

PRO SOUND



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June 2019



DOBIAN TOCKER

Audio Pros Prepare for VR's Next Step

BY STEVE HARVEY

LOS ANGELES, CA—By mid-2018, some pundits were ready to write off virtual reality as headset sales took a downward turn in only their second year of commercial availability. Now it appears those predictions of VR's demise were premature; a sharp uptick at the end of last year was followed in April by

analysts at IDC predicting that 2019 would see a 54 percent growth in headset sales over 2018, driving a 66 percent annual growth rate through 2023.

That said, in February of this year, a digital publication focusing on virtual and augmented reality reported that VRLA, an annual VR conference held in Los Angeles that

(continued on page 49)

FROM BEDROOM TO BILLBOARD—In April, Billie Eilish's debut album *When We All Fall Asleep, Where Do We Go?* entered the *Billboard* 200 at Number One, making her the first artist born in the 21st century to top the chart. Finneas O'Connell—her co-writer, producer, older brother and an artist in his own right, seen here—discusses recording the sonically adventurous collection in his bedroom at their family home on page 18.

Reinventing the Audio of *Apocalypse Now*

Francis Ford Coppola's *Apocalypse Now Final Cut*, a new edition of the classic war film, premiered at the Tribeca Film Festival in April, marking the culmination of a multiyear restoration effort that included a new Dolby Atmos mix presented in Meyer Sound's Sensual Sound process.



Recording in Paradise

Setting up a temporary studio for two weeks each year in St. John to record reality TV music is a tough job, but multitasker Rich Tozzoli was not only up for the challenge this year, he also reviewed all the portable recording gear he brought along for the project.



Breaking Down an Upswing, State by State

BY STEVE HARVEY

Organizations representing musicians, songwriters, publishers and record labels in the United States launched a new interactive website on April 30 that, for the first time, analyzes the economic

and cultural impact of the music industry on each individual state. Aggregating data from the American Association of Independent Music (A2IM), ASCAP, BMI, the Recording Industry Association of America (RIAA) and SoundExchange, and incorporating analysis by Stephen Siwek of Economists Inc., the infographics offer insight into the participation of each state in the country's music industry, which contributes \$143 billion to the U.S. economy and supports

nearly two million American jobs. The website, www.50StatesOfMusic.com, drills down into the data to highlight the contribution of the music industry to each state's GDP (gross domestic product). Although the website acknowledges that the information is not intended to be comprehensive, nor does it detail the sources and derivation of the data displayed, it does present some enlightening music industry metrics.

(continued on page 48)

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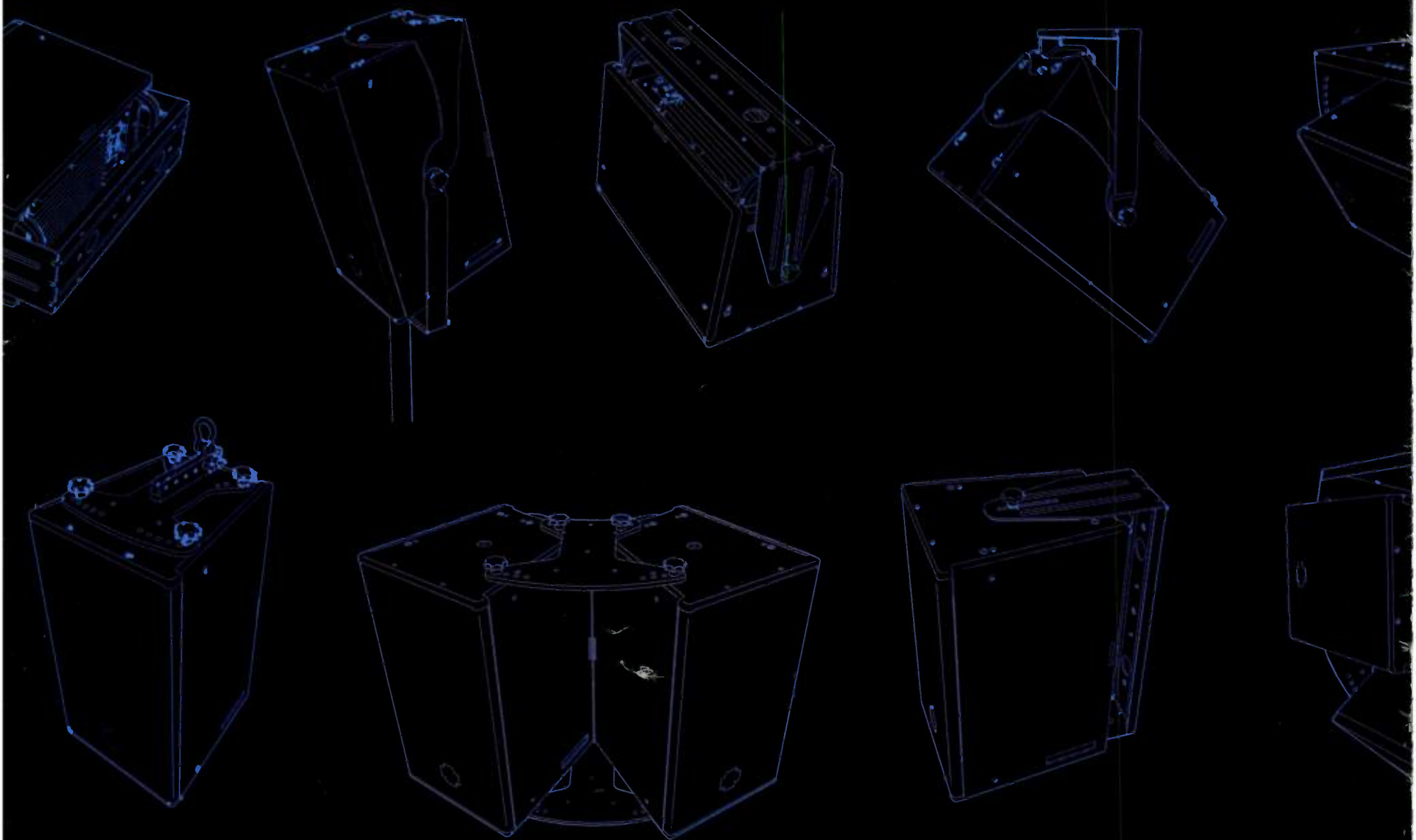


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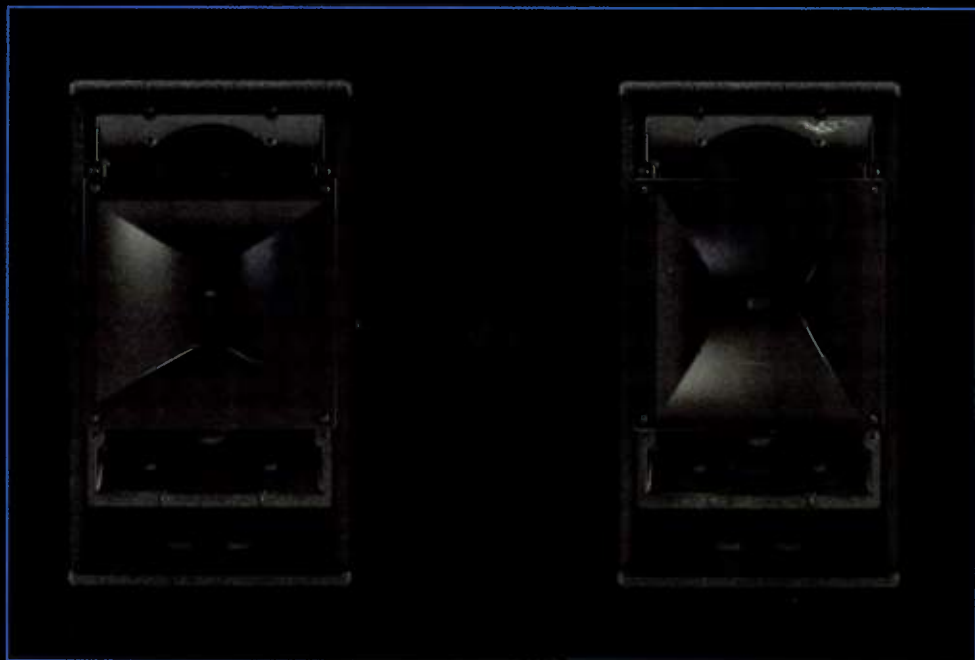
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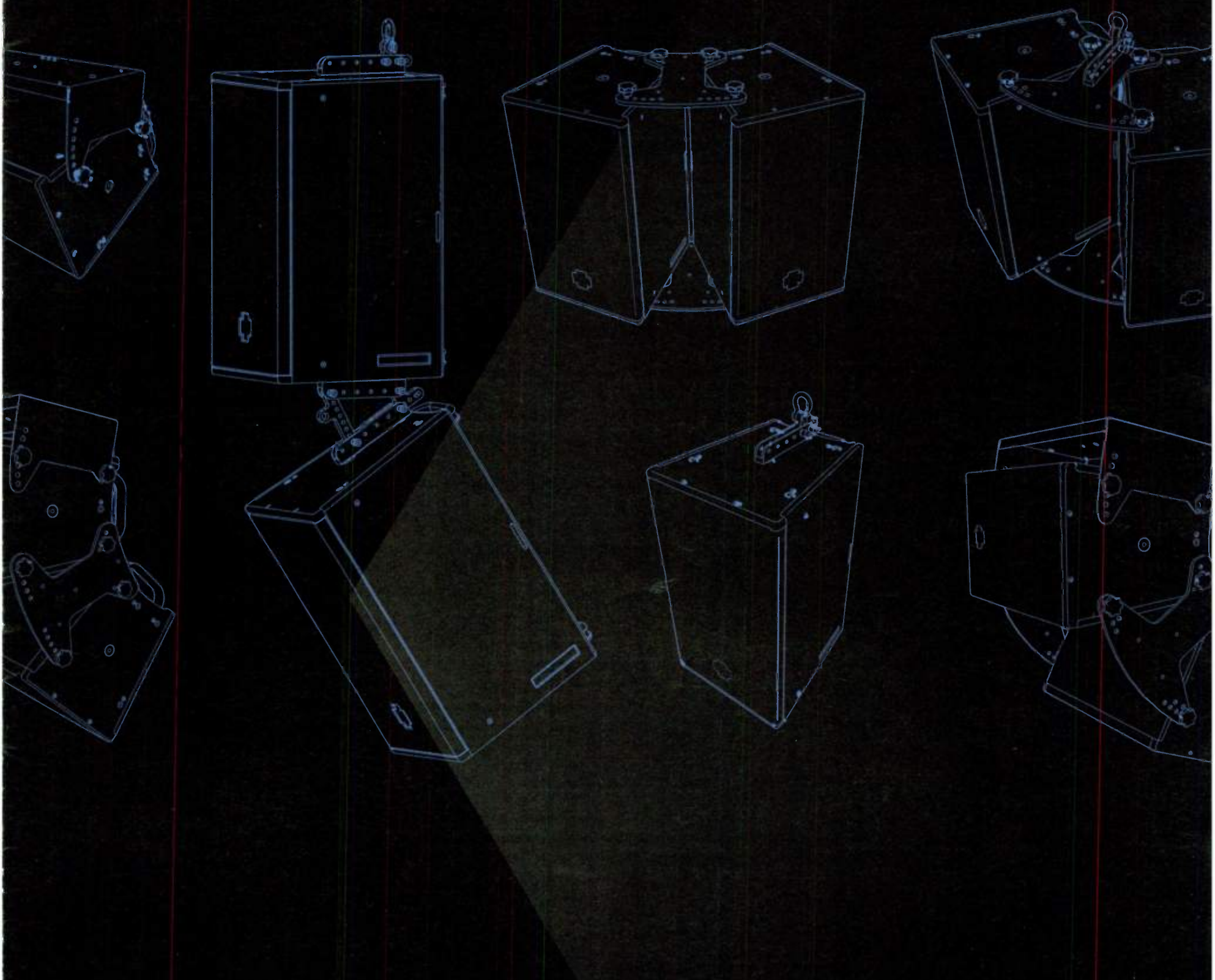
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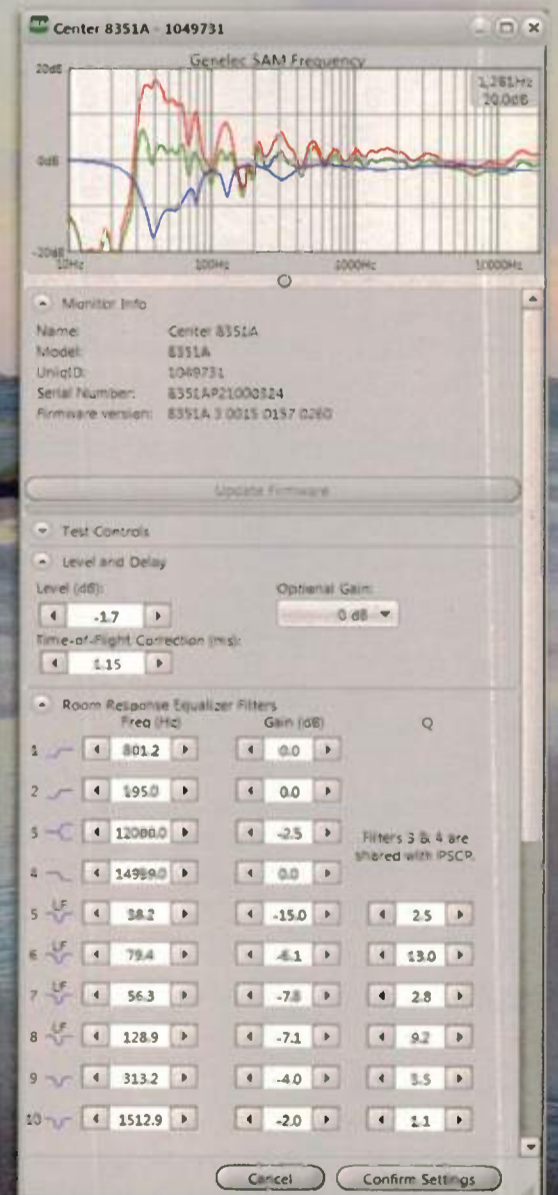
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Netflix Unveils Audio Streaming Improvements

BY STEVE HARVEY

LOS GATOS, CA—Netflix has announced that it is now streaming

adaptive high-quality audio with its programming, bringing sound up to the company's established video quality benchmark, largely in response to the demands of content creators.

"We're really proud of the improvements we've brought to the video experience, but the focus on those makes it easy to overlook the importance of sound, and sound is every bit as important to entertainment as video," write Guillaume du Pontavice, Phill Williams and Kylee Peña—on behalf of Netflix's streaming algorithms, audio algorithms and creative technologies teams—in a post on Medium.

The drive to improve audio quality was inspired by critical feedback from the Duffer brothers, the producers behind hit Netflix series *Stranger Things*. The brothers reported a reduced sense of sound localization in the 5.1-channel stream, as well as audible degradation of high frequency content. In working to correct those specific issues, Netflix began a larger conversation regarding audio quality.

"Series mixes were getting bolder and more cinematic with tight levels between dialogue, music and effects elements. Creative choices increasingly tested the limits of our encoding quality. We needed to support these choices better," the trio write on the Netflix Tech Blog.

Netflix has been streaming 5.1 au-



dio since 2010 and began streaming Dolby Atmos in 2016. But while the company has supported video technology initiatives, including HDR and Netflix Calibrated Mode, to maintain creative intent from production to viewer, the same could not be said of audio.

Netflix refers to the newly unveiled improvements simply as "studio quality" or "high-quality audio." The audio stream is not lossless, but based on listening tests conducted by Netflix, together with data from Dolby Labs and other scientific studies, the company determined that for Dolby Digital Plus at and above 640 Kbps, audio coding quality is perceptually transparent.

"In addition to deciding 640 Kbps—a 10:1 compression ratio when compared to a 24-bit 5.1 channel studio master—was the perceptually transparent threshold for audio, we set up a bit rate ladder for 5.1-channel audio ranging from 192 up to 640 Kbps. This ranges from 'good' audio to 'transparent.' At the same time," state du Pontavice, Williams and Peña, "we revisited our Dolby Atmos

bit rates and increased the highest offering to 768 Kbps. We expect these bit rates to evolve over time as we get more efficient with our encoding techniques."

Until now, Netflix has streamed audio at a constant bit rate determined by network conditions at the start of playback. "However, we have spent years optimizing our adaptive streaming engine for video, so we know adaptive streaming has obvious benefits."

In their Medium announcement, the Netflix team take a deep dive into the challenges of adaptive streaming, which center on achieving a balance between audio quality and video quality while avoiding rebuffering. With its large subscription base, Netflix also had to consider the wide variety of TV devices in the field and their respective CPU, network and memory profile differences.

"We had to assess this by testing adaptive audio switching on all Netflix supported devices. We also added adaptive audio testing in our certification process so that every new certified device can benefit from it," the Netflix team writes.

Now, they state, "If your network conditions are good, you'll be served up the best possible audio, and it will now likely sound like it did on the mixing stage." So if you're being chased by the Demogorgon, you'll know exactly where it is.

briefs

Recording Golf Tourney Returns

LOS ANGELES, CA—The 2019 Recording Industry Golf & Poker Tournament (<https://2019rigt.eventbrite.com>) will take place on June 3 at Sand Canyon Golf Club (formerly Robinson Ranch Golf Club) in Santa Clarita, CA. Organized by event producer Karen Dunn of KMD Productions, the long-running event supports the music program at A Place Called Home, a community center/safe haven in South Central Los Angeles. Ed Cherney and Al Schmitt will return as co-chairs, and sponsors include Audio-Technica, Lurssen Mastering, NAMM and others.

Onkyo Consumer Audio Acquired

MAHWAH, NJ—Sound United (www.soundunited.com) will acquire Onkyo Corp.'s consumer audio division, including the Onkyo, Pioneer, Pioneer Elite and Integra brands. Onkyo Corp. will retain the rights to the Pioneer and Onkyo brands for its Digital Life and Embedded Audio businesses. Sound United will acquire all worldwide third-party distribution agreements under which the premium audio products are currently sold. Sound United CEO Kevin Duffy will be CEO of the newly combined businesses. Sound United includes the Denon, Polk Audio, Marantz, Definitive Technology, Heos, Classe and Boston Acoustics brands under its umbrella.

GameSoundCon To Return

LOS ANGELES, CA—The annual video game music and sound design conference GameSoundCon (www.gamesoundcon.com) has announced an open call for video game sound designers and game audio experts to speak at the two-day event, which will be held Oct. 29-30 at the Millennium Biltmore Hotel in Los Angeles, CA. Planned conference tracks include audio for VR/AR/MR, game audio essentials, academic research in interactive audio technologies, Ludomusicology and more.



Avid Q1 Results Show Continued Growth

BY STEVE HARVEY

BURLINGTON, MA—Avid announced its first quarter 2019 financial results on May 6, reporting revenue of \$103.3 million and a second consecutive quarter of 5 percent year-over-year growth.

"We are pleased that the momentum Avid generated at the end of last year has continued throughout the first quarter of this year, underscoring our continued success in executing our strategy," said Jeff Rosica, CEO and president of Avid.

"We are focused on delivering meaningful product innovations to the market, including several new products in Q2 that we expect will support our growth in the second half of 2019 and beyond. We expect that this renewed growth, combined

with greater discipline in our operations, will drive increased profitability and deliver greater shareholder value."

"As a result of the improvement in our financial performance, we have secured \$100 million in additional bank debt at a reduced interest rate and more favorable terms to support our business strategy. Since the proceeds will be used to repurchase our outstanding convertible notes, there will be an immaterial change in the total debt for the company once the transactions are completed," added Ken Gayron, executive vice president and chief financial officer of Avid.

During an earnings call, Rosica noted the importance of several multiyear agreements that the company signed with large media enterprises

in Q1, including a deal with HBO that virtualizes the Media Composer editing and Nexis storage resources available to creatives in its Manhattan facility. Avid also signed a multiyear enterprise agreement with CBS News to upgrade its Avid-based production infrastructure across multiple sites in the United States and Europe.

Software revenue from subscriptions increased 10 percent year-over-year, with approximately 137,000 cloud-enabled software subscriptions at the end of Q1 2019, according to a statement from Avid. Recurring revenue was 57 percent of the company's revenue in the 12 months ending March 2019, up from 50 percent in the 12 months ending March 2018. E-commerce revenues grew 33 percent year-over-year.

He also revealed that Avid is preparing product announcements for pro audio and music customers that will be unveiled at the summer NAMM Show in Nashville.

Avid Technology
www.avid.com



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Studio Showcase: Sweetwater Studios 20
From its humble beginnings as a 4-track mobile recording studio in the back of musician Chuck Surack's Volkswagen Samba bus in 1979, Sweetwater Sound has become a juggernaut, morphing into the largest online pro audio and MI equipment retailer in the United States. Yet as Sweetwater has evolved, the recording studio has remained a constant, initially moving into Surack's house, then to various commercial properties before settling into its forever home inside a Russ Berger Design Group-designed space on the Sweetwater campus in 2008.

SOUNDPOST/BROADCAST

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Full Sail University's new \$6 million, 11,000-plus-square-foot esports arena, The Fortress, is the largest such facility on a college campus in the United States. It's part of the media arts and technology college's Dan Patrick School of Sportscasting studio facility.

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Live Sound Showcase: New Orleans Jazz Fest 38
A musical institution for 50 years, the New Orleans Jazz & Heritage Festival takes over the city's fairgrounds for two four-day weekends every spring to present dozens of acts on 17 stages and tents simultaneously, making for a considerable live audio challenge.

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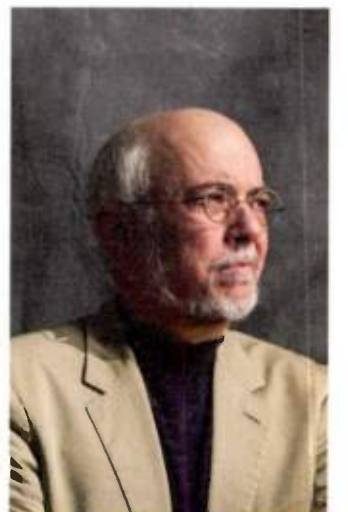
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SPECIAL REPORT

Podcasting 8, 25, 33
Podcasting has matured to become a mainstream media format, but most of its practitioners are audio engineering novices—an irony that's creating new opportunities for pro audio manufacturers and engineers alike. *Pro Sound News* expands its coverage this month with the debut of the Inside Podcasting column and its first review of gear aimed specifically at the burgeoning podcaster marketplace.

COLUMNS

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insidepodcasting 25	In our new podcasting column, Chris Curran defines who today's podcasters are.
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Podcasting Goes Prime Time

While podcasting has been around for 15 years now, it's only in the last few that the format has exploded. According to a new study by the University of Florida College of Journalism and Communications and Futuri Media, nearly three-quarters of podcast users have been listening to podcasts for less than three years, but they're sold on the format—on average, they listen to four shows per week for either 30 or 60 minutes. Some pundits point to the investigative journalism podcast *Serial*, whose first two seasons have been downloaded more than 340 million times, as the “killer app” that finally brought podcasting into the limelight, but regardless of what made the format take off over the last few years, all those new mainstream listeners have high expectations for podcasts, not only in terms of content but audio quality.

With that in mind, *Pro Sound News* has been increasingly covering podcasting-related audio stories in recent times, and this month, we expand on that further as we kick off a new column, *Inside Podcasting*, (see page 25) and also for the first time, review audio gear specifically intended for podcasters. While it's no secret that many podcasters are amateur enthusiasts when it comes to audio engineering, the writers sharing their podcasting insights in our pages are not—Chris Curran and Frank Verderosa are long-time audio professionals who also have solid credentials in the podcast world.

Curran will expound monthly on the topic in his new column, drawing on his experience as a podcast producer for numerous corporations, time spent as the host of *The Podcast Engineering Show* and as the founder of Podcast Engineering School. While today he creates podcasts for the likes of Forbes, Dun & Bradstreet, Johnson & Johnson and others, Curran started his career in New York as a staffer at studios such as The Hit Factory, Quad Recording and Soundtrack, where he worked on projects with dozens of artists, including Foreigner, Sarah McLachlan, Jeff Buckley, Puffy, Notorious B.I.G., Itzhak Perlman and many others.

Meanwhile, over in our reviews section, Frank Verderosa has penned the first of what will be occasional reviews of podcast audio gear (see page 33). Verderosa got his start as a music engineer/producer in the early Nineties, working with acts like Run-DMC and Bill Evans, before moving into audio post-production, mixing and sound designing spots for numerous ad agencies and putting out his own Planet V shingle for eight years. Later, he teamed up with Nutmeg Post, working on campaigns for Volkswagen, Burger King, Budweiser and others when he wasn't recording cartoons for Disney and Nickelodeon. These days, he plies his trade at Digital Arts in NYC, but you can also hear his podcast engineering work weekly on *Gilbert Gottfried's Amazing*

Colossal Podcast, which he's handled since 2014.

The recent emergence of podcast-specific audio gear is a unique phenomenon, as it takes pro-audio manufacturers' prosumer/MI lines in a new direction, aiming to meet the needs of a specialized customer base with wildly varying audio abilities and knowledge. “The podcast production world is an interesting intersection of people that come from very different backgrounds and disciplines,” says Verderosa. “A medium once populated largely by non-engineers creating interesting content that resonated with like-minded individuals, it is now a rapidly expanding and diverse industry. In its early days, home-spun production was often limited to cheap headset mics, built-in laptop mics and low-res Skype audio—but that was part of the charm. At the same time, radio stations and other companies began delivering their content on podcast platforms, giving rise to shows with higher production values, and a growing demand for those working from home to increase theirs. Needless to say, affordable gear targeting podcasters is a growing market.”

We'll be keeping an eye on that growing market, as well as what it means for audio professionals like you, whether you're part of the burgeoning podcast production industry or merely someone who enjoys listening to the format. Stay tuned!

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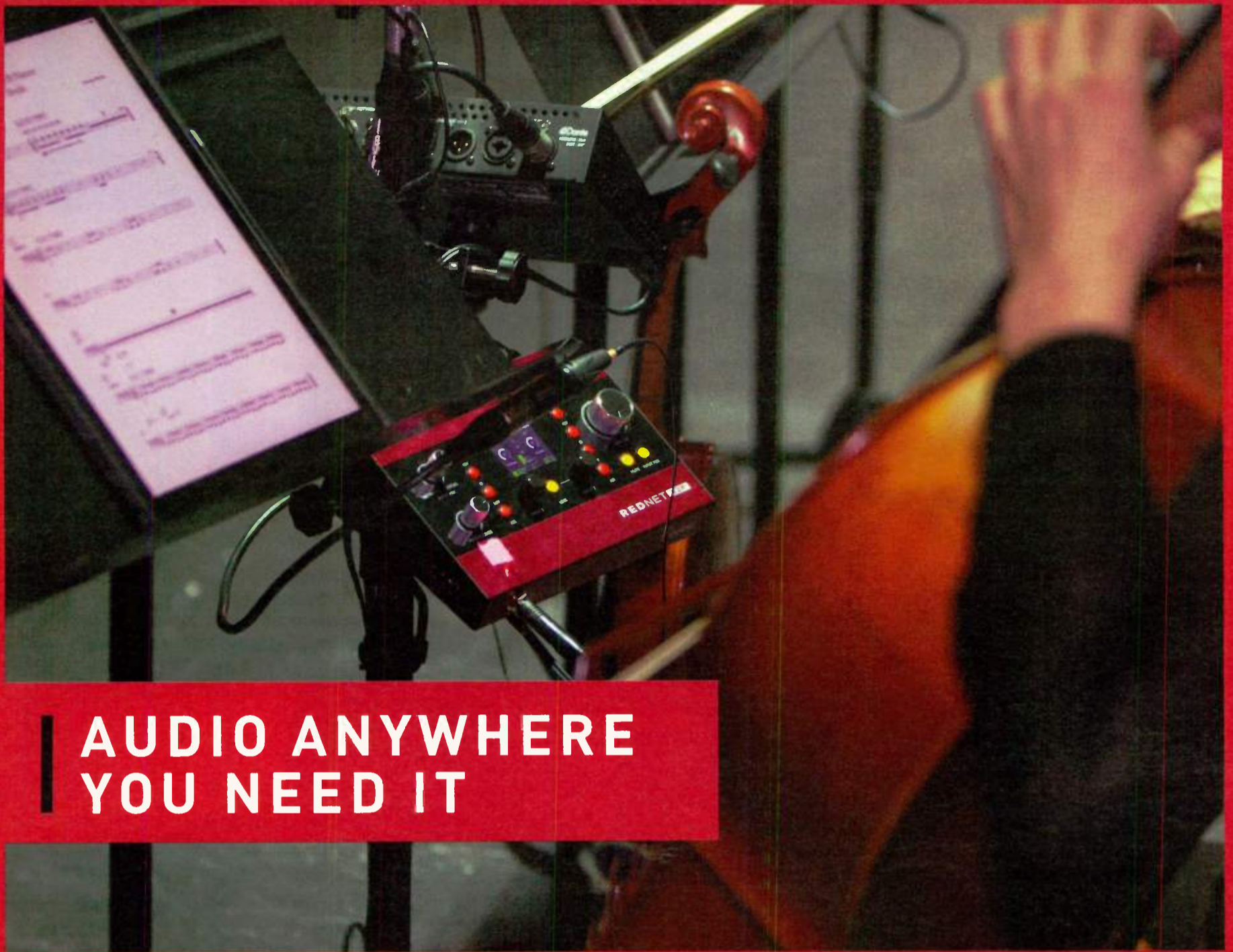
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2019 Tony Sound Design Nominees Named

BY CLIVE YOUNG

NEW YORK, NY—Nominations for the 73rd annual Antoinette Perry “Tony” Awards were announced April 30. The annual ceremony highlighting the best of this year’s Broadway season will be broadcast on CBS on June 9, hosted by James Corden and broadcast live from Radio City Music Hall.

SOUND DESIGN OF A MUSICAL

Peter Hylenski is nominated twice this year—for *Beetlejuice* and for *King Kong*.

Steve Canyon Kennedy is nominated for *Ain’t Too Proud—The Life and Times of the Temptations*.

Drew Levy is nominated for *Rodgers & Hammerstein’s Oklahoma*.

Nevin Steinberg and Jessica Paz are nominated for *Hadestown*.

BEST SOUND DESIGN OF A PLAY

Adam Cork is nominated for *Ink*.

Scott Lehrer is nominated for *To Kill a Mockingbird*.

Fitz Patton is nominated for *Choir Boy*.

Nick Powell is nominated for *The Ferryman*.

Eric Sleichim is nominated for *Network*.

The Tony Awards
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Eventide’s Agnello Honored by NJIT

NEWARK, NJ—Eventide co-owner and managing director Anthony “Tony” Agnello accepted the Jay Kappraff Award for Excellence in Science and Arts on May 1 at the New Jersey Institute of Technology in Newark, NJ.

The award, presented as part of the school’s 2019 College of Science and Liberal Arts Awards ceremony, recognized Agnello for his lifetime of contributions to music production and pro audio.

His acceptance speech was accompanied by a live performance on Eventide’s Rose pedal, released at NAMM 2019, and the H9 Max, provided by violinist and Eventide’s artist-in-residence, Martha Mooke.

A young recording engineer in the 1970s, Agnello partnered with Richard Factor to create the H910 Harmonizer in 1975. The signature unit would go on to be employed in creating much of the popular music released in the decades that followed, famously becoming a cornerstone of David Bowie’s *Berlin Trilogy* (*Low*, *Heroes* and *Lodger*) throughout the late 1970s. Gear and plugins descended from the Harmonizer continue to be used today in studios throughout the world. Agnello received a Technical Grammy Award from the Recording Academy in 2018 for Eventide’s significant contributions to the record-making process via products including the Harmonizer effects processor.

Eventide
www.eventide.com



Owners of Eventide Audio, Richard Factor and Anthony Agnello, accepting their Grammy Awards in 2018 for their historical contributions to pro audio and recording.

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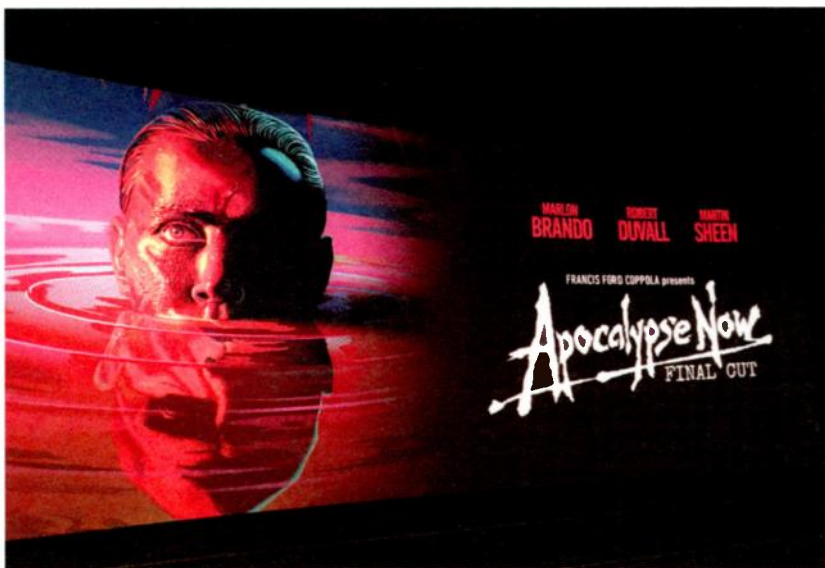
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CELESTION



Apocalypse Now is celebrating its 40th anniversary with a newly edited cut enhanced by new technologies including Dolby Vision, Dolby Atmos and Meyer Sound Sensual Sound.



Joining director Francis Ford Coppola (far left) at the Tribeca Film Festival premiere of *Apocalypse Now Final Cut* are, from left, Meyer Sound's Helen Meyer, John Meyer and Perrin Meyer.

Apocalypse Now Final Cut: Hearing It Again for the First Time

BY KATIE MAKAL

Director Francis Ford Coppola's *Apocalypse Now* is celebrating its 40th anniversary with a newly edited cut featuring enhanced audio and remastered picture restored from original film negative.

This new version, the three-hour *Apocalypse Now Final Cut*, premiered at the Beacon Theatre on April 28 as part of the 2019 Tribeca Film Festival. Under Coppola's supervision, a team from his American Zoetrope production company remastered the film's visuals in 4K Ultra HD with Dolby Vision from original negatives, and also transferred the soundtrack to high-resolution 96 kHz digital for remixing and remastering in Dolby Atmos.

LIKE A KICK IN THE CHEST

Final Cut's audio post process took advantage of new technologies including Meyer Sound's Sensual Sound, which uses ultra-low frequency sounds to increase audio intensity in key moments of the film.

Sensual Sound, trademarked by Meyer Sound, is produced by Meyer Sound's VLFC "Sensual Sound" loudspeakers and loudspeaker technology, and brings to life the sound experienced in the film's exhibition. Sensual Sound allows post-production of a film's soundtrack to reach greater creative heights.

Meyer Sound's recently developed VLFC subwoofers are able to deliver sounds down to 13 Hz, below the limit of human hearing but well in the range experienced as a physical sensation of rumbling or vibration. These very low frequency sounds are bolstered by a corporeal sensation of physical force.

Of the VLFC subsonic subwoofers installed temporarily in the Beacon Theatre for the film's premiere, James Mockoski, film archivist at American Zoetrope, said, "You're going to feel it like a kick in the chest."

Mockoski spoke at a panel discussion following a press screening of *Apocalypse Now Final Cut* at the Dolby Auditorium at AMC Empire 25 in Times Square. He was joined by American Zoetrope sound mixer Pete Horner, who performed the Atmos mix on *Final Cut*, Meyer Sound CEO John Meyer, and Glenn Kiser, director of the Dolby Institute.

Sensual Sound was implemented in both the post-production of the soundtrack—which took place at Coppola's private post facility in the Napa Valley and at Dolby Studios in San Francisco—and in the film's exhibition.

The complete Meyer Sound loudspeaker system installed at the Beacon included front LCR screen systems of 10 each LEOPARD line array loudspeakers and surround systems with UPA-1P, UPJ-1P and M1D loudspeakers. This standard sound system was augmented with 12 VLFC elements, placed in an end-firing cardioid array, and six 1100-LFC elements.

The studios at Coppola's Napa facility, where much of the initial work on sound editing and infrasonic enhancement was carried out, are fully equipped with Meyer Sound cinema systems. The mixing suite was further equipped with two VLFC elements for *Final Cut*.

The final Atmos mix, performed at Dolby Studios by Pete Horner, also took advantage of a pair of VLFC elements to extend low frequencies into the infrasonic realm.

FEEL THE SOUND BEFORE YOU HEAR IT

Enhancing the realism of cinema sound has been a lifelong passion for John Meyer, and his relationship with Coppola's production company extends back to 1979, when Zoetrope's Tom Scott invited Meyer to bring his experimental subwoofer to the facility for a tech shootout.

According to Meyer, Coppola had a similar interest in low frequencies to re-create the visceral power of sound. His goal in projects including *Apocalypse Now* was for recorded sound to more accurately represent real life, for a film's soundtrack to convey emotional as well as literal meaning.

"Coppola always said he wants to feel the sound before you hear it," Meyer related. "I don't know if you've ever been around big explosions, but [sound] travels faster through the ground [than the air]. We've done a lot of measurements around big explosions, trying to figure out this thing. So you feel it first and then you hear it. It's still low frequency, but the real low frequencies, 12, 14 cycles, travel faster through the ground. They don't get attenuated, either, so you feel that. And then the sonic boom comes," he noted.

"No subwoofers at that time went down below 60 Hz, even though people were claiming they did," Meyer said of the status of audio technology in 1979. "We had a subwoofer that would take us down to 27 cycles, so we could show people what this dimension sounded like."

Meyer took his experimental subwoofer over to the Northpoint Theatre in San Francisco for the shootout. "So we went over with our subwoofer—this was an 18-inch speaker and a big box that was tuned to 27 cycles with

3,000 watts of power," Meyer said. "We demonstrated this and I think we were way beyond. Francis was saying, 'I want to feel the sound in the bathroom,' there were a few comments like that. We were over at Northpoint for more than a month listening to that one scene with the helicopters coming in," Meyer said, referring to one of the film's iconic sequences of air cavalry helicopters advancing on a Vietnamese village scored to Wagner's "Ride of the Valkyries."

The scene concludes with a dramatic punch as B-52s drop napalm to take out Viet Cong mortars and neutralize the village in a fiery inferno with a concussive shockwave, inspiring the film's Lt. Col. Kilgore's famous line, "I love the smell of napalm in the morning."

Throughout work on that one scene—"I know that scene really well. I saw it in black and white every day for a month."—Meyer and the *Apocalypse* team learned a few things about low frequencies. He noted, "Ten minutes of rumbling of very low frequency creates, we were learning, this tremendous adrenaline burst. So that was really very important."

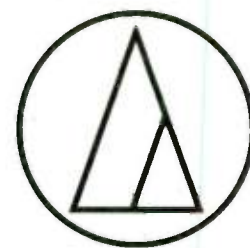
Meyer continued, "What happens with low frequency is it releases adrenaline. You have to get below 20 cycles for this to happen, and the body releases adrenaline trying to get you to wake up to deal with the problem," Meyer says, describing the body's "fight or flight" reaction to perilous situations and loud noises.

"We were trying to get the sound of napalm, but we wanted to go further," he said.

The result of this first collaboration with Coppola was the 650 subwoofer, one of Meyer Sound's first products. It was deployed in a few Bay Area and New York theaters for screenings of *Apocalypse Now*.

Meyer and Coppola would be able to go further with low-frequency

(continued on page 16)



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Apocalypse Now

(continued from page 14)

sound reproduction, but the technical evolution would not come for nearly 40 years. The breakthrough would depend on the development of Dolby Atmos and Meyer VLFC technology.

REMASTERING APOCALYPSE

Shortly after the *Apocalypse Now* remastering project was launched, Meyer Sound was again brought on board, and John Meyer started rethinking the possibilities in light of new technologies.

"I had been watching the film with the original soundtrack, which only went down to 30 Hz, and I really felt it needed to go deeper," he recalled. "If you are ever around guns, even at a shooting range with only handguns, the sound hits your body with a powerful feeling. We weren't getting that. Francis agreed to come over to our theater in Berkeley to hear our new technology, and we demonstrated how this effect would add a new

dimension to his film. He agreed this was the path to take, and that's how we got started on the partnership for this re-release."

"The low frequency is really a new dimension" in film sound, Meyer said, recounting his experience of watching the remastered *Apocalypse Now Final Cut* prior to its Tribeca premiere. "I was sitting there waiting, they were going to show me some stuff up at Coppola's studio, and the sound hits me. It was instant. If you don't know what's coming, it just stuns you. It's a dimension that's really exciting."

Meyer continued, "One of the things that was really interesting for me to watch in the last year of them putting this film together is, they're creating textures with the low frequencies—not just pink noise like they were doing in Sensurround, some kind of rumble. There's dimension down there. This is an amazing new tool."

VOLUME VERSUS IMPACT

Meyer technology is used widely in live sound applications, especially

concerts, with systems installed at music and entertainment venues, houses of worship, universities, corporate offices and museums.

Meyer explained what the company has learned from working with touring acts like the Grateful Dead and Metallica: "One of the things that we do know from work with acts like Metallica is that you don't have to run the show too loud. We've discovered that high frequencies [and high volume] also release adrenaline, but it's hard on the hearing system. With low frequencies, the hearing community isn't concerned with anything below 100 cycles, so we can do anything we want. Which means we have a whole dimension to explore, to create feeling, and not have it so loud" that hearing is damaged.

Sensual Sound is used to great effect to convey a sense of disorientation and confusion in *Apocalypse's* explosive, fast-paced battle scenes, but perhaps a more significant benefit of VLF is demonstrated in the way it amps up the anxiety in the film's quieter, more abstract moments.

Near the end of the film, when

Willard (Martin Sheen) has reached Kurtz' compound in Cambodia, for example, his boat passes through a line of small boats, silently, save for the soundtrack's slow, resonant drum beat.

The audio team was able to build infrasonic sound into the story, using it creatively to convey specific emotion.

"It really is a physiological response," Horner said. "We would work on the sequences over and over, as you do, trying to craft it into a shape that has a response. But one of the things we came to realize is you could only do that for about 20 minutes [until] you would start to feel it and would need to take a break. It really is generating a physiological response. It's a power that you've given us," he laughed, "and we need to use it responsibly."

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David Foster Hits the Road

CANADA—This summer, 16-time Grammy-winning producer and songwriter David Foster is heading out of the studio and onto the stage with the Canadian leg of his The Hitman tour. When the production kicks off on June 3, the tour will be carrying audio production from OSA International.

Multiple Grammy Award-winning audio engineer Orlando Calzada will mix the show nightly behind an Allen & Heath dLive S5000. “Initially I was searching for a bigger drum sound,” he said. “I needed more compression with added warmth. I had no idea then that I would also be getting a lot more in terms of how I handle my workflow.”

Prior to Foster’s recent U.S. tour, his first here in eight years, Calzada had little time to assimilate to the dLive S5000 beyond using a show file in the shop as the basis for dialing in his sound as best as he could. Time was so tight that the first show of the

U.S. run doubled as his first full run-through with the desk.

“The preamps were fantastic,” Calzada reports. “The way they worked harmonically provided the basis for the drum sound I was seeking, all without distortion. I didn’t notice any latency, either. In the past, when I added a channel to my drum

group—a plug-in compressor, for example, or anything else—there was noticeable latency. On this console, there’s none.”

OSA
www.osacorp.com

Allen & Heath
www.allen-heath.com



Orlando Calzada has been mixing David Foster live on an Allen & Heath dLive S5000 desk provided by OSA International.

WSDG Room Is Catnip

RIO DE JANEIRO, BRAZIL—WSDG Walters-Storyk Design Group has completed work on a production room for Brazilian recording duo Cat Dealers.

The 130-square-foot production room benefits from low-frequency treatments installed behind the fabric finishes to maintain the room’s spare, clean and efficient look. The dedicated space is equipped with an RGB LED lighting system for creative inspiration, as well as Focal SM9 audio monitors carefully tuned to the client’s taste, with a high-end DSP processor to establish a universal sweet spot throughout the small room.

Walters-Storyk Design Group
www.wsdg.com



The Cat Dealers’ new mix room.

 A large advertisement for Adamson's S-Series speakers. The main image shows a stack of three large, black, rectangular speakers with a perforated metal grille, standing on a wooden floor against a stone wall. The text below the image reads:

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Producing a Number-One Album in His Bedroom

BY STEVE HARVEY

LOS ANGELES, CA—Much has been made of the fact that virtually everything Billie Eilish has released with her co-writer, producer and older brother Finneas O’Connell was recorded in his bedroom at the family home. That’s hardly surprising when you consider her career trajectory, going from a song posted in late 2015 to Soundcloud for a dance class that blew up almost overnight to becoming the first artist born in the 21st century to have a Number One album on the *Billboard* 200, in early April 2019.

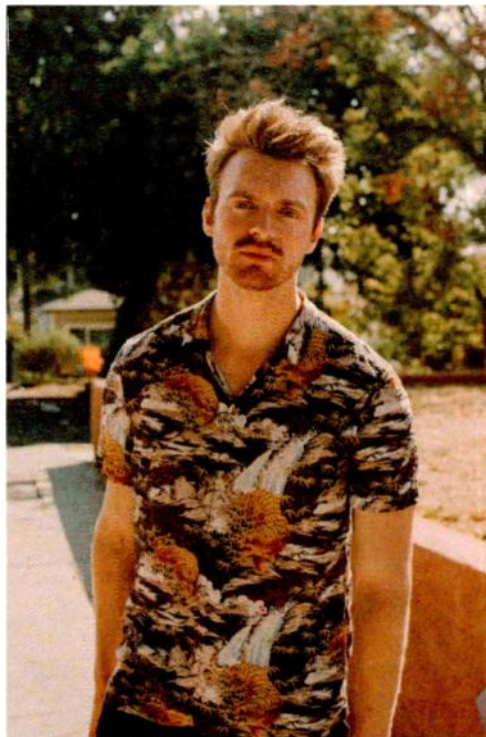
In the intervening three and a half years, Eilish (full name: Billie Eilish Pirate Baird O’Connell) racked up one billion on-demand streams before releasing her debut full-length, *When We All Fall Asleep, Where Do We Go?*—Nielsen Music reported that she had passed 3.79 billion streams by April 25—and has seen 12 of the 14 album tracks, plus two other songs, hit *Billboard*’s Hot 100. Not bad for a 17-year-old who, incidentally, is now the youngest female ever to have a Number One album in the UK.

“People have put a lot of emphasis on that room as part of our lineage,” says O’Connell on the phone

from Australia during a tour leg on which he both opened for, as a solo artist, and performed with Eilish. “It was lovely to make an album there, but I think it’s really important to work wherever you are, or wherever you have your tools.”

This is no humblebrag bedroom studio that turns out to have been professionally outfitted. It’s just a regular bedroom, with a bed against one wall, where Eilish sat to record her vocals, facing a desk and bookshelves and O’Connell’s modest production setup: Apple Logic Pro X, a UA Apollo 8 interface and a pair of Yamaha HS5 nearfields with an H8S subwoofer. O’Connell, who turns 22 in July, has since moved out, setting up a duplicate, slightly upgraded collection of gear at his new home, including a pair of Yamaha HS8 monitors and an Apollo X.

As his sole reference, O’Connell says he didn’t really think about the way the bedroom sounded until he started recording elsewhere. “The bedroom has a very specific sound, very tight and intimate and closed and quiet. I love the way it makes vocals sound.”



MORGAN HILL-MURPHY

Finneas O’Connell may have produced his sister Billie Eilish’s hit album in his bedroom, but he doesn’t want that to define his sound: “I think it’s really important to work wherever you are, or wherever you have your tools.”

Eilish’s next album could potentially sound a little different. “All of my solo material, I record at my new house. I’m sure Billie and I will start recording there whenever we get back

into recording mode for the next record,” he says. “But even if we never record full albums there again, maybe sometimes there will be just a vocal that we feel we must record in that room just to make it sound that way.”

Eilish’s hip-hop-influenced yet pan-genre songs (she calls it simply “Billie Eilish music”) sometimes feature heavily effected vocals, and harmonies that are equal in level to the lead—not to mention sound effects such as an Easy-Bake oven, dentist drill and audience reaction. “Especially in a song like ‘Bad Guy,’ the thing that’s interesting isn’t necessarily the vocal melody on the verses; it’s that there’s three-part harmony and it’s the rhythm,” says O’Connell.

The secret behind some of those vocal effects is Logic Pro X’s Vocal Transformer plug-in, he reveals. “It’s really good at making a vocal sound crazy and unique. It’s not necessarily the most intuitive plug-in, but if you twiddle the knobs and change some dials, it makes things really interesting. That’s the plug-in I use on ‘Bad Guy’ for the ‘rattlesnake’ vocal.”

(continued on page 24)

Making Elements Co-Exist

BY STEVE HARVEY

LOS ANGELES, CA—Any article about Jacob Collier must inevitably begin with a list of his accomplishments, and with good reason: he’s done so much, and in such a short time. Largely self-taught, he’s a composer, arranger, producer, engineer and mixer who sang every line and played every instrument on his debut album, 2016’s *In My Room*, which he recorded in his room at the family home in London at the age of 21. It earned him two Grammy Awards.

And that’s barely scratching the surface. It doesn’t cover his signing with Quincy Jones’ management company; hooking up with MIT Labs Ph.D. student Ben Bloomburg to create the technology for his one-man shows, which recently morphed into a full-band touring project (see *PSN* May 2019); or his live collaborations, self-made videos, TED talks or master classes.

In late 2018, Collier announced his next album project, and it’s an effort very much in keeping with his

life to date. *Djessa* is a four-volume opus of more than 40 songs, each album focusing on a different musical world. Featuring a host of collaborators, it was mixed and mainly recorded in his room, but also in Holland, Portugal, Morocco, Japan, the United States and Abbey Road Studios in London.

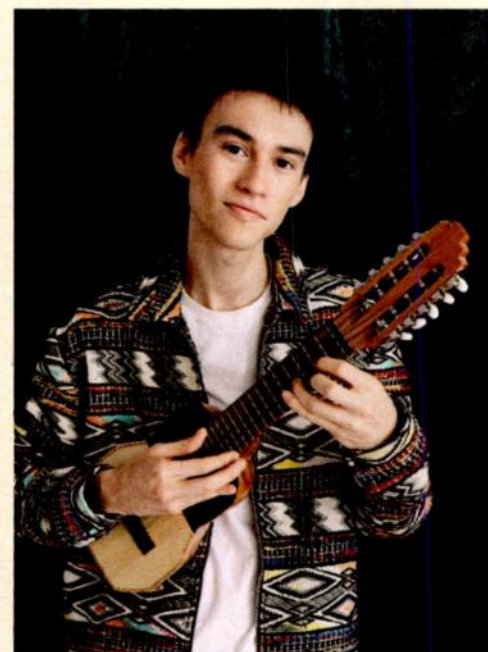
“Each volume is almost like a different sonic universe,” says Collier. “The first is orchestral, so it’s really broad and about space. The second is a lot more intimate and cozy. That’s basically folk music, so a lot of smaller rooms, closer-sounding things, lots of delicate ingredients, like a string sextet.” *Djessa—Volume 2* will be released June 28 via Hajanga Records, licensed exclusively through Decca/Geffen.

He continues, “*Volume 3* is a lot more of the electronic, digital, hip-hop, R&B, broken beat kind of crazy stuff. There’s a lot of sound play. That’s where I get to unleash a lot of my Logic chops, in the sense that I can achieve strange grooves with odd sounds; I’ve been wandering

around the world recording all these weird sounds. Then the fourth and final quartile is fundamentally based on a 45-piece church choir based out of Huntsville, AL. Those guys were recorded in Nashville.”

Despite his facility with any instrument he cares to pick up, Collier’s musical universe revolves around Logic Pro. “I’d almost say that that workspace is more prevalent in my creative life than any musical instrument, just because it was my canvas from day one. I’ve used Logic since I was 11 years old,” he says, adding, “I was on Cubase for four years before that.”

As far as playing musical instruments goes, he says, “I’ve picked up a few different dialects, I suppose, of music as a language, with piano and bass and drums and vocals and guitar—but I don’t necessarily think of myself as an instrumentalist; I think



TEREN MABRY

Jacob Collier produced and recorded his four-album, 45-song opus, *Djessa*, in Apple Logic Pro.

of myself as a musician. Playing musical instruments will teach you a lot about music, but it’s a means to an end, and Logic ends up being the end, often, for me. That’s where I can join all these different elements together and figure out a way for them to coexist.”

(continued on page 24)



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Mark Hornsby, vice president of operations and senior producer/engineer, sits at Sweetwater Studios' "Neve 6," a mash-up of an Avid S6 control surface flanked by Rupert Neve Designs 5088 desk Shelford input modules.

Full Service Sound in Fort Wayne

BY STEVE HARVEY

FORT WAYNE, IN—From its humble beginnings as a 4-track mobile recording studio in the back of musician Chuck Surack's Volkswagen Samba bus in 1979, Sweetwater Sound has become a juggernaut, morphing into the largest online pro audio and MI equipment retailer in the United States. Yet as Sweetwater has evolved, the recording studio has remained a constant, initially moving into Surack's house, then to various commercial properties before settling into its forever home inside a Russ Berger Design Group-designed space on the Sweetwater campus in 2008.

The campus—and studio—were considerable then, and they're still growing. In October 2018, Sweetwater began a \$76.4 million expansion at the 163-acre campus that will add a 350,000-square-foot warehouse, a 30,000-square-foot event center and eventually more than 1,000 jobs. Sweetwater added 400 employees in 2018, finishing the year with more than 1,500 people on its staff, almost half of whom relocated to Fort Wayne.

Talk to Mark Hornsby and you'll be ready to pack your bags and move to Fort Wayne, too. Hornsby, who joined Sweetwater Studios, the company's recording studio division, as vice president of operations and senior producer/engineer in 2008, is a booster for the city and its conveniently accessible Midwest location. "It's the cheapest place to live in the United States, and we probably have more musicians per capita than any other town. Everybody who works at Sweetwater is a musician. It's a music city on totally different terms than Nashville, L.A. or New York," he says.

"Then you add the Sweetwater campus into the equation—the restaurant, coffee shop, fitness center, doctor's office," he says. Fort Wayne's nightlife includes the

2,150-capacity Clyde Theater, recently renovated with contributions from Surack and his wife and Sweetwater co-founder, Lisa.

Sweetwater Studios houses three traditional facilities that are interconnected with each other, as well as a 250-seat performance theater that doubles as a recording space. "There are drop-down screens in A and B," says Hornsby. "We can have a live rhythm section in Studio A, with a chamber orchestra on the stage in the performance theater, and musicians in both Studios B and C—with video, so everybody can watch each other in real time." The stage, coffee shop and all the conference spaces across the campus are also connected back to the machine room, he reports.

Pro Tools HDX2 systems with MTRX IO boxes are common to all three studios, as are ATC reference monitors. Studio A, the main tracking and mix room, which includes a couple of iso booths, features a pair of SCM150s and an ATC sub. Studio B, a mix room with an overdub space large enough for a drum kit, offers a 5.1 setup with three SCM45s across the front and powered SCM20 rears. Studio C, a mixing and mastering space that

also accommodates guitar and vocal overdubs, includes a pair of ATC SCM25s.

Studio B is outfitted with an SSL AWS 948 Delta desk. Studio C is tricked out with a lot of Dangerous Music gear, says Hornsby: "All their routing and mastering stuff, and their converters, if you want to use those instead of the MTRX."

Studio A houses a hybrid console designed by Hornsby and the team that they call a "Neve 6." It's a mash-up of an Avid S6 24-fader control surface flanked by double-wide console racks housing 32 channels of Shelford input modules from the Rupert Neve Designs 5088 desk, plus that company's summing and master bus modules. The racks are also populated with a variety of outboard preamps and processing, from tube to solid-state.

"The idea of putting everything in one desk was to accommodate anybody's workflow," Hornsby explains. The Shelfords are there for those who prefer to cut drums or an entire rhythm section through a console or the same preamps. Conversely, he says, if you prefer to mix things up, run the bass through a Shadow Hills unit, the drum overheads through Daking devices for their Trident A Range EQ sound,

and the kick and snare through API modules.

As for mixing, he says, "You can stay completely inside Pro Tools with an Avid S6 control surface, or you can use the keyboard and mouse. And there's every plug-in known to man on the computer." Or patch in Shelford modules for their EQ, and SSL, API or Manley compressors for a hybrid workflow, he says.

The equipment choices in the 8,000-square-foot production complex might seem limitless, but there's more. "When you're recording in a facility that has 150,000 square feet of warehouse, you have access to more gear than anyplace in the world," says Hornsby. "If you want to use a '59 Gibson Les Paul Reissue on a certain track and we've got six in stock, then the question is, What weight and color would you like?"

That might seem like an unfair advantage over other studios, or even competition for Sweetwater's clients. "We're not interested in competing with them or taking business away from people," says Hornsby. "It's not the cheapest place in the world to record; we did that intentionally."

For the right situation, the setup is perfect. From the beginning of Sweetwater's recording master class program, Hornsby called on his session player friends. "The goal was to give our customers an opportunity to sit in the studio with people who make records for a living," he says. Artists including Robben Ford, Chester Thompson, Peter Erskine, Oz Noy and Jonatha Brooke have recorded projects at the facility, some of which have been released on Sweetwater's own imprint.

The events also offer opportunities for vendor participation, of course, while providing content for Sweetwater's YouTube channel, which has hundreds of thousands of subscribers and millions of views. "We've got a revenue model where the studio time is paid for. We have customers who are thirsty for knowledge. So now there's a line out the door of artists who would love to do master classes; they get paid to record their own record," says Hornsby.

"We can do these projects in a lot of different ways that check a lot of boxes for a lot of different people. We can make vendors happy, customers happy, artists happy, and do it in a way that makes financial sense for us. It's a proactive new model."

Sweetwater Studios

www.sweetwaterstudios.com

Recovering from OS Meltdowns



BY CRAIG ANDERTON

From my January 2016 column: “As we become ever-more dependent on computers, we increasingly run the risk of being blindsided by our tools.” This is one of many times I wish I had been wrong. From Microsoft pulling a release because it erased user data, to Macs that overheated and required throttling back speeds, to the slow dribble of bug and compatibility fixes—some significant—for Windows and macOS, many of us are now unwilling players in computer roulette.

A recent Windows 10 update gave my studio computer the Blue Screen of Death on restart, for example. System Restore restored functionality, but a few days later the same update wanted to install itself again. Once more a BSOD, and this time System Restore wasn’t successful. I was able to restore from a disk image—but it’s with the OS version that BSODs the computer if updated. Meanwhile, after I updated my secondary Windows 10 office machine, it no longer recognizes that additional updates exist. Maybe that’s a blessing in disguise.

The answer to these troubles used to be to “get a Mac.” Now, maybe not so much. When I booted up my Mac recently, Apple advised me of recommended Safari and security updates. After a restart, the Mac said it couldn’t complete the update. When it wouldn’t boot after several more tries, an Apple store associate walked me through five increasingly invasive procedures that culminated in reinstalling the entire OS. (Note that the Mac platform still has the edge here; unlike Windows, macOS preserves your existing programs and data after complete reinstalls.) Several hours later, that computer was back online.

This is scary. These problems were not caused by anything I did—they were the result of installing (or trying to install) approved manufacturer updates. I’m not alone. When I searched on these issues, pages and pages of complaints and suggested fixes turned up. Some worked, most didn’t.

I’m not sure this situation will get better, so I’m asking music software manufacturers to find ways to keep us productive when we have to start all over. And starting over will

happen with increasing frequency, whether it’s because we need upgraded hardware, or because of buggy operating system releases. Here’s what might help:

Make dongle- or cloud-based protection the standard operating procedure. No one likes dongles, and they raise

the price of software, but they keep your license in a place where your computer can’t accidentally obliterate it. Just download the program, then reinstall (and remember to get zero-downtime insurance on the dongle).

A “migration” option for cloud-

based licenses. With a failed hard drive or computer change, the current process is to de-authorize and re-authorize the license. I’d like a “migration” option that allows a 30-day window for the license to exist on the old and new machines simultaneously, so you can complete old projects while getting the new machine up to speed. For a system

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ARTIST: BILLIE EILISH
ALBUM: WHEN WE ALL FALL ASLEEP, WHERE DO WE GO?

LABEL: DARKROOM/ INTERSCOPE RECORDS

PERSONNEL:

Produced by: Finneas
Mix Engineer: Rob Kinelski
Studio: Private Studio (Los Angeles, CA)
Mastered by: John Greenham

EQUIPMENT NOTES: Yamaha HS5 and HS8S monitors, Apple Logic Pro



ARTIST: HOLLYWOOD VAMPIRES

ALBUM: RISE

LABEL: EARMUSIC

PERSONNEL:

Produced by: Alice Cooper, Joe Perry, Johnny Depp, Tommy Henriksen
Engineered by: Mike Plotnikoff, Alice Cooper, Joe Perry, Johnny Depp, Tommy Henriksen, Philip Krause
Mix Engineer: Mike Plotnikoff at West Valley Recording Studios, with Johnny Depp and Tommy Henriksen for The Gypsy Punk

Studios: Infinitum Nihil Studios, Anarchy Studios West, The Bat-Cave, The Hameau, Emil Berlin Studios (aka Hansa)

Mastered by: Howie Weinberg Mastering

EQUIPMENT NOTES: SSL 4000 E-Series console; Avid Pro Tools 2018; ADAM Audio S3A, KRK E8B Expose, Yamaha NS-10M, Auratone 5c, Genelec 1030 studio monitors



ARTIST: NATHAN WHITEHEAD

ALBUM: DAYS GONE SOUNDTRACK

LABEL: SONY CLASSICAL

PERSONNEL:

Produced by: Chuck Doud, Keith Leary, Peter Scaturro
Engineered by: Nick Spezia, Eddie Jackson, Kellogg Boynton, Chris Steffan, Jasper Lemaster
Mix Engineer: Satoshi Mark Noguchi

Studios: Ocean Way Studios (Nashville, TN), Band House Studios & PlayStation Recording Studios (Los Angeles, CA)

Mastered by: Patricia Sullivan at Bernie Grundman Mastering

EQUIPMENT NOTES: Avid Pro Tools



ARTIST: BROOK DAVIS

ALBUM: SERIOUS DAMAGE

LABEL: RED BEDROOM RECORDS

PERSONNEL:

Produced by: Jack Mason
Engineered by: Jack Mason
Studio: Jack Mason Recording
Mastered by: Jack Mason Recording

EQUIPMENT NOTES: Apollo Twin mkII, Antelope Orion 32+, Amphion One18 monitors, Avid Pro Tools Ultimate



ARTIST: CHARLIE MARIE

ALBUM: CHARLIE MARIE

LABEL: SELF-RELEASED

PERSONNEL:

Produced by: Charlie Marie
Engineered by: Ben Klise
Studio: The Tracking Room (Nashville, TN)

Mastered by: Andrew Darby at Georgetown Masters

EQUIPMENT NOTES: SSL 9000J, DAM Audio S3A monitors, Avid Pro Tools



ARTIST: JOY WILLIAMS

ALBUM: FRONT PORCH

LABEL: SENSIBILITY/THIRTY TIGERS

PERSONNEL:

Produced by: Kenneth Pattengale
Engineered by: Matt Ross-Spang
Mix Engineer: Richie Biggs

Studio: House of Blues Studios (Nashville, TN)
Mastered by: Richard Dodd

EQUIPMENT NOTES: 1979 vintage API console, Ocean Way Audio custom 415T monitors, ATC SCM25 monitors, Neve 1081 preamps to Pro Tools HD



ARTIST: MISSYOU

ALBUM: YOURBODY

LABEL: SELF-RELEASED

PERSONNEL:

Produced by: Missyou, Jared Scharff, Drew Williams
Engineered by: Omer Walk, Drew Williams
Mix Engineer: Drew Williams, Mark Barre

Studios: BMG Studios & Obladee Studios (New York, NY)

EQUIPMENT NOTES: Universal Audio Apollo Twin, Avid Pro Tools, Apple Logic Pro X



ARTIST: CRICKET BLUE

ALBUM: SEROTINALIA

LABEL: SELF-RELEASED

PERSONNEL:

Mix Engineer: Jeff Oehler
Studio: Beehive Productions (Saranac Lake, NY)

Mastered by: Jeff Oehler

EQUIPMENT NOTES:

Antelope Orion Studio, Aphex 1788 mic preamps, Event 20/20BAS monitors, MOTU Digital Performer 9



ARTIST: THE MRS

ALBUM: FIVE MINUTES

LABEL: JL ENTERTAINMENT MANAGEMENT

PERSONNEL:

Produced by: Maika Maile, Gavin Jasper

Engineered by: Maika Maile

Studios: The Sanctuary (Orlando, FL), 512 Studios (Austin, TX)

Mastered by: Randy Merrill at Sterling Sound (New York, NY)

EQUIPMENT NOTES: Otari DB-32 analog console, Genelec 1031a monitors, Avid Pro Tools 2018



ARTIST: MINDI ABAIR AND THE BONESHAKERS

ALBUM: NO GOOD DEED

LABEL: PRETTY GOOD FOR A GIRL RECORDS

PERSONNEL:

Produced by: Kevin Shirley
Engineered by: Matt Wolach

Mix Engineer: Kevin Shirley at The Cave (Malibu, CA)

Studios: EastWest Studios, Studio 1 (Hollywood, CA)

Mastered by: Bob Ludwig at Gateway Mastering (Portland, ME)

EQUIPMENT NOTES: 80 Channel Neve 8078, custom ATC 300 monitors, Yamaha NS-10, Auratones, Avid Pro Tools

notes

CTD Brings PFS to Jankland

NASHVILLE, TN—Carl Tatz Design (www.carltatzdesign.com) completed installation of its PhantomFocus System (PFS) into Jankland Recording, which is owned by trumpet player Steve Jankowski, who produces, engineers and arranges for top-name jazz acts at his facility in Wall, NJ.

Ross Builds Out with Genelec

NATICK, MA—Producer, mixer and songwriter Keith Ross added a pair of Genelec (www.genelec.com) 8350A Smart Active Monitors and a 7380A Smart Active Subwoofer to his South Florida personal studio.

Abbey Road Masters Bows

SANTA MONICA, CA—Universal Production Music (www.universalproductionmusic.com) and sister company Killer Tracks have partnered with Abbey Road Studios to launch a new production music catalog, Abbey Road Masters, that comprises tracks recorded, mixed and mastered at the famed facility, also forging relationships with composers Michael Price, Rob Lane, Samuel Sim, Christian Henson, Andy Bell and Tom Furse.

Book Discusses Women in the Studio

NEW YORK, NY—Written by musician/academic Paula Wolfe, the book *Women in the Studio: Creativity, Control and Gender in Popular Music Sound Production* (www.routledge.com) aims to explore the cultural and historical frameworks that underpin the sustained inequalities of gender, class and race in the music industry and their consequences for female producers and self-producing artists.

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Finneas

(continued from page 18)

Other than that, he says, “I use really harsh tremolo a lot. It’s set to zero percent smooth, so it’s chopping the signal, and I’ll set it to eighth- or sixteenth-note values, then set the depth.”

When initially working together, a period that included the production of songs such as “Ocean Eyes,” “Six Feet Under” and “Bellyache,” O’Connell used an Audio-Technica AT2020 cardioid condenser mic on his sister’s vocals. More recently, he has been using a Neumann

TLM 103 large diaphragm mic. “I recommend the TLM 103 to anyone; it’s such a good microphone.” But when he has some free time, he says, “I’ll probably do a microphone shootout somewhere and try a bunch of different things.”

In fact, he bought a pair of TLM 103s and hopes to use them to record his piano eventually, but for Eilish’s productions, he has always used virtual instruments, such as Keyscape by Spectrasonics. “It’s amazing, especially the Dark Indie upright pianos. My piano in my parents’ room is not situated well for recording. It’s more fun to write on it, then record on a MIDI keyboard, especially because I like tweaking

Collier

(continued from page 18)

As the sole producer of the *Djesse* album cycle, a large part of his job has been to bring cohesion and continuity to the project, he says. “The challenge is to make it feel like one continuous story and not just a jumble of different worlds. But also, it’s managing all these different physical spaces and getting them to feel coherent and not like you’re jumping back and forth in terms of sound worlds. I’m used to my room in London. I’ve been working in that space since day one. It’s been really exciting to travel and to expand my space to meet other people’s spaces, and then to shrink those spaces back into my room without reducing any of the impact or scale.”

Collier’s productions are known for layered vocal harmonies, a feature of the live shows that he achieves through use of the Harmonizer. Bloomberg, Collier’s live show production director, custom-configured the collection of electronics to enable Collier to generate up to 12-part harmonies from his vocal on stage in a similar manner to a vocoder. However, combine all those vocals with tracks and tracks of instruments in the studio and Logic eventually runs out of steam.

“Logic has a 253-audio track limit, which is a real bind. I’ve been moaning about that for so many years now,” he says. As Collier has explained elsewhere previously, it’s not unusual for him to create a separate project for each section of a song, otherwise he would quickly run out of tracks.

But working in Apple’s Logic Pro X environment offers a bonus—namely the MainStage companion app, which enables Collier to bring

the sounds of his recordings into his live show. “I’ve gotten very used to my sounds,” he says, “so the really cool thing is, from my MainStage, I can have the exact same sounds so that people in the band can play them and it feels very similar to the recorded version on the album and my creative space at home.”

Globetrotting to record with orchestras and collaborators, he’s had to learn how to get Logic to play nice with other DAWs. Recording the Metropole Orkest under the direction of Jules Buckley in Holland, for example, “The challenge there was to get the Pro Tools tracks out and into Logic.”

As it turns out, Bloomberg was also able to bring his talents to bear in the studio. “It’s been amazing to have Ben in tow because he’s had some amazing experience with recording spaces, far more engineering experience than I’ve ever had. To have Ben involved with, for example, engineering the orchestra sessions and the church choir sessions, has been super cool because he has a really keen idea as to how best to get that space to translate into the listening experience.”

Collier’s role as *Djesse*’s producer is almost akin to that of a movie director. “It’s organizing space in a very particular way. Obviously, I’m writing the music and orchestrating and arranging it, but I guess it really is about managing sound in the biggest possible sense. That’s why this quadruple album was such a juicy challenge to me—45 songs in totally different genres with 26 different collaborators, all my musical heroes. It was about how can I find this continuum of sound worlds where things are consistent, effective and there’s no extraneous rubbish? It cuts to the point and just tells that story.”

Jacob Collier

www.jacobcollier.com

“It’s really important for kids to not think that there’s something intangible and out of reach for them. The truth is that you just have to make a song that people like.”

Finneas O’Connell

MIDI parts, changing and perfecting them.”

O’Connell hands Eilish’s songs off to mixer Rob Kinelski. “Everything that I’ve sent that he’s mixed is pre-compressed and pre-panned, and all the reverbs and all the delays are pretty much already there. I’m not looking for Rob to ‘fix’ anything; he just makes it a little more balanced, because everything comes out of my bedroom at my parents’ house with too much bass. Rob and our mastering engineer, John Greenham, make sure our stuff sounds good everywhere.”

O’Connell has been using Justin Hergert, a Grammy-nominated mixer and engineer who has long worked with Tony Maserati as chief engineer of Mirrorball Entertainment’s Outfit 27 team, to mix his solo work, as well as projects with artists such as Ashe, whose four-song EP he executive produced. “Hergert is really fast,” he says. “It’s fun to go into the room with the mixer and watch what they do; he’s always been very nice about letting me do that.”

While O’Connell can now afford to employ a mixer and mastering engineer on his productions, it wasn’t always that way. But lack of a budget should not be a barrier to anyone starting out in the business, he says.

Take “Ocean Eyes,” for example—the song that went viral and caught the attention of the management team and record label now behind Eilish. “It was mixed and mastered by me and uploaded to Soundcloud. And that song saved our lives,” says O’Connell.

“When I was starting to make music, I thought I had to pay a bunch of people to do all my things professionally and that that would be the only way I would ever have any success. It’s really important for kids to not think that there’s something intangible and out of reach for them. The truth is that you just have to make a song that people like.”

Billie Eilish

<https://site.billieeilish.com>

Finneas O’Connell

www.finneasofficial.com

Anderton

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drive change, this would also allow using a removable system drive, or booting from an external drive, during a transition.

A “back up my personal stuff” option. When we need to reinstall a program, we can usually download a working version of the program we bought—but programs also create user-generated data that’s not part of the program per se, like presets and content. These get stuffed in places like Mac Libraries, mysterious Windows folders, Documents folders and the like. It would be great if programs could sweep all this data up into a folder that you could back up with your projects.

Make older program versions accessible for reinstalling. When you reinstall a program, you often get the latest version instead of what was on your machine previously. This can interfere with productivity as you have to learn a new environment or, worse, can make the pro-

gram out of sync with your operating system, which is likely to lead to new problems. Perhaps companies could have a legacy section where you can reinstall the version you had, with the option to do subsequent free upgrades (if available) when convenient.

As for Windows backup, as Mark McLeod says, “Any Windows backup system that requires Windows to be running is, to my mind, flawed.” He recommends the Linux-based Clonezilla, because it’s completely unaware of Windows.

What about never updating? That’s an option, but, among other issues, it can make collaboration difficult, and with a Mac, it can obsolete your hardware. Unfortunately, we can’t trust our computer-based tools. To avoid a productivity hit, we need to make sure we can start all over again at a moment’s notice.

Craig Anderton’s new book series, *The Musician’s Guide to Home Recording*, is available from Hal Leonard in softcover and online as a series of ebooks. Please visit www.craiganderton.com for more news.



briefs

Cinematic Media Adds Sound

MEXICO CITY, MEXICO—Oscar-nominated supervising sound editor Martín Hernández is overseeing construction of a new sound division at Mexico City's Cinematic Media (www.cinematicmedia-mx.com) that features six sound editorial and mixing stages, each with Avid Pro Tools, Avid S6 and Avid S3 control surfaces and JBL monitoring systems, and each certified for Dolby Atmos sound production.

Sony Adds Atmos to Stages

CULVER CITY, CA—Sony Pictures Post Production Services (www.sonypicturespost.com) has upgraded three mix stages—the Cary Grant Theatre, Jimmy Stewart Theater and 10-seat Theater 3 on Stage 6—with Avid, JBL and Harrison audio technology to support sound mixing for film and television in Dolby Atmos format as part of the ongoing expansion of its sound resources on the Sony Pictures lot.

Mets Pregame Scores with DPA

NEW YORK, NY—Searching for a microphone that would meet the sound quality needs of the pregame broadcast on SNY, the New York Mets' official television network, Luis Pantoja, SNY's senior studio director, selected the d:fine 4288 directional in-ear broadcast headset from DPA (www.dpamicrophones.com), also using it at the Mets' spring training in Florida.

Auralation Flexes with Focusrite

LOS ANGELES, CA—Focusrite (<https://pro.focusrite.com>) Rec 8Pre, Red 4Pre and Clarett OctoPre interfaces have been enabling Auralation Music to get the most out of its Auralation Studios in Knoxville, TN, when working on projects for networks such as Lifetime, Oxygen, Discovery and Spike TV, including helping move sessions between the main 5.1 mix room and two smaller production rooms.

Full Sail Goes All-In on Esports

BY STEVE HARVEY

WINTER PARK, FL—Full Sail University has unveiled its esports arena, The Fortress, constructed on a former soundstage adjacent to the media arts and technology college's Dan Patrick School of Sportscasting studio facility. Representing a capital investment of \$6 million, the 11,000-plus-square-foot arena seats 500 and is currently the largest esports arena on a college campus in the United States.

Built for Full Sail's Armada collegiate esports organization, The Fortress houses the latest technologies and products from an array of audio, video and lighting brands, enabling fans to watch everything from one-on-one games to competitions among as many as 100 esports athletes simultaneously. Pro Sound & Video worked with L-Acoustics on the arena sound system design and integrated all the AVL systems.

Esports is potentially changing the face of broadcast, streaming globally to an audience whose size rivals that of traditional sporting events. With new production centers built on current technology, unencumbered by



The largest esports arena on a U.S. campus, Full Sail's The Fortress houses technologies and products from an array of audio, video and lighting brands.

the legacy of traditional television, esports could well be a signpost to the future of the broadcast medium.

Viewers typically watch esports competitions via YouTube and Twitch, but games are increasingly being picked up for a cable audience by traditional entities such as Disney and Turner, requiring connectivity with the outside world.

Arenas are popping up nationwide as esports picks up momentum, but

Vincent Lepore, Full Sail's director of event technical operations, believes The Fortress has one distinct advantage over its rival standalone venues. "One of the things that is great about Full Sail is that we already had this campus built up around us. We have a lot of these redundant internet service providers and an IT team that supports the campus already. I think that's unique," he says.

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INSIDE PODCASTING

Who Are Podcasters?

Big radio companies like NPR, Gimlet and others may be the first names that come to mind when you think of podcasters, but in fact it's the independents that create the vast majority of podcasts out there.

Independent podcasters are regular folks—hobbyists, business owners, entrepreneurs and others—and mostly they produce (and usually host) podcasts for the purpose of growing an audience of fans and/or prospects who may buy their widget.

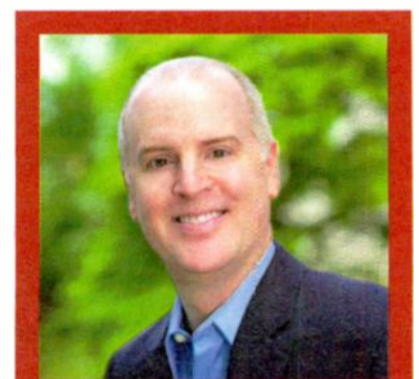
Their shows usually don't gain the number of downloads needed to be able to earn money by bringing on sponsors, but there are still benefits for them to produce podcasts. Many use the shows to generate good content, develop relationships in their industries and attract prospects. They play the long game. Side note: Many people want to start a podcast and immediately blow up, get rich from sponsor money and become a celebrity—and this is why almost all those folks last just five to 10 episodes before reality smacks them in the face and they give up.

At the other end of the spectrum are NPR, Gimlet and others; they have different goals and bring an entirely different set of skills to the podcasting space. They want to make money, and they have the audio production manpower to produce really good audio, as well as big teams of people to handle all the various aspects of their business.

Beyond the audio quality itself, these companies use a rich storytelling format that entails recording lots of audio with guests, going on location, sifting through all of it, using the best parts, incorporating music for transitions and background, scripting the hosts' narrative, mixing and re-mixing many versions due to the evaluation and re-evaluation by a team of producers, long production times and lots more.

Of course, they need big budgets to make all this happen, and they leverage their production expertise with their radio allies to create a big audience, and then bring on big sponsors to make the show and/or network profitable.

Now, you can understand that



BY CHRIS CURRAN

Chris Curran is a podcast producer, host of *The Podcast Engineering Show* and the founder of www.PodcastEngineeringSchool.com. While on staff at The Hit Factory, Quad Recording and Soundtrack, he worked on projects with dozens of artists, including Foreigner, Sarah McLachlan, Jeff Buckley and many others.

these two groups of podcasters are not even comparable. The big companies bring a lot of resources to the table that the independents—the ones creating the vast majority of podcast shows—just don't have. As a result, the name of the game for independents is production speed. Podcasters typically don't want to spend much time producing their episodes, be-

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Esports

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Full Sail currently uses Telestream's Wirecast for live video streaming, but that may change as Lepore weighs the options. "We're looking at getting some video services type of fiber into our facilities so that we can have true connectivity with the outside world," Lepore says, enabling The Fortress to connect to other arenas for competitions and other events.

Locally, the campus is fully wired, with fiber between buildings enabling the new arena to cohost events with, say, Full Sail Live, the college's live production teaching venue. "In fact, in the next few weeks, we have one of our largest events of the year on the campus that will link both venues," says Lepore.

The college's reliance on Dante networking informed audio equipment choices at The Fortress. On the broadcast side, for example, a Calrec Brio36 console is outfitted with a Dante I/O card as well as MAD1 and Waves cards, the latter for connectivity with a Waves SoundGrid Server One. "Full Sail has numerous Calrec consoles around campus, so we're really comfortable with Calrec and what they do for a broadcast mix.

That was an easy choice for us," says Lepore.

Monitoring at the Calrec console is via a pair of Genelec 8340A speakers with a 7360A subwoofer. The broadcast room is also outfitted with various items from Ross Video, including an Ultrix 112x112 video router, Carbonite Black 3 M/E switcher and Xpression graphics system. An EVS XS3 server handles playback and replays.

In the arena, the audience mix is generated from a Yamaha CL3, which checked a couple of boxes, he says. "First, it's a great little console, and we had some space constraints, like everybody does. Also, the tight Dante integration is the killer feature for me. Having a console that could just drop right onto the Dante network and be seamless was a big deal for us."

Game shoutcasters make use of Studio Technologies Dante-enabled announcer's consoles, reports Lepore, who is now eyeing the company's Model 207 eSports Console, introduced at the recent NAB Show. Shoutcasters and players are equipped with HMDC 27 headsets from Sennheiser, a Fortress sponsor along with MSI, Logitech, DXRacer and 3N2.

"One of the things I was worried about was how those Sennheiser mics were going to come across live through the P.A. We just used them

for the first time on a tournament and I was blown away by the sound of the microphone," says Lepore. Eight channels of Shure Axient Digital with Beta 58 handheld transmitters plus eight DPA headset microphones and four channels of Shure PSM 1000 IEMs are additionally available.

A combination of processing keeps crowd noise out of the microphone feeds. "A little bit of Dan Dugan-type automixing and a little bit of Waves' WNS noise suppression goes a long way here," he says.

Production communications are built on the Telex ODIN frame and includes 10 KP-5032 intercom keypanels plus Roameo wireless and BP-325 wired intercom packs. "The intercom sits on the Dante network as well," says Lepore. "Full Sail is a very heavy Telex user and has been for many years."

As for the house PA, he says, "We wanted to be able to do a traditional end-stage configuration, but we also wanted to be able to do an in-the-round setup" without re-hanging loudspeakers. Twin arrays of L-Acoustics SB15 subwoofers atop Kiva II elements support end-stage events. For in-the-round events, 13

L-Acoustics X12 coax speakers are installed in a 360-degree ring, accompanied by two hangs of SB18 subwoofers. Four L-Acoustics 5XTs deliver front fill while four more X12s are available as floor monitors.

Depending on the stage configuration, fans can follow the action either on an Absen 36-ft. by 11.5-ft. LED videowall or a 24-ft. circumference, 3.25-ft. tall ring of LED panels above the center of the room. "That's where the gameplay can be viewed," says Lepore. "We have 354 tiles in the room," all offering a pixel pitch of 2.9 mm.

"No one sees a loudspeaker in their view of any of the LED walls," he stresses. "That was really, really important, and it was very difficult to achieve."

Full Sail's Armada teams, launched in 2018, compete in various collegiate-level events, including *League of Legends* and *Overwatch*. But the college's esports involvement began in 2012, when the campus hosted Red Bull LAN Orlando. More recently, in 2018, Full Sail hosted Florida Mayhem's inaugural *Overwatch* season.

Full Sail Armada
armada.fullsail.edu

Podcasting

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cause podcasting isn't how they make their living and they have lots of other things to do; they live busy lives like the rest of us.

There are three main workflows in this type of podcasting. The first one is used by the majority of independent podcasters because it's the easiest and requires the least amount of time and audio production knowledge. The podcasters will record their own interviews or just talk solo, and then do the bare minimum of post-production.

In terms of audio knowledge, skills, equipment and software, these folks are pure amateurs. If they have guests, they usually record using online services like Skype, Squadcast, Zencast or Ringr. For post-production, they use no EQ or compression, and don't pay much attention to levels—including the level of their intro music, which usually ends up being way too loud or too low in the mix.

In the end, the final quality of their episode audio is not good, and it's usually quite annoying to listen to

due to the huge dynamic range, background noises, guests using earbud mics, plosives, sibilance and much more.

The second type of workflow is when the host records interview audio (which often contains lots of the amateur mistakes listed above) and then hands over all the audio tracks to a podcast editor to remove umms, remove lipsmacks, level the voices, mix in music and create the final MP3 episode file.

And the third type of workflow is when the podcaster actually does some basic/intermediate audio production for the show. There are very few podcasters who do this! They do everything I mentioned above with regards to what a typical podcast editor usually does, and in addition, will use EQ, compression and de-essers, as well as some audio repair tools like de-reverb, de-plosive, de-noise, de-hum, mouth de-click, breath control, and more. Obviously, their final episode audio sounds way better than the average podcast, and can be very good quality at times.

In future columns, I'll talk more about all those amateur mistakes, and we'll get into the podcast editing industry and other important topics.

Outfitting Montreal's MRC Broadcast Center

MONTREAL, CANADA—CBC/Radio-Canada will implement a large communications backbone for its new headquarters in Montreal centered on Riedel Communications Artist and Bolero wired and wireless intercom systems, resulting in one of the largest Artist installs in North America when completed.

Due to open in 2020, Montreal's Maison de Radio-Canada (MRC) broadcast center was conceived as a creative hub for the city's digital and artistic communities. CBC/Radio-Canada had mandated that its new communication infrastructure be entirely IP-based, utilizing the established SMPTE ST 2110-30/31 and NMOS IS-04/05/07 standards to create a future-proof communications environment.

"The combination of cutting-edge technology, modern user interfaces and panels, and commitment for open specifications and standards from AMWA and SMPTE will give our creative people a very powerful and fully integrated intercom system," said



Francois Vaillant, executive director, engineering solutions, CBC/Radio-Canada; Rik Hoérée, director of sales, Americas and Europe, Riedel Communications; François Legrand, senior director, core systems engineering, CBC/Radio-Canada; and Joyce Bente, president, Riedel North America

François Legrand, senior director, core systems engineering at CBC/Radio-Canada.

"CBC/Radio-Canada will be one of the first customers to take delivery of the newest software-defined node in the Artist family, the Artist-1024," said Rik Hoérée, director of sales, Americas and Europe, Riedel Communications. Artist-1024 uses software-definable Universal Interface Cards that combine networking, mixing, and management on one card.

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Let's Not Lose the Art in Engineering

BY CHUCK AINLAY

Wikipedia defines art as “a diverse range of human activities in creating visual, auditory or performing artifacts (artworks), expressing the author’s imaginative, conceptual ideas, or technical skill, intended to be appreciated for their beauty or emotional power.”

Going by this definition, it’s easy to see how recording engineering can and should be considered art. I grew up listening to recordings and marveled at the imagination and technical skill that my favorite engineers had acquired that enabled them to make such emotive records. I would follow their work and when I’d see a new recording one of them had done, I’d buy it because I knew it would take me on an amazing journey through sonic wonderlands. Sometimes the music itself would let me down, but the recordings were always something special. I’m so fortunate that many of those engineers that I followed I now consider friends, as they make up the METAlliance.

Okay, I’m going to show my age a bit, but in part I’m bragging as well, since I feel like I grew up through the Golden Age of Recording. I was about 10 years old when I began to understand that there were differences in the quality of the recordings I listened to. This was about the time The Beatles arrived in the United States. From then on, the impact and imagination of recorded music exploded, partly due to technological changes. Within a few short years recordings transitioned from a few microphones recorded directly to mono to incorporating multichannel record-



Chuck Ainlay

ing and overdubs. I began to hear huge setups with multiple, synchronized multitrack machines and mixes done using automation on massive analog consoles.

FM radio played a big part in the album becoming the main release medium. The longer format fostered bolder exploration, as artists had a chance to create music that wasn’t just for mainstream consumption. Engineers were creating new sounds and became important contributors to the creation of the music. The engineering craft became more of an art itself, and the skills and knowledge required to operate all the equipment was very specialized.

This brings me back to our definition of art. The art in engineering is not just the imaginative interpretation, but also the required technical skill necessary to actualize the creation and to capture the musical creation in a manner that doesn’t compromise the intent.

Just having a pair of ears, an Apollo and a multitude of plug-ins on every

track doesn’t make a great recording. It takes years of experience to gain the knowledge of what mic to use and where to put it, as well as when and how to apply those plug-ins.

I’ve had many conversations over the years with Mark Knopfler about working on projects that were, shall we say, less than desirable. He would wonder why I would accept work on some of these projects, and my reply was that they prepared me to have the necessary skills to make his recordings.

I guess it helps to love what you do, and working nearly every day for over 40 years has allowed me to adapt to new technology and stay dialed in. Here’s an idea: Try introducing something new into your workflow every day—like a new microphone or preamp while recording, a technique that you may have heard or read about, a different plug-in or piece of outboard gear while mixing, or maybe just try reversing the panning from the way you usually do it. You’ll find a new perspective and maybe some

METAlliance
MUSIC ENGINEERING & TECHNOLOGY
Advancing Excellence and Integrity in Music Technology

The METAlliance—Al Schmitt, Chuck Ainlay, Ed Cherney, Elliot Scheiner, Frank Filipetti and George Massenburg, along with the late Phil Ramone—has the dual goals of mentoring through our “In Session” events, and conveying to audio professionals and semi-professionals our choices for the highest quality hardware and software by shining a light on products worthy of consideration through a certification process and product reviews in this column. Our mission is to promote the highest quality in the art and science of recording music.

new inspiration for the project you’re working on.

Here’s where I get into trouble, but it just has to be said: I feel there’s a lack of respect for the art of engineering borne from the convenience of the workstation approach to recording and mixing. Practically everyone now thinks they can engineer, and judging by some of the recordings that are sent to me to fix—oops, I mean mix—I think that’s fair to say.

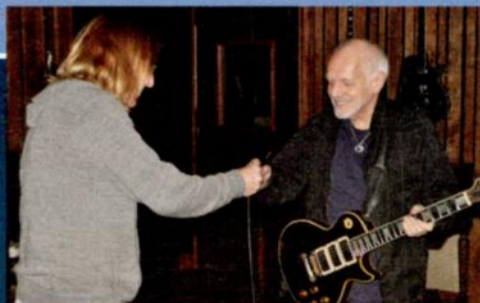
I’m not suggesting that things should go back to yesteryear, but what I’m hoping to convey is that recordings are a sum of what goes into them. If every component is recorded skillfully and with some sort of concept, then the final outcome is so much greater.

New streaming technology with MQA allows for Hi-Res Audio, and Dolby Atmos brings us total immersive sound. My hope is that the applied art of engineering prevails and fosters great new listening experiences that will reengage the listener.

With four Grammys, two CMAs and 10 ACM awards, producer/engineer Chuck Ainlay has recorded and/or mixed well over 300 albums, including work with legendary and current country artists such as George Strait, Taylor Swift, Miranda Lambert, Lee Ann Womack, Steve Earle, Lyle Lovett, Emmylou Harris and the Dixie Chicks. Chuck has placed his distinctive production and engineering stamp on projects with mainstream pop artists such as Dire Straits and the near entirety of Mark Knopfler’s solo career, as well as Peter Frampton, Lionel Richie, James Taylor, Jewel, Bob Seger, Pentatonix and Sheryl Crow. His work in immersive audio has resulted in groundbreaking projects such as the 25th anniversary remix of Peter Frampton’s *Frampton Comes Alive* and the Grammy Award-winning 20th anniversary remix of the Dire Straits album *Brothers in Arms*.

By the Way ...

On a product note, I’ve been working with Peter Frampton for the last few months. The other day we were looking at different guitar cables to find a great one for use on his upcoming tour. Peter is not only an amazing guitar player, but he is also way into sonics. He won’t use a wireless setup for his guitar because the technology hasn’t yet lived up to his demand for the best sound possible. I’m not sure who is more of a gear junkie, Peter or me, but I’ll give the nod to Peter. At any rate, I’ve done tests with different speaker cables and mic cables, and the differences are pretty amazing, but I was completely blown away at the difference a guitar cable can make. If you haven’t done it yourself, I’d suggest giving it a try; your favorite guitar player will really appreciate the insight. We settled on the LLX guitar cable from Sommer. It sounded best to us, had great shielding, was easy to wrap, had great build quality to stand up to rigors of touring, and had really high-quality connectors.



Peter Frampton (right), trying out the LLX guitar cable on “Phenix,” his original *Frampton Comes Alive*-era Gibson Les Paul guitar, with Chuck Ainlay (left).

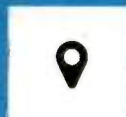
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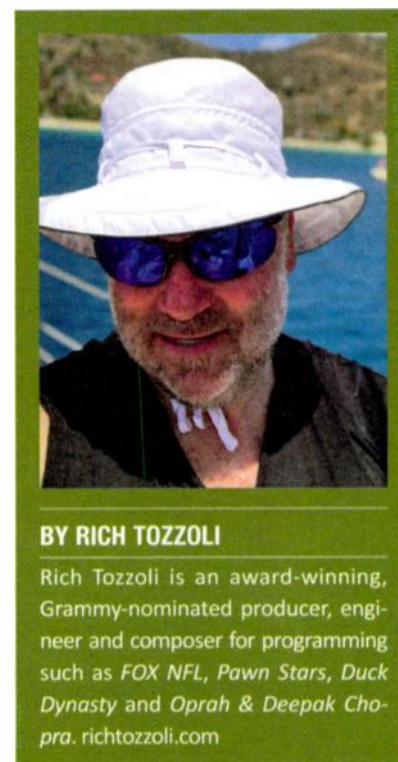
Rich Tozzoli's Sixth Annual St. John Recording Retreat



Recording in paradise for two weeks each year is a tough job, but reviewer Rich Tozzoli is the man to do it.



Rather than blow more than \$750 on FedEx shipping, Rich Tozzoli and crew carefully packed their two-week studio into two suitcases that survived the trip without incident.



BY RICH TOZZOLI

Rich Tozzoli is an award-winning, Grammy-nominated producer, engineer and composer for programming such as *FOX NFL*, *Pawn Stars*, *Duck Dynasty* and *Oprah & Deepak Chopra*. richtozzoli.com

This year's recording adventure down in St. John, U.S. Virgin Islands, was another example of how carefully selected, small but powerful gear can deliver superb results. The island has recovered quite a bit since the devastation of 2018's Hurricane Irma, and while not yet 100 percent, it's headed in the right direction. Composing, recording and sharing knowledge for two straight weeks side-by-side with a top-flight team that included engineer/keyboardist Bruce MacPherson (Fleetwood Mac, Yes), engineer Mike Dwyer (Shawn Mendes, Bob Weir, The National), drummer Ray Levier, singer/guitarist Scott E. Moore and bassist Hank Skalka (who owns the house) was both an education and a delight.

Taking the time to curate a gear list in advance, we flew down with just enough equipment to get several collections of TV music done, which ranged from edgy BBQ Blues to pulsing Electro Crime, as well as some cool tracks for Animal Planet. We also had time to stretch out and play a few shows in town, which is always a blast. We discovered once again that the limitations of the gear and instruments forces you to improvise and work differently—a situation that is both challenging and rewarding.

We were unsure but excited about what was ahead of us. When the Delta Airlines captains were kind enough to make room for three of our instruments on the flight down, we had a feeling this was going to be good. And it was. Here's the gear

that found its way into our studio and daily workflow.

UNIVERSAL AUDIO APOLLO X8

The Apollo x8 audio interface was the brains of the whole St. John recording and production chain this year. Featuring Thunderbolt 3 audio connectivity to our MacBook Pro laptops, it offers HEXA Core processing with six DSP chips, 18 ins/24 outs with 24-bit/192 kHz performance, four XLR preamps on the back, +24 dBu operation, two Hi-Z inputs on the front, two headphone outs, upgraded AD/DA conversion, and full metering. In short, it was just what we needed to turn a house into a fully functioning remote studio.

Since FedEx wanted \$380 to ship it one way, we decided to fly it down in a small gear case, packed in bubble wrap. It arrived just fine and we relied on it to take in all of our outputs, connect to our headphone amp, connect to our speakers, run all of the UAD plug-ins, and allow us recording control using the UA Console software.

Since I've used every version of Apollo since the line first came out, I can say unequivocally of the x8 that these preamps are the best yet—by far. They have more top, bot-



Universal Audio Apollo x8

tom and depth than the previous generation, and I would put them up against some of the best preamps out there. Having Thunderbolt connectivity meant a single cable from the laptop to the x8, which provided us low latency and better stability than USB or FireWire. As a side note, it's good to know that the Thunderbolt 3 ports are backward-compatible with Thunderbolt 1 and 2 Macs (with an adapter).

In the course of daily use, it earned its position at the center of our workflow. Sometimes we would use the front Hi-Z inputs, other times the XLRs on the back. We ran some of our favorite plug-ins, such as the Lexicon 480L and 224 on percussion and pads, the AKG BX 20 on Hammonds and electric pianos, Ocean Way Studios and EP-34 Tape Echo on guitars, and the AMS RMX-16 on most everything. Of course, we turned to some of the classic compressors like the LA-2A and 1176 for attitude, some Pultec and Manley EQ, and got some great sounds with the Unison-enabled Ampeg B-15N on bass and Fuchs Train II and Suhr SE100 on guitar. In the end, the Apollo x8 not only sounded great, but it proved to be flexible, got plenty of chip power and delivered on everything we needed it to.

IK MULTIMEDIA ILOUD MICRO MONITORS

I've long been on the hunt for a set of small but powerful speakers that can actually deliver on tone, volume and attitude for mobile sessions. While in L.A. this January, I stopped in to visit veteran Hollywood sound designer Scott Gershun, who had a set of iLouds sitting next to one of his many

monitors. When he played them for me, I not only looked for the subwoofer (that wasn't there) but I was floored by the amount of sound coming out of these two ultra-compact monitors. Knowing the St. John trip was upcoming, IK was kind enough to send a pair along, and wow, am I glad they did.

The Micro Monitors feature a 3/4-inch tweeter, 3-inch woofer, bass reflex port, activity LED and a cool, adjustable isolation base that swings out when needed. The rear features a Bluetooth pairing button, volume control, EQ positioning switches for Flat or Desk (desktop), Flat or +2 HF and Flat or -3 dB LF, TRS 1/8-inch stereo input, RCA inputs, a L/R speaker link, power switch and connection for a power supply, and a UNC 3/8-16 mic stand thread. These two-way active bi-amped speakers de-



IK Multimedia iLoud Micro Monitors

liver a combined 50W RMS of power with remarkably flat 45 Hz–22 kHz specs and sit comfortably next to a monitor or on a mixing desk. The pair come with a power supply unit, power supply cable, 4-pin speaker connection cable and a TRS 1/8-inch stereo to 2x RCA cable.

I bought a small iLoud speaker bag before the trip and was able to pack them easily into one of the suitcases for the journey. When we

arrived in St. John, we set them up on their own tilt stands and plugged them into the Apollo x8 via a set of 1/4-inch to RCA connectors—and were shocked by what came out of them. The sound was plenty loud to fill the room, but more importantly, it was clean and clear, with a remarkable amount of bass. I commented that not only could I track on these, but with a little time, I could mix on them. That's a surprising and shocking statement for pair of light, small speakers that run less than \$300.

During the two weeks, we pushed them hard, and yes, they will compress and clip if you hit them with too much, but they can take a surprising amount of volume. They were, without exception, one of the hits of the trip. Since they include Bluetooth functionality, we also used them as a music playback system from our iPhones. I will be using these on every mobile session I do from now on.

MOJAVE AUDIO MA-301FET

As is our routine on these journeys, we keep the number of microphones to a minimum, which means we have to hope the ones we choose will deliver (and don't need a separate power supply). Based on word-of-mouth from some well-respected engineer/producers, we selected the Mojave MA-301fet as our only mic on this trip.

The MA-301 is a large-diaphragm condenser built on the foundation of the company's popular MA-201fet, with the addition of three polar patterns (cardioid, omni, figure-8), a low-cut filter and a 15 dB pad. Inside is a Jensen audio transformer, military-grade FET, 3-micron gold-sputtered capsule and custom low-noise resistors. It's got 20 Hz to 20



Mojave Audio MA-301fet

kHz specs with a max SPL of 135 dB with the pad on. It comes with a well-built shockmount, and overall, it has quite a solid feel to it, weighing in at 1 pound.

Is it challenging to record with one mic? Yes, but this one was up to the task. We used it for a wide variety of sources including cymbals, toms, kicks and shakers, which were all recorded as sound design elements for crime tracks. For some of the other

rhythm tracks, we captured hi-hats, a cajon and vocals.

I made a few observations about this mic after working with it for two weeks. First, it has a clarity to it that allows it to cover a lot of ground with ease. The lows it captures are thick and solid, and when it was too much (we tended to mic quite close), we just rolled off the bass switch, which provided 6 dB per octave below 100 Hz. On vocals—which we honestly didn't do much of—it captured air and depth. You can play with the mids quite a bit by changing how far or close you get to it, all with very little self-noise.

It can take compression quite well and retain much of its natural flavor. We tended to push a lot of these elements quite hard with things like aggressive 1176-style compression, and it always held up for us.

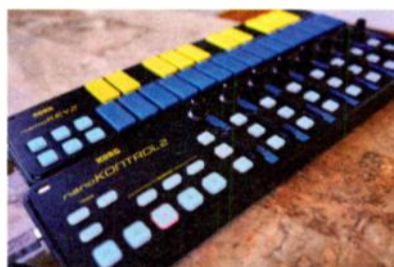
We were concerned that the island humidity was going to affect the capsule because we had the doors open most of the day. Not once did we have a problem with it. The Mojave MA-301fet turned out to be an excellent all-around mic that can cover a lot of ground.

KORG NANOKEY2 AND KORG NANOKONTROL2

These two little guys were amazingly useful. The nanoKEY2 is a 25-key, USB bus-powered, compact MIDI controller that's velocity-sensitive and features octave up and down buttons, sustain, pitch+ and pitch- and a Mod button. I picked up the easy-to-see blue and yellow key version and found it useful to trigger pads or

play basic keyboard parts. The nanoKontrol 2, which is the same size as the nanoKEY2, is also bus-powered; it features eight touch-sensitive faders (which actually feel pretty good!), eight rotary encoders, transport controls, Solo, Mute and Record controls on each channel, and even cycle, markers and track advance buttons.

The included Korg Kontrol Editor software lets you customize the controller. We used it quite a bit to run Avid Pro Tools 12 and move faders in real time on plug-ins such as the Vienna Smart Orchestra, and it quickly became a must-have to help us flow with sessions. It was especially useful when tracking and muting clicks, punching in and out, and just



Korg nanoKEY2 and Korg nanoKontrol2

basically making quick level adjustments. We also enjoyed the cool cases from Sequenz that fit these models, which helped protect them for the trip down.

VIENNA SMART ORCHESTRA

Vienna Symphonic Library's website says of Smart Orchestra, "Playing a 140-piece orchestra on the keyboard has never been easier and more rewarding." Simply put: I have to agree.



Vienna Smart Orchestra

I'm a longtime Vienna user and can compare it directly to its other products.

The Vienna Smart Orchestra, which was recorded at the Synchron Stage Vienna and uses the new Vienna Synchron player, is a powerhouse of creativity—but don't just think of this as string, brass and orchestral sounds. It's actually an orchestral sound design and soundscape tool unlike anything else in my arsenal. Calling it up while looking out over the Caribbean at 7 a.m., which is when I started each day's writing, was inspiring, to say the least.

Smart Orchestra runs lean at 9.9 GB (with a 4.4 GB download). It features a full orchestra and percussion with and without mallet sections, access to individual sections, separate full-range solo instruments (horn, trumpet, violins, flute, oboe, clarinet, trumpet), a variety of articulation types, pads, a huge variety of effects and FX presets. It's built on the new Synchron Player, which is much easier to use (and more colorful!) than other Vienna offerings.

I won't dig much into the more traditional part of this plug-in, which

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is the Smart Orchestra itself, and will instead move right to my favorite part—the FX presets—which are not exactly what you would expect from Vienna.

Opening 05 Evolving Mystery in the 01 Pads dropdown folder, for example, you get strings, woodwinds and brass all playing at once, but when you hold a key down, you hear flanging, reverb, delays, saturators, phasers and compression. It's a deep, edgy, wild soundscape that's perfect for creating moody cues. Using the Mix tab, you can raise, lower or mute any of the faders; using a MIDI fader controller (such as the Korg nano-Kontrol 2), you can ebb and swell the orchestral sections and Aux tracks in real time. You can also add solo instruments, which can be sonically useful. Note that if you roll over any of the knobs, faders or buttons, a text window pops up with an explanation of what it is/does, which can make for quick learning. Taking it a step further, the FX Presets folder also includes Plucks, Leads and Processed Percussion.

Vienna Smart Orchestra goes far beyond a traditional orchestral tool. It's easy to use, fun, light on the computer and super creative, and the new Synchron Player interface is excellent. The sound, which is really what it's all about, is what you would expect from Vienna—first class all the way—yet it's available at a very reasonable price point of under \$200. I hope they include even more FX presets in the next release because they are so useful. Overall, I highly recommend Vienna Smart Orchestra.

PROCESS AUDIO SUGAR

Process Audio's Sugar was so new that none of us knew exactly what it did when we tried it out. It turns out that Sugar is a full-spectrum mono, stereo or M/S audio sweetener with a few analog-inspired twists up its sleeve.

It's interesting to work with a plug-in that uses colors to help you hear. Sugar features four colored



Process Audio Sugar

Band Faders for Low, Medium, High and Air, each with its own fader, which splits into two when MS Mode is selected. Each band has two switches below it with a different processing chain for tonal shaping of thick/punch on the Lows, warm/broad on the Medium, shine/excite on the High, and yin/yang on the Air. These may or may not cross over the band next to it, so you just use your ears. You can also bypass each band individually with the Bypass buttons.

There are in and out meters aside a unique jog wheel (Wet Inject) that lets you raise or lower all four faders at once, which they like to think of as a VCA for the Sugar faders. Next to that sits an FX-only button, which lets you hear what the bands are adding in isolation, and below that is a Level Management button, which helps compensate for the process generation. Then you've got High Pass, Low Pass and Saturation knobs, as well as Filters on/off and Saturation Types of Drive/Distort/Crush. Besides the presets and settings up top, that's all there is to it—but that's also the beauty of it.

Strap it on your master fader and twist the Wet Inject knob up; all four bands will visually and sonically push at once, and you sure will hear it. Alternately, you can grab a band and push that up as much as needed. Note that you cannot drag the bands to change the crossover points, which was included in the design for simplicity.

I was able to use Sugar in a variety of ways: pushing the lows up on an 808 kick, punching some acoustic out with Highs and Air (which is especially nice) and getting keyboard pads to scream using all the bands and the Crush feature. I found it most useful on our trip as a master fader tool to enhance the whole mix, especially on the pulsing crime/drama tracks, where it made the low drums, bass, sound design elements and percussive highs all sound better as a whole. You can push it a lot or a little. We also used it to get some extra volume, in a tasty way, out of the whole mix—especially with Level Management enabled.

There are times when you need a variety of tools to get the harmonic enhancement job done in a specific way, and there are times when you want a simple tool that can get it done with less effort and with a bit of color thrown in. That's where Sugar shines. With a few twists, you can get individual elements or the entire track jumping out of the speakers.

BEHRINGER MICROAMP HA400

I picked up this 4-channel headphone amp at the last minute because I had forgotten whether or not I left a headphone amp at the house last year. I'm glad I bought it—the Behringer MicroAmp HA400 is ultra-



Behringer MicroAmp HA400

compact, crazy useful, crazy small and sounds great. Powered by a DC 12-volt adapter, it's got four independent TRS headphone outputs, each with volume control, and a mono/stereo input to feed your source into. It puts out plenty of volume, weighs a bit over 6 ounces, didn't break up when pushed, and can literally fit in your pocket. Small, simple, easy.

LUNASTONE BOOST 18

Keeping with the small-yet-powerful theme, the Lunastone Boost 18 pedal had quite an impact. Since all of my guitar and bass sounds on this trip were DI and not through an amp, some creativity was in order. The Boost 18 sat at the end of my small pedalboard, and with its one knob, it couldn't get any easier to use. With up to 18 dBs of clean boost and True Bypass switching, it doesn't just push out a clean sound. The Boost 18 added a touch of low mids and thickness while at about 9 o'clock. As you push it up higher, there's a bit of dirt that starts to happen that definitely sounds like a natural overdrive, but in a subtle way. I used it to push my guitar tone, a hot-rodded Telecaster, through another pedal with additional tone controls, and it ended up living around the 12 o'clock position for most every track. The clearest indica-



Lunastone Boost 18

tor of a great pedal is that you miss it when you take it out, which is what happened with the Boost 18. This is not just a clean boost; it's a thickener with some analog attitude.

SPECTRASONICS OMNISPHERE 2.6

For those of you who know software synths, Spectrasonics Omnisphere is a flagship piece. It's long been a part of my creative arsenal, and with the 2.6 update, we had to have it in our bag of island tricks. Aside from a bevy of new sounds

(over 1,600) and features like an enhanced arpeggiator, a standalone application, audio file import and an expanded synth engine, it now supports hardware integration, with more than 65 synths ranging from a few hundred dollars to many thousands. What this hardware integration feature offers users is the ability to bring physical control of Omnisphere from the user's actual synth, effectively bridging the gap between both.

There was a little bit to learn about what it was and how it worked, so we figured it out on the fly in St. John. Since keyboardist Bruce MacPherson bought an analog synth with him (the Roland SE-02), we were able to put this new feature to the test. Luckily, it turned out to be a lot easier than we thought.



Spectrasonics Omnisphere 2.6

You connect the synth to your computer, open the hardware dropdown menu on the top of Omnisphere, and find the hardware profile for that synth. There are useful instructions included about how to set up your hardware unit to work with the software, so Spectrasonics have made it a fast-moving process. Note that if you don't own any of the hardware units, you can still access any of the hardware library patches that Omnisphere offers (custom-created using that synths profiles). You can even tweak other software synths with your hardware unit, as certain parameters will still work.

We learned that the integration of hardware and software lets us do things that would not be possible otherwise. You can take the software to new places by simply having control over things like oscillators or filters and engaging with it, not just using a mouse to get where you need to go. While sometimes it was best to use Omnisphere, sometimes we used the real synth. That's the beauty of it; it's not meant to replace your synths but instead bridge both worlds and expand both. Omnisphere 2.6, with its hardware integration, is a great new technology that we were lucky to have with us.

THERE'S MORE ▶ More reviews from the St. John recording retreat next month!

Røde PodMic Podcasting Microphone

BY FRANK VERDEROSA

The first word that came to mind when I picked up PodMic, Røde's broadcast-grade dynamic microphone specifically designed for podcast applications, was "heavy." The second was "sturdy." PodMic feels like a product that's built to last, especially when compared to similarly priced microphones. While its appearance evokes the Electro-Voice RE20-style broadcast mic, its shorter profile, built-in mounting system and \$99 price tag set it apart.

As a podcast producer and engineer, people looking to try their hand at podcasting often ask me what equipment to buy, particularly microphones. The answer always boils down to budget. The podcast industry seems to be covered by the ubiquitous Shure SM7B, but as reasonably priced as it is, it's often just out of range for beginners, especially those who will need more than one. With that in mind, Røde's price point allows newcomers to purchase four PodMics for the price of one SM7B.

But how does it sound?

As a starting point, I brought the PodMic along to a podcast session for a show I produce. I put it side-by-side with the Shure SM7B in front of the show's co-host, who has a smooth, rich, "radio-friendly" voice. Both mics were recorded flat. On playback, I was pleasantly surprised to hear that the Røde unit truly held its own against a mic that costs four times as much. The PodMic had a pleasing high end and tight mids, but lacked a bit of bottom—though, in fairness, I think this mic is made to benefit from proximity effect, and the co-host doesn't stay that close. An EQ boost in the

low end put it right up against the SM7B, but with a natural brightness that gets lost in the Shure, probably because of its foam windscreen.

Where PodMic disappointed, somewhat expectedly, was with the built-in windscreen. PodMic's marketing materials describe the

foam windscreen as a selling point, but unless you're a seasoned voice actor with excellent mic control, this mic most definitely needs a windscreen to block plosives. I worry that a foam cover might take away from some of its

(continued on page 44)



PodMic is a broadcast-grade dynamic microphone optimized for podcasting.



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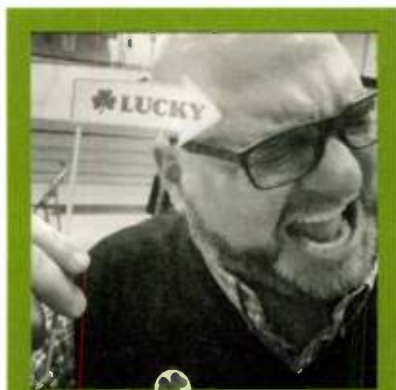
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Frank Verderosa is a 30-year veteran of the audio industry, fighting the good fight for film studios, ad agencies and production companies, but secretly loves mixing music most of all. www.frankverderosa.com



Waves Audio Submarine Plug-In

Submarine is a two-octave subharmonic generator plug-in that supports the prominence of sub frequencies in music today, adding bigger, deeper sub bass to tracks while maintaining clarity and low-end accuracy. Offering two subharmonic generators, the plug-in is built around Waves' Organic ReSynthesis technology. Submarine's two sub generators process a source and add new subharmonic frequencies up to two octaves below the precise frequency range selected. The Organic ReSynthesis engine looks at the original signal's core elements—carrier, pitch, formant and envelope—processes them individually, and then reconstructs the audio to create new sub frequencies within the exact pitch and time of the original signal, aiming to create deep subharmonic content that works properly with the source. The plug-in's Range slider lets users zero in on the exact frequencies to be used for generating subharmonics, while the Drive control allows users to determine the saturation of the added subs and glue them into the rest of the mix. The Dynamics knob goes from short transient sub sounds to heavier compression for longer sustained sub notes.



Avid Pro Tools 2019.5

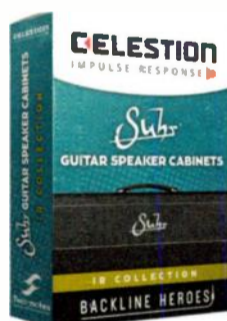
Pro Tools 2019.5 offers new capabilities including higher track counts, the promise of seamless track and timeline interactions during playback, macOS Mojave support, and the immediate availability of multi-seat network site licensing.



According to Avid's announcement, Pro Tools Ultimate delivers 50 percent more voices/audio tracks than previous versions, supporting a base voice limit increase to 384, up from 256. Pro Tools Ultimate software and HD Native customers will be able to further increase the number of available voices up to 768 per system—on par with a three-card Pro Tools HDX system—with the addition of native Pro Tools Ultimate Voice Packs.

Celestion Suhr Cabinet Impulse Responses

Teaming with Suhr, Celestion has released the Celestion Suhr Cabinet Impulse Responses, which replicate the tones of various Suhr cabinets' tones in the Two Notes Wall of Sound software environment. A half-dozen Suhr speaker cabinets are represented in the IR group: Suhr Bella 1x12 with a Celestion V-Type speaker; Suhr Badger 1x12 with a Celestion Vintage 30; Suhr Hedgehog 2x12 with Celestion G12-65 speakers; Suhr PT 2x12 with Celestion G12H-75 Creamback speakers; Suhr 4x12 with Celestion G12M Greenback speakers; and Suhr 4x12 with Celestion Vintage 30 speakers. In addition to the range of cab sizes (1x12s, 2x12s and 4x12s), several other Celestion speakers are offered, including the V-Type, Vintage 30, G12-65, G12M Greenback and the G12H-75 Creamback. The Suhr Cabinet Impulse Responses from Celestion are available for purchase individually or as a collection. Celestion IR digital downloads are available in uncompressed .WAV format at 44.1, 48, 88.2 and 96 kHz sample rates at 24-bit depth, in lengths of 200 and 500 ms.



Audient Nero

Nero, a desktop monitor controller from Audient, features a variety of inputs and outputs, console-style monitor control, an assignable sub output, and Audient's Precision Matched Attenuation Technology. The latter technology matches the volume of the left and right channels of a stereo signal in an effort to prevent deviations in volume and thus enable users to monitor accurately. Four stereo analog inputs, including two line level inputs, a dedicated cue mix input, one aux input (RCA or mini jack), and both optical and coaxial SPDIF inputs are available on the unit. They can be fed to



firstlook

Arista Corp. Stealth Audio Workstation

The Stealth Audio Workstation from Arista Corp. is a quiet-by-design computer customized for multitrack audio recording and editing, sound effects work, audio post-production, and related music/audio creation tasks. Completely fanless for silent operation, the workstation's Intel i7-8700 six-core processor offers performance optimized for demanding audio applications. The system is populated with 64 GB of DDR4 memory. It may be configured with either two 1 TB HDDs or SSDs, providing enough storage space to record live instruments or save a library of sample-based plug-ins. The system supports 7.1 channel surround sound HD audio via a Realtek ALC892 audio codec. Additionally, it can support a 4K display or up to three HD displays simultaneously. For users with greater storage requirements, the Stealth Audio Workstation has an option for two additional removable 2.5-inch SSD drives that can be configured as RAID-1 or RAID-0. The system also provides one Type-C and one Type-A USB 3.1 port, as well as four USB 3.0 connectors.



three stereo speaker outputs, one assignable sub output and four headphone outputs. Nero sports a range of monitor controls including dedicated talkback, cut and dim, along with polarity, mono, speaker select and cue mix monitoring.

KRK Rokit G4

KRK Systems has released a new line of studio monitors, the Rokit G4 product range, which includes 5-, 7-, 8- and 10-inch models. This fourth generation of KRK monitors has been completely redesigned, according to the company. The Rokit G4s feature an onboard, DSP-driven graphic EQ with 25 settings, visible via an LCD screen. The monitors also sport advanced drivers made with Kevlar, Class D power amplifiers and a front-firing port to aid bass reproduction and reduce listening fatigue. The KRK Rokit G4 monitors feature a low-resonance enclosure and a high-density ISO foam pad that decouples the speaker from the surface on which it rests. The bi-amp G4 range includes RP5 (5-inch), RP7 (7-inch) and RP8 (8-inch) models; an additional tri-amp RP10-3 (10-inch) version incorporates a 4.5-inch mid-range woofer and 1-inch tweeter for mid-field monitoring. The RP10-3 can also be arranged in horizontal mode, allowing the user to rotate the mid-range woofer and tweeter by 90 degrees.



Apogee Symphony I/O Mk II with Dante

The Mk II edition of Apogee's flagship modular multichannel audio interface includes Pro Tools HD connectivity via Dante. The Symphony I/O Mk II Dante option card uses Audinate's Dante Brooklyn II module, which features plug-and-play media networking for up to 32 bidirectional channels at 96 kHz and 16 bidirectional channels up to 192 kHz. With the included Pro Tools HD peripheral port, users can route audio between a Pro Tools session, the Dante network and Symphony I/O modules. Symphony features Apogee's flagship AD/DA conversion; modular, configurable I/O (up to 32 inputs and outputs); touchscreen display and optional microphone preamps.



With the Symphony I/O Mk II Dante option card and an Ethernet cable, Symphony I/O Mk II can be connected and shared across networks. With the Pro Tools HD Peripheral Port, users can get up to 32 bidirectional channels up to 192 kHz, routing Symphony I/O module inputs or Dante Rx to Pro Tools inputs by blocks of 8 channels. Pro Tools HD outputs are routed to Dante Tx and I/O module outputs.

UNiKA Pro NBB-0202 Dante I/O

UNiKA Pro has expanded its Dante range with the NBB-0202 Dante I/O, which allows users to add two mic/line inputs and line outputs to any Dante network. The



two-input/two-output transceiver sports front-panel rotary level controls and individual 48V phantom power switches. Audio specifications include 24 dBu maximum output level; uncompressed 24-bit PCM encoding/decoding; and the option of 96 kHz, 48 kHz or 44.1 kHz sample rates and programmable mic pre-amplifiers with 132 dB dynamic range. A pair of RJ45 connectors enable daisy-chaining on the same network link, and the unit can be powered via Ethernet or a supplied 48V external PSU. Combination XLR/TRS connectors complete the half-rack package.

d&b audiotechnik ArrayCalc Exchange

ArrayCalc Exchange software, now available from d&b audiotechnik, is a SketchUp extension intended to simplify the import of complex venue geometry data from CAD and EASE into the company's ArrayCalc simulation software. d&b ArrayCalc Exchange can convert CAD and EASE files into an ArrayCalc venue file (*.dbacv) that in turn can be imported directly into ArrayCalc. d&b ArrayCalc Exchange supports system designers in mobile and fixed applications by simplifying the creation of complex venues in ArrayCalc. Selected elements are divided into triangles or quadrangles and converted into corresponding triangular or quadrangular planes that are used in ArrayCalc. Different layer name extensions are available, which will determine the input type of the single components from SketchUp in ArrayCalc.



Alto Professional TS3 Series Subwoofers

Alto Professional has added TS315S and TS318S powered subwoofers to its TS3 speaker line. Both subwoofer models feature a long-excursion woofer mounted in a braced ported enclosure made from a dense wood composite. The subwoofers offer six selectable DSP output modes, so the subwoofer's frequency response and crossover frequency can be matched to the speaker it is being used with. Four of the output options match the subwoofer with Alto TS2 and TS3 full-range speakers, while the other output options help them

match with non-Alto full-range speakers. Users can also choose Hi-Pass or Bypass mode. Both subwoofers have an onboard 2,000W Class D amplifier (1,000W continuous) with proprietary limiting circuitry that provides electronic clip, thermal and transducer overload protection. Each model includes an extended LF switch for increased EQ control, XLR outputs, an integrated 35mm pole socket, and M10 suspension points.

The subs are expected to ship in the second quarter of this year.



Audio-Technica ES954 Mic Array

The ES954 hanging mic array from Audio-Technica is intended primarily for video-conferencing applications in huddle rooms, conference rooms and meeting spaces. The four-capsule microphone array provides 360-degree coverage through virtual hypercardioid or cardioid outputs that can be steered horizontally and tilted vertically when controlled by the Audio-Technica ATDM-0604 Digital SmartMixer.

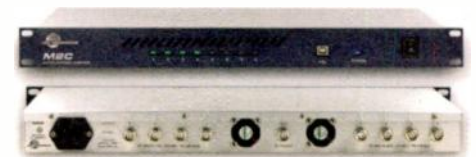
The ES954 may be used singly or in multiples to capture people in a room, with the total number of channels restricted only by the capacity of the mixer or DSP device controlling the system. The array features a permanently attached 4-foot cable with locking grommet enabling microphone height adjustment. UniGuard RFI-shielding technology provides rejection of RF interference. The package includes a Plenum-rated AT8554 ceiling mount with RJ45 connectors and push-type wire terminals for installation. The ES954 connects to a mixer over a pair of shielded standard Cat 5 cables. Two RJ45 breakout cables are provided to input the four channels, plus an LED conductor, into the mixer.



Lectrosonics M2C Active Antenna Combiner

Now available, the M2C active antenna combiner is intended to be a matching component to Lectrosonics digital transmitters including the DCHT portable stereo unit and Duet M2T dual stereo unit. Up to eight transmitter sources can feed a single antenna to minimize cabling in multichannel systems.

The M2C inputs are isolated in an effort to minimize crosstalk and intermodulation between RF channels. The overall architecture reportedly provides low power consumption and heat buildup. Front-panel LED indicators display active status of RF inputs, and a USB port is provided for firmware updates. This 1 RU, AC mains-powered, fan-cooled unit sports eight 50 ohm BNC input ports and a single 50 ohm BNC output port. The frequency range for the M2C is 470-614 MHz, and the unit accepts input sources up to 100 mW, while RF gain through the system is at unity.



QSC AD-S6 Loudspeaker

QSC's AD-S6 loudspeaker, available in black or white, is intended for foreground and background music applications. The transformer-less, surface-mount, 6.5-inch two-way loudspeaker is also aimed at installations that require higher SPL foreground sound reinforcement. Part of the AcousticDesign Series loudspeaker line, the AD-S6 will be offered as part of QSC's Premium Business Music solutions. The speaker also includes QSC's patented X-Mount mounting system.

Travis Nie, product manager, Installed Loudspeakers, QSC, noted, "We are excited to expand our popular AcousticDesign Series with a loudspeaker that is nearly identical to AD-S6T, but with the AD-S6, we lowered the cost by removing the transformer and providing 16 ohm nominal impedance, making it ideal for use in low-impedance distributed systems."



firstlook

Peavey Elements CS Series Loudspeakers

Peavey will be adding marine-grade models to its Elements C Series weatherproof loudspeaker line. The marine-grade versions, denoted by a CS suffix, are designed to withstand the effects of saltwater, making them an option for cruise ships, swimming pools or coastal outdoor environments such as theme parks and resorts.



The enclosures are constructed from a composite fiberboard material said to be dimensionally stable in wet conditions while retaining resonant properties associated with wood. In order to qualify for marine-grade ranking, all metal components have been upgraded to 316 stainless steel; the permeable hydrophobic membrane between the speaker and the grille has also been upgraded. The number of mounting points has been reduced to reduce the risk of corrosion and water/salt ingress, but a purpose-built U-bracket with a positive locking mechanism is included to allow for installation. The CS versions feature an integrated multi-tap transformer with 70V, 100V and 8 ohm taps, along with removable plugs for all ports.

There's more information on all the products featured at prosoundnetwork.com/jun2019.



Zappa Returns in Hologram World Tour

BY PAROO STREICH

PORT CHESTER, NY—"When your star is a hologram, it's a lot different than just throwing a rock show up on the stage!" said Drew Consalvo, monitor engineer/production manager for The Bizarre World of Frank Zappa hologram tour hours before the show's world premiere on April 19 at the Capitol Theatre in Port Chester, NY. It's been over 25 years since Zappa's band performed live with its late beloved leader in all things sonically strange, but technology and devoted fans have given the group that opportunity once again.

"We're pushing the boundaries of what's ever existed in any kind of music setting," said Ahmet Zappa, Frank's youngest son, who, along with his three siblings, has been the keeper of his father's musical flame. Hologram production company Eyclusion joined forces with the Zappa Family Trust to reunite the man and his band for a heartfelt holographic showcase that aims to provide all the charm, wit and eccentricities of a full-on Zappa freak out, incorporating classic images and characters from his extensive, eccentric song catalog.

Sound Image of Escondido, CA,



Monitor engineer Drew Consalvo and FOH man Nate Lettus pause with the Frank Zappa hologram tour's Solid State Logic L200 console.

provided the audio package for the tour, including a Solid State Logic L200 console for FOH man Nate Lettus, a 15-year live sound veteran. "The hologram show is really unique," he said. "The band are all on Shure PSM 1000 in-ears, so there's really no stage volume, we've got some cabinets turned off-stage so you're not hearing much direct sound, and we're not dealing with a

live mic for our star."

Monitoring stage-side via an Avid Venue S6L desk, Consalvo performs daily latency-time checks to ensure the hologram's guitar and vocal parts are delivered with accuracy as the tour moves through different rooms. "Nothing is more annoying than seeing lips and hands move at the wrong time," he said. "Getting the audio

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A Different Kind of Church Sound

BY LARRY JAFFEE

JERSEY CITY, NJ—In 1987, Australian band The Church broke into the U.S. radio mainstream with its swirling, psychedelic hit "Under the Milky Way," a song that immediately inundates your brain with simple yet mesmerizing acoustic guitar chords. Today, the band is on the road marking the 30th anniversary of *Starfish*, the album from which that song was culled. The band plays two sets nightly: one being *Starfish* in its entirety, the other a collection of a dozen songs from the band's other 25 albums.

"*Starfish* is quite authentically being played," commented drummer Tim Powles to *Pro Sound News* at the White Eagle Hall in Jersey City, NJ, on the third night of the U.S. leg. Caretaking The Church's live sound since the early 1990s, Powles has also engineered and/or produced and played on the band's albums since 1997. Steve Kilbey and original band member/guitarist Peter Dinklage have been along for the entire 38-year ride; guitarist Ian Haug has been on board since 2013.



On its current tour marking the 30th anniversary of its classic *Starfish* album, drummer Tim Powles oversees the band's monitors via an iPad and Mackie rack.

The band's touring setup doesn't require a monitor engineer. Powles handles those duties remotely, controlling a Mackie rack via an iPad by his side, which allows him to oversee

his fellow musicians' monitors without missing a drumbeat.

Mix-wise, "Pete likes his vocal really loud. Ian's wedges sound like

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briefs

Allen & Heath Reaches Destination

SARALAND, AL—Destination Church in Saraland, AL, recently updated its audio system—a system that had also been updated in 2016—with an Allen & Heath (www.allen-heath.com) dLive S5000 mixing system to mix audio for the 1,250-seat sanctuary. A dLive DM64 MixRack supplies 64 mic/line inputs and 32 line outputs, gathering a variety of microphone and instrument signals prior to traveling to the dLive S5000 Control Surface via a Cat 5 cable. Meanwhile, the praise band now hears itself via A&H ME Personal Mixing Systems.

The Roots Get Frosty

NEW YORK, NY—New York City's Metropolitan Museum of Art kicked off its *Play It Loud: Instruments of Rock & Roll* exhibit with a bash in its massive front lobby, the Great Hall. Manhattan-based Frost Productions fielded a Martin Audio (www.martin-audio.com) system to present late-night mainstays The Roots, with special guests including Steve Miller and Don Felder of The Eagles. The stage had four MLA Mini cabinets and one MSX sub on top of a WS218X sub per side, while four CDD-LIVE 8s acted as front fills and eight more were used around the room.

Yorkville Set for InfoComm

ORLANDO, FL—Yorkville Sound (www.yorkville.com) plans to bring a lot to the table when it appears at InfoComm 2019 in Orlando, FL, this month. While it will present its Synergy Array (which was a *Pro Sound News* Editor's Choice at NAMM this year), it will also be exhibiting new products from Dynaudio, ART, and for the first time, HK Audio.

Shure Aids Burgled Venue

HALIFAX, UK—Last year, 150-cap venue The Lantern in Halifax, West Yorkshire, was burgled, just five months after it opened. Thieves stole cash and gear, including 20 mics. When Shure (www.shure.com) heard, it donated nine mics to the fledgling venue: three Beta 56s; a pair of Beta 98D/Cs; an SM 91; a Beta 52, a Beta 57 and a Beta 58a.

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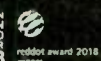
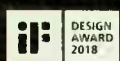
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New Orleans Jazz Fest Marks 50 Years

BY JIM BEAUGEZ

NEW ORLEANS, LA—John Koehler is sitting at a laptop in a production trailer on the New Orleans Fairgrounds, watching an RTA audio readout. This is about as much rest as Koehler—who goes by the nickname “Klondike,” the name of his company, or “Klon” to his friends—gets in a typical day as director of Audio for the annual New Orleans Jazz & Heritage Festival. Before long, the meter spikes and then hovers in the red, and Koehler reaches for the radio clipped to his T-shirt.

“Big Freedia just hit 110 at front of house, you wanna stop over there?” he radios to Deshaun Washington, one of the assistants on site.

He’s talking about the Congo Square Stage, the third largest of 17 stages and tents at the 50th Jazz Fest, which covers every patch of green space and fills the grandstand on the nearly 200-year-old tract in the heart of the city.

“That particular stage is sort of the most rambunctious on the site,” says Koehler. “It’s a lot of low end, which is required for that music—rap, reggae and some R&B. Even though there’s a pretty serious complement of directional subwoofers to keep the low end from going places other than straight ahead, propagation of the sides and rear becomes a problem when they exceed their SPL limit ... which is really our primary concern in terms of sound field containment.”

For two back-to-back, four-day weekends every spring, there is no greater collection of eclectic artists and musicians than Jazz Fest. Headliners like Van Morrison, Diana Ross, Katy Perry and Jimmy Buffett share stages with a fleet of pop, jazz, blues and rock artists, alternating slots from 11 a.m. to 7 p.m., when the crowd—which can swell to nearly 100,000 on a given day—disperses to the French Quarter and



The Dave Matthews Band graced the Acura Stage at Jazz Fest this year, performing through Clair Global’s proprietary Cohesion line array system.

other parts of the city.

For 42 of those 50 years, Koehler has been involved in producing the collection of stages and performers at Jazz Fest. He’s seen it grow from merely covering the racetrack infield to its current size, and has helped the audio component evolve from

towers of point-source loudspeaker systems to the line arrays that hang today. Those advancements have enabled them to fit numerous performance areas here in an arrangement akin to piecing together a massive jigsaw puzzle.

“My success is directly due to the

evolution of the line array,” Koehler readily admits. The sprawling Acura Stage is Exhibit A. As host to the festival’s largest crowds and biggest draws, accuracy in system deployment is the stage’s biggest challenge and the most important objective.

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Jumping at the Jazz & Heritage Stage

There was a wild array of musical styles at the 50th New Orleans Jazz & Heritage Festival—to mention the heat, humidity and thunderstorms—but Jefferson, LA-based audio/video production company Propaganda Group rose to the challenge as it fielded a sizable audio system for the Jazz & Heritage Stage.

Central to that effort was a Bose ShowMatch line array sound system that Jeffrey Gex, an audio vet who has worked with the Neville Brothers, Yes and more, oversaw as he ran the stage for Propaganda Group. Two eight-box main arrays included four ShowMatch SM5 5-degree boxes forming the top and mid section of each hang, with three SM10 10-degree boxes and one SM20 20-degree box rounding out the bottom of the curve. Four ShowMatch front fills were on deck and a whopping 15 SMS118 subwoofers anchored bottom end across the frontline.

The result was a stage with almost too much firepower. “Having 15 subs and trying to stay below 100 dB is challenging,” says Gex, “but the cardioid preset for the subs seems to work pretty well. It’s well controlled, focused, right in the middle. If you walk around, you’ll notice that it tapers off to the sides pretty nicely.”

Each ShowMatch full-range enclosure has dual 8-inch drivers and four 2-inch compression drivers; the compression drivers are crossed over at 750 Hz to keep the crossover point out of the vocal range.

“That provides a lot of benefits as far as clarity,” says Jeff Lange, a live sound field engineer with Bose Professional who was on site, “because you’re not transitioning between the 8-inch drivers and the 2-inch drivers as the vocal input changes in frequency. It’s very stable in that region and it also shows itself really well with

horns, like [on this stage].”

With so many genres and instruments represented at every stage during Jazz Fest, versatility is key to success. Along with that comes the requirement that a sound system be as neutral and transparent as possible—a challenge Propaganda met with its Bose rig. “There isn’t a specific anomaly to the way this box sounds,” says Klon, commenting on the system. “They don’t have a box tuning that accentuates what a single type of music might require but another type of music might suffer from.”

As a result, the ShowMatch system ably handled a variety of audio situations, from the bold swagger of the Storyville Stompers Brass Band to the percussive wallop of Big Chief Juan & Jockimo’s Groove, throughout the 8 days of Jazz Fest, allowing Propaganda Group to take everything thrown at it in stride.

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New Orleans Jazz Fest

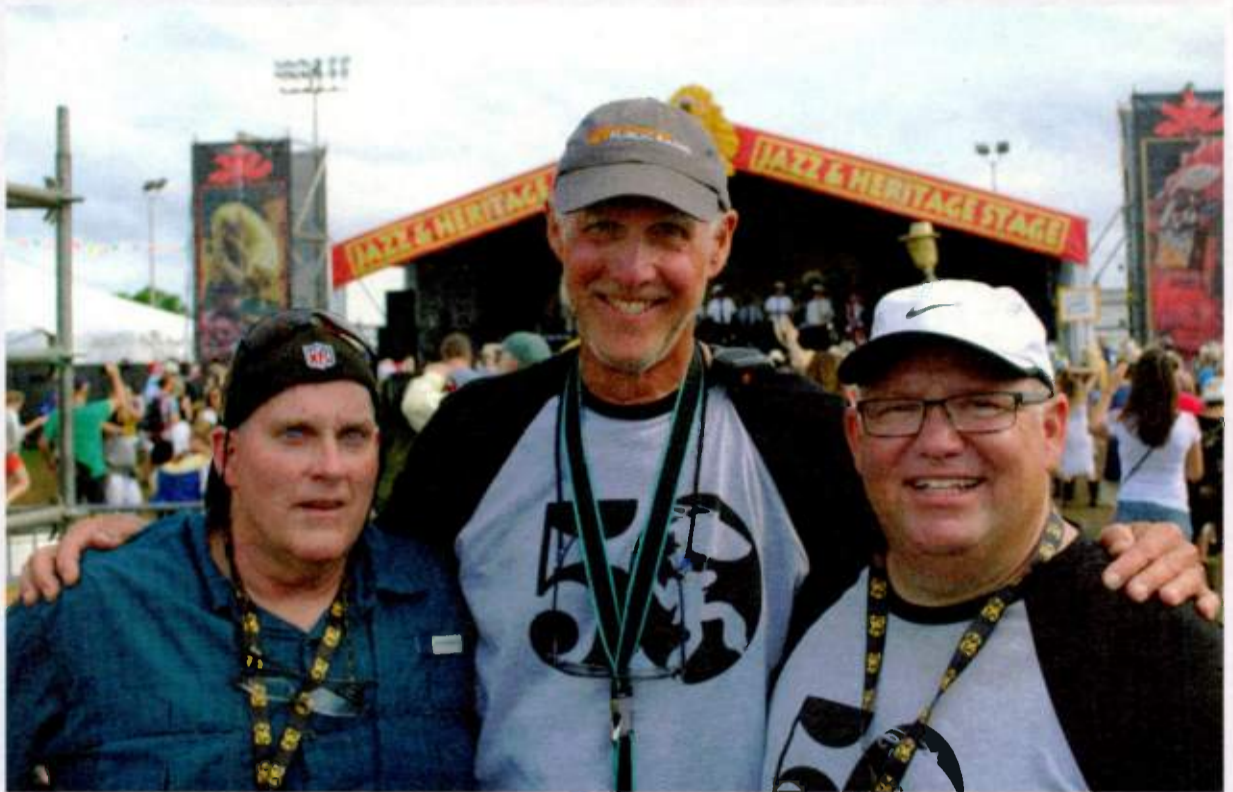
(continued from page 38)

The lawn spreads out from the massive stage in an asymmetrical pattern, with pockets on either side, and stands placed around the perimeter. At the rear of the field, the Congo Square Stage competes for audience and air space, pitting artists like Dave Matthews Band against Pitbull.

“Strategically, Dave Matthews has two hours,” says Koehler, “but there’s a significant gap in here to allow their sound to sort of come into its own and hopefully become somewhat well contained by the size of that audience.”

To make everything work, Jim Bowersox, head of speaker development at Clair Global, worked with Koehler and others for months to design the Acura Stage system in a way that balances performance with maintaining good relations with neighboring stages and audiences.

“We may have a pop or heavy rock act playing at the same time as a quieter jazz performance in the tent immediately behind the stage,” says Bowersox. “The use of steered, cardioid sub arrays helps to mitigate excessive low frequency behind and to the sides of the Acura Stage. The speaker hangs are also surrounded by acoustic blanket materials to help improve rear rejection characteristics



At the Jazz & Heritage Stage were (l-r): Engineer Jeffrey Gex; John Koehler, director of Audio for Jazz Fest; and Brian Hrabar, owner of Propaganda Group.

when the scrim in front of the main hangs becomes wet and excessive high frequency energy gets reflected rearward.”

The hulking system centers on hangs of 16 Clair Global Cohesion CO-12 arrays per side, made up of a dozen 80-degree boxes and four 120-degree boxes each. A total of nine CP-218 subs drive the low end in a steered, cardioid configuration on each side as well. A dozen CO-10s, four CP-6 front fills and three delay hangs of eight CO-10s cover

the outlying areas. In total, 30 Lab. gruppen PLM20K44 amplifiers power the rig.

“Clair is a clear choice for all national acts because so many already tour with Clair,” says Koehler, “and if they come in with tour packs, they can easily interface to the Clair stuff because it’s already dialed in.”

“The nice thing is the boxes sound the same regardless of how big they are,” he adds. “They’re all voiced in a very uniform way, so a global EQ, should that ever be

applied from one point upstream, makes similar changes in the intelligibility or sound quality, the timbre, of every enclosure.”

Weatherproofing in the humid Southern Louisiana spring is a significant consideration. Rain delays are routine, and sound companies have to prepare for storms that blow in from the Gulf of Mexico with lightning, whipping winds and heavy downpours. “The system needs to be operational through any weather condition, so waterproofing and thermal performance are of high importance,” explains Bowersox.

While he can’t control the weather, Koehler can make sure the stages are prepared for whatever season shows up. Ultimately, he is responsible for mitigating the impact of weather on Jazz Fest performances. “I monitor the weather pretty closely because sound is at the mercy of air. Quite frankly, moisture, wind direction [and] temperature all affect how well we propagate and how well the waves stay where they belong.”

It’s a similar story for the Gentilly Stage, Fais Do-Do Stage and every tent on the grounds. At the end of the day, Koehler hopes his work helps festivalgoers relax and discover: “Out here in the field, it can be just a big gumbo of sound, and my goal is to sort of allow the sound to spread where anyone who isn’t committed to a stage can hear it, but as soon as they’re within an audience area, have that sound be attenuated so they can concentrate on the sound that’s in front of them.”

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Zappa Tour

(continued from page 36)

and video content to lock is really important or suddenly disbelief is no longer suspended. We go to great efforts to sync that up."

The process is simple enough: Lettus receives a 96k fiber optic signal at FOH in the form of a MADI stream traveling through an SSL Blacklight II MADI interface directly from Avid Pro Tools being run by Consalvo. "We're using the S6L's word clock at 96k and sending that to a redundant Pro Tools system," Consalvo explained. "We then send out timecode that is massaged by a destripilizer and bounced back to the video/hologram element and the lighting element so that we're all locked in with the band and Frank and everything. Each song is saved as a snapshot, which follows the timecode. I'm actually starting each song from monitorland, so everything takes the cue from Pro Tools and the timecode that we're generating there."

Lettus pays strict attention to where the hologram's performance sits in the mix. "The big thing is Frank," he said, "I try to keep his vocal and guitar on top of everything, but it's important that his parts don't stand out as 'something other.'"

However, locking in the live musicians with "hologram Frank" proved more natural than expected. "It starts with the drummer—Joe "Vaultmeister" Travers—who's hearing a click

track," said Ahmet Zappa. "These guys did a lot of prep and they're all really pro; Joe just lays down the groove and the band follows." Along with Travers, the band consists of guitarists Ray White and Mike Keneally, bassist Scott Thunes, multi-instrumentalist Robert Martin and percussionist Ed Mann.

Live vocals on stage are handled with Shure wireless in the form of Axient Digital mics. The musicians are captured using a variety of Shure, Sennheiser and Neumann mics, as well as Radial DIs. According to Lettus, the two soundmen agreed on using primarily Shure SM57 and 58 vocal mics as "the tried and true, industry-standard gear."

Zappa's band is kept comfortable on stage thanks to Consalvo's diligent monitoring. "These guys are legacy musicians, so they want to hear it a little more like it would sound coming through wedges," he said. "For a couple of the band members, it's the first time they've ever been on in-ears, so I did the transition with them." He added that Shure PSM 1000s have been very reliable: "You can hammer nails with them all day long and still use them to listen a monitor mix."

A Rupert Neve Designs Portico 5045 Primary Source Enhancer was brought along to clean up and brighten vocals, a tool Lettus added to his arsenal on a recent tour he and Consalvo did with Pat Benatar. Otherwise, he happily employs the preloaded effects on his SSL L200 console, "That's one of the big sell-

ing points of this board," remarked Lettus. "Everything sounds excellent and it's great to not have to carry much extra stuff with us. Overall, the L200's been outstanding. Not only is it fully loaded, but it's got great natural warmth, and sounds closest to analog in my opinion."

Consalvo, with 30 years in the sound industry, has found that "less is more" also in terms of plug-ins, opting to primarily use effects preloaded on his Avid S6L. "I use the Fairchild, a little De-Essing and a lot of Smack," he said. Lettus lends some reverb to "Hologram Frank's" guitar lines. "Just out of the box, they sound a little sterile to me," he noted, "so we're 'live-ing' them up a bit. Also, at the top of the show, Ahmet likes a very spacey effect on Frank's vocal until we actually see him arrive. Other than that, it's pretty much straight-ahead rock 'n' roll."

The tour is using local P.A. through its run, as it did on opening night at the Capitol Theatre, where the house d&b audiotechnik V-Series loudspeaker system was employed. "I've done the house thing before and it's fine; a little more challenging, but that keeps you on your toes," said Lettus, who typically keeps his mix below 100 dBA.

Though a portion of the show features tracks from other eras, most of the Zappa hologram audio is culled from an unreleased performance videotaped on an L.A. soundstage in 1974 with only a small crew in attendance. "We did have a little remastering on some of that stuff from the

vaults," said Eyellusion CEO Jeff Pezzuti, who worked closely with Ahmet Zappa on the project, "but we pretty much kept it as-is. It's an incredible session and we've used that as the inspiration for about 95 percent of the show."

Whereas the 1974 videotapes were "the first big Lego piece to building the show in terms of audio," according to Zappa, the holographic images of Zappa performing were created expressly for the tour. "We studied that early '70s video as the basis for building the photoreal version of Frank, but it's all computer-generated; there's no video reference of it," said Pezzuti. Zappa added, "That's sort of the main look for Frank, because that's what I gravitate toward when I think about my dad ... how I see him in my mind's eye."

Ultimately, bringing the holographic Zappa and his performance together was a challenge for the team. "It's a combo of video file along with stereo channels for Frank's isolated vocal and guitar," said Pezzuti, "so getting four channels of Frank to sync with everything happening with the video on stage was complicated; some significant thought went into it."

Zappa's band rehearsed with Consalvo in L.A. for two weeks before moving the troupe to Palm Springs to be joined by Lettus for several more days of full production rehearsals. As the show began to gel, the vibe was bittersweet, but very positive. "Besides the amazing spectacle of visuals, the band is absurdly good," Pezzuti confirmed. "They took that leap of faith [to join the production] because of their love for Frank."

The tour wrapped up North American and European tour legs in May, with more on both continents to be announced in the months ahead. Understandably, Zappa and Pezzuti are hoping for a big response from Frank's fans. "It's hard to contextualize the feeling and how magical the band is when they're playing," said Pezzuti. "You're definitely going to see the time and effort put in—it's musically and visually stunning."

Lettus is enjoying the ride as the tour builds steam and hints that special guests are likely to enliven the psychedelic proceedings as they roll along. "You never know what's going to happen. There are a couple of moments in the show that give you the old 'hair standing up on the back of your neck' type thing. It's really nice to get encompassed in that kind of moment."

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The Church

(continued from page 36)

the P.A. He creates a wall. Everything sounds louder from there; it doesn't start with a big drum sound and everyone fills in."

Supplementing the quartet on guitar and keyboards for the *Starfish* anniversary tour is Jeffrey Cain, best known for his band Remy Zero, which won notices as a support act for Radiohead in the 1990s. "Jeffrey is the new fifth member of the band live. He handles all the bits from the record we can't play and a lot of the keyboard parts on his guitar that our old keyboard player used to play," Powles explained. "[Cain's] a got a wealth of wet sounds, verbs and Mellotron." Cain also handles the piano, and plays a lot of acoustic guitar throughout the show.

"The vocals go to the house but come back to me [at the drum kit], sometimes mastered down," Powles explained. "The guitar levels change a lot. Atmospheres, backing vocals, some drums, all sorts of things are on the sampler. Some I trigger in real time, some I play as a backdrop and send them back on the same line. If I have an ambient section on a break, I'll push my own verbs. I used to run my own reverb unit out front and have it programmed up, but that's long gone. Now it's returned to stage with different patches for different songs."

For some Church tours, Powles

managed all the boards from the drums manually, running them straight to the wedges. "The house guy did nothing—just stood there—and I even did cues between songs," he reminisced. "Now everything is placed in the field as I see it. The guitars are all panned, the vocals are there, another reverb patch just for me."

Powles started playing drums with an earbud connected to FOH as far as back as 1983. In 2003, an FOH engineer told The Church they all should be on in-ears, "and slowly the whole band dropped off except for me. I can play comfortably with in-ears. Without them, the sound of the drum kit gets eaten by guitars."

Plenty of the setlist is a challenge for Powles to mix, not the least being the three interweaving guitars.

"Years before harmonized strings sounds became popular, [Koppes] made his own version of it," the drummer said. When Powles started making records with the band in 1997, "We really refined the idea of taking the guitar sound and putting it through multiple delays and reverbs and harmonizing it, then putting it into either two amps or a Leslie cabinet or two," he explained.

The streamlined rig calls for Koppes getting a clean amp and a channel-changing dirty amp side by side. The guitarist used to have a third amp, but today he uses a Tech 21 SansAmp Bass Driver, a device first adopted by bassist Kilbey totally by accident.

Following the Jersey City sound-check, Kilbey explained that a heroin-induced stupor in the mid-1990s resulted in him literally losing his amp on the way to a gig. Realizing that the show must go on, "I said at the time, 'Give me a DI line and I'll plug into the board.' Through my negligence, I made this discovery, and I've never looked back," said Kilbey, who doesn't "understand why other bassists don't do it."

Powles chimed in, "SansAmp has got an incredible bottom end."

Ironically for the White Eagle Hall gig, there happened to be an extra Ampeg 8x10 cabinet on hand, and as a goof the crew positioned it on stage behind Kilbey. Purely a prop, the amp was never turned on or connected to the bassist's axe during the show.

Powles replaced the Patti Smith Group's Jay Dee Daugherty, who joined The Church unofficially on the drums from 1990 until 1993, after which the band tried to use a drum machine, without success. "They rung me up. They were having trouble," said Powles.

"We made quite a few records without an engineer. Pete also plays drums, and I'd run around [to man the console]," Powles explained.

When asked if he felt like Ron Wood, being a longtime member of an established band, he said, "No, it's a bit different." The Rolling Stones guitarist "doesn't do as much work."

The Church

www.thechurchband.net

Røde

(continued from page 33)

pleasing top end, and would personally opt for pop filter on this mic. But that's certainly not a deal-breaker when you're talking about a mic in this price range.

I was impressed enough with the PodMic to do a more ambitious test. The next day, I brought it to Digital Arts in New York, the recording studio where I work for ad agency, film, animation and television clients. I took the bold step of putting it side by side with a Neumann U87 during the recording of a TV commercial, with both mics' diaphragms behind a single windscreen. No, I didn't expect the \$99 mic to sound as good as the \$3,200 mic, but I've been using U87s for over 30 years, so it gave me a good point of reference. While it didn't sound like the Neumann out of the gate, some quick EQ work—just a Pro Tools channel strip with a bass boost and some upper mid gain—brought it into the neighborhood, which really surprised fellow engineers who came into the studio to check it out. I don't think you'd fool anyone by trying to pass PodMic off as a U87, but the fact that it can deliver that large diaphragm sound with some EQ know-how is impressive.

Given its affordability and quality, I started to wonder how the PodMic might handle non-voice recording chores. For fun, I put it on my acoustic guitar. Sadly, it didn't do much. For comparison, I recorded the same instrument with my Røde NT1A, which gave a clean and rich sound with very little effort. I placed the PodMic in several positions, but I just couldn't get a great sound. Keep in mind that this mic is designed for a specific task, so this test was really just to see if there was any bonus usage—because honestly, at this price point, I could see having a number of these on hand.

So who is this mic for? It's a definite for podcasting beginners looking to hit the ground running, but for \$99, it's a solid backup mic to have on hand for professional studios. Røde has given us an entry-level price point for a mic that will last a lifetime.

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Despite a Long Past, Celestion Looks to the Future

ANDY FARROW, GLOBAL SALES DIRECTOR, CELESTION

BY CLIVE YOUNG

For many a longtime manufacturer, their history is a double-edged sword: The benefit is brand awareness and a legacy of well-regarded products, but the drawback is that the past can become an anchor, slowing you down and preventing you from keeping up with the times and answering the needs of current-day customers. With that in mind, Andy Farrow has spent the last five years as global sales director of Celestion, ensuring the world knows that the 95-year-old company isn't merely current, but in fact determinedly ahead of the curve.

A 24-year veteran of the UK loudspeaker manufacturer, Farrow started off as an apprentice-trained manufacturing engineer, leaving school at 16 to spend two years working at a grass and farming technology manufacturer in Ipswich in the east of England, before attending Brunel University in West London, where he received his bachelor's degree in manufacturing engineering. "While at university, I developed a love for music, having bought a CD player and a couple of speakers, and my love for all things audio took off," he recalls. "Afterward, in the '90s, I took the chance to join Celestion, who were a large manufacturer of speakers in Ipswich—which seemed to be more exciting than working on lawnmower technology!"

At the time, the company had just come under new ownership; Farrow took on a production engineering role and soon also began earning an MBA with a focus on international business. He joined Celestion's sales team in early 2000, where he was charged with looking after OEM clients. Success there led to a significant change in 2002, when Farrow, as vice president of sales, moved with his family to New Jersey to set up a U.S. sales office for Celestion. A dozen years later, they returned to the UK as Farrow took on his current role as global sales director at the company's global headquarters in Ipswich, where he oversees sales teams based in their home regions throughout the United States, Europe and China.

The company has changed and evolved significantly since he first joined it. "In the early 2000s, Celestion made the decision to stop producing finished goods and focus entirely on the design and manufacturing of transducers," he says. "We also knew that the pro-audio market represented a large growth market for transducers, so we designed products specifically for this marketplace and developed deep relationships with P.A. manufacturers. Now this segment represents a very large part of our business, and the compression

drivers and coaxial loudspeakers that we produce have been a big part of that success story."

Farrow adds, "We develop both new products that we define internally, as well as products by working in partnership with [a given] sound reinforcement system manufacturer to develop a specific transducer solution." As it happens, the list of OEM customers over the years reads like a who's who of the industry, as Celestion's professional loudspeakers and compression drivers have been created with and used by some of the best-known loudspeaker manufacturers across the globe.

Farrow credits his ability to work closely with B-to-B clients—the engineering and R&D teams at manufacturers—as due to his engineering background. "Being able to understand their needs from an engineering point of view helps us collaborate and come to a solution to meet their individual needs," he said. "Having an engineering background is helpful with new product development, all-around problem solving and an analytical approach. How do we make things work even better? How do we get to the next level as a company?"

Celestion is a sizable company as well. The headquarters in Ipswich houses all product research and development required to get to a finished product—acoustic research, product development and engineering, mathematical modeling, computer prototyping, physical prototyping, test and measurement, and manufacturing.

"We have a large team of loudspeaker project engineers on site, all of whom get involved in the development of new products from the ground up, and who are very skilled in the use of our in-house finite element analysis software, used for mathematically modeling the acoustic, magnetic and mechanical properties of a speaker," says Farrow. "Our innovative in-house technology is one of the unique advantages we have over our competition. In support of this team, there is a drawing office,

prototyping and sampling laboratory, and test and measurement facility."

Celestion manufactures a wide range of loudspeaker components for pro-audio applications, from high-frequency compression drivers to low-frequency woofers. While large-scale volume manufacturing takes place in Celestion's Huizhou, China-based factory, the Ipswich headquarters handles some manufacturing as well, specifically building small-run, specialist and high-value products. Farrow points out, "Many of my colleagues have been with Celestion for decades; the employee with the longest tenure, Dee, has been with us for 45 years and she is still the current production manager on the shop floor. She has been a part of building millions of speakers!"

Celestion's UK manufacturing continues to expand as well. Says Farrow: "Right now, our UK manufacturing is undergoing another level of growth, and we are continually making advances in our designs and manufacturing processes in order to bring new technology to the future."

Some of that effort has included new driver technology, which Farrow says represents a significant next step forward in terms of how loudspeakers are deployed in certain applications. "The initial result of this is the Axi2050, a high-power, high-output wideband compression driver that is able to reproduce a frequency range of 300–20,000 Hz without the need for a mid-band crossover, essentially performing the role of two speakers in one," says Farrow. "As a technical achievement, we cannot overstate the importance of this, particularly in mid-range clarity and vocal intelligibility. This is significant new driver technology, and there is more coming from Celestion."

That's not the only forward-looking step for Celestion, either; on the MI side, where the company's OEM products have long been part of many guitar amplifier manufacturers' tones (the Celestion website alone lists nearly 70 past and present corporate clients), Celestion recently released



Andy Farrow, global sales director, Celestion

the new Copperback guitar speaker and F12-X200 guitar speaker, designed for use with amplifier and cabinet emulation technology—and there's more.

"Our movement into the digital domain is the perfect example of the company's constant innovation," says Farrow. "Celestion's Impulse Responses—digitally downloadable versions of our classic guitar tones for use in recording and live production—have been overwhelmingly well received and are very successful. We are the only transducer manufacturer who has done this. Celestion is a 95-year-old speaker manufacturer with a long, rich heritage—and we are now making software!"

That movement is fairly indicative of the state of Celestion, as it maintains growth and forward momentum, regardless of being a near century-old brand. "Celestion is still evolving and ever-changing to adapt to new marketplaces and develop future technologies," avers Farrow. "I think this is the main reason that our employees stay at Celestion for decades. I'm proud to have worked at Celestion for more than 24 years and I continue to be excited for the future."

Celestion
www.celestion.com

Controlling Your Own Destiny, Part One

BY PETER JANIS

Change is inevitable. In business, you are either growing or dying a slow death; no business simply stays the same. There are too many outside pressures—for instance, competition in the market or distribution channels, emerging technology that is creating a shift in demand, or even new government regulations that may be forcing one to conform. In pro audio, the shift in wireless frequencies is a perfect example of a technology shift being forced on manufacturers.

Radial Engineering began life as Cabletek, a manufacturer of guitar and mic cables, concert snake systems and custom patchbays for studios. At the time of this story, I had just spent several years learning the distribution model at Fender Canada (TMI), where we imported products from companies like Alesis and Audix from the United States and Akai and Casio from Japan, and sold them to dealers in Canada. The biggest challenge was being able to set prices so that they were profitable while remaining competitive with pricing in the United States, the biggest and most competitive market on the globe.

My first task at Cabletek was to secure “exclusive distribution” in Canada for lines that we used in manufacturing, such as Mogami cable and Jensen transformers. This way we could both sell premade products such as mic and guitar cables to regular music stores and deliver bulk to larger sound rental companies that had in-house manufacturing. I spent years traveling across Canada putting on “We Hate Noise” clinics, where I would explain proper grounding techniques and the benefits of quad-balanced, low-capacitance wire and transform-

ers to eliminate hum and buzz in the studio; how dynamic microphones work and the benefit of a tighter hypercardioid pattern when it comes to eliminating feedback on stage; and the usefulness of acoustic panels and how they are used to create a relatively neutral mixing environment for the home studio. As this was pre-internet, dealers were supportive because the tour provided their cus-

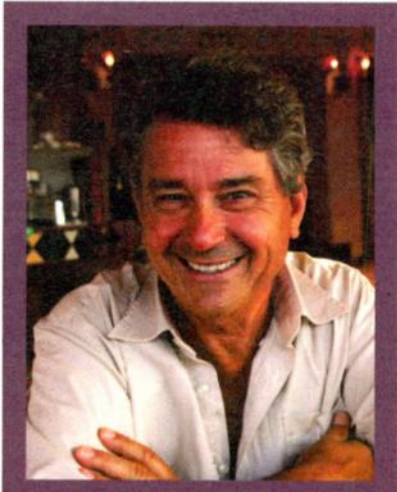
tomers with useful education they couldn’t get elsewhere. Clinics were usually well attended, and because we put in the hard work, the results from our efforts came quickly.

I met with a buyer at a large contractor in Montreal, who asked me why a cable company was trying to sell him amplifiers and microphones. This hit a nerve. I realized that the Cabletek name pigeonholed the company, so I changed the name to C-Tec to make it less cable-centric. I then began chasing down brands that I felt could be added to our product

range and be sold through our small but growing dealer network.

At this point in the story, it is important to understand the dynamic of a distribution firm. Distributors are middle men. In the United States, there are very few “true” distributors; most, in fact, would be better tagged as wholesalers.

Wholesalers serve a purpose by providing smaller music stores,



BY PETER JANIS

Peter Janis, former CEO of Radial Engineering, is a 40-year veteran of the music industry. Exit Plan (www.exitplan.ca), his consulting firm, assists business owners to build their companies and prepare them for eventual sale.

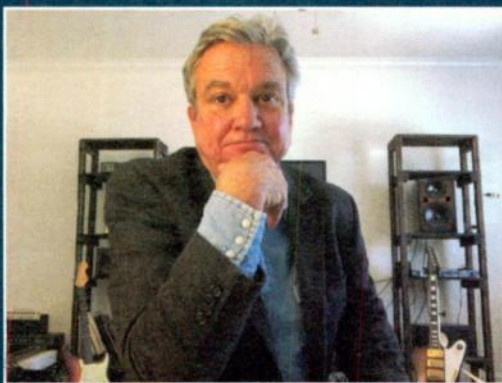
Change is inevitable. In business, you are either growing or dying a slow death; no business simply stays the same.

tive for a brand in a given territory. This is how most of the music and pro audio industry is set up outside the United States. For instance, there is only one distributor for Shure in Canada, called SF Marketing. In France, Shure is distributed by Algam. When you take on the responsibility as the exclusive distributor for a brand, you cannot bring on a competitive brand, so you won’t see a distributor handling two microphone brands, for instance. As the manufacturer’s exclusive agent, they have no choice but to sell that brand’s wares, even when the market may be hot for something else. If they deliver the sales, all is good. If they do not, you can expect that the manufacturer will find another distributor that is willing to do the hard work.

sound companies and contractors with products that a manufacturer deems too expensive to service directly. Wholesalers typically work on lean margins, maybe 8 to 12 percent, and make it up in volume by offering a wide arrange of brands. Their mantra is to follow a “flavor of the month” or “most popular” approach, whereby they will have items like a Shure SM58 or Samsung TV on the shelf that will ship every day to fill orders.

A distributor is different in that it tends to be the exclusive representa-

60SECONDS



Larry Italia,
d&b audiotechnik
Americas

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

A: President and CEO of d&b audiotechnik Americas. I am responsible for all aspects of our business in North, Central and South America.

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

A: I have over 30 years’ experience in sales, marketing, product development and management in manufacturing and systems integration companies. I’d better be prepared....

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

A: A new vice president of marketing Americas (Marc Lopez) and a re-engineering of our marketing department, a major update of our website, expanded focus on the systems integration market, “lighthouse” Soundscape (a d&b toolkit that provides an entire

audience with an unparalleled listening experience) projects, a major campaign in support of our new KSL Series, a new Southern California facility, and an increased trade show presence in the U.S. market—to name just a few.

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

A: In the short term, to complete our internal restructuring and fill the open positions in our expanded organization; finalize implementation of our new go-to-market model; the opening of our new Southern California facility; and expand our systems integration and Soundscape business. Long term, to make d&b audiotechnik the top audio technologies and solutions provider in the industry.

Q: What is the greatest challenge you face?

A: Conversational German.

State by State

(continued from page 1)

The website break down the number of jobs and businesses that the industry supports, along with with the number of royalty recipients, songwriters and streaming music subscribers residing in each state. Each state's page also identifies its major music venues and festivals, and lists some of its most prominent musicians. Where applicable, each page also lists a state's music schools and major music conferences.

The fact that streaming music subscriber numbers for each state are included is illuminating. The RIAA's annual music industry revenue report for 2018, released at the end of February, noted that the third consecutive year of double-digit growth was due in no small part to music streaming service subscriptions, which passed the 50-million mark last year. Glazier comments that fans have access to music via 400-plus licensed services globally.

Thanks largely to the growth in streaming, which accounted for 75 percent of 2018's total revenues, last year saw a 12 percent increase in revenue over the previous year to \$9.8 billion (estimated retail value). Physical sales accounted for 12 percent, digital downloads contributed 11 percent and sync licensing generated 3 percent of the year's total revenue.

Mitch Glazier, RIAA chairman and CEO, offered a reality check, however. "As noteworthy as it is for the business to approach \$10 bil-

lion in revenues again," he wrote in a Medium post that coincided with the annual report's release, "that only returns U.S. music to its 2007 levels. Stream-ripping, and a lack of accountability for many Big Tech companies that drive down the value of music, remain serious threats as the industry strives for additional growth."

That industry revenues are now nearly equal to 2007's \$10.8 billion highpoint suggests that major labels have successfully reinvented themselves for the new streaming era, an environment in which an artist such as Billie Eilish could rack up 1 billion streams before releasing a full-length debut album on the Interscope imprint. The all-time peak for U.S. record revenues was \$14.6 billion in 1999, according to the RIAA (approximately \$21.5 billion, adjusted for inflation), when the compact disc dominated but before the impact of Napster, launched in June 1999, was felt in earnest. The RIAA successfully sued and shuttered Napster in July 2001.

Glazier's post, referencing a report by Larry Miller, music business program director at NYU Steinhardt, notes that, encouragingly, major labels signed more than 650 new artists in 2017, up from 589 the year prior.

Nationwide, in addition to the music industry's previously mentioned \$143 billion contribution to the U.S. economy, it also supports 1.9 million jobs and 157,189 businesses. Across the country, 141,866 musicians receive record royalties, according to SoundExchange figures, while ASCAP and BMI put the total

number of songwriters at 1.17 million.

California's numbers are pretty eye-popping. The music industry contributes \$38.4 billion to the state's GDP, supporting more than 447,500 jobs and 40,301 businesses. For comparison, in New York, the country's other major music business hub, the industry contributes just a fraction under \$20 billion to the Empire State's GDP while supporting 224,701 jobs and 18,322 businesses.

In Tennessee, home of Nashville, the country's third major music business center, the industry accounts for just short of \$5 billion of state GDP and supports 61,769 jobs and 5,846 businesses.

That said, Tennessee is put in the shade by the Lone Star state, host of the South by Southwest festival and Austin City Limits and home of Beyoncé, Willie Nelson and ZZ Top. Supporting 119,476 jobs and 8,331 businesses, the music industry contributes \$6.5 billion to the Texas GDP.

Of course, someone must always be in last place, an honor reserved for Wyoming. While the state hosts the annual Grand Teton Music Festival in Jackson Hole and three other major festivals, Wyoming's page on the 50 States of Music website lists just three notable artists: Chris LeDoux, Teenage Bottlerocket and Scott Avett. The industry generates \$42.2 million toward state GDP—less than half of nearest rival Alaska's figure of \$106.7 million—while supporting 117 businesses and fewer than 700 jobs.

50 States of Music
www.50StatesOfMusic.com

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VR Audio

(continued from page 1)

last year attracted 10,000 attendees, was taking a hiatus this year. It quoted a co-organizer of the event as saying, somewhat enigmatically, “VR is in a weird place right now, and we’re taking a break while it sorts itself out.”

New York City has no such reservations. In October 2018, the New York City Economic Development Corporation (NYCEDC), the Mayor’s Office of Media and Entertainment (MOME), and Brooklyn Navy Yard announced the launch of RLab, the first city-funded virtual and augmented reality lab in the country. The program is administered by NYU Tandon School of Engineering with a participating consortium of New York City universities, including Columbia University, CUNY and The New School.

“The existence of RLab is a sign of New York City’s commitment to this industry,” says Janice Brown, manager, education and outreach at RLab, (and *PSN*’s recording editor for six years, through 2007). “Its mission is to spur economic growth in this industry in New York and to make it a global hub.”

Operating out of a warehouse in Brooklyn’s Navy Yard, RLab’s ambitious program offers education to practitioners looking to move into or advance in the field of VR and AR, as well as to corporations seeking to train employees, via masterclasses and workshops. Online courses launch in August. An accelerator program kicks off in the fall and, as XR Beta, already involves 10 startups co-working at RLab. There is also community outreach, says Brown.

Some of the immediate growth ar-



A 2018 GameSoundCon attendee tries out Sennheiser’s AMBEO AR One, an accessory for the Magic Leap One AR headset.

eas for XR—extended reality, the umbrella for VR, AR and MR, or mixed reality—are healthcare, heavy industry and smart cities, according to Brown, and RLab’s initial programming reflects that.

For sound designers and engineers currently employed in media and entertainment who are prepared to make a transition to these corporate environments, there are tremendous opportunities, she says. “The trick is figuring out how to get involved without having to learn how to code—but some of the sound designers I know are just diving in. I hope we can be a resource for folks like that,” says Brown.

GameSoundCon, an annual conference that offers in-depth technical presentations and workshops at a two-day event in downtown Los Angeles (this year it will be Oct. 29–30 at the Millennium Biltmore Hotel), launched 10 years ago to assist people film and TV sound transition into games. It has also addressed the interests of VR practitioners for several years; founder Brian Schmidt is bullish about the future of VR, using the

term as shorthand for all the related disciplines.

VR has been tremendous for sound professionals, Schmidt says, noting that even people on the visual side now recognize the importance of sound to the medium. As he notes, there were opportunities galore from the get-go: “VR was the sound designer employment act of 2016,” he says, generating work in research and development of the much-needed tools and technology as well as the creation of content as the business began to take off.

Don’t write VR off too soon, says Schmidt, pointing out that it is still very much in its infancy. “The film industry didn’t go from *Al Jolson to Star Wars* in five years. And it’s not going to replace traditional interactive media; it just expands it.”

However, he says, despite the great strides that the audio tools and technologies have taken with respect to VR in a few short years, there is room for improvement. “There are some almost mundane issues we have to deal with to make audio believable and real in VR,” he says. For instance,

“We need a dialogue pipeline with multiple performances for different distances that the character might be from the player,” he says, since HRTF and reverb modeling still don’t deliver sufficiently believable results.

Brian Glasscock, project manager for Sennheiser’s AMBEO Immersive Audio products and program, also cautions against dismissing VR out of hand. “As a company, we still see the long-term value of immersive audio, especially in relation to augmented and virtual reality,” he says. “I think we’re just in a moment of transition as we move away from hype-based activities and early types of content—in particular, 360 video—as these new mediums move toward finding the appropriate niches and applications for these new types of spatial computing.”

Sennheiser has brought various tools addressing VR to market, says Glasscock, beginning with the Ambisonic AMBEO VR microphone. That was followed by the AMBEO Smart Headset, for consumer and portable binaural recording applications. More recently, Sennheiser launched the AMBEO AR One, an accessory for the Magic Leap One AR headset.

If anything, the VR business is simply following well-established models regarding the lifecycle of any new technology. “It’s not disconcerting that some of the initial excitement has died down as the hard work of bringing it to the mainstream begins,” says Glasscock. “We’re still excited about it and think that it has the potential to reshape how media is created, and how people enjoy content.”

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[50] MUSICetc. IIII

Master of Intergalactic Waves

BY JACQUES SONYIEUX

From the outside, Craig Leon seems to glide effortlessly across his musical adventures. The expanse of his creative accomplishments is startling, ranging from early production work with The Ramones, Richard Hell and Blondie, to his orchestration and recording projects with Luciano Pavarotti and the London Symphony Orchestra, to his early experiments with quad recording and immersive audio.

However, Leon's true passion is evident in his own recordings, where he is pushing the boundaries of contemporary electronic music. His newest album, *Anthology of Interplanetary Folk Music Vol. 2: The Canon*, is the latest in a multi-decade project that finds the artist combining unique synthesizer-based compositions with astounding dynamic visual elements. *Pro Sound News* caught up with Leon after a commanding performance at Moogfest 2019.

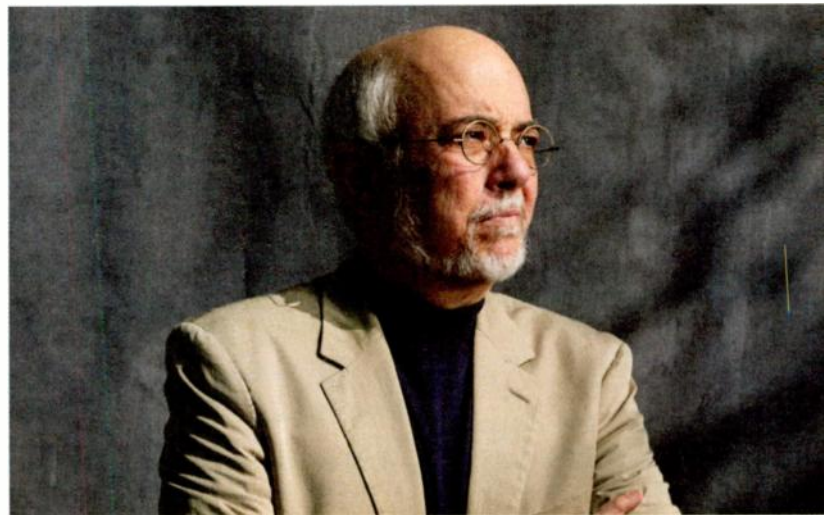
ON FOLK ROOTS

Basically, the album was projected as a series and it was supposed to parallel an American compilation from the '50s that was very important. This four-record set, called *The Anthology of American Folk Music*, was put together by a fellow named Harry Smith around 1951, when he collected all of this American heritage music. He put it together in such a way that people were not supposed to be prejudiced against each other any-

more when they heard it and would become more tolerant. Eventually it became the role model for all of the folk singers; they learned their repertoire from that in the 1950s and '60s and eventually became the protest writers who were politically motivated: Bob Dylan, Joan Baez, Roger McGuinn—just about anyone who got started in folk.

ON INTERSTELLAR INSPIRATION

My first album came from a fairy I got from an art exhibit of a tribe in Africa. Over thousands of years, this tribe's entire output has been pictures of beings from another planet that came down from space, taught them about civilization and gave them their religion—these things were called the Nommos. So when I started this recording, I wanted to parallel Harry Smith—I wanted to do the *Anthology of Interplanetary Folk Music*, to include my theories about the folk music of the visitors from another planet. So I created a mathematical system and a



AMELIA TROUBRIDGE

Craig Leon

musical system to try to portray that, and it was planned to be a three- or four-album set. *The Canon* carries this on and takes the listener on a journey through a fictional story on the teachings of the Nommos into our society.

ON USING SYNTHS

In classical, you have a set of rules that you can't avoid. You can't make a clarinet play lower than it can play without moving to a larger member of the family, to an alto or a bass clarinet if you need it. And you can't make it go higher than the person playing it can manage without killing himself. Ultimately you are constrained by the physicality of what those instruments can do. With synths, you have a much wider representation. Synths grew out of electronic organs and theremins, and electronically, they were supposed to re-create orchestras but ended up having a sound of their own. With synths, there are an infinite variety of sounds you can achieve, and if you use many synths, like I do, each one has a different characteristic that you can blend to make your own individual sound. My choice of instruments is a bit more instinctual now because I kind of know what these instruments are capable of. And I mean "kind of" because you learn something new every day.

ON TRACKING AND MIXING

I love my Pyramix system, which is totally digital. But I use this tool in an analog way—I hit play and record, then I play. I was first introduced to Pyramix because it became the standard for classical recording in Europe, and it still is. It is great for editing—as good as anything, in my opinion. Also you can get 200 tracks at 192 kHz if you want—it can go as big as your computer can handle. What you don't get is the variable tape speed that we had on Nommos because the machine was

worn out! As for the mixing, a lot of the effects, echoes and delays you are hearing are inherent in the original sounds, so it is mostly a question of placement. Most of the effects are already printed, and luckily I have enough tracks, so I print them on many tracks—so the stems are available if I want to work in immersive audio. All in all, in terms of mixing, I might do 40, 50 passes and spend about five or six days max.

ON WORKING WITH THE RAMONES

There were a lot of rehearsals involved with The Ramones in the studio because they were very raw live. When I first saw them, it was like one big blur all the way through, kind of like Can's *Monster Movie (Made in a Castle with Better Equipment)* but played at 300 miles an hour! Tommy [Ramone] was meticulous and would play to a visual metronome. He would watch it like a hawk in front of his drum kit while playing at 180 bpm or whatever it was.

On the reissue, we did the mono mix, but back in the day, the record company suit guys said that "mono is old-fashioned," but I had all the notes to do it and the original rough draft mono mixes were in the vaults at Warner—so when it came time to do the reissue, we did it in mono! One of the funniest things about that record was that Dee Dee [Ramone] counted in each song live at the beginning with the mic feeding back. But he counts "1, 2, 3, 4!" in the same rhythm and the same bpm every time, even if the song itself has a different rhythm! It was his trademark, and it had absolutely nothing to do with what is going on in the song after it.

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 jacquesonyieux@gmail.com.

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