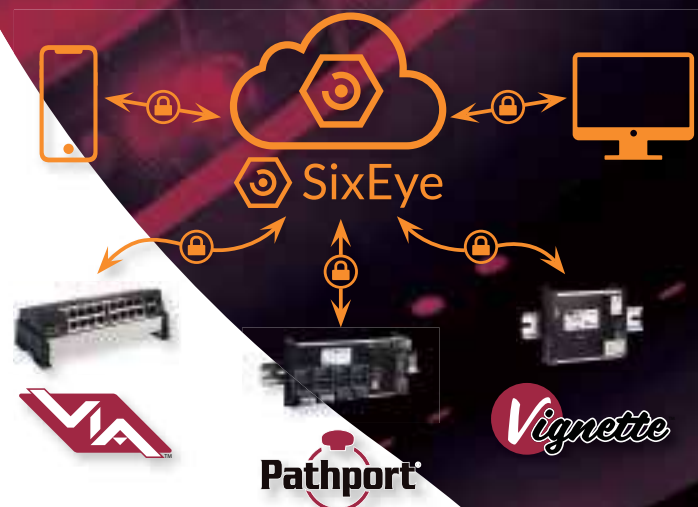
The lighting design brought a theatrical flourish to a concert stage and was also arranged in layers, offering the ability to change and shift the environment and to highlight and emphasize different areas separately or combined.

At some points, the visuals took center stage, and other times the video faded into the background while lighting and scenics took up the narrative, with the two medias working closely and complementarily throughout.

Liteup provided 16 Martin by Harman MAC Viper Performance and 37 Mac Viper profiles for the main hard-edged moving lights, which were arranged on six over-stage and two front-of-house trusses, with 29 GLP X4s as the primary wash lights.

Two Robe BMFL WashBeams running on a RoboSpot

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remote followspot system were positioned at the front of house off to the sides, to increase the subtlety of their impact onstage—the goal being that the artist should not even feel their presence.

The RoboSpots were a key element. “We always try and spot Björk from a very side-on angle, which isn’t always possible when touring multiple venues,” states White. Using this system allowed him to keep control of the color and intensity parameters from the front of house, making the artist’s

key light much more “live” and controllable, particularly given the show’s layered projection surfaces and automated drapes.

Thirty-two GLP X4 Bar 10s and twenty X4 Bar 20 LED battens were positioned on the overstage trusses in upstage and downstage rows. The staging concept is based around a “utopian planet” and Poet and White wanted to create multiple sunrise and sunsets with stage-wide shifts of color.

Both GLP JDC1 and SGM Q-2 strobes have been used throughout all



the shows, offering a wealth of different effects. On this leg, White spec’d Q-2s for the floor and JDC1s for the overheads, as they had swapped to a festival-style rolling stage with the floor units completely visible. The requirement was therefore for a small footprint strobe.

Twenty Astera AX3 LightDrop battery-powered LED “pucks” were dotted around the stage, providing a neat wireless uplighting solution to highlight the mushroom gills and other set elements.

“These were our footlights and sat on the stage set itself,” White says. They wanted to achieve close angles and bring another dimension to the lighting but without cabling and fixing points. White had used them before and knew they’d be “perfect for this job.” They could be charged during the load-in and simply positioned and focused before doors each day.

Two grandMA3 light consoles were supplied by Liteup with a disguise 4x4 pro media server for the playback video, operated by Daniel Bond.

One of the biggest challenges for lighting was during the more video-driven songs, where people and set had to be lit in complementary and subtle ways, and serious detail went into finding angles “to create our effect but avoid any of the projection surfaces.”

This was the primary reason they



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needed so many fixtures with framing shutters and, at one point, units had to be rigged on the curtain trusses in order to light performers while sandwiched between multiple curtains.

The rigging detail comprised 136 motors from Liteup—a mix of quarter-ton, half-ton, one-ton and two-ton and including the five Kinesys variable-speed hoists—which were shared between lighting, audio, and video departments, together with 143m of Litec PR60 pre-rigged truss. Head rigger Steve Belfield worked alongside Toby Lee.

Dan Bunn worked closely with Belfield to work out multiple rigging solutions for a show that had to be millimeter accurate when it came to the positioning of all the elements each day. This included getting one of the truss structures reengineered to achieve a result not possible with any off-the-shelf-product.

The lighting crew chief was Aiden McCabe, Ryan Harrington oversaw dimmers, and the lighting crew was completed by techs Simon Carus Wilson and Mick Stowe, all working directly for the production. All were chosen by White for the tour and most had worked with him and Poet previously. Overseeing everything on the road was production manager Peter van der Velde.



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Threnody of Hope:

Designing *Ode* at Alvin Ailey

One of the most acclaimed offerings of Alvin Ailey American Dance Theater's winter season at New York's City Center was *Ode*. Choreographed by Jamar Roberts, it tackles the issue of gun violence in the black community, a constant source of anguish that has been explored in dramas like Antoinette Nwandu's *Pass Over* and films like *Blindspotting*. How to represent it in dance while avoiding the obvious or mawkish would seem to be a considerable challenge. But as Brian Seibert wrote in his *New York Times* review. "*Ode* isn't obvious, though. It's delicate, daring, and heartbreaking. Pitfalls of maudlin cliché surround the subject, but Mr. Roberts has skirted them, above all through his bold choice of music."

The latter is Don Pullen's 1975 solo piano improvisation *Suite (Sweet) Malcolm (Part 1 Memories and Gunshots)*; it proves to be uniquely suited to Roberts' ends and more about it in a minute. The production, however, also benefits from a striking and original set design by Libby Stadstad and lighting by Brandon Stirling Baker.

Interestingly, the action of *Ode* is set against a gorgeously floral backdrop, a seemingly counterintuitive design choice that proves to be thoroughly in synch with the choreographer's intentions. In her conversations with Roberts, Stadstad recalls, "He said that he has been hit hard, emotionally, by the gun violence of the last few years. He wanted to honor the victims in a piece that is hopeful. He presented images of flower sculptures, saying, 'I have no idea how to do something like this in this theatre.' I responded with more ideas. Once we found one that we both really liked, I started working on the scale model, to figure out how it would live in this environment. From there, it was matter of marrying the concept to reality."

Among the realities to be dealt with was the fact that, in a repertory dance company, Stadstad had a single line set at her disposal. "I spoke at great length with Joe Gaito, the company's technical director, because the idea of the design opened up technical issues: For example, should the flowers be painted or real? We made the decision to move into the painted environment, which, I think, ended up being more poetic. It also allows us to easily tour the design internationally."

The design consists of flowers made of dyed muslin affixed to a net drop. "Scenic Arts Studio [based in Newburgh, New York] developed a way to mass-produce the flowers," Stadstad says. "They stamped the flowers with a resistance stamp. It's like a wax; you paint over it, and it doesn't absorb into the fabric. It also gave us colors that are even more surreal."

Addressing the layout, she says, "It's instinctual. I laid out each piece individually. It is like someone threw flowers up in the air; it wouldn't land in an even pattern. That's why it's

dense in some areas and not in others." Indeed, the result is both beautiful and oddly melancholy.

The designer notes that her conversations with Roberts started in March of last year, with the model being solidified in July. Construction took about a month, with Stadstad making several trips to Scenic Arts Studios to check on progress. "I can't say enough about them," she says, praising the work of owner Joe Forbes and his staff.

Baker notes that *Ode* represents Roberts' first ballet as resident choreographer for Alvin Ailey, "so there was a lot of weight to it. With that kind of pressure, you have to deliver something very powerful, but also elegant, with an aesthetic that perhaps represents a new generation of design at Ailey. It was an exciting opportunity."

Echoing and expanding on Stadstad's comments, he says, "Jamar wanted it to be a tribute to everyone affected by gun violence in the world today. But, instead of telling a story that highlights the tragedy, he decided to focus on the lives of those who are affected and the people they leave behind. Instead of creating a literal, raw, violent experience, he chose to promote color and beauty, a world that exists between life and death. How should that look? Violent? Dark? Symmetrical?"

Noting that "you have to earn the right to use color," Baker says he "pulled inspiration from the world of flowers that Libby created, which I thought of as a constellation of flowers. Instead of using pink and purple and green, which are in the drop, I decided to go with variations of lavender light, which allowed the dancers to be separated from the constellation of flowers; it also connected the worlds of living and dead."

To work out his palette, he adds, "I went to Scenic Arts Studios and did color tests with Lee 142 [Pale Violet], Lee 710 [Spir Special Blue], Lee 700 [Perfect Lavender], and Lee 137 [Special Lavender], working different mixtures of these colors." To deliver these colors, he added a set of ETC LED Source Four Series 2 Lustrs, a choice made with all due deliberation. "I also had to earn the right to use the Lustrs," he says. "It's not that easy for Ailey to tour with extra equipment. I had to justify it. Thankfully, Al Crawford [lighting director] and Roya Abab [associate lighting director] were



Photo: Paul Kolnik



willing to accommodate me.”

The music, Seibert noted in the *Times*, “begins and ends as a jazz ballad, tenderly ruminative and soulful. But in the middle, it goes way,

way out into cats-pouncing-across-the-keyboard territory. Whether or not you think of that section as a shootout, you will probably experience it as an assault.” Baker’s lighting reacts to this structure. “The piece is structured into three stanzas,” he says. “I organize the style and angle of light by each stanza. The opening could be seen as a dream, perhaps of Heaven.” The sequence is dominated by sidelight on the dancers uplighting on the flowers. “It is symmetrical and clear of any shadows,” he says. “I avoided any sense of

backlight. The moment we enter into the second stanza and the piano goes wild, is when I first introduce the idea of backlight. In the same way that I justify color, I like to always justify the angle of lights; it was challenging, because Libby’s ceiling of flowers blocks out most of the electrics, but when light shines through, we created these incredible shadows of flowers.” The third stanza reverts to the same sidelight/uplight combination of the first.

Interestingly, *Ode* can be done either with all-male or all-female companies. “I did a lot of work lighting both casts,” Baker says, in part because the costumes [designed by Roberts] are so different: off-white pants for the men and full-length dresses for the women. “I couldn’t change the cuing, which caused me to make decisions that were universal,” he says.

The Ailey rig, he adds, is “a mix of [Martin by Harman] Viper Performances and Viper Washes, along with Source Fours. For this piece, I mostly used the Viper Performances and ETC Lustrs as my workhorses. Because the piece is a departure, I wanted it to look and feel different.” The company uses an ETC Gio console.

The result was triumphantly received. “It says something sad and awful about the state of the world,” Seibert adds. “But that very honesty says something hopeful about the present and future of this company.” *Ode* will remain in the company’s repertoire as it continues on its annual tour. 

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The 4430 is a compact design that accepts both Dante and AES67 IP audio streams, and derives power via both PoE and PoE+ formats, with a proprietary internal power supply helping to deliver 104dB of short-term SPL, via two integral 50W Class D amplification stages feeding the woofer and tweeter. The single rear panel CAT connector also allows access to Smart IP Manager—a downloadable software tool running on Windows 10 that allows installers to configure an almost unlimited number of rooms, zones, loudspeakers, and audio channels, and includes device discovery, a versatile room-equalization tool set, system organization, and status-monitoring. APIs within the 4430 support the hooks to allow external control via third-party hardware, software, or house automation.



The product supports up to eight audio channels in a stream with sample rates of 32kHz – 96kHz and 16 – 24-bit resolution. Streams can be managed by both Dante Controller and Dante Domain Manager software, as well as legacy balanced line analog audio. The unit delivers a frequency response of 45Hz – 23kHz (-6dB) via a 5" woofer and 3/4" metal dome tweeter, and the compact, lightweight enclosure utilizes Genelec's trademark Minimum Diffraction Enclosure and Directivity Control Waveguide technologies to ensure neutral, uncolored sound both on- and off-axis.

The enclosure is produced from recycled aluminum; is available in black, white, or 120 custom RAL colors; and is compatible with Genelec's extensive range of mounting accessories to allow the unit to be floor-, ceiling-, wall- or truss-mounted. www.genelec.com

JBL — EON ONE Compact Portable PA System

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makes it easy to stream music and link multiple speakers; a mobile app for Android and iOS provides intuitive control. The 8" woofer and 1" tweeter produce up to 112dB of output from 37.5Hz—20kHz, providing loud, uncompromis-

www.jbl.com

Martin Audio — Blackline X218 Subwoofer

This product extends the company's BlacklineX portable series, designed for a range of applications including portable sound reinforcement and stage monitoring for live bands, DJs and corporate events, and installations in nightclubs, bars, commercial spaces, and houses of worship. It is a dual-driver, high performance subwoofer with an operating range of 42Hz—200Hz + 3dB. It produces high output levels—141dB peak SPL (half space)—with low distortion and can



be used singly or stacked horizontally. It features dual 18 1/4" voice coil, long-excursion drivers in a reflex enclosure with eight large ports that reduce air turbulence at high output levels. It is fitted with a 1 3/8" pole-mount socket for mounting BlacklineX full-range enclosures, and integral M10 inserts provide for eyebolt suspension of a single enclosure. When used with BlacklineX Series full-range systems, crossover and EQ functions can be performed by DX0.5 or DX4.0 system controllers or by a Martin Audio amplifier with onboard DSP.

www.martin-audio.com



Pliant Technologies — MicroCom M Wireless Intercom System

This product, available in 900MHz (where legal) and 2.4GHz frequency bands, provides single channel, full-duplex, multi-user intercom for applications where high-quality audio, excellent range, and low-cost are essential, the company says. The unit features 10-hour lithium ion battery



operation and has the ability to have up to five full-duplex users. The system is simple to operate and provides unlimited listener capability in addition to duplex users, without the need for a base station. Up to four different systems

can be deployed in the same area at the same time. The product's RF technology is based on an encrypted frequency-hopping spread spectrum transmission that ensures secure connectivity along with reliable communications. The system features small, water-resistant, lightweight belt packs; it is very simple to set up and is user-friendly, a plus when working with less-technical staff and volunteers. www.plianttechnologies.com

RF Venue — DISTR09 HDR Antenna Distribution System

The product's proprietary architecture can connect up to nine wireless microphone receivers with two zones of antenna coverage built in. With superior gain flatness and high-dynamic range across VHF, T-Band, and UHF, it comes ready for multi-band wireless microphone operation in a compact 1RU footprint, the company says. Any of its clean, low-noise diversity outputs can be cascaded to another unit, for up to seventeen channels of wireless microphones in just two units of rack space. Multi-zone installations are



easy with the two zone antenna inputs, providing coverage for large areas or multiple rooms, each with switchable DC power available for in-line amplifiers or active antennas. Using the internal power supply, the product can provide clean DC power to wireless microphone receivers with an optional DC cable kit and can also be powered directly from a DC battery source for location sound cart applications. It is also ETL-listed to meet bid specification requirements on municipal, government, and other high-profile projects. An internal I/O section provides a range of future module add-on capabilities ranging from remote Web-based spectrum monitoring to band-pass filtering and more. As RF spectrum congestion grows and operating bands evolve worldwide, it is highly configurable to meet the current and future needs of any professional wireless microphone system.

www.rfvenue.com



Focusrite — Additions to ISA Range

The company says the ISA range brings classic Focusrite sound to Dante Audio-over-IP networks. The eight-channel ISA 828 MkII features the same transformer-based input stage, complete with the Lundahl LL1538 transformer, as its predecessor. New, however, is compatibility with Dante Audio-over-IP networks, facilitated by the optional ISA ADN8 A-D card. Also new is an updated power supply that allows for more efficient power consumption, a reduction in heat generation, and extremely reliable operation. The front panel remains unchanged, with six-step metering on each channel, and front-panel instrument inputs for channels 1-4. The ISA ADN8 is an optional A-D card for the ISA 828 MkII and ISA 428 MkII. It provides ADAT Optical, AES3, and Dante connectivity at rates up to 24-bit/192kHz. The card offers primary

and secondary RJ45 Dante output ports, an AES59-configured DB25 connector for AES3 output, and a pair of TOSLINK connectors for ADAT output. Word clock I/O on BNC connectors allows synchronization with many external devices. The ISA ADN2 is an optional two-channel 24-bit/192kHz A-D card that provides high-quality analog-to-digital conversion for the ISA One mic preamp and DI. The card offers primary and secondary RJ45 Dante output ports, an XLR connector for AES3 output, a TOSLINK connector for ADAT output and RCA connector for S/PDIF output. Word clock I/O on BNC connectors allows synchronization with many external devices.

focusrite.com

Waves Audio — OVOx Vocal ReSynthesis Plug-in

Users can utilize OVOx as a plug-in or standalone app (with or without a DAW) to create rich vocoder, talkbox, harmonizer, pitch/tune, vocal arpeggiation effects and beyond, the company says, adding that it features an unprecedented menu of vocal synthesis and vocal morphing options, from classic Daft Punk-style vocoding to futuristic vocal effects that defy category. The plug-in delivers its ultra-high-resolution sound quality thanks to Waves' Organic ReSynthesis (ORS) technology, which takes vocal signal and breaks it

down to its core "DNA" elements—amplitude, pitch, and formant. It then resynthesizes

these elements to create a new pristine processed signal, the company says, without any of the artifacts that sometimes plague vocal synth-type instruments. The workflow is instant, with none of the difficult routing, typical of other vocoders and vocal synthesizers. MIDI control is optional: Users can simply use a live or recorded voice to trigger automatic chords, harmonies, or scales, using automatic Note Mapper. www.waves.com



Spot Focus - Lighting

Elation Professional — Artiste Rembrandt

The latest addition the Artiste range is a companion wash light to the Artiste Monet LED Profile; it is designed for service on even the largest stage, the company says.

The product's Fresnel lens optics and hotspot LED engine provide an optimized wash field and high center intensity that make it a well-suited wash solution for high-output applications. The robust moving head uses the same 950W 6,500K bright white LED engine as the Monet, for up to 51,000 lumens of output. With a fast zoom range from 8°–72° and an 180mm front lens, it has the power to cut through great distances in arena touring environments or large TV or theatre stages. The traditional Fresnel lens is interchangeable with a pebble

convex lens, providing a tighter beam angle and higher center intensity for long throws or beam applications, and DMX-controllable variable-fan modes ensure low-noise operation in noise-sensitive environments.

The unit houses the same seven-flag SpectraColor color-mixing system as the Artiste Monet. Exclusive to Elation Professional, it combines industry-standard CMY color mixing with complementary RGB flags for the ability to fade between soft pastels to saturated primary colors. With the addition of variable CTO, as well as a fixed color wheel with UV and high-CRI options, it offers the color combinations that world-class lighting designers require, the company says.

www.elationlighting.com



Harman Professional — Martin ERA Performance Series

The ERA Performance Series includes the 400, 600, and 800 fixtures and the first outdoor-rated moving head, the ERA 500 Hybrid IP. Each of the fixtures features full CMY color mixing and

separate color wheels, plus an iris for beam adjustment and a full curtain framing system. Fixed and rotating gobo wheels loaded with user-favorite gobos from the MAC range offer a wide variety of effects. The

curtain-framing system offers lighting designers a high degree of flexibility to achieve precise looks onstage. The entire system can rotate, allowing designers to direct light exactly where they want it to go and achieve unique movement effects not otherwise possible, the company says. martin.com

ADJ — Hydro Beam X1

The second model to join the company's Hydro Series of IP65-rated movers, the X1 is a compact and punchy beam fixture designed to gen-

erate dazzling aerial effects, the company says. It is powered by a 100W Osram Sirius HRI discharge lamp with a 9,000K color temperature and CRI of 60. It offers a 6,000-hour typical life span and makes for a power draw of 199W @ 120V (192W @ 220V). The lamp, combined with specially designed optics, allows the fixture to create an extremely potent output. With a tight aperture of just 3°, it generates a razor-sharp beam capable of extremely long throws and chunky midair effects. At 5m, the fixture's output measures at 310,200 lux; at 20m, it still clocks in at 19,387 lux. It has a dedicated color wheel with 12 options as well as a CTB color-correction filter and UV. A separate gobo wheel comes with 11 metal patterns—all specifically designed for creating aerial effects—as well as four gobo reducers, allowing for extremely tight pinpoint beams. www.adj.com

Chauvet Professional — Maverick Storm 1 Spot

This 480W cool white moving spot fixture takes outdoor reliability to a new level, the company says, with its IP65 rating, aluminum alloy housing, marine-grade 316 stainless-steel screws, M12 Gore valves, and a sun-shield optical-protection system. It delivers a flat even field of light with variable CMY plus CTO color mixing to create a wide palette of colors. Designers will enjoy a range of creative options with this fixture, thanks to features like its 8° — 48° zoom angle and field angle, 16-bit dimming for smooth control of fades, five-facet motorized and rotating prism, animation wheel, iris for beam control, and independently controlled light and medium frosts. It has seven glass rotating and indexable gobos on Wheel 1 and nine metal static gobos on Wheel 2. Compact and lightweight at 84.2lb, it provides a 32,000-lumen source and illuminance of up to 28,829 lux (at 5m). Various control options are offered, including



DMX, RDM, W-DMX, Art-Net, and sACN. The menu system makes it simple to adjust control protocol, in addition to fan, pan and tilt, and dimming. By setting up a menu preset, the user can save time by loading choices on all Maverick Storm 1 Spots in a rig simultaneously, instead of manually presetting each unit individually.

www.chauvetprofessional.com

Claypaky — ReflectXion Moving Mirror Unit

The product has a highly reflective 390mm-by-280mm mirror, featuring up to 99% reflectance without chromatic aberrations. It can redirect beams of light from any stage light with the same intensity as it receives them. The



unit offers 540° pan and unique, continuous tilt movement at adjustable speeds. The mirror is the same on both sides, giving users two highly reflective surfaces with which to direct light beams.

Using the same omega clamp hanging system seen on all Claypaky luminaires, this compact moving mirror can be used virtually anywhere on- or off-stage in any working position, the company says. For control, the unit uses only six DMX channels, and pan-and-tilt resolution are both 16-bit for precise movements. The onboard LCD menu system is very user friendly.

www.claypaky.it

Acclaim Lighting — AL Driver 200

This multi-protocol 200W driver, designed to optimize the usage of low-voltage LED products, features DMX, RDM, 0-10V, and DALI input control protocols, along with four terminals for PWM output. With an input voltage between 100–277VAC and an output of 24VDC, the unit contains internal temperature and usage sensors that record data on its onboard



display. Included are static color selection and an internal preset program as optional operating modes. The compact 10" x 7" x 3" unit is housed in aluminum and performs in temperatures ranging from 14° – 113 °F. It is IP22-rated for dry locations and comes with a five-year warranty.

www.acclaimlighting.com

ETC — fos/4 Panel Light

In 2016, a dedicated research team was formed at ETC to advance the technology of future product offerings. The team's first project was to create the best light for use on-camera. The findings from this multi-year, industry-wide study on color perception come together in the family of fos/4 panel lights, the company says. Each of the three panel sizes (small, medium, and large) is billed as delivering unrivaled brightness in two array options. The Lustr X8 array adds a deep red LED to its mix that brings a richness to the spectrum by enhancing skin tones and giving new depth to blues, greens, and ambers. The Daylight HDR is a tunable white light array that, using a calculated selection of LEDs from the X8 color system, delivers a natural warmth when rendering skin tones and is optimized for output in cooler temperatures. These soft lights offer what the company calls a "shocking" level of brightness, and selectable CCT between 1,900K – 10,450K, without compromising on color quality. The full-color screen and tactile encoders



on the user interface were designed with the cinematic workflow in mind. It gives nuanced color control from the full-spectrum color picker within the UI, letting users choose how they mix each color. Use the "tune" function to choose brightest, best spectral, or a hybrid of the two. Users can save their customized color palette to one of the many programmable presets.

studio.etcconnect.com

PR Lighting — AQUA Marine 580 BWS/AQUA Marine 580 Beam

Thanks to the double-layer special coating of the chassis, accompanied by PR's patent-pending sealing system, both fixtures can provide superior resistance to a wider range of corrosive media, the company says, making them well-suited for use on projects close to the seashore or in sea water. Housing either a Philips MSD Platinum 25 R lamp or Osram Sirius HRI 550W XL, both are fully featured. Colors include CYM linear mixing system with macros, a color wheel with 12 color filters (plus open), rainbow effect with bidirectional and variable speeds, and stepping/linear color changing, while the color filters can be in any position. They also boast a linear



CTO system. The products accommodate one fixed gobo wheel (containing 17 gobos plus open), bidirectionally rotatable and shakable at variable speeds. A rotating gobo wheel, with seven interchangeable rotating gobos (plus open), is bidirectionally rotatable and shakable at variable speeds. Four different facet prisms can be overlapped (other prisms are optional). The graphic effect wheel offers bidirectional rotation with variable speeds and can be overlapped with the fixed and rotating gobo wheels. Features also include an independent frost filter.

www.pr-lighting.com

Spot Focus - Imaging / Staging / Effects

Harman Professional — CloudworX Manager AV Management App

The first application from Harman's cloud-based CloudworX Software was developed to unify the configuration, deployment, and monitoring of its audio, video, control, and lighting systems.

The product is browser-based, offering system integrators the ability to install, configure, and maintain many devices without having to configure them individually or locally at the device. Initially supported devices include the AMX by Harman Acendo Core meeting space collaboration system as well as AMX Acendo Book scheduling touch panels. These products may be configured and deployed by visiting cloudworx.harman.com. More devices are being scheduled for inclusion in upcoming CloudworX releases.



Features include support for private or single sign-on accounts; comprehensive sorting, filtering, and searching of discovered devices; simultaneous configuration of like or unlike devices; simple connection of local installations using CloudworX Gateway software; device firmware management; and template creation and deployment. pro.harman.com

Analog Way — Aquilon RS alpha Video Processor

An addition to the company's LivePremier series of 4K/8K live presentation systems and video wall processors, the product offers eight seamless HDMI 2.0 inputs: four HDMI



2.0 outputs configurable as single screens, edge-blended wide screens or scaled auxiliary outputs; two dedicated 4K multiviewer outputs; and up to four 4K or eight HD freely assignable mixing layers in a 4RU chassis. Its modular design makes it easy to swap I/O cards to accommodate a variety of connectivity arrangements to match the source and display requirements. It also offers real-time 10/12-bit 4:4:4 video processing power compliant with HDR and pure 4K60p on each input and output with ultra-low latency. With native Dante audio routing capa-

bility, up to 64 channels of audio can be embedded or de-embedded over a Dante network. The product is controlled by an HTML5-based user interface that simplifies configuration and operation through unique features such as live program/preview workspaces, multi-operator collaboration, keyword search, and multi-language support. www.analogway.com

Penn Elcom — Panel Designer App

Panel Designer—accessible at <https://bit.ly/2XL3jPc>—enables anyone with 20 minutes, a good Internet connection, and ideas to design and order their dream rack panels, adding practical, individual touches, the company says. Panels—currently sized between 1U and 6U—are selected first. Users then browse through a variety of pre-made cut-outs indexed by category e.g. power, audio, video, fan, multi-core, Harting, sub-D, and other connectors, any of which can be dragged into place on the panel and easily labeled using the text function. Graphics, logos, other branding artwork or text can also be uploaded and positioned on the designed panel. The



cut-outs snap into place automatically on the design drawing, leaving the correct spaces for connectors, fans, etc. Text and logos will be expertly UV-painted. Once the panel design is complete, the price is displayed (this increments as the panel is being built) and the "order" button is clicked, then the design moves straight into production at Penn. Customers receive an email when it is ready, and the product can be shipped to all Penn Elcom's regular destinations via the worldwide distribution network.

www.pennelcomonline.com



Tomcat — Ultimate Hinge

The product's design allows for extreme flexibility for height and angular adjustment of truss for exciting backdrops and support structure configurations, the company says. A combination of aluminum truss and steel hinge parts, it connects seamlessly with Tomcat's light-duty 12 x 12 plated truss, with a spigot connection version also available. It features an integrated high-strength lifting eye for safe and simple connection with users' electric hoists or lifting points. Unlike similar products, this is engineered to be fully load-bearing, with an allowable capacity of a half-ton.

www.tomcatglobal.com

James Thomas Engineering — L-Wall System

The product is billed as providing maximum flexibility, combined with extreme precision and very fast setup



times. Users are given the means to create small-to-big screens without adding additional loading to their roof system. Features include dramatically reduced assembly times, robust aluminum frame, and fork connection system for creating various arch configurations. The product's modularity allows for additional reinforcement with other elements in the rear of the structure for increased safety, and each attachment point provides the possibility of connecting an LED wall element (usually 500mm x 500mm).

www.jthomaseng.com

Christie — Pandoras Box V6.4

This release introduces Christie's 64-bit processing software. In addition to new features on the redesigned interface, the performance of all systems has been significantly increased, with the updated software unlocking additional resources from existing server

hardware. Working completely in 64-bit, the render engine is now ideally adapted to the operating system, the company says. Pandoras Box can make use of additional resources, such as system memory, or process more calculations in parallel. These performance-boosting improvements allow the simultaneous playback of more or larger video files. The software has become clearer and more structured, making it easier and faster to keep an eye on important data or settings, the company says. Additional icons facilitate intuitive operation and give the user direct access to key



functionalities. The revised QuickTime decoder delivers faster decoding, includes hardware acceleration, and supports additional codecs such as H.264, HEVC, ProRes, and DNxHD.

www.christiedigital.com

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Touring with COURAGE

Celine Dion inaugurates a new stage of her career
with a freshly designed new tour

By: Sharon Stancavage

Celine Dion's core team has been with her for decades; therefore, one might expect that the design process for her current *Courage World Tour* might have been business as usual. However, says production designer Yves Aucoin, "This is the first show without René [Angélil, Dion's manager/husband, who passed away in 2016], so we were doing it a little bit differently. Normally, he was the guy making all the calls and

talking with her about everything. I was in more of a leading role this time." The rest of the creatives, he says, included, "Celine; Pepe Muñoz, who is her stylist; Scott Price, her bandleader; and her co-managers: Denis Savage and Dave Platel."

Under the circumstances, Aucoin says, "We wanted to do something fresh and something new, although we're playing a lot of the same songs. I came up with three set



"She wanted to be alone with the audience at certain points," Aucoin says. "She also wanted big extravaganza looks with the band at other moments. But these needed to be separated."



Due to the weight of the video stage deck, Tait engineered a custom truss that is installed underneath to ensure it would not deflect.

designs, to give her options. I've learned that if I do that, Celine has the opportunity to choose what feels and works best for her." Dion had certain requests. "She wanted to be alone with the audience at certain points," Aucoin says. "She also wanted big extravaganza looks with the band at other moments. But these needed to be separated."

To achieve Dion's requests, Aucoin—and scenic designer Eric Tendi—came up with a scheme that relies on numerous lifts, turning to TAIT for scenic construction services. "I came down [to Tait, in Lititz, Pennsylvania] with Charles Ethier, my production manager," Aucoin says. "We showed them what we wanted to achieve, even the type of lifts. I told them I wanted to open September 18, I wanted it to fit into this budget, and I wanted to see it working on August 1. After that, we went back and forth with emails and drawings to see if I was on target with the budget."

Tait engineered and custom-manufactured an automated mainstage featuring a modular lift system equipped with 20 custom-built (and trademarked) MOD LIFTS. These are modular, high-capacity lifts that, the company says, are almost infi-

nitely configurable. Each is a 42" square that can lift a payload capacity of 2,000lb at 1' per second. The lifts are engineered at that capacity with a 10:1 safety factor, reducing the risk of failure to nearly impossible, the company adds.

A stair lift, supported by four Mod Lifts, located at the center of the main stage, is 10' wide x 6.5' deep, and is fully surrounded with LED fascia. Due to the weight of the video stage deck, Tait engineered a custom truss that is installed underneath to ensure it would not deflect. The custom truss was required because the payload itself is so heavy that the span between lifts required additional structure. On several occasions, Dion is lifted 5.5" above the venue floor using the stair lift.

Located upstage, the 10'-wide x 8'-deep drum lift is also supported by four Mod Lifts. During the show, the drummer is lifted 16' above the venue floor to reveal a 6'-tall circular structure through which Dion makes a grand entrance. For the set piece that acts as both a stage deck and light wall (equipped with 20 Ayrton IntelliPix-XT units in a 5'-wide x 4'-high configuration), the light wall lift,

which is 10' wide x 3.5' deep, lifts 10' above the floor via two Mod Lifts. The light wall creates a silhouette effect by backlighting Dion in the drum lift structure. The video wall lift, located downstage of the drum lift, is 10' wide x 3.5' deep; it rises up, 10' above the floor, via two Mod Lifts, in sync with the drum lift; the video wall then lowers to reveal Dion inside the drum lift's circular structure.

Each of two band lifts is 14' wide x 8' deep and is supported by four Mod Lifts. Due to the width and capacity of each, Tait engineered a custom truss that is installed underneath the stage deck, again to ensure it would not deflect. The musicians rise 8' above the floor; when the band lifts lower back to the floor level, automated soft goods cover the lift area to give the illusion of an empty stage with the spotlight on Dion.

The lifts—as well as the video wall, light wall, and lighting pods featured in the design—are run using Tait's Navigator automation platform. "I always prefer to be on one control system," Aucoin says, "since I'm calling the show; it's a lot easier to know that it's one system and that everything talks to each other."

The stage's basic dimensions are 64' x 54'; also, two L-shaped ramps, Aucoin notes, run "into the bleachers. They are about 16' long and, after that, they turn 90° for another 20'. We like to bring her to the audience, so people in the bleachers feel connected." These function like B stages, allowing Dion to perform "All by Myself" and "Because You Loved Me" to different sides of the audience.

Video

Aucoin's design makes use of several video walls.

"Upstage," he says, "we have a 110' x 22' wall, using Saco 6mm product, from Solotech, [the provider of lighting, video, audio, and rigging gear for the tour]. In front of that is a U-shaped screen with a Saco 9mm see-through product. It's about 110' long x 15' tall and is driven by the [Tait] Nav-Hoist. In front of that, on the downstage edge, is the square 'Instagram screen,' for IMAG; it is 18' wide x 15' tall and consists of Saco 6mm, the same product as the upstage screen.

"We are also using [Martin by Harman] Scepter 10s [LED video battens] that we feed with video and lighting from the [disguise gx 2 media server] or lighting console," he continues. "They are on the sides of the ramps, down in front of the main stage, and on different levels of the set." Part of the stage floor is covered with "[Theatrical Technologies VLED] video tiles, built into the Tait deck and ramp."

The production is well-supported by video content from Silent Partners Studio. "With Gabriel Coutu Dumont and his team, we brought a new and fresh look," Aucoin says. "The mix of live image and video content works amazingly for some of the songs. When Celine talks, we use multiple camera angles in one big image; we show her to her fans from every angle." Mathieu Coutu is live video director. Notch video production software is also used, under the supervision of video operator Marc-André Tremblay.



The lifts—as well as the video wall, light wall, and lighting pods featured in the design—are run using Tait's Navigator automation platform.



Aucoin and audio systems designer François Desjardins have also combined lighting with the PA hangs. “Over the years, the PA has created visual black holes, but we have now solved that with Sceptrans,” Aucoin says.

Lighting

“It took me a while to realize that I’m almost using only Robe products; it’s just where I was at the time,” Aucoin says. “We are touring with [40] BMFL WashBeams, [80] MegaPointes, and 16 of the new ESPRITES.” The latter is a 650W WTE (White Transferable Engine) LED automated luminaire that features a static and rotating gobo wheel, an animation wheel, a prism, framing shutters and a 5.5° – 50° zoom. (See review in last month’s issue.)

Also, Aucoin says, “This is the first time I’m using [Robe] Tarrantulas [50 in total]. The Tarrantula is the bigger, better, more powerful Spider.” It is a LED beam/wash/effects fixture with a virtual color wheel, tungsten lamp effect, preprogrammed pixel effects, an optional beam shaper, and a 4° – 50° zoom range. “It’s my go-to wash light. Because of the effects that you can do with it, it’s also an eye-candy light for the camera.” Also, he notes, “On January 7, we were the first to feature the brand-new Tetra2 from Robe. We’ll be adding 15 into the original design.” Tetra2 is a linear LED RGBW bar featuring a 4.5°

beam from 18 pixels to create sheets of light. It has a 4.5° – 45° zoom range, pixel control, virtual color wheel, tungsten lamp effect, and multi-colored flower effect.

In addition, Aucoin says, “I have [21] Chauvet [Professional] COLORdash Hex 8 battens, [20] Ayrton IntelliPix-XTs, and about 80 [TMB] Solaris Flares.” The IntelliPix units are used to create the light wall behind the drummer. However, the designer says, his workhorse is the MegaPointe. “It is what I use for the architecture of the lighting; it’s the one that I’m leaning on the most.” For example, four pods, also controlled by the Navigator system, make use of these units. “A big pod downstage has 25 MegaPointes,” Aucoin says. “It creates a nice cage effect. The other pods are further upstage, with a mix of MegaPointes and Tarrantulas, used for wash looks.”

Aucoin, who is using Robe’s RoboSpot remote followspot system for the first time, says, “In the beginning, understanding and programming it was a challenge, but I love it now. Every day, the lights are in the same place, and there is the same quality of light; I put the meter on it,



Aucoin is using Robe's RoboSpot remote followspot system for the first time.

and it is perfect. Using local followspots is a nightmare; this is a lot better." He uses three RoboSpots, which control eight BMFL FollowSpots for the front and four BMFL WashBeams for back light. "When I don't need a backlight on [Dion], I can use the WashBeam for something else."

Aucoin and audio systems designer François Desjardins have also combined lighting with the PA hangs. "Over the years, the PA has created visual black holes, but we have now solved that with Sceptrons," Aucoin says. Desjardins adds, "Yves and I worked this idea up while we were doing the residency at Caesars Palace Colosseum in Las Vegas, and Yves was able to present it to Celine during the design approval process for the tour."

The Sceptrons "are on the front, side, and flown subs," Desjardins says. "In all, there are six arrays with the Sceptrons. The mounting mechanism of the lights to the PA is clever; it was invented by one of Solotech's technical advisors, Martin Kyncl. Essentially, it consists of long plastic pieces that can hold two or three Sceptrons. The whole thing takes literally two minutes to set up and clip on to

the speakers."

In terms of power, Desjardins explains, "The Sceptrons are looped up to the loom on top of each speaker; they are linked to the distribution system on each side of the stage. The amps are flown in the air, and the Sceptrons' drive system is mounted inside the amplifier racks. The Sceptrons mounted along the speakers have worked very well; we also send video to them and that really completes the picture."

In addition to the Sceptrons, Desjardins says, "We also have a large number of [TMB Solaris] Flare Q+ units, which are used as blinders, on top of the arrays." Bringing the lighting onto the speakers "really highlights the value of the coordination you get working with Solotech as a 360° provider," Aucoin says.

Aucoin programmed the show himself on an MA Lighting grandMA2 console. "Celine has always been the show that I keep for me," he says. "Because I'm doing a lot of things on this, it's the moment where I can calm down and look for details. I have my time a



few hours a day, behind the desk, just on my own.” He adds, “We opened the show in Québec City, where we do one-third of the show in French and two-thirds in English, but we tour mostly in English. We had to put together 40 songs for the start of the show, which was a real challenge.”

Special effects

When envisioning a new show for Dion, Aucoin says, “We always ask, Are the fans going to have the best of her? With the technology, we can manage a lot of things, but it’s always a question of her comfort.” Therefore, instead of pyro, flames, or confetti, the designer tried something different in terms of special effects: “I looked into drones—



Aucoin programmed the show himself on an MA Lighting grandMA2 console. "Celine has always been the show that I keep for me," he says.

how they worked and what we could do with them." Conversations at Tait led him to Verity Studios, the manufacturer of automated drones. "Verity's first demo for a show, a few years back, was to the song from *Titanic*. One of the top people there is a fan of Celine, which I didn't know. They showed me that demo, and I said, 'Let's talk seriously about this: What can we do? Is it really tourable?

How complicated is it?'" Next, Aucoin says, "I introduced this to Celine, and she was excited about it. After that, we tested it in Québec City, made a couple of changes, and now it's a real crowd-pleaser."

In the drone scheme, he adds, there are "104 little units that have to know where the others are; we had to understand the space map and what we can do, which was a

CONCERTS

challenge. It was more complicated than I expected in terms of the way the system works, and touring with it, but now it's behind us." The drones, each one bearing a white light, appear during "My Heart Will Go On," the first song of the encore, rising above the star and circling her like an arrangement of fireflies or a galaxy of stars.

Sound

"Celine Dion is really different from other artists," Desjardins says. "She sings like no one else and her live performance bares an immense range of emotions, which people expect from her concerts." That the sound system is key to the production is clear: "If you're not able to deliver her feelings to the crowd, you miss the point of her performance. That's why we have put so much emphasis on designing and optimizing the system so that everybody, in every seat, can hear every subtle note of feeling in her voice. Having done a few shows with her—over 2,000—her performances always amaze me; a Celine Dion show is about connecting and making a difference in everybody's life for two hours." Dion and her management team thoroughly support Desjardins: "Over the years, we have never had any restrictions; so, we are lucky."

At the start of the process, Desjardins says, "I sit down with Denis Savage, the house mixer and manager, as well as Yves Aucoin. We look at the venues we are performing in, what kind of system we can have, and the various requirements. From that point, I try to find the best solu-

tion, making sure we are covering every angle, so that every seat experiences the show equally."

For the current tour, Desjardins designed a system using six hangs of loudspeakers from L-Acoustics: K1s and 2s at front left and right, K2s at the left and right sides, and flown bass arrays at right and left using K1-SBs. Two additional hangs, consisting of A15s, extend the coverage to the sides as needed. Two delay systems, made up of K2s, cover the top rear of the arena. Sub systems include KS21s inside the stage floor. In addition, KARAs, 5XTs, and X8s provide front fill. All of the speakers are run by the company's LA12X and LA4X amps. "L-Acoustics gives us a lot of flexibility in terms of their different enclosures with the K1, K2, and the Kara," he says. "Depending on the need, they have the right enclosure. And, in the end, it sounds really good and consistent. We also have two drive systems running simultaneously. We run one in AVB and one in analog, so there is full backup everywhere." The drive system consists of a Meyer Sound Galileo Galaxy and five Galileo Galaxy 816s.

Audio is controlled using a Solid State Logic SSL Live L550 console. "We have been using SSL's products since 2002," Desjardins says. "In fact, Denis and I also participated in the design of this console." Two additional SSL Live L550s are used by Dion's monitor engineer, Jean Sébastien Boucher, and band monitor engineer, Martin Paré.

As for outboard gear, Desjardins says, "We use a TC Electronic System 6000 for various reverb effects, a



Verity Studios drones, bearing white lights, surround Dion during "My Heart Will Go On."



Outboard gear is minimal, Desjardins says, because “the musicians are among the very best. They are aware of the quality of their sound.”

Bricasti M7 for string reverb, and an Eventide Eclipse [V4 digital effects processor] on the background vocals. It’s really minimal.” He has good reason for this approach: “We’re lucky on this tour; the musicians are among the very best. They are aware of the quality of their sound. And it’s first-class equipment, so the source is taken care of.

“The way we distribute the signal between the different microphones is also unique to Celine Dion,” Desjardins continues. “We use Millennia Media HV 3D-8 eight-channel mic preamps at the first stage. The analog signal is transformed to MADI with DirectOut Prodigy.MC converters and goes right into fiber. The longest cable distance between a microphone and a preamp is about 60’, so the audio stays as clean as possible for the longest time. When you have a really good source, a really good way to pick up that source, and a really good sound system to do the job, you don’t need that much transformation to make everything appear in your mix.”

Dion’s vocal mic varies from show to show, he notes. “We have a range. This allows her to select what she wants

for a particular performance. She still uses a [Shure] SM58 with a cable and also a wireless Axient system from Shure with all the adds; sometimes, the Shure transmitter is mounted with an SM58 head or a DPA d:facto 4018 head.” Backup vocals are also on the Axient system.

The drummer, Dominique Messier, is a studio owner and studio musician, and Savage works closely with him: “He pretty much chooses all the microphones on the drums. For the snare, we’re using DPA 2011s, which is unusual on a live setup. On the different kicks, Sennheiser e 902 and Shure BETA 52A; the high hat is a Neumann KM 150, and the toms/floor are also Sennheiser e 902s. The microphones on the drums are really high-quality microphones.”

“A good design on a great tour is nothing if you don’t have the perfect crew to tour with,” Aucoin says. “I’ve been blessed on this one. After years on the road, I am touring with the best group of people ever. It is a real pleasure to collaborate with such a talented team.”

The *Courage World Tour* continues in North America through April and then moves to Europe. 🌍

A Musical Meeting Place

The Conrad Prebys Performing Arts Center is a reflection of La Jolla's community spirit

By: David Barbour



The community of La Jolla, California, already known for its vibrant arts scene, got a vital new addition in April with the opening of the Conrad Prebys Performing Arts Center. Conceived as the new home of the La Jolla Music Society, it provides the downtown district known as La Jolla Village with a useful and ornamental venue for a variety of presentations. Costing \$82,000,000—all but \$700,000 of which had been raised by opening day—the 42,000-sq.-ft. building is named for the late philanthropist Conrad Prebys, who pledged \$5 million for construction and \$10 million for the center's endowment fund.

The team behind the project includes Cambridge, Massachusetts-based Epstein Joslin Architects, Theatre Consultants Collaborative, and Nagata Acoustics, the latter working with Robert F. Mahoney & Associates.

Joseph Wong Design Associates served as architect of record. Together, they have created a distinctively styled building that reflects the surrounding community and is well-suited to serve the needs of La Jolla Music Society. Indeed, it presents that organization with many new opportunities.

Finding a home

For many years, La Jolla Music Society presented at Sherwood Auditorium in the town's Museum of Contemporary Arts. When the auditorium was eliminated as part of a renovation, the search was on to find a venue that the society could call its own. "They needed a place for their Summerfest, a chamber music festival that has been running many, many years," says Alan Joslin, principal, Epstein Joslin. "They also wanted to make sure that the building had features that allowed for broader range of performances. So, in addition to their main hall, they decided to build a second venue, one which would be smaller in scale and would offer space for music for younger audiences, children's and youth programs—in other words, very much a multipurpose room for 150 audience members." Diversity was the hallmark of the opening weekend, which featured the classical violinist Hilary Hahn, the ukulele virtuoso Jake Shimabukuro, the dancer Lil Buck (a specialist in the street dance form known as Jookin), the pianist Inon Barnatan, a chamber music quartet, the pop singer Seal, and the neo-swing band The Hot Sardines.



Photo: Darren Bradley

After a search, a footprint was found on Fay Avenue, on the site of a former one-story retail building. “They wanted to remain in the Village of La Jolla,” Joslin says, noting that, during construction, the supermarket across the street was converted into The Lot, a cinema/bar/café, which shows a combination of major studio and indie releases; the synergy between The Conrad and The Lot adds much to the neighborhood’s allure.

According to the *San Diego Union-Tribune*, “One unforeseen factor—which added \$1 million to the budget—is that the property The Conrad occupies is at a low point where rainwater accumulates from both directions. This necessitated constructing a giant ‘bathtub’ under the main floor seating area of the Baker-Baum Concert Hall to prevent flooding —although, in this case, the ‘bathtub’ is designed to remain dry and keep water out, rather than to be a receptacle for it. ‘There’s a huge drain line that runs diagonally through The Conrad site,’ Joslin said. ‘So we had to negotiate with the city of La Jolla to build over it’.”

Seen from the street, The Conrad Prebys is a sleek low-rise structure; thanks to municipal zoning rules, the building could not be higher than 30' tall. The middle section, which includes the entrance, appears to consist of wooden pavilions, striking something of a tropical theme. “They may look like wood, but they are built of tubes of terra cotta, suspended in a steel frame,” Joslin says.

The exterior also serves another function, Joslin adds, “We organized the complex with the two performance ven-

ues [the Baker-Baum Concert Hall and the JAI, the multi-purpose space] across from each other, with a courtyard between them, which would function as a public space. We decided to close in the courtyard, but the terra cotta exterior has a permeability to it; it’s a kind of screen between the street and the courtyard. The concept of the tubes, or slats, was inspired by the Botanical Building in Balboa Park. It was a wonderful precedent to create an outdoor lobby; it’s rather fun to see people mingling behind the screen.”

To the left of the terra cotta pavilions is a white stucco structure, which houses the JAI. Its look is, in part, Joslin says, a tribute to Irving Gill (1870 – 1936), a noted local architect whose style had a major influence on the urban styles of San Diego and La Jolla. His extant buildings include the Museum of Contemporary Art San Diego, La Jolla Woman’s Club, and the George W. Marston House, the latter two of which are listed on the National Register of Historic Places. The exterior of the JAI, Joslin adds, “is meant to recall some of Gill’s style in a way that is consistent with the whole.”

Delving further into the issue of influences, Joslin says, “The nature of the architecture in La Jolla is wildly eclectic, but we found that the buildings that have aged really well are in the Spanish style, with stucco walls and terra cotta tile walls. It’s also a style that people recognize as part of the city’s history; examples include the Atheneum and some of the churches in the area.”





Above and opposite: "We combined the shoebox and opera forms," Joslin says of the Baker-Baum. Surrounding the attractively curved horseshoe auditorium is a concrete shoebox. Separating them is a wood lattice, which defines the room visually and has acoustical implications. "The sound goes through the slatted walls and meets the concrete of the shoebox."

Inside the Baker-Baum

The interior of the Baker-Baum Concert Hall, named after donors Stephen Baum and his wife Brenda Baker, is horseshoe-shaped, with seating on two levels. The overall design is more complex than it looks, however. "An acoustically natural sound needs a classic shoebox shape," Joslin says. "But it creates less-than-desirable side balconies in which the audience members are oriented perpendicular to the stage. We wanted to create a more intimate, lyric opera seating arrangement that would allow people to focus on the stage." Therefore, he notes, "We combined the shoebox and opera forms." Thus, surrounding the attractively curved horseshoe auditorium is a concrete shoebox. Separating them is a wood lattice, which defines the room visually and has acoustical implications. "The sound goes through the slatted walls and meets the concrete of the shoebox."

According to information supplied by Nagata, "The basic shape of the hall is a rectangular prism, with a rounded balcony at the far end of the hall. The ceiling slopes gently

upward from the stage to the balcony and along the cross-section of the hall; the ceiling is one large convex shape. The audience is laid out in a compact, yet comfortable, arrangement at the center of the hall.

"The audience and stage are enclosed by an acoustically transparent wooden 'nest.' The main outer volume of the hall is formed by rough plaster on heavy concrete blocks and is washed by color-changing LED cyc lights. This additional volume helps expand the space available for the necessary early reflections and the large volume necessary for richness or warmth. Behind the wooden nest walls, surrounding the stage on three sides, are the soffits, which send supporting reflections back to the performers.

"Large areas of sound-absorbing curtains are suspended on rails in this interstitial volume, allowing the hall to be prepared for amplified performances without making any visual changes to the hall. The front of the stage can take several different configurations for increased flexibility, and the upstage wall can slide away in order to present cinematic events on a large screen, or a scrim or a cyclorama



The Baker-Baum is set up for video projections, which can be used to enhance musical performances.

can be hung.”

Motoo Komoda, of Nagata, says, “From the beginning, we aimed to have a compact and very intimate space for performers and audience. We shared this concept with the architects, and they designed a horseshoe shape for the interior. But for the acoustics we needed a tall ceiling and as much room as possible.” Indeed, the space between the slatted and concrete walls is big enough to serve as a circulating space. (The room seats 513, an increase from the 400 at Sherwood Auditorium; seating is by Ducharme.)

Daniel Beckmann, formerly of Nagata and now principal of Beckmann Acoustics, says, “The majority of the room’s acoustic isolation is done with the 8” concrete block wall, with a 4” brick layer on the outside to provide additional isolation from street noise.” Overall, he says, “It’s not in a particularly noisy location. There are no major air routes to contend with and the Village is a relaxed seaside town.”

Two hundred and twenty-six air vents located under the seating provide circulation to the room. Beckmann says, “The mechanical room is below the main audience cham-

ber, and there is an under-floor plenum for air supply.”

“Yasuhisa Toyota, whose work is extraordinary, put a lot of emphasis on the quality of the stage floor,” Joslin told the *Union-Tribune*. “It was built almost like a Japanese temple, with lots of beams and a 2’-thick air space. We used Alaskan yellow cedar. The stage allows the musicians to subtly vibrate with the music, as they feel it through the floor.”

Jason Prichard and Curtis Kasefang, of Theatre Consultants Collaborative, specified technical amenities and gear to make the space truly flexible. (“It had to function as more than a concert hall,” Kasefang says.) One of the key features of the Baker-Baum, Kasefang notes, is “a tension wire grid that is not like any other.” Prichard adds, “It consists of diamond-shaped and triangular panels and it is bent to create a kind of bowl shape.” It functions as a visual ceiling, providing access to performance lighting and rigging and allowing for acoustic transparency.

Because it is a concert hall, Prichard adds, “There’s no stage house. The upstage wall is about 30’ from the edge

of the stage and there is room for three pipes on which to hang backdrops and screens.” Down front is a forestage lift that can extend the stage by 6.5'; three adjustable step wagons can be deployed on the lift to connect the stage to the audience. Also, rows of seating can be added, or a space can be opened up to make room for an orchestra pit. The wagon, rigging, and acoustical drapes were supplied by Las Vegas-based Protech.

In order to facilitate dance productions, Kasefang notes, “The side doors onstage pivot 90°, revealing positions for sidelight.” Additional lighting positions are found overhead and on the upstage wall. Kasefang says that the lighting package, which was chosen to meet the building’s NC-15 noise criteria, includes ETC Desire D40 downlights, Altman Lighting Phoenix ellipsoidals, ETC ColorSource Cycs (approximately 100 units distributed throughout the room to wash the ribs of the walls), High End Systems SolaFrame Theatre LED moving heads, ETC Source Four Series2 Lustrs for color-changing front light, Robert Juliat Oz followspots, and Rosco Cubes, the latter to highlight the chevrons placed on the wall’s grillwork. An ETC Ion console controls stage lighting. House lighting is run using an ETC Mosaic controller with a Crestron interface. (Other lighting gear includes Lex Products power and control cables, and accessories from Altman, City Theatrical, Doug Fleenor Design, and The Light Source.)

A Protech custom chain hoist system with CM hoists is used to lift the portable Da-Lite screen dedicated to cap-

turing the pianist’s hands as (s)he plays; it can also hoist Meyer Sound LINA line arrays used for amplified sound. (Other Meyer gear includes UPQ-1Ps, UPJ-1XPs, UPJunior XPs for delays, and 900-LFC subs.) Meyer MM-4XP surround speakers are embedded in the grillage surrounding the room, along with a left-center-right Acheron cinema system, also supplied by Meyer. Additional audio gear includes Shure ULXS wireless mics, Countryman E2 headset mics, Yamaha CL3 and CL5 mixers, and a Clear-Com HelixNet intercom system.

Projectors for showing video and film include Christie LWU720i-D and Digital Projection Titan units, along with a Strong MDI custom motorized screen. Installed lighting gear was supplied by Berg Electric, the fixture package was supplied by Production Advantage, and sound gear was supplied by Sound Image. Other amenities include a Harlequin Marley dance floor.

The JAI and courtyard

The JAI, named for donors Irwin Jacobs and his wife Joan, can accommodate 116 people in table arrangements, 170 seated in rows, and 300 standing. It also features floor-to-ceiling windows. About the latter, Joslin says, “We had just finished the Shalin Liu Performance Center in Rockport, Massachusetts,” a project done in collaboration with Theatre Consultants Collaborative, which features an upstage wall made of glass, offering a view of the Atlantic Ocean. “It was just wonderful to see daytime turn to dusk



This drawing shows the full layout, with the Baker-Baum and JAI separated by the Wu Tsai Courtyard and Garden, the latter fronted by distinctive-looking pavilions.



The JAI set up for a special event.



Steps leading up to the Belanich Terrace.

during the concerts. I was excited about the notion of people walking up and down the street, seeing performances taking place.” He notes that room is set up with a cinema screen and bar, for screenings and various social events. “Sometimes they fill it with lounge furniture,” he adds, “and it functions as an extension of the outdoor lobby.”

Kasefang notes that the JAI has a lighting package of ETC Desire D40s for downlight washes onstage, D22s as table spots, Source Four Series 2 Lustr front and side lights and SolaFrame Theatres, along with a d&b audiotechnik loudspeaker system, including d&b

audiotechnik 24C column speakers, B4 subs, and 10D amplifiers. Prichard notes that the room also features a set of acoustical drapes.

The Wu Tsai Courtyard and Garden, which separates the two performance venues, “is also used often for events,” Joslin says. “One evening, it was filled with beautifully decorated dining tables. Dance performances have taken place there, too.” The space has an upper balcony, the Belanich Terrace, which is used as a podium for DJs and public address and also a space for cocktail parties. “It really is their third performance venue,” Joslin notes. Kasefang points out that a show relay system delivers audio to loudspeakers placed in the surrounding shrubbery. Production lighting in the courtyard uses ETC D40-XT Lustr+ wash fixtures and SGM G-Spots for specials and moving lights. Seven video screens publicize coming attractions. Komoda notes that the Wu Tsai Courtyard performs a vital function, creating a natural sound isolation between the Baker-Baum and JAI.

Ancillary spaces include rehearsal rooms, a kitchen, storage, staff offices, and the Atkinson Room, which functions as a donors’ lounge.

“The La Jolla Music Society is made up of community members, so it is a place of identity for the community,” Joslin says. “It’s different from a performance venue that has everybody and anybody moving through it.” It seems guaranteed to be a musical meeting place that will serve La Jolla for years to come. 🌿



Wu Tsai Courtyard and Garden.

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The United Way

A Chicago sports arena gets a new scoreboard
plus lighting and sound systems

By: Sharon Stancavage

“The United Center [in Chicago] was ready for a new scoreboard,” says Eric Wade, of Crossfade Design, the firm charged with the task. The existing model was fairly old, he notes, adding, “they did a lot of updates over the years, but it was pretty small. In this day and age, everybody has big, nice scoreboards, and, being the Blackhawks and the Bulls, they needed to step it up.”

Crossfade Design was brought into the project by the global design firm HOK. “We did Little Caesars Arena [in Detroit] with them,” Wade notes. “They’ve given us a call on a few projects, and they’re a wonderful company to work with.”

The Crossfade team, which includes Michael Nevitt and a staff of designers, got to work. “We put together several different ideas because they didn’t know exactly what they wanted,” Wade says. “We were trying to make something that would fit the building and the space.”

The United Center did have one requirement, Wade notes. “Our directive was, ‘We don’t want the largest board in the business; that’s not our idea here’.” Nevitt adds, “Everyone wants their scoreboard to be bigger than the last guy. They have reached the point that they can’t get larger.” In some venues, he notes, “You can’t put a concert in there anymore. It takes up the whole room.” Instead of going for size, the client “wanted a creative idea and a different approach.”

“The concept from Day One was to make it a transforming scoreboard,” Wade says. “We didn’t want the box that sits in the middle and only goes up or down. The idea was to have it form different shapes.” The resulting unit

moves in six different pieces. “The upper ring is about 192’ in diameter,” he adds. “It is 9’ high and moves on high-speed winches down to about 6’ off the floor; it can go as high as 135’. The next section down is the main screen. It moves up and down on its own. The rest consists of what we call aux screens.” There are four of the latter, each of which moves independently. “They are there for eye candy, advertising, or whatever you want.”

Screens are also found on the underbelly of the main scoreboard. “The players always want to see replays,” Wade says; “you can see these poor guys craning their heads, looking up at the ceiling to see the main board. I wanted a design that was customized for the players; when they are sitting on benches, they can look up and see a screen angled primarily for them. It’s an angled curvature screen; it’s very unique.”

The video product was supplied directly by Mitsubishi. “The center-hung screen is composed of Mitsubishi XL-Series of ultra-lightweight, high-brightness SMD LEDs with true 4mm pitch,” notes video designer Barry Otto. At 8,661 sq. ft, “it’s nearly five times the previous center-hung display,” he adds.

“A lot of [the rigging] was done by ETC Hoists sales and service,” Wade says. “They did most of the winches and upper rigging. Crossfade designed and manufactured parts of the board and designed the truss structure that goes up the middle. We designed the truss and Reliable Truss Design did the fabrication of the custom trussing. The automation is [ETC’s Prodigy] proprietary system; we worked with them and came up with 28 or 29 presets; there are that many different configurations of the board right now. They can simply hit a preset and the board will go to that position.”

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Video content control is handled by a “routable Ross [Video] content system with backup servers,” explains Otto. It comprises three [XPression] Tesseract control systems, 34 Tesseract nodes, five Mosaic video processors, two Dashboard servers, two Ultrix routers, and three XPression INcoders. “There are also seven cameras on the scoreboard, a combination of in-house and broadcast,” Wade says.

Lighting

The center’s lighting system also needed to be updated and reimagined. “They didn’t have lights to color the interior,” Wade says. Enter the Robe ColorStrobe, a color-mixing LED unit. “It’s a really nice fixture that’s super-bright and super-reliable. They have 24/7 operation. In the arena it can do red during the game; it can also turn white after the game and light the building for cleanup. There’s no longer any need for mercury vapor or metal halide lamps; the new fixtures don’t have to warm up and you save money.” Nineteen ColorStrobes light the floor and the lower bowl.

“From Elation [Professional], we have the ZCL 360i,” Wade says. “It’s a small moving-beam fixture. We installed 96 in the scoreboard. We have them at the bottom of the auxiliary screens and also a bunch in the upper truss structure. In the middle of a game, you can have beams all over the floor. They also have a zoom. They’re very functional little fixtures.”

In the scoreboard’s upper corners, Wade says, “We wanted a hybrid fixture, so we went with the MegaPointe from Robe, the premier hybrid light in the market.” Twelve MegaPointes are placed in the scoreboard, with room for more in the future.

Also part of the installation are seven Elation Professional Artiste Monets. “For another concert venue in Louisville, we specified a number of the smaller version of that product line, called the Artiste DaVinci,” Nevitt says. “We’re very happy with them.” The Monet is “a 50,000-lumen LED fixture that has a hard edge, so we can have custom gobos,” Wade adds. “We have Bulls and Blackhawks gobos to run around the floor.”

The Monets have another benefit. “We were looking for



“The center-hung screen is composed of Mitsubishi XL-Series of ultra-lightweight, high-brightness SMD LEDs with true 4mm pitch,” notes video designer Barry Otto.



Above: Eight double-nozzle cryojet heads are located around the scoreboard, creating a circular ring of effects. Below: Screens are also found on the underbelly of the main scoreboard, allowing the players to easily see replays.

change. The M6 is a very user-friendly console that is easy to operate. The in-house staff is very good; they worked with interfacing the new stuff into it and that was very seamless. I was scheduled to go up there, since I had the expertise with that console, and in terms of programming, they were totally on top of it.”

Also, Wade notes, “We built and installed a computer for Vision by Vectorworks, so they have a 3D visualizer with really detailed 3D of the building and lights. That way, they can program without having the rig on. We’re very big on making sure these 3D files are accurate and as detailed as possible.”

Special effects

“The special effects cryo system is a one of a kind,” states Wade. It’s provided by Michael Willet, of Atlanta Special FX. “The United Center wanted

a high-output fixture for sports specifically, that we could put in these boards, and offer to the teams so they’re not replacing lamps,” Wade says. “At the end of the day, no one likes spending money on bulbs.”

These are some of the first Monets in use. “The units come from the product’s first run,” Wade says. “It’s the primary workhorse under the board and everyone is happy with it.”

The console is an M6, originally manufactured by Martin but now marketed under Elation’s Obsidian label. Nevitt says, “I was involved in the initial R&D on the console with Martin, quite a while ago. It was already installed and there was no reason to make a





Above and opposite: Sycamore, Illinois-based Upstaging did a full mockup, using drapes, of the scoreboard for the Crossfade team.

cryo in the board,” Wade says. “They wanted something unique, and we wanted to make sure the system functioned.

“The biggest issue with cryo is working with engineering to get a humidity level that works,” he continues. “This is a challenge because most hockey arenas try to remove as much humidity as possible to keep glass from sweating, etc. There is a happy medium, however, so all items can function as needed.”

Eight double-nozzle cryojet heads are located around the scoreboard, creating a circular ring of effects. “Basically,” Wade says, “a system of hoses runs up into the ceiling and across; there are eight home runs to 16 heads. The hose reels were custom-made, so we could have 125' of vertical hose and the board could move up and down with the hoses. Two rooms on the upper floor behind the suites were usable; we ended up putting cryo tanks for one side of the board in one room and those for the other side of the board in the other room. The entire home run of hose ended up at about 550' per head, with check valves along the way.”

Customization was key to the success of the cryojet installation. “We had custom carts built with custom manifolds,” Wade says, “so that each head can have six or eight tanks running at one time. The manifold is critical because it takes nearly two full tanks to energize the line. There are four double head jets on the lower ring, and four on the upper ring, in the corners.”

Sound

“The United Center wanted a sound system like no other building,” Wade says. To realize it, he and Nevitt called on sound designer Horace Ward. “I went to the United Center with them and thought, ‘God, this is a project,’” Ward admits.

“The original setup was four speaker clusters hung north, south, east, and west around the old screen,” Ward says. “They also had speakers scattered around to provide sound to the corners of the arena; 20 years ago, it was a pretty good system.”

Ward adds, “When I heard it, the room overpowered the system. It was probably meant just for speech vocals,



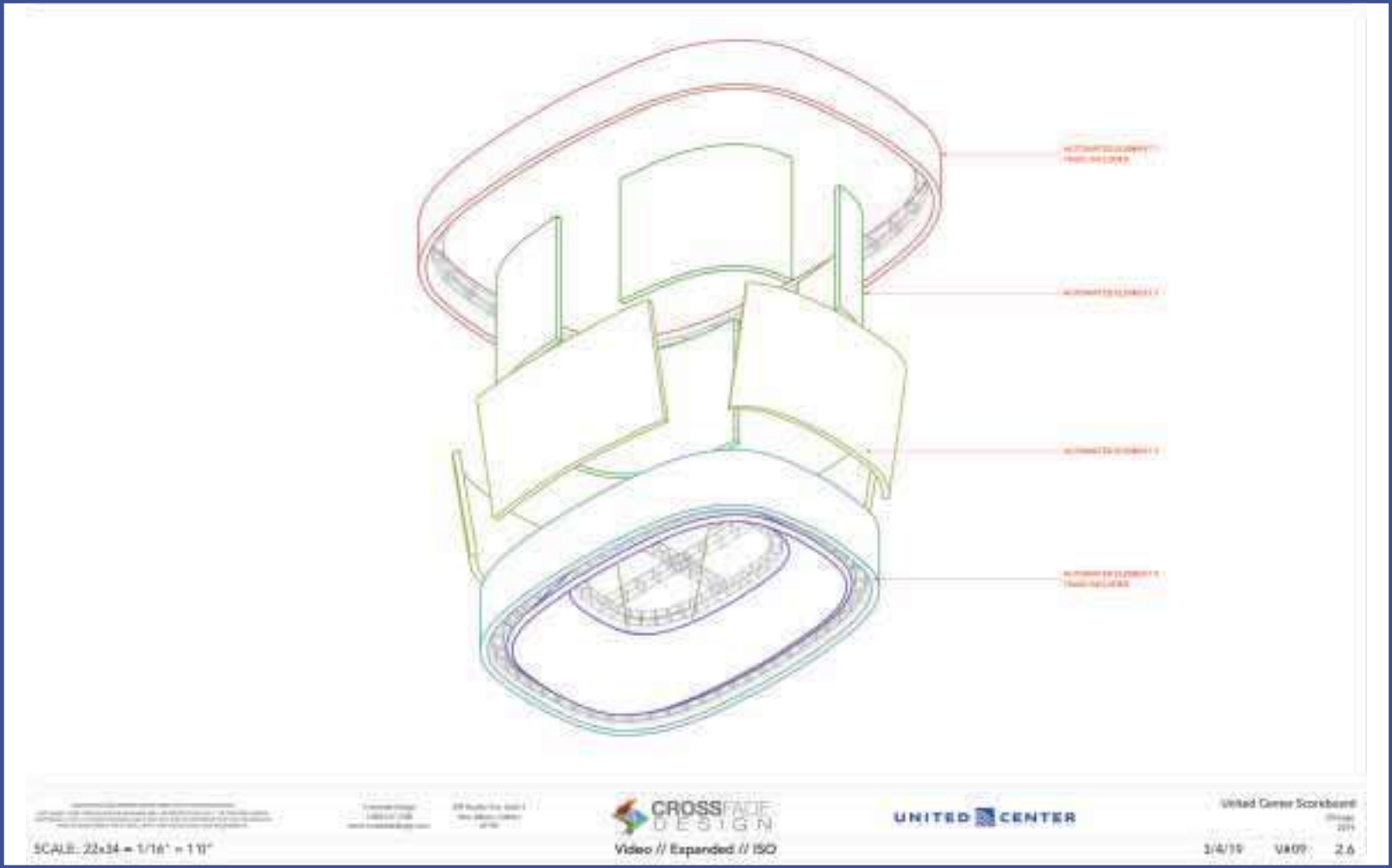
Concept drawing showing the scoreboard at work.

period; it wasn't meant for music and it wasn't meant to reproduce sub low end of any sort. If you played music through it, you would think it was a large radio speaker with no depth. It sounded off in the distance, and it sounded reverby, without adding reverb."

Also, he says, "The boxes, which were meant to throw 100', were trying to throw 250', so they could never win. The longer you throw your sound in certain frequency ranges, the more reverb you get. The highs, the high-mids, and mids are basically the vocal range [for announcements]. If you have all that midrange reverb going on in the body of the vocal and all that clatter going on in the high end because of reflection, that's because you're trying to throw sound too far and it's bouncing everywhere."

Therefore, he says, "I wanted a nicely distributed system with a central configuration around the scoreboard, and a delay outer ring, so you don't have to pump the sound so far." The main system is located level with the top edge of the screen. "We have an eight-hang main system: four hangs of six [Clair Brothers] C12-i-90s and four hangs of five C12-i-90s with eight hangs of three CS218

INSTALLATION



The above drawings break down the scoreboard to its various components, suggesting how it can be used in different configurations for different events.

subs flown behind each of the main hangs. The subs are in a cardioid setup, so we push that bass sound out from the middle. You hang the top and bottom speakers facing forward, and the middle units facing back, which helps to direct the sound outwards and give it directivity. Otherwise, it would be an omni-like low-end presence with a lot of sub frequencies in the middle of the arena.”

Another challenge involved delivering sound to the floor level. “During a basketball game, I walked the floor when [the operator] was trying to pump up the music with the older system during the break,” Ward says. “He had it up so loud that there was feedback down the floor, because to shoot it back to the audience, you had to have it up really loud. We need to control what comes onto the floor and what goes out to the different seating sections.” To address this, he positioned hangs under the scoreboard. “There are 12 speakers [eight Clair Kit15-60vs and four Kit15-90vs]. All are positioned inside of the scoreboard; its underside area is pretty great, so we’re providing coverage with these speakers in four controlled zones on the game floors [the ice rink floor and all the basketball court].”

In most arenas, he notes, coverage of the upper areas consists of “line arrays coming from the middle to reach that seat up in the third balcony; up at the top that’s a 250’-plus shot. A lot of people do it, but you are overworking the system, shooting loud sound over a great distance to achieve the coverage. I was going to do something like that, but I always wanted to use a delay ring on the system.”

As it turns out, delays were a requirement, rather than an option in the United Center. “There are so many banners in the [ceiling],” he says, “we had to design the system that way anyway, because you can’t shoot through them. The grid is so low there that you can’t do a line array arc of more than eight boxes high.”

The delay rings are “located right above the top of the Section One seating. If you walk halfway up the staged seating and look up, you can see the line of the speakers. They cover the top two seating sections and the VIP seats.” The delay rig consists of 12 clusters: six clusters of eight Clair Brothers C12-i-90s and an additional six clusters of four C12-i-90s plus four C12s with custom horn flares.

To complete his design, Ward added in downfills for hockey games: six JBL PD544 15” horn-loaded full-range units are three spaced, equidistantly behind the goal scoring areas on each end of the floor.

Amplification is achieved using a variety of Lab.gruppen products; the main rig features D120:4Ls, and D200:4Ls; the delay ring contains D120:4Ls, with Dunits for under-scoreboard and goal fills. All of the audio equipment is provided through Clair Solutions.

Audio is controlled using a Avid S6L-32D, “a console I

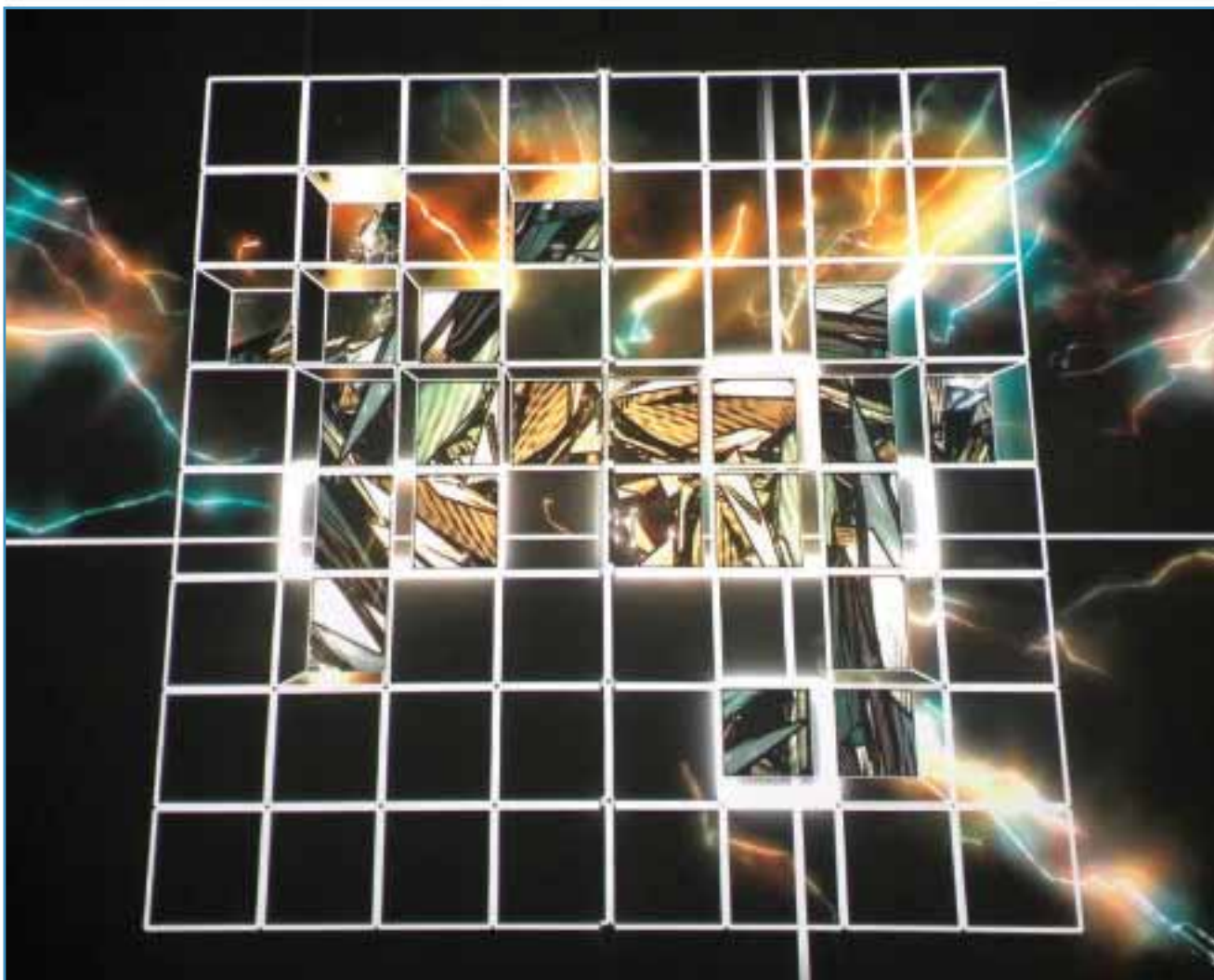
use live,” Ward says. “I went through custom layouts with them; we have a hockey layout, and basketball layout; it’s just a flick of the button and you’re in a different setup. We have also split the arena into eight audio zones; we can receive eight individual sounds from video and pump it through the system: You can have eight different things playing in eight zones. You can rotate music around the room; it adds audio effects to the modernization of the system.”

Ward adds that he has little use for outboard gear “unless you want a nice tube compressor to give it warmth, or unless you want to come out from a group to a summing amp,” says Ward. “If you want a warm sound, get a warm-sounding console. We gave them the S6L, which is naturally warm, and Waves plug-ins were added. You can enhance the vocal, so you can articulate it more with plug-in vocal chains, and everything is, like, ‘Wow’.”

The audio system goes far beyond simply basketball and hockey. “With it, the United Center will be able to do productions and save so much money,” Ward says. Such events can be done at either the end of the arena, in a concert format, with a small line array enhanced by the new in-house system, or in-the-round. For the latter, he adds, “You don’t need to bring anything else in; it’s already there. It’s probably going to be one of the favorite places to do shows. The system was designed for visiting engineers to do what needs to be done while bringing in bringing in a minimal amount of gear. It doesn’t fight the space; it is now a well-defined, well-distributed, powerful audio system.”

The new-and-improved United Center system opened in September 2019; the entire project spanned approximately 13 months. Nevitt notes, “We had the limitation of getting this installed in the off-season, and it had to be ready for this season. The entire ceiling had to be reengineered to handle the new scoreboard.” Wade adds, “The old scoreboard was 90,000lb and this one is around 125,000lb, so it’s a big difference in the ceiling. They ended up moving catwalks and putting in new catwalks, a new fly bridge, and more steel in the ceiling to support the weight; it was a lot of work for weeks on end for all of us and especially the staff at the United Center.”

Nevitt notes that Crossfade worked to give the client more than was expected. “In the entertainment side of the industry, the artist wants to see multiple concepts, but in the sports arena world, that almost amounts to special treatment. We’re used to talking to the artist, getting their opinions, implementing them, and being collaborative.” Wade adds, “We treated the United Center like we would treat a rock star. At the end of the day, that’s what we wanted; we want them to have something they are proud of for years and years to come.”



Above and page 68: Scenes from Potential Energy.

Energy Fields

By: David Barbour

SPLNTR represents the latest exploration in video display as art

Visitors to last November's edition of the LDI Show (who were willing to take a break off-campus) could get a jolt of visual thrills by checking out SPLNTR. This installation, at the CMXX event space downtown, provided a deep immersion in video content that functioned like a trip to another, visually disorienting world. Created by special-

ists and supported by several industry companies, it was an intriguing exercise that pushed the use of video in a potentially new direction. Like *Machine Hallucination*, recently seen at Artechouse in New York, SPLNTR points the way toward a video as an artistic discipline divorced from its customary role in live performance.

The SPLNTR art concept was created by Ed Shaw and Brett Bolton. Shaw is managing director of NEICO, a video production company that focuses on "tailoring motion graphics for the music industry." Its work has been seen at Coachella and at the Vegas nightclubs Omnia, Hakkasan, and Jewel. NEICO has also toured recently with artists including Above & Beyond, Deadmau5, and Gorgon City. Bolton has worked as a Notch visuals designer on The Chainsmokers' *World*

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War Joy Tour, Queen + Adam Lambert's *The Rhapsody Tour*, The Rolling Stones' *No Filter Tour*, and U2's *Experience + Innocence Tour*. Non-touring projects include the Vegas nightclub KAOS.

Shaw says that the inspiration from SPLNTR came from seeing POETIC – AI, a digital installation in Paris by OUCHHH, the digital creation studio. The project used artificial intelligence, with forms, light, and movement generated via an algorithm; Shaw began to wonder about applying similar concepts using his own work. He contacted Bolton, who he met at the Hard Rock Circle Bar during The LDI Show 2018, about putting together such an installation. His first choice for technical support was Avolites.

Avolites saw the opportunity to create an exciting experience in Las Vegas to showcase the creative work where their products shine “We were looking for an alternative to a trade show that was more appealing to our

clients and designers,” says Stephen Baird-Smith, the company's sales manager. “At the same time Ed had the idea for an interactive installation. We'd worked with him and NEICO before on the Omnia and Jewel projects so we knew we would work well together. It was the perfect opportunity to bring it together.”

The basic idea behind SPLNTR is that visuals and audio were controlled by attendees moving through the building. In addition to Bolton, Shaw worked with his team of artists at NEICO; Tom and Satoko Wall, of blinkinLAB; Spencer Heron, of Rebel Overlay; and combined artists from Notch. “It's content and a style I don't get to produce very often in the dance music industry,” Shaw says. “A lot of visuals you see nowadays are very polished, glossy 3D environments and I wanted to bring it back to a more artistic interpretation of my ideal visuals.” Bolton adds, “We normally work for other artists, using their aesthetics.

What got me onboard with this was the ability to make the kind of art that we want to make.”

“The area was divided into two rooms—the art side and the demo area,” Shaw says. “In the first room, the first thing you saw was the Tunnel, which was a NEICO project. I worked on it with Rebel Overlay and blinkinLAB. I know their style and capabilities; I came up with an overall style and aesthetic and let them fly with it.” The result was a narrow space with large video screens on each side, leaving one engulfed in imagery.

Leaving the Tunnel, one entered into Bolton's display, Potential Energy. “I wanted to create an interactive environment that is also a musical instrument,” he says. “It broke down into three different zones: drums, melody with a sequencer, and bass. Based on where they stood in the three zones, people were jamming together and creating their own music and visuals.”

Also, Shaw notes, “We got feed-

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The Tunnel. Left and right: Brett Bolton and Ed Shaw, creators of the SPLNTR art concept. Center: Avolites' Stephen Baird-Smith.

back from Brett's area as well. When the drums were triggered by an interactor, it would also send MIDI triggers

to the Tunnel."

Bolton says that he used the programs Notch and Cinema 4D to

design the imagery, adding Ableton Live to provide the audio, with TouchDesigner, the node-based visual

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programming language, to link it all together. Shaw adds that he relied on Notch to create his visuals. Avolites Ai software was the backbone for powering the installation itself, with the content running through a range of Q-series servers to then be mapped onto the surfaces of the wall and create the installations.

Describing some of the interactive effects, Bolton says, "In one display, when people walked by, the image would fade from a primordial goo or liquid into smoke. It was done by Matt Swoboda, the founder of Notch." Regarding how the system functioned, he adds, "I had four sensors and one RealSense IR camera in the ceiling, all feeding into TouchDesigner, which took the data and mapped it to different MIDI and OSC signals. The MIDI went to Ableton for the audio and the OSC went out to Notch. Ableton also spat out its own MIDI signals and went into Notch as well."

The overall installation was supported by Avolites, Group One Limited, Notch, AG Light & Sound, X-Laser, GLP, Robe, Audiotek, and Campbell Castle. Avolites provided control for the nine Barco 20K high-definition projectors used: three Q3 media servers for the Potential Energy wall, two QGen servers for the tunnel, another for the Notch wall, and two additional Q3 servers for pre-production.

Regarding the project's laser component, Adam Rough, president of X-Laser says, "When [Baird-Smith] invited us to be a part of SPLNTR my mind began racing with the possibilities. We began focusing on our Mercury laser control system in 2017 and Avolites was the only console manufacturer that was willing to help us develop that product in a way that best reflected what lighting designers needed and how to best leverage the modern console workflow. The Avolites team truly understands and embraces innovation in a way no other lighting control system manufacturer does and it's an honor to be a part of the movement they're leading with



SPLNTR." Sarah Cox, of Notch, adds, "When we at Notch heard about all the great collaborators involved in this event, we immediately said, Yes! This is going to be a lot of fun!"

The install required a two-day build, "but," Shaw notes, "the majority of it had been worked on beforehand. We had been talking about it since March." Bolton adds, "I spent about two months on it, between other jobs. The tech side for me was pretty seamless. I had Bluetooth sensors, which worked surprisingly well, although they

didn't provide the type of instant feedback that I wanted."

SPLNTR provided the LDI Show with a major talking point, and, Shaw says, it may be done again, in other locations. "We're looking forward to doing it the same time next year in Vegas," he says. Bolton says, "We're also planning on enhancing Potential Energy for music festivals or possibilities." You can get a sense of the effect of SPLNTR by checking out the recap video at <http://www.splntrart.com>.

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Creating a Cosmos

By: David Barbour

Cosmos Within Us is a harbinger of a new hybrid art form

It's not every day that someone pioneers a new art form, but that's what Tupac Martir has done. The definition of the term "multi-hyphenate," Martir has been a production and lighting designer working with the likes of Elton John, Sting, Jon Bon Jovi, and Beyoncé, as well as luxury brands like Prada, Alexander McQueen, Moschino, and Boss. As the founder of multi-disciplinary studio, Satore Studio and sister company Satore Tech, Martir leads an international team of creative minds, producing groundbreaking work, mixing art and technology for clients in commercial and cultural spaces. More recently, he

directed and produced the award-winning production *Cosmos Within Us*, premiering last year as an official selection at the Venice Film Festival, before going on to Raindance Film Festival and winning the Spirit of Raindance Award. More recently, it gained recognition for its nomination in the Innovation category at the Producers Guild of America.

All of this—and the project's listing on the IMDB.com—is interesting because whatever *Cosmos Within Us* is, it is not, by definition, a conventional film. Indeed, it unfolds on a stage populated with live performers reacting to events in real time. Described as "a

mixed reality experience," it has been given by Martir the genre name Performative-R. It combines traditional stagecraft with virtual reality and networked technology, a hybrid of old and new, designed to tell a story in a unique way.

Cosmos Within Us—a production of Satore Studio, Satore Tech, and a_BAHN—unfolds inside the head of Aiken, a 60-year-old man suffering from Alzheimer's disease. Throughout the story, he rummages through his failing, shapeshifting memories, many of which involve time spent with his little sister, Lily—but another, darker memory tugs at his consciousness. Meanwhile, the stage is occupied by five musicians (playing cello, violin, viola, and keyboard), two dancers, a voiceover actor reading narration from a script, a sound engineer, and an



The interactor is attended by two dancers, known as Shadowmen.

interactor, wearing a VR headset and driving the visuals that directly address Aiken's predicament, while the imagery is projected on a screen for the audience to see. In addition, Martir is onstage, acting as the conductor and directing the live performers in real time.

"As a production, we perform for the interactor," explains Martir, "but when they put the headset on, they become one of us and perform for the audience. The story is linear, but what changes is the interaction." Indeed, each performance is unique; the interactor's individual responses control the shape and focus of the imagery, a fact that has implications for the rest of the company. As Martir describes it, "We are performing live to the interactor," and, based on how the interactor behaves, "the cadence changes, the music might have two or four extra bars, and the sound effects might change." For this reason, Martir's presence as a director is crucial.

In other words, Martir explains, "The interactor is, essentially, the director of photography, shaping the look of the piece with their reactions. Also, two dancers, called the Shadowmen, are involved; they perform around the interactor, based on three other elements: smell, touch, and taste. For example, there are moments in the piece when you are smelling specific essences; also, there is a cookie involved and a moment with Aiken's grandmother, which involves touch."

Martir conceived the 38-minute piece, which was written by Benjamin



The interactor's individual responses control the shape and focus of the imagery.

Farry, with a score composed by Steven Weston, production design by Sergio Gómez Settanni, and cinematography by Sergio Ochoa. The visuals "were all done digitally, but we did shoot a lot of real footage in Luxembourg and London," Martir says. For example, "We did a scene in which Aiken goes back to his childhood, remembering when he was four and was told he was going to have a baby sister."

In order to create *Cosmos Within Us*, Martir says, "Volumetric capture, motion capture, and every available technique has been thrown at it. The work was done in-house at Satore Studio and took around 29 months. I began working with virtual reality in 2015, trying to understand different ways of using it. We did an earlier piece in VR, then began exploring how to tell a story in a more cinematic way.

We see it as a kind of surrealist play. Martir has many influences, and says it is a "homage to Almodóvar, for putting a play in a movie; to Wes Anderson, for the way it is blocked; and to Terry Gilliam and Peter Greenaway for its surrealism."

In performance, the video is run on Unreal Engine, with ProTools cuing the sound effects. The musicians and narrators feed through a Dante network into the binaural audio headphones (Sennheiser HP-02s with G3 wireless transmitters and receivers) worn by audience members. There is a 11.1 surround sound system for environmental effects, delivered via studio monitors. "Some sounds can start on the environmental layer, say to the left, and then move to the left headphone," Martir notes, "For example, the opening scene has about 24 different sounds; however, it is only when peo-



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ple approach where they are supposed to be within the experience that these sounds are triggered.”

Martir adds, “When we first started, the show audio was primarily designed for the interactor, who would be inside the environmental layer, wearing the headset and using open headphones. The environmental layer is now able to surround the entire audience and the interactor, giving every person in the room the same intimate, live sound experience.”

The sound design is by Gareth Llewellyn and Jon Olive, from the immersive audio company MagicBeans. Llewellyn says that the system for the Raindance show included 12 Genelec 8010A studio monitors with 7050B subs. An early presentation at the Eye Filmmuseum in Amsterdam made use of the venue’s in-house rig, which was the first time it was not possible to have a height element to the loudspeaker configuration. “We had to fold the periphonic mix-

down into 7.1,” says Llewellyn. “We missed the height slightly, but it worked for the audience at large.”

In performance, the Unreal Engine sends triggers to the musicians, who are playing live. Meanwhile, the Ableton workstation also has prerecorded instruments and a click track. Llewellyn and Olive designed their own audio engine to work in conjunction with a Unity 3D sound system running custom tools, with the two components communicating over OSC.

All audio outputs are sent to ProTools, which is used for mixing and distributing sounds to the loudspeakers and/or headphones. Monitor mixes and communications for the earlier presentations are mixed by Hugh Fielding through a Dante-enabled Yamaha console.

Since premiering at the film festivals last year, *Cosmos Within Us* has been performed at the Eye Filmmuseum and New York Live Arts in Manhattan. Martir says he is currently “looking to

perform it in theatres or other cultural spaces.” The audience size has gradually scaled up from four to 150 in just a couple of months. Before Amsterdam, he says, “We had only performed it to a maximum of 10 people, so to grow the audience tenfold meant that we were taking risks we didn’t know would pay off.”

Meanwhile, Martir states that developments within Performative-R are currently underway, and he is in the process of “writing a new piece that has a full orchestra and a full ballet” to fit within this new genre. As he notes, he continues to explore the dimensions of technology and what can be done with it: “What makes it amazing is the scalability of VR. If I can make it work for 100 audience members, the barrier of what we have done is destroyed. My new piece could be done for as many as 400 people.”

We will continue to follow Martir’s path, to see where it leads next. 

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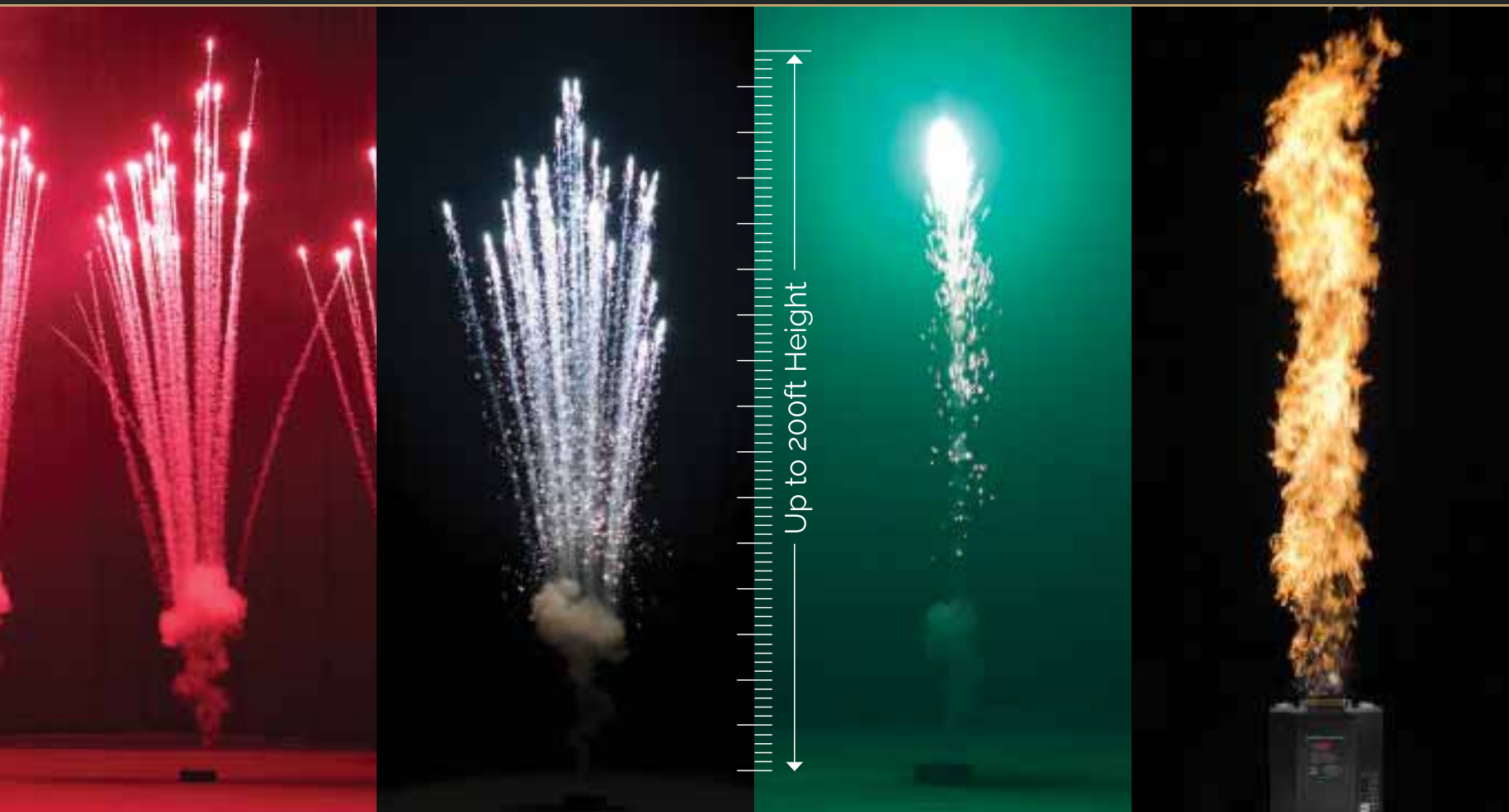




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Meyer Sound ULTRA-X40

Wide Coverage Loudspeaker

By: Mark Johnson

In 1980, when Meyer Sound introduced the UPA-1, I don't think anybody involved imagined that it would become an iconic (and often copied) loudspeaker. It introduced the concept of arrayability with the now-ubiquitous trapezoidal cabinet, along with other innovations that are commonplace nowadays.

I had an opportunity, early in my career and early the product's evolution, to mix a show using UPAs, and they left an indelible mark in my mind's ear. I was a freelance audio engineer out of Nashville and was mixing a bluegrass group at a corporate event at Masonic Auditorium in San Francisco. Arriving at the venue, I saw a smallish cluster of speakers flown above the stage. I could not identify the brand or model, so I asked the system provider what it was. He said it was a Meyer Sound UPA, designed and built across the bay in Berkeley, California. I was concerned that the system would be too small to adequately cover the room but was obliged to use what had been provided. My concerns were unfounded and when I returned to Nashville, I told my colleagues about this great-sounding, powerful little PA speaker. I hadn't written the make and model down, however, and I forgot the name. Since this was the early '80s there was no Google to search, so I would regularly look through industry publications in search of ads or case studies that referenced it.

I finally saw an ad and notified my colleagues. I contacted the company and requested a demo system. Their closest dealer at the time was in Austin, Texas, so it was arranged and four UPA-1s and two USW subs were



Front and rear of ULTRA-X40.



User panel.

shipped to us in Nashville. We wound up purchasing the demo system.

New kid in town

Those products, along with the UM-1 stage monitor, made up the Ultra Series. Over time, there were incremental updates and improvements; among other things, the units became self-powered in the 1990s. The UPA remained in Meyer's product lineup until recently, when its successor hit the marketplace.

The public spoke and Meyer listened. While the UPA was right in so many ways, time marches on and there were improvements and updates of which to take advantage. Loudspeaker technology and design has advanced, so new levels of performance become more easily achievable.

The ULTRA-X40, introduced early in 2019, represents a collaborative effort over a ten-year-plus period. Conversations were held with customers who had used the UPA in its various incarnations, noting its strengths as well as areas in need of improvement. The discussions provided guideposts for the new product. Key points included a desire for a more lightweight product, greater rigging versatility, and the ability to rotate the high-frequency section. Acoustically, the wish list included extended frequency response (both low end and high end), lower distortion, a more linear phase and frequency response, and more peak output.

In the design and construction of the Ultra-X40, Meyer was able to leverage technology developed and refined from other products, including LINA and LEOPARD. The company drew on its collective experience and incorporated innovations in drivers, amplification, DSP, and horn design, as well as directional control that extends below the crossover range.

The Ultra-X40 is named as an acknowledgement of the 40th anniversary of Meyer Sound (the product was introduced in 2019, the company was



Lower handle and AC input.

founded in 1979), and it is part of the Ultra series of loudspeakers.

The Ultra-X is available in two versions; the wide coverage version is the Ultra-X40, with a 110° x 50° coverage Constant-Q horn, which has the ability to rotate; the controlled-coverage version with a 70° x 50° Constant-Q horn is the Ultra-X42. The speaker we'll be looking at is the Ultra-X40.

The original UPA-1A (which did not

have an integrated amplifier) weighed 66lb. The self-powered UPA-1P weighed 77lb. The Ultra-X40 weighs in at 52lb. That's significant, considering that the new product also incorporates its own three-channel amplifier (Class D, 1,950W peak power). The Ultra-X40 features a maximum sustained current draw of just 1.3A. All this is contained in a relatively compact form factor that is just 12.5" x 22" x 14" and less than



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ULTRA-X40 rear. (Note handles at top and bottom and the water drainage slots back-mid of the cabinet, on either side of the amplifier.)



Front grille removed and rotatable horn exposed.

55lb—20lb lighter than its predecessor, the UPA-1P, and 11lb lighter than the UPA-1A.

The Ultra-X40 specs out with an operating frequency range of 55Hz — 19.5kHz. Linear peak SPL is 132.5dB with an 18dB crest factor, measured using Meyer's M-Noise (130dB with pink noise).

The driver complement comprises two 8" cone drivers in a concentric configuration with one 3" diaphragm compression driver. Meyer states the concentric configuration has more advantages than a coaxial configuration. For example, concentric driver configuration helps to reduce distortion both on the high-frequency and low-frequency drivers. Typical coaxial designs tend to exhibit distortion on the high-frequency driver, since the throat of the horn (inside the low-frequency driver) cannot be optimized completely. If the coaxial driver does not use a horn, then there are Doppler effects due to the cone moving and

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modulating the highfrequency. If the coaxial driver does have a horn, then the horn design is compromised between its optimal design and what can fit inside the low-frequency driver diameter. Additionally, in a coaxial configuration the heat generated from the low-frequency and high-frequency drivers is common and increases power compression. In the concentric driver configuration, there is no thermal interaction between any of the drivers, since they are not touching each other.

The user panel module is fitted with a three-pin XLR connector with a looping output. Optionally, you can get the speaker outfitted with a five-pin XLR that also carries RMS (Meyer's remote monitoring system). A pair of RMS connectors resides at the bottom right of the I/O panel. A recessed remote mute disable/enable toggle switch is located just to the left of the RMS ports. Also featured is the "identify" button and "wink" LED, to help discov-



Top rigging points.



Horn orientation and indication for 110° horizontal coverage.

er and identify the loudspeaker on an RMS network. In order to enable RMS functionality, Meyer's Compass RMS software is required. LEDs are used for "on/status" and limiting indications. There are two "limit" indicators, one each for the high-frequency and low-frequency amplifiers.

The system uses a powerCON 20 connector for power to the amplifier, with a looping output. The Ultra-X40 features Meyer's IntelligentAC automatic voltage selection and will accept any voltage within the range of 90—265VAC, 50Hz—60Hz.

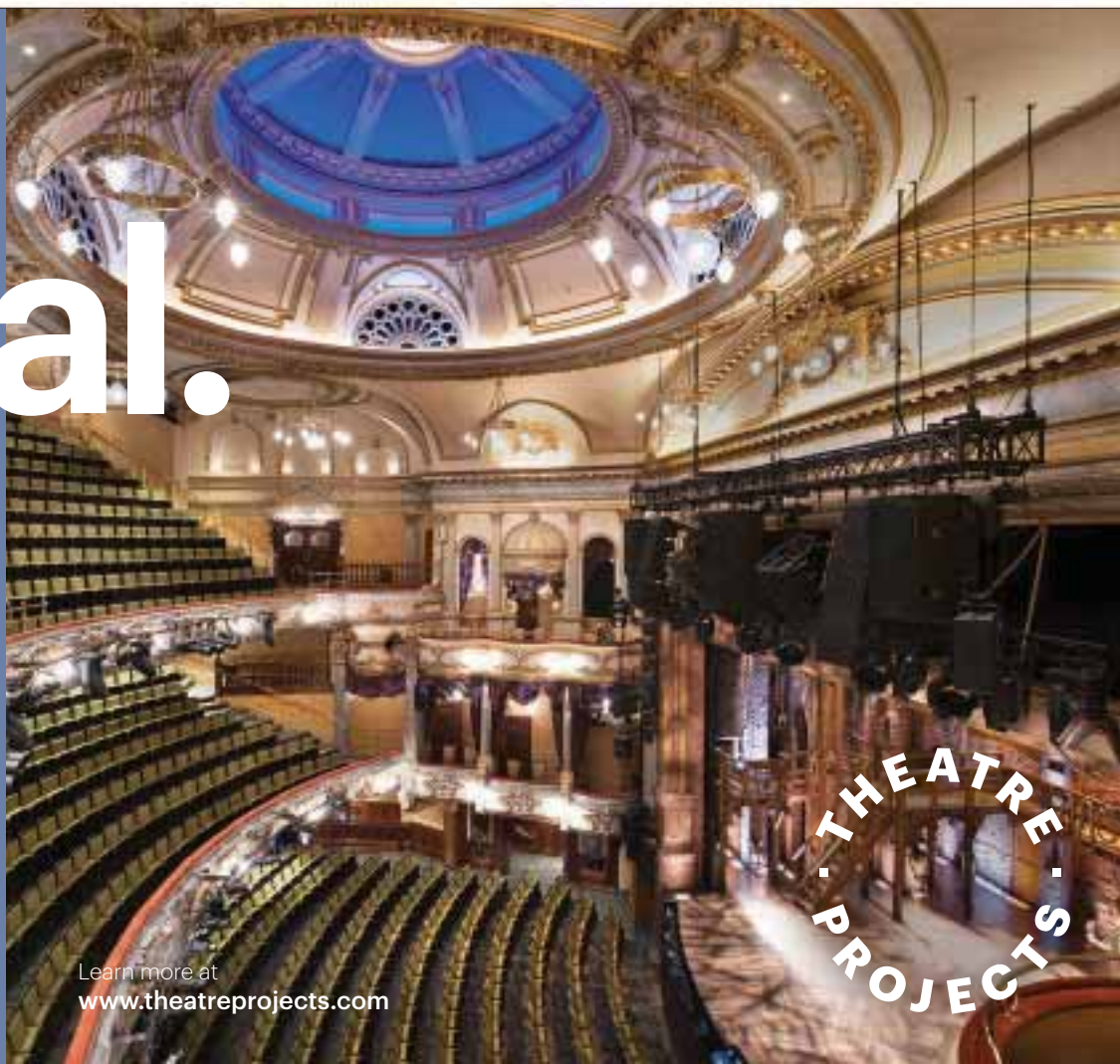
The system is efficient and the cur-

rent draw at idle is 0.27A ms, the maximum long-term continuous current draw (greater than 10 seconds) is 1.9A ms, and the burst current (less than one second) is 3.1A ms. The maximum instantaneous peak current is 6.9A ms.

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The inrush current is less than 20A peak. Up to seven Ultra-X40s can be run on a 15A 115VAC circuit, and up to 10 can be used on a 20A circuit.

The enclosure is manufactured of multiple-ply birch wood and is finished with black textured paint. The front grille is made of perforated steel and powder-coated black. Custom color finishes are available as well. Four screws (two top, two bottom) hold the front grille in place to facilitate easy access for rotating the horn. Another four screws hold the horn. The screws can be removed, and the horn rotated clockwise to change the coverage to 110° vertical and 50° horizontal. About midway on the side and back of the cabinet are two “slots” that help facilitate water drainage in wet weather, when using the weatherproof version with the rain hood attached, and the speakers are oriented horizontally.

Usability

The ability to use the gear in a variety of applications, environments, and situations is one of the key elements in the design criteria of professional audio products and the Ultra-X40 is designed to cover many production bases such as fills or delay speakers, portable PA, theatre sound, nightclubs, and houses of worship. The cabinet is fitted with 11 integrated M8 threaded points, and a 35mm pole mount (with an M20 thread). There are also additional optional rigging accessories, including a 35mm pole; a U-bracket; a yoke; a pinnable link on a channel, which provides the ability to hang multiple units from a single point; and plates that allow for configuring the Ultra-X40 (or 42) into horizontal or vertical clusters. All the accessories provide myriad options for rigging or mounting the loudspeaker. As previously mentioned, for outdoor applications, the Ultra-X40 can be ordered with weather protection.

The things I noticed right away...

When I initially took delivery of two Ultra-X40s, I set them up in my house for low- to medium-level listening. I was impressed right away with the extended high-frequency response of the system. With advancements in



Horn orientation and indication for 50° vertical coverage.



Low-frequency and high-frequency concentric driver configuration.

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technology, design, and engineering, the lines are blurring on loudspeakers used for sound reinforcement or critical listening applications such as recording.

In the UPA, handles were inserted into cutouts on the sides. For the Ultra-X40, Meyer cleverly adds cast metal handles (similar to amplifier rack handles) directly above and below the amplifier module at the rear of the speaker. This works well for both an individual carrying the speaker or if two people each grab a handle to transport the speaker. I don't know if it was intentional, but the bottom handle can also serve as a guide for cable management.



Pole mounted for event sound system.

The best laid plans...

Several people at my day job were interested in listening to the Ultra-X40 system and we had an upcoming event for which they might be useful. I took the speakers to work and we set them up. Meanwhile, I was encouraged to use them in conjunction with

the 750-LFC subwoofer. As luck would have it, two were available for demo locally. We configured the system (the hydraulic poles were very cool) and determined that the Ultra-X40s would be useful for outfill, covering a fairly large lawn area as part of a larger system for an outdoor event we were doing. Did I mention that I'm located in Central Florida? The Sunshine State? Setup day went fine, rehearsal day went fine, and, on performance day, it rained, pretty much all day, and ultimately the event was cancelled. I was not at the show site until performance day; alas, I never did get to hear the speakers in that application.

The next opportunity was indoors, in a church fellowship hall. This time, the Ultra-X40s would be the main system, one per side, supporting three singer-songwriters with acoustic guitars for an audience of about 250 people.

During this performance, of course, the test signal consisted of voices (one female, and two males) and the three

acoustic guitars. The Ultra-X40s handled the voices with ease, from a sound-quality standpoint: Nothing stood out, and nothing was lacking; it was very neutral-sounding. The sound was smooth, powerful, and full-bodied. (I know it sounds like I'm describing a glass of wine or a cup of coffee.) The speakers were responsive to EQ.

The coverage was cool. During the performance, I wandered the length and breadth of the room. The wide, even coverage was very impressive. Also, the consistency, from the front of the room to the back, was notable, in a good way.

List price for the Ultra-X40 is \$5,600. Check Meyer Sound's website for the list of available rigging and mounting options.

If you are looking for a high-quality loudspeaker system that can be used in multiple ways, look no further. The UPA has run its course. Long live the Ultra-X40. 🇺🇸

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Robert Bell makes a humorous point about a serious situation.

The Ticking Data Bomb

By Richard Cadena

How easily can your lighting system be hacked?

One minute, your lighting system is working fine, and you're happily triggering one cue after another. The next minute, you lose control of the entire system. The lights start flashing randomly, and there's nothing you can do to regain control. Your worst nightmare has been realized; your lighting system has been hacked.

That's what happened at LDI,

except it wasn't really a hacker; it was a demonstration that Robert Bell, director of product innovation at Pathway Connectivity, put together.

Hacking into the lighting network was easier than you might expect. He simply programmed a small, stand-alone computer to output sACN with the highest priority (200) so it will override every other control signal with a

lower priority, including those with the default priority of 100. Then he connected this "data bomb" to the network and watched it do its thing.

The demonstration was Pathway's clever, eye-opening way of demonstrating how easy it is to take over a lighting network with no security and to show how the company has locked down its network-connected products. First, it uses digitally signed software for updates to minimize the possibility that a hacker can intervene during the process. Second, it uses good authentication to access and configure a net-

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work or device, meaning it has password protection. This is in response to the growing threat of network vulnerabilities and the California Civil Code Title 1.81.26, Security of Connected Devices.

Title 1.81.26 is a new law that went into effect on January 1, 2020, requiring all devices that can connect to a network to have “reasonable security features.” It is designed to help close the gaping hole in the security of an alarming number of Internet of Things devices. Many IoT devices have little or no security at all, and the number of incidents is growing in which hackers gain access to private networks because of flaws in security. Oftentimes, it is due to very simple oversight or outright neglect by the manufacturer. There are, for example, lots of home security cameras being sold with no means of changing the default password, which is easily obtained by anyone with access to the Internet. Other devices have no password protection at all.

This can leave networks vulnerable to attack. It happened to a casino in Las Vegas in 2018 when someone gained access to the entire network by hacking into the digital thermometer in a fish tank. Then there was the time in 2019 when a security flaw in Chromecast allowed hackers to take over the video being cast to a television set. Imagine watching Netflix, and up pops a video promoting the YouTuber PewDiePie, asking you to subscribe to his channel, which is what happened to thousands of people. The hackers also hijacked printers and had them spit out the same mes-

sage, all because Chromecast defaults to using universal plug and play (UPnP). UPnP leaves ports open to anyone, which makes it easy for hackers to gain access to the entire network without authentication. It’s a feature in some other devices like Xbox and network switches that should be disabled.

It was just a matter of time before legislators got in the act. Not only has California passed a law, but there is a voluntary Code of Practice in the UK that is very similar. Basically, the law makes it mandatory for manufacturers to use unique passwords instead of a default like “password,” and it requires other basic protections against hackers. And since a lot of computer and networking products are designed in California’s Silicon Valley, it is likely to have far-reaching effects the world over. Also, since non-compliant products will not be allowed to be sold in California, it’s also likely that it will impact our industry as well. The only question is how much of an impact is likely, since the wording is vague.

I’ve been wondering when this ticking time bomb would go off ever since I noticed that I could see the grandMA network, the production office network, and the audio network on my mobile phone right before the start of a show I attended. Had I been a mischievous hacker, I might have attempted to take them over during the show just for LOLs. And, on a university campus, like the one where this show took place, there are lots of young college students studying cybersecurity, who have the skills to exploit vulnerabilities.

To be clear, in order for a network to be hacked, it has to be accessible, and there are a couple of ways that this can be done. One is to access it locally, meaning the hacker must be able to physically connect to the network through a switch or wirelessly, and the other is to access it remotely, which means your network has to be connected to the outside world, typically via the Internet. You can quickly check to see which ports are open by using the command prompt and the command “netstat -ab” or “netstat -aon.” Either one will provide a list of ports and the processes associated with them.

If all this talk of network security sounds like gibberish to you, then it’s time you buckled down and did some research. It won’t take you too long to learn the basics of Ethernet and network security. There are lots of great resources like YouTube and podcasts. One of my favorites is called “Security Now,” hosted by Steve Gibson. It’s a bit geeky, and if you’re not used to the terminology it can be a lot like eavesdropping on a conversation in a foreign language. But once you listen for a few episodes, you’ll start to get the gist. You might even backtrack and listen to some of the early episodes where he explains the basics of network security. They’re really good.

It’s time for the live event production industry to lock down our networks. This time, it was only Robert Bell and his data bomb that took over the network, and he’s a nice guy. But the next time it could be Robert’s evil twin. 🦹

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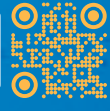


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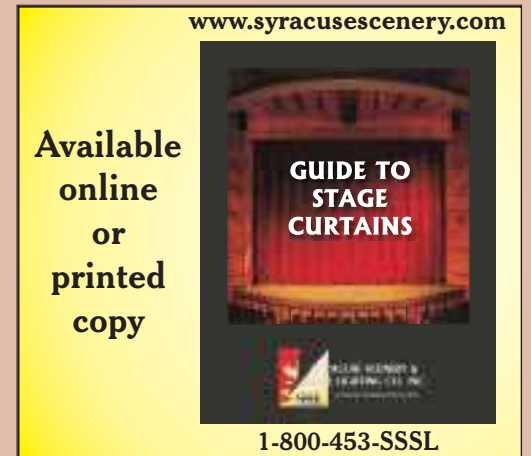
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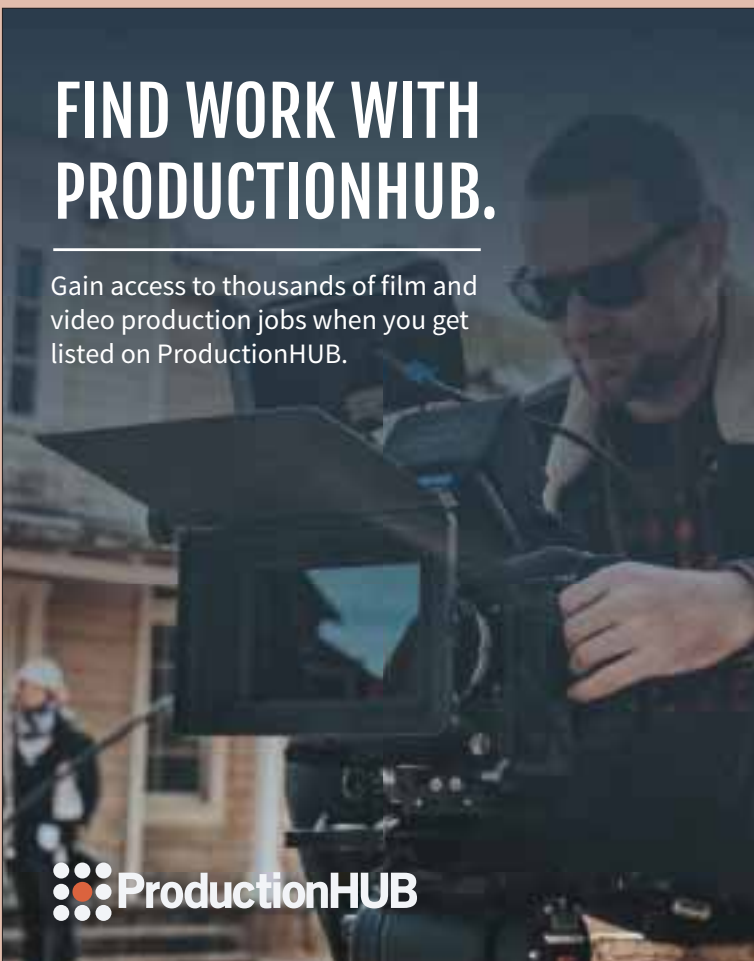
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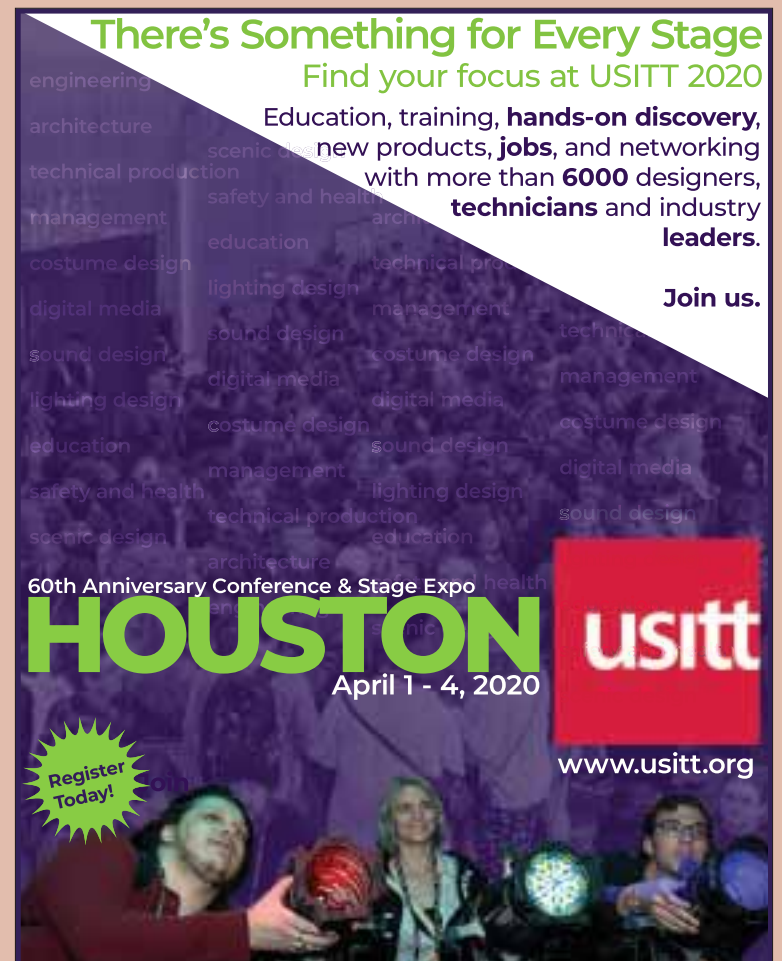
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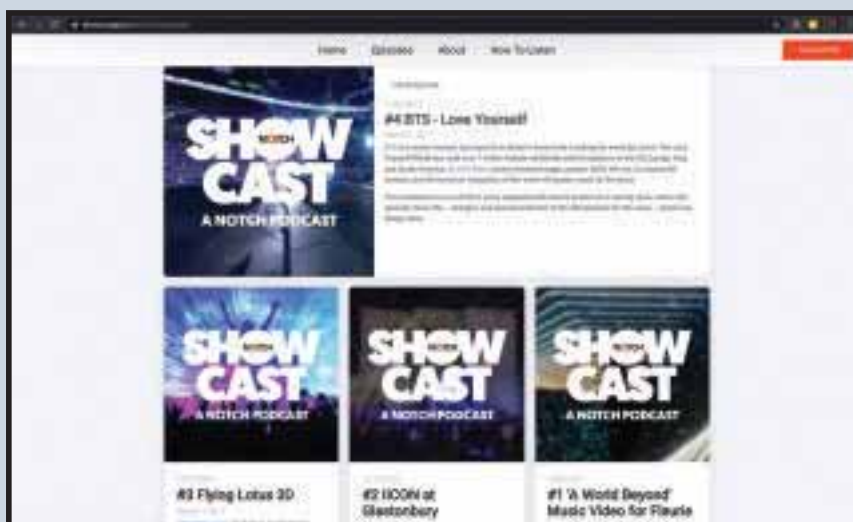
Job Skills for the Future

By: Richard Cadena

In 1967, when a neighbor by the name of Mr. McGuire was trying to help a young Benjamin Braddock find a lucrative career path, he uttered but one word to him: “Plastics.” That, of course, is the most quoted line from the Dustin Hoffman movie, *The Graduate*. If it were being made today and Mr. McGuire was dialed into video production, that word might have been “Notch.”

The big difference is that, in the movie, the word carried strong undertones of a staid and boring lifestyle, especially for a 21-year-old college graduate looking for an exciting career and meaning in his life. By contrast, Notch is being used today in most of the top tours around the world, and it’s exactly the type of challenge that Benjamin would have loved. It’s the opposite of staid and boring, and as designer Kev Zhu said on Reddit, “If you are an adept Notch programmer, work should be pouring in the front door.”

Whether you are a young person seeking to get into live event production or a seasoned professional trying to keep your career on an upward path, learning Notch or any number of new technologies is good way to ensure that work will keep coming. Unlike in 1967, there are many avenues, many of them free, to start learning not only Notch but also almost every other video technology. You can start by diving into reading and tutorials, like the ones on Kev



A new podcast, Notch Showcast, hosted by Kat Kemsley, covers some of the latest video technology.

Zhu’s website, www.kevzhu.com. But don’t stop there; there are lots of other opportunities in video production.

If 2019 taught us anything, it’s that there is a new world of emerging technologies, which means there are new and growing openings for the eager video professional. Behind every project is a team of people who support it, a team is growing in size and diversity. This translates to a growing demand for people who know how to use the tools of the emerging trades.

Take, for example, the disguise demonstration at NAB 2019. The company created an interactive immersive environment using an LED video wall fed by a disguise media server that took in data from the live camera. To call it the new green screen doesn’t do

it justice because it’s so far beyond a backdrop. It allows the actors to interact with live graphics in a 3D set. It’s becoming more commonplace and if it doesn’t make green screens obsolete, it will certainly overtake them.

If you think about what it takes to make it happen, it’s like a peek into the future of job opportunity. First, the LED video wall has to be designed, built, tested, and maintained. Aside from the manufacturing aspect, it takes a team of video techs who understand rigging, power and signal distribution, and video processing.

Second, the virtual set has to be designed and built. That means there will be a growing demand for people who know how to build 3D virtual sets and UV-map them using software

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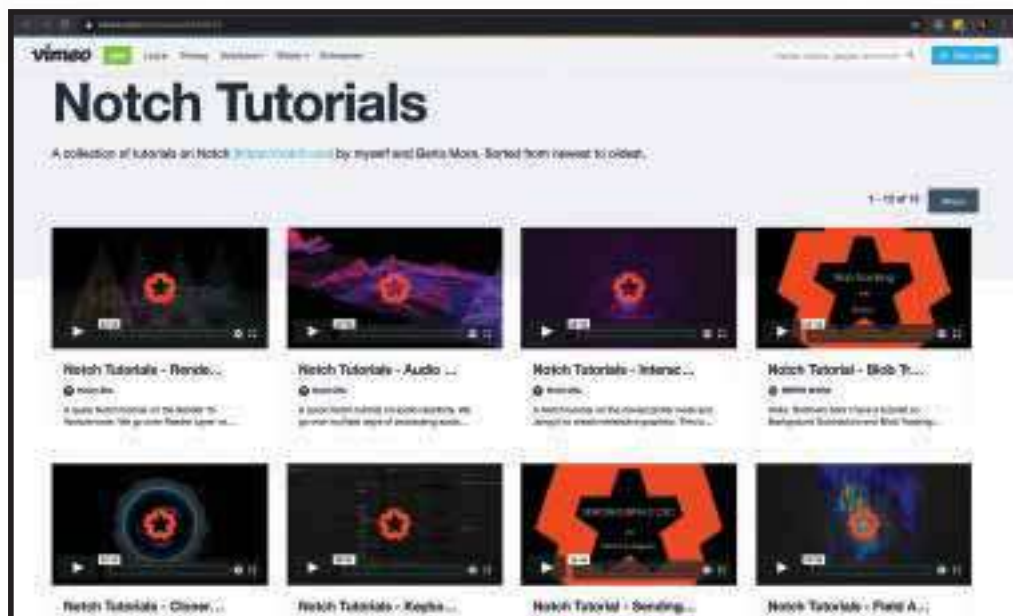
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Kev Zhu's website has a number of great tutorials.

tools like Zbrush, Blender, Cinema 4D, and others. If you know how to write code, that's a bonus. At the very least, it helps to understand coding logic. If you're serious about coding, check out How to Design Programs at www.htdp.org.

Higher resolutions plus greater bit depth also means longer render times in an environment where lead times are shrinking. There will be a growing demand for people who can work with generative graphics, which is where Notch comes in, as well as those who know how to create real-time, interactive graphics using tools like TouchDesigner.

Third, someone has to program the

media servers. Most every live production, and many that are not live, use DMX-controlled media servers to trigger video files and effects. There are many video tutorials and classes for all levels of media server programmers. Just pick your favorite media server and search for it on YouTube.

Fourth, automation is becoming more important in video production. The disguise demo at NAB used the Stype RedSpy camera tracking system, but there are others, like the CAST BlackTrax system. Someone has to set it up and integrate it into the system. It might as well be you, but you have to be trained. Unfortunately, I don't think there are any tutorials on

YouTube but there are BlackTrax classes at CAST in Toronto.

The disguise demo at NAB is but one example. There are many other projects happening around the world that are increasingly relying on cutting-edge technology and need of skilled professionals. I started thinking along these lines while listening to a new podcast called Notch Showcast, hosted by Kat Kemsley of Notch. After listening to the first couple of episodes, I'm more convinced than ever that video technology is ramping up and, along with it, more opportunities for people with skills. I've also been reading Laura Frank's book, *Screens Producing and Media Operations: Advanced Practice for Media Server and Video Content Preparation*. What I'm learning from it is that the craft is rapidly changing, new positions are developing, and new skills are required for those who want to stay employed in the future.

Video technology is getting more complicated and more specialized. It used to be that you could go to a technical school, learn how to shoot and edit video, and you'd be set for most or all of your career. Like it or not, those days are over. Now it's all about embracing change. And that's why there's a growing demand for people who can keep up with technology, keep their skills sharp, and keep learning. 📺



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Home and Away

By: Phil Ward

“Luxury,” said fashion designer Karl Lagerfeld, “is the ease of a T-shirt in a very expensive dress,” and I can think of no better analogy to explain the phenomenon of Integrated Systems Europe, appearing for the last time in Amsterdam before next year’s relocation to Barcelona. With a slight adjustment from clothing to AV systems, the juxtaposition of snug daily use and wow-factor impact holds true.

In the developed world, we aspire to some idea of luxury, or at least quality, at every turn. The power of consumer spending has triumphed over every force in politics and economics, and, frankly, we take extraordinary privileges for granted, demanding more. The ambitious AV visible—and, finally, audible—at ISE is the result of the momentum reaching into every corner of our lives.

The luxury developing in the markets covered by ISE is the ability to have everyday communications, demonstrations, and displays delivered—via significant derivations—by technology used in professional touring and concert production and, in a few cases, the studios where the best recordings have been made. The previous generation of workaday AV, with the greatest respect, is being challenged by the pressure to go larger, more impressive, and more lavish than ever before; it’s a change most apparent this year in audio.

I say “significant derivations” because it’s not a matter of backing up a Britannia Row truck to the back door of a Costa Coffee. As has been

proven at trade show after trade show, if you send a token delegation of existing portfolio into alien territory, you’ll have a quiet few days in Orlando or Vegas.

Many applications are, quite literally, luxury: the finest hotels; the most prestigious art galleries and museums; clothing emporiums—probably dripping with Lagerfeld—that require a resident DJ; skiing resorts in the desert. A subtler dimension is the use in a conference room of microphone technology also deployed by Adele...well, the medium is the message, whether you’re chasing pavements or penthouses.

If the luxury market is pulling pro audio brands towards ISE, we might expect the upper echelons of domestic and consumer AV technology to take its own bite at the cherry. True, there is a new presence for CEDIA at ISE: the Design & Build Conference appears to be a welcome attempt to get architects and interior designers to think more proactively about AV in the context of smart homes, so that the machinations of self-loading and garage-opening playlists will still look good in the color supplements. But the training program is a slightly unfocused agenda of “multiple residential and business applications,” with “cybersecurity” well to the fore: a subject for both residential and commercial integrators, agreed; but will the former be there in force?

There are also speaker brands at ISE highly regarded in luxury home hi-fi—specifically PMC and Dynaudio—

but they too have origins in the professional sector and portfolios that include the world’s very best studio facilities. It seems the route to the commercial market from a domestic background is less obvious.

It’s relatively easy to approach the domestic market from a studio background. Not only PMC and Dynaudio but also ATC and others have successfully convinced audiophiles of the kudos attached to listening to records through the same technology that helped to make them. It’s even okay to approach the commercial market from a stage background—all the big names at ISE from Adamson to Yamaha prove this. It’s harder to approach the commercial market from a studio background, although if anyone can, Genelec can. But it’s hardest of all to approach the domestic market from a stage background. Few companies could bring this off, but then... L-Acoustics has announced L-Acoustics Creations, which includes residential in its immersive manifesto.

Until now, the uncrossable divide has been between professional and consumer. This is true of MI, sound reinforcement, power tools, kitchen knives...everything for which price, durability, and finish are criteria. Behringer may disagree. But I don’t see them—or Turbosound and Midas—on the ISE list. That’s a shame because the original Lagerfeld dress with the ease of a T-shirt was Turbosound’s first install boxes, released as Oasis conquered Knebworth. Luxury. 🎧

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- ☐ G. Manufacturer
- ☐ H. Distributor
- ☐ I. Consultant
- ☐ J. Other (please specify)

3. PLEASE INDICATE WHICH OF THESE VENUES BEST APPLIES FOR YOUR BUSINESS: (REQUIRED)

- ☐ A. Concerts & Touring
- ☐ B. Clubs
- ☐ C. Theatre
- ☐ D. Houses of Worship
- ☐ E. Presentation/Events
- ☐ F. Themed Entertainment
- ☐ G. TV/Film
- ☐ H. Other (please specify)

4. PLEASE CHECK ALL VENUES THAT APPLY FOR YOUR BUSINESS: (REQUIRED)

- ☐ A. Concerts & Touring
- ☐ B. Clubs
- ☐ C. Theatre
- ☐ D. Houses of Worship
- ☐ E. Presentation/Events
- ☐ F. Themed Entertainment
- ☐ G. TV/Film
- ☐ H. Other (please specify)

5. PLEASE INDICATE WHICH OF THE FOLLOWING BEST DESCRIBES YOUR TITLE: (REQUIRED)

- ☐ A. Designer
- ☐ B. Engineer/Technician
- ☐ C. Educator
- ☐ D. Chairman, Owner, Partner, President, CEO
- ☐ E. VP, CFO, COO, CIO, MD
- ☐ F. Director, Manager, Supervisor
- ☐ G. Sales &/or Marketing Manager
- ☐ H. Producer or Director
- ☐ I. Student
- ☐ J. Other (please specify)

CODE: PLASA0220



Amnon Harman

The CEO of d&b audiotechnik talks about new products, the new facility in Signal Hill, California, and where the company is headed next.

Lighting&Sound America: What drew you to d&b audiotechnik?

Amnon Harman: It was an easy decision, based on four reasons. First, d&b is a strong brand, continuously shaping the industry. I've always worked for strong brands, helping to evolve them. This creates exciting journeys. Second, d&b is built on technology. I truly believe that you can make a difference with excellent technology; d&b has always demonstrated that. Thirdly, when I've started a new job, I've always looked for over-proportional growth opportunities. d&b was already international but had lots of potential for further growth in existing and new markets. And, based on a strong live entertainment business, there was a clear opportunity to win significantly more market share in fixed installations.

LSA: What do you consider to be your most significant achievement at d&b so far?

AH: The d&b Group has achieved an average of over 15% revenue growth year-on-year over the last 13 years. Maintaining this level of growth annually is challenging and has required a clear strategy. It also requires great communication to bring everyone at d&b and our partners with me during an ongoing change process. My contribution was to define a clear strategy based on customer segment focus, continuous technological innovations, further internationalization of our business, and a continuous-change management.

In the last five years, we have significantly grown across our live entertainment and fixed installed markets. We brought more product innovations to the market than any of our direct competitors. We have also significantly enhanced our global presence with regional headquarters in Singapore and four new offices in Greater China as well as a new experience center on the West Coast in Signal Hill. We've established more customer- and partner-facing roles in sales, business development, and technical support to put a lot more feet on the ground.

LSA: Can you talk about the significance of the opening of the Signal Hill Facility?

AH: It speaks to our commitment to comprehensively and strategically address both US coasts with dedicated teams and resources. We have brought on 70 new distribution partners in the US. These moves guarantee that d&b solutions are available on a broader scale and show that we're working to make it even easier to do business with us. Increasingly, we are working with not just system designers, specifiers, and consultants but also end users. They want to leverage the expertise of the manufacturer as well as their integrator.

LSA: Can you talk about the importance of the new additions to the SL-Series, which was seen at NAMM?

AH: The KSL-SUB, shown for the first time at NAMM, addresses the need for a small, lightweight cardioid subwoofer that extends the frequency response of a KSL system and also provides impressive low-frequency headroom to provide performance never before available in such a compact form. At the ISE Show in Amsterdam, we will launch the KSLi System Package for fixed install applications. The package is designed specially to deliver SL-Series sonic capabilities—including extraordinary full broadband directivity control—in a smaller footprint.

LSA: Strategically, where does d&b audio go next? New markets? New types of products? Something else?

AH: Following our segment strategy, live performance, house of worship, performing arts, nightclubs and bars, and custom solutions for cruise ships and stadiums are priorities for our teams in 2020. We will continue to place a strong emphasis on the mobile market, where we have been a longtime leader and create the prerequisites for innovation and customer benefit in fixed installations. Mid-term, immersive sound experiences through [the d&b technology] Soundscape will play a much more important role in our system offering. Long-term, we will continue our transition to become an audio technology and solutions company, which is based on significant market trends like an increasing demand from an experience-driven audience; changing buying behavior, especially from installation customers; and the need to be closer to artists, system experts, and installation consultants. 🎧

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