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Volume 40 No. 4

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April 2018



GARRETT EDSON

**CAPITOL BRAINS**—March 10 and 11 saw the METAlliance—composed of legendary engineers George Massenburg, Elliot Scheiner, Al Schmitt and Chuck Ainlay (L-R, center front), Ed Cherney (far right) and Frank Filipetti (fourth from right)—hold the 2018 METAlliance Academy at Capitol Studios in Hollywood, CA. Throughout the weekend, attendees participated and interacted with the team, learning and observing during multiple recording sessions with numerous artists, including Tierney Sutton and Blue Note recording artist José James working with producer Don Was (second from right).

## IP at the NAB Show: Showcasing the Future

BY STEVE HARVEY

LAS VEGAS, NV—Featuring 60 manufacturers and eight standards bodies, the IP Showcase at this year's NAB Show is an affirmation that networking infrastructures are beginning to see wider adoption in the broadcast industry. The tipping point for more mainstream ac-

ceptance undoubtedly came about because of several standards and recommendations falling into place over the past year, as indicated by the eight industry organizations and alliances co-hosting the showcase: AES, AIMS, AMWA, EBU, IABM, NAB Show, SMPTE and VSF.

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## Big Changes at Avid

CEO Louis Hernandez Jr. was terminated by Avid's board of directors in the wake of an internal investigation into "improper non-financially related workplace conduct." Jeff Rosica (pictured) has been appointed to the post.



## Mixing the Oscars

Handpicked for the Oscars telecast 20 years ago by super-producer Quincy Jones, Tommy Vicari has handled the music mix ever since, making sure the orchestra has the grandeur people have come to expect from the live show.



## Saving the Show: Live Audio Capture

BY CLIVE YOUNG

A live concert may sometimes be transcendent, but it is

always transient, affixed to a fleeting moment in time. Capturing and preserving those moments has been a challenge ever since record-

ing technology was invented. The first concert recordings were made in 1901 by Lionel Mapleson, a librarian at the Metropolitan Opera House in New York City, who used a phonograph recorder given to him by Thomas Edison to capture select arias. Most of Mapleson's recordings were made on a catwalk above the stage, though initially he put the machine in the prompter's box, until customers complained about the recording horn blocking their view—a portent of concert-

ruining smartphones to come more than a century later.

Today, show recordings are a necessity for every artist. With recorded music sales down and the concert stage a primary source of income for many acts, live recordings can become instant products, downloadable from websites; content for the artist's social media streams; bonus tracks for future release bundles; or simply archival material. Engineers benefit, too, as these

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degradation to the instrument's tone. Signals pass through the MultiSelector PRO transparently, with no coloration and the digitally controlled optical switching is completely silent. We've also included a Tuner output on the front and rear. All three non-active inputs are routed to the tuner outputs so a guitar tech can tune any instrument in a non active channel without unplugging it.



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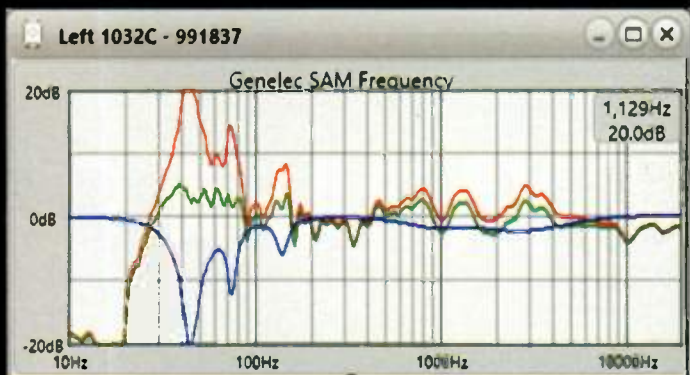


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# Avid Terminates Hernandez, Names Rosica CEO

BY CLIVE YOUNG

BURLINGTON, MA—Avid’s board of directors terminated chief executive officer Louis Hernandez Jr. on Feb. 26 and immediately appointed Jeff

Rosica as its CEO. Hernandez additionally resigned from his position on the Avid board of directors and Nancy Hawthorne was elected chairman of the board.

According to Avid, the termination was due to violations of company policies related to workplace conduct. A statement from Avid noted that the move was made with the assistance of independent external legal counsel after a special committee comprising independent members of the board of directors conducted “a thorough investigation into allegations of improper non-financially-related workplace conduct by Mr. Hernandez. After reviewing the findings of the special committee’s investigation, the board of directors unanimously concluded that the findings warranted immediate termination of Mr. Hernandez’s employment.”

Assuming the mantle of CEO is company president Jeff Rosica, a three-decade industry veteran who joined Avid in early 2013. Prior to his role as president, he served as senior vice president, chief sales and marketing officer for Avid.

Rosica remarked, “I am honored and excited for this opportunity to lead Avid through this important moment in the company’s history. The outlook for Avid is strong, and I look forward to working with the leadership team, the board and our incredibly talented employees as we



In late February, Avid terminated CEO Louis Hernandez, Jr. (left) and immediately appointed industry veteran Jeff Rosica to the role.



execute on our strategic priorities and continue our journey to be a best-in-class company and leader in our industry.”

Hernandez came to Avid in February 2013, appointed in the wake of the resignation of the company’s previous president/CEO, Gary Greenfield. Prior to his time at Avid, Hernandez was chairman of the board and chief executive officer of Open Solutions Inc., a technology provider for financial institutions.

Under his watch, Avid underwent an often painful consolidation, shuttering numerous U.S. offices and laying off hundreds of employees in 2016 to move R&D, engineering and customer care services overseas to Taiwan, Poland and the Philippines, though Hernandez later stated in an interview with *Pro Sound News*

that the overall reduction was only 10 percent of the company’s workforce. During his five-year run, the company also introduced its Avid Everywhere infrastructure, which has taken root and helped stabilize the company.

Avid has the opportunity to quickly put the sudden change behind it, however, as it hosts the fifth-annual Avid Connect conference April 6-8 in Las Vegas, preceding the NAB Show later that week. The event will see the company present numerous speakers; lead two learning tracks, “Business of Broadcast & Media” and “Creation of Compelling Content”; announce results of the second-annual Avid Customer Association vote; and unveil new products and updates.

Avid  
Avid.com

## briefs

### Take1, L.A. Xcess Merge

LAGUNA HILLS, CA—Live Entertainment Production Insurer Take1 Insurance (take1insurance.com) has merged with L.A. Xcess Insurance Brokers, a Los Angeles-based national wholesale broker of entertainment, sports and leisure insurance. The move will allow the companies to offer a range of customized insurance solutions for rental and staging, film and television production, loan out, touring entertainment, live event production, event service, special events, motor sports and contingency. The move comes in the wake of L.A. Xcess’s acquisition by U.S. Risk Insurance Group, corporate parent of Take1.

### Dunkirk Sweeps Audio Oscars

HOLLYWOOD, CA—Director Christopher Nolan’s *Dunkirk* stormed the 90th Academy Awards, winning Oscars for both sound mixing and sound editing. Re-recording mixers Gregg Landaker and Gary A. Rizzo and production sound mixer Mark Weingarten won for best sound mixing. Richard King and Alex Gibson won in the best sound editing category. The win allowed Landaker to retire on a high note, opting to close out his 47-year career after 207 feature films, nine nominations and four Oscar wins.

### AES Opens Event Registrations

NEW YORK, NY—Highlighting its ability to educate and improve the careers of members around the world, the Audio Engineering Society has opened registration for multiple upcoming events, including the 144th AES International Convention (aes-europe.com), being held at the NH Hotel Milano Congress Centre in Milan, Italy, May 23–26, 2018. Soon after, AES will hold its third International Conference on Music-Induced Hearing Disorders, taking place at Columbia College in downtown Chicago, June 20–22, 2018 (aes.org/conferences/2018/hearing).



## BandLab Rescues Cakewalk with Acquisition

BY CLIVE YOUNG

NASHVILLE, TN—Gibson Brands has sold its Cakewalk music division to Singapore-based BandLab Technologies. The deal is solely for the software company’s intellectual property, patents, trademarks and various assets related to the Cakewalk product suite.

The move comes three months after Gibson Brands announced it was ceasing new product development at Cakewalk. Reps stated that the move was made to “better align with [Gibson Brands]’ acquisition strategy that is heavily focused on growth in the global consumer electronics audio business under the Philips brand.”

BandLab, a holding company established two years ago, owns a number of brands, including its namesake BandLab, a social media/music

creation platform; MONO, an MI accessories brand; and 49 percent of Wenner Media, publisher of *Rolling Stone*.

“The teams at both Gibson and BandLab felt that Cakewalk’s products deserved a new home where development could continue,” Meng Ru Kuok, CEO of BandLab Technologies, said.

BandLab plans to maintain Cakewalk’s online forums, and to wit, Kuok announced on them that it would ensure existing SONAR owners would not have to pay to “cross over/cross-grade to the future flagship product.” The post also announced that former Cakewalk CTO Noel Borthwick and former senior engineer Ben Staton are joining the new Cakewalk engineering team.

Initially founded in 1987 as Twelve Tone Systems, Cakewalk was

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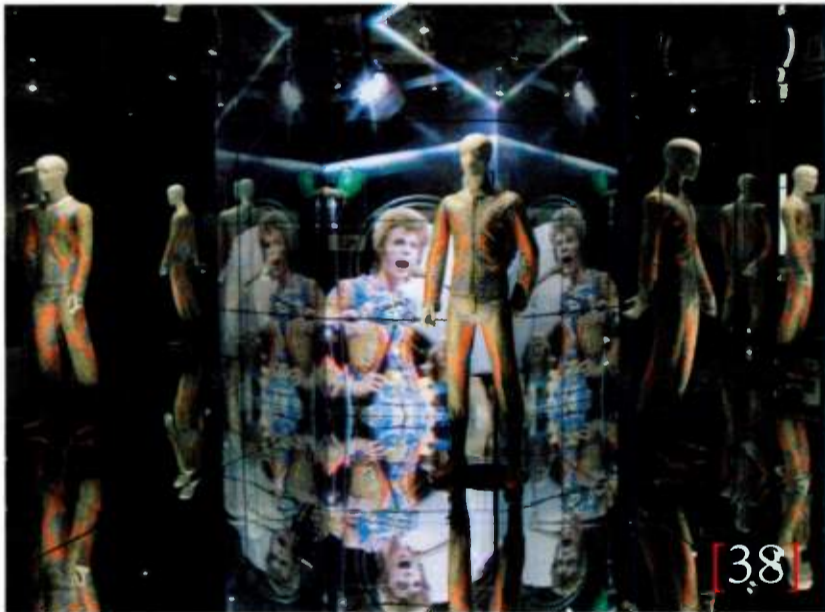
**cakewalk**

an early pioneer of MIDI sequence software, over time growing to develop products like its respected SONAR DAW, various virtual instruments and effects, and a handful of entry-level musical consumer products. Following eight years of growing collaborations, Roland invested in the company in 2003, eventually taking a majority stake in 2008. Cakewalk was sold to Gibson Brands in 2013, a purchase made with the intention of forming a new brand, TASCAM Professional Software, that would publish Cakewalk products and jointly develop products with TASCAM.

Cakewalk  
Cakewalk.com



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### A Studio with Social Media in Mind . 20

When indie act the Annie Moses Band decided to build a studio in Franklin, TN, the group kept the needs of the modern artist—and the demands of that artist's social media feeds—in mind, opting to create a facility that can provide extensive recording, performance and media options to clients.

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### Bringing Sound Together in *Electric Dreams* . . . . . 24

The sound team and producer behind Amazon's 10-episode sci-fi anthology series *Philip K. Dick's Electric Dreams* spill the beans on maintaining the show's unusual aesthetic, over-the-top sound design and removing crickets from the future.

### The Oscars Go to Tommy Vicari . . . . 24

Handpicked for the gig 20 years ago by super-producer Quincy Jones, Tommy Vicari has handled the Academy Awards telecast's music mix ever since, making sure the orchestra has the grandeur people have come to expect.

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Since first appearing at the V&A Museum in London five years ago, this multimedia museum exhibit has traveled the world and is now taking its final bow at the Brooklyn Museum. While it features more than 500 items from Bowie's archives, the exhibition hinges on aurally dense sound presentations as it explores the artist's touring and studio life.

### Live Sound Showcase: Janet Jackson . . . . . 40

Janet Jackson is still getting arenas on their feet three decades into her career. Helping make that happen every night is FOH engineer Kyle Hamilton, a massive Cohesion PA from Clair Global and a fastidious attention to detail when replicating the razor-sharp production of '80s and '90s dance music.

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Jaques Sonyieux talks with David Alvin about the latter's new duo album with Jimmie Dale Gilmore, keeping recording feeling live and creative mixing.



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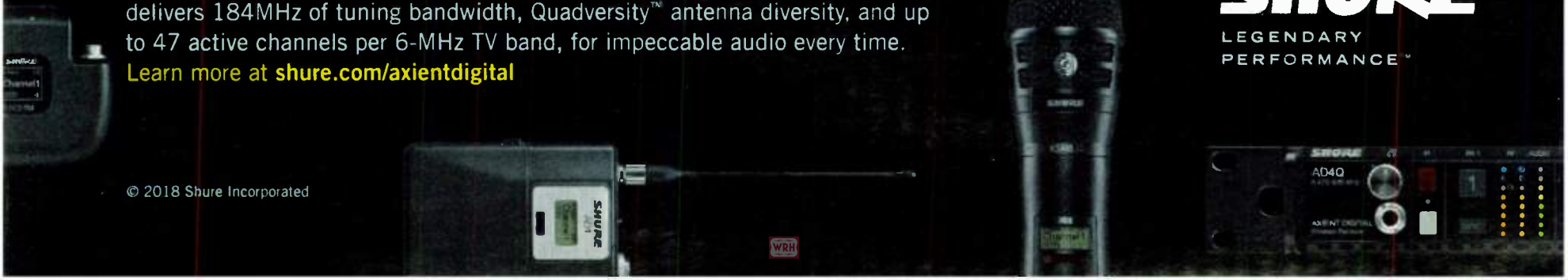
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## Saving Studios to Build the Future

Live music has always brought people together, and for the last 100 years or so, recorded music has done that, too—people gathered around stereos to listen to songs, studios inevitably fostered creative communities, and there were plenty of indie replication plants making vinyl, CDs and tapes that considered their staffs family.

A lot of those traditions seem to be falling by the wayside—today, people plug their ears with Bluetooth earphones and listen to music alone; numerous high-profile studios have shuttered; and two decades after Napster turned an entire generation into music pirates, the same thing has happened to replicators as well.

The value of community hasn't changed, however, and in some areas, rescuing historic recording studios is becoming a way to bring people together and forge new communities for the future.

In the 1970s, Macon, GA was the home of Capricorn Records, the indie label behind the Allman Brothers Band, the Marshall Tucker Band, The Outlaws and others until it went bankrupt in 1979. In the decades since, the label's offices/studio building deteriorated to the point that it was condemned and dangerously close to collapsing.

The facility is getting a new lease on life as the city of Macon, Mercer University and housing developers have radically reinvented the building as The Lofts at Capricorn, a mixed-

use facility nearing completion. The site will host apartments, more than a dozen 24/7 rehearsal rooms for musicians, a museum detailing the region's musical history, office space for local nonprofit arts organizations, a performance area and, the centerpiece of the ready-made community, Capricorn Studio, restored and open for business. While Mercer's music school will occasionally hold classes there, the site will be a working studio, offering both analog and digital recording for local musicians. Some fundraising remains, but stakeholders expect the project to be completed in 2019—the 50th anniversary of Capricorn Records.

Looking north to New Jersey, another site crucial to the history of recorded music is on the verge of reinvention. Founded in 1901, the Victor Talking Machine Company in Camden grew over the years to fill two dozen buildings across 10 city blocks as it manufactured record players, accessories and a whopping 800,000 records a day. Few signs of that empire exist today, however, and Victor's main eight-story office building near the city's waterfront, sat barely used by its owner, the Camden City School District, for the last decade.

Now developers have purchased the edifice and envision a renovated, modern office space that will evoke its musical past. Tentative plans call for the eighth-floor recording studio—where the likes of Nat King Cole, Louis Armstrong, Duke Elling-

ton and Billie Holiday reportedly cut sides—to be redeveloped and possibly joined by a video production facility. Other possibilities include a roof-based restaurant offering views of Philadelphia across the river, first-floor shops and a performance space. The result is a developer using the cachet of musical heritage and a historic studio to attract business tenants and infuse the site with a sense of unique community going forward.

The future is also what some groups have in mind with their efforts to save the former home of King Records in Cincinnati. Founded in 1943, King grew to be the nation's sixth-largest label until fading in the 1970s. Over the years, plenty of top acts recorded for King, from Petula Clark to James Brown. At press time, the Cincinnati Planning Commission looks to be nearing a land swap with the vacant building's owners, Dynamic Industries, which wants to demolish it. If successful, and if funds can be raised, three nonprofits have proposed an ambitious renovation that would include a performance hall, museum and restored recording studio—all of which would help bring visitors to a community that is seeing increasing revitalization after decades of urban decay.

By looking back and respecting the importance of both recording history and creative communities, these redevelopment projects are finding ways to use historic studios as catalysts to create new visions of the future.

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## Sumner to Lead Yamaha in U.S.

BUENA PARK, CA—Marking the first time that Yamaha has appointed an American executive to its top position in the United States, Tom Sumner has been named president of Yamaha Corporation of America (YCA) effective April 1, 2018.

In his new role, Sumner will lead Yamaha operations in the United States and oversee operations in the Americas. He is a 30-year veteran of YCA and has served as senior vice president since June 2008. For nearly 10 years he has led or co-led sales and marketing efforts, including the

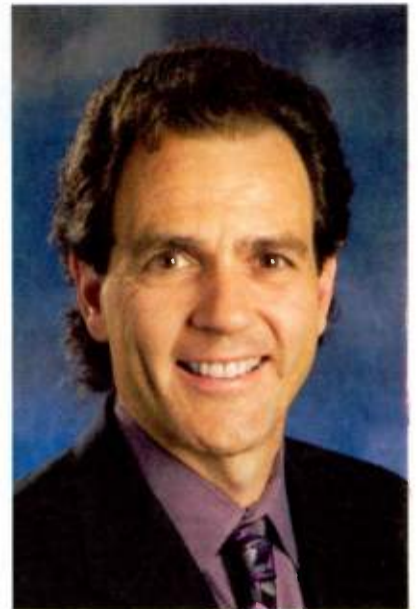
in-house creative agency—the Customer Experience Group—Corporate Marketing, Artist Relations and End-User Support. The Professional Audio division, as well as the Keyboard, AV and Car Parts divisions, also reported to him.

Sumner succeeds Hitoshi Fukutome, president of YCA since March 2013, who will return to Yamaha in Japan as its new senior general manager of Asia-Pacific Sales. “It has been my deep privilege and honor to lead YCA for the past five years, and I am extremely grateful to our exceptional

team for their support and dedication,” said Fukutome. “I am particularly proud of our company’s business performance during my tenure, and I know that Tom will bring continued success to YCA.”

Sumner joined Yamaha in 1988 as national account manager for the Consumer Products division, where he’s held a variety of roles over the years. During that time, he earned an MBA from Pepperdine University in 2003, and is currently a member of NAMM’s board of directors and CTA’s Audio Board.

“I am so humbled by the opportunity to lead the talented YCA team here in the United States,” said Sumner. “Hitoshi has set a high standard of excellence, and I look forward to building on his success and strengthening our team and our brand, our



Tom Sumner

dealer base and our focus on, and dedication to, our customers.”  
Yamaha Corporation of America  
yamahaca.com

## Producer/Label Founder Matt Dike, Dead at 55

BY KATIE MAKAL

LOS ANGELES, CA—Matt Dike, co-founder of influential hip-hop music label Delicious Vinyl and a creative force who helped shape the sound of the Beastie Boys’ second album, *Paul’s Boutique*, has died. Dike passed away at his home in Los Angeles in January after a brief, undisclosed illness.

Born in West Nyack, N.Y., in 1962, Dike was raised a Jehovah’s Witness in a home where music from Led Zeppelin, Black Sabbath and similar artists was forbidden. Growing up outside New York City in the 1970s, he became a music lover and embraced the city’s vivid music and arts scene, making a living as a DJ while attending New York University. After moving to Los Angeles in 1980, Dike rose to promi-

nence within the L.A. music scene at nightclubs including Rhythm Lounge and Power Tools, which helped power the emergence of bands including Red Hot Chili Peppers, Jane’s Addiction and others.

During that time, he met Mike Ross, with whom he founded Delicious Vinyl in 1987. Significant releases from the label, including Tone Loc’s “Wild Thing” and “Funky Cold Medina” and Young MC’s “Bust a Move,” were instrumental in helping hip-hop music cross into the mainstream.

Around that time, Dike lent his music sampling skills to the Beastie Boys’ sophomore album, *Paul’s Boutique* (Capitol, 1989), produced by Dust Brothers Mike Simpson and John King. Initially a commercial flop, the album went on to be certified double-

platinum a decade after its release. Much of the densely layered album was recorded in Dike’s apartment. “The album was a complete and utter failure at the time,” he recalled in 2014. “It didn’t sell s\*\*\*! But it got mind-blowing reviews, which I think is better for me in the long run.”

Dike sold his interest in Delicious Vinyl to Ross in 1992 and retreated from public life thereafter.



Matt Dike influenced the sample-heavy *Paul’s Boutique* album by Beastie Boys.

## Glen Campbell’s Home, Studio for Sale



The sizable house includes Agoura Borealis Recording Studio, formerly a three-car garage.

BY CLIVE YOUNG

AGOURA HILLS, CA—When country legend Glen Campbell died last summer, he left behind a legacy of more than 70 albums across five decades and sales of more than 45 million records. As it happens, he also left behind a home/recording studio in Agoura Hills, CA, that his family put on the market in March for \$960,000.

The three-bedroom, three-bath house 15 minutes outside of Malibu was purchased in 2006 and soon upgraded with a custom studio in what was previously the three-car garage. The facility, dubbed Agoura Borealis Recording Studio, was designed and built by Capitol Records’ vice president, general manager and chief engineer, Arthur Kelm.

The sizable space sports a live tracking room, large control room with separate iso/amp room, and small vocal booth. Additionally, the studio’s floors have been floated and the facility has been duly soundproofed to avoid irritating the neighbors. According to Realtor.com, music for the 2014 documentary on Campbell, *I’ll Be Me*, was recorded and mixed at the facility.

The 1,938-square-foot home has an in-ground pool and its interior was decorated by Campbell’s wife, who studied interior design at UCLA. While the Campbells moved to Nashville four years ago to be closer to their daughters, their son ran Agoura Borealis, but he, too, is now moving to Nashville and the family has opted to sell the property.

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US.KEF.COM

# Need to Know: Blockchain

BY MARGOT DOUAIHY

Welcome to *NewBay's* inaugural edition of *Need to Know*, where we explain complex topics and demonstrate how they apply to each industry we serve. Future topics will include 5G, cybersecurity and artificial intelligence.

From using an app to order a morning latte to reading an ebook before bed, we're living more of our days—and our lives—online. As digital footprints grow and cyber-infrastructures mature, more industries are exploring potential uses for blockchain, a shared ledger technology for recording transactions and protecting the integrity of digital information.

Imagine having a ledger book and inputting all relevant data about a purchase. Instead of sliding that ledger onto your bookshelf, you make it public and give a tiny piece of it to hundreds of others. The ledger can be seen as data, but it is secure due to its advanced encryption. Blockchain is that distributed ledger, and it is not housed on one server. No one person or one server contains it; it is fundamentally decentralized.

Let's say you want to buy a new track from your favorite band. You'd buy the digital file online using your



Visa card. Visa would store that transaction, and the place you purchase the music from would store it. It would then be housed in two locations. On a blockchain, the transactional information doesn't live in only two locations; it lives in hundreds, thousands or even millions of places—living on the peer-to-peer computers running the blockchain encryption. A blockchain system replaces human guesswork and vulnerability of digital transactions with algorithms and advanced cryptography. It's harder to hack. It's a whole new way of thinking and a brand-new

method for securing digital information.

In a time when even SSL-protected environments are breached, blockchain's transparent, decentralized approach to cybersecurity is increasingly attractive, according to Mike Walker, research director at global intelligence firm Gartner Research. Walker views blockchain as a "potentially transformative digital platform."

Walker, also an author of Gartner's *Hype Cycle for Emerging Technologies 2017*, explained that blockchain's traceability is another element of its growing appeal. "The Honduras gov-

ernment will use blockchain to secure land titles," he said. Other use cases for the digital ledger include blockchain-enabled voting machines, online music payments, asset transfer and cloud storage. Samsung SDS blockchain technology will work to bring more transparency to the city of Seoul, South Korea.

The technology was created to support the cryptocurrency Bitcoin, and its peer-to-peer model is best suited for similarly digital-only ecosystems, so any industry using all-digital assets is poised for disruption by blockchain.

## What Blockchain Means for Pro Audio

By Clive Young

Blockchain as a concept has been making noise (perhaps a low rumble) across the music industry for a few years now, but it hasn't made significant inroads into the pro audio world—yet.

Related as it is to cryptocurrencies and Bitcoin, blockchain has largely piqued the music industry's interest as a potential answer to the eternal issue of getting stakeholders—artists, producers, labels and anyone else due royalties for a track—paid.

In theory, implementation of blockchain could aid the creation of a track's metadata and in turn help streamline payments for the song's use in streaming, radio play, TV/film syncs or other forms. It's been done on a small scale—the first instance was Imogen Heap's 2015 single, "Tiny Human," released on the Ujo Music platform, with all parties involved paid via the cryptocurrency Ether—but widespread adoption could radically change the process of paying rights-holders. Not only would it speed up payments, but it could also make those amounts more precise. Given that some streaming services pay as little as \$0.0084 per stream—a sum that is then divvied up among all the rights-holders—achieving accuracy is not always a simple or efficient process.

Some added efficiency couldn't come at a better time, as the potential uses and outlets for music are only on the rise. Panos Panay, vice

president of innovation and strategy at Berklee College of Music and founder of the school's own blockchain effort, the Open Music Initiative (OMI), claims that an international hit can have anywhere from 500,000 to 700,000 lines of revenue and upwards of 50 intermediaries between the listener and the creators of a song. Accordingly, having a blockchain arrangement on a track, with permissions and rights control automated and essentially baked into the song, would help ensure payments were made to the parties listed in the metadata.

That's the catch, because for years, metadata—and the lack thereof—has been a thorn in the side of the music publishing world. Perhaps underlining the situation, Spotify kicked off February by adding a "Show Credits" option to its desktop app, allowing users to see a music publisher-provided list of a track's performers, songwriters and producers. While touted as a user feature, some critics see it as a passive-aggressive jab toward publishers who complain about low payments from the streaming service, in essence highlighting the inconsistent metadata they've provided the service to use.

The Spotify feature may make the issue a little more public than usual, but it's no secret that millions of tracks have incomplete metadata, and there's no universally accepted global database of

music rights for streaming services or anyone else to turn to. The last attempt—an international cooperative effort between collection societies dubbed the Global Repertoire Database—was killed off in 2014 after amassing \$13.7 million in debt.

An industry-wide adoption of a standardized blockchain framework, then, would bypass the need for a global database; merely listening to a song would be enough to trigger a set string of contracts, agreements and algorithms, allowing all stakeholders to be paid.

This is all fine, but what does it have to do with pro audio? Pro audio manufacturers create the tools brought to bear at the moment of creation, whether it's songwriters on acoustic guitars playing into a handheld digital recorder, producer/engineers slaving over their DAWs at 4 a.m. or remixers radically reinventing a track far down the line. Logically, those tools should be blockchain-compatible, able to create and preserve rights metadata from the very start. While no major DAW manufacturers have committed to the blockchain concept yet, they're watching it. Notably, Berklee's Open Music Initiative has garnered significant support with a membership that now includes the major labels (Sony, Universal and Warner), most major streaming services (conspicuously absent: Apple) and, tellingly, the publisher of Pro Tools, Avid.

“First-order applications for blockchain are purely digital,” explained professor Christian Catalini, founder of the MIT Cryptoeconomics Lab at the MIT Sloan School of Management. The reason we see it at scale in the financial sector, supporting online banking and accounting, is because “blockchain is good at digital verification,” he said.

Beyond the financial sector, blockchain is a candidate for any application that relies on digital value transactions. New sectors embracing blockchain are supply chain management and logistics, “file storage, data storage, bandwidth and even electricity grids,” according to Catalini. “File storage online is easy to meter and measure,” he explained, and therefore can be an appropriate application for blockchain.

Gartner Research suggests that the “blockchain revolution promises to touch every industry,” but the realities are nuanced. While the technology could be embraced to support auditable voting, currency, software and digital data transactions, the all-digital nature of these ecosystems is why blockchain is both feasible, scalable and is seen to make economic sense. Where there is mix of physical data and digital data, however, requiring users to port information stored offline into an online system, blockchain’s adoption will take more time. Sectors such as education and healthcare are increasingly interested in blockchain, deploying pilots and experiments, but the evolution there will be slower.

Nonetheless, venture capital firms are investing in blockchain. Established heavyweights and startups alike are aggressively trying to leverage the technology to solve problems. Cyphrium, Wal-Mart, Thrive, Odem, Oracle, Visa, Bank of America and IBM are just a few examples of companies firmly in the blockchain gang.

Blockchain is available in open-source platforms and it offers quantifiable benefits for all-digital environments, but it shouldn’t be mistaken for a panacea, warned a 2017 report from Tractica, a market intelligence firm that focuses on human interaction with technology. In that same report, Tractica analysts urged businesses to “avoid jumping on the blockchain bandwagon and instead view blockchain as a series of tech-

nological modules and concepts to selectively choose, apply and/or complement other emerging technology trends.”

Blockchain also has limits beyond the digital-only prerequisite. A diversity of nodes will help defend against the so-called “51 percent” attacks that could compromise blockchain-supported data. A “51 percent attack,” according to Coindesk author Frederick Reese, “would find a single

entity introducing a version of the blockchain that it controls and is accepted as valid.” But on one small college campus or in one building, is the required physical diversity of blockchain peers possible? What makes it an ideal platform to scale may also limit it for smaller use cases.

While blockchain is already disrupting the financial sector, perhaps its greatest promise is how it radically reimagines a digital information in-

frastructure. With its decentralized, broadly distributed model, the immutability of its transactions and vetting of online identities, blockchain builds trust into the very architecture of its system.

Blockchain may not be the right fit for every industry, nor is it an immediate answer to the question of how to safeguard digital information, but its paradigm shift is already inspiring next-level innovation.

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# Clash Producer Mickey Foote, 1951-2018

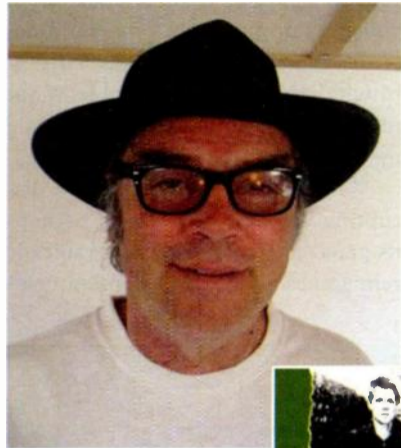
BY CLIVE YOUNG

ABERDEEN, SCOTLAND—Michael “Mickey” Foote, producer and engineer of The Clash’s eponymous debut and numerous singles, died in Aberdeen, Scotland, on March 2 after a short, undisclosed illness. He was 66.

While he had production credits with acts like Ellen Foley, Sex Pistols and Vic Goddard & Subway Sect, Foote was instrumental in developing the sound of the early Clash and, as a result, is widely credited with creating the template of the punk rock sound.

Born in Aberdeen on Sept. 8, 1951, Foote attended Newport College of Art (later part of the University of Wales), where he met visiting singer/guitarist John Mellor one day in the student union. Mellor, who later adopted the stage name Joe Strummer, reunited with Foote in London when Strummer headed The 101ers and brought Foote on to handle the band’s live sound. When The Clash formed and subsequently went on the road opening for the Sex Pistols on its chaotic 1976 Anarchy Tour of the UK, Foote was on hand to mix the proceedings.

Soon he was drafted to produce The Clash’s first demos, capturing the band’s on-stage energy on tape; that effort led to producing the band’s debut album, which contained incendiary tracks like “London’s Burning” and “White Riot.”



Mickey Foote produced the Clash’s first album in 1976. (Inset) The Clash’s eponymous first album.

As legend has it, Foote was fired by the band in early 1978 after the release of the standalone single “Clash City Rockers,” recorded at a tumultuous time in the band’s history when guitarist/vocalist Mick Jones and bassist Paul Simonon were only speaking to each other via Strummer. After the single was finished, manager Bernie Rhodes declared the final mix was “a bit flat,” so Foote used varispeed to pick up the pace, which also raised the music up a semitone. Strummer and Jones were in Jamaica at the time, however, and didn’t get to hear the change until the single was released. Furious, they sacked Foote, and virtually ev-

ery re-release of the song since has featured the original-speed version. Eventually, Foote and the band got back on cordial terms and Foote became involved with numerous Clash archival releases over the years.

If The Clash was in part about standing up to authority, Foote possessed some of that spirit, too. Decades later, after he had moved back to Aberdeenshire, he became the face of a protest movement in the mid-2000s against Donald Trump, who began building a golf resort with a hotel and numerous houses near Foote’s home.

Upset about the damage that the campus would cause to the coastal area and its wildlife, Foote led the Sustainable Aberdeenshire movement in a legal fight that continues to this day, some of which was captured in a 2011 documentary, *You’ve Been Trumped*.

Due to Foote’s efforts, the local council will not allow the resort’s houses to be built until its clubhouse and hotel are completed. According to Scotland’s *The Herald*, Foote believed Trump planned to build 600 houses first in order to pay for the course and hotel.

Foote is survived by his partner of 30 years, Kym Swindells; his sister Alison Duncan; and nieces and nephews. Swindells and Duncan have vowed to continue Foote’s fight against the Trump development.

## Gamung Embraces Harman for Growth

JAKARTA, INDONESIA—To upgrade both the scale and scope of the live sound production services it provides for conventions, conferences, concerts and trade shows, Gamung Productions has updated its inventory with a robust selection of Harman audio systems. The Harman gear supplied by local dealer CSA Indonesia includes JBL Professional speakers, Crown amplifiers and Soundcraft consoles.

For large, high-profile events, Gamung deploys JBL VTX V25-II line arrays and G28 subwoofers, which offer powerful sound reinforcement and coverage in a compact and lightweight footprint. For medium-sized events including concert audio and corporate AV applications, the company relies on JBL VT4888 line array speakers. Smaller events are served well by Gamung’s inventory of JBL SRX Series and PRX Series self-powered speakers. Mixing duties are handled by the company’s Soundcraft Vi3000 audio consoles, which feature automated microphone mixing, VM2 wireless monitoring and Vistonics II touchscreens.

“We’re proud to be the first company in Indonesia to own a Soundcraft Vi3000 and offer complete Harman tour sound solutions,” said Farid Boy, owner of Gamung Productions. “Whether we’re faced with a ballroom presentation or an outdoor concert, Harman’s comprehensive audio solutions bring these events to life, ensuring that every word, musical note and sound effect is delivered with absolute clarity and dynamic range.”

HARMAN  
harman.com

## VUE Keeps the Beat at Palermo Festival

PALERMO, ITALY—The fifth annual Beat Full Festival in Palermo, Italy, held next door to a UNESCO World Heritage Zisa Cultural Site, featured plenty of pop and hip-hop, highlighted by Italian rap star Ghali. Ensuring everyone could hear every beat, Sinergie Group fielded a system based on VUE’s al-12 compact line array.

Lead live sound engineer Rosario “Saro” Tine provided system design and rental services for the festival.

The Beat Full main stage sported eight al-12 compact line arrays flown per side, with eight as-418s in the middle in an end-fire configuration, and hs-221 dual 21-inch subwoofers at both ends of the subwoofer array.

Meanwhile, al-8 stage-mounted line array elements provided front fill. “In the first day alone, acts ranged from electro-rock and regga-muffin to classic rock and drum and bass,” said Tine. “Thanks to the flexibility and sonic character of VUE’s Continuous Source Topology, the



Acts at Palermo’s Beat Full Festival heard themselves via VUE Audiotechnik PA and monitor systems.

system delivered flawlessly with each and every act.”

According to Sinergie’s VUE Italia marketing manager, Livio Spallino, “The Beat Full Festival finished out a record-setting summer for Sinergie Group, with seven completed

all-VUE festivals. VUE’s versatility has given Sinergie the ability to take on a wide array of business, regardless of how challenging the setup or venue.”

VUE Audiotechnik  
vueaudio.com





# Lewis Gets Sharp with Solid State Logic

CAMBRIDGESHIRE, UK—British mixer, producer and engineer James Lewis has enhanced the processing capabilities of his Cambridgeshire facility, Studio27a, with the addition of a Solid State Logic Sigma delta remote controlled analog summing unit.

“The Sigma has enabled me to get more out of all my other gear,” says Lewis, who has been using the unit to mix tracks for Rudimental’s third album. “One way to describe it is ‘faster.’ It preserves the transients better. It’s lighter on its feet. That works for any genre of music, but particularly with the high-tempo Rudimental tracks I’m working on at the moment. I don’t think you could succeed on anything else but SSL, just because of the sharpness.”

Sigma delta is a 16 stereo/32 mono channel rack-mounted, automatable summing mixer that uses the same SuperAnalogue mix bus technology as SSL’s AWS and Duality consoles. Control is via the Sigma Remote App (Mac, PC, iOS or Android), MCU or Eucon-compatible control hardware, and via delta Control. Mix buses A and B can be combined into a single mix for creative parallel processing options.

Studio27a is equipped with a Pro Tools/UAD DAW and a selection



James Lewis in his Cambridgeshire facility, Studio27a.

of outboard gear, much of which is dedicated to his mix bus chain. “It’s quite a hybrid system,” he says. “I have parallel mix summing going on, with Sigma taking care of 80 percent of the mix, and additional processing being mixed in via the Sigma’s Mix Bus B.”

Lewis, whose recent credits include Clean Bandit, Rae Morris, Charli XCX and Sunset Sons, started out as assistant to Mike Crossey and later went on to train under Manny Marroquin. “I ran a couple of other mixes through it recently; they were simple in-the-box monitor mixes. I

bounced three versions down, a digital bounce straight out the DAW, another analog summer, and the Sigma. The Sigma track was much tighter—there’s definitely something nice going on.”

Solid State Logic  
solidstatellogic.com

# Australia’s Oldest Studio Moves, Reopens

ALEXANDRIA, AUSTRALIA—Australia’s Studios 301, originally established in 1926, was forced to relocate in 2016 and, following a change of ownership, has reopened in a new multi-million-dollar building.

As Australia’s longest-running professional recording studio, Studios 301 was founded in Sydney as the Columbia Graphophone Company, and later became EMI. It has hosted acts like Coldplay, Kanye West, Lady Gaga, U2, David Bowie, INXS, Elton John, Bob Dylan and Lana Del Rey over the years.

The new owner is familiar with the studios—Dr. Tom Misner, founder of SAE Institute, owned and rebuilt Studios 301 in the late 1990s before divesting his Australian business interests in 2011. He reacquired Studios 301 at the end of 2016. The new facility now sits in the suburbs of Sydney.

The new facility features classic Neve 88R and SSL K series consoles, plus new additions such as an API console and an Avid S6 in the 5.1



The main studio of Studios 301 sports PMC QB1-A monitors.

mixdown suite. To achieve the sound returning owner Tom Misner wanted throughout the main rooms, the team built the rooms for their monitor speakers rather than trying to fit the speakers to the existing acoustics of the room.

“I chose PMC’s QB1-A monitors for our main studio because they are currently the best studio monitors on the market, especially when they are installed in a room that has been purpose-built to house them,” said Misner.

The choice of QB1-A monitors for Control Room One makes this the first facility in the Southern hemisphere to have installed PMC’s flagship monitoring system, which already has pride of place at Capitol Studios in Los Angeles and Metropolis Studios in London.

PMC’s MB3 XBD-A monitors reside in Control Rooms Two and Three and Mastering Rooms Two and Three, installed in stereo configurations in all rooms except Control Room Three, where they are part of

a 5.1 surround sound setup, in conjunction with a PMC MB3-A center speaker and MB2S passives for the rear surrounds. Control Rooms Four and Five and three production suites are all equipped with PMC twotwo monitors.

“The PMC MB3 monitors were the only ones I could find that were sufficiently versatile for recording, mixing and mastering,” Misner adds. “We are very happy with the sound they deliver. All the local engineers who

have heard them have been pleasantly surprised and are looking forward to working with them. I also love the character of the twotwo speakers that we are putting into the production suites and smaller mix rooms. I am quite familiar with these, having used smaller PMC speakers at Abbey Road Studios. My main criteria were to use the same monitors throughout—for the smaller rooms, the main rooms and for mastering.”

PMC  
pmc-speakers.com

# Concentrix Music's Story Comes Full Circle

BY STEVE HARVEY

CHARLOTTE, NC—Composer Fred Story, founder of Concentrix Music and Sound Design, doesn't need a weatherman to know which way the wind blows. And so, with the impact of evolving production technologies, changes in the studio business model and the advent of the gig economy, he's putting his multiroom facility up for sale.

"It's not like I'm a trend-setter. This is pretty much the model for a lot of guys," says Story, who plans to convert a room at his house into a studio where he can focus on a lifelong ambition: scoring for motion pictures.

Story started out in broadcasting, taking the plunge and becoming a freelance composer in 1990. He and his wife decided to build a studio in Charlotte, partly so that Becky—a successful actress, radio personality, Emmy Award-winning lyricist and accomplished ceramic artist—could be closer to her aging parents, he says. The other reason was that studios were a rarity in the city at the time. "There would be occasions when I would have trouble getting studio time to meet a deadline. The only way I could have a guarantee that I could meet these deadlines was to

have my own studio," he says.

"I was fortunate in that I got some word-of-mouth referral early on. Before I knew it, I was turning away work. I had to hire an assistant, then another composer. We organically grew into a company."

Having outgrown the studio, Story and his wife, who handles the business side of things, accepted an offer and sold the facility. "We did fairly well on the real estate deal, so we decided to sink it all back into my dream studio. At that time, 2008, we figured this would be the last studio we'd ever have to own."

In February 2009, Concentrix moved into its new 4,000 sq. ft. facility, designed by David Rochester of Technical Audio Services and architect Brian Gaddis. The complex houses three identically sized control rooms and three live rooms, ranging from a small iso booth to a large tracking space.

As it turned out, 2008 was a tipping point, not just for the economy, but also for the studio business. "In those days, if there was a session, everyone was in the room," he recalls. But attended sessions started to become increasingly rare. At the start of 2017, he reviewed the invoices for the previous year: "I realized that for 90



Concentrix houses three identically sized control rooms and three live rooms, ranging from a small iso booth to a large tracking space.

percent of the work for the previous year, I never saw the client's face."

Over the past 27 years, Story has been honored with 14 regional Emmy Awards, three Telly Awards and over two dozen Addy Awards. Over the years, Concentrix has also diversified beyond music production, adding voiceover recording, sound design and mix services and evolving into a hybrid recording/post production facility.

"This is a relationship business," he says. "By having clients in the build-

ing who might come in for a simpler task, it was a chance for them to get to know you and—oh, by the way, do you need music for your next gig?"

Buoyed by North Carolina's film and TV production tax credits, Concentrix's voiceover booths were busy for a time, he says. "During pilot season, we were doing six or eight ADR sessions a week, hooking up with L.A. stages."

But those tax credits expired, *(continued on page 23)*

## Mastering Engineer Katie Tavini Talks Techniques, Stereotypes

BY DANIEL GUMBLE

MANCHESTER, UK—The year may still be young, but 2018 has already proved significant in the life of Katie Tavini. On Jan. 1 she boarded a train from Manchester to London, where she was to relocate and begin work on a substantial project—which, at the time of going to print, must remain under wraps—in addition to a series of other projects set to see the light of day in the not too distant future.

But while the past three months have arguably provided the most significant personal and professional shifts in her burgeoning career thus far, Tavini has been diligently honing and refining her studio skills for the best part of the last 10 years in and around the Manchester punk scene, her work with Sonic Boom Six quickly catching the collective ear of local contemporaries. On the rare occasions she would chance



Mastering engineer Katie Tavini

upon spare time, she would fill it by engineering and producing her own electronic compositions, adding to her ever-growing studio skillset.

Displaying a precocious level of musicianship in classical music, her studies led to a performance-based university course, although it quickly became clear that Tavini's calling was

emanating not from the stage but the studio, with a small yet path-altering recording module providing a much-needed outlet for her sonic pursuits.

"I spent pretty much all my time in the studio on this recording module thinking, This is what I want to do," Tavini explains. "And I had a little home setup where I was pro-

ducing my own tracks. With all my coursemates wanting to be performers, I got the benefit of recording them and they had the benefit of being recorded, so it worked out really well. One day my teacher said, 'Katie, you're always here. I've been offered a job in a studio but I can't take it. Do you want it?' I was like, Hell yeah! Even if it was just making tea, I was up for it. Then I worked my arse off to make myself invaluable."

Having served in an assistant role across numerous sessions, the obvious next step may have been to continue on down the engineering and production route; however, while seeking advice on how to take her mixing skills to the next level, her attention was diverted to the art of mastering.

"I was in a forum and I asked if anyone had any tips for improving mixing techniques," Tavini elaborates. "Then this guy says, 'If you want to learn how to mix, learn how to master.' I used to sneak finished tracks home from the studio and try to master them. Then, once we got the finished masters back, I'd compare them and see what I could do to make mine more like theirs, so I was teaching *(continued on page 23)*

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## A Studio with Social Media in Mind

BY STEVE HARVEY

FRANKLIN, TN—“The fact of the matter is, if you’re not feeding the social media channel, you just about don’t exist as an artist,” says Scott Dupre, chief audio engineer at ManAlive Studios, which recently opened just outside Nashville. The facility, which offers DSD audio capture and a six-camera 4K video workflow, was built by the Annie Moses Band for its own use and to provide affordable content production and web streaming capabilities to independent artists.

YouTube’s algorithms are, first and foremost, designed to benefit YouTube, Dupre says, and if you don’t generate enough content or enough views, you will find yourself falling down the site’s recommended list. The answer, he says, is to keep feeding the machine. “You really want to work with YouTube—or any social site, for that matter—to try to get your content in a favorable position by offering regular, high-quality content.”

The Annie Moses Band, made up of six members of the Wolaver family, has been around about 15 years, playing a multi-genre style of music that combines classical (several band members are Juilliard-trained), pop and Americana. The band has released a dozen albums and a handful of live DVDs, tours worldwide and mentors young musicians through its Fine Arts Summer Academy and Conservatory of Annie Moses.

“Over time, the band has gone through all the struggles that every other independent musician has been through in the changing landscape of the recording industry,” says Dupre, who is married to lead vocalist and violinist Annie Wolaver (the band takes its name from her great-grandmother) and is also the FOH mixer and technical director. “The band found that they needed an outlet that would allow them to create great content in a much shorter time span.” Since the musicians perform together all the time, he says, “We need to really have the whole group playing together and maintain that energy.”

The original plan was to build a recording studio on some land the band had purchased. Then they found a 4,000 sq. ft. former TV production studio in Franklin, a city that describes itself as “14 miles and 100 years from Nashville.” In addition to recording or livestreaming audio at ManAlive, he says, “At the same time, you can grab great video as well. You can be releasing live video footage along with the music, and it still allows you to post-mix and you can post-process the video.”

The facility was virtually move-in

ready, requiring simply the application of some acoustic treatment in the control room and live space and the addition of sound isolation on the outside walls. The band had an effective home studio setup, but Dupre and Alex Wolaver, band member and studio manager, went looking for additional audio equipment plus all-new lighting, camera and web streaming gear from the likes of AJA, ARRI, Blackmagic, Canon and Panasonic.

The band’s project studio didn’t include a console, so ManAlive features a 24-channel Solid State Logic SSL 924 AWS desk. While the

Beyer 160 mic. “It’s just got a really beautiful, airy top end with this warmth to it. And because it’s hyper-cardioid, you can still get a nice close sound on her, even with a band in the room. It’s a very organic, natural, true sound, but it’s not sterile. When I play the DSD mixes, it just sounds like they’re washing over me. I expected it to be great, but I don’t know if I expected it to be that great.”

A 32-out/8-in Horus lives in the control room. The racked 32-in/8-out Horus in the live room doubles as a mobile recording rig: “It’s as easy as running a Cat 6 cable from



The facility, a former TV studio, is designed to provide clients with high-end video material for use as social media content.

studio includes a Pro Tools | HDX rig, the primary DAW is a Merging Technologies Pyramix DSD/DXD workstation with a pair of Ravenna/AES67-networked Merging Technologies Horus Premium mic preamps and converters, which operate at a sample rate of 11.2 MHz (256 times that of CD).

“I spent a long time talking to Fraser Jones and Dennis Gaines at Independent Audio, the Merging distributor, about how it might work,” he says. “The thing that we found working in DSD is that these Merging preamps sound incredible; they are so enveloping and holographic. When I listen to Annie singing, if I close my eyes, it feels like she’s right there,” he reports.

Dupre typically puts her on a

the unit to a computer.”

The units feed Pro Tools as an HDX device. “But I can also run it into Pro Tools as a Core Audio device, which gives me more channels than through the HDX card,” says Dupre. Merging system settings can be saved as presets. “It allows me to flip between Pro Tools and Pyramix, and all those settings—all the patching and interconnects—are saved to the preset.”

The monitoring setup is essentially stereo, although Dupre can reference 5.1 mixes. “The SSL AWS is not really friendly for 5.1 mixing, but it allows us to use the PMC twotwo.8 monitors as a front pair with the JBL LSR305s in the rear, just for a reference,” he says, noting that his focus is on ambisonics,



Scott Dupre, chief audio engineer (left), and Alex Wolaver, studio manager, had a 24-channel Solid State Logic SSL 924 AWS desk installed in ManAlive Studios.

which can be easily delivered over the web.

“Much of what I listen to on any day is on headphones or earbuds; I think most people are that way. So I don’t think there’s a reason why I shouldn’t be providing binaural mixes,” he says. He’s still moving toward implementing a binaural workflow, and the mic locker includes a Sennheiser ambisonic microphone, but ultimately, he says, “I’d like to be able to offer, in one go, a stereo mix, binaural mix and 5.1 mix, so however your fans want to access it, it’s available.”

The mic collection also includes choice models by Audio-Technica, Coles, DPA, Earthworks, Neumann, Oktava, Schoeps, Sennheiser, Shure and Upton. “We wanted a core selection that would work in concert with the Merging equipment,” he says, noting that almost any additional items can be rented easily in Nashville.

The live space accommodates an audience and features a KV2 Audio point source PA speaker system. Serendipitously, says Dupre, the Horus converters have an analog post-preamp direct out and feed a Midas M32 console at line level. “We’re bypassing the first stage of the Midas preamp and keeping the high-quality sound through to front-of-house,” he says.

ManAlive offers artists a three-tier subscription service based on hours per month of content creation or streaming. “The studio opens up a lot of options for artists, particularly independent artists who maybe don’t have the financial backing of a big label and can’t put together big video shoots. You’ve got to get all the crew, the gear, find the location; each of those things has a cost associated with it,” says Dupre. “What we can do is bundle it all together and keep the quality really, really high—in fact, as high as you can possibly go.”

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# Is Thunderbolt 3 the Data Savior?



BY CRAIG ANDERTON

A lot has happened since we last looked at Thunderbolt in 2012. According to *Forbes*, more data has been created in the past two years than in the entire history of the human race. And by 2020, it's estimated that our accumulated data will be around 44 trillion gigabytes (44 zettabytes)—and a lot of that is audio/video/photographic media.

With our studios becoming ever more data-intensive, determining where and how to store data is a significant undertaking. Fortunately, hard drives continue to become less expensive, and there's the cloud as well as 100 GB-capacity Blu-ray discs. But we also have to transfer that data, whether for backup, archiving or streaming the quantity of data required by 96 or 192 kHz/24-bit audio interfaces.

Help is on the way. For several reasons, Thunderbolt 3 looks poised to become the breakthrough protocol its originators always hoped it would be. First, the "competition" is falling behind. USB 3.1 Gen 2's maximum speed is 10 Gb/s, while Thunderbolt 3 is four times as fast—it tops out at 40 Gb/s. Granted, to achieve this speed for a 2-meter connection requires an active cable, but Thunderbolt 3 can still do 20 Gb/s over the same distance with less expensive, passive cables. And to be fair, for consumer devices, USB 3.1 Gen 2's speed is impressive. Still, for pro applications, it can't touch Thunderbolt 3.

Second, Thunderbolt 3 tears down the wall between it and USB 3.1. Thunderbolt 2 didn't really support USB; it required adapters to talk to USB devices. However, Thunderbolt 3 handles USB 3.1 natively, as well as DisplayPort and PCIe Gen 3—not to mention protocols like FireWire and HDMI, which it can manage with adapters. Essentially, every Thunderbolt 3 port is also a USB 3.1 port. With suitable adapters, USB 3.1 supports previous USB generations, so Thunderbolt 3 is about as universal a data transfer protocol as we've seen.

Furthermore, Thunderbolt 3 is (mostly) compatible with devices based on previous Thunderbolt versions, although adapters are required. And Thunderbolt 3 peripherals can generally work with Thunderbolt 2 ports, although there are

some complications. For example, some Thunderbolt 3 peripherals don't operate well with early USB-C chipsets, and some expect data from the USB 3.1 channels—but USB was never supported by Thunderbolt 2, so the Thunderbolt 3 peripheral won't see anything.

One factor that makes Thunderbolt 3's universality possible is the USB-C connector and cable specification. (You've probably already seen USB-C connectors on newer Android smartphones.) In a significant break with precedent, both Thunderbolt 3 and USB 3.1 use the same

connector—which is very convenient, but spawns confusion because while Thunderbolt 3 can connect to USB peripherals, USB 3.1 can't connect to Thunderbolt peripherals. Regardless, being able to use a single type of cable for both Thunderbolt and USB 3.1 is a welcome change from needing a zillion different cables, as is currently the case with USB.

(continued on page 23)



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**ARTIST:** 9 DAY TRIP  
**ALBUM:** INTO THE GREAT UNKNOWN  
**LABEL:** SELF-RELEASED  
**PERSONNEL:**  
**Produced by:** 9 Day Trip and Rob Tavaglione  
**Engineered by:** Rob Tavaglione  
**Studio:** Catalyst Recording (Charlotte, NC)  
**EQUIPMENT NOTES:** Apogee Symphony mkII conversion, DP9 DAW, Millennia-Media vox channel, SPL analog summing, Neumann KH310 monitors, Audio-Technica headphones



**ARTIST:** GANG OF YOUTHS  
**ALBUM:** GO FARTHER IN LIGHTNESS  
**LABEL:** MOSY RECORDINGS LICENSED TO SONY  
**PERSONNEL:**  
**Produced by:** Gang of Youths/Adrian Breakspear  
**Engineered by:** Adrian Breakspear  
**Mix Engineers:** Peter Katis (tracks 1-4, 6, 9, 11, 12, 14, 16), Adrian Breakspear (tracks 5, 7, 8, 10, 13, 15)  
**Studio:** Sony Music Studios (Sydney, Australia)  
**Mastered by:** Joe Lambert Mastering  
**EQUIPMENT NOTES:** Neve VR, ATC SCM custom monitors, Genelec 1032 monitors, Yamaha NS-10s, Pro Tools HDX



**ARTIST:** KIRAN AHLUWALIA  
**ALBUM:** 7 BILLION  
**LABEL:** SIX DEGREES  
**PERSONNEL:**  
**Produced by:** Rez Abbasi  
**Engineered by:** Jeremy Darby  
**Mix Engineer:** Adam King  
**Studio:** Canterbury Music Company (Toronto, Ontario)

**Mastered by:** Peter Letros at Wreckhouse Mastering (Toronto, Ontario)  
**EQUIPMENT NOTES:** Neve 8026, ATC-SCM25, Neumann 310, DynAudio BM6, Avid Pro Tools 2018



**ARTIST:** HIGH UP  
**ALBUM:** YOU ARE HERE  
**LABEL:** TEAM LOVE  
**PERSONNEL:**  
**Produced by:** Mike Mogis  
**Engineered by:** Mike Mogis  
**Mix Engineer:** Mike Mogis  
**Studio:** ARC Studios (Omaha, NE)  
**Mastered by:** Joe Lambert Mastering (Jersey City, NJ)  
**EQUIPMENT NOTES:** Vintage Neve 8068 console, Coil Audio CA-286 mic pres, vintage Neumann U-47 mic, Tannoy monitors, Pro Tools 10 via Black Lion-modded 192 converters



**ARTIST:** GIFT WRAP  
**ALBUM:** LOSING COUNT  
**LABEL:** CAPTURED TRACKS  
**PERSONNEL:**  
**Produced by:** Brendon Avalos  
**Engineered by:** Brendon Avalos  
**Mix Engineer:** Brendon Avalos  
**Studios:** 20 Bleeker Street (New York, NY) and home studio (Brooklyn, NY)  
**Mastered by:** Carl Saff at Saff Mastering (Chicago, IL)  
**EQUIPMENT NOTES:** Yamaha HS7s, Ableton, Focusrite Scarlett 2i2



**ARTIST:** SWOLL  
**ALBUM:** SWOLL  
**LABEL:** BLIGHT RECORDS  
**PERSONNEL:**  
**Produced by:** Matt Dowling, Ben Schurr and Grey Goon

**Engineered by:** Ben Schurr and Grey Goon  
**Mix Engineer:** Grey Goon  
**Studio:** Myster Studio (Hollywood, CA)  
**Mastered by:** Calin Enache at District Sound Lab (Washington, D.C.)  
**EQUIPMENT NOTES:** ADAM A7X with KRK subwoofer, Yamaha NS-10s, Avantone MixCube, Amphion Two18 and BaseOne25 subs, SSL Bus Compressor, Chandler Curve Bender EQ, Shadow Hills Mastering Comp, ProQ2, Massenburg EQ, Crane Song Phoenix, Brainworx Digital V3, Brainworx Saturator, Logic



**ARTIST:** JUKEBOX THE GHOST  
**ALBUM:** OFF TO THE RACES  
**LABEL:** JUKEBOX THE GHOST / CAROLINE  
**PERSONNEL:**  
**Produced by:** Chris Cubeta and Gary Atturio, CJ Baran, Peter Thomas, Chris Wallace  
**Engineered by:** Chris Cubeta and Gary Atturio, CJ Baran, Peter Thomas, Chris Wallace  
**Mix Engineers:** Chris Cubeta and Gary Atturio, Robert Orton  
**Studio:** Studio G Brooklyn (Brooklyn, NY)  
**Mastered by:** Joe LaPorta at Sterling Sound (New York, NY)  
**EQUIPMENT NOTES:** SSL 8048 G+, Neve 5316, ATC SCM25A, Auratones. Most drum tracks (and some guitars and basses) were recorded either to Studio G's MCI JH-24 2" machine or Studer A827 2" machine. They were then dumped into Pro Tools, and we overdubbed from there.



**ARTIST:** REBECCA ANGEL  
**ALBUM:** WHAT WE HAD  
**LABEL:** TIMELESS

**GROOVES**  
**PERSONNEL:**  
**Produced by:** Jason Miles  
**Engineered by:** Jason Miles and Steve Addabbo  
**Mix Engineer:** Jimmy Bralower  
**Studios:** The Clubhouse, Shelter Island Sound (New York, NY), Dynatone Studio  
**Mastered by:** Mike Fossenkemper at TurtleTone Studio (New York, NY)  
**EQUIPMENT NOTES:** MCI/API/53-input 636 with Neve Flying Faders, KRK Expose 8 studio monitors, Focal monitors, Avid Pro Tools



**ARTIST:** DAVID FITZPATRICK  
**ALBUM:** PARACHUTES IN HURRICANES  
**LABEL:** DAYSTORM MUSIC  
**PERSONNEL:**  
**Produced by:** Gary Tanin  
**Engineered by:** Ric Probst, Gary Tanin  
**Mix Engineer:** Gary Tanin  
**Studios:** Tanner-Monagle Studios, Planet Green Productions and Daystorm Music (all in Milwaukee, WI)  
**Mastered by:** Gary Tanin at Daystorm Music (Milwaukee, WI)  
**EQUIPMENT NOTES:** Neotek Elan Series, Avid ProTools, Custom Yamaha NS-10M with JBL SB-1 Subwoofer, Klipsch Heresy, Auratones



**ARTIST:** XXXTENTACION  
**ALBUM:** ?  
**LABEL:** BAD VIBES FOREVER  
**PERSONNEL:**  
**Produced by:** John Cunningham  
**Engineered by:** Robbie Soukiasyan  
**Mix Engineer:** Robbie Soukiasyan  
**Studio:** XXX Studios  
**Mastered by:** Dave Kutch at The Mastering Palace  
**EQUIPMENT NOTES:** Logic Pro X, Pro Tools

## Studios 301 Reopens with PMC

BIGGLESWADE, UK—Studios 301's newly reopened multi-million-dollar facility in Australia is the first in the southern hemisphere to install PMC's (pmc-speakers.com) flagship QB1-A monitors; MB3 XBD-A monitors are installed in two other control rooms and two mastering rooms. A PMC MB3-A and two MB2S passives complete a 5.1 setup.

## Brin Travels with Manley Mic

TORONTO, CANADA—When composer and producer Derek Brin works outside his home base at Toronto's Post Office Sound in the Virgin Islands, Barbados, Anguilla, Cuba and other Caribbean islands, he travels ultra-light, opting for a minimalist setup based on a Manley (manley.com) Reference C cardioid tube mic.

## Mitchell Rocks to DPA's CORE

LOS ANGELES, CA—Producer, songwriter, musician and audio engineer Mat Mitchell, a longtime DPA (dpamicrophones.com) user, has added the company's new CORE amplification technology to a collection that includes the d:vote 4099 instrument mic, d:dicat 2011A and 2011C twin diaphragm cardioids and, now, the d:screet CORE 4061 miniature mic.

## Drexel Expands with Rupert Neve

PHILADELPHIA, PA—Drexel University recently expanded its Walters-Stork Design Group-designed facilities, installing a 32-channel Rupert Neve Designs (rupertneve.com) 5088 console loaded with 24 Sheldford 5052 mic preamp/EQ modules and outfitted with the manufacturer's proprietary SwiftMix automation, supplied and integrated by AVN Systems.

## Concentrix

(continued from page 18)

and other states picked up the slack. “There were 17 major Hollywood films shot in Georgia last year,” he reports.

On the music side, “Most of the players that we record, even the great A-list players I use here in Charlotte, have their own home studio setups. Plus, we’re using musicians all over the world. I hired a fiddle player in Vancouver for a documentary not too long ago. You email a chart and tracks, and they send back great stuff.”

The team had grown to include a full-time mixer and sound designer and full-time composer, he continues. But a couple of staff members had to leave for one reason or another. “We organically worked into the freelance model, so we had this big studio with all these rooms and no one sitting in them most of the time. The need for a studio had diminished based on technology and the business model for the industry changing over time.”

The facility is on the market, but



**Fred Story has been honored with 14 regional Emmy Awards, three Telly Awards and over two dozen Addy Awards.**

in the meantime, Story has leased all available space to Elevation Church, which previously had been renting studio time all over the South. “They’re here every day, and I still have my room. Either they’ll buy it, or someone will buy it, and I’ll pack up my stuff.”

David Rochester is already drawing up plans for Story’s home studio. “I’ve got a great big room he says he can make sound fabulous. I’ll keep on doing what I’m doing, except from home.”

Studios aren’t exactly hot real

estate properties right now, he acknowledges. “But when we sold the old place, we sank every penny into this place. When the head of the audio department at Elevation came in—he’s been a studio owner; they recruited him in Nashville—he was asking questions about the infrastructure and the wiring. He says it all the time: ‘You guys built this place right.’ The clients who do come here just rave about the studio. I know there’s someone for whom the studio would be a good fit.”

As Story also observes, running a studio takes time. He’s looking forward to his newfound freedom after years of having to be around to answer the phones and accept deliveries.

“I started thinking, if I had all that time back—just the time it takes to run and manage a facility—what if I could put that into just being a composer, the thing I started out to do? I haven’t been able to get out to film festivals and industry events. This will free me up and allow me to do the relationship building to get those scoring gigs,” he says.

“I said to my wife, ‘Do I really

want to check out without giving it a shot? I know it’s competitive, but nothing ventured, nothing gained.’ So here I am, back where I started.”

**Concentrix**  
concentrixmusic.com

## Anderton

(continued from page 21)

Another benefit of USB-C is the companion USB PD (Power Distribution) specification. USB-C can deliver up to 100 watts to either Thunderbolt or USB 3.1 peripherals. However, it’s not a given that a port can deliver this amount; there are “power profiles” for 20W, 60W and 100W, so it’s necessary to check specs carefully to make sure that a port can provide enough power for the peripheral being used.

Note that power distribution with USB-C is bidirectional—hosts can charge peripherals, and peripherals can charge hosts. And because USB-C handles such significant amounts of power, it will be possible to charge high-power items like laptops through USB-C. A USB-C DisplayPort device could be designed for charging a laptop, and one universal USB-C AC adapter could be truly universal by being able to charge anything with a USB-C connector—just like anything with a USB-C connector. The only real caution is that you would need to make sure the USB-C cable can handle the current, which may be as much as 5 amps.

The introduction of any new standard also tends to introduce challenges, which USB 3.0’s early adopters know—some chipsets weren’t audio interface-friendly. However, over time, older gear goes by the wayside in favor of modern gear that conforms well to new specifications, and firmware updates increase compatibility. The bottom line is that Thunderbolt 3 is needed for our data-intensive world, and it should take care of our data transfer needs for the foreseeable future ... which I suppose these days is defined in years instead of decades.

*Author/musician Craig Anderton updates craiganderton.com every Friday with news and tips. His latest album, Simplicity, is now available on Spotify and cdbaby.*

## Tavini

(continued from page 18)

myself how to master thinking it would help me become a better engineer.

“Around that time, this producer messaged me on Facebook asking for some mastering, so I said I’d master his EP, but asked, ‘If it’s s---, please don’t release it because I’m just starting out!’ But when he got it back from me, he thought it was great.

“He was not only a producer but also had his own band, Sonic Boom Six, and they had a really big album and PR campaign in around 2011, so I got to master that album, the singles from it and a load of remixes. That was quite a lot of work, and they have a large fanbase, so I kind of spread throughout the punk scene just through that one project. I was still doing sessions on the side, and mastering was just this thing I was doing occasionally. But it started spreading in Manchester and people were saying, ‘There aren’t many people that do mastering round here, can you do it for us?’ It just snowballed due to demand, plus people didn’t want to pay London rates. And I enjoyed it! I get a big buzz out of finishing things.”

For those who aren’t fully conversant with the art of mastering, the process can appear daunting. This, Tavini offers, should not be the case, arguing that the perception could be off-putting to potential mastering

practitioners of the future.

“The word ‘master’ sound quite intimidating. I think that’s why some people are so terrified of it,” she says. “And there’s also the whole stereotype of, You’re not really a mastering engineer unless you’re a 60-year-old guy with ruined hearing! And if the 60-year-old guy with ruined hearing is mastering, anyone can do it.

“The mistake I made at first was thinking it’s this incredibly scary thing, like a lot of people do, and as a result ended up doing too much to the track. It’s often a case of less is more. The most important element of mastering is letting people know what could be better about the mix—not creatively, but the functionality and balance of it before it gets mastered. That’s one thing you don’t get with online mastering. There’s no feedback. If the track is too bass-heavy, it’s not going to tell you that. Once the mix is solid, the mastering should happen naturally. A lot of mastering is like admin—labeling, filing stuff, frequency analysis, checking a mix for corruption, that kind of stuff.”

Back in January of this year, Tavini featured on a Women in the Studio panel at AIM’s (Association of Independent Musicians) Women in Music conference at London’s City Hall to discuss the sector’s gender imbalance. Additionally, Tavini has been closely involved with Red Bull Studios’ Normal Not Novelty initiative, a monthly workshop open to female DJs, sound engineers and producers at Red Bull

Studios London.

“We made so much progress last year, with Red Bull putting money and publicity behind the fact there are female engineers out there,” she states. “Because there are fewer female engineers and producers, we are more easily remembered and have occasionally found it easier to get work once we’ve made that initial step. However, I think people assume there aren’t as many women working in the studio as there really are. The females who are working in this industry are just happy to get on with it, and we don’t necessarily sit behind a computer shouting about the fact that we’re women.

“But Red Bull sticking at it has really been key. Until last year, very few of my mastering credits were with female bands or female producers, but since around June 2017, about half of the people I’ve been working with are female bands, producers or engineers. Red Bull has helped to connect the dots between women in studios, which is great, and it’s also given us a wider network and a bit of media attention.

“That’s not my priority, but it has put women in the spotlight so that men can see we are doing this and doing it well. It’s getting there.”

With a busy schedule of exciting projects currently in-hand, for now it’s back to the studio for Tavini. And if this year continues as it has started, you can certainly expect to be seeing a lot more of her throughout 2018.

**Katie Tavini**  
katietaavini.co.uk

# The Oscars Go to Tommy Vicari

BY STEVE HARVEY

HOLLYWOOD, CA—In 1996, Quincy Jones, at that time the executive producer for the Academy Awards telecast, asked Tommy Vicari to handle the music mix for the broadcast. “I said, ‘I don’t know how to do a TV show.’ He said, ‘Well, figure it out,’” recalls Vicari.

Twenty years later, on the 90th anniversary of the Oscars, Vicari is still at the musical helm, mixing the orchestra during the live show. It hasn’t always been smooth sailing. “Once, I got to the theater and the bass player was standing outside the pit because there was nowhere to fit him,” he reports.

Now, Vicari has someone representing him at the venue during the setup. “We have measurements for how many feet it takes for a cello player to bow, and how big the drum kit is.”

At Hollywood’s Dolby Theatre, which has hosted the Oscars since 2002—the year the show switched to HD and 5.1—he tries to place each orchestra section in the same place every year. “When I got this gig, they never did that,” he reports.



The audio team behind the annual Academy Awards broadcast includes (standing, l-r): Chandler Harrod, assistant recording engineer, Dan Vicari, orchestra setup, Larry Mah, Pro Tools engineer; (seated, l-r) Steve Genewick, assistant recording engineer, Tommy Vicari, recording and mixing engineer.

Vicari has been working as an engineer, producer and mixer in recording studios since 1969. Over the course of his career, he has been honored with multiple Grammy and Emmy Awards and a Cinema Audio Society Award. His credits range from studio productions with a who’s who of artists to television series and

motion pictures.

He starts making Oscar plans in December, including booking the truck. Two years ago, he brought one of Viacom’s audio trucks out to the show, having used it previously for *A Capitol Fourth*, the PBS show celebrating Independence Day in Wash-

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## Bringing Sound Together in *Electric Dreams*

BY STEVE HARVEY

CULVER CITY, CA—The Los Angeles Section of AES and the Hollywood Section of SMPTE co-hosted the sound editorial team behind the Amazon sci-fi anthology series *Philip K. Dick’s Electric Dreams* at the end of January. The panel presentation, in the Kim Novak Theater at Sony Pictures Studios in Culver City, CA, was moderated by Mark Lanza, supervising sound editor on the project, and included sound effects editor Harry Snodgrass, dialogue editor Ryne Gierke and music editor Brittany DuBay, plus executive producer Michael Dinner.

The series, which debuted on



At the *Electric Dreams* panel were (l-r): Music editor Brittany DuBay, dialogue editor Ryne Gierke, executive producer Michael Dinner, sound effects editor Harry Snodgrass and supervising sound editor Mark A. Lanza, MPSE.

Amazon Prime Video in January, features 10 standalone episodes based on the writings of Philip K. Dick. The evening began with a screening of “Autofac,” based on Dick’s 1955 short sci-fi story about factories run by self-replicating robots producing products that are consuming the world’s resources and threatening the continued existence of humans following an apocalyptic war.

The *Electric Dreams* project began five years ago, Dinner reported. “The original idea was for an anthology series, and a show that encouraged diverse points of view,” tied together by Dick’s writing and filtered through

the minds of British and American writers and directors. There are numerous themes, he said: “What does it mean to be human? What does it mean to be an individual faced with technology or authoritarianism? What’s the nature of reality?”

There were different casts, different locations and different directors for each episode, half of which were shot in the U.K. and half in the U.S. Virtually the only constant was Dinner and the sound team.

The series features scores by five composers from around the world, each working on one British and one

(continued on page 26)

### briefs

#### Moots Tunes in with Lectro

RIO RANCHO, NM—Lectrosonics (lectrosonics.com) Digital Hybrid Wireless equipment’s wide frequency tuning range was reportedly invaluable to freelance field audio mixer Callahan Moots at the Olympic Winter Games in South Korea, where, as part of an ENG team, he used a pair of Lectrosonics SMQV transmitters for the wireless hop to a camera outfitted with an SRC dual-channel receiver.

#### Nugen Audio Delivers Breakfast

SANTA FE, NM—Filmmaker Tom Uhl had Michael Stearns clean up the stereo soundtrack for his documentary *Zydeco Breakfast*, which features zydeco music and dancing in Louisiana. The experienced sound designer achieved the task using Nugen Audio’s (nugenaudio.com) Stereoizer for stereo enhancement and Stereoplacer for frequency-specific panoramic placement.

#### Shure Takes on All-Star Games

NILES, IL—Firehouse Productions, responsible for RF coverage in and around the Staples Center arena in downtown Los Angeles for NBA All-Star Game weekend, utilized 64 channels of Shure (shure.com) wireless mics and IEMs, including Axient analog handheld mics with KSM8 capsules and Axient Digital with PSM 1000 in-ear monitors, and Shure UHF-R wireless.

#### JTN Music Adopts Fortium

LOS ANGELES, CA—Emmy and MPSE Golden Reel Award-winning music production and editing studio JTN Music in Los Angeles, which works on *Brooklyn Nine-Nine* (Fox), *Ozark* (Netflix) and *Superstore* (NBC), is the latest company to adopt Fortium’s (fortiumtech.com) MediaSeal encryption-at-rest solution as part of its cybersecurity strategy.



## NAB Show

(continued from page 1)

The more widespread adoption of IP networking will not occur overnight; many facilities are initially making a transition from SDI to hybrid IP/SDI systems and workflows. But with SMPTE 2110 (which adopts AES67 for audio), AMWA NMOS discovery and registration specifications, and the ATSC 3.0 Next Gen standard all now in place, the industry has a roadmap. There will be plenty of new products on the show floor in Las Vegas to help take us there; the following are just a few examples of the products enabling this all-IP future

Audio-over-IP is at the very core of Solid State Logic's System T family of dedicated live-to-air broadcast production consoles and controllers. The technology leverages off-the-shelf switching infrastructure to reduce the overall system design cost and improve redundancy topologies. The 2018 NAB Show will see the global debut of the latest addition to the line: the System T S300 compact control surface, available with 16 or 32 faders, which can connect to either a Tempest T25 (256 paths @ 48 kHz) or a T80 (800 paths @ 48 kHz) processor engine. It runs the same software as the larger S500 surface and TCR (Tempest Control Rack). System T S300 includes a fully integrated Dante control API; with more than 1,000 Dante devices available from approximately 350 manufacturers, System T control surfaces can act as direct routing controllers to extremely large, multi-manufacturer-based AoIP routing systems.

A v2.0 software update for System T offers improvements including immersive audio, another important path to broadcast audio's future. The release reportedly places support of immersive audio for ATSC 3.0, Dolby Atmos and MPEG-H at the heart of the console architecture: new 3-axis coordinate panning for System T incorporates 2- or 4-channel overhead speakers into the available channel and bus formats.

Audiotonix acquired SSL at the end of 2017, which means the brand is now stablemates with Allen & Heath, Calrec and DiGiCo. Calrec has been coyly dropping hints on social media regarding a new mixer for radio applications, but details are under wraps until the show.

In the meantime, DiGiCo has already announced its 4REA4 processing engine, which debuted recently in Europe. The system offers 128 input channels, 48 bus output processing strips and four dedicated mix areas,

or zones, each with its own stereo master output, CGs and allocated effects, managed via proprietary Ethernet or Dante connectivity. "4REA4 will allow our customers and new facilities to expand the function and reach of our live consoles," according to James Gordon, DiGiCo's managing director. While 4REA4 appears aimed more at the install market, there are certainly potential broadcast applications.

president of marketing for RHC Audio. "The AoD is an asset for anyone using Dante networks, as its design is intuitive and truly plug-and-play. We're looking forward to debuting these modules at NAB and presenting broadcasters with a durable, dependable solution for delivering high-quality audio."

The modules use Power over Ethernet (PoE), with power sourced through standard Ethernet cable via a

MPA1 devices now offer SNMP support.

As audio product manager Stephen Brownsill's comment indicates, TSL Products is fully aware that its customers are making the transition to IP one step at a time. "The solutions we offer today are for both SDI and IP infrastructures. We understand that a key challenge for any audio solution is to create and present an operational experience that is both simple and intuitive, regardless of the method being used to carry audio through a broadcast facility."

Jünger Audio, too, takes a software-defined product design approach. The company will launch a new audio processing platform and a new product, AIXpressor, at the NAB Show that use Jünger's Flexible Audio Infrastructure, flexAI, to customize the system for specific requirements. The IRU device is based on x86 processors and is equipped with a range of built-in interfaces, including AES67 and SMPTE ST2110 redundant AoIP.

The software products created using flexAI will be licensed flexibly, according to the company, allowing users to incorporate additional functionality, increase channel count or shift licenses between devices. The system scales by cascading additional AIXpressors or servers via Jünger's new optical connection, tieLight, which can reportedly transmit up to 1,152 audio channels in each direction.

NAB Show IP Showcase  
www.nabshow.com

"A key challenge for any audio solution is to create and present an operational experience that is both simple and intuitive, regardless of the method being used to carry audio through a broadcast facility."

—Stephen Brownsill

Conveniently interfacing with Dante AoIP networks, ProCo Sound's new AoD Output Module will be at the NAB Show. It features a Dante audio input and two channels of analog output from an aluminum extrusion housing with hand-soldered, 3-foot analog audio tails. The D-to-A converters support a 44.1, 48 and 96 KHz sample rate and up to 24-bit depths.

"Given the positive feedback we have received since we initially developed this product, we're thrilled to be shipping our AoD Output Modules," says Darius Seabaugh, vice

PoE-capable network switch. The free Dante Controller software provides configuration of device names, channel labels, signal routing, sample rates and latency.

TSL Products' approach to product design has allowed it to continually update its audio monitoring products as the nascent AES67, SMPTE 2022-6, SMPTE 2110 and other standards have developed. The company's PAM1-IP and PAM2-IP precision audio monitors now support SMPTE 2022-6 and SMPTE 2110 audio and video networks plus Ember+. All TSL

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## Oscars Audio

(continued from page 24)

ington, D.C.—the only other TV show he regularly mixes. Last year, the truck was unavailable, so he hired Music Mix Mobile and Mark Linnet's vehicle. This year, the Viacom truck—under new ownership, he says, and now outfitted with a Lawo mixing console—was back.

Several days before Oscar weekend, Vicari heads over to the venue to the music mix remote truck for his first line and level check. "I get the orchestra for two hours, to set all the preamp levels. Of course, they're not playing at full level because they're saving themselves for the show, so you have to leave room so that if they do play out, you're not breaking up the preamps."

Broadcast lead mixer Paul Sandweiss and front-of-house mixer Patrick Baltzell pick their microphones for the podium and the host, but anything musical is Vicari's domain. "We basically set up a studio in the pit. We partition and give them monitors and the feed from the show, give them a conductor cam and air conditioning. They're down there for eight hours." The musicians wear headphones and have a dedicated monitor mixer, who also feeds them

click tracks, he says.

With an audience of 1.2 billion in 225 countries and territories, there is no margin for error, so the orchestra visits Capitol Studios during the week before the show to record the music cues, including the nominated songs, in case of technical failure on the day, and for playback in some of the trickier situations. The best picture category, for instance, can be a contest among as many as 10 nominees. The conductor and the orchestra hear the announcement at the same time as the audience and have no time to shuffle through 10 charts in time to play the winners onto the stage.

The show's conductor and musical director change each year; this year it was Harold Wheeler. "A lot of people contribute," says Vicari, busily mixing in Capitol's Studio A before the show. "He writes some of the charts. This year we're using mostly newer charts from a lot of the composers who have contributed over the years, like John Williams and Jerry Goldsmith."

Vicari and Pro Tools operator and engineer Larry Mah (the two have worked with composer Thomas Newman for 19 years), plus Capitol Studios engineer Chandler Harrod and the facility's crew spent a couple of days in studios A and B tracking the 42-piece orchestra before the broadcast. Vicari essentially had 10 to 15

minutes per cue available for mixing. "We've got a system, so it's not so scary," says Vicari, who brings in his Millennia mic preamps, GML EQs and PMC monitors, which are all carted over to the remote truck at the Dolby Theatre after the sessions.

Mah cleans up the audio and mutes unused tracks while simultaneously fielding requests from show producers and artist managers. "I have a remote," says Vicari, "so I can start Pro Tools and Larry can be sending stuff on his computer."

Once upon a time, it would take Capitol's staff 12 hours to set up. This year, it took five hours. "We've done it enough times now that we're starting to figure it out," says Mah. "It's written down, and while it's a little different year to year, a lot of it is the same."

"We work as a collaborative team; I have all the best people," laughs Vicari.

That team is the reason why the production returns to Capitol every year. "I was really proud of the setup crew this year. They did a really good job," says Harrod.

Capitol's job is to make Vicari and his people comfortable, says Paula Salvatore, vice president and studio manager for the past 27 years. Continuity is also important. "There's so much going on that once they get it right, Michael Seligman and Rob Paine, the executive producers, like

to keep the same procedures and the same people," she says.

There is another reason why Capitol is a preferred destination, says Arthur Kelm, Capitol Studios' chief engineer, general manager and VP, which is that the equipment is always current and cutting-edge. "Staying on top of technology is what we do; that's part of being Capitol," he says.

On Kelms' watch, all the facility's Pro Tools rigs have been reconfigured identically, with the same software, same plug-ins, and 72 inputs with 80 outputs. "You can take a project from room to room to room. It wasn't that way when I got here six years ago."

Fiber and Focusrite RedNet interfaces now tie the Capitol tower's rooftop performance area to any control room, he adds. And in C, where he installed a Dolby Atmos monitor speaker system almost a year ago for internal mixing projects, the Pro Tools system is MADI-enabled to manage 128 channels.

"My next big project is a central server for all the studios," says Kelm. Carving out a few terabytes from the existing video server will enable automatic backup, he says, replacing the current nightly sneaker-net system. "It will also make working on the same project in multiple rooms easier."

Capitol Studios

capitolstudios.com

## Electric Dreams

(continued from page 24)

American show. Lanza asked DuBay how she approached the music edit.

"Carefully," she said. "It's about keeping what the composer wants. What changes is what the showrunner wants."

Director Peter Horton had very specific ideas for "Autofac," she said. "It takes out some of the grey area when someone knows exactly what they want you to do," although it also presents challenges.

Each composer had a different workflow. "Whenever we got music—for some people it would be stemmed out; from one, we just got a stereo file. If we wanted to add anything, he would send us an additional stereo file to play along with it," she said.

In general, few music changes were needed. When they were, though, "It was a lot of work," said DuBay.

For instance, in one scene in "Autofac," there was no music. "Peter was adamant that there needed to be music. I had to go through the entire episode and find something that fit. This was a show where we had to

think on our feet."

Each episode portrays a different and unique world, explained Lanza. "This means that we couldn't use any sound effects twice. We had many different location recordists, and each episode had to be redesigned from the ground up."

Since Amazon was releasing the entire series all at once, said Lanza, "There was no order to how we started. It was by which had the most complete visuals or which story was the most put-together."

Adding to the challenges, the series averaged 300 to 400 visual effects per episode, Dinner commented.

One central challenge was how far into the future each episode was set and what had changed. The production tracks included crickets and birds, for example, but did they still exist?

Lanza asked Gierke how—without naming a specific manufacturer—he cleaned up the production dialogue and removed birds, crickets and traffic sounds. Someone in the crowd shouted out the name of the software, to laughter. Gierke admitted he had the latest version and used it to "derustle" the tracks. "We also had plenty of takes to work through," he said.

For each episode, Snodgrass had to

create a new world while also keeping everything time-appropriate throughout the series. "I had to create libraries for every show, of beeps, boops, every sound a computer makes, and they could not cross over between episodes," says Snodgrass, who got out his old analog synths to create the sounds.

"I cut backgrounds first," he continued, describing his process on "Autofac." "It gives me a sense of the show, so, tonally, I knew I had big limitations. I had to clean birds out of tracks. I needed some factory sounds, something that added weight. There were so many factory locations, and different drones, and I wanted them all to sound different."

The "Autofac" episode stars Janelle Monae as a robot. "This show was so complicated that I attacked it piece by piece," he said. It took Snodgrass a full day just to do the servos for the main character, he said: "The eyes, the head, the legs, the arms."

"You can always hear the eyes, every time she blinks," said Lanza. "It reminds you that she's not one of us."

"It took me out of my process, as many of the episodes did. This episode was a very big challenge," said Snodgrass. Organization was key. "I did things to make it easier on the

mixers, so they could get through it, because of the sheer volume of tracks and sound effects in this episode."

The episode "Safe and Sound" was especially challenging, according to Lanza: "All the effects were musical, including all the background traffic, the cars, the drones. And they all had to match the key of the music, which changed all the time."

"I'm a musician. That's not something you get to do often," said Snodgrass.

"I came up with the real sound for each item. Then I unraveled the music and figured out the key and put in a musical element for every car by, every drone by, all the background traffic." Sometimes he went against the chord with something dissonant to add tension.

"As the key of the music changed, I would make sure we were matching so it would play with the music, but they would play on their own and would still have a good sound," Snodgrass added.

"It's my favorite episode because of the challenge," he said.

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innovations: the manufacturer's view



Passion, Physics and Perseverance:

EHRLUND EHR MICROPHONE LINE

BY GÖRAN EHRLUND

As far back as microphone history goes, a round membrane has primarily been used in microphone capsules to capture sound. Picture a miniature gong inside the microphone—a round, thin membrane that reacts to vibrations and transfers them to a series of amplifiers to reproduce the sound. While some microphones color the sound they reproduce in pleasing ways, most microphone manufacturers seek to produce the most natural and transparent sound reproduction possible.

Ever since designing my first microphone as a young middle-school boy in Sweden, I've been driven to find the best way to capture and reproduce sound. The triangular membrane idea came from experimenting with contact pickup designs using various geometrical shapes, which led me to believe that perhaps a round membrane wasn't the best shape for capturing sound.

In principle, sound is composed of short impulses that make up a more complex sound. If we look at how a sound system works, we can characterize it by its impulse response. If an impulse is introduced into a system, the system will react and then stabilize over time. Since a round membrane produces a long impulse response, or decay, it will take longer to stabilize. Think of a gong and how long it vibrates. A triangular membrane, on the other hand, will decay four times faster and therefore has a relatively short impulse response.

When sound impulses hit a round membrane with a long decay in rapid succession, the membrane cannot stabilize before the next impulse hits, and the impulses combine and build up, resulting in a "thick" or "muddy" sound. When those same impulses hit a triangular membrane

with a shorter decay, the membrane stabilizes four times faster, resulting in less buildup of impulses. This produces a clearer sound and higher frequency response that is not possible with a round membrane.

Not only does a triangular membrane produce a more transparent sound, but it has less distortion. Imagine peering into a pool of water at your reflection. Drop a pebble into the water and your reflection is distorted. Drop another pebble into the water before the ripples have subsided and your reflection is further distorted. The triangular membrane stabilizes 400 percent faster than conventional round membranes, producing less distortion and a truer sonic image.

While I knew from a physics perspective that a triangular membrane is a superior shape to accurately reproduce sound, the path to Ehlund Microphones as it is today was not a simple one.

I approached Sven Åke Eriksson at Research Electronics to assist with the electronics and engineering aspects of creating a line of microphones. The ultimate goals were low noise from the amplification process, low distortion, low power use and a strong signal output utilizing this new concept of a triangular membrane. We began a research and development process that would take over 10 years to yield our current product line.

Now that we had a better membrane design, we needed to take a fresh look at the electronics needed to amplify the sound. The electronics in Ehlund microphones also represent a completely new way of thinking and are very different from anything on the market. The low noise, energy efficient, phantom-powered amplifier has a frequency range that

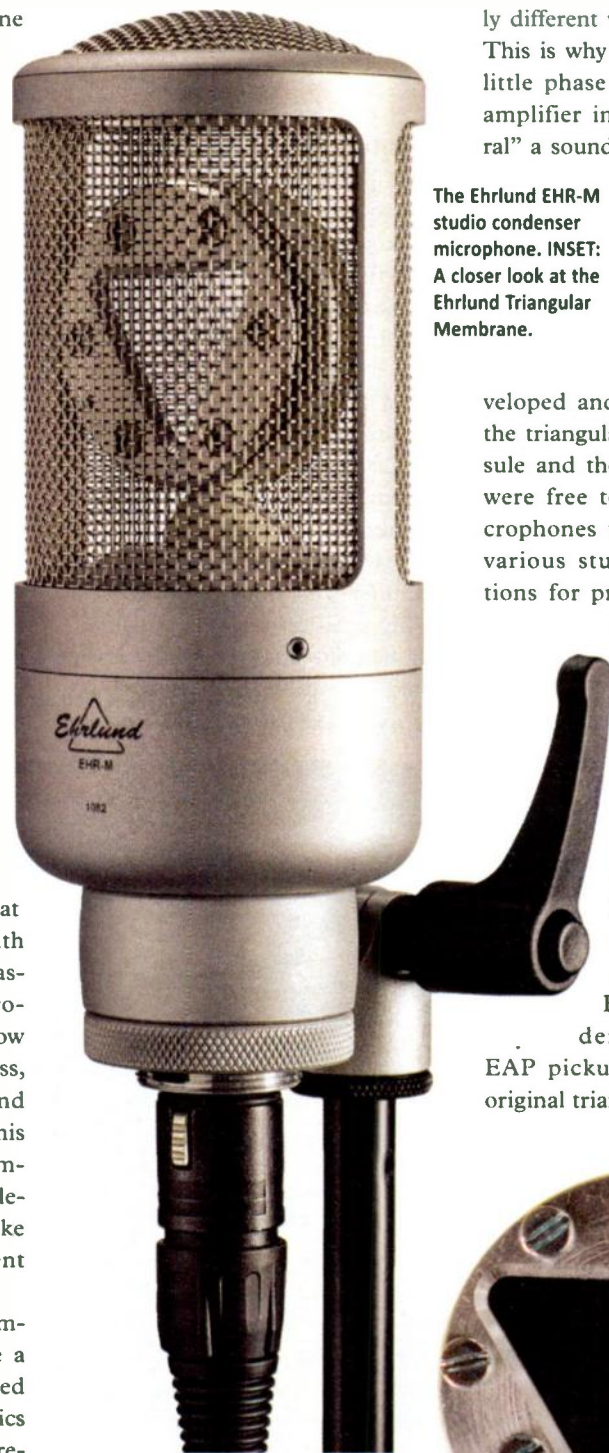
ly different when you listen to them. This is why it is desirable to have as little phase shift as possible in the amplifier in order to get as "natural" a sound as possible. It's also the

reason why one Ehlund microphone will sound virtually identical to the next, eliminating the need for matched pairs.

Once we had developed and successfully integrated the triangular membrane into a capsule and the correct electronics, we were free to develop a line of microphones that would complement various studio and stage applications for producers, engineers and

musicians. Our current line of microphones includes the EHR-M studio condenser microphone, EHR-T dual-capsule studio condenser microphone, EHR-M1 small studio condenser microphone, EHR-D drum microphone, EHR-E high-SPL condenser microphone, EHR-H handheld condenser microphone and

EAP pickup system based on the original triangular design.



The Ehlund EHR-M studio condenser microphone. INSET: A closer look at the Ehlund Triangular Membrane.



matches the bandwidth of Ehlund's triangular microphone membrane. Furthermore, we have designed it to have as little phase shift as possible in order to reproduce transients in a natural way. A low level of phase shift is synonymous with low dispersion. In turn, this means that complex signals are reproduced as they "really are," as the integral signals are not shifted relative to each other during their passage through our electronics. Phase shift and the accompanying dispersion is part of the reason why two systems with apparently equal frequency response can sound entire-

While real innovations in microphone design do not come along often, we believe our years of research and development leading to the triangular membrane will change the shape of microphone technology now and in the years ahead.

Göran Ehlund is the founder of Ehlund Microphones  
Ehlund Microphones  
Ehlund.se

The triangular membrane idea came from experimenting with contact pickup designs using various geometrical shapes, which led me to believe that perhaps a round membrane wasn't the best shape for capturing sound.

Göran Ehlund

AUDIO-TECHNICA AT5047 CONDENSER  
MICROPHONE ■ NEUMANN KH80 DSP  
MONITORS ■ SOUNDTHEORY GULLFOSS INTELLIGENT  
EQ ■ EVE AUDIO SC207 NEARFIELD MONITORS

## AUDIO-TECHNICA AT5047 CONDENSER MICROPHONE

I remember reading *Pro Sound News'* October 2013 review of the A-T 5040 with great interest, as it was loaded with superlatives for that unusual mic—four 2-micron thin, rectangular diaphragms summed together to create a very large surface area that accurately translated sound without the usual large-diaphragm issues (sluggishness, poor transients, harsh off-axis response) or small-diaphragm issues (lower output, higher noise floor). With that review in mind, I was delighted to try this new 5047 and try to determine how it might differ from typical LDCs.

A-T calls the cardioid-only 5040 its “ideal vocal mic” and indicates that the 5047 is the company’s “ideal vocal and instrument mic,” even though both models have the exact same capsules, body and shock mount (the A-T 8480). Yet the 5047 has higher impedance (150 ohms, compared to 50), about the same extremely low noise floor (6 and 5 dB), higher sensitivity, and it can handle another 6 dB of SPL (a high 148 dB). The crucial difference appears to be the output transformer, which keeps the 5047’s load stable to signal amplification at the pre-amp, allowing more headroom and dynamic range.

A sum of \$3,499 purchases the mic, a storage case and the 8480 shock mount, which is worthy of mention. I am prone to anger when faced with nice mics in inadequate mounts, but this mount grabs the mic snugly in a cradle of rubber-ring-cushioned arms that locks into place with a small lever. The result is a requisite firm hold that does not slip at all, even if the suspended assembly sags a bit (which is unsightly for a mic of this fine pedigree).

For testing, I had to start with vocals (I mean, really, who wouldn’t?), as I had a familiar and talented voice in for sessions—one who has overloaded a lesser mic with power and has range (both frequency and volume) that puts my gear to the test. Paired with my ultimate vocal channel-strip reference (a top-shelf Millennia-Media STT-1), I dialed in only moderate gain, bypassed EQ, contained lev-

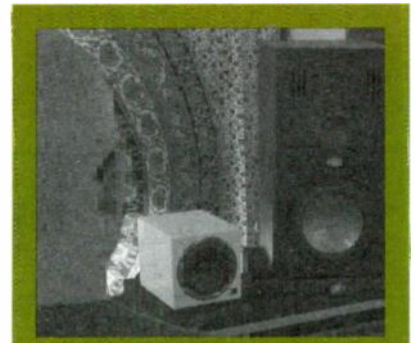
els with some el-op compression and enjoyed the fruits of such labor. The sound quality was excellent, the frequency response seemingly ruler-flat, and the dynamics were the most unrestrained and natural I think I may have ever heard! Despite these superlatives, it’s not like I was sitting there in disbelief; the sonic reproduction was so effortless and true that I took it for granted nearly immediately. No euphony or epiphanies here.

Next up, I had a fantastic rock drummer who would surely provide quality tones for serious evaluation. I only had one 5047 or else overheads would have been the natural choice. My usual coterie of mics was get-

ting me a kit sound that was already ideal, so I added the 5047 as a center overhead to grab more snare (the cardioid pattern has great side rejection, typical of rectangular diaphragms). Paired with my AMS-Neve 4081 mic amp (and no EQ or compression), I heard a sound on playback I was not accustomed to from any single mic—it was basically the sound I heard in the room. Such a rare signature, it was a combination of seemingly flat mids, bass extension that was colorless and punchy, and a top-end that was truer than any (comparatively) sizzly LDC, less pingy than any SDC and more truthful in frequency and dynamics than any ribbon (active or passive).



If you can afford one of these 5047s—or better yet, two—allow me to recommend them wholeheartedly



BY ROB TAVAGLIONE

Rob Tavaglione owns and operates Charlotte's Catalyst Recording and has been a long-time Studio Contributor. [twitter.com/robtavaglione](https://twitter.com/robtavaglione)

I realized now my challenge was to find weakness in this mic. Sorry A-T; it's all in a day's work. I knew what to do—I'm as picky as all get-out about LDCs on electric guitar amps, so I put the 5047 right smack at the grill in front of my Vox AC30 with Celestion-cab, where many an LDC will either overload, need a pad or just sound irritating. You guessed it: The 5047 handled the SPL without restraint, translated all the frequencies without harshness and required no EQ other than high-passing in my mix.

In all my subsequent test recordings and tracks, I didn't learn much of anything new; the 5047 “hears” a lot like your ears and doesn't contribute much. Acoustic guitar sounded like acoustic guitar (neither woofy, nor crispy, nor boxy), piano sounded like piano (the polar pattern did reject a lot of room), vocalists (men, women, singers, talkers, et al.) sounded like the person sounded (a little dark if they're mumbly, a little strident if they're thin). Now, if you do want to get colored up with some extra brightness—and I sometimes did with electric guitars and vox—I found a little 5k presence peak did the trick and the 5047 accepted top EQ rather nicely for an LDC, sort of like ribbons do.

Hearing this mic in action has been revelatory, if a bit depressing. I would really like to make a pair of these mics my go-to's for piano, drum overheads, acoustic guitar and such, but that's not possible for me at this price point. This 5047 is only \$500 more than the 5040 and I'm pretty sure that it is worth it for the extra headroom, sensitivity and transformer-stability. If you can afford one of these 5047s—or better yet, two—allow me to recommend them wholeheartedly. This much accuracy, musicality and reference quality would be ideal for almost any musical, vocal, Foley, classical or sound FX sound capture, transduction and reproduction.

[Audio-technica.com](http://Audio-technica.com)

## NEUMANN KH80 DSP POWERED STUDIO MONITORS

I remember when the term “micro-monitor” equated restricted frequency response, minimal dynamics and very little SPL. We’ve gone from Auratones (which are actually quite useful because of the above limitations), to Avantones (modern self-powered “Auratones” that I find indispensable), to postmodern DSP-aided ultra-portable models like IK Multimedia’s much-lauded iLoud Micro Monitors.

Well-implemented DSP can seemingly do miracles for such micro-monitors, but the world of broadcast requires more than the great performance we require for music production. For production trucks, edit bays and tiny offline edit rooms, small size is paramount, along with wall mounting, rack mounting, desktop use and modern networking requirements. It is in these areas that Neumann monitors and accessories rule the roost.

The KH80s utilize 4” composite sandwich woofers and 1” fabric alloy tweeters (a metallic cloth, I presume) housed in a composite polycarbonate cabinet. That cabinet features two front-panel ports, allowing wall mounting with optional mounting brackets. The woofer sports a sturdy metal protection grill that is tough despite being acoustically transparent, and the tweeter has an oval waveguide that is particularly suited to low-ceiling environments, as it minimizes “off the ceiling/console comb-filtered reflections.” Bi-amplified power provides 120W to the woofers, 70W to the tweeters (with THD + noise at 10%, drops to 70 and 50W at 0.1% THD + N). The digital crossover is placed at 1.8 kHz. Wisely, these “likely to be driven hard” monitors have advanced protection including soft-clip, peak and thermo limiters, as well as woofer excursion limiting.

Standby power mode is indicated by the backlit, three-color (on, standby or clip/error) Neumann logo, which is dimmable for behind-screen placement. Four output levels are offered, with a max short-term SPL of 93 dB and a long-term output of 88 dB (C-weighted with music material, not pink noise). Four levels of midrange reduction EQ are present for correcting placement issues with desktops and walls, providing eight bands of parameters EQ, plus high/low shelving via Neumann.Control software.

Input is via XLR jacks with attenuable level down to -15 dB. An Ethernet jack allows input from a network, with advanced features like lip sync delay and distance compensation delay. As if all that wasn’t



These aren’t just for mixing voice; you can mix music on them!

enough, Neumann technicians hand-test each speaker and pair them accordingly for ideal matching.

Full disclosure: I’m quite a fan of Neumann monitors, and a pair of KH310As (with a sub) are my mid-field mains. I like those cabinets, the amplifiers, the controls and especially that tweeter, whose dispersion pattern makes a big difference in my low-ceilinged room. Placed alongside my mains, the KH80s looked excellent and immediately impressed me with excellent treble/tweeter performance and bass response that showed more note differentiation than other

small-woofer models I’ve tried.

The only problem was a bit of cloudy lower-mids—a problem I find common with small-box designs that rely on DSP for bottom-end performance—but these 80s offer four levels of fine-tuning for those pesky low-mids, and I found the “large desk” setting to be just right. It cleaned up that cloudy area and revealed excellent midrange response that didn’t suffer from “crossover-point hollowness.” In fact, once I’d made all the adjustments for switching between monitor sets without level changes, I found these KH80s keeping up with

their big brothers! These aren’t just for mixing voice; you can mix music on them!

I drove the 80s hard—very hard—until I got uncomfortable, but they were still clean and not jumping with resonances. I finally got them to flash their overload indicator, though they were screaming at that point. There may not be enough power and dispersion to reach clients in the back of a big room, but there’s plenty to satisfy any one-person situation, whether that be bedroom, small control room or broadcast truck. I like to give my clients a ride in the sweet spot, and they all commented on these monitors. “I’m hearing the little speakers right now? You’re kidding me. Wow!”

Unfortunately, I didn’t find a way to get these little beauties into a production truck, or even on a network, where I estimate they would show even more of their advanced abilities. At press time, Neumann.Control software is not yet available, but it is expected to arrive in mid-2018; it will provide advanced alignment, calibration and fine-tuning options.

At right around \$1K per pair at retail, these KH80 DSPs are hardly the most affordable of the micro-monitors out there today. They are, however, the most advanced, the most flexible, and quite likely the best sounding. The Neumann name is synonymous with microphones, but the truth of it is that it should be known for market-leading transducers at both ends of the audio chain. Neumann.com

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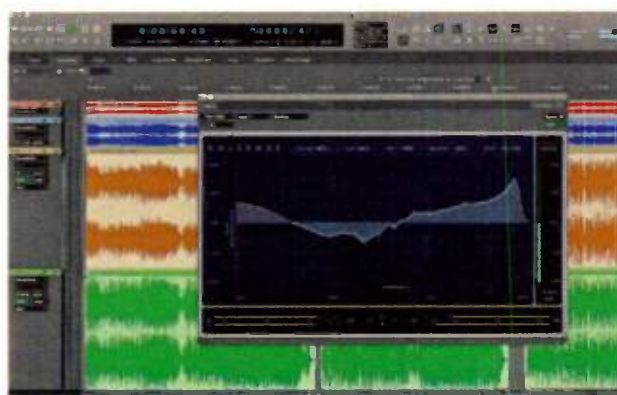


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## SOUNDTHEORY GULLFOSS INTELLIGENT EQ

Happy with my frequency balances, tones and dynamics, I've been disappointed with the width and imaging of my soundstage, even though I typically analog sum mixes for the soundstage depth. Once mastering squeezes out all but the last 9 or 10 dB of dynamics, I'm underwhelmed, wishing I had more separation, more clarity and less congestion. If only there were a way to easily fix that beyond better rooms, better hearing and better skills. Well, I think now there is.

Gullfoss is an intelligent equalizer that employs a sophisticated algorithm that has modeled what the human ear likes to hear, can apply those standards at varying user-selected degrees to incoming audio, utilizing EQ changes in tremendous number and frequency (up to 100 times per second) and increase the perception of clarity, space and dimension—and do all that without latency, artifacts



or phase destruction. This probably sounds as impossible to you as it did me, as it should.

What makes all this possible is the depth and versatility of said algorithm; developed by Andreas Tell, an Icelandic fellow who dedicated 12 years of his life to the research behind Gullfoss (which is also the name of an iconic Icelandic waterfall and popular tourist draw). His work

had much to do with quantum physics and mathematical theorems, more so than psychoacoustics or artificial intelligence.

The controls provided are not typical: Recover seeks to find elements within the mix, correct their equalization and phase relationships, and bring them more to the forefront. Tame seeks to find elements with too much prominence in your mix, cor-

rect their balances and subdue them. Bias allows you to choose your bias toward Recovering or Taming during moments of threshold in a fine-tuned way beyond the relative settings of Recover or Tame. Detail allows you to dial in more (or less) top-end and brightness, while Boost allows you to tailor the "loudness response curve" perceived as largely bottom-end response, with a boost or cut.

### Gullfoss Inventor Andreas Tell Tells All

By Rob Tavaglione

**Tavaglione:** Is Gullfoss intended for most/all tasks, or particular applications? Would you say it's advisable for individual tracks, subgroups or primarily whole mixes?

**Tell:** We have not really finished exploring the usefulness of GF [Gullfoss]. It's definitely useful on individual instruments, mix buses and the master stereo sum, but we've also cleaned up dialogue and greatly enhanced stereo live recordings, especially those done with very simple equipment. You know how frustrating it is if you put your 2-track recorder on the table in your acoustic jam session and the recording sounds nothing like it was when you were there? GF fixes that amazingly well and restores that feeling of being right in the middle of it, so we certainly won't limit the use cases to a few intended ones. As a scientist, I love to experiment and I can only recommend trying the same.

**How did you come up with this concept?**

**Tell:** I was doing a lot of live sound for a band I was involved with. I usually received compliments for the sound, but I was never entirely happy myself. At some point I realized that the problem was nothing I could solve with an EQ—or, in fact, any tool available at that time. I didn't quite know what the solution could be until another question randomly came up in a discussion: "Why do waterfalls sound so pleasant?" You're probably tempted to answer with "Because they sound like pink noise!" but that's not really an answer. Why does pink noise sound pleasant then?

At this time, I was already deeply involved in researching auditory perception, and we had been working on this particular model for many years, so it was obvious to try to use the model to see what pink noise does to it. We found that pink noise could even be improved upon, but also, more importantly, that the reason why it sounded good was very deep and could be generalized to a much more powerful concept that would also give an answer to the other question, "What can be done with live sound to improve it beyond simple equalization?"

The actual insight is difficult to formulate in simple terms, but it is essentially about information.

What we found was that the amount of information reaching the brain, as modeled by our perception algorithm, could be maximized by dynamically equalizing the signal depending on its content. Maximizing this information translates to a more pleasing sound with more detail, clarity, spatial precision and presence. And it is exactly what GF does.

**How did you manage to model the psychoacoustic perception and traits that we desire in our audio?**

**Tell:** The model we use is based on an idea that I came up with more than 15 years ago. In order to understand where I came from, it's also important to understand that we are not really using psychoacoustics.

"Psychoacoustics" is the name of the discipline that describes acoustical perception by means of empirical methods. The methods usually involve listening tests, and produce tables listing the description of the perception of test subjects to certain sound stimulation. Such experiments are extremely difficult to interpret and hard to evaluate because of the subjectivity of perception. Also, because hearing is very deeply nonlinear, these specific listening conditions and stimuli are not easily extrapolated to a more general auditory scenery. In other words, working with psychoacoustic methods is a lot of frustrating guesswork and bad approximation.

I was very aware of that back then and did not find the signal processing methods related to perception and, more generally, time-frequency processing very satisfactory. The academic physics research I was doing was all about quantum theory, but apparently auditory perception was always in the back of my head. The mathematical methods I had used and developed eventually inspired me to take a different approach to time-frequency analysis. This led me to a formulation of time and frequency that was deeply about geometry and information, and, later, to a purely theoretical construct that describes perception as a process that, under the pressure of evolution, optimizes certain informational properties. The resulting computational perception model is therefore based on first principles with very few free parameters that depend on the actual physical realization of the human auditory system and can be estimated easily.

This is also why GF is all about information. We don't apply any measures of aesthetics based on what music has been successful earlier. Instead, we try to please your brain in a very fundamental way and leave aesthetic decisions to the user.

**Is Gullfoss considered to be "artificial intelligence" or simply objective intelligence?**

**Tell:** This is a difficult question. The modern understanding of artificial intelligence is very closely linked to machine learning, which does not find any application in our technology. As a theoretical physicist, I much prefer to understand every aspect of a model and work from first principles.

Training a black-box neural network with examples of what it should be doing can be impressively successful, and recent progress in deep learning certainly gave a few stunning examples for that. However, it also has a number of problems. Machine learning methods often reproduce very well what they have learned, but then fail spectacularly at extrapolation. Another related problem is that of "overfitting," or favoring certain aspects over others. There is very little you can do about it other than training longer with more examples, but the selection of these examples already creates a bias for the result. So in this context I would probably say no, GF is not artificial intelligence; it is insight and careful design.

**Is this the end, or the beginning? That is, does Soundtheory hope to apply such intelligence to other audio processing functions? What might we expect from you in the future?**

**Tell:** Oh, we're definitely not stopping here! Our auditory perception model has many applications that we need to explore. And apart from that perception model, we also have a few more algorithms that may find use in a future product. Where exactly we are going has not been decided yet, but in the short term, we will invest more work into GF to make it even better; what comes after that remains to be seen.

For an extended version of our interview with Gullfoss founder Andreas Tell, visit <https://www.prosoundnetwork.com/pro-sound-news-blog/gullfoss-inventor-andreas-tell-tells-all>

Whenever engaged, Gullfoss exhibits the amount of work it is doing with a frequency/amplitude display that rapidly bounces with the frequent boosting and cutting. Vertical meters show the Bias, the amount of Recovering or Taming, and the input and output level, as well as a pair of frequency filters (the red lines at the extreme left and right). These filters allow you to contain Gullfoss' EQ-ing to only the frequencies that lie between the frequency extremes you exclude, or you could reorder the two filters to create a bandpass-filter excluding a specific frequency range. The process will seem less complicated once you jump in and begin to tweak around.

Recover and Tame have a range from 0 to 200; upon taking each up to a mere 25 or so, the mix begins to clean up, revealing inner detail and clarity, as if the smoke got sucked out of the room. Take those controls up to 75-ish and the mix seems to jump to life with separation, transients, detail and attack. Take things up over 100 (which Soundtheory does not recommend) and finally things begin to get just a little too aggressive. A little too rude and crisp, the processing is then audible, but not loaded with artifacts like you might think. Still,

like most things audio, moderation is the key to success.

Pull those controls back to reasonable levels, fiddle with Bias a little, maybe rebalance the top to bottom a touch, and the rewards are quite obvious in the sweet spot or headphones. Your mix gets bigger and wider, depth and detail are increased, murky low-mids are removed, transient detail is enhanced and the EQ balance seems more even and consistent. Out of the sweet spot, you cannot tell all of the above improvements, but EQ is definitely improved; in fact, I found that even if the playback system does not allow accurate imaging (car stereos, poorly placed speakers, mono systems) or is frequency-limited (i.e. Auratones), that translatability is nonetheless always enhanced by Gullfoss.

It was as if I had better drum overhead technique and mics, as if my guitars got out from under a blanket, as if my basses had that elusive perfect low-mid EQ sculpt, as if my vocals had a better mic and ideal EQ (and width, as my vocal stereo-izer processors and doubles basked in the glow). My reverbs—and especially my echoes—had an increased intelligibility and imaging I was convinced I could reach out and touch.

Convinced I had found the solution to my mix problems, I began to experiment. Solo mono sources could gain fidelity, if maybe not so much size. Voices, basses, single-miked instruments could all gain an ideal EQ curve, like using the world's most responsive (and least destructive) multiband compressor or dynamic EQ. Stereo sounds, like synths or stereo-miked instruments, came to life with not only idealized EQ, but now with a bigger, wider and prettier soundstage. Stereo subgroups like drums gained significantly, too, with pinpoint internal imaging, better transients and smart, nimble EQ.

I tried Gullfoss on some live on-location gospel mixes I had recently completed, with interesting results. The usual improvements in frequency response, clarity and transient response were there, but I also noticed that a sense of the actual room came through better. I still remember how that choir sounded in that church, and I felt like I could sense that imaging and energy with more truthfulness. I am going to apply Gullfoss to my choir, drum and instrument subgroups (and mixes) in round two of this very project and preserve more of the concert's vibe.

I'm afraid I cannot explain how this works—it defies logic—but I can say that the CPU hit on my black-donut Mac Pro was minimal and I didn't even get a dropout when bypassing/engaging with my Digital Performer 9.51 DAW host. (Gullfoss buffers the audio even when in bypass.) Frankly, I'm rushing this review to press out of excitement, but I hope to find more operational limits over time and repeated experimentation.

Gullfoss is in an Early Access phase now, priced at \$99, but with limited online authorizations only. Once Early Access ends, the price will be \$199 for one offline activation and three online ones.

It appears we now have a growing crop of postmodern plug-in processors that can clearly exceed hardware limitations. I can sense resentment from some of you out there that AI (artificial intelligence) may ultimately spell the end for audio engineers. Gullfoss is not AI, however, just quite intelligent; it requires your experience to gauge severity, appropriateness and artistry. Fear not—it's like my colleague said when testing, "Don't worry, this isn't your enemy replacement. This is the ultimate assistant." Soundtheory.com



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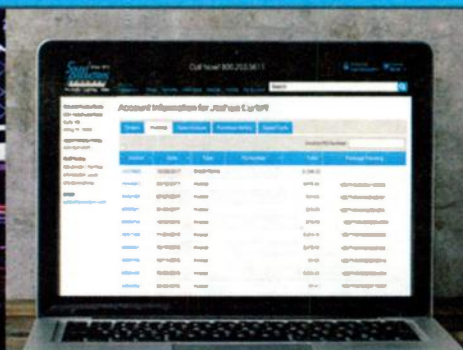
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## EVE AUDIO SC207 NEARFIELD MONITORS

There's nothing harder than accurately reviewing monitors; the disturbance to the most important link in our studio's audio chain, interaction with the room, breaking-in periods, the gradual familiarization necessary.... Lots of concerted effort is required for an effective review.

So I hope you can appreciate this unusual review of Eden's SC207 nearfield monitor, where I simply unboxed them, placed them (a bit inappropriately) atop my favorite Neumann KH310 three-way mid-fields and felt comfortable to mix on them in mere seconds! For me, in my well-tuned, nicely diffused basement studio, they just simply sounded right ... and continued to do so.

The SC207s employ Eve's 6.5" SilverCone honeycomb woofer, which is driven by a "copper cap magnet system," thrust by a 1.5" voice coil and delivers an impressive 44 Hz lower frequency response. A large, rectangular rear port (with no sharp edges, to reduce "chuffing") reportedly reduces bass distortion. A 100-watt PWM (pulse width modulation) amp drives the woofer, along with a 50-watt amp for the AMT (Air Motion Transformer) RS2 folded-ribbon tweeter. Together, 106 dB (SPL at 1 meter) is achieved.

DSP is a big part of many a modern, self-powered monitor's success, and the 207s offer three filter points for fine-tuning via a single ring-of-LEDs-paired knob—a low shelf at 300 Hz (range from -5 to +3 dB); a high shelf at 3 kHz (again from -5 to +3); and a "desk filter" (helps negate low-mid buildup from desktop reflection/

diffraction) that is quite interesting in its flexibility. This filter is at 80 Hz for boosting (up to +3) and positioned at 170 Hz for cutting (-5 dB max). The DSP section is fed by Burr-Brown A/D conversion at 192 kHz for accuracy and directly feeds the PWM amps without further conversion. You can find more details on Eve's website. A pair of SC207s will run you about \$1,400 per pair, street.

I'm quite familiar with the unique response of ribbon tweeters, especially from my previous reviews of ADAM Audio monitors—Eve's founder was a founder of ADAM as well—yet I was still unprepared for just how

natural these 207s sounded. That characteristic "extremely detailed, yet extremely smooth" ribbon tweet response massaged my ears with nicely balanced and imaged vocals, snare drums and midrange instruments—all strength areas for folded-ribbon designs.

Once I realized that I was hearing trustworthy and familiar midrange (Eve crosses over between woofer and tweet at 2,800 Hz—a little high but without much perceivable dip at the crossover point), I began to focus on the bass response. I had to check my eyes because I was seeing a 6.5" driver but I'd swear I was hearing an 8- or 10-incher. Allow me to stress this point: I was hearing nicely extended bass, with good consistency across the range, and it had the right "texture" (punchy, tight, defined) too. No "one-note bass syndrome" here!

After a week of getting acquainted, and while they were still mounted atop my Neumann three-ways, I began to try some DSP adjustments. At first the single knob seemed difficult to adjust, but once I grew accustomed to its multifunction ergonomics, I found it to be a pleasure to use. Half-dB adjustments gave me the finite accuracy I desired and proved to be adequate for room tuning. Now quite impressed, I moved the 207s into my hallowed mains position, proceeded to complete my EQ tweaks and get ready for work without my usual mains. (A little scary, I know, but it's all for you, my dear readers!) After much wrangling, all I adjusted was the desktop filter, with a slight 0.5 dB boost. I can see how the 170 Hz filter point could be quite use-

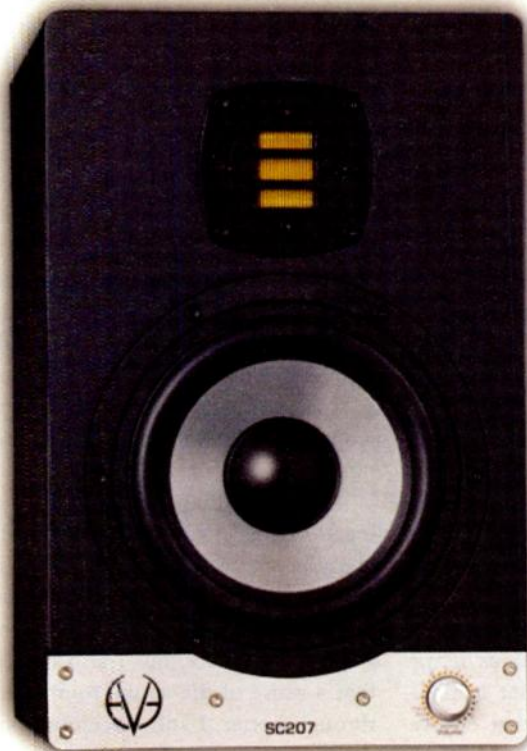
ful and I remain impressed that they sound so good and flat with only one small adjustment. Work went on successfully without disruption.

I have been reviewing gear since 2007, and although I am quick to find usefulness in most all products, I do not hand out superlatives easily, or engage in hype, or declare "best of class" without careful consideration. Despite this, I will still name these Eve 207s as the best ribbon-tweetered nearfields I've heard. They have excellent dynamics, flat response, great imaging, powerful bass reproduction, more even vertical and horizontal dispersion than typical for a folded-ribbon tweeter and, most of all, a relaxed, natural and trustworthy midrange reproduction that requires no decoding, learning or translating.

I tested the SC207s in my large control room, where they created enough SPL to please clients at the couch. Based on my current and previous experiences, I'd say these versatile little nearfields will excel at music production in smaller project studios, are excellent for "pure voice" VO and audiobook projects, provide an excellent alternate point of reference for big rooms, and would be a fine choice for production trucks and other location apps where this much quality sound in this small a package is indeed a very, very good thing.

These are mid-market-priced monitors with top-of-market performance, and I recommend them highly. Now I need to hear Eve's three-way 307s, four-way 407s and 3010 mains, because if the 207s can impress this much, these Berliners may really be on to something.

Eve-audio.com





## EVENTIDE H9 CONTROL ANDROID APP

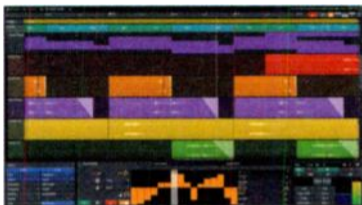
Eventide announced availability of the H9 Control app for Android devices, which allows users to wirelessly control the H9 Harmonizer Effects Processor stompbox family. The pedal is designed for studio and stage use, so when paired with an appropriate Android tablet or phone, the H9 Control app is used to manage parameters, presets and settings.



The app provides access to more than 500 presets, including delays, reverb, pitch-shifting, modulation and distortion. The Ribbon control allows users to manage multiple parameters and create new sounds. Pedal settings such as tuner, MIDI settings, routing and aux switch mappings are accessible, as is the editor librarian. Preset lists can be created using the drag-and-drop feature, and users can audition and purchase new effect algorithms via the built-in store. Compatible with Android 6+ (Marshmallow and newer), H9 Control is available for free via the Eventide website or the Google Play store.

## TRACKTION WAVEFORM 9 DAW

Tracktion Corp. has released Waveform 9, the latest edition of its long-running DAW. The update introduces a library of exclusive 24-track drum loop construction kits, which can be combined with a new Multi Sampler “one button” import/slice tool to slice and dice beats and rework them as the user sees fit.



The Multi Sampler Instrument helps users develop, create and build musical content without the need for presets. Used in conjunction with the multi-screen setups of the new Modular Mixing Tool, this aids users in customizing the interface to provide more control. Expanding on the capabilities of Waveform’s MIDI pattern generator, new features include a global chord track, a custom plug-in faceplate designer, macro parameters and track loops/presets. New modifiers and enhancements have also been made to the fully modular “rack” environment to encourage user experimentation.

## JÜNGER AUDIO AIXPRESSOR PLATFORM

Jünger Audio is launching AIXpressor, an audio processing platform that will first be embodied in the



AIXpressor hardware unit. Rather than being a single product, the unit acts as a base for software-defined products that are created using Jünger’s new Flexible Audio Infrastructure (flexAI). Users can customize the audio processing system to meet their needs for processing capabilities and channel count by buying additional software licenses. The system scales in terms of processing power; the system is equipped to cascade additional AIXpressors or servers whenever more processing power or media interfaces become necessary.

The AIXpressor unit is a 19” 1RU device is based on x86 processors and equipped with a range of built-in interfaces, including redundant Audio-over-IP with full compatibility to AES67 and SMPTE ST2110, USB host and client interfaces, as well as MADI, AES/EBU and analog I/Os.

## MXL/MARSHALL PODCASTING BUNDLES

Marshall Electronics and MXL Microphones have teamed up to create MXL Visual Podcasting Station (VPS) Bundles, which include MXL microphones, Marshall cameras and accessories. The two bundles—VPS Solo and VPS Duo—are configured with combinations of the MXL BCD-1 live broadcast microphone, MXL BCD-Stand articulated swivel arm mount, MXL Mic Mate Pro XLR-to-USB adapter, MXL USB Hub, Marshall CV502-U3 USB-powered POV camera with stock 2.3mm lens, and a CV-4706 6mm interchangeable lens.



MXL’s BCD-1 live broadcast dynamic microphone is a broadcasting mic

with hinged mic stand for easy handling, and built-in shock mount to negate vibrations and unwanted noise. Combined with MXL’s Mic Mate Pro audio interface, which converts XLR to USB, and the included MXL USB Hub, the VPS bundles provide users with everything needed to produce livestream video podcasts on a home computer or laptop.

## ANTELOPE AUDIO EDGE STRIP BUNDLE

Antelope Audio has shipped its EDGE Strip bundle, comprising the EDGE modeling microphone and specifically-designed Discrete MP discrete dual ultra-linear microphone preamp, aiming to emulate a locker full of vintage mics and rack full of outboard gear. The Discrete MP matches the frequency response of the EDGE, a large-diaphragm modeling microphone featuring dual edge-terminated capsules. The bundle includes free native-format Fusion AFX Pack plug-ins, with several microphone and preamp emulations alongside the BA 1073 EQ and STAY-LEVIN compressor.



On the microphone emulation side, offerings include Berlin 47 FT; Berlin 67, emulating a tube condenser microphone with cardioid, omni and figure-eight polar patterns; Berlin 87, intended for recording brass sections, guitars, overheads, piano, percussion, strings and vocals; and Tokyo 800T, a vintage tube mic for vocal recording. Other emulations include Antelope V76, Giraffe G9 and BAE 1073 MP preamp.

## BEYERDYNAMIC DRUM MIC PACKS

Beyerdynamic has revamped its TG Drum Set mic packs to create a varied line with numerous mic combinations, all of which include the new TG D71 boundary microphone. The new line of TG Drum Sets are available in four versions—PRO S, PRO M, PRO L and PRO XL—all of which come in soft carrying cases with protective molded foam padding and enough space for additional microphones. The microphone packages are appropriate for beginners and professionals alike. Beyerdynamic notes that while the sets now include the TG D71 boundary microphone, their retail prices have not increased.



## firstlook

### SOUND DEVICES MIXPRE-10M RECORDER

The MixPre-10M from Sound Devices is a portable 10-input/12-track recorder, mixer and USB audio interface with features including overdub, remix, reverb



and metronome. Aiming to provide the core functionality of a DAW, the MixPre-10M is intentionally simplified, according to the company, in order to ensure technology keeps out of the way of the creative process.

The unit sports eight balanced XLR/TRS combo mic/line level inputs (each with 96 dB of gain, 48V phantom power, low cut filters and limiters), a 3.5mm 2-channel aux/mic input, and four USB inputs from a Mac or PC. The MixPre-10M’s two balanced outputs, two unbalanced outputs, and stereo HP output can be configured to provide multiple monitoring options. It can simultaneously record, play back, mix, monitor, layer and overdub up to 12 tracks; it offers vintage reverb and vocal air effects, metronome, punch in and out, and the ability to locate to cue points.

There’s more information on all the products featured at [prosoundnetwork.com/archive/apr2018](http://prosoundnetwork.com/archive/apr2018).



## IO AUDIO TECHNOLOGIES AWG XLR CABLES

Io Audio Technologies has introduced a family of 3-pin XLR cables available in three grades: Premium, Professional and Performance. Available in standard lengths of 10, 25, 50 and 100 feet, these cables are designed to provide EMI resistance for low noise performance in a variety of applications. Its top-shelf cable is the 24 AWG Premium 3-pin XLR, which uses a 4-conductor design and sports two braided shields for protection against EMI. The conductors are made of stranded oxygen-free copper and are silver-plated with an eye toward improved conductivity. The 23 AWG Professional 3-pin XLR has two copper conductors with a braided copper shield, which allows the cable to maintain its shape while reportedly providing up to 97% coverage from EMI. The 24 AWG Performance 3-pin XLR has a PVC jacket to protect copper conductors and a copper spiral shield.



## FULCRUM ACOUSTIC CCX12 LINE

Fulcrum Acoustic has launched its CCX12 line of 12-inch subcardioid coaxial loudspeakers. While the original CCX1295 (90° x 45°) loudspeaker was announced last summer, it is now part of a full-fledged product line, expanded to offer various horn patterns. New models include the CCX1265 (60° x 45°), CCX1277 (75° x 75°), CCX1200 (100° x 100°) and CCX1226 (120° x 60°).



The CCX12 product family marks the first application of Fulcrum's Passive Cardioid Technology in its TQ Install line of installation loudspeakers. CCX12 loudspeakers reportedly provide 9 dB of low-frequency attenuation in the rear hemisphere without requiring additional cancellation drivers, amplifiers or signal processing channels. The speakers are suggested for use in foreground distributed systems, as well as for systems requiring targeted pattern control. Their trapezoidal shaped enclosures allow for mounting close to ceilings.

## ALLEN & HEATH SQ SERIES FIRMWARE UPDATE

Allen & Heath has introduced a firmware update for its SQ digital mixer series, with added support for the DX Hub, a hardware expansion hub that allows multiple DX168 stage box expanders to be connected to an SQ mixer. DX Hub enables SQ users to source 48 channels from the stage, all at 96 kHz, or to deploy up to eight portable expanders as required.



V1.2 adds two independent AMMs, based on the D-Classic algorithm. The AMMs are part of Allen & Heath's DEEP processing system and are said to have no latency. SQ can handle two simultaneous meetings with up to 24 mics each, or the AMMs can combine to manage a single conference with up to 48 channels. Other additions include Noo Phaser and Chorus RackFX units for the SQ FX library, new factory processing libraries, and the ability to change channel colors to speed up engineers' workflows.

## LD SYSTEMS CURV 500 TS COMPACT TOURING ARRAY

The CURV 500 TS compact touring array system has been released and is currently available from Adam Hall Group's LD Systems. The CURV 500 is intended for situations requiring particularly high sound pressure levels and a wide and long-range dispersion. Equipped with four array satellites—two duplex satellites with twin-speaker configuration and two single satellites—the CURV 500 TS has a narrower vertical dispersion. In conjunction with the lightweight 15" bass reflex Class D subwoofer with DSP control, the CURV 500 TS set includes a Gravity rod attachment and a 2.2 m speaker cable.



## firstlook

### YAMAHA RIVAGE PM7 CONSOLE

Yamaha Professional Audio has introduced the RIVAGE PM7 Digital Mixing System as a more portable counterpart to the RIVAGE PM10. The PM7 system is composed of the CSD-R7 Digital Mixing Console, TWINLANE-based RPi0622 and RPi0222 I/O Racks, and Dante-based Rio3224-D2 and Rio1608-D2 I/O Racks.



The CSD-R7 Digital Mixing Console is the same size as the RIVAGE PM10 system CS-R10 control surface and has the same panel layout. The DSP engine is built into the console. The desk sports 120 input channels, 60 mix buses, 24 matrices and 48 plug-ins. A Dual Console function also allows the CSD-R7 to be connected to one of the RIVAGE PM10 system control surfaces (CS-R10 or CS-R10-S). The CSD-R7 Digital Mixing Console offers connectivity with two types of audio networks—TWINLANE and Dante—allowing either or both to be used for connection and control of I/O Rack units.

## TASCAM MZ SERIES MIXERS

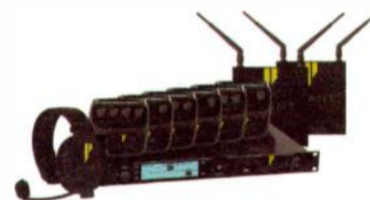
TASCAM has introduced a new line of rackmount analog mixers, kicking things off with the MZ-223 and MZ-372. The 2U rackmount TASCAM MZ-223 provides five audio channels, each with a



dedicated gain potentiometer and two stereo sets of RCA line-level inputs. Channels 1 and 2 can also accommodate phono-level signals for use with a turntable; two front-panel, balanced XLR inputs handle microphone signals. The 3U rackmount MZ-372 enables audio signals to be mixed, muted and routed to two redundant outputs or destinations. Each of its six audio channels has an independent volume control and features two stereo sets of unbalanced RCA line-level inputs and six balanced XLR mic/line (switchable) inputs on the rear panel, plus a mic-level XLR input on the front panel. Channels 1, 2 and 3 can be switched to accommodate phono-level signals for use with a turntable.

## PLIANT TECHNOLOGIES CREWCOM WIRELESS INTERCOM SYSTEM

Pliant Technologies is now shipping its wireless intercom system, CrewCom, said to offer high wireless user counts, range and scalability. CrewCom offers 1,024 conferences that provide the flexibility of a matrix/party line, but unlike a matrix-based architecture, CrewCom is based



on a decentralized platform that puts system resources where they are needed. CrewCom wireless products are available in 2.4 GHz and 900 MHz models. (900 MHz models are limited to locations where the band is legal.) Any combination of these frequency bands may be simultaneously used on the same CrewCom system, giving the ability to put RF coverage where needed while employing a consistent user interface throughout the system. CrewCom's graphical software, CrewWare, provides for offline configuration, online control and real-time monitoring of all system components. The software tools augment CrewCom's use and system scalability but are not required to operate the system.

## MARTIN AUDIO SXH218 HYBRID DOUBLE 18" SUBWOOFER

Martin Audio has introduced the SXH218, a hybrid passive subwoofer with two 4.5" coil, 18" drivers. Intended for use with Martin Audio's new WPC optimized line array in live applications and installations, the SXH218 is powered by either one channel of an iK42—from the company's iKON amplifier range—or, for full output, a bridged pair of channels. The subwoofer can reportedly hit a max SPL of 148 dB.



# T-Mobile 600 MHz Game Plan Gets Aggressive

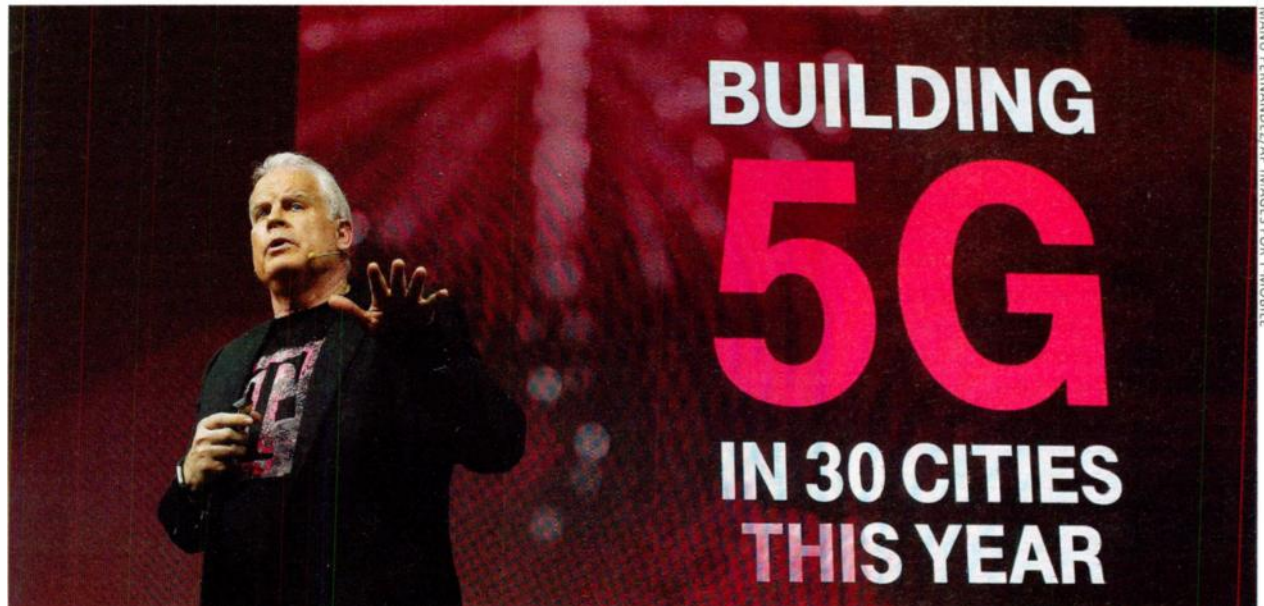
BY STEVE HARVEY

BELLEVUE, WA—At the Mobile World Congress in Barcelona, Spain, in late February, T-Mobile announced its plans to build out 5G service in 30 major U.S. cities this year, including New York, Los Angeles, Dallas and Las Vegas. In mid-March, the self-styled “Un-carrier” followed up with the announcement of an agreement to accelerate the repacking of NBC-owned station NBC 5/KXAS-TV’s 600 MHz spectrum in North Texas and surrounding areas.

The 30-city plan unveiled by T-Mobile in Barcelona was somewhat vague regarding the specific spectrum in which 5G would be deployed. In a blog, company CTO Neville Ray previously wrote, “In addition to the 600 MHz band, we have 200 MHz of spectrum in the 28/39 GHz bands covering nearly 100 million people in major metropolitan areas and an impressive volume of mid-band spectrum to deploy 5G in as well.”

However, this latest agreement does accelerate the rollout of T-Mobile’s services in the 600 MHz spectrum—or Band 71, as it is known in the telecom industry—to cities in North Texas, including Paris, Sulphur Springs, Tyler, Waco and Wichita Falls, as well as adjacent areas in Oklahoma, including Ardmore and Durant. According to the announcement, NBC 5/KXAS-TV, which serves the Dallas/Fort-Worth area, will move to its new frequency in late May 2018, more than one year earlier than the FCC’s scheduled deadline of June 21, 2019.

Licensed and unlicensed wireless audio equipment operators must vacate frequency spectrum in the 600 MHz band as soon as any of the new licensees who acquired bandwidth in



Chief Technology Officer Neville Ray details T-Mobile’s plans to build a nationwide 5G network in the U.S. at Mobile World Congress on Tuesday, Feb. 27, 2018 in Barcelona, Spain. The Un-carrier is building out 5G in 30 cities this year, with customers in New York, Los Angeles, Dallas and Las Vegas being the first to get it on 5G smartphones next year. (Manu Fernandez/AP Images for T-Mobile)

the FCC’s 2017 Incentive Auction announce an intention to begin using it, whether for testing or full-time services. The FCC may impose a fine of “\$10,000 per violation or per day of a continuing violation and \$75,000 per any single act or failure to act” on anyone who continues to operate in the relevant spectrum.

While T-Mobile’s 600 MHz Extended Range LTE network build-out initially targeted rural districts of the United States, the company is making good on its promise to blanket the nation by 2019 with these recent announcements that it will soon be lighting up in select major metro areas. At the beginning of this year, T-Mobile boasted that its 600 MHz services already covered 586 cities and towns, including major cities such as San Jose, CA; Jacksonville, FL; Seattle, WA; Louisville, KY; and Tucson and Mesa, AZ.

T-Mobile previously announced a

partnership with FOX Television Stations to assist with its spectrum repacking ahead of the FCC’s 10-phase plan. This and other previously announced agreements will reportedly expand T-Mobile’s potential market of 62 million living in the areas already cleared for Band 71 deployment by an additional 38 million people.

The partnership with FOX accelerates the relocation of WWOR-TV, located in New Jersey and serving New York City, by 16 months. According to a report on Spectrum Gateway’s website, T-Mobile will not have full access to its spectrum in metro New York until WRNN-TV—which entered a channel-sharing agreement with WWOR-TV in February 2018—relinquishes channel 48 after May 23, 2018.

In the wake of Hurricane Maria’s devastation of Puerto Rico’s infrastructure, the FCC granted T-Mobile’s request to speed up the transfer

of 600 MHz licenses from TV broadcasters to mobile operators on the island. The carrier acquired 50 MHz of Puerto Rico’s 600 MHz band spectrum in the auction.

The FCC had previously scheduled Puerto Rico’s TV stations to transition by June 21, 2019, and July 3, 2020. Under the new plan, the stations may transition to their post-auction channel assignments beginning Sept. 14, 2018.

The level of T-Mobile’s Band 71 activity will of course be dependent on how many of its customers have capable handsets. While the carrier has previously said that as many as one dozen different 600 MHz-enabled models should be on the market by the end of this year, it is currently offering just three: LG’s V30 and V30 Plus and Samsung’s Galaxy S8 Active.

T-Mobile: How Mobile Works  
howmobileworks.com



## FCC Changes Spark Wireless Mic Evolution

BY GLENN GREENBERG

For wireless microphone users, July 13, 2020, will mark the end of an era. On that date, by order of the Federal Communications Commission, wireless mics will no longer be allowed to operate in the 600 MHz service band. As manufacturers brace themselves for the change, they are offering advice on how to best use current technology—and urging users not to wait until the

last minute to get on the bandwagon.

“We’ve known about this transition for years,” says Karl Winkler, vice president of sales and service for Lectrosonics. “We’ve been investing a lot of R&D into product development, new products and updates to older products. There are new products in the UHF range and some in alternate frequency bands.”

Joe Ciaudelli, director of spectrum affairs for Sennheiser Innovation & Research, believes his company is

prepared. “I think we’re poised well to evolve and provide equipment for the new RF landscape,” he says. “My deeper concern is the understanding of a lot of end users.”

One potential issue, according to Ciaudelli, is the belief among many users that the current transition is like the one that happened in 2010, when wireless audio equipment was moved out of the 700 MHz band. “In 2010, there was a specific deadline,” he says. “The day before, we had one

channel configuration, and then the day after, it was clear what [the configuration was]. Whereas this is going to be a 10-phase transition over the next three years.”

Ciaudelli says he is aware of a misconception among many people that they have until the end of that 10-phase transition, which falls on July 13, 2020, to get with the program. “They think, ‘Okay, I have till then, and all my existing equipment

(continued on page 37)

# Gary Trenda on RF Intercom Trends

BY STEVE HARVEY

Having been chased out of the 700 MHz band some years ago by the advent of DTV broadcasting, and now having to make way for the new telecom licensees in the 600 MHz band as they begin their services, equipment providers and frequency coordinators for major events are faced with a spectrum crunch. Now, and in the foreseeable future, that means that RF professionals will most likely need to deploy a patchwork of wireless microphone and in-ear solutions at large-scale sports, entertainment and other events—and that goes double for wireless intercoms.

Comms frequencies far outnumber the wireless mic and in-ear channels at major events like the Super Bowl and televised awards shows—events that employ Gary Trenda, an RF technician with Orlando, FL-based Professional Wireless Systems. But while wireless mic and IEM setups are typically operated in the so-called beachfront property of the low-band UHF spectrum, comms products have increasingly moved up the spectrum.

Trenda was the lead RF intercom technician this year for the Latin Grammy Awards, held at the Grand Garden Arena at the MGM Grand Hotel & Casino in Las Vegas. He says, “We had three—four, if you count the red carpet—different intercom systems. We had close to 80 users on wireless intercoms. To get that many people on a wire-



Professional Wireless Systems' team at the 18th Latin Grammy Awards included (l-r): Jordan Smith, Dave Nichols, Jason Lambert, Tim Kepner and Gary Trenda.

less intercom system, you reach the limitations of the various systems.” With the available UHF TV channel bandwidth shrinking, he comments, “People are looking for where else they can locate these systems.”

For example, he says, Clear-Com's FreeSpeak II system, which operates in the license-free 1.9 GHz DECT band, maxes out at about 25 people. It is also available in a version that operates on the 2.4 GHz ISM band (which is also occupied by Wi-Fi) that supports a larger number of users. Riedel's Bolero can handle 50 users, but there are some practical limitations, says Trenda. At the Latin Grammys, PWS also used a Radio Active Design (RAD) system, which utilizes both UHF and VHF, and some older Telex BTR 800 UHF systems, he reports.

“To get enough people onto wireless intercom, you're using a vari-

ety of different systems,” he says. “We could put, let's say, 28 people on RADs and another 25 people on FreeSpeaks, then some on Telex BTRs.”

Going into an event, there are several things to consider, says Trenda. For instance, “We're trying to cover a wider area than you typically would with microphones and ear monitors. A lot of the wireless intercom coverage needs to be a good chunk of the entire venue in which the show is happening.”

Not all systems work the same, either. “The coverage requirements for setting up antennas for a RAD system, with UHF and VHF antennas, is very different than, for example, a Clear-Com FreeSpeak, where the antennas are essentially a Cat 5 connection—but you only get five users connected to each individual antenna, so you end up building a small cellular telephone-style distribution system all around a venue.”

At a recent show, Trenda had two technicians for an entire day just running antennas. “We put up over a dozen antennas all around the Amer-

ican Airlines Center in Miami. You're talking about one full load-in day just for antennas and cabling.”

Operators need to select a system that best meets a specific application—in addition to spectral efficiency, of course. “There are certain restrictions to what you can do in the 1.9 MHz DECT band versus what you are doing in 2.4 GHz, which is an ISM band,” he says. The RAD system uses AM, while DECT equipment communicates between the beltback and base station digitally; the respective propagation characteristics need to be considered.

In the future, operators will need to use a variety of products and solutions appropriate to each application, and it's entirely possible that a touring production might need to travel with multiple solutions to handle variable conditions. “If you were thinking of using a Pliant or a Tempest wireless intercom system that operates in 900 MHz ISM, that works very well in some venues, but it may not be the best solution in others,” says Trenda.

One of the larger challenges, he says, is building these different systems, which all operate differently, into a cohesive setup that works reliably and can offer access to everyone who needs it. “If you already own a Clear-Com matrix frame, the way that a FreeSpeak intercom will integrate into that matrix frame is different than how a Riedel Bolero integrates with their own matrix frame, versus tying a Clear-Com system in with, say, an RTS system,” he says.

“Our challenge as technicians is knowing how to make these systems all work well and get the coverage that we need with the number of users that these shows are asking for. I enjoy the challenge of it,” he says. “It's been fun to see all of the changes that have happened with the different intercom systems.”

Professional Wireless Systems  
professionalwireless.com



Riedel Bolero Beltpack



Clear-Com FreeSpeak  
Beltpack



Pliant Technologies CrewCom Radio Packs



Radio Active Designs UV-16

## FCC

(continued from page 35)

will work as is, and I have years to figure this out,” he says. “They really don’t. July 13, 2020, is the final deadline before the new regulations for wireless microphone equipment come into play.”

When a mobile broadband carrier that has purchased a license for some of the 600 MHz spectrum begins service on those frequencies, wireless mics must leave—and in some cases, that is happening much sooner than the general deadline.

“The big winner of the 600 MHz auction was T-Mobile, primarily,” according to Mark Brunner, vice president of global corporate and government relations at Shure. “And T-Mobile has put together quite an aggressive schedule to try to move into the newly-purchased auction spectrum, and that is riding alongside the 10-phase plan by the FCC to transition the broadcasters to their new channel assignments, which are further down on the UHF TV band.”

Ciaudelli says the key point for users is that they should not wait three years to transition. “They should do it now,” he says.

Brunner advises users that if they have wireless mics with the ability to tune above 614 MHz, those systems are at risk. “It’s important to know what channels will be available, so look at what the final TV map is going to look like at the end of the transition when making purchasing decisions for replacing equipment,” he says.

Winkler says that Lectrosonics, Sennheiser, Shure, Audio-Technica and other manufacturers have “stepped up” by offering rebate and trade-in programs for users with gear that needs to be replaced. “Unfortunately, unlike some other countries, our pro audio industry and the users and owners of wireless microphones are not receiving any of the proceeds from the [FCC] auctions,” he explains. “The users and the manufacturers have to bear the costs of the transition. It was the same in 2010.” Through the rebate and trade-in programs, Winkler says, the manufacturers and users share the costs.

Naturally, manufacturers are developing new equipment to support the transition. Several products are available now. Lectrosonics introduced its Duet wireless monitor system last year. Shure offers the Axient Digital system, as well as the ULX-D



Joe Ciaudelli, Sennheiser

and QLX-D systems. Sennheiser has its recently updated Digital 6000 system, and its SK 5212 bodypack transmitter, SKM 52000 handheld transmitter and EM 3732-II receiver were produced to work within ranges that have been opened up to wireless microphones, specifically 941.5 to 960 MHz.

Ciaudelli says the 941.5 to 960 MHz range is particularly good for licensed operators who have used all the available UHF TV spectrum within their area. “They’re losing some channels up in the 600 MHz range, but this is a great alternative,” he says.

Winkler also notes the overcrowding of the standard UHF band that the industry has used for decades. Years ago, he explains, VHF was relatively crowded and UHF was relatively open. Now the reverse is true. “The issue is the pressure to keep wireless channels working and do the kinds of productions that we see today, that are very wireless-heavy,” he says. “We’ve got to find spectrum somewhere. Now VHF looks more attractive again because there’s some spectrum left there.”

Brunner agrees. “VHF—the low portion of the TV band—is in vogue again,” he says. “There are open channels down there. [Shure] is offering a lot of our higher-tier product line in VHF, as well.”

However, Ciaudelli advises users that, for now, they should stick with the UHF TV band. “It’s still a great place to operate wireless mics if there are available channels,” he says. “Use them!”

According to Brunner, UHF is still preferred by the touring and broadcast industries. “UHF is kind of a sweet spot for the range of the signal and the ability to have known interference-free blocks, meaning vacant TV channels,” he says. “The goal is to keep UHF for the high-money applications, because that’s what pros need to do their productions successfully.”

Within the next couple of years, Ciaudelli says, users will also see equipment for the 1,435 to 1,525 MHz band: “That band is designed for power users—audio engineers who are staging mega-events like the Academy Awards or the Super Bowl.” In the past, wireless mic operators had

to request special authorization from the FCC to use that band for such “mega-events.” Now, approvals are overseen by the Aerospace & Flight Test Radio Coordinating Council (AFTRCC), a not-for-profit organization of radio frequency management representatives from major aerospace companies. According to its website, AFTRCC is the only organization dedicated to protecting radio frequencies for aerospace test and evaluation.

“The 1,435 to 1,525 MHz band is used for flight training, so access to the band [for wireless mic operators] needs to be coordinated,” Ciaudelli says.

For users who think they won’t get caught if they keep operating wireless mics, in-ear monitors and other devices in the 600 MHz range—think again.

Ciaudelli says it’s unlikely that the FCC itself will actively police the frequencies, but the companies that paid to use the spectrum most certainly will. “If they find something that’s using the spectrum that they paid billions of dollars for, they’re likely to pick up the phone and call the FCC. And the FCC is obligated to respond,” he says.

Users who continue to operate on the frequencies after they’ve been warned to stop doing so may be subject to hefty fines. Citing the new regulations, Brunner says, “It is the obligation of the wireless microphone operator not to interfere with licensed services once they go on the air. ‘Licensed services’ in these cases would be referring to the mobile broadband providers.” So how can a user know whether T-Mobile has lit up in his or her area? “Fortunately,” Brunner says, “most of today’s modern wireless systems have a scan function to help people find a clear channel. We advise people to scan early and often.”

Winkler says the most likely scenario for users is that their systems just won’t work anymore “because there’s a new data service transmission on your frequency. T-Mobile is turning on services now in the United States and testing and putting out their schedules.”

Which raises the question of whether manufacturers and end users

will face the same situation in the future, with similar FCC auctions limiting even more spectrum and rendering equipment useless within just a few years. “That is always a specter hanging over us, and I think it’s very difficult to look past a five-year horizon anymore,” Winkler says.

“There are no long-term guarantees,” Brunner acknowledges. “However, it’s probably more likely that future spectrum for mobile broadband will be outside of the TV band. This industry has now undergone two pretty big transitions of TV spectrum, and it’s likely to stay stable for the next several years.”

Ciaudelli agrees. “I cannot see any major reallocation of the remaining UHF TV band for at least a decade,” he says. “We have to keep in mind that this 600 MHz auction was successful, but it did not generate as much demand—and it did

not repurpose as much spectrum—as the FCC tried to do.”

Ciaudelli notes that Europe and the rest of the world are not planning to reallocate and repurpose the 600 MHz range. “North America tried to push it to the rest of the world at the World Radiocommunication Conference in 2015, and the rest of the world flatly re-

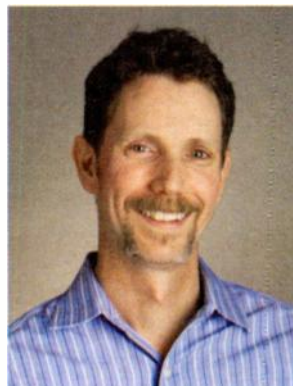
jected it,” he says. “They’ll discuss it again at the WRC in 2023, but even if anything is acted upon there, nothing will really happen until 2027. So for the next 10 years, we know the rest of the world isn’t going to reallocate the 600 MHz band.”

But while the auction is over, Ciaudelli stresses that an important issue is still pending involving what is called the Reserved Channel Proceeding. It proposes the reservation of one vacant UHF TV channel in every geographic area of the country for use by unlicensed wireless microphones and white space devices.

“Licensed mic operators could reserve the channel during the times of their productions,” Ciaudelli explains. “It would basically be an oasis, a safe harbor, for wireless microphones to operate in. The FCC issued a Notice of Proposed Rulemaking—this was a few years ago [2015]—and they have yet to make a final ruling on that. Now we’re under new leadership and they may not appreciate the importance of ratifying this rulemaking that was initiated by the former FCC leadership. So I highly encourage readers to write to the FCC and to reinforce that the FCC should ratify it.”



Mark Brunner, Shure



Karl Winkler, Lectrosonics

## SOJA Soldiers On Around The World

BY KEITH YOUNG

PORT CHESTER, NY—Together since high school, SOJA has spent the last two decades touring the world, bringing its roots reggae music to the masses. Dedication to the craft has helped the band garner 7 million online followers, rack up more than 300 million YouTube views and land two Grammy nominations in the process. Currently on the road supporting its new *Poetry In Motion* album (ATO Records), SOJA is just as likely to be in the air, heading to South America and Europe, where it tours as frequently as the United States. As a result, the group averages 120 shows a year, and that's probably a low figure, says veteran FOH engineer Michael Versteegt.

Grabbing a bite before showtime at The Capitol Theater in Port Chester, NY, Versteegt jokingly shared a benefit of the band's widespread fanbase: "A band like this has found popularity around the world, so there's a lot of markets they can play—they can go to South America and play summertime there, which is December, January, so you get to



Michael Versteegt mixes SOJA on the band's Midas Pro2 console, using a Strymon El Capistan dTape Echo guitar pedal (at left) for dub effects.

go from summer in one place to another."

In truth, however, mixing the band not only keeps Versteegt on the move, but also on his toes: "It's a lot of dynamic mixing because they have elements of rock 'n' roll, Latin, D.C. go-go funk, and you have to mix it per the style. With the Latin music,

you want to emphasize the percussion and the horns; rock 'n' roll is going to be a lot of guitars; go-go is very percussion-driven, so that's a lot of dynamic mixing to move from one style to the next. You can't leave the faders flat and let it mix itself; you really have to keep on top of it."

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## David Bowie Is Installation Explores Artist's Touring, Recording Life

BY CLIVE YOUNG

BROOKLYN, NY—After traveling the world for the last five years, the massive retrospective *David Bowie Is* is taking its final bow in New York City at the Brooklyn Museum. Running through July 15, the exhibition pres-

ents more than 500 artifacts from the rock star's 50-year career, including outrageous costumes, drawings, paintings, tour set dioramas, movie props, favorite books, instruments and audio and video footage.

The touring exhibition originated at London's Victoria and Albert Mu-

seum; as Victoria Broackes, senior curator, theater and performance at the V&A, explained, "We aimed to create an exhibition that is crucially about inspiration, process and impact. It's not a chronological review of Bowie's life, but a thematic one, exploring the creative processes of Bowie as a musical innovator and cultural icon, and tracing his shifting style of sustained reinvention over five decades."

As a result, the exhibition largely steers clear of Bowie's sometimes tumultuous personal life (a rare exception: a small item, labeled "Cocaine Spoon, 1976"), opting instead to delve into the artist's time in the studio and his work as a performer.

Bowie's performing life is illustrated via the many wild costumes he wore for TV appearances and music videos, but other times it's presented more subtly, such as by an itinerary page from the 1973 *Aladdin Sane* U.S. tour. Bowie was notoriously fearful of flying, so the production traveled via train, as the schedule notes; added at the bottom: "After

(continued on page 42)



The *David Bowie Is* exhibition explores the artist's creative life.

### briefs

#### Topgolf Opens Nashville Venue

NASHVILLE, TN—Topgolf recently opened a 600-seat concert hall in Nashville with a system of Nexo and Yamaha (yamahaca.com) gear, including 10 Geo S1210s, two 1230s, six LS18s, four Nexo ID24 front fills, six monitor mixes of 45-N12s, PS15 speakers over an LS600 for drum fill and Yamaha SWP1 L2 switches for the Dante network.

#### Snoop Dogg Prowls with A&H

NEW YORK, NY—Snoop Dogg is always on the road, and recent swings through the southwest and West Coast found his monitor engineer, Freddie Johns III, mixing on an Allen & Heath (allen-heath.com) dLive S Class S5000 Surface with DM64 MixRack. Johns noted, "I have the Dyn8 dynamic EQ on the vocal, and I really like that multiband compressor, too. Snoop says it makes him sound like himself."

#### Blondie Calls Up Monitors

NEW YORK, NY—Blondie's production manager/monitor engineer Robert Nelson recently put the band on Clair Brothers (clairbrothers.com) 1AM+ monitors. Frontwoman Debbie Harry hears herself via two 1AM+ monitors, while other members get a single 1AM+, and the drummer's 1AM+ is paired with a kiT-Sub+ 18-inch subwoofer.

#### Van Damme Gets Festive

AUSTIN, TX—Nomad Sound has been using UK-manufactured Van Damme (fingerprinaudio.com) Black Series Tour Grade cable, which features fine-stranded ultra-pure copper and an anti-kink core, for its PAs on festivals like Levitation, SXSW, Old Settler's Music Festival, Riot Fest, WanderLust and others.

#### PayPal Picks Renkus Heinz

NEW YORK, NY—Online payment platform PayPal has opened an outpost in New York City. Housed in a 1911-vintage building in the West Village, the PayPal offices enclose an interior auditorium, "Central Park," which sports a pair of Renkus-Heinz (renkus-heinz.com) ICONYX IC Live Gen5 digitally steerable line arrays.

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## Gimmie a Beat: The Sound of Janet Jackson's Tour

BY CLIVE YOUNG

BROOKLYN, NY—Dance pop hits tend to be ephemeral things—quick musical bursts of good times that usually leave the artist forever defined (and trapped) by that era and sound. But standing in the crowd at Barclays Center in Brooklyn, NY, one evening in early winter, it was clear that Janet Jackson didn't get the memo. As she knocked out hit after hit to the sold-out crowd, it was a not-so-subtle reminder of just how long and far-reaching her career has been. When you bring all those smashes together for a 40-plus song set, it's suddenly easy to spot a career-spanning throughline of razor-sharp production and lyrics charting politics both societal and personal, and see how she's made them her trademarks. More importantly, even after three decades for some of those hits, the songs still accomplish their ultimate goal: They make you dance.

Bringing those tunes to the crowd each night was FOH engineer Kyle Hamilton, who's spent the last 24 years mixing the likes of Pharrell Williams, Kendrick Lamar, Prince, Lionel Richie, Mary J. Blige and Rihanna, to name just a few. Manning a DiGiCo SD7, Hamilton spent each show re-creating the massive '80s production of Jackson's early hits and the smoother but no less meticulous sounds of chart-toppers from more recent times. That's no accident: "When [producers] Jimmy Jam and Terry Lewis are standing right next to me, they want to hear their record! When I give Janet her two-mix of the night, she wants to hear her record—with a live feel, of course. All those signature sounds, the little things that put you back into the moment when you first heard that record? That's what we strive to do, night in and night out."

That's a tall order, given Jam and Lewis' impeccable production, but it was a challenge that the whole team focused on: "You have to keep it sounding true to then," said Hamilton. "Even with drum triggers, they're the actual sound; nothing is re-created. An '80s snare, a mid-'90s snare, a '90s kick? They have their own texture and timbre, so we don't try to re-create that; we strip that out, edit it up and make that sound."

To deliver all that sonic information, the show had 32 channels of Pro Tools supplementing the nine musicians onstage, giving Hamilton an abundance of material to work with: "We have about 110 inputs to-



Kyle Hamilton, seen here at Brooklyn's Barclays Center, has mixed Janet Jackson's tours for the last eight years, most recently on a DiGiCo SD7 console.

tal; it's a lot of music from Pro Tools and the band, so to make that merger come to life, we have a lot of separation. Stems can't be all merged together, so I spread everything out like you would the record so that we can bring the balance back to life—because everything that sounds good in-ear or in a nearfield situation may not translate out here in the house."

That workflow, in turn, altered his mixing style for the tour. While as adept with popular plug-ins as the next guy, Hamilton largely eschews them for Jackson tours for the simple reason that much of the material has already been effected. "At the end of the day, this house is a big reverb chamber, so when he hits the snare, I don't have to add it—we're already there!" he said with a laugh. "For me to do it twice would be overkill, and it takes away from the trueness of the music. OK, you used a plug-in to make a great recording, capture a moment and it's printed onto that stem. That moment's already done, so what am I going to do at 102 to 105 dB? If I do the same thing, it's not going to translate, right? It'll sound like you've added delay, added latency on something. You start to change what the sound really was."

Make no mistake—the musicians onstage generated plenty of sound on their own, with Jackson's vocal captured alternately via a Sennheiser 2000 Series handheld wireless with a 5235 capsule or a Sennheiser HSP 4 headset mic. "She's soft-spoken, but she has great mic technique; she knows when to dig in," said Hamilton. "I also run her through Avalons

to give her that feel of the studio vocal. Sometimes stuff has a tendency to feel a little distant, so that's my trick to bring it to the forefront—that makes it sound nice and tight and in your face."

"In your face" is key, especially with dance music, so Hamilton had

22 mics on the drum kit alone: "I do close miking; I don't have overhead mics in the stratosphere. Because of the era of the music, we have enough reverb on everything, so we want our pulse to be nice and tight. The gates are real tight on my drums—almost

(continued on page 48)

## VITALstats

## Janet Jackson

Clair Global (LITEZ, PA)

## FOH Engineer:

Kyle Hamilton

## Monitor Engineer:

Jim Roach

## Crew Chief/System

## Engineer:

Matt Van Hook

## Systems 1:

Eric Ruiz, Carlos Lopez Olavarria

## Systems 2:

Brad Galvin, Jim Miller

## FOH Console:

DiGiCo SD7

## Monitor Console:

DiGiCo SD7

## House Speakers:

Clair Cohesion CO-12, CP218 sub, I-3, P2

## Monitor Speakers:

Clair Cohesion CM22 wedges, CO-12 sidefills, CP118 drum subs

## Personal Monitors:

JH Audio

## House Amplifiers:

Lab.gruppen

## Monitor Amplifiers:

Lab.gruppen

## FOH Equipment/Plug-Ins:

Waves SoundGrid Extreme Server, Mercury bundle; Avalon VT-747, VT-737 SP; Lake LM44

## Monitor Equipment/Plug-Ins:

Shure Axient; Sennheiser EM3732-II, SR2050XP, Shure ULXD4D, UA845-SWB; Logitek Pre-10M cueing system; DiGiGrid MGB-P multitrack converter box

## Microphones:

Lewitt MTP440DM, LCT-340, 340TT, DTP340TT, LCT550, LCT640; Sennheiser e901, e906, MKH-416, 2000 Series handheld wireless with 5235 capsule, HSP 4 headset; DPA 4099; Royer R-121; Shure SM58, KSM-9, SM58; Radial JDI, Hotshot; Heil PR-35



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## SOJA

*(continued from page 38)*

As an added bonus, he gets an opportunity to perform with his mix thanks to the band's proclivity for dub music. "Reggae involves a lot of dubbing," Versteegt explained. "You can throw in effects, and it gives you a lot of play to create your own soundscape, which is always a lot of fun. They give me a lot of freedom with the dubbing, so it's something I do just about every night. I have certain parts that I do, but it's not always the same. I might improvise if I feel that something needs to be changed."

"Phasers, reverbs and delays are the go-to effects," he added. "You have a big reverb on the snare usually, and phasers are a typical effect used in dub—Lee 'Scratch' Perry would

run reverbs through phasers and hi-hats and things like that. It's also a common thing to use guitar pedals as delay effects in dub, so I have a Strymon El Capistan dTape Echo guitar pedal. It used to be people would use the Boss RE-20 Space Echo, and I've used the Line 6 delay, but I like the El Capistan. It emulates a tape delay pretty well, has some ring reverb effects on it as well, and it's handy to have actual knobs there because you're regenerating sound on the fly—stuff you really can't do that well on a digital console."

The eight-piece band fills up 40 inputs on its Midas Pro2 digital console when touring the U.S., but picks up local Avid Venue Profiles when overseas. Versteegt eschews outboard gear other than the Strymon pedal, but he is now venturing into the world of plug-ins: "We have a laptop that we use for mul-

titracking the shows, and now I'm starting to get into plug-in hosts like Waves MultiRack and LiveProfessor by AudioStrom to bring in effects that you can't typically use on the Midas console." The band carries its own control gear, cabling and miking, the latter a varied selection of Shures, Sennheisers, Mikttek, Heil and AMT microphones and Radial DIs.

This summer, the band's heavy schedule will find it playing festivals as far ranging as Bottlerock in California's Napa Valley; Summerjam in Cologne, Germany; and Reggae Sun Ska Festival in Vertheuil, France. That far-flung fanbase is no accident, as the band makes a point of speaking to audiences in their native tongues, recording songs with guest vocalists like Collie Buddz and Damian Marley, and welcoming regional stars on stage—Marcelo Falcão of O Rappa has sat in with the band in Brazil

and likewise Balik from Danakil in France.

SOJA's international presence has made the last two years a personally satisfying experience for Versteegt. "If you go outside the major cities in Brazil or France, people don't speak English—and I'm fine with that. I can speak Portuguese, Spanish and French pretty well, and that goes a long way. Being able to communicate not only technically but also vibewise shows that you really take an interest in their culture and you're not just an English-speaking American. They give you really nice treatment and want the best for your show, too. One of my favorite things about touring with SOJA is visiting different countries and learning, which is one of my passions. It's not just work, it's learning."

SOJA  
Sojamusic.com

## David Bowie Is

*(continued from page 38)*

Denver we cannot continue by rail as whatever trains there are don't run on the days we (sic) need them. We will therefore go by Caravan-truck, or covered wagons or Pegasus-drawn chariots."

Bowie's studio days are also intriguingly represented, most often via choice instruments. Visitors can spot his Dubreq Stylophone, a miniature analog synth with a metal keyboard played with a stylus; introduced to the instrument by T. Rex's Marc Bolan, Bowie used it on his breakthrough hit, "Space Oddity."

Later in the exhibit, the Koto played on "Moss Garden" from *Heroes* sits next to a 1974 EMS AKS Synthi synthesizer used in the recording of *Low*, "Heroes" and *Lodger*. Its original owner, Brian Eno, gifted it to Bowie in 1999 with a note: "Look after it. Patch it up in strange ways—it's surprising that it can still make noises that nothing else can make." Bowie soon put it to work on 2002's *Heathen* album.

Elsewhere, there's an invoice from producer Gus Dudgeon for the string session behind "Space Oddity," 85 handwritten lyric sheets with plenty of notes and crossed-out lines that didn't make the final cut, and some video commentary from legendary producer/collaborator Tony Visconti—who, it should be noted, will give a lecture at the museum on April 5 at 7 p.m. Tickets start at \$25.

As it has throughout the exhibition's tour, Sennheiser and its audio gear play a vital role, with the company's headphone-based Guide-

PORT systems used to immerse visitors in music and interviews, all synchronized to specific exhibits, video screens and more. For the New York stop, said Stefanie Reichert, director of retail trade marketing/lifestyle business development for Sennheiser USA, the GuidePORT systems' headphones were upgraded, allowing visitors to hear the show through premium consumer HD-1 headphones.

Separate from the GuidePORT system, Sennheiser also created the high point of the exhibition: a large, immersive AMBEO 9.1 audio space in which visitors are surrounded on three sides by giant video screens presenting concert footage from different eras of Bowie's career.

The Brooklyn Museum edition features an expanded AMBEO experience, according to Robert Genereux, research and innovation, Sennheiser, who designed and oversaw installation of the exhibition's audio technology at every museum: "For New York, we said, 'We want to make it bigger and better,' so instead of three songs as we did for everywhere else, it's six songs that are mixed with the AMBEO technology. Because the original recordings were not 3D, Gregor Zielinski took the original mono and stereo files and made this magic, creating an immersive experience using studio processing for the upmix. Now you feel immersed, like in the crowd, and that's what we want to have people



Robert Genereux created the Sennheiser GuidePORT layout for the retrospective.

of. I'm not the only one; others are doing their work at the same time, like lighting and video players, and everyone is moving forward together."

When *David Bowie Is* debuted at the V&A in London, its namesake was still alive. (He never visited the exhibition, though we're told unofficially that he nearly saw it at Chicago's Museum of Contemporary Art in September 2014.) As it happens, since the tour began in 2013, GuidePORT has reached its end, too, as some of the components comprising the technology have since been discontinued by Sennheiser's suppliers. Will GuidePORT have a successor? Sennheiser officials have no answer,

but the systems remain in use

on other rock-oriented V&A touring exhibitions, including *Pink Floyd: Their Mortal Remains* and *You Say You Want a Revolution? Records and Rebels 1966-1970*; and Sennheiser has been tapped to be part of another one currently in development. For now, Genereux remains sanguine about the turn of events: "Our goal is not necessarily to sell GuidePORT, but to promote the expertise of Sennheiser and our 3D audio work like AMBEO. It shows our expertise."

Brooklyn Museum  
brooklynmuseum.org  
Sennheiser USA  
sennheiser.com

While each museum installation required Genereux to be on site for three weeks before opening, "By the time one venue opens, I'm already at work on the next one," he said. "The zoning is custom-made for each museum because every location has a new design. The system can affect the exhibition, too, because it can do things that no other system can do, so this influenced how they lay out exhibits. The design takes place before we get there because it has to be integrated into the drawings and the design of the museum, [taking into consideration] AV integration, power sources and everything you can think



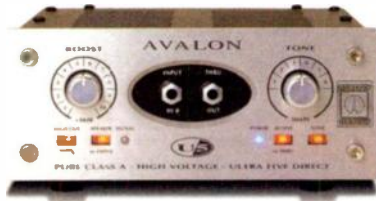
# Diving into DI Units

BY AL FERNALD

The “I” in DI Unit is variously said to stand for *input*, or *injection*, or *induction* or *interface*. If that seems like a lot of variation on a basic theme, it’s quite fitting because there’s seemingly endless variations on the units themselves, and not merely between brands. Whether you’re looking for active or passive, something for your bass or for your laptop, whether for the studio or for the stage, there’s a specialized DI out there that will suit your needs. Here’s a brief rundown of just a handful of available DI models, drawing from all different kinds across the market.

## AVALON U5 MONO INSTRUMENT & DI PREAMP

If you’re judged by the company you keep, the U5 keeps good company—we spotted at least a half-dozen of them around the stage on Paul McCartney’s last tour. Intended for bass guitar and acoustic instruments, electric guitars, keyboards, synthesizers and low-output pickups, the unit offers a high-input impedance input stage for reportedly zero load effect on sensitive pickups and keyboards, and 100 percent discrete, Class A signal amplifiers. A half-dozen passive tone-EQ curves are included to accommodate various acoustic and electric instruments; a high-cut switch eliminates unwanted acoustic pickup and high-frequency noise; and a ground isolation switch eliminates potential earth loop and AC buzz problems.



## BAE PDIS 2-CHANNEL DI

Introduced at last year’s AES Convention, BAE’s PDIS is a passive DI stereo box that utilizes an OEP/Carnhill transformer and Neutrik connectors, sporting 1/4” inputs and low-impedance XLR outputs for each channel on one side, while a pair of through outputs for each channel can be found on the reverse side. The PDIS can be used as a DI for stereo instruments, or act as two independent, separate instrument DI channels for separate mono instruments. The PDIS is hand-wired in California and has 100 percent through-hole components.



## COUNTRYMAN TYPE 85 ACTIVE DI

A staple of the industry, the Type 85 connects a high-impedance instrument pickup to a balanced XLR mic input. Because it’s active (i.e., powered), the box runs on 48V phantom power, but if that’s not available, you can still use the unit with a 9V battery, which should last for roughly 400 hours. Countryman says it uses only hand-selected, high-quality discrete components to create the Type 85’s single-ended Class A circuit. Keeping it simple, there’s no roll-off switches or effects, leaving frequency decisions to the engineers instead.



## MACKIE MDB SERIES DIS

The newest offerings on this list, Mackie’s MDB Series debuted at this year’s NAMM Show. The line consists of four models: the MDB-1P passive DI, the MDB-2P passive stereo DI, the MDB-1A active DI and the MDB-USB stereo DI. The 1P and 2P both offer a high-impedance 1/4” input with Thru output, a balanced male XLR output connector with ground lift, and a -15 dB pad for connecting to high-output sources. The 1A, intended for instruments like guitars and basses with active pickups and preamps, offers increased headroom, a -20 dB pad and a Merge switch that turns the Thru jack into a second input. The USB stereo DI brings audio from a computer into analog gear, offering output level control, headphone output, mono sum and dual XLR analog outputs with ground lift.



## RADIAL JDI PASSIVE DIRECT BOX

An industry standard if ever there was one, the JDI is a passive direct box equipped with a Jensen audio transformer to handle high-to-low impedance conversion and signal balancing at the same time. The transformer also uses a magnetic bridge that passes signal while rejecting stray DC voltage, helping the unit eliminate hum and buzz caused by ground loops. Some of the JDI’s features include input and throughput 1/4” connectors, a -15 dB input pad, and 180° polarity reverse to help phase-align the instrument with the PA. A secondary circuit is added for direct interfacing with high-output devices, and a Merge function sums stereo sources to mono.



## RAPCOHORIZON DBBLOX DIRECT BOX

As a one-channel passive instrument direct box, the DBBLOX is diminutive in size but gets the job done handily. Roughly 3 1/2” x 1 1/4” x 1”, the DBBLOX converts a high-impedance source to a low-impedance load. The unit sports a 1/4” input, an XLR male output and a DBT Transformer. For those who need to head the other way around, the DBBLOXF version can be used to convert a low-impedance source to high-impedance load, with an XLR female input and 1/4” output.



## RUPERT NEVE DESIGNS RNDI STEREO ACTIVE TRANSFORMER DIRECT BOX

Rupert Neve has designed some of the most legendary studio gear in existence, so it’s no surprise that the RNDI has its fans. The unit’s sound is based around custom Rupert Neve-designed transformers, and Class A biased, discrete FET amplifiers, powered by 48V phantom power on the XLR connection, creating high-impedance input of 2 megohm. RND claims there is no crossover distortion added to the signal. Likewise, there are no ICs or digital components in the design. In instrument mode, the RNDI offers input headroom of +21.5 dBu, allowing it to handle instruments, interfaces, CD players and drum machines without a pad.



## SWITCHCRAFT 370DI MINI AUDIO-STIX DI

As many of our audio sources get smaller—smartphones, laptops and the like—it makes sense that people want equally portable DIs to go with them (even though the average DI isn’t exactly titanic to begin with). With that in mind, Switchcraft has the 370DI Mini AudioStix DI, a pocket-sized DI that melds together the company’s SC700CT DI Box and 318 Inline Audio Adapter. Sporting a 3.5mm input jack, dual RCA inputs, a DE Series male XLR, ground lift switch and a 20 dB pad, the 370DI sums and converts the unbalanced stereo outputs of smartphones, tablets, laptops and consumer gear to a balanced mono line level so that they can be connected to consoles or house systems.



## WHIRLWIND DIRECTOR PASSIVE DI

While Whirlwind offers the IMP2—its basic DI with a TRHL transformer, parallel input and Thru jacks, and a ground lift switch—the Director builds on the IMP2’s features, bringing to the table a specialized metal shield around its TRHL-M transformer; a lowpass filter switch; and a 30 dB pad switch. If that’s not enough, there’s the version that builds on the Director: MultiDirector is essentially a 4-channel rackmount version.



ACT / STATISTICS	CREW	EQUIPMENT
<b>1 BLAKE SHELTON   CLAIR GLOBAL</b>	Jeff "Pig" Parsons (be); Brad Baisley (me); Dave Moncrieff (cc/se); Nathan Lowe (mse); Sean Bacca, Brandon Allison, David Enderle (techs)	HC: Avid Venue Profile; MC: Avid Venue S6L; HS: Clair I-5D, I-5, I-3, CO-8, CP-218; MS: Clair CM-22, P-2; IEM: Sennheiser G3; HA: Lab.gruppen PLM 20000Q; MA: Lab.gruppen PLM 20000Q; <b>HARDWIRED MICS:</b> Sennheiser; Audio-Technica AT4081; Radial J48 DI, JDI, SW8, ProD1, SGI, ProRMP; <b>WIRELESS MICS:</b> Sennheiser; <b>FOH EQUIPMENT:</b> Rane Seratto EQ
<b>2 LANA DEL REY   SOUND IMAGE</b>	Kevin Madigan (he); John Lammi (me); Sean Herman, Dave Shatto	HC: DiGiCo SD5; MC: DiGiCo SD10; HS: L-Acoustics K1, K2, K1-SB, SB28; IEM: Sennheiser 2050; JH Audio Roxanne; Sensaphonics; <b>HARDWIRED MICS:</b> Royer Labs Ribbon R-121, R-10; Audio-Technica; Beyerdynamic M 201 TG; Audix; <b>WIRELESS MICS:</b> DPA d:facto II; <b>FOH EQUIPMENT:</b> Waves CLA2A, CLA76, H-Delay, H-Reverb; Avalon VT737p; Bricasti M7
<b>3 GEORGE STRAIT   VER TOUR SOUND</b>	George Olson (be); Josh Kaylor (me); Joe Casanova (cc); Mo Eddie Harbin (se); Clinton Hermann (mse); Alfonso "Fonzie" Torres, Nikki Berna (tech)	HC: Avid Venue Profile with Pro Tools HD2; MC: Allen & Heath dLive S5000 with Allen & Heath IP-8 8x Motorized Fader Controller; HS: JBL VTX V25-II, S28 Sub, VT4887A; MS: d&b audiotechnik M2; L-Acoustics 108P; IEM: Shure PSM 1000; Shure P9HW; HA: Crown I-Tech 12000HD, 4x3500HD; MA: d&b audiotechnik D12; <b>HARDWIRED MICS:</b> Shure KSM9HS, SM58, VP88; Audix D6, D2; Sennheiser MD 441-U; Royer R-122, R-121, R-101; AKG C 451; Beyerdynamic M-201TG; Radial J48, JDI; Optogate; Neve RNDI; Avalon U5; <b>WIRELESS MICS:</b> Shure UHF-R; Lectrosonics R400A; <b>FOH EQUIPMENT:</b> Lake LM44; Apogee Big Ben; Focusrite ISA828; Sound Devices USBPre 2; Denon DN500R; Waves 9; McDSP; Crane Song; SPL TwinTube, EQ Ranger
<b>4 JAY-Z   CLAIR GLOBAL</b>	Ken "Pooch" Van Druen (be); Jimmy Nicholson (me); Phil Kriz (cc); Adam Stuart (se); Rich Burke (m tech); Elliott Wiley (rf tech); Rich Thompson, Rachel Rozzi, Tim Baness (tech)	HC: DiGiCo SD7; MC: DiGiCo SD7; HS: Clair Cohesion CO-12, CO-8I, CP-218; MS: Clair CM22, CP-118; IEM: Shure PSM 1000s, Albatros Audio PH9B; JH Audio Roxanne (Jay-Z), assorted JH products (band); HA: Lab.gruppen; MA: Lab.gruppen; <b>HARDWIRED MICS:</b> Sennheiser 901, 902, MKH-416; Shure SM57, SM58, SM91, KSM32; AKG C414; DPA d:vote 4099; Neumann KM184; Royer 121; Telefunken M81, M82; Audix OM7; Audio-Technica AT4050; Radial JDI, J48; <b>WIRELESS MICS:</b> Shure Axient, Axient Digital; Sennheiser 6000; <b>FOH EQUIPMENT:</b> Waves; Neve Master Buss Processor, 5059; Bricasti M7; TC Electronic M3000; <b>MONITOR EQUIPMENT:</b> TC Electronic System 6000
<b>5 BILLY JOEL   CLAIR GLOBAL</b>	Brian Ruggles (he); Josh Weibel (me); Rich Schoenadel (cc/se); Jay Yochem (m tech); Tom Ford, Bryan Darling (tech)	HC: DiGiCo SD5; MC: DiGiCo SD10; HS: Clair Cohesion CO-12, i-3, P-2, R4, CP-218; MS: Clair CM-22, SRM, ML-18; IEM: Sennheiser 2050; HA: Clair StakRak (Lab.gruppen); MA: Lab.gruppen; <b>HARDWIRED MICS:</b> Shure; AKG; Sennheiser; Audio-Technica; Radial J48, JDI, SW8, Firefly; <b>WIRELESS MICS:</b> Shure UR Series; <b>FOH EQUIPMENT:</b> Waves
<b>6 CHRIS YOUNG   SOUND IMAGE</b>	Gary Lewis (he); Travis Briles (me); Chris Demonbreun (cc/se); Brittnl Werner, Philip Piercy (tech)	HC: Yamaha PM10; MC: Yamaha PM10; HS: L-Acoustics K1, K2, Kara, SB28; MS: Sound Image MA115; IEM: Jerry Harvey IEM; Shure PSM 1000; HA: L-Acoustics LA8; MA: Crown I-Tech; <b>HARDWIRED MICS:</b> Telefunken; Shure; Audio-Technica; Sennheiser; Radial; <b>WIRELESS MICS:</b> Shure UHF-R, Shure UFX-D; <b>FOH EQUIPMENT:</b> Rupert Neve Designs 5045; Lake LM44; <b>MONITOR EQUIPMENT:</b> Rupert Neve Designs 5045; SoundHound; Shure Wireless Workbench
<b>7 THE KILLERS   DELICATE PRODUCTIONS</b>	Kenny Kaiser (he); Marty Beath (me); Nate Lettus (cc); Chan Howard, Ben Bruns (sys techs); Chip Valentino (m tech); Andrew Neumiller (stage tech)	HC: SSL Live L500 Digital Console; MC: SSL Live L500 Digital Console; HS: Martin Audio MLA, MLD, MLA Compact, MLX, WT2; MS: d&b audiotechnik M2; IEM: Shure PSM 1000, P9HW; MA: d&b audiotechnik D80; <b>HARDWIRED MICS:</b> Everything; <b>WIRELESS MICS:</b> Shure UR Series; <b>FOH EQUIPMENT:</b> (2) Bricasti M7; <b>MONITOR EQUIPMENT:</b> Bricasti M7; Summit DCL200
<b>8 PINK   BRITANNIA ROW</b>	Dave Bracey (he); Jon Lewis (me-Pink); Horst Hartmann (me-Band); Guillaume Burguez (cc); Johnny Keirle (se); Juan Beilin, Shaun Ayles (ae); Jack Murphy (tech)	HC: DiGiCo SD7; MC: DiGiCo SD7; Yamaha PM10; HS: L-Acoustics K1, K2, K1SB, KARA, KS28; MS: L-Acoustics X15, Clair CM-2; IEM: Sennheiser 2050; HA: L-Acoustics LA12X; MA: Lab.gruppen; <b>WIRELESS MICS:</b> Sennheiser 6000 series
<b>9 TRANS-SIBERIAN ORCHESTRA   CLAIR GLOBAL</b>	Dave Whitman, Michihiro Tanikawa (he); Scott Fraser, Earl McCoy (me); Jim Ragus, Dean Mizzi (cc/se); Erik Rodstol, Ken McDowell (mse); Nicole Wakefield, Thomas Birkhead, Mike Gamble, Rachael Stuemke (techs)	HC: DiGiCo SD7; MC: DiGiCo SD7; HS: Clair CO-12/ i-5 CP218; MS: Clair CM-22; IEM: Sennheiser 2000; HA: Lab.gruppen; MA: Lab.gruppen; <b>HARDWIRED MICS:</b> Shure; Sennheiser; Radial; Audio-Technica; <b>WIRELESS MICS:</b> Shure AD-2
<b>10 KATY PERRY   CLAIR GLOBAL</b>	Toby Francis (he); Dave "Supa" Rupsch (me); Paul Jump (cc/se); Ben David (ame); Justin Robinson (rf); Andrew Kastrinelis, Jesse Cole (techs); Jay Schmit (pm)	HC: Yamaha PM10; MC: DiGiCo SD7; HS: Clair Cohesion CO-12, CO-8, i-3, CP-218 Sub; MS: Clair 12AM; IEM: Shure PSM 1000; HA: Clair StakRak (Lab.gruppen PLM 20000Q); MA: Clair StakRak (Lab.gruppen PLM 20000Q); <b>HARDWIRED MICS:</b> Sennheiser e901, e904, e905, e914; Telefunken M82, M80; AKG 414, 214; Nuemann KM184; Radial SW8; <b>WIRELESS MICS:</b> Sennheiser EM 3732; <b>FOH EQUIPMENT:</b> Neve Portico II MBP; Neve 5059, API 500; Smart C2; API 2500; Crane Song STC-8; Tube Tech SMC-2b; Lake LM44; MISC: Clear-Com FreeSpeak

**LEGEND:** (he) house engineer. (ahe) ass't house engineer. (be) band's house engineer. (me) monitor engineer. (ame) ass't monitoring engineer. (bme) band's monitor engineer. (se) systems engineer. (ae) ass't engineer. (tech) technician. (cc) crew chief. HC: house console. MC: monitor console. HS: house speakers. PMS: personal monitor systems. MS: monitor speakers. HA: house amplifiers. MA: monitor amplifiers.

Top 10 grossing tours according to *Billboard*. Some tours did not report grosses for all shows; rankings may be affected as a result. Equipment and crew information are provided by the respective sound reinforcement companies.

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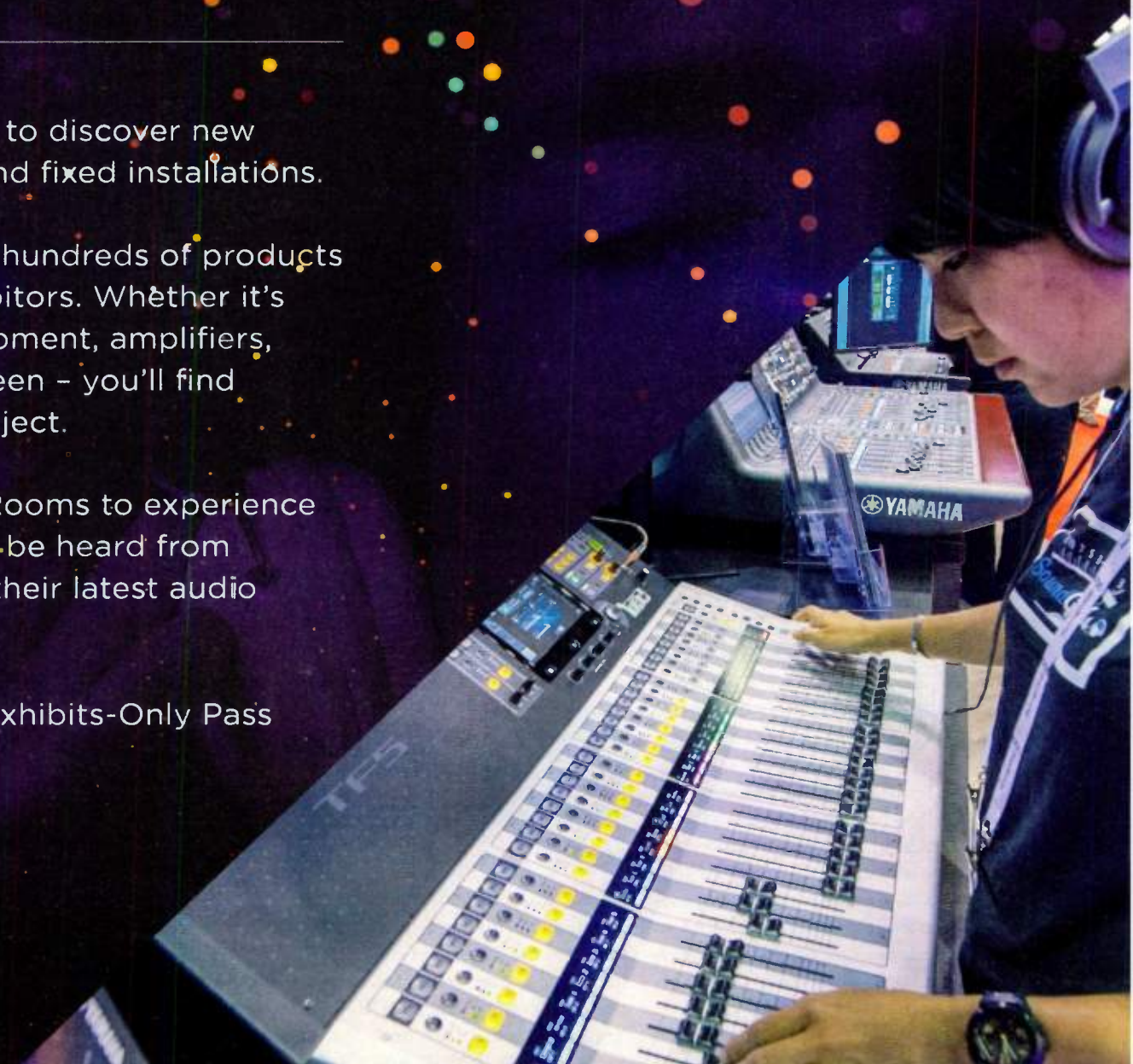
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Paul Peace

Community Professional Loudspeakers has appointed **Paul Peace** its new senior director of engineering. He comes to Community from Harman/JBL Professional, where he was senior manager in systems engineering. Previously, Peace has held technical leadership roles at Renkus-Heinz and IMAX. Peace will oversee product development, production engineering and management, and vendor research, while directing research in advanced directivity control, equalization techniques and loudspeaker specifications.



Chris Tso

Full Compass Systems has named **Chris Tso** vice president of merchandising, where he will help develop the strategic merchandising direction of Full Compass across catalog, internet, retail and wholesale distribution channels. He will also be directly responsible for vendor collaboration; trend forecasting and market opportunity identification; new product and brand development; product assortment, planning and pricing; top-line sale growth strategy; and point-of-sale execution.



Graham Murray

**Graham Murray** has been appointed to take charge of international business development and channel management for JoeCo. Most recently, he held the position of sales director, EMEA, for the Harman Pro brand Studer, while in the past he has served in leadership positions for brands including Calrec, Fairlight and AMS Neve. Murray will spearhead international sales, aiming to provide increased visibility and success for JoeCo products.



Adam Sheppard

ADAM Audio has promoted **Adam Sheppard** from East Coast sales to national sales manager. Additionally, **Benton Purvis** has joined the com-



Benton Purvis



Alex Spencer

pany as marketing manager and **Alex Spencer** as western product specialist. Sheppard has been with the company since its start. Purvis comes to ADAM Audio with 15 years experience in television, film, graphic design, marketing and live entertainment. Most recently, Purvis worked in the roles of consultant and multimedia director at Harns Media, where he designed and created information technology-based multimedia products. Spencer joins from the California urban and pop mixing scene; his recording background includes working with mixer Erik Madrid.



Chris Russell

Group One Ltd., the U.S. distributor of numerous pro audio brands, has added **Chris Russell** as sales and support associate for DiGiCo. He will aid with systems design, order processing, product delivery and training, and service and maintenance issues. Previously, he worked six years at Long Island venue The Paramount, most recently as head systems tech and audio engineer/department crew chief.



Jim Sides

Point Source Audio has named pro-audio industry veteran **Jim Sides** its vice president of global partnerships. Sides began his relationship with Point Source Audio as a consultant in late 2017, and he brings with him nearly four decades of experience in the entertainment industry, including senior management positions at Apogee Sound, NEXO USA/SA, Meyer Sound Labs, and as co-founder of VUE Audiotechnik and founder of entertainment consultancy Eklektric.

Genelec has named **Michael Bohlin**, who started his career with the company almost 25 years ago, as



Michael Bohlin

its new international sales manager. Based in Stockholm, Bohlin will be responsible for the development and support of distributor, dealer and key user networks for Genelec's professional monitoring segment within Europe.

Martin Audio has named **Ben Tucker** a product support engineer. Tucker has a Distinction in Live Sound Foundation Degree from the University of Plymouth,



Ben Tucker

a BTEC in Music, and is an avid musician. He worked for Millstone Sound and as a freelancer live sound engineer, designing, preparing and deploying audio systems for large-scale events, as well as carrying out console operation duties at both FOH and monitors.

## 60SECONDS



### GENE HOUCK

Audix

**Q: What is your new position, and what does it entail?**

**A:** My new position is director of sales. I am responsible for directing all sales activities within the company. This includes developing key growth strategies and action plans, and overseeing our marketing direction to ensure that our objectives are attained.

**Q: How has your background prepared you for your new role?**

**A:** I have been the national sales manager at Audix since 2005. In that role, I managed our outside territory reps, analyzed marketing trends and identified new vertical potentials. I led our expansion into the house of worship market and, more recently, in the commercial installed sound market with our focus on ceiling microphone development for conferencing.

**Q: What new initiatives are we likely to see from the company?**

**A:** For one, we are expanding our sales force here at our Wilsonville, OR, headquarters and manufacturing facility. I feel we have the best outside sales representatives in the industry, as well as a tremendous inside factory support team. This year, to better service our expanding customer base, we will be adding three new regional sales managers (eastern, mid states and western). This will greatly enhance our ability to offer factory training and strengthen our valued partnerships.

Product-wise, this year, we are introducing AVB-enabled models of our range of ceiling conference microphones. We feel it will prove beneficial to provide solutions for both networking platforms, so we have plans to include Dante in the future.

**Q: What are your short- and long-term goals?**

**A:** Design, innovation and performance are always at the forefront at Audix. In the short term, we really want to fill out our product line. We have a dedicated engineering team working on everything from AVB/DANTE applications to digital wireless and other items in between.

In the long run, we want to continue to have an impact on the success of a live performance, an enduring recording session and improved communications between two or more parties. We want to know that we have been a trusted resource to that end, and have helped to promote our strongly held belief that good sound matters. Great sound is achievable with the right gear.

**Q: What is the greatest challenge you face?**

**A:** First off, we are a microphone manufacturer making our products in the United States. Keeping manufacturing "on shore" is a tremendous challenge, but it's one we embrace. I think the greatest challenge for any manufacturer is being able to identify market and industry trends and to stay in front of them. One of the ways we have successfully accomplished this is to be a company that actually sets new trends. For example, we are known for our great drum microphones. We were the first to introduce drum packs. Now, most microphone manufacturers offer a drum pack, but we will always be the first. The same is true for being the first to offer slender, carbon fiber choir microphone boom systems. Now portable choir mic booms are the standard in houses of worship and schools. Over the past decade, we innovated a family of highly sensitive ceiling microphones for conferencing and distance learning. In the beginning, we kept hearing engineers say they hated ceiling microphones. However, with our high-output microphone models, coupled with new features offered by DSP companies, it was a fortuitous marriage of technologies. End users loved the design and performance. As a result, ceiling microphone deployment is at an all-time high, and Audix has emerged as a premier leader in ceiling microphones while continuing to maintain our following for application-specific microphones for live performance and studio recording.

# Working Hard and Solving Problems

JACK KELLY, PRESIDENT, GROUP ONE LTD.

BY CLIVE YOUNG

They say a craftsman is only as good as his tools. In the realm of pro audio, Group One Ltd. is where some of the best get their tools. Founded in 1991, the Farmingdale, NY-based company is the U.S. importer and distributor for a slew of top professional audio manufacturers covering every corner of the industry, from studios and broadcasters to live sound installations and productions.

With decades of experience under its belt, Group One currently distributes Blue Sky powered nearfield monitors, Calrec broadcast solutions, DiGiCo digital mixing consoles, KLANG:technologies 3D in-ear monitor mixing systems, MC2 amplifiers and XTA digital signal processing equipment. Since sound and lighting go hand-in-hand, Group One has a lighting division as well, which distributes Avolites lighting control consoles, elektraLite controllers and intelligent lighting, and Pulsar LED lighting.

Its broad product menu has given Group One a considerable presence in the pro audio world, and that's due to the vision and guidance of president and founder Jack Kelly. His own history in pro audio began in 1975, when he became a repair technician, making the most of the basic electronics training he received in the Air Force. As it happened, that first pro audio job was for Revox Corp., the distributor for Revox, beyerdynamic and Klark-Teknik. More pro audio experience followed. "After a brief time as an independent rep in Chicago, I set up the Klark-Teknik Electronics subsidiary in 1980, which I ran until the sale of the company to Mark IV in 1990," he recalls. "In 1991, I established Group One Ltd. and remain president of Group One today."

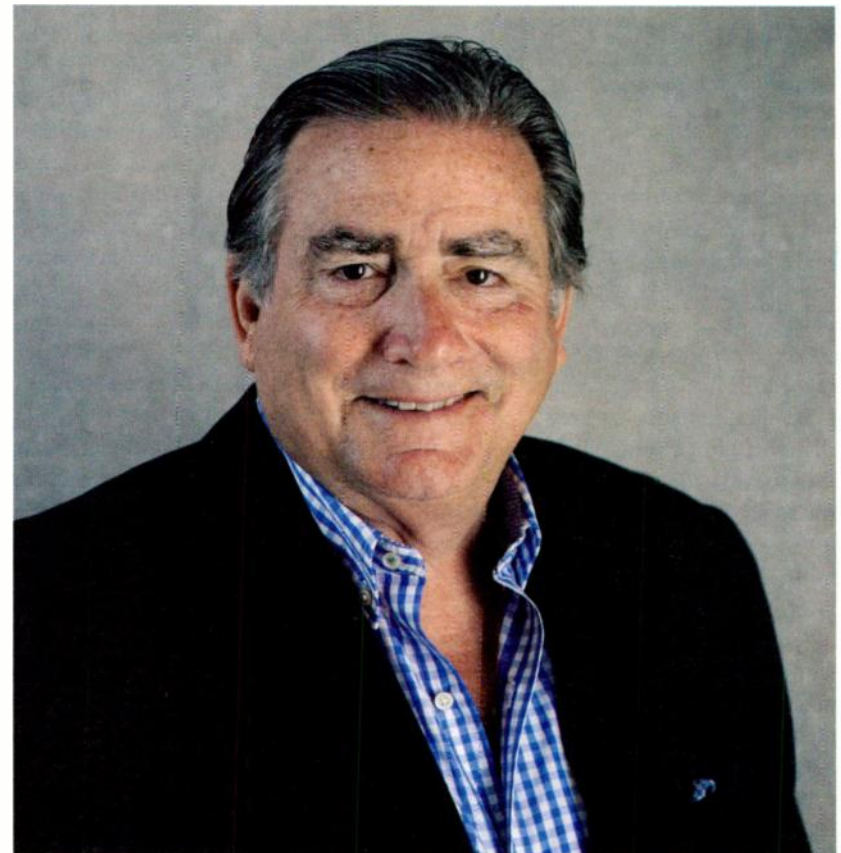
One could argue that Kelly's exposure to pro audio distribution early in his career inspired his eventual path, but there's more to it than that. "The first company I worked for and the company I founded and run now have essentially the same business model," he concedes. "We are an importer of professional audio and lighting products from around the world. My first experiences in the industry resonate in decisions I have made throughout my career."

Nonetheless, Group One's offerings and approach reflect a remarkably changed marketplace from that of the 1970s. Providing solutions for challenges facing the audio industry has been Job One since Day One of Group One. Kelly has consistently drawn from different experiences across his career to inform how he has positioned his company.

"As in most long careers, I think there are many experiences that have influenced how I have operated and run Group One," says Kelly. "My electronics background definitely en-

abled me to understand product at a deeper level early in my career, which was extremely valuable in the earlier days of the professional audio industry. Working as an independent rep gave me great appreciation for how a dozen different sales managers approached selling their product lines. Running my own company gave me a great understanding of how important it is to empower and reward people at every level of the organization. The formal education I pursued through obtaining an MBA gave me a framework with which to analyze business opportunities, set brand strategy, develop action plans—all the usual 'formal' aspects of company management."

With the landscape of the pro audio business perpetually changing, spotting the right brands for Group One is a skill Kelly has honed over time. "I still look at opportunities to distribute exciting brands from around



Jack Kelly, President, Group One Ltd.

"I think our company culture is founded on two very simple principles: Work hard and solve problems. I don't think it's any more complicated than that."

Jack Kelly

the world that have great management and great R&D; that will never change," he says. "With respect to the economy, while we are certainly not immune to downturns, I have found over my career that our business is not as 'tied-in' to general economic conditions as, say, the musical instrument or consumer industries."

That doesn't mean working at Group One is a foolproof gig. "I think our company culture is founded on two very simple principles: Work hard and solve problems," he says. "I don't think it's any more complicated than that. My role, like that of all CEOs, is to spend enough time looking into the future for new opportunities, without losing sight of where we are today. I try my best to take on the role of problem-solver for my sales team so they can focus on customer opportunities."

That sales team—and the rest of the company—is spread out across the country. Group One employs roughly 30 people, split into three near-equal areas of responsibility: sales, support and administration. The company's original and primary location is in Farmingdale, NY; there's also a support and warehouse function in Las Vegas, NV, and an office in Santa Clarita, CA, dedicated

to the sales and support of the Calrec product line. Additionally, Kelly notes, "One of the great benefits of technology is that I am able to allow our sales team to be located where they call home: Minneapolis, Nashville, Los Angeles, Knoxville, Alexandria and San Francisco."

Group One's product lines span virtually all of the professional segments, but its core markets tend to be worship facilities, live sound, theater and broadcast. With so many manufacturers under its umbrella, there's always something new around the corner, and that helps keep things hopping at Group One. "There are always new initiatives, and if I've learned anything in this business, it's that we all get excited about what's next, even if our jobs all revolve around what's now," says Kelly.

OK, so what's next? "Product development includes extension of current product capabilities and range, as well as entering new markets," he explains. "This varies by brand, so, as an example, by the time this is published, Calrec will have introduced a new initiative in the radio segment, and DiGiCo will have shown a complete new line of products for the installation segment."

Even with Group One nearing the 30-year mark, Kelly still has plenty in mind for his company and doesn't see himself stopping anytime soon. "I have grown to really love this industry," he muses. "The work ethic and dedication of the people I've met on this journey are nothing short of amazing. I think I'll stay."

Group One Ltd.  
G1limited.com

## Live Recording

(continued from page 1)

days a preserved performance is usually fodder for virtual soundchecks, making the days of tuning the PA with Steely Dan tracks a thing of the past.

As a result, the demand for live recording has only increased. While most national touring artists playing theaters and arenas have recorded shows every night for years, the ability to do so—and the accompanying features—has filtered down to more budget-aware house mix systems over time, putting the ability to record multitracks of an evening's set within the reasonable economic reach of small venues and everyday performers. Answering that demand are a variety of console manufacturers, each tackling the process from their own unique perspective.

For instance, PreSonus champions use of its Capture software, designed for use with its StudioLive mixers. Available for both Mac and Windows, Capture provides one-click multitrack recording at up to 96 kHz directly from the mixer. Using the 64-

bit Studio One audio engine, the software can record every channel on any StudioLive mixer—up to 64 when cascading certain models together—but also lets users record a stereo track from the mixer's main outputs, subgroup outputs, aux sends, solo bus, talkback mic, aux inputs, internal FX sends or internal FX returns. While providing basic edit functions, Capture also integrates with other PreSonus software like the Studio One DAW.

Over at QSC, a key aspect of its TouchMix line of compact mixers has been the ability to record multitracks directly to a connected hard drive without the need for a computer. Capable of recording all inputs plus a stereo mix directly to an external USB drive, the mixers create files in 32-bit Broadcast Wave format, which in turn can be played back and mixed down on the mixers or imported to a DAW. The TouchMix-8 can handle 14x14 tracks, the TouchMix-16 can capture 22x22, and the flagship TouchMix-30 Pro hits 32x32. Additionally, the 30 Pro can also be used as a 32x32 track USB computer interface for recording to Macs and PCs; the Windows USB driver, though downloadable from QSC's

site, is still in beta.

While Mackie offers a range of mixers, its most extensive offerings to record live sound can be found in the 32-channel DL32R digital mixer, which is part of the larger Axis Digital Mixing System. The DL32R offers a few options when it comes to multitracking live events, with 32x32 channel direct-to-disk recording and playback; 32x32 channel recording to a Mac or PC; and 32x32 channel recording and playback via a DL Dante Expansion Card, allowing users to work with a Mac, PC or any Dante-equipped recording device on a network.

Allen & Heath's 48-channel/36-bus digital mixer, the SQ-6, sports an integrated SQ-Drive, intended to simply capture a 96 kHz multitrack or stereo recording on a USB key or drive. For those wanting to get their laptop involved, the desk has a built-in 32x32 96 kHz audio interface for multitrack recording, though it can also be used for playing backing tracks or doing a virtual soundcheck before the gig. Helping ensure that everything plays well together, the interface is Core Audio- and ASIO-compliant and comes complete with MIDI and DAW control capabilities.

## Janet Jackson

(continued from page 40)

no decay, in and out—and I let the room do the rest. Also, the hi-hat work is quite important to her music and you need to hear that, so all the brass is close-miked, not just the two crashes and the ride; you hear the splashes and everything else. When you see the drum kit played in the show, whatever he hits, you hear!"

Ensuring that everyone heard it was a sizable Clair Global PA based around Cohesion CO-12s in the main arrays, side arrays of I-3s, 16 powered CP218 subwoofers across the front of the stage, and eight P2 frontfills, all overseen by crew chief systems engineer Matt Van Hook. "The CO-12 is a step forward as to how little work I have to put into it to get an even result every day," Van

Hook enthused. "It goes up quickly, and when I turn it on, it comes out very flat and doesn't take long to get really good results. They've taken the time to draw all the venues, so when I come in in the morning, I don't have to spend 90 minutes drawing the room. I just have to input the speaker configuration data into the software, which takes me 10 minutes."

Helping ensure that the PA covered every seat, the hangs had green lasers atop them to verify the math. "The PAs are incredibly accurate," said Van Hook, "so I'll point those lasers literally 4 feet above the last row of chairs and walk up there. You're in the high end, and then you stand on the chair and it goes away; it's that accurate." The lasers were accessed via a web-based GUI, allowing Van Hook to simply turn on his phone's Wi-Fi, open his web browser and turn the lasers on and off as needed to check his work.

Thoughtful design all around—from lasers helping speed things up to simplified custom amp rack designs—helped ensure that the production ran like clockwork, day in and day out: "We are 38 shows into a 56-show run, so everyone knows their exact movements," said Van Hook. "Today, the truck didn't even dump until noon, and we were complete and timed and tuned by 2 p.m."

All that hard work came together every night as the show carried the crowd out of the arena to another place. "It's an emotional rollercoaster from when you were a kid until now with all those songs, and to have mixed her for the last almost eight years now has been a blessing," said Hamilton. "With Janet, you want to get them up and make 'em party for the entire two hours. When you see Janet, it's not just a show—you get an experience!"

Clair Global  
Clairglobal.com

"When Jimmy Jam and Terry Lewis are standing right next to me, they want to hear their record! When I give Janet her two-mix of the night, she wants to hear her record—with a live feel, of course. All those signature sounds, the little things that put you back into the moment when you first heard that record? That's what we strive to do, night in and night out."

Kyle Hamilton

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[ 50 ] MUSICetc. IIII

# An American Odyssey

BY JACQUES SONYIEUX

Separately, Jimmie Dale Gilmore and Dave Alvin have forged their own paths while remaining closely rooted in Western folk music, Americana and rhythm and blues.

Gilmore's career has centered on his pioneering folk trio, The Flatlanders, and Alvin is known both as a solo artist and founder of punk-a-billy trailblazers The Blasters. While pursuing separate but parallel paths, the lifelong friends only recently discovered their musical chemistry while playing a handful of live performances just over a year ago. June 1 sees the release of their first album as a duo, *Downey to Lubbock*. *Pro Sound News* spoke to Alvin about preserving the magic of live performance in the studio and amalgamating musical synergies.

**ON EMBARKING ON A NEW JOURNEY:**

We've known each other for 30-some years, but in that time we'd never really played music together, except for maybe a sing-along at the end of a show. There were things I knew about Jimmie musically that other people didn't know, and I picked up these things over time—like the guy is a great blues singer. So this new project

came up a little over a year ago in Texas at a gig Jimmie and I played with acoustic guitars. We were only about halfway through, and it sounded like we'd been playing together for years. After three or four gigs, we said, "Maybe we should record some of this!" Our shows became absolutely freeform—we would start with a song or two that everyone knew, but after that we were off to the races. I would pull out a song, then he would pull out a song, and we would go anywhere from Sam Cooke to Merle Haggard.

**ON CHOOSING MATERIAL:**

There is a song on the new album called "Silverlake" that was written by a mutual friend of ours, a great songwriter by the name of Steve Young, who passed away about two years ago. We were originally going to do it as a tribute to Steve, but Jimmie just sings the living hell out of it, so we had to cut that one. Steve had written a few hits for people and this was one of his best songs, but it had never really been recorded so it was an obvious choice for the record. While we were recording, we would do three different sets of sessions, kind of like we do in the live show. We cut an Elmore James tune, because Jimmie could sing the hell out of Elmore James, too. Then the next day I would bring in a song that I was working on. It was all a little like the live shows, yet at the same time, we didn't know



TIM REESE PHOTOGRAPHY

Jimmie Dale Gilmore (left) and Dave Alvin

what we wanted to do.

**ON KEEPING IT LIVE AND CONTEMPORARY:**

There is a certain ambience to a live studio recording, and that's what I was going for. I wanted the record to sound like we decided to record it just before we actually recorded it. My motto for recording is: Put a great mic in front of a great instrument in front of a great musician and you're covered. If you listen back to some hit records from the '80s, '90s or teens right now, there are certain sounds and they become archaic. There are certain types of keyboards and synths from the '80s, for instance, that nobody would ever dream of putting on a record now, because it immediately typecasts it. But if you listen to "Kind of Blue" by Miles Davis, that is timeless. It could have been cut last week by a new jazz quartet. I always try to go for what's timeless. What can hold up in 10 years? This album will sound as contemporary in 10 years as it does now, if that makes any sense.

**ON "BILLY THE KID AND GERONIMO":**

I was looking for songs we could sing together, because neither one of us is a great harmony singer; we are individualistic and stylistically set in our ways. I had scraps and pieces of this song lying around and I thought, "I was a kid once, I could be Billy the Kid, and Jimmie has some native blood, he could be Geronimo!" I have written a lot of mythic storytelling songs, and usually when you write

those, you write about four or five verses that are not needed so you go through the process of filtering those down. You don't really need to know what color socks we were wearing. So I thought I would use a couple of classic western archetypes: Billy the Kid and Geronimo. Perhaps I painted Billy a little too bleakly and Geronimo a little too rose-colored, but I wanted to use the two myths and make some kind of comment on the way people are.

**ON CREATIVE MIXING:**

One of the beauties of digital is that you can mix as you go along. I've been involved in projects that have gone on way too long, and I could tell horror stories, but I enjoy mixing. And for someone who plays more older-style music, I think digital was just a psychological boost for me, and going from tape to digital was totally liberating. You can get a mixing groove going while you are deciding whether or not we are going to use take four—our engineer Craig is great at that. By the end of a few days of recording, we have a vague idea of what the mix is going to be. And then you can get creative. I may have an idea of an arrangement, we track it, and then, after repeated listenings, I want to move things around. Mixing is always creative for the engineer, but now I view it as part of the creative process for me as a songwriter.

*Jacques Sonyieux is a devout explorer of recording studios and the artists who occasionally inhabit them. Please send any tips or feedback to Jacques at jacquessonyieux@gmail.com.*

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