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Music Instruments & Pro Audio

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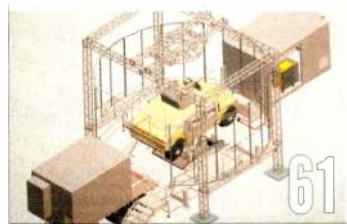
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**NEW
COLUMN!**

20 Gear Stories With Sylvia Massy

Tool meets the AKG C 1000 in the debut column from Grammy-winning engineer/producer Sylvia Massy. Each month, Massy will bring us a colorful story on the creative application of a single piece of technology on a single project. Sort of a "Classic Tracks With Gear." Enjoy.

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Oscar-winner Chris Boyes of Skywalker Sound heads up the inventive sound team behind future-fantasy blockbuster *Avatar*. Photo: Steve Jennings.



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Magic From Stage to Studio

For the past couple of years, I've been meeting my brother Kit and his daughters in the Tennessee countryside for some good times at Bonnaroo. He's a poli sci professor at LSU in Baton Rouge, and each year he's traveled up in an RV with a colleague from the English department, Sharon, and her family. It's big-time fun, sort of like a tailgating family reunion with better music. This year, during a Zac Brown Band performance, Sharon looked up from her chair with a big smile and said, "People ask me what kind of music I like, and I say, 'Live Music!'"

That still makes me laugh, and I've used the line myself since. But it also got me thinking: What drives her—and millions of others each year—to go see live music today? When hi-def concert experiences are available at home and movies have gone 3D. When the overall economy is down and ticket prices are up. When the spectacle often outshines the performance. What drives her to go to a field in Tennessee for a weekend or a small club in Louisiana on a Thursday night?

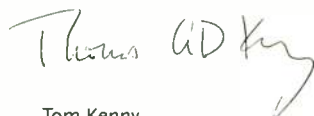
It's the same thing that fuels the live sound engineer: the sense of immediacy, the energy, the possibility of something new every night. She doesn't want a re-creation of the album when she's in the audience; she wants a performance. She doesn't care about all the equipment thrown at a production or the presence of playback tracks. She wants to rock out. She doesn't care that the artist is making more off merch or had to give some tickets away to fill a house. She's after the magic.

And so is the engineer. Many of the best tracking and mixing engineers in our industry started off as live engineers. There they learned how to listen each night, to respond and adapt to changing conditions, as the music warranted. They learned to balance a stage by the end of the first song and to mix dynamically as crowd volume rose or guitars poked out front. They mixed a new show every time out, without presets and programs. The buzz, the adrenaline, the magic happened each night, without a net. It still does.

So here's a *Mix* salute to live sound engineers. They work long hours away from home for less pay than you might think; they eat bad food and sleep in buses for months on end; they walk into a new room every night and make "challenging" systems sound good. They bring us the magic.

•••

We are thrilled this month to debut a new column at the front of the magazine: "Gear Stories With Sylvia Massy." Each month, Massy, a Grammy-winning engineer/producer of rather unconventional style, will pick a single piece of equipment and talk about its application on a specific record, sort of her take on "Classic Tracks With Gear." From her travels through the S.F./L.A. recording scene of the late-'80s/early '90s, Massy assembled quite a discography, working with the likes of Tool, Prince, Johnny Cash, Tom Petty, Red Hot Chili Peppers, System of a Down, Smashing Pumpkins and many more. She left the urban wilds of L.A. for the remote wilds of Weed, Calif., in 1999 and set up RadioStar Studios, where she continues to produce and engineer local and national projects. In her first column, fitting with our theme, she talks about how she got a studio vocal out of Tool by applying some live sound techniques and technology. We hope you enjoy the column.



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BY DAVID SCHWARTZ, PENNY RIKER AND BILL LASKI



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Cakewalk is a company of musicians with a mission to help other musicians. We don't just work here; we all use SONAR on a daily basis to make our own music. When it came time to design the new features in SONAR 8.5, we decided to focus on what we felt would be the absolute best enhancements to help us all be more creative and produce better sounding music. We've added new beat creation and arrangement tools, a new drum instrument loaded with stellar sounding kits, enhanced audio quantizing, new multi-stage effect plug-ins, and so much more. We're excited about the new version 8.5 and we're sure you will be too. SONAR 8.5—the musician's digital audio workstation.

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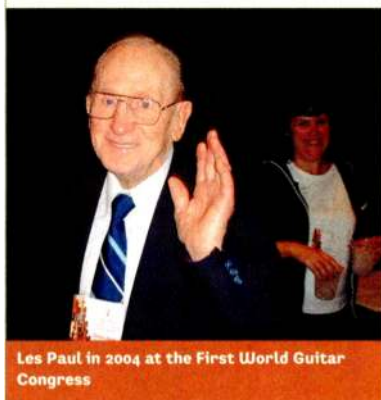
SONAR 8.5

See the faces behind SONAR 8.5 at:
www.cakewalk.com/mix01

cakewalk
by Roland

Another Les Paul Memory

In the August and September editions of the MixLine e-newsletter, we asked readers if they have a Les Paul memory or a great photo to share.



Les Paul in 2004 at the First World Guitar Congress

I have a great photo of Les Paul. I was at the First World Guitar Congress at Towson University near Baltimore in June 2004. I was an exhibitor for NeckUp Guitar Support, a product I own. Gibson Guitars had a dinner and reception one night for all the vendors and performers. After dinner, I went up to the dessert table and found myself alone and face to face with Les Paul, whom I had never met. I said, "Hi," and asked him if I could take his picture, and he said, "Sure!" So there you have it. I just wish I had had the presence of mind to get a picture of [Les and me] together. He was just as open and friendly as he appears in the photo.

I offer my thanks to Les for his inspiration and profound influence on my musical life in so many ways,

Mark Hamre

For more remembrances of Les Paul from leading members of the pro audio community, see Mix's special Les Paul Tribute page at mixonline.com/ms/les_paul.

School Is in Session

In our October 2009 TalkBack section, we asked, "What advice would you give to a student looking for the right audio program?"

During my 30-plus years as an engineer/producer, I've often heard, "My brother's kid wants to work in audio. What would you recommend?" When I was coming up, there were no schools for what I wanted to do. You apprenticed at a studio, hustling burgers, setting up when they trusted you with their mics and looked over the shoulders of giants. If you were lucky, someone would take the time to answer a few questions at the end of a long day. I was also fortunate to be given free studio time to learn the ropes and make my own mistakes. Those days are all but gone.

Apprenticeships are fewer and further between, as are the studios that used to offer them. More productions are taking place in small, private studios, and to a lesser degree in the remaining commer-

cial rooms. The premier rooms will always have a place, but the middle ground of "overdub studios" has all but disappeared.

For students who are starting out, the formula seems to be to learn by doing, read the forums and trial by fire. But at some point, they hit the wall.

Having chosen to split my time between independent production and teaching, I was impressed with career colleges. Students are advised from day one to keep their eyes on the horizon and to have a diverse set of skills. They get studio recording experience, the full gamut of sound reinforcement, audio for games, sound-for-picture and more. They also take classes required to satisfy a Bachelor of Science degree.

Today's student never knows where this career path will lead and being prepared with the "Swiss army knife" of talents will carry them a long way.

*David Cole
Art Institute of Calif., San Diego*

I see the complete relevance of educating as many people as possible to the basics of audio. Some might argue, "What is the point of training if all we are doing is mixing down to an iPod?" I believe that the cream will eventually rise to the top, and that we will see the next generation of MPEG players offering uncompressed/compressed audio with much higher resolution.

The flip side is the tacit fraud perpetrated by institutions as to the possibility (and in many cases a guarantee) of career/employment.

During the '80s, when the industry was at its financial peak and large studios were flourishing, there were thousands of wannabe engineers (many with engineering diploma/degrees) who were placed

on waiting lists just to do an internship for no pay. This scenario worsened with the closure of hundreds of major studios beginning in the mid-'90s.

Yet now, when the industry is at its weakest and the Internet has watered down sales and marketing strategies, there are more institutions than ever that offer a "rewarding career" for the sake of preserving their company's bottom line.

What actually defines a "career?" Technology has made it possible for studios to be built for vastly less money and require less square-footage, and to that end a smaller staff. However, with escalating rent, utilities, Web services and advertising costs, we often see studios that cannot afford a staff engineer. In fact, most studio owners are the primary engineers.

I can't speak for every graduate, but it's a fair bet that most of them don't have the resources to fund such a startup—and even if they did, what would be their reward? While we would seemingly desire the benefits of having a more educated engineering base, there are fewer opportunities to utilize it.

*Plex Barnhart
The MusicPlex*

Choose a well-rounded program that includes business and communication courses. Technical skills are great, but you need to be able to apply them to real-life situations. If you aren't personable or can't see the big picture, and have difficulty contributing to the studio business as a whole, all the skills in the world won't help.

*Stacey Gamble
Allure Sound III*

It seems that every day, there is a new iPhone app ready for download—whether it's a game, tracking sport scores, etc. Next month, *Mix* looks at high-end audio iPhone apps that can be tools for your next production. Tell us your favorite audio app by e-mailing mixeditorial@mixonline.com.



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compiled by Sarah Benzlitz

Wayne Freeman,

1947-2009

Audio industry icon, friend and innovator Wayne Freeman passed away on November 11, 2009, near his home in Southern California from a sudden, massive heart attack at age 62.

Hailing from Yonkers, N.Y., Wayne graduated from Saunders Trades and Tech High School in 1965. Wayne joined the Air Force and was decorated for his combat actions during two tours of duty in Vietnam. After completing his service, he attended New York University, at NYU's campus in Manhattan.

After moving to California and working at BGW, Wayne became the national sales manager at UniSync and he rep'd amps for AB Systems before setting out

on his own to found New West Marketing with Tom Carlile. Around 1982, Wayne's success caught the attention of British console manufacturer Soundcraft, which recruited him as a marketing and sales manager.

As a member of the Soundcraft crew in the early '80s, Wayne (then VP of sales and marketing) was part of an amazing brain trust—a creative/technical group affectionately known as audio's "A-Team," which branched out to forever change professional audio. Wayne eventually left Soundcraft and held key positions with Trident USA, Fairlight, Amek and Otari, but seemed to find his niche with Marshall Electronics. As the company's sales director from 2001 through 2008, Freeman brought its MXL mic brand into prominence.

A Man of Many Ideas

Wayne was always an idea guy. Every time I talked to him I felt like I had learned the equivalent of an MBA in marketing. While at MXL, he came up with the notion for the first USB adapter for connecting pro mics directly to computers; he brought the Mogami cable brand as a supplier for high-end guitar cables sold through MI stores; he differentiated the MXL mic brand by having its mics use quality Mogami internal wiring; and he made deals to supply custom-branded mics to companies—such as Tascam—that were built by MXL.

One of Wayne's amazing concepts was MXL's 1006BP, a large-diaphragm condenser mic that could be powered by phantom power or via an internal 9-volt battery. He originally developed that idea as a way to pitch large condenser mics to Radio Shack stores, which had 5,000 stores in its chain—a huge market compared to pro audio outlets. As most consumers had no idea how to deal with phantom power, he knew a mic that could be battery/phantom-powered was a must for that crowd. Wayne also saw that traditional boxed mic packaging wouldn't work for the RS crowd, so pitched them with samples that were blister packed for hanging on store hooks. Although RS eventually nixed the deal—evidently their buyers felt the mics were too upscale for their clientele—this one example speaks volumes about Wayne's innate ability to connect manufacturing with marketing needs.

More recently, Wayne was the president of Bond Music Research, working with company CEO Ken Berger (co-founder of EAW) to expand the markets for high-end, high-definition audio and music cabling and other high-tech products. One of the company's recent projects was developing custom cables for Paul Reed Smith to be sold under the PRS brand.

Wayne is survived by his wife, Carol, and their two daughters, Julia and Jennifer. Memorial donations should be made to the American Heart Association.

—George Petersen



Wayne Freeman (left) with Paul Reed Smith during the launch of the new line of PRS Signature Series cables at NAMM 2009.

Sound Recording Encyclopedia

The first six exclusive scenes from Alan Parsons' *Art and Science of Sound Recording* are available for streaming and digital download at artandscienceofsound.com. The full collection—eight hours' worth of training videos produced by Parsons—features such guests as Jack Joseph Puig, John Fields, Elliot Scheiner, Jack Douglas and more, as well as takes you inside his personal

Alan Parsons shows you how to set up a proper mix.



custom HD recording facility and other high-end spaces. From the beginning principles of studio acoustics through the final mix, musical examples, diagrams and interview clips illustrate each step in the process. To get your feet wet, those six scenes cover MIDI, EQ, delays, drums, noise gates and recording a choir; the next set of six should be available by the time you read this, followed by the final scenes this month and then a complete DVD boxed set.

Studio Unknown's "Confessions of a Small Working Studio"

If time is money, can small and mid-sized studios stay in the game when "time" (studio hours) is all they have to offer? In the third installment of our online series, Studio Unknown's "Confessions of a Small Working Studio" (mixonline.com/studio_unknown/), Kevin Hill and Lisa Horan reveal how studio owners around the country have answered that question with a resounding, "No." These studios have made the leap into the land of diversification and have successfully incorporated live sound services into their repertoires.

The Music Group to Buy Midas, Klark Teknik

The Music Group, a holding company for pro audio and music products brands (including Behringer), has inked a deal to acquire the Kidderminster, UK-based Midas and Klark Teknik brands from Bosch Communications Systems.

The KT and Midas brands "will continue to operate autonomously under the leadership of John Oakley while benefiting from the synergies of our combined efforts," says Music Group CEO Michael Deeb. In addition, Midas and Klark Teknik distribution remains unchanged.

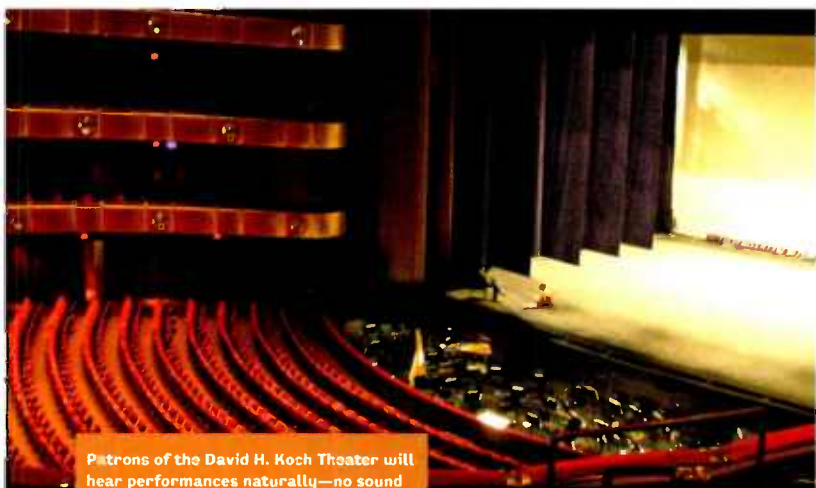
The asset deal was signed on December 8, 2009. The sale is subject to regulatory approval, with the deal scheduled to be completed by January 31, 2010.

OPERA GOES AU NATURAL

Situated in the Lincoln Center for Performing Arts (New York City), the David H. Koch Theater (which hosts the New York City Ballet and New York City Opera) has finalized its \$107 million renovation, which began in July of 2008. The most unique aspect of the project is the absence of the electronic acoustic enhancement system installed in the theater since 1999. George Steel, general manager and artistic director, told *The New York Times* that every microphone, amplifier, wire and speaker has been removed—performances will now be heard with natural singing and natural acoustics. Steel told the paper

that "the expanded orchestra pit now has an air space under its floor. The players will be able to hear one another better, and the conductor will be able to control balances and give the orchestra presence in the hall without undue volume."

The theater has undergone a number of acoustical enhancements because of this change, including removing carpet from the floor and rear walls of the auditorium, and adding new acoustic side walls near the proscenium. Additions include a complete onsite media suite for capture/distribution of images and digital sound.



Patrons of the David H. Koch Theater will hear performances naturally—no sound reinforcement to be found in the venue.

PHOTO: DAVID SHANBONE

on the move

Sarah Jones,
Women's Audio
Mission associate
director



Main Responsibilities:
guide the growth of WAM's educational programs for women through industry outreach, partnerships, and fundraising and marketing.

Previous Lives:
• 1995-2009, *Mix* magazine

My favorite NAMM event was... a toss-up between the Spinal Tap show and the night someone floated a mattress through the Hilton bar.

If I could do any other profession, it would be... a musician as a day job!

Currently in my iPod: Them Crooked Vultures and Calle 13.

When I'm not in the office, you can find me... drinking wine on a large granite rock three hours east of San Francisco.

Mix Master Directory Spotlight

EAR

This month's featured listing from the new online-only Mix Master Directory (directory.mixonline.com/mmd)

EAR Professional Audio/Video

EAR Professional Audio Video specializes in equipment sales as well as system and facility design solutions for Music and Video recording and post-production. EAR is a unique source for either project studios or large-scale production facilities. www.ear.net

ARE YOU LISTED? MAKE SURE AT DIRECTORY.MIXONLINE.COM/MMD.



PETE KALMEN, 1947-2009

Longtime QSC sales and marketing executive Pete Kalmen, 62, lost a prolonged battle with frontotemporal lobar degeneration (FTLD), a cluster of progressive diseases that damages the areas of the brain responsible for the control of personality, behavior, language skills and decision-making. Symptoms of this affliction led to Pete losing his job and unfortunately, due to the rarity of the condition, FTLD was not diagnosed until two years later, in 2005. Pete's condition continued to worsen; eventually he was also struck with supranuclear palsy and he

passed away on November 12, 2009.

A fun, smart guy whose warm smile, friendly manner and genuine concern for his customers earned him many friends in the pro audio and music industries, Pete Kalmen will be missed by all. He is survived by Jodee Kalmen, his wife of 36 years and their sons, Zack and Parker. Memorial donations in Pete's name can be made to the Association for Frontotemporal Dementia, www.ftd-picks.org. —George Petersen

Harman Goes to The Grammys

Harman will serve as an Official Sound Partner to the Grammy® Awards, beginning with the 52nd Annual Grammy Week festivities this month. Harman will sponsor The Recording Academy/Clive Davis Pre-Grammy Gala, hosted by the legendary music executive, as well as



Recording Academy president/CEO Neil Portnow (left) with Harman International chairman/CEO Dinesh Palluwal

be a participating sponsor at the official Grammy Viewing Parties (held at Hard Rock Café locations across the country), the annual MusiCares® Person of the Year Tribute and the official Grammy Celebration after-party. The 52nd Annual Grammy Awards will take place on January 31, 2010, at the Staples Center in Los Angeles and will be broadcast live on CBS at 8 p.m. ET/PT.

Make sure you check out *Mix's* tribute to this year's Grammy nominees at mixonline.com/grammys.

Bookshelf

Bob McCarthy's *Sound Systems: Design and Optimization Second Edition* outlines how sound is spread over a listening area, looks at the physics of speaker interaction, methods of alignment—including mic placement—



equalization, speaker placement and acoustic treatment, and now includes case studies of real-world examples. Focal Press, \$69.95.

Industry News

Music/sound design company **Expansion Team** (NYC) welcomes **Jean Kouremetis**, producer, and **Carter Butler**, assistant music supervisor...**Jonathan Firstenberg** fills **MusicBox's** (Calabasas, CA) newly created senior VP position...Los Angeles-based **Music Collective** appoints **Alec Puro** to the VP/creative director/composer post...**Ontario Institute of Audio Recording**



Jonathan Firstenberg



Alec Puro

Technology (London, Ontario) hires **Dan Brodbeck** as full-time music production and Pro Tools instructor... New head of R&D at **RTW** (Cologne, Germany) is **Jörg Striegel**...Former East Coast sales manager for Digidesign, **David Charles** joins **Universal Audio** (Scotts Valley, CA) as director of sales, Americas...**Alexander Schek** joins **Sennheiser's** (Old Lyme, CT) Latin American sales team, responsible for Central America and the Caribbean...Strengthening its crew is **Sweetwater** (Fort Wayne, IN), which hired 19 new employees: 12 new sales engineers, a sales assistant, an accounting assistant and five shipping specialists.

TOP-SELLING TOURS OF 2009

Average gross for tours saw a boost from 2008 to 2009. In 2008, the highest-grossing tour (as of November 24, 2008) was Madonna, bringing in \$6,071,181. Last year (as of November 30, 2009), the highest-grossing tour was U2, at \$7,689,626. For 2008, the number 10 spot went to American Idols Live, which only brought in \$544,754 as compared to Miley Cyrus in 2008 (\$1,012,567). What will this year see?

Artist	Average Gross	Average Tickets	Average Price
U2	\$7,689,626	82,004	\$93.77
Bruce Springsteen & The E Street Band	\$3,246,542	38,779	\$83.72
AC/DC	\$1,827,586	21,386	\$85.45
Jonas Brothers	\$1,388,330	20,936	\$66.31
Metallica	\$1,372,098	20,138	\$68.13
Depeche Mode	\$1,248,377	19,274	\$64.77
Kenny Chesney	\$1,216,996	18,966	\$64.17
Dave Matthews Band	\$1,073,658	21,636	\$49.62
Britney Spears	\$1,022,687	15,360	\$66.58
Miley Cyrus	\$1,012,567	14,723	\$68.77

—Courtesy Pollstar Concert Pulse, November 30, 2009

The Concert Pulse ranks each artist by its average box-office gross per city in North America and is based on data reported within the last three months.

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SESSIONS

Battle Born Studios—The Killers Make Themselves at Home

Engineer Robert Root began his recording career as an intern at Pat Amico's Studio Vegas, a longtime commercial facility with a steady clientele and comfortable relationships with the Las Vegas music community. Targeting Studio Ve-

enough to home where if it didn't work out, I could easily pack up and head back home," he explains. "So I randomly chose a studio that had a little bit of exposure online."

Root's casual approach was fortuitous. A couple of months after

five years—working with clients from Wayne Newton to Layzie Bone of Bone Thugs-N-Harmony, and running a studio education program for at-risk teens—until he was asked to become chief engineer at SonSongs, another local facility. But while Root was settling in at SonSongs, Amico cut a deal to sell Studio Vegas to The Killers.

"The bandmembers asked Pat if he knew someone who knew the studio well and could wire it up for what they wanted and could get along with everybody, and he was kind enough to give me the good word," Root says.

Root was brought on in time to help whip the studios into shape and record most of the band's 2008 release, *Day and Age*. Changes to the studio include aesthetic improvements and installing a new API 1608 console. "I had no experience on it—it was a brand-new console at the time—but I knew I was in love with the sound of API's products," Root says. "Everybody who has worked in our 'A' room agrees it sounds amazing. It has such a small footprint that it almost takes you off guard when that big of a sound comes out."

Most of the recording at the re-named Battle Born Studios (www.battlebornstudios.com) is done in Logic Pro Version 9. The facility includes a smaller B studio attached to a small live performance room that serves as the home of the studio's most recent acquisition: a baby grand piano purchased from SonSongs. The large tracking room connected to Studio A is used for drums and live band recording. Control room A includes a pair of Westlake BBSM-10 main monitors that are original to the studio, and Yamaha NS-10 and Focal Twin 6 near-fields.

In addition to The Killers' projects, Battle Born is now bookable for outside clients. Since the studio changed hands in 2008, visitors have included Elton John, Canadian singer/songwriter Kalsey Kulyk, Iowa band the Envy Corps and locals the Imagine Dragons.

"I think that the reason there has been a shift to alternative rock projects at Battle Born has been because of word of mouth, now that the studio is associated with The Killers," Root observes. "We're all kind of living in that world right now."

—Barbara Schultz



Engineer Robert Root (seated at the API console) works with members of Imagine Dragons: Dan Reynolds (rear, in blue T-shirt), Ben McKee (foreground) and Wayne Sermon in Battle Born Studio A.

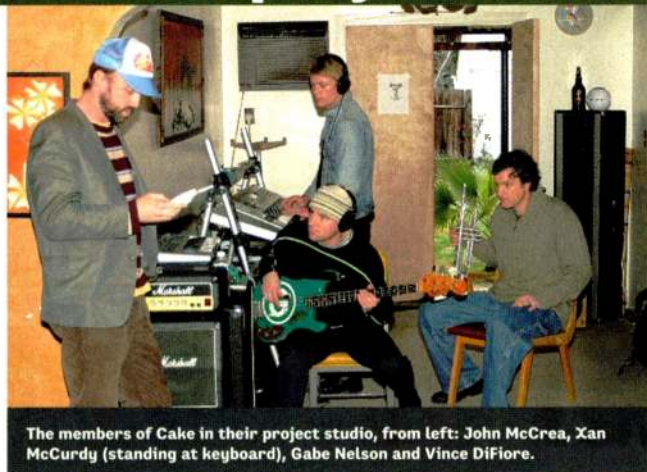
gas didn't begin as an especially inspired choice by Root. He needed to fulfill an internship requirement to complete his program at the Conservatory of Recording Arts in Mesa, Ariz., where he grew up.

"I figured Vegas is the entertainment capital of the world, and close

he finished his internship, the chief engineer quit and Amico hired Root full-time. "It immediately threw me into the fire," Root says, "and that's how I started running the place, almost fresh out of school."

Root served as chief engineer of the two-studio facility for about

project studio **Cake Facility Goes Solar**



The members of Cake in their project studio, from left: John McCrea, Xan McCurdy (standing at keyboard), Gabe Nelson and Vince DiFiore.

Alternative pop-rock band Cake first gained widespread attention in the mid-'90s for ironic, iconoclastic music that flew in the face of mainstream trends. With its clever mash-up of styles, Cake's carefully cultivated sound garnered the band a loyal fan base. Relishing complete creative control over their music, the members of Cake (John McCrea, vocals and guitar; Vince DiFiore, trumpet; Gabe Nelson, bass; and Xan McCurdy, guitar) purchased a two-bedroom house in Sacramento, Calif., for use as their personal recording studio and rehearsal space, beginning with production for their 2004 album, *Pressure Chief*. All four members share in recording duties.

Committed to protecting the environment, the members of Cake are producing their sixth album—which is untitled as of this writing and slated for release in mid- to late 2010—entirely on solar power. Bandmembers contracted Boston-based renewable energy company Borrego Solar to install solar paneling on the band's house and documented the installation in a two-minute video, which is available at www.cakemusic.com/solar.html.

King Crimson Meets Tool



Mix engineers Greg Townley and Jeff Fayman mix their version of "21st Century Schizoid Man" at Immediate Music.

PHOTO: JEFF FAYMAN

"The Human Experimente" (www.thehumanexperimente.com) is a music collective started by Emmy Award-winning musician/composer/executive producer Jeffrey Fayman (also of commercial music company Immediate Music, Santa Monica, Calif.) to cross-pollinate musical talents and styles. Their first release, a re-recording of King Crimson's "21st Century Schizoid Man," features guitar work by Crimson's Robert Fripp and vocals by Maynard James Keenan of Tool.

"I recorded Robert Fripp's guitar parts and an orchestra along to my basic temp track at Studio X in Seattle," Fayman says. "I [used] those initial stems to begin building the [track] at our Immediate Music production facility. But

first I had preliminary conversations with engineer Greg Townley about my goals for the direction of the tracking. I wanted this iconic anthem to sound huge, cinematic and with a fantastic amount of aggressive punch."

Ultimately, the recording included multiple vocalists and complex instrumentation that, by the final mix, was "over 90 tracks wide at 96k," Townley says. "I ran subgroups of the mix through a Neve sidecar, giving the tracks some analog warmth. To get things sounding close, I used GRM Tools' Bandpass filters and Waves' SSL EQs. To push things back, I used a custom space for all the tracks, so I spread things very wide and generated wonderful front-to-back imagery."

—Barbara Schultz

Track Sheet

Jon Langford—the vocalist/guitarist leader of The Mekons, Waco Brothers and Pine Valley Cosmonauts—brought his Bloodshot Records

labelmates **The Sadies** to **Wally MacLellan's Wally Sound** studio (Oakland, CA: www.wallysound.com). The sessions followed The Sadies' appearance with Langford's Cosmonauts at the **Hardly Strictly Bluegrass** festival in San Francisco. Langford produced the roots band's forthcoming album, and MacLellan engineered... Producer/engineer **Daniel Wyatt** (Norah Jones, Mos Def, Blues Traveler, others) was in **Clinton Recording** (NYC: www.clintonrecording.com) to record two founding members of The Roots—**Leonard Nelson Hubbard** and **Ralzell**—for a Hubbard solo project... Solo recordings by Big Star co-founder **Chris Bell** are now avail-

able from Rhino Records' Handmade division. The tracks were mixed and re-mastered at **Ardent Studios** (Memphis, www.ardentstudios.com) by engineer **Larry Nix**, using analog masters made in the '70s... **RoomOne Studios** (Valrico, FL: www.roomonestudios.com) is a new space providing music recording, audio post, commercial production, and surround mixing and sound design. The studio, which centers around a Digidesign Cj24 console, Pro Tools HD, and Event and Avantone monitoring, includes a nice selection of microphones and processing, and guitars and basses from Fender, Taylor, Gibson and more.



L-R: Sadies members Dallas Good, Mike Belitsky, Travis Good and Sean Dean with producer/musician Jon Langford

Send "Sessions" news to bschultz@mixonline.com.

by Matt Gallagher

"We did it for personal reasons," DiFiore says. "As a band, you're always aware of things like climate change and energy shortages. We had to do something. [Borrego Solar] keeps up on panel technology and uses photovoltaic cells that are the lightest and most efficient.

"The conversion box is continually making electricity, which is either used in the house or sent back into the city's [electrical power] grid, and you get credited for it on your [electric] bill," DiFiore continues. "We have a negative balance on our SMUD [Sacramento Municipal Utility District] bill. It's working out really well." Sacramento-based mix engineer Patrick Olguin, who helps Cake with overdubbing and mixes their album tracks in their studio, concurs: "I was a little bit skeptical, but it's really painless—the noise level is a little bit lower in there. We don't seem to be having the computer problems we've had."

The house's living room is set up as a tracking space for a drum set, keyboards, antique upright piano, various acoustic instruments, guitars,

basses and vocals. "John [McCrea] found a place for his vocals right in front of the fireplace because there's a mantle there," di Fiore says. One bedroom is used as a secondary tracking space while the other bedroom serves as the control room.

For recording and mixing, Cake depends on a 2.66GHz dual-processor Mac Pro running Pro Tools LE, a Digidesign 003 FireWire audio interface, Universal Audio 6176 tube preamp/compressor and Tannoy Reveal monitors. Mics include models from Shure (SM57s, KSM27, Beta 52A), RØDE and Sennheiser. "Their environment is totally in the box," Olguin says. "When I'm working in my place, I'm an out-of-the-box mixer. Probably one of the biggest challenges [in mixing] is getting everything to sound like I want it to sound inside the box.

"It's just a crazy home environment," Olguin says of Cake's space. "I like it. It's comfortable and I can see why they like to record there." DiFiore adds, "We've made a good space and we're just going to keep on recording songs, even after this album is released." III

L.A. Grapevine

by Bud Scoppa

A recent addition to the A-list of mix engineers, Joe Zook is on a roll, having scored chart-topping singles and albums with OneRepublic, Katy Perry and Modest Mouse, as well as artists all over the stylistic spectrum—including Tricky, Kelly Clarkson, Pink, The Hives, The PlebZ, Marc Broussard, Mika, Liz Phair, Lindsay Lohan, Brian Ray and Butch Walker—and international mix gigs from Australia to Belgium.

Zook did some recording in 2009, primarily for OneRepublic's second album, including a string date at Abbey Road that he's still buzzed about. He also worked with OneRepublic leader and hit songwriter Ryan Tedder recording Leona Lewis, Kristinia DeBarge and Adam Lambert, and with Butch Walker on tracks for Weezer's latest. Otherwise, he's been mixing away at 2010 Mixing, his studio in Studio City, tucked away off Ventura Boulevard a few doors down from a locally popular breakfast joint.

I walk through the door expecting to see a big ol' analog console dominating the room. Instead, he's sitting in front of a Digidesign Command8 and a Mac Pro, surrounded by stacks of new and vin-

Level Devil tube compressor/limiter; 1959 Blonder Tongue B9b graphic tube EQs and modified Blonder Tongue B9 EQ/filter of the same vintage for bass; Neve 2264x compressors for all of the above instruments; a JFL Audio MP F6E, Vac Rac tube limiters and EQs on pianos and background vocals; Compex 760 for drums; Blue Stripe 1176 for vocals; SPL Transient Designers; Crane Song STC-8; SSL E Series compressors and EQs; Cinema EQs for vocals; spring reverbs; a stack of Distressors; a few dozen guitar pedals; and miscellaneous esoteric pieces.

Zook got the gear bug while working for nearly two years with producer/mixer Jack Joseph Puig. "After you hear some of those rare pieces, you don't just forget about them," he says. The Boulder native came to L.A. in 1996, learning the ropes under Buddy Brundo at Conway before moving over to Sunset Sound and Sound Factory with Mitchell Froom and Tchad Blake, among others, then Ocean Way with JJP. He's been on his own since 2002, and two years later opened his own place, where he works with an eclectic clientele, which recently included Dashboard Confessional, Pink, Kevin Rudolf, Kimberly Caldwell, Matt Wertz, Debi Nova, Peter Conway, Josh Hoge, Sara Bareilles and newcomer Ashlyne Huff. Next up is a project for edgy pop band the Plain White T's.

He attributes the diversity of his work to "a wide range of taste in music. You're not really supposed to like Top 40 hits if you really love music far outside the mainstream, but that's how I've always been. *Sgt. Pepper's* got me started when I was 4 or 5, and I listened to ABBA and AC/DC. I've always been into all different genres, and not just as, 'Oh, that's kinda cool'—I love all those genres. I think people who do a specific kind of music can tell that I love it. I feel that energy with them, and they believe it because it's true."

Zook sees his primary job as interpreting and refining the work of an artist and producer—"completing the vision," as he puts it. "There's a dialog that happens just from throwing up the tracks," he points out. "I don't always talk to people about what they want for the mix, and some



tage outboard gear and a Studer 24-track tape machine. So it appears that Zook does his magic outside the traditional lines and outside the box.

"When I moved in here," he says, "I thought I would put in a console. Now, if you gave me a console, I would get it out of here—this is everything I want right now. At first it was a struggle, and it took a lot of practice-engineering and trial and error. But then, once I got it, this system expanded the possibilities so far beyond the console that I just won't go back. Not only that, but I've had that little Command8 for five-and-a-half years, and the first downtime I had on it was two weeks ago. It took me 15 minutes—just trashed the preferences and it was back up and running. I do the Pro Tools software updates and that's it. It works perfectly, and I know it so I'm very fast on it. I have almost no limitations on it. I have a 32-channel passive analog summing system—that's very important—but the control surface gets it done."

His go-to gear choices include Collins tube compressors for electric guitars; CBS Audimax II tube compressors for acoustics, overheads and sometimes electrics; Chandler EMI stereo compressors and EMI Zener stereo limiter for drums and vocals; Gates

people refuse to have a conversation. They say, 'Just do what you do.' Oftentimes, I don't need anyone to tell me anything because most of it is right there. It tells its own story, and you can hear what's happening from the way someone's playing or singing or breathing, and the spectrum of choices a producer made—sometimes there are plug-ins and they have automation going; sometimes it's completely blank. All of it tells the story of how a project's been going. Once you start, you just get in that world and go until it's done."

On average, Zook does a mix a day, listening back to the mix on Highway 101 North as he drives home to Woodland Hills. But you won't find a stack of burned CD-Rs on the passenger's seat. These days he loads all his work into his iPhone.

Before he gets back to work, Zook returns to the subject of methodology. "Today, there are so many ways to do it," he says. "There's people mixing on old Neves killin' it, people working on brand-new SSLs killin' it, people mixing in the box and killin' it. Technology is a wide-open field now." He swings back into position in front of his trusty Command8. "I've got my hands on these knobs, and that's all I want." III

Send L.A. news to Bud Scoppa at bs777@aol.com.

NASHVILLE Skyline

by Peter Cooper

Ricky Skaggs' fascination with recording studios began in the late 1970s, when he joined Emmylou Harris' Hot Band and began studying the techniques of Harris' producer, Brian Ahern.

"I saw his microphone collection and saw how he got sounds, but when I started working in Nashville studios, I didn't see many microphones like the ones Brian had," says Skaggs, who now owns and operates Skaggs Place Recording Studio in Hendersonville, Tenn. "Any time I saw a good mic or good gear, I'd try and buy it. The Quonset Hut [the studio where Johnny Cash, Bob Dylan and many others recorded] wound up going out of business in the early 1980s, and I bought a bunch of mics from there. The Neumann 47 that was the house mic in there—that George Jones and Tammy Wynette sang into—I got it. And I got their [Teletronix] LA-2A compressors and some 1176s. I was collecting stuff, always in hope that someday I'd have a place of my own where I could record."

In the late 1990s, Skaggs' career as a country hit-maker was

10 pounds of music into a 20-pound sack. I had room to make a guitar sound as big as a truck because we had so much bandwidth to work with. So that big ol' E string on guitar sounds like a rope. Everything sounds so rich and real."

In the 1980s, Skaggs helped bring acoustic instruments up in Nashville mixes. He and George Strait spearheaded the New Traditionalist movement that shifted Music Row records away from the synthesized late '70s, and he insisted that acoustic guitars could be used as lead instruments, the way Hank Snow had done in the '50s and the way The Beatles had done in the '60s. With Skaggs hits such as "Highway 40 Blues" and "Don't Get Above Your Raising," others began to believe him. Brent Maher followed Skaggs' lead in recording The Judds, and acoustic guitars once again got the dB respect afforded electric instruments in Nashville mixes.

"My whole desire when I left Emmy's band was to try to bring the mandolin, the banjo, the fiddle and the acoustic guitars up loud, to mix them in the track as loud as the electric guitar or piano," he says. "Why put an acoustic guitar in a track if the only thing you hear is from 6k up? I didn't care that much for the jing-a-ling. In the early days, I would play the acoustic live when the track was going down, and then I'd do overdubs and double it, and split them in the mix at 2 o'clock and 8 o'clock. It made it beefier and gave it a nice sheen."

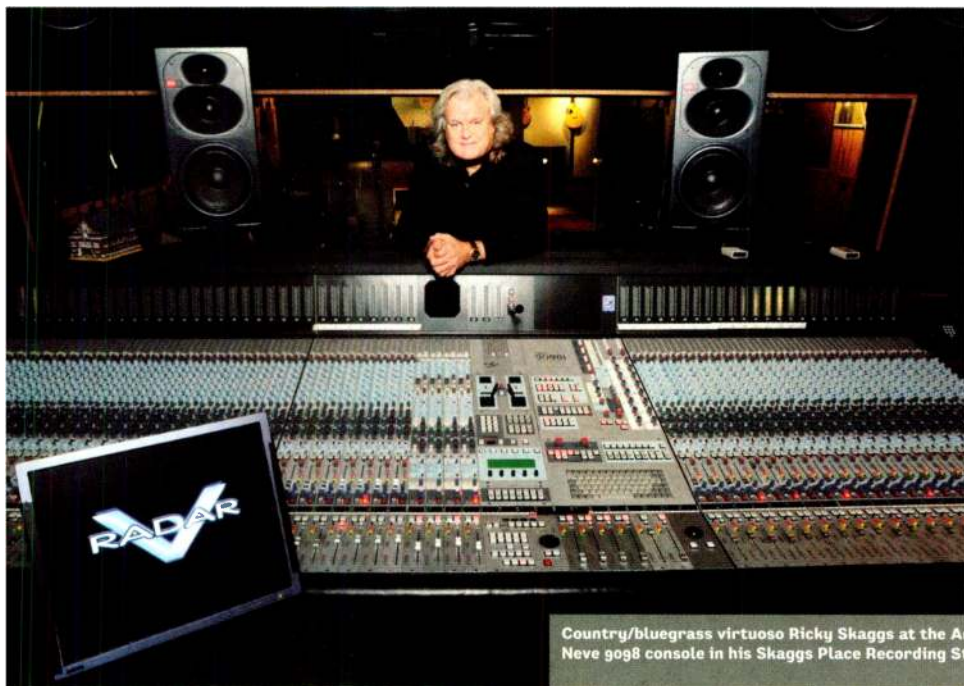
These days, Skaggs is apt to stereo-mike an acoustic guitar, and then overdub another stereo-miked guitar in another position. "I'll be in G on one guitar, and then I'll double it in the E position, capo'd three frets up for the next guitar," he says. "You'll have all those notes meshing together in a different position."

Skaggs Place has a large enough tracking room for ensembles to play together at once, with dense foam baffles to help with separation. The tracking room also has a 9-foot Yamaha piano once used by Elton John, who autographed it, and added the inscription, "This is a great piano."

"We have an Amek/Neve console, and the mic pre's sound killer," Skaggs says. "Recording our tracks, we use a lot of old Class-A Neve pre's and EQ, and we go right straight through to RADAR. I love recording on RADAR 96 because I think that's as close to analog as you get in the digital world."

Skaggs Place clients have included Dolly Parton, Rob Ickes, Cheryholmes, The Whites and many other luminaries of the acoustic music world. At the studio, there's a poster of Skaggs as a boy. "It's me in front of an RCA ribbon mic in Ashland, Kentucky," he says, though it's not the mic that he covets. His wish list has moved toward the practical. "It says 'Little Ricky Lee Skaggs, World's Youngest Mandolin Player,' and the mic is on this big boom stand that I wish to God I had in my studio." ■

Peter Cooper can be reached at peter@petercoopermusic.com.



Country/bluegrass virtuoso Ricky Skaggs at the Amek/Neve 9098 console in his Skaggs Place Recording Studio.

winding down, and he decided to return to his bluegrass roots. With that shift, he determined that there was no need for him to be on Music Row in Nashville, and he began looking for studio space outside of town that would afford him some privacy, creativity and sonic viability. He purchased Acorn Recorders from the Oak Ridge Boys, and hired Tommy McCormick's Straight Arrow Development to renovate the place, raising the ceiling and making other changes.

"It's one of the best-sounding studios around now," says Skaggs, who has won multiple Grammy Awards for works recorded at Skaggs Place, and who recently used his studio to record the uncluttered *Solo: Songs My Dad Loved*, an album that finds Skaggs playing and singing with sparse acoustic instrumentation.

"With this record, because it was so small, I didn't have to stuff 20 pounds of music into a 10-pound sack," he says. "I could stuff

NEW YORK Metro

by David Weiss

Musicians need extra inspiration today, and not just when they're playing their instruments. In New York City, where overhead is high and the competition intense, creativity must play out as strongly in the business realm as it does in the recorded one.

David Fraser and Neil Goldberg founded Heavy Melody (www.heavymelodymusic.com) to be a distinctive audio-for-picture house. After six-and-a-half years in business, they have a solid track record of music/sound design/dialog production for trailers, TV, videogames, mobile apps and artists (Volkswagen, Campbell's, *Bioshock II*, *The Chronicles of Riddick*, Grand Master Flash, Damage Vault). But having a diverse reel isn't necessarily enough anymore.

"Our approach now is to create different ways to produce revenue streams, ones that weren't previously around for a typical music house in New York City," Fraser says. "I know a lot of struggling composers with previously flourishing companies, and now the ad revenue is gone. People have to fight over a diaper commercial."

"We're changing how things are done so that we're more agile in an increasingly competitive industry. To be succinct, there are no rules in this industry anymore. What I mean is that

loops for Evolve. In addition to recording in their well-equipped studios in the Fashion District, Fraser, Goldberg and composers Ari Winters and Mark Kauffman would go out with field recorders to capture real-world industrial and natural sounds. A more intuitive system of mapping within the Native Instruments Kontakt interface was laid out, as well.

"We were developing it over several years," explains Goldberg. "We were making this instrument with every spare second we had, in between working on our composing—but you don't get money until it's out there, so it's a gamble. In the end, we had to devote hard-core time to complete the instrument because we were the guinea pigs for our own product. We knew that this virtual instrument would work because it was working for us."

With available GUIs out there like Kontakt, the onus is off

developers who don't want to worry about creating a whole new playing interface along with their sounds, let alone being responsible for the inevitable OS updates. "NI will license their sample engine to play back your samples, whether it's a beat slice or a melody. You have to put your content into it, and then you can customize quite deeply. Ari really delved into the project and figured out the scripting."

Evolve went to market in 2008, and so far seems to have been getting a warm



The main live room at Heavy Melody



The Heavy Melody/Heavyocity team in Studio A, L-R: Dave Fraser, Neil Goldberg, Mark Kaufman and Ari Winters

if you're a musician today, you have a good idea, and you're really ambitious, then use technology and work hard, no one can stop you from developing it."

Fraser and Goldberg's determination to do something new resulted in the creation of a composing/sound design-oriented virtual instrument named Evolve, and a sister company, Heavyocity (www.heavycity.com), to manage, distribute and promote it. "In one sentence, Evolve is a virtual instrument that inspires creativity and streamlines productivity," says Goldberg. "It has very modern melodic elements for film, TV, videogames. 'Music meets sound design' is a phrase we like to use. It's not traditional; it's fresh and exciting."

"We developed Evolve because we weren't that satisfied by some products on the market and we thought we could do it better," Fraser says. "Launching Heavyocity gave us new opportunities, and both companies have fed one another equally."

Believing that they could design a virtual instrument that would have superior sonic elements and workflow for scoring to picture, the pair began burning the midnight oil to produce new samples and

reception from composers and sound designers, with brisk sales leading to the 2009 release of a follow-up instrument, Evolve Mutations. "If anyone is interested in doing this kind of thing," Fraser says, "you need something unique—something that people who create music will be interested in. There are lots of VSTs out there, and with the Internet you can download something from the Netherlands, and be using it 15 minutes later. It's a global marketplace. So it's really about the idea, initially."

A lot of important new business skills needed to be developed alongside of the concept. Notes Goldberg, "We had to learn about a lot of things: making a retail product, marketing it, the day-to-day accounting, getting distributors as far away as India and Japan, getting visibility for it—all those factors. Those are not the fun part of it for musicians. But that was the reality. Once we launched this thing, it was time to let Frankenstein out of the cage and guide him appropriately."

With a musical instrument company now firmly integrated into their music production practice, the Heavy guys can see how all of their beasts are feeding each other.

"We used the head we made for Heavyocity to think about Heavy Melody," Fraser says. "Sound designs and compositions are a product; how do you market it? There are a lot of similarities: getting yourself out there, meeting people, spending every moment you have trying to make new connections and networking. It works really well for both companies." ■

Send news for "Metro" to david@dwords.com.

Hit Records are Mixed Analog

Allen Sides explains why he mixes to the DV-RA1000HD



Want the major-label sound? "The majority of hits are not mixed in the box," says Grammy award-winning producer/engineer Allen Sides. "Probably 85% of the high-end albums that come out, all of those mixes are done analog."

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Read the entire Allen Sides interview, including his thoughts on affordable analog mixing and CD copies, at www.tascam.com/dvra1000hd.

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Tool Meets the AKG C 1000

THE BIRTH OF A NEW VOCAL MIC?

■ How many times have we set up a fire hazard of Mexican prayer candles and tapestries to give an anxious vocalist just the right “vibe” to spit out a decent vocal performance? Making the singer as comfortable (or as uncomfortable) as possible in the studio is one of the secrets to getting a great vocal take. As much as I love them all, singers are often overly sensitive characters that need to be coddled. Forget the fact that we are going to comp the hell out of them later and tweak them with a dozen digital processors and tuners, you still have to treat those singers like an important part of the project—I mean *the* most important part. Ahem.

The recording studio can often be intimidating to a singer,

“This mic’s not generally meant to be handheld, but after wrapping it in foam and duct tape to reduce the handling noise, it performed surprisingly well.”

so occasionally it’s necessary to try techniques and equipment not traditionally used for vocal recording—just to stop the singer from feeling self-conscious. That’s where the AKG C 1000 microphone came in on the Tool sessions. It was not my first choice. It was not even on the list of choices because I had never used it for vocals—ever.

I was looking for the sound of a Neumann U67 on Maynard James Keenan’s voice, but because the little troll squats and shouts into the floor when he sings, it was difficult to suspend a Neumann U67 in the right position for a vocal take.

We tried it, spending several hours adjusting the mic so it was a foot off the floor facing upward to capture Maynard’s verbal regurgitation. But ultimately it failed. This was 1993, and I’d seen

The AKG C 1000 condenser, with duct tape resin, is still in use at RadioStar Studios.



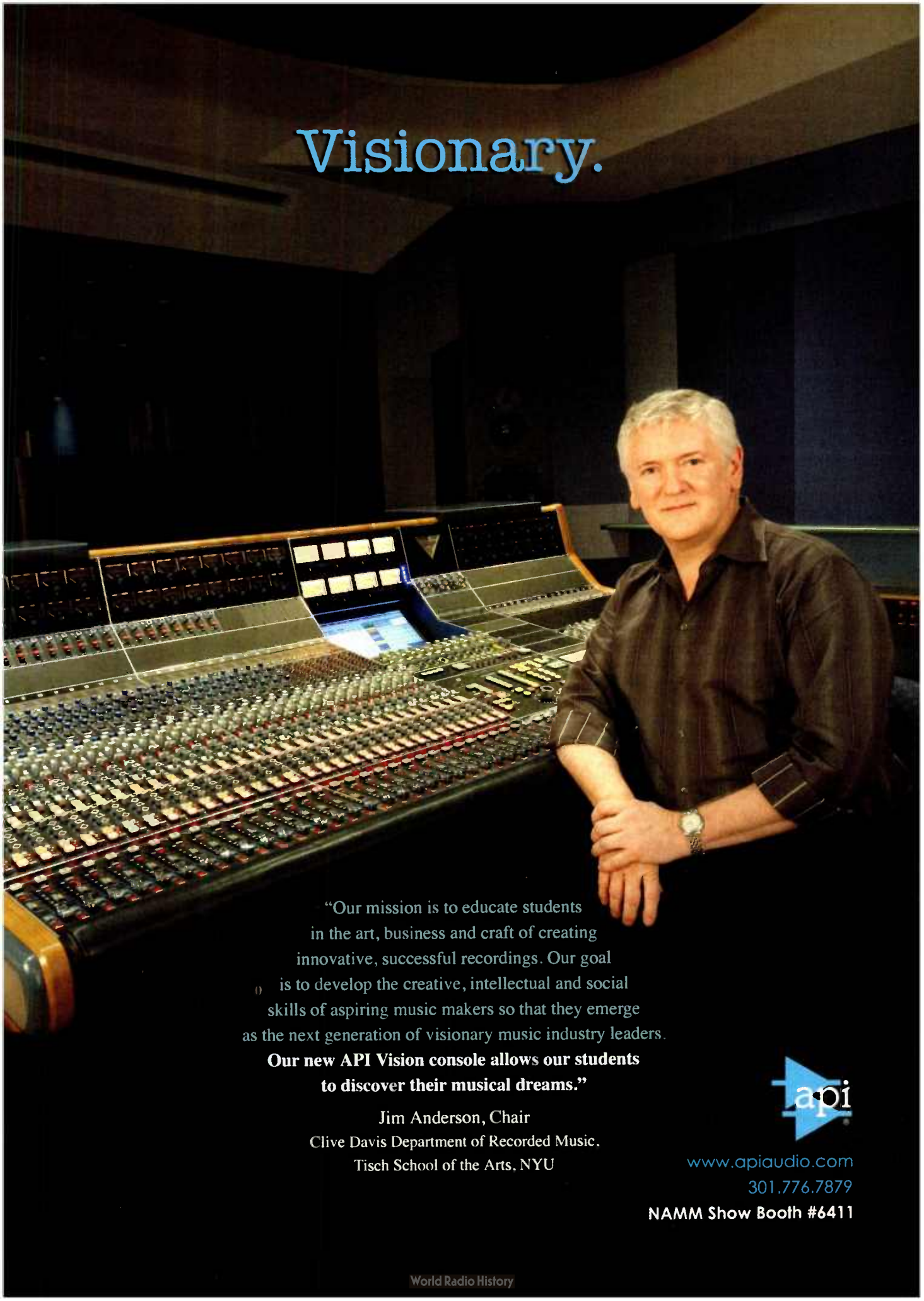
The vocal sessions for *Undertow* were all about making singer Maynard James Keenan comfortable—and uncomfortable—in the studio. He ended up on an AKG C 1000 condenser, not a typical vocal choice.

Tool play in local clubs many times. It was obvious that these first studio vocal takes lacked the fire of Maynard’s stage performances, so we looked for other options to harness that intense stage energy. I knew we needed to use a handheld but felt cheated that I couldn’t use the most expensive mic in Grandmaster Studio’s arsenal for the task (which was the U67 at the time). I wanted quality vocals that were crystal-clear. I wanted the listener to experience every ounce of pain this singer could deliver.

The handheld dynamic mics we tried seemed dull and unwieldy, but Maynard immediately sang better into them. The C 1000 was actually Maynard’s suggestion. This mic’s not generally meant to be handheld, but after wrapping it in foam and duct tape to reduce the handling noise, it performed surprisingly well on his vocals. Because it was a condenser, it retained most of the sparkle of the U67 and Maynard could grab it in his fist and smack the mic around. Ultimately, the C 1000 was the workhorse on the sessions, but we did use the Neumann U67 for the more intimate passages with a UREI 1176 compressor cranked way up to expose all the little details in Maynard’s voice.

Tool’s *Undertow* album is filled with blood-vessel-popping screams, like on the song “Crawl Away.” I had heard them in

Visionary.



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rehearsals, I heard them onstage. But in the studio, Maynard's screams were lackluster, even with the perfect complement of the C 1000. After several attempts at one of those 10-second screams without a good take, and with his voice obviously wearing thin, I finally asked him to go outside and run around the block five times. This would make him furious, but after doing it he nailed those screams. He was pissed and you could hear it in his voice. The lesson here? Sometimes it's necessary to make the singer as *un-comfortable* as possible to get the right performance!

Handheld condenser mics were mainly developed for live performance applications, yet they are fantastic additions to a recording studio's collection. Today, there are many options for crystal-clear vocal recording with handheld condensers. I am most impressed with Audio-Technica's AE3300, the handheld version of its AT4033, a popular mid-priced vocal mic in many commercial studios. The AE3300 has an extra level of warmth on a male vocal and it adds a measure of depth on a female vocal without sacrificing the clean top of

a good studio condenser.

AKG also currently has two excellent handheld condensers, the C5 and the D5. And although not really meant to be handheld, AKG's C 1000 is a good, relatively inexpensive condenser that's powered by a 9-volt battery with an on/off switch. The main complaint about it is the mic battery always seems to be dead because someone always leaves the switch on. Hmpf! Luckily, it runs on phantom power, too. I've heard how well a pair of these C 1000s do as overhead mics on drums, especially when the drummer is hi-hat- and cymbal-happy, because they are a little bit darker than other condensers. They also do well on acoustic guitars, in pairs or solo.

My AKG C 1000 is still as decent as ever today, even with all the scars and war wounds from its intense studio history. It wasn't my first choice, but it is vastly more important to

give the singer what he needs to give you that blistering vocal performance. III

Sylvia Massy is the unconventional producer and engineer of artists including Tool, System of a Down, Johnny Cash, Red Hot Chili Peppers, Tom Petty and Prince. She is a member of the NARAS P&E Wing Steering Committee and Advisory Boards, and is a resident producer at RadioStar Studios in Weed, Calif.



The author at Grandmaster Studio in Los Angeles tracking Tool's *Undertow* sessions



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'Avatar'

by Blair Jackson

JAMES CAMERON AND AUDIO TEAM CREATE A NEW WORLD OF FUTURISTIC SOUNDS

If you've seen James Cameron's epic 3-D film, *Avatar*, or even just the trailers and commercials, you know that the director has gone to incredible lengths to create a visually and aurally sumptuous adventure set in a fantasy world unlike any that we have ever seen before. There are bizarre creatures, fierce and friendly, that walk the planet Pandora or soar its skies. There are futuristic machines and aircraft straight out of Cameron's vivid imagination. And then there is the Na'vi, a peaceful race of tall, blue-skinned, long-tailed, humanoid tree dwellers who have their own customs and language and are now being threatened by an incursion to Pandora by people from Earth bent on exploiting the planet's valuable natural resources. It's a rich and very complex story I won't recount here, but suffice it to say, it involved incredible feats of technical wizardry to bring it realistically to the screen, including improved motion-capture technology, next-gen visual FX supplied by the best digital artists, and newly designed 3-D cameras that allowed Cameron to see approximations of the story's virtual world in the camera as the film was shot. No wonder it took three years to make.

Not surprisingly, *Avatar* also required tremendous imagination and dedication from Cameron's sound crew, which was spearheaded by supervising sound editor/sound designer/re-recording mixer Christopher Boyes (pictured on this month's cover), who earned his first sound Oscar for Cameron's *Titanic* in 1998, and subsequent trophies for *Pearl Harbor* (2001), *The Lord of the Rings: The Return of the King* (2003) and *King Kong* (2005). He's also had five other nominations, the latest last year for *Iron Man*. In fact, when I caught up with Boyes in early December, he'd just started work on the sequel to *Iron Man* down at Fox in L.A.—this after a mere one-day break following the nearly 80-day final mix on *Avatar* (also at Fox).

Avatar was not your typical film where the "post" crew gets heavily involved once principal photography has been completed. Rather, Cameron brought in Boyes, who in turn called on sound editor Addison Teague to start working on sound design from the beginning of the shoot. "When Jim and I sat down in the summer of '06," Boyes recounts, "he said, 'This is what I want to do: I'm going to shoot, then I'm going to go in and edit, and while I edit I want

to be cutting sound effects that you've made, and then I'm going to go back to shooting'; and back and forth like that. And true to form, that's exactly what he did. What we didn't expect him to do was *keep* shooting as long as he did, but then all these big films tend to do that so it wasn't exactly surprising."



Teague, who shares a supervising sound editor credit on the film with Boyes and dialog specialist Gwen Whittle, says, "Jim wanted to have a sound editor working in the picture department [during editing], and I had done that before for Chris on the first *Pirates of the Caribbean* film. *Avatar* was going to be a multi-year commitment and involve relocating from Skywalker Sound to L.A. to work alongside Jim. It was quite a commitment for a sound editor, but seemed like an amazing challenge and experience so I jumped at it.

"In a way, working like that is a dream job for a sound editor," he continues. "You want to be involved as early as possible because oftentimes as sound editors, we're fighting what a director and a picture editor have been listening to for months, and in some cases, years [as crude temp FX], and you want to get your own fingerprint on it. So for us, this was perfect. There were so many creative sound possibilities, and we were able to get in right from the beginning and work with Jim and try to get our ideas in there right away. But it also provided some interesting challenges, because since we were doing it as we went, the turnaround on these sound effects requests was actually much faster than it would be in a traditional sound



Opposite page: the Na'vi people of Pandora. Above: Banshees and copters required two radically different forms of sound design. At left: director James Cameron and actress Sigourney Weaver.

recordings of everything from birds and other animals to dinosaurs Boyes had helped create as an assistant under Gary Rydstrom for *Jurassic Park* in the early '90s. The base sounds of another intriguing animal, the Viperwolf, came from recordings of hyenas at a university research center in Berkeley, Calif., made by Boyes' assistant, Dee Selby; coyotes that Teague recorded outside his home in Southern California over the course of

schedule because we would need to provide something almost immediately for some scene he was shooting.

"Jim wanted the sound and picture editing always moving forward together so he could make creative choices that traditionally might be left for post-production at any point in the process. There was never a clear production and post phase on this movie; one was always informing the other. So his goal was to never have to start over building what he'd already worked out, but rather do it for real as he went—so a decision that he might make in 2007 was done and in place for the final mix two years later. Obviously there were changes along the way, but he really did keep some things that long."

Boyes recalls that the first design work he did on the film—based on memory of the script at that point—was on two of the flying creatures that inhabit Pandora: Banshees are similar to pterodactyls (and have a special function in the story because Na'vi warriors can psychically bond with the creatures and then ride them through the air), and the Leonopteryx is a bird-like sub-species of the Banshees. As is usually the case with creating vocalizations for mythic creatures, sound design usually involved combining original and library

about a month; and a little bit of sound library snake hisses thrown in for good measure. Boyes also cites editors Ken Fischer and Shannon Mills as being critical members of the FX team.

Unlike many modern sound designers who do their work exclusively in a Pro Tools environment, Boyes uses that platform ("I have pretty much every plug-in Pro Tools can accommodate," he says with a laugh) but relies *more* on an old favorite: the Synclavier. "I guess I wouldn't suggest using the Synclavier to a young sound designer coming up, but for me it's like a tool that's an extended part of me. I know how to work with it, and it's a very fast machine for me to do certain types of things with; specifically, blending or layering different sounds and finding what pitch of one sound will complement the pitch of another sound—right now. In my opinion, no platform has ever been able to emulate what a Synclavier does with the equivalent kind of dexterity. I've got one here with me at Fox that I brought down, and I also have one at Skywalker [where he often works]."

Teague says, "Chris and I figured out pretty quickly that our best approach was to provide Jim with lots of alternatives, some of which even went in radically different directions. I'd give him a

bunch of sounds, and he might come back and say, 'This sound is wrong for the Thanator, but it might work for the Hammerhead.' Or, 'This one's too big for the Viperwolf, but could be good for the Thanator.' So he would mix and match from this palette of sounds. He might file something away in his head that he felt was not an appropriate sound for what I pulled it for, but a year later when he edited a different scene, all of a sudden that sound would show up, used for something else. This process helped Chris and me get into his head and figure out what he was after, because [Cameron] was so busy he didn't have time to sit down and talk with us in detail about sounds early in this phase. The ultimate spotting for us would be listening back to what he cut."

Cameron is a notoriously hands-on director

synergy of this process he outlined to us," Teague continues, "was on this sequence called 'hometree destruction,' in which the Na'vi's home [in a skyscraper-sized tree] is destroyed and falls down."

"Within that scene, there are two different types of explosives," Boyes adds. "The initial explosives are meant to get the Na'vi to leave, and they catch the base of the tree on fire. They're like these big whooshing explosions. But then there are the much bigger H.E.—high-efficiency—explosives, which were a challenge because they needed to detonate with a furious attack but then have a sort of sonic wash that goes over you. You get this very percussive attack—this impact I made by picking elements of some of my favorite explosions and then truncating very transient elements of them on the keyboard in the Synclavier

but basically took his tracks straight to the premix, and that's the backbone of the final track."

Those are just a few of the *hundreds* of sounds Boyes and Teague were tasked to create for *Avatar*. We haven't even mentioned the heavily technological world that comes with the invading Earthlings—from a couple of different kinds of futuristic helicopters (which drew upon Boyes' extensive collection of helicopter recordings) to a shuttle-rocket (another Boyes specialty, having worked on *Space Cowboys*, *Titan A.E.*, *Armageddon* and *Iron Man*) to the giant robotic AMP Suits the humans sometimes don to do battle (the sounds of which began with recordings of various machine servos blended with other metal and mechanical sounds).

Most of the early work on the film was done



Michelle Rodriguez in James Cameron's *Avatar*

who is ready, willing and able to handle just about any technical task himself—from film editing to color timing to sound design. "He would take the elements we gave him and make his own choices and mix it himself," Teague says. "Then, we would take scenes back, study what Jim did with them and build from there. A successful soundtrack to Jim is all about clarity and dynamics, so he could cut a very simple track, if you will, but it's *exactly* what he wants to hear and nothing that he doesn't want to hear, and that was a great blueprint. Then it was our job, as sound people, to fill in the gaps with details that he wouldn't necessarily cut, with the challenge of never stepping on the beautiful simplicity he created with 16 Avid tracks.

"There was one Monday morning I walked in and the picture assistants told me he had been in his cutting room until midnight on Sunday cutting Foley footsteps—that's when I realized how detail-oriented this guy is. That would be crazy for a picture editor to be doing, much less the director. But that's Jim.

"Where we hit the perfect moment of the

and then playing it as a sharp attack and a quick decay. It's very effective in the film."

For the gargantuan falling tree, the duo employed a combination of recordings Boyes has made through the years of trees being cut down in his native Marin County, all sorts of wood-related sounds he'd captured for other films, and some new recordings Teague obtained "from a eucalyptus tree that had fallen down outside Jim's house," he says. "I climbed underneath it and twisted roots around and got great dirt recordings and collected a number of sounds I was able to bring back and manipulate [in Pro Tools] and make bigger.

"So we create this palette of sounds for Jim and now he can go at it. He finished his picture edit with temp music and literally stayed up all night cutting his pass on the sound effects. He was headed for bed as I walked in to start my day. I listened to it and he did such a great job cutting! I'm not going to fight that. He loved our sounds and he did a great job orchestrating them, so I cleaned it up, added some elements to fill it out,

in Malibu at the director's work space, but at a certain point, some of the more traditional post sound work shifted to Skywalker Sound in West Marin—the usual home base for Boyes and Teague, and a number of the other sound personnel who ended up working on the film. Skywalker's Gwen Whittle, for example, supervised the dialog, from cleaning up the production tracks as necessary to shepherding the ADR, which was mostly recorded by Doc Kane over at Disney, but also, over the course of the long production, required sessions at Todd-AO, Fox and smaller studios in San Diego and Shreveport, La.

"Jim's not afraid of ADR at all," Whittle says. "He's very aware of how powerful a tool it can be. But he also has the issue that he's been working on this film for five years, so the guide track is sort of embedded in his head. I don't care how good you are at ADR, you get used to hearing the production track and you know the tiniest nuances of it, so sometimes directors are reluctant to do ADR. But Jim is good about saying, 'Well, I am used to hearing that, but this [ADR version] is a

lot better,' so he's willing to go with the best that's there."

Whittle says the production sound—which was captured by several different recordists—was mostly quite good, though she was vexed by some of the material that came from the La Playa shoot: "The set was plywood, and a lot of time they're running around and I guarantee you, Pandora, their planet, is *not* made of plywood. So that was an issue. [Laughs] Also, [the actors] have their virtual suits with the [motion-capture] dots on them and headgear for their microphones and sometimes there would be some crunchy sounds that came with their movements."

Another unexpected challenge for Whittle was dealing with dialog and ADR in the Na'vi language. "At first, I thought, well, if we have to do any ADR or loop group stuff around it, it will be pretty easy because as opposed to some kind of Urdu or Pashto or other languages we've had to do in the past, where people actually speak it so you have to be really precise with it—which is difficult when it's not your own language—I thought this might be a lot looser because nobody speaks Na'vi. But no, I was totally wrong. They were *completely* precise about it. Carla Meyer, the accent coach, worked with me—she worked closely with Paul Frommer, who invented the language, who is a Ph.D. from USC. He actually developed the language from various Indonesian and African languages—it has some of the clicks and mouth sounds that a lot of South African tribes speak. There are also no 'p's and no 'th's; things like that. So when we had the loop group in, we had to make sure they didn't say those sounds. It was quite strange. But it was also fun, and I even picked up a little of it myself."

Because *Avatar* was such an enormous sound job, the decision was made to have separate re-recording mixers handling music and dialog for the final mix—tasks that are often combined into one job. For the dialog mix, Cameron went back to another veteran of countless Skywalker sessions: Gary Summers, who won Oscars for his work on two previous Cameron films, *Terminator 2* and *Titanic*. "Jim wanted the dialog to be straight-up front and center," Whittle says. "Sometimes Cameron wanted Gary to raise stuff a little more than our instincts would have told us to raise it, but he wanted to make sure that for that bad theater in Topeka, Kansas, that you could still hear the dialog at all times. He actually said, 'What if the right speaker goes out and then they can't hear it? So pan it a little more to the center.' He was very clear that the dialog had to be heard at all times. He's a storyteller, and that's important to him."

Andy Nelson—a 13-time Oscar nominee

and one-time winner (for *Saving Private Ryan*)—was charged with doing the re-recording mix on James Horner's big score, which included both traditional orchestral music and smaller-scaled, more tribal elements. Years before the final, Cameron built a temp music track primarily from previous Horner film scores (as well as some from other composers) to get the feeling he wanted for a given scene. "Then, when James started writing properly," Nelson explains, "he would bring in synth mock-up versions of what he thought he wanted to do on a particular scene. Bit by bit they would be incorporated into the scenes, and then

once Jim was happy with them, they would get the go-ahead to start orchestrating them."

Simon Rhodes, who did the music recording, supplied Nelson with premixed 5.1 stems of percussion, orchestra, synths, vocals and more: "Most of the time I was working with nine or 10 5.1 stems of music for every single cue. And the beauty of that is it gave me and Jim Cameron complete flexibility to sit the drums out front, or maybe where there were certain action scenes, the drums were starting to tangle up with some other things, so we could pull them back a bit and

Continued on page 86

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TOURING ENGINEERS REVEAL THEIR MUST-HAVE GEAR

by Steve La Cerra

Whether it's because of the state of the economy in general or a struggling music industry in particular, more tours are carrying less gear. Reduced trucking and airline baggage expenses are just a few of the reasons why touring engineers are relying on house-provided equipment. Factor in the success and popularity of festival circuits for both the bands and the concertgoers, and it's easy to see why this has become a rising trend in the concert industry.

What would you do if you were about to embark on this type of tour and could only carry one audio toy with you? What item would make your mixing duties easy if you had it, or difficult if you did not? *Mix* asked several live sound engineers for their answer to the "Desert Island Gear" question.

Essential Mics

Engineer Noel Ford, whose duties include mixing front of house for Dinosaur Jr., says that when he is out with that particular band, he is typically working in good venues and is "comfortable with the processing that the house has to offer. I do like to have certain mics though," he says. "J Mascis [singer/guitarist] uses a lot of vintage gear, including Marshall and Hiwatt heads, and lots of old effect pedals. This can result in J getting shocks from his microphone, but with a Shure SM57 he won't ever get a shock, so I always make sure to have a Shure SM57 for him [laughs]. We have tried wireless systems as well as some other solutions, but the SM57 has proven to be the

workhorse. Sometimes the simplest things are exactly what you need.

"After a lot of experimentation," he continues, "I have found that I can get a nice warm sound from J's guitar rig using a combination of Sennheiser e906s and e609s. I have tried many vocal microphones for Lou [Barlow, bassist], but the Beyer M88 suits his voice and I get more clarity from that mic than any other. It works for Lou in his monitors, as well. I carry a Sennheiser e901 for inside kick—the e901 is awesome when you have a closed front head—and an Audix D6 for outside kick. I am a big fan of the D6 because I can get that little bit of top that helps it cut through the mix, as well as a solid low end. I'm just not happy if I don't have a D6!"

Ford is also using the SM57 on hi-hat, saying that the band's stage setup is very tight and he can get a lot of bleed from the bass amp into the hi-hat mic. "The bleed is less ferocious with the 57 than it would be with a condenser micro-

phone. Using the same mics in different rooms provides a nice basic reference point."

Over a period of more than 35 years, Bob "Nitebob" Czaykowski has worked with artists ranging from Aerosmith, KISS, Ted Nugent and Ace Frehley to Hanoi Rocks and most recently Madeleine Peyroux, New York Dolls and Steely Dan. Nitebob agrees that having the right mic for the lead vocalist is paramount: "I consider that to be the most important element of a live show," says Czaykowski. "Be it a Neumann, Sennheiser, Shure or something else, I want a mic that has not been overused or damaged. I find more damaged vocal mics than anything else; kick drum mics come a close second. Madeleine prefers the [Neumann] KMS 104 because she feels it suits her voice, and it works for me. David Johansen [formerly of New York Dolls] uses the Beta 58 because it complements his voice and works well when he plays harmonica."

While Czaykowski is particular in his mic





Frank Marchand III carries a Phonic PAA3 to get a feel for what the room is doing and be able to make adjustments.

selections, he's not as picky about certain pieces of outboard gear, noting that most modern digital desks have the comps, gates and effects he requires. "Though if I am in a situation where I can spec the tour, I'd like a mixing desk that suits the needs of the act—maybe a Digidesign with a Waves [plug-in] package or a well-maintained Midas, etc."

Frank Marchand III, whose credits include Calexico and Bob Mould, says, "The thing that single-handedly has solved more problems for me than anything else has been showing up with my own microphones. I have a bag of 15 or 20 mics that I drag out, mics that I know that will generally work in all situations and aren't horribly expensive, so if the bag gets stolen or something breaks, I am not heartbroken. Having a few SM58s that are in good shape that I know work all the time helps me evaluate the monitor response relative to what I expect from the sound of those microphones. I have been in some clubs where you look at the microphone and it has rust on the grille. Why would I put someone in a position that they need to have a tetanus shot just to go sing on that thing? If all of a sudden you lose a channel or something goes wrong with a line, you can eliminate one variable in the chain. Even if we are on a festival circuit, I'll replace the vocal mics with mine because the artist will know that they are singing on the same mic every night—which brings consistency to the monitor mix."

When I ask Jacob Feinberg (currently on tour mixing FOH with Monsters of Folk) about his "go-to" gear, he laughs and quips, "There are a lot of *one* things I'd like to have. If I could only carry one thing, it'd be the vocal mic, probably a Sennheiser e 935. I have a long-standing history with many of the artists I work with, and

I've been able to introduce that mic to them early on so they are familiar with it. If they don't like it, then I'll use whatever they want, because ultimately they have to be comfortable onstage with the sound they are getting back. Having said that, most of the artists I work with have embraced the e 935 because the mic speaks for itself when I get it in front of them. It has a ton of gain and a lot of presence and articulation, which is important when you are working with a singer/songwriter. It's also very tight in the low-mids so I don't need much EQ.

"When I work with Gillian Welch," he continues, "we have five microphone inputs. They have been using 58s and 57s for a decade now, and I've never recommended anything else. We carry the mics, they are comfortable with them and that's their sound. It is a different scenario from other artists I mix. On this tour, Jim James from My Morning Jacket has gone through a lot of vocal mics. He is not someone I normally mix and he had been using other mics. I put up the e 935 and asked him to give it a shot. If everyone is consistent [i.e., if all the vocal mics are the same], I think it's easier to dial in the monitors. He loved it and it has not been an issue since."

Working With House Racks and Stacks

All of the engineers we spoke with agree that their choices of prime-time gear depend upon the type of tour. Feinberg says that if he has a "bit of luxury, if I am carrying a console—which

I try to do as often as possible—I like to have a Dolby Lake Processor to drive the system and a tablet PC with a wireless router to run it. If I have that, I can walk the room and make adjustments. Even if I am using it only for the EQ and not crossover, I can go into any room and no matter what the P.A., I have the flexibility to turn anything I get into being usable. If the venue has a faulty crossover or a noisy house EQ, I can take it out of line and go straight into the Dolby Processor, adjust EQ and create crossover points if needed. If I am not carrying a console, having a DLP doesn't make much sense because I can't take advantage, and the consistency doesn't matter as much. If I'm working on the house console, I'm pulling my mix out of nowhere anyway, so to a certain degree the [house] zero is equivalent to anything I might create. Most of the time, I'll go from the Dolby Lake Processor right into the house crossover and I'll run subs off an aux. If the house system is not set up to drive a sub from an aux [send from the console], I might have to create that crossover and that output, and go directly to their amps."

Adam Robinson (whose recent tours include They Might Be Giants, Plain White T's, Duncan Sheik and Mike Snow) concurs with Feinberg, adding, "I've used all of the Lake processors: the Dolby Lake, Lake Contour, Lake Mesa. If I'm on a tour and I don't need all the I/O, the Lake Mesa is a great EQ unit. I've come across a lot of ailing systems, and having powerful EQ has always been helpful. On tours where I've had a 4x12 DLP, I've used it as a full system crossover in place of older or analog units [where venues have agreed to let us] and not just using the EQ functions.

"At times, I'd go into places that have no idea what the processor truly is and they'd put up a bit of a challenge when I asked to hook it up to their system," Robinson continues. "A bit of talking usually convinced them and then I'd show



Jacob Feinberg on the Sennheiser e 935: "I have a long-standing history with many of the artists I work with, and I've been able to introduce that mic to them early on so they are familiar with it."



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Noel Ford: "We always take a Korg KP2 KAOSS pad because [band Boris] has some very specific vocal effects that they use during the show."



PHOTO: BRIAN L. SCHWARTZ

"What I do travel with," he continues, "is a Phonic PAA3 handheld analyzer. The PAA3's mic is attached so it gives me the ability to take it into the crowd. I'll put it into spectrum analysis mode and walk the venue. Most venues have weird room modes or comb filtering, and even 20 feet away from the mix position you

them why with my show. For instance, Duncan Sheik's tour melded his pop catalog with his successful Broadway catalog. It wasn't your typical rock show where you just put up a band and go. I had nine musicians onstage including a mini-orchestra. Having some powerful EQ was necessary not only to tame less-than-stellar systems, but also to keep feedback in check.

"I even would run a loop from the stage to FOH and EQ Duncan's wedge mix [run by house-provided engineers] from the Lake. The combination of the Neumann [KMS 104] vocal mic—along with him liking wedges that can really get loud when he does—gave us a very unique challenge. Ninety-nine percent of the systems we came across have traditional 31-band graphic EQs. I find that more often than not, EQ problems do not exist exactly on 1/3-octave divisions. Additionally, when needing to make a single cut that might be an octave wide, the Lake—like any parametric EQ—makes only one cut, where your run-of-the-mill graphic requires cutting multiple frequencies, messing further with the phase response and rarely resulting in an even octave-wide curve. EQ'ing out feedback points on a standard graphic resulted in us just completely killing his mix. With the Lake, we were able to zero in on problem areas and not affect anything that wasn't a problem in the first place."

The Festival Circuit

Marchand has found that sometimes *traveling* with gear does not necessarily mean that one is able to use that gear: "When you're on the festival or summertime circuit, you don't have a lot of time for setup. Your priorities shift due to the time allotted and it becomes forensic audio: more about what you are correcting, not what you are connecting. It'd be nice to have a rack full of processing, but you need the *time* to be able to connect it.

might have no idea what people are hearing. I'll look at the screen and see if there's a bump or notch in the frequency response. I also use it as an SPL meter because I want to see what the bottom octave is doing. I want a big presence but I am not going to wipe out the crowd and walk away with my ears ringing. I am very conscious of watching the crowd during the show to see how people are reacting. That's my indication that I am getting it right. I always mix a little different where I stand relative to the crowd because they have expectations of how the artist should sound and I try to hit that mark."

Ford's go-to gear "depends upon the band I am mixing. I also work for a Japanese heavy psych band called Boris. We always take a Korg KP2 KAOSS pad because they have some very specific vocal effects that they use during the show. We use the KAOSS for vocoder, reverse delay and the reverbs. The reverbs are gritty-sounding and are very cool. I use them on all of the singers at some point or another during the show. There's also a nice dub echo preset that I'll use on the drums on a couple of songs. I run an aux send out of the console into the KAOSS, return the KAOSS output to a channel and then dial it in. I have one and the band has one in Japan, so between us we always have a KAOSS pad. It really makes a huge difference in their sound and it's fun to work with."

Marchand adds one final comment of which all touring engineers are painfully aware: "After doing this for so long, the less I have to schlep to the airport, the less baggage I have to pay for, the less money flies out of my pocket! Oh, yeah, and I always bring Sharpies and marking tape!" Amen. III

In addition to being Mix's sound reinforcement editor, Steve "Woody" La Cerra is the tour manager and front-of-house engineer for Blue Öyster Cult.

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Staging Green Day's 'American Idiot'

PUNK ROCKS BERKELEY REP

by Sarah Benzuly

PHOTO: COURTESY KEVINBERNI.COM



PHOTO: COURTESY MELLOPIX.COM



Clockwise, from top left: Tony Award-winner John Gallagher Jr. stars as Johnny. Johnny and St. Jimmy begin their "drug-induced" friendship. Tunny decides to join the Army.

“Don’t

wanna be an American idiot/Don’t want a nation under the new media/And can you hear the sound of hysteria?/The subliminal mind-f*** America.”

So begins the song “American Idiot” from Green Day’s 2004 album of the same name—a brilliant conceptual punk odyssey that grabbed post-9/11 American teens (and adults) with such inescapable songs as that title cut, “Boulevard of Broken Dreams” and “Holiday” on the radio. Now, that album’s fervor and tumult have been compellingly translated to the stage. This past fall, a de facto rock opera called *American Idiot* enjoyed a highly successful run on Berkeley Repertory Theatre’s Roda stage—just a stone’s throw away from 924 Gilman St., the club where the band got its start some 20 years ago.

The musical of *American Idiot* tells the story of a character named Johnny who is desperate to escape the boredom of his suburban life, so he flees to the city, where he expands his mind with drugs (creating the drug-dealing alter-ego St. Jimmy) and pursues the woman of his dreams, “Whatsername.” The story also follows two of Johnny’s buddies: Tunny, who enlists in the army, is injured in war and falls in love with a military nurse; and Will, who had planned on joining Johnny in the city only to learn that his girlfriend is pregnant, so instead his escape is to take up residence on his couch with his trusty beer, driving the mother of his child away.

As staged at Berkeley Rep, the enormous,

four-story stage was wallpapered with hundreds of posters advertising punk rock shows that took place in the Bay Area through the years, and dozens of flat-screen TVs blared out news footage and other images in an overwhelming media overload. Meanwhile, a stellar company of young actors sang, danced, throbbled and head-banged to songs from *American Idiot* (as well as a handful of tunes from Green Day’s more recent *21st Century Breakdown*, and some rare cuts); and an eight-piece band, mostly right onstage just behind the action, kept the energy high and the action moving straight through the show’s 95-minute running time.

‘Awakening’ the Idiot

For the Rep’s production, director Michael Mayer brought in some of the same team that staged Broadway’s *Spring Awakening* (Tony winner for Best Musical), including sound designer Brian Ronan. “I’m fortunate in that I’m on Michael’s call list,” Ronan says. “We’ve worked together many times. He’s great at letting me know about the challenges that lay ahead. Our relationship is such that he knew I’d work it through; most of his direction came in real time in the theater.”

Ronan was charged with transferring studio tracks to the stage, which can be a difficult proposition, and in this case Ronan did not meet with Green Day prior to production, so there was little direction from the band on that end. However, as production began, Ronan was impressed with the band’s involvement. “I’d have thought with all their success and wide reach that they might consider a theater piece small change, but that was not the case,” he recalls. “Tre Cool and Mike Dirnt were actively involved with the show’s drummer and bassist, respectively. They both donated instruments that would have been out of the budget of a regional theater production, and worked with the guys to share insights into their licks. And [Green Day leader] Billie Joe Armstrong was extremely present; he and Michael transformed the album content into a stage production. He also worked with our guitarist on style and interpretation and he, too, donated gear. One day, about a dozen of some of the sweetest guitars I’ve ever seen showed up at the theater for our use from his personal collection.”

Ronan notes that musicians coming into a theater production sometimes bring in expectations from tours that do not equate to a theater situation, and so there needs to be an adjustment period. “The quickest way for Green Day to feel secure was to have their trusted managers and engineers come by and check up on the show,” Ronan says. “Before the first preview, their recording engineer came by and tweaked some of the instruments to sound like the record. We learned that what was spot-on for the album was not a perfect fit for our live show. Their FOH engineer came by later that week and we worked together to EQ some of the instruments to give them the breadth they needed to be more applicable to the live show.”

Expanding for the Cast

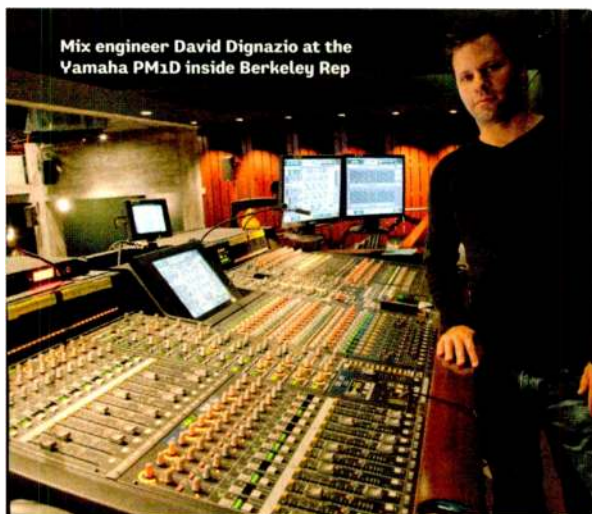
In any album-turned-rock-opera, the sound designer must “expand” the range and tonality of select tracks so that they can be sung by a company (in this case, 19 cast members), and match the actors and their vocal ranges. Tom Kitt handled orchestrations, arrangements and music supervision, while Carmel Dean is credited as music director. Ronan notes that mix engineer David Dignazio then took the vocal arrangements and “mixed them superbly. I supported him sonically by choosing reverbs [Lexicon TC3000s on vocals] that fit the various songs.”

Dignazio, who previously mixed *Shrek: The Musical* and other shows on Broadway, says of working with Ronan: “He’s amazing. He’s got a fantastic ear, which is always something great. He’s got a really even-keeled disposition, which is necessary in this high-stress business: People want something, and they want it now. He has a big-picture mentality, as well, and he gave me the freedom and trust, which as a mixer I appreciate.”

Ronan’s overall vision for the sound design was to capture the power of the music and the songs. “Every musical has a voice of its own, and *American Idiot*’s had to bring a level of strength and anger that would match the characters,” he says. “I’m not referring to sheer volume; 90 minutes of a loud show is draining on the ears. It was important for me to arrive at strong levels that were felt in the chest, as much as the ears. It was imperative for me to make sure the vocal level cut through the band mix. Without the words, the story of *American Idiot* would be lost and the audience won’t connect with the show.”

PHOTO COURTESY MELDORIX.COM

Mix engineer David Dignazio at the Yamaha PM1D inside Berkeley Rep



Dignazio agrees: "The most important element in Broadway mixing is lyrics because the lyrics tell the story. And if people can't hear the words, then they have nothing to go on; that's the vessel, the vehicle. So the implementation and the challenge is how to take a rock musical, where you want to put rock-level energy into it with musicians onstage, and be able to get the vocals to a place that is loud enough where people can discernibly hear what they're saying, and be powerful enough to have that rock 'n' roll element. At the same time, there are moments in the show that are tender and quiet. So we need to create moments of gentleness, as well."

To achieve this, Dignazio and Ronan worked on laying out a Yamaha PM1D board and coming up with the programming and tweaking as needed during rehearsals. "When we started to map the physical production to see how his design elements were implemented into what I was doing mix-wise—what worked, what didn't—he would give me notes, things he heard at different places in the house," Dignazio says. "As a Broadway engineer, stuff is coming at you so fast the first time that you're reacting on-the-fly, so it's a great thing to have Brian there to hear everything that's going on as you're reacting." Dignazio used CueLab as his outboard-based program: He had an outboard Go button to fire CueLab so it sent a MIDI signal to the Yamaha board to constantly change scenes.

Musicians Everywhere!

Part and parcel of working on the sound design for any theater show is the amount of collaboration between the various departments and how decisions in one department can affect the sound design. For instance, audiences will notice that there is no standard orchestra pit; in-

stead, four of the musicians (strings and drums) are seated on different tiers of the set, the violinist as high up as a four stories. When asked how this arrangement molded his design, Ronan replies, "To make my job much, much harder! It was really done to fit into the expanse of Christine Jones' set. The landscape she created was meant to represent a wide range of demography and geography. By spreading out the band, she was adding another stroke of the brush."

Dignazio adds, "This is the challenge of the job; it's the white elephant in the room. The drummer is the noise floor; that's my threshold I have to get above every night and I have no way of getting around that. Yet we found that just to have the drums acoustically wasn't enough; we still had to amplify them. So it became a challenge of amplifying the drums in the house, then create enough hard-driving guitar and bass and rhythm section sounds around that to give the punch needed, blend in strings, blend in a keyboard and then get the vocals on top of all of that."

"Brian worked really hard at finding the levels, the correct amount of amplification we needed for the drums to fit in the house," he continues, "and then from that point forward, it was a matter of getting those vocals on top every night and keep the rest of the band punching along so that it has the impact of a rock concert every night."

The cast is wearing DPA 4065 boom mics, "and that's one of the ways we are able to get away with what we're doing because they're not singing into handhelds," Dignazio says. "With traditional Broadway miking, you would put the lavalier elements in the middle of their foreheads, but that wasn't enough [for this show]; we needed to have something a lot closer to their mouths to get that impact." The band is on in-ears; the cast hears themselves through the house and five downstage monitors that Dignazio dials up a mix to.

When it came to choosing loudspeakers Ronan says, "As soon as I was presented with *American Idiot*, I had Meyer on my mind. Meyer systems allow vocals to cut through what I knew would be an aggressively mixed instrumentation. Then, when we decided to premiere the show in Berkeley, it was a *fait accompli*. Helen Meyer sits on

the board at Berkeley Rep and [the loudspeaker company's headquarters] is a couple blocks away." The system at the Roda comprises three M'elodie elements, UPJ rears and back row of the balcony, and UPM fills.

Another consideration Ronan had to take into account was the acoustics and dynamics inherent at Berkeley Rep. "It is a very live house that is probably great for straight plays that make up the bulk of their season," Ronan responds. "To me, it added unwanted reflection. By keeping speakers focused off the walls, I reduced that as much as possible. The Roda is a shallow room, so the high volume of our show had very little chance of dissipation. By ducking out offensive frequencies, I was able to deliver the size the show required without attacking the audience's ears."

It's a Wrap?

At the time of this writing, *American Idiot* was wrapping up its run at Berkeley Rep and had set its sights on Broadway; although no dates nor a theater were determined, casting calls had been open. In thinking of his overall strategy for the show, Ronan also had to keep in mind that *American Idiot* could have a run in other cities. Ronan says that most of his design is "expandable" to allow for this, and that the proscenium and center arrays would work in a variety of houses. However, he says, "I had a fortunate subwoofer situation at Berkeley that would be hard to recreate. The floor subs fit under our stage without encroaching into the first row. This is not always the case. Hard decisions have to be made to get the optimum low end without breaking fire-exit laws. There are fills that supply sound to the box seats and are specific to Roda. I'd have to revisit those choices in another venue."

Dignazio concludes, "Hearing Green Day and knowing their music and then being able to mix it through different people, different voices, it's made me hear their songs in a completely different light. So much so that if I hear '21 Guns' on the radio, I'll turn it off because I want to keep for my job the picture that I'm given and the picture I'm painting every night as pure and clear as possible. This show speaks to me as an individual and as a mixer as no other show has done. I am so honored to be a part of this, and it's really incredible to know that I am a cog in the wheel of something that is so special. And I think that's felt by the entire company. The music is so phenomenal to mix every night. You can't help but feel so alive when you're mixing it." III

Sarah Benzuly is Mix's managing editor.



Sound designer Brian Ronan (left) and David Dignazio at the premiere

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TAKE A GREAT LIVE VOCAL PERFORMANCE TO THE NEXT LEVEL

Every day, thousands of bands and artists around the world are getting ready to perform. With any show, there are a lot of details that need to be just right to create a distinctive sound. Pro musicians spend countless amounts of money and time selecting the right combinations of new and vintage guitars, amps, drums, horns and keyboards that complement their performance. Yet for some reason, the selection of vocal mics is too frequently left to chance; whatever's available at the venue is handed to the singer just before hitting the stage.

And with the important part vocals play in most music shows, it's sad (and somehow ironic) that after all the rehearsals, pre-production and preparation, the lead vocal mic—the single element that the entire production hinges on—often costs less than a top-end bass drum pedal, a couple stomp boxes or even the road case used to transport the power amplifiers.

The availability of quality handheld mics is hardly an issue. In surveying top-of-the-line offerings from various manufacturers, we en-

countered a dazzling array of models from which to choose, with most priced in the \$200 to \$700 range and another dozen priced even higher. These prices are MSRP, and for the most part, street prices are well below that—good news for the savvy shopper.

So the variety's there, and the good news is that the sound and performance specs of today's handheld mics are better than ever. Unlike rare guitars or classic studio mics, this is one area in audio where new gear easily outperforms vintage models. And at the same time, new handheld mics are coming ever closer to providing full-on studio performance in a rugged, compact package. Sennheiser's e 965 and the Shure KSM9 feature switchable cardioid/supercardioid response; Audio-Technica incorporates capsules from its 4050 and 4033 studio mics into some of its Artist Elite models; and an increasing number of companies typically associated with studio mics—such as Neumann, Schoeps, Milab, RØDE, Blue, Pearl, Violet Design and Telefunken—include handheld mics in their current lines.

Beyond audio specs and “sound,” other issues are important. A tight polar response

pattern may be great for reducing bleed from onstage high-SPL sources (drums, amps, wedges, etc.) but may not fit the performer's style. A vocalist that moves around a lot while singing is probably better suited to a cardioid or wide-cardioid pattern, and in such cases, the mic's off-axis response may also be key in the selection process. Speaking of patterns, a mic's rear-lobe response can be critical in the placement of wedge monitors. Hypercardioids are better suited to wedges slightly off to the side; for monitors in line with the mic's rear, cardioids are preferred.

With a huge available selection of great-sounding mics (dynamics, condensers and ribbons) at nearly every price range in the accompanying chart, this is a great time to check out something new while helping educate artists you work with on the affordable pleasures of a truly great vocal mic. After all, isn't their performance worth a little extra? ■■

Mix executive editor George Petersen operates a small record label and performs with the Bay Area rock ensemble Ariel.



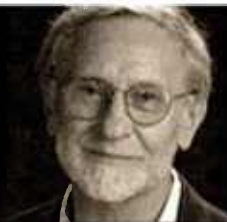
From left: Audio-Technica AE5400, Audix VX5, Blue enCORE 200, Heil Sound PR 35, Neumann KSM 105, Violet Design Pearl Vocal, Telefunken M 80, Shure KSM9

TOP-OF-THE-LINE HANDHELD MICROPHONES, AT A GLANCE

COMPANY; WEBSITE	MODEL	TYPE	PATTERN	MSRP	NOTES
AKG; www.akg.com	C5	condenser	cardioid	\$299	removable presence-boost adapter
AKG	D7	dynamic	supercardioid	\$239	also offered as \$259 D7 LTD (limited edition with chrome finish)
AKG	C 535	condenser	cardioid	\$499	LF roll-off and pad switches
Audio-Technica; www.audio-technica.com	AE5400	condenser	cardioid	\$529	same capsule as the AT4050 studio mic; has HPF and pad switches
Audio-Technica	AE3300	condenser	cardioid	\$429	same capsule as the AT4033 studio mic; has HPF and pad switches
Audio-Technica	AE6100	dynamic	hypercardioid	\$289	
Audio-Technica	AE4100	dynamic	cardioid	\$289	
Audix; www.audixusa.com	VX10	condenser	cardioid	\$599	VX10-Lo low-output version also available
Audix	VX5	condenser	supercardioid	\$299	10dB pad and LF roll-off switches
Audix	OM7	dynamic	hypercardioid	\$349	
Audix	OM6	dynamic	hypercardioid	\$329	
Audix	OM5	dynamic	hypercardioid	\$265	
Beyerdynamic; www.beyerdynamic.com	M88 TG	dynamic	hypercardioid	\$499	rugged TourGroup version of classic M88
Beyerdynamic	M160	ribbon	hypercardioid	\$799	dual ribbon transducer provides hypercardioid response
Beyerdynamic	M260	ribbon	hypercardioid	\$499	dual ribbon transducer provides hypercardioid response
Beyerdynamic	TG X80	dynamic	hypercardioid	\$379	also offered in switchable version (TG 81)
Blue; www.bluemicro.com	enCORE 200	dynamic	cardioid	\$149	
Blue	enCORE 300	condenser	cardioid	\$199	
CAD; www.cadmics.com	C195	condenser	cardioid	\$199	transformerless design
CAD	D189	dynamic	supercardioid	\$169	high-output neodymium magnet
Crown; www.crownaudio.com	CM200A	condenser	cardioid	\$448	CM-200ASW switched version available
Earthworks; www.earthworksaudio.com	SR20	condenser	cardioid	\$765	removable windscreen converts mic to instrumental use
Electro-Voice; www.electrovoice.com	N/D967	dynamic	supercardioid	\$322	high-output neodymium magnet
Electro-Voice	RE510	condenser	supercardioid	\$322	LF roll-off switch
Electro-Voice	RE410	condenser	cardioid	\$322	
Equation Audio; www.equationaudio.com	DS.V11	dynamic	cardioid	\$239	high-output neodymium magnet
Equation Audio	DS.V10	dynamic	supercardioid	\$229	
Equation Audio	DS.V9	condenser	cardioid	\$199	
Groove Tubes; www.groovetubes.com	Convertible	condenser	hypercardioid	\$149	ball windscreen removes for instrumental miking
Groove Tubes	Hardtop	condenser	hypercardioid	\$129	
Heil Sound; www.heilsound.com	PR 35	dynamic	cardioid	\$249	3-position bass roll-off switch
Heil Sound	PR 22	dynamic	cardioid	\$165	high-output neodymium magnet
Heil Sound	PR 20	dynamic	cardioid	\$150	also available in white/red/pink body versions for \$179
M-Audio; www.m-audio.com	Aries	condenser	cardioid	\$199	
Milab; www.milabmic.com	LSR-3000	condenser	cardioid	\$885	transformerless; 80Hz HP filter and -12dB pad switches
Milab	LSR-1000	condenser	cardioid	\$525	transformerless design
Neumann; www.neumannusa.com	KMS 140	condenser	cardioid	\$2,098	switchable HPF and -10dB pad
Neumann	KMS 150	condenser	hypercardioid	\$2,098	switchable HPF and -10dB pad
Neumann	KMS 105	condenser	supercardioid	\$998	available in black or silver finishes
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Pearl; www.pearl.se	TLC 90	condenser	cardioid	\$503	
Peavey; www.peavey.com	PVM22	dynamic	cardioid	\$199	high-output neodymium magnet
RØDE; www.rodemic.com	M1	dynamic	cardioid	\$199	lifetime warranty
RØDE	M2	condenser	supercardioid	\$299	locking on/off switch
RØDE	S1	condenser	supercardioid	\$329	available in nickel or black
Roland; www.roland.com	DR-50	dynamic	hypercardioid	\$149	locking on/off switch
Samson; www.samsonetech.com	CO5	condenser	cardioid	\$112	
Samson	Q8	dynamic	supercardioid	\$129	high-output neodymium magnet
Schoeps; www.schoeps.de	CMH-641U	condenser	supercardioid	\$2,000	available in matte gray or nickel
Schoeps	CMH-64U	condenser	cardioid	\$1,975	available in matte gray or nickel
Sennheiser; www.sennheiserusa.com	e 965	condenser	multi*	\$1,050	*switchable cardioid/supercardioid patterns; HP filter and -10dB pad
Sennheiser	e 865	condenser	supercardioid	\$405	
Sennheiser	e 935	dynamic	cardioid	\$250	high-output neodymium magnet
Sennheiser	e 945	dynamic	supercardioid	\$330	
Shure; www.shure.com	KSM9	condenser	multi*	\$850	*switchable cardioid/supercardioid patterns; Class-A preamp circuitry
Shure	Beta 87A	condenser	supercardioid	\$462	
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Shure	Beta 58A	dynamic	supercardioid	\$300	high-output neodymium magnet
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Glee castmembers perform a mash-up of Katrina and the Waves' "Walking on Sunshine" and Beyoncé's "Halo."

By Sarah Jones

The Joy of 'Glee'

PRODUCER ADAM ANDERS GIVES HIT SONGS 'JAZZ HANDS'

What do "Imagine," "I Could Have Danced All Night" and "The Thong Song" have in common? Musically, not a lot. But they've all been covered on Fox's smash hit show *Glee*, a smart, funny musical drama that chronicles the lives and loves of a bunch of social misfits who sing and dance together in their high school glee club.

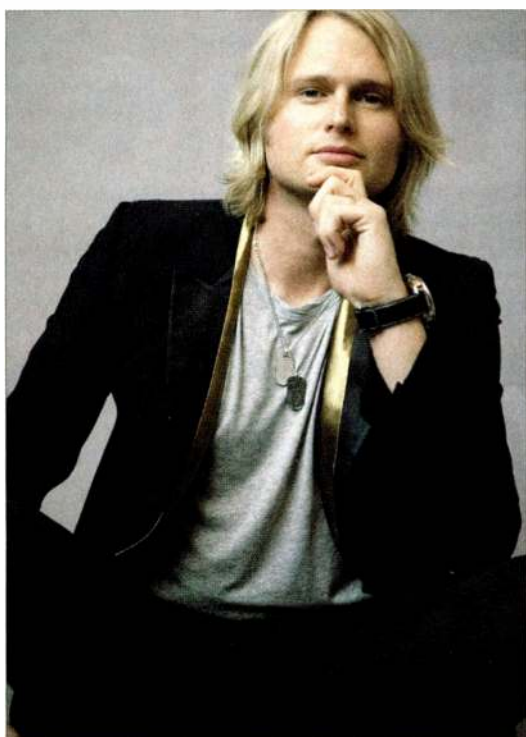
Developed by *Nip/Tuck* creator

Ryan Murphy and starring the hilarious Jane Lynch (*40-Year-Old Virgin*) and a cast of mostly stage actors, *Glee's* formula is simple: Nine students (and their oddball teachers) deal with typical teen issues, and the drama is played out in larger-than-life song-and-dance arrangements of iconic songs from the past four decades. More than 50 hits have been covered, includ-

ing songs from artists ranging from Madonna to Kanye West to the Rolling Stones.

Glee attracts more than 8 million viewers each week. But the real success story is the music: iTunes downloads of *Glee* singles have topped 2 million, two soundtrack albums have been released and a concert tour is planned for 2010.

The show introduces classic



Producer/songwriter Adam Anders heads up the *Glee* music team.

hits to new audiences—the cast version of Journey’s “Don’t Stop Believin’,” showcased in the pilot, sold 500,000 downloads and generated new sales for the original. *Glee* also has a knack for turning show tunes into pop hits, propelling cast versions of “Defying Gravity” from *Wicked* and “Maybe This Time” from *Cabaret* up the charts.

The show owes much of its success to its superstar music team, led by Adam Anders, whose producing and songwriting credits include Ashley Tisdale, the Backstreet Boys, *High School Musical 3* and *Hannah Montana, The Movie*. Anders is a hit-maker: He recently had 18 simultaneous singles on the iTunes chart, including 16 songs from *Glee*, one by Miley Cyrus and one from a Disney collective. A few years back, he wrote some TV themes for Fox; when *Glee* was being developed, the network suggested creator Murphy meet with Anders. He wasn’t hired right away.

“I think part of it was, he wanted this show to be the anti-*High School Musical*, and he was nervous because I had done *High School Musical*,” Anders says, laughing. “I told him, ‘Look, that’s just one thing that I’ve done so I understand the logistics of

doing a musical, but obviously, the music doesn’t need to sound like that.’ He came back to me, I think it was on a Friday, and said, ‘Can you have [Amy Winehouse’s] “Rehab” to me Monday morning? If you nail it, the show’s yours.’ We spent the weekend on it, and the rest is history.”

Anders and his partner in Sweden, super-producer Peer Astrom (Celine Dion, Madonna), work on an intense timeline, with about seven days from music approval to show taping to producing songs. Their teams work across time zones, around the clock, arranging, tracking and mixing—multitasking to produce up to 11 songs in a single week. “We use the time change to our advantage, so when I go to bed he keeps working, and vice versa—basically, 24 hours a day, six days a week,” says Anders.

The team communicates via Skype and transfers files over the Internet. “At one point, I had three studios in Sweden going, I had three here and one in New York, at the same time,” says Anders, who records vocals at Chalice in Los Angeles. “I’m recording, then checking in every half hour on Skype, with all of the other things going on at the same time. It’s pretty crazy.

“The main thing it comes down to is hav-

ing the right people,” he stresses. “Everybody working on my team is supertalented; everything they bring to the party is top-notch. You really only get one shot when you’re on this compressed a timetable. That’s what I’ve been most proud of: how we’ve been able to pull off so much volume at such a high level. There’s one episode where we’re doing a huge Broadway number with a full orchestra to a Kelly Clarkson cover, to a Rolling Stones song, back to a *Dreamgirls* cover, all in the same week.”

Creating the songs is essentially a two-step process. Once a song is cleared, the team creates a guide demo with a “stunt double”—a singer who sounds like the cast member who will ultimately sing the song. After the arrangement is approved, castmembers are brought in to replace the vocal tracks. Anders records lead vocals separately, and has the group perform together around one mic. Anders uses a variety of mics on the castmembers: “Amber Riley [Mercedes] blows up pretty much everything she gets in front of,” he says. “She’s an amazing singer and she’s probably the most experienced singer in the studio coming in; she’s done background work. She ends up on a [Shure] SM7, which is the only thing that can handle her power. Lea [Michele, aka Rachel] is usually on a 47; for Cory [Montheith, quarterback Finn] we usually use a 251; and then the choir stuff is usually a 251 or 47 middle; and then I use 67s on the sides.”

Anders coaxes pop performances from



The boys of *Glee* sing a medley of Bon Jovi’s “It’s My Life” and Usher’s “Confessions Pt. II.”

singers who were initially out of their comfort zone in a recording studio. "Cory had never sung in the studio in his life before 'Don't Stop Believin'," he says. "The first time we recorded, he didn't know how to breathe and sing at the same time; he almost passed out. To see where he is now is like night and day; he's come so far." Lea Michele was accustomed to performing show tunes onstage. "The challenge with her was not can she sing, it was getting her confident that she can sing these different styles," Anders says. "Onstage, there's a different way you project and you use more vibrato; pop singing requires a lot of straight singing." Anders says it's rewarding watching the singers rise to the occasion. "They're like, 'I can't do this.' Then they get in there and tough it out, and it turns out amazing."

Glee is all about vocals—big, huge vocals. Anders likens them to the way the show characters might sound in their own minds. "These kids, they're like, 'We sound amazing, we're huge,' and that's what you want—big, grandiose sound." Lots of vocals means lots of passes recorded in a big, live room. And lots of reverb. "I want the vocals to be inspiring," he says. "People want to enjoy listening to it."

Songs are prepared for broadcast and download simultaneously, but the mix aesthetic is the same. "There's no synching to any picture, so it's pretty much the way I would make any record," Anders says. "We program in Logic, we do vocals in Pro Tools, we mix in Pro Tools, I do all the cut-downs in Pro Tools." Two versions of each song are created: a full-length version for iTunes and an edited version for TV. For the show, Anders FTPs mix stems, broken out into separate backgrounds and leads, with and without effects.

Anders admits that producing a glee choir version of a great pop song "could be the cheesiest thing you've ever heard if you're not careful. So the fine line for me and Peer when we arrange these things is, how do we keep this cool, current, something that could actually work on radio, but then put the 'jazz hands' on it?"

"I'd be lying if I said I knew it was going to work," Anders continues. "I did feel like when you heard 'Don't Stop Believin'; you definitely get goose bumps, and we were like, 'Okay, we did something right here.' It's one of the greatest songs ever written, and we said, 'Let's just not screw this up.' And a lot of it starts with that: Let's stay true to the song, respect the song and add our *Gleeness* to it." III

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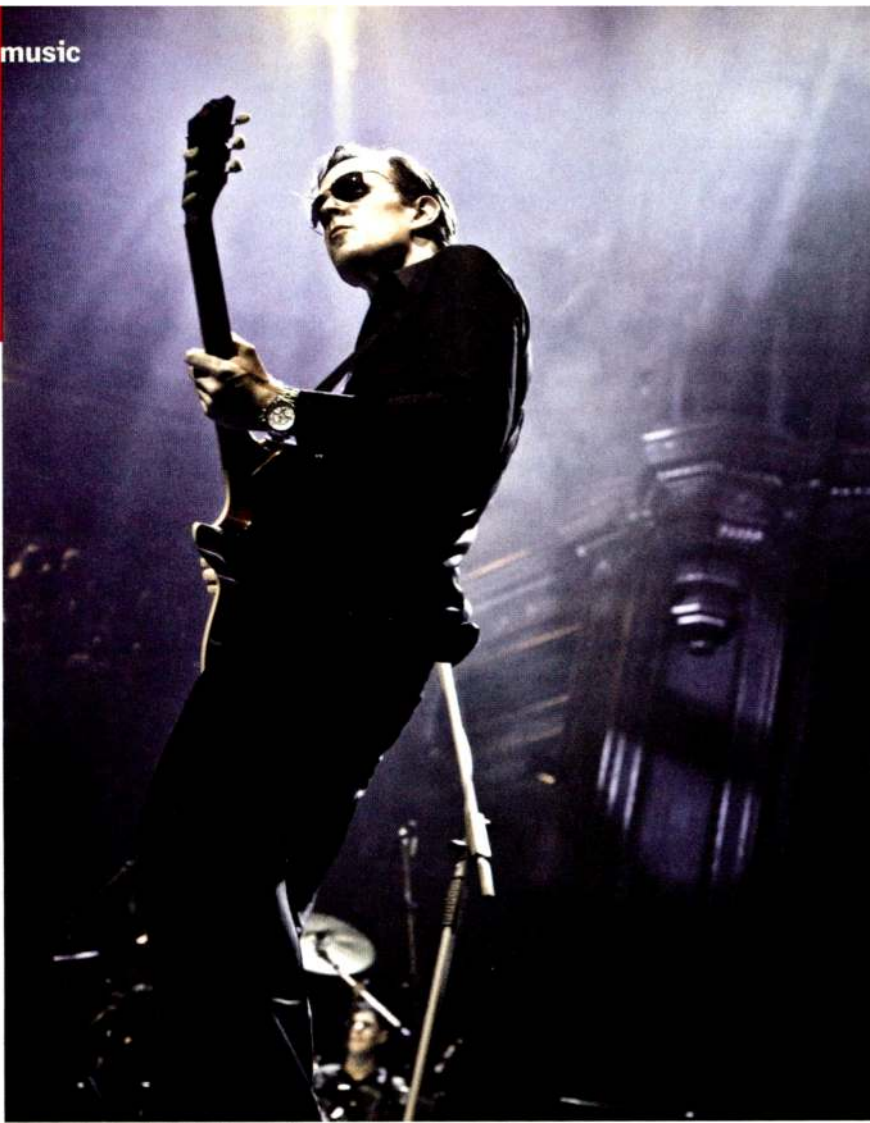
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Bonamassa's 'Black Rock'

INVENTING THE NEW GREEK BLUES

By Barbara Schultz

Joe Bonamassa has built his career on the foundation laid by white blues/rock guitar legends like Stevie Ray Vaughan and Eric Clapton. He fell in love with this music very early in life—grabbed his first guitar at age 4, and was landing gigs near his home in upstate New York by age 12. Often associated with other guitar prodigies such as Johnny Lang and Eric Johnson, Bonamassa has developed a style that incorporates numerous blues idioms—a bit of Elmore James, a touch of B.B. King, etc.—but owes more to rock interpreters like Jimmy Page and Jimi Hendrix.

So Bonamassa is very well matched with his longtime engineer/producer Kevin Shirley, who has wrangled seminal performances from guitar bands like Aerosmith, Black Crowes, Silverchair, Iron Maiden and Journey. Shirley, who says his clients have affec-

tionately described him as “a nice guy, but one of the most bull-headed producers you could hope to meet,” knows how to capture wild guitars; he also knows he’ll get more compelling performances from artists if he keeps stirring things up.

“This is our sixth project together,” Shirley says. “When we started recording together way back when, one of the tenets of our working relationship was that we were going to push the boundaries. I recognize where Joe’s roots are, but we were going to take the blues to different places. So over the years, we’ve gone swampy, we’ve gone eclectic; in our conversations, we’ve recognized that there are different blues genres: Memphis versus Chicago, Delta blues, Appalachian music, New Orleans, and it’s all related—even back to Celtic music. We’ve always wanted

to explore blues around the world and see how all that fitted in.”

So Shirley saw a great opportunity when a friend, studio owner/engineer Kostas Kalimeris, mentioned that he was building Black Rock, a brand-new studio/villa in spectacular Santorini, Greece. Crystal-blue sea, historic architecture, a wealth of cultural/musical possibilities and a brand-new SSL 9080 J-based studio designed by Roger D’Arcy of Recording Architecture. It probably wasn’t too tough for Shirley to convince Bonamassa to bring his band to Greece to record a new album.

One of Shirley’s trademarks is that he insists on a lot of pre-production so that in-studio performances can happen quickly and be captured in the moment. Shirley helped prepare for Bonamassa’s sessions at Black Rock by auditioning YouTube videos that Kalimeris sent; he was able to choose a handful of Greek musicians and line them up before bringing Bonamassa and his bandmembers to Santorini.

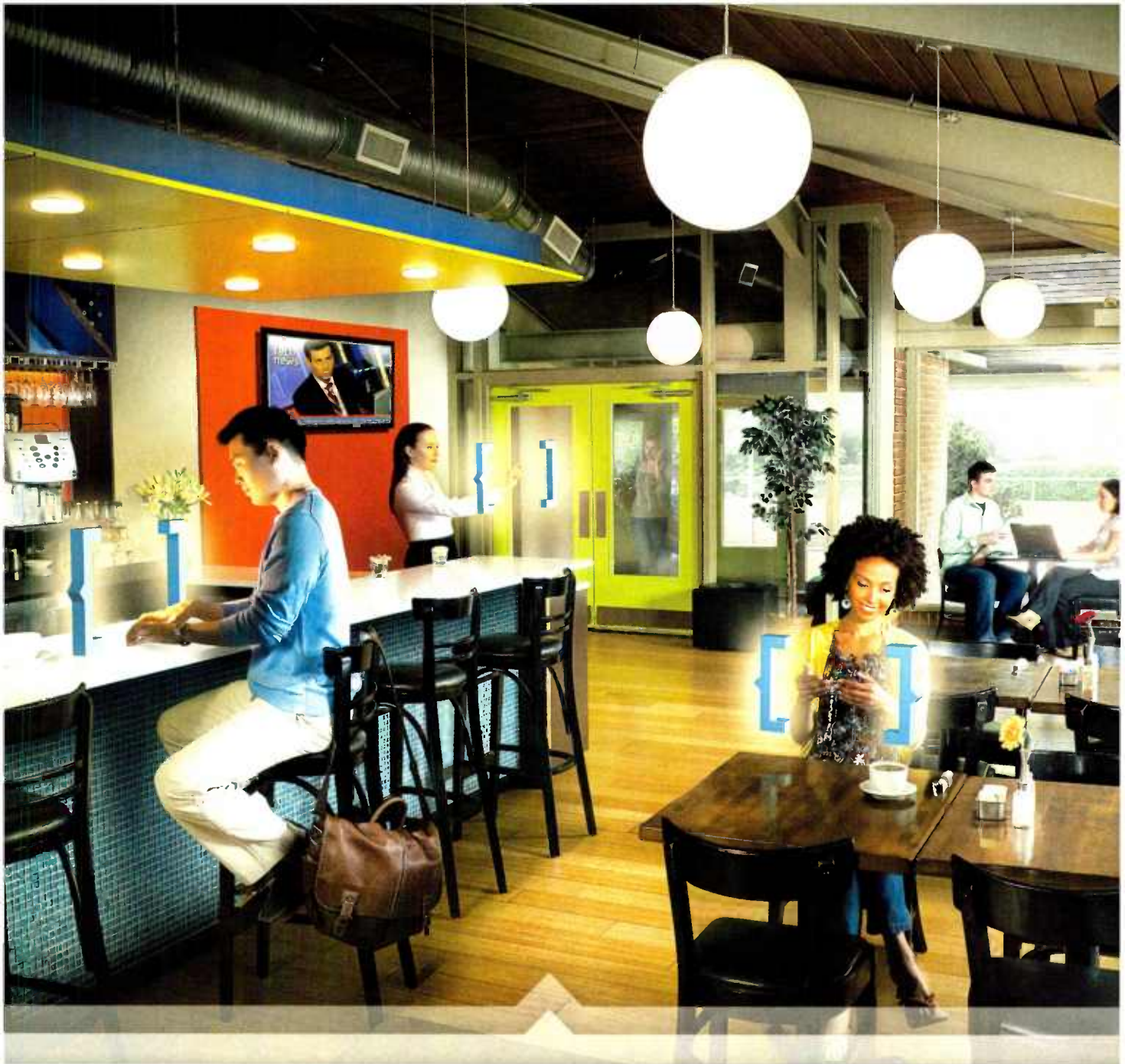
Arriving while Kalimeris and his staff were still putting the finishing touches on the studio, Shirley and the bandmembers enjoyed the residential facility’s hospitality and daily dips in the Aegean Sea, while Bonamassa sequestered himself to write new material. Then Shirley arranged some front-porch-style sessions with just Bonamassa and the Greek musicians he’d selected.

“The first thing we did was have a session with these two Greek guys, Thanasis Vasilopoulos on clarino and Manolis Karadinis on bouzouki,” Shirley says. “Neither of them spoke English, and it was an interesting way of getting the music going. We actually recorded one track sitting outside on the patio outside the studio. At night it’s so quiet there, the recording was beautiful. These were different elements that we introduced into Joe’s sound.”

Kalimeris, the studio owner, also found those sessions particularly memorable: “That night was so peaceful, it made the recording really unique,” he recalls. “The vibe from everybody was fun and experimental.”

The introduction of folk instruments is especially effective in Bonamassa’s cover of Leonard Cohen’s inspiring “Bird on a Wire”—a song that’s been recorded by singular artists such as Johnny Cash and Joe Cocker, but Bonamassa makes it his own.

Shirley, who records all of his projects live, also took Bonamassa out of his guitar comfort



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zone on this album: "Normally, Joe plays a Les Paul guitar, but on this album I wanted to try to challenge him, so I asked him to put away his beloved Les Paul and we recorded with him playing a Telecaster and an amplifier and nothing between them. Then I just I dangled a [Shure SM] 57 over the speaker, just trying to get an edgier live feeling. After five or six days of that, we went back to Joe's comfort zone; we put up the huge stacks and miked them up properly with

a 57 and the Beyer 201 and a Royer R121 and a Neumann 67 back into the room to give it a little bit of ambience."

Shirley's mixing process, done this time on the SSL console and listening through KRK VXT6s, also seems to be part and parcel of recording live: "We don't mix separately," he says. "I always mix as I go, and my rough mixes are what make the album. I feel that when it's coming off the console, you're right there, into the music, and you're aware of the minutiae when you're that close to it. When you wait until four weeks later, it's, 'Why did we put that guitar part in again? I know I had a good idea at the time.' The rough mixes really capture the way we heard the song."



Rehearsing outside at Black Rock, L-R: Joe Bonamassa (guitar), Manolis Karadinis (bouzouki), Rick Melick (keyboards), Thanasis Vasilopoulos (clarino)


Bonomassa and friends were so happy with what they heard at Black Rock that they named their album after the studio. *Black Rock*, the album, comes out March 9, 2010, on Bonomassa's own J&R Adventures label, and he and Shirley plan to return to Greece to record a follow-up next year.



Bonomassa playing a Resonator Dulcimer

"I love the studio; it's absolutely the most creative studio I've ever been in," Shirley says. "There's all this traditional Greek architecture with concrete, concave ceilings. Once you're inside these things, you get this amazing resonance and explosion of sound, which is a little uncontrollable, but it's fantastic. And staying in the place and being able to go in at 7 a.m. or coming back after dinner and cutting a track at 11 or 12 at night—it's a wonderful environment to be able to do that." III

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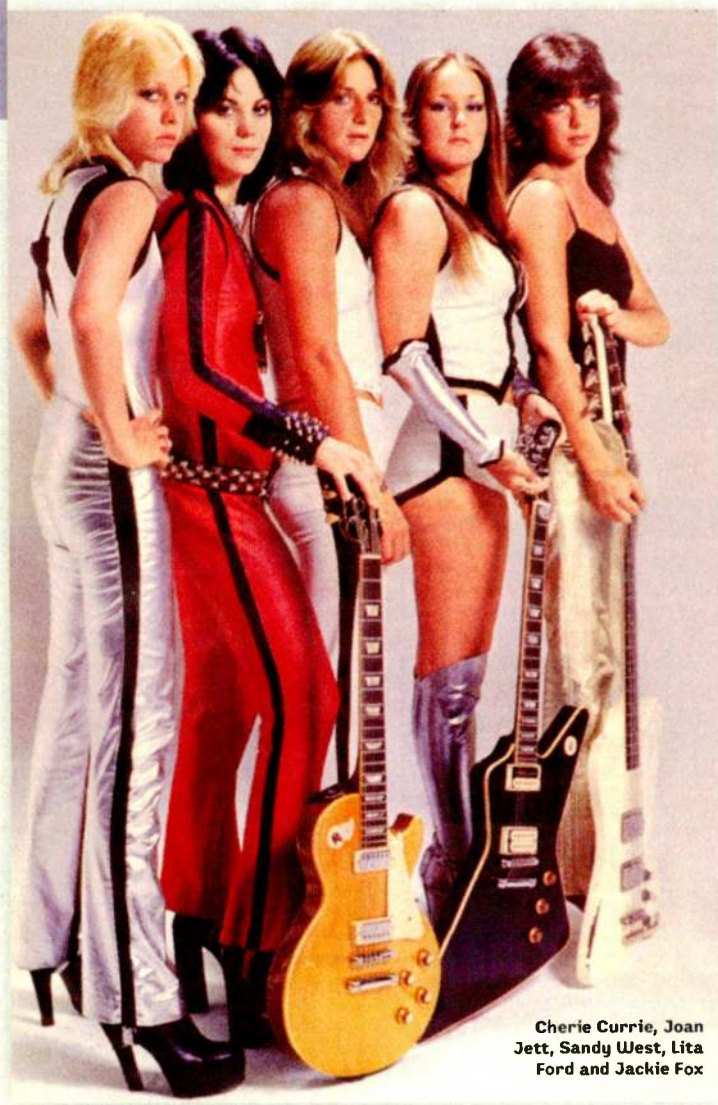
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The Runaways

"CHERRY BOMB"

By Barbara Schultz

"Here's your headline," says musical genius Kim Fowley, who occasionally refers to himself in the third person. "Kim Fowley and the Runaways recorded 'Cherry Bomb' in a store room on purpose. We didn't have an equipment list. We barely had equipment. But we had a plan.' Then everybody reads it, and this will be the best article you've written in 10 years." Fowley, who helped form The Runaways and produced their first album, has really thrown down the gauntlet here, especially considering that "Cherry

Bomb" could be considered a dubious choice for a "Classic Track." It's kind of a garage band song, and the band's eponymous debut album, which includes "Cherry Bomb," barely cracked the *Billboard* 200. But "Classic Tracks" aren't just about hits, and "Cherry Bomb," written by Fowley and a then-unknown rocker named Joan Jett in 1976, marked the debut of America's first all-girl rock band. Go back and listen, and those punk guitars and racy vocals sound just as tough as they did back then:

*Can't stay at home, can't stay at school
Old folks say, ya poor little fool
Down the street I'm the girl next door
I'm the fox you've been waiting for
Hello Daddy, hello Mom
I'm your ch ch ch ch ch cherry bomb*

Fowley had been in the music biz for almost 30 years when he met founding Runaways members Jett and Sandy West. He made his first studio recording in 1949, when he was 10, and from that point on, he was never not working in studios, or writing, publishing or producing bands. "I've sold 102 million records in a 50-plus-year career," Fowley points out. "I've produced everybody, worked with almost everyone. The Beach Boys did songs I published. I've recorded with Andrew Loog Oldham, who was producer of the Rolling Stones. Jimmy Page and John Paul Jones of Led Zepelin played behind me on a song that I did. It's a huge list."

Fowley's credit list also includes The Byrds, Warren Zevon, KISS, the Hollywood Argyles, Frank Zappa's Mother's of Invention, Cat Stevens, Alice Cooper, Jonathan Richman, BTO, The Germs and Nirvana, to name a handful of the acts that have capitalized on Fowley's songs, productions and his keen, intangible sense of what music the public wants. And he says he knew he had something great from the moment he met Joan Jett, whom he has called the "musical child of Keith Richards and John Lennon."

"Teenaged girls with guitars," he states. "We knew it from the day it started. And we were in a hurry. It only took 17 weeks for the band to form, rehearse, play, learn songs and get a deal with Mercury Records, with no demo."

A major-label deal with no demo? "Kim Fowley is a genius and knows how to do things," Fowley says.

But let's get back to the forming part. Fowley hooked Jett up with West. Next to join was bassist Micki Steele, who didn't stay with the band but later became known as Michael Steele, bassist in The Bangles. Cherie Currie—then only 16—joined next as the group's lead vocalist, followed by future metal guitar icon Lita Ford. The last piece of the puzzle was the bassist who appears on The Runaways album, Jackie Fox. Fowley then brought the group he calls the "fabulous five" into Artie Ripp's Fidel-

ity Recording in Studio City, Calif., to make their first album; the lead track was "Cherry Bomb," a song that is rumored to have been written in five minutes, on the spot for Currie's audition: "There was rock 'n' roll magic there," Fowley says. "It was no problem."

Fowley says he chose to record at Fidelity because of the studio's atmosphere, but he doesn't mean that in a good way. "We were in the B room, which was a remade storeroom," he says. "It was awful. But it wasn't scary. It was the kind of studio you wanted a garage product out of. A lot of young bands go into studios with chandeliers and red-velvet rugs and a receptionist who looks better than they do, and they're terrified. But if you walk into a room where they store stuff, you're not going to be intimidated. You're going to swagger about: 'What a horrible place. Oh, well, we've played a lot of horrible places. This is nothing new.'"

"Studio B was like I had rooms and I converted them into a studio when need be, as opposed to Studio A, which was a studio all the time," clarifies Ripp, who founded Fidelity in 1971. "Studio B was a control room and a reasonable-sized office—kind of a large conference room. The other side of the back wall was the front office so you could easily blow away anything that was going on in the front office. But there was an intimacy in the room and there was a sound that was tight and alive, despite its lack of, shall we say, visual amenities."

Behind a 16-channel Quantam console for The Runaways' first sessions was the studio's chief engineer, Andy Morris, whom we were unable to locate for this article. Fowley recalls that Morris was "a genius engineer. He understood every accident that makes a hit record. It's the accidents and the things you leave out that make a record."

What else does Fowley remember about working in Fidelity? "Chaos, madness, fighting, drama. Seizing the moment. Changing the world. Boredom," he says. "And no guests. No visitors. No parents, no record company, nothing. We were at war. We didn't have time to entertain in the foxhole. No drugs or alcohol either. Fast food. You always play obnoxious rock 'n' roll when you eat bad fast food."

When asked if he recalls what equipment was used on these sessions, Fowley says, "How should I know? I don't engineer anything; I can't even drive a car. I sit there and dream and do conceptual supervision, and all the guys who are technical interpret it. I've never bothered to learn anything other than if it sounds good or bad."

"Anyway, it was all awful. It was sub-par. It was old. It was like Ingmar Bergman says: 'I always use bad equipment so my actors perform better.' Here's the trick: Hey morons, don't worry about the equipment, worry about the song and the players and the singers and make sure that some person in the public will want to own the recording when it's finished."

Stand back, Fowley's just getting warmed up: "Nirvana didn't show up with a list of equipment, and say, 'We demand this equipment.' They said, 'Let's go make a record like we've always wanted to; now we can. Here we are, let's rock.' I don't care about the egg-head aspect of your readership. Eggheads, I am a moron, and I sold 102 million records not knowing anything about equipment, but I knew the song, I knew the tone of the voice and what tone and tempo and timbre was, and I understood there had to be some tuning, and I understood somebody had to buy it, and I always left holes in the arrangement so people could smoke dope, get drunk, fall in love, have fights, have sex, go for a ride, or if they're lonely, keep from killing themselves."

You're making records for the listener, not for yourselves, so get off of that, 'Oh, we must have an Aphex Aural Exciter,' or the modern equivalent of that demand. Go get your own studio. Get your mom to buy you a Fostex and a manual, and you can start your own Failure Sound Studios upstairs in your baby brother's nursery."



Producer/artist Kim Fowley (left) with Fidelity Recording Studios owner Artie Ripp circa '76

Clearly, no one's going to get anything more from Fowley on the subject of equipment, but at Mix, we have our ways.

Joey Latimer, an engineer, composer, musician and label owner who currently lives and works in Idyllwild, Calif., apprenticed at Fidelity Recording in the late '70s, and though he wasn't present for The Runaways sessions, he remembers what equipment would have been used in Studio B. He says they would have recorded to a 3M M79 16-track machine with Dolby B NR. The speakers were 12-inch three-way JBLs. Ironically, Fowley does admit to using an Aural Exciter on this project, and Latimer says there was also a BX10 spring reverb in that room that engineers would patch into the EMT 150 plates in Studio A. Also on hand were LA-2A and 1176 limiters, Pultec EQs, Roger Meyer noise gates and outboard API EQs. Fidelity also offered a host of Neumann and AKG tube mics, as well as models such as the Shure SM57, Electro-Voice RE20 or 666, and Sennheiser 421 and 441s.

So it doesn't sound like Fidelity's gear was actually
Continued on page 86



"Kim Fowley and The Runaways recorded 'Cherry Bomb' in a storeroom on purpose. We didn't have an equipment list. We barely had equipment. But we had a plan."

—Kim Fowley

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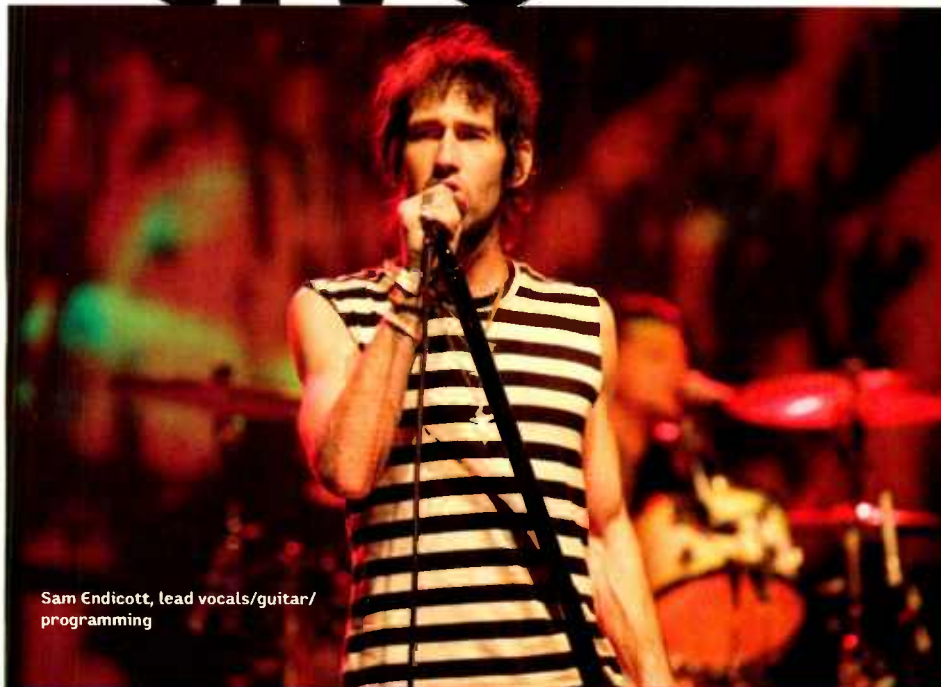
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Sam Endicott, lead vocals/guitar/
programming



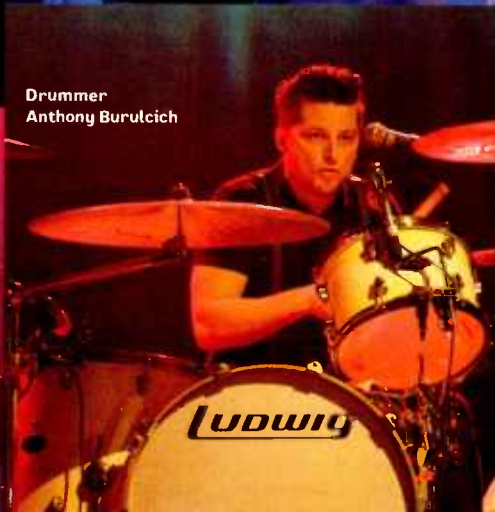
Bassist Michael
Hindert



Guitarist
Michael
Zakarin



John Conway, keyboards/
programming



Drummer
Anthony Burulcich

By David John Farinella

The Bravery

RISING GROUP KEEPS GEAR, MIXES LIGHT

Front-of-house engineer/tour manager Keith Danforth explains The Bravery's touring strategy simply: Keep things light. After all, this is a band that's bounced between small and large clubs, amphitheaters and even a stadium or two since its self-titled first album was released in 2005. "On each tour, they will have a cornucopia

of different events," he says. "So carrying a truck full of gear around that we only need half the time doesn't make much sense. Plus, when you're globe-hopping, you quickly learn the less you bring the better."

Danforth and monitor engineer Scott Eisenberg have been with the quintet since the early days. Where-

as Danforth got the gig based on his experience at the Viper Room in Los Angeles, Eisenberg first met the band before their eponymous debut was released when they came through a club he was working at in Boston. Despite this experience, Danforth and Eisenberg were adjusting to a collection of songs from

the band that hadn't yet been released. Those songs featured new backing tracks to work with, as well as the addition of a bow to Michael Zakarin's guitar repertoire and a couple

4s and four CQ-1s for front-fills and six M1Ds for under-balcony fills. Most of the time Danforth is fine with what's at the venue. "I care that it's a name brand and there's a bunch of

and not catching them," Danforth says with a laugh. "We get boxes of grilles sent out to us on a regular basis for that reason. We just want to make sure he doesn't cut his lip on the busted grille; the mic itself sounds fine the whole time. They are road warriors, and we love them."

While Danforth is not a fan of an effected vocal track, he's been charged with replicating the sound the band used during the recording of the most recent collection of songs, as well as their past catalog. He specifically mentions the song "Slow Poison" off the new album, *Stir the Blood* (released last November), as an example. "It has a very distinct delay on it that we use live to create the same vocal effect," he says. "Another song has flange on it and we do the same thing for that. Those are pretty album-specific and most of it translates live. It's not the same thing that's on the album, but it has the same desired effect overall."

Laughing, he says that he won't divulge the exact processing used on Endicott's vocals, but he does admit there are effects on every song. "You have to have a decent reverb on it so the vocal sounds nice and even," he says. "A lot of times I'll use a chorus on the vocal, but I will use the Eventide program that has a zero-percentile shift that doesn't move the note necessarily. Sam's on-key enough that I don't necessarily need to use it to make it sound like he's on; it's really just to beef up the vocal to get it over the sheer volume of the rest of the band."

Front-of-house engineer/tour manager Keith Danforth at The Warfield's Midas H3000

of drums for him to play. "It's been fun to play with that stuff," Danforth says. "We've been doing this for four years together. Those types of textures and additional instrumentation and a host of other things they have added on this run have brought a lot more to the overall sound and what they are going for."

Sparse FOH, Racks 'N' Stacks

In keeping with their "travel light" mantra, the crew arrived at The Warfield in San Francisco in early November with a monitor desk, personal monitors and Danforth's FOH rack that goes with him everywhere to ensure continuity in singer Sam Endicott's tracks. The rack is stocked with an Eventide H3000, TC Electronics 2290, and a couple of M1s and D2s.

"The H3000 and 2290 are pretty high-end, but the M1s and D2s are there because they only cost a couple hundred bucks, so if they destroy themselves it's easy to grab another one and I'm not in the middle of nowhere looking for vintage gear on a Wednesday," Danforth explains. "I try to keep most of what I'm doing as simple as possible so that it doesn't become a big complicated mess moving from venue to venue and situation to situation every day."

The console at The Warfield is a Midas H3000 and the P.A. includes 22 boxes of Meyer MILO gear, 11 HP-700 subs, a pair of MSL-

it," he says of the P.A. "In general, I would like to see something that has a little more power and a few extra boxes so that I don't have to turn it up so loud.

"I listen from the FOH position—mixing for the bulk of the room—and then walk around to see what changes may need to be made to fill things out, to create an even feel in the venue," he continues. "I'm not going to grab a tablet and sit in every seat in the balcony. But I will walk the room during soundcheck and make sure there is continuity. That's all you can do unless it's your P.A. anyway."

The only other thing Danforth carries is a mic package that includes a collection of Shure 57s and 58s that are used on vocals, snares and guitars, as well as a couple of Sennheiser tom mics and a few KSM 32s that are also put on guitars. "I like to get a condenser and dynamic working together so we get the meat and potatoes out of one and nuance and volume out of the other," he explains.

Endicott sings into a 58, for their durability if nothing else. "Sam has a habit of throwing them up in the air

Overcoming Stage Volume

That said, as most of the band has moved to personal monitors (Sennheiser 300s), Danforth's challenge to get over the band is not as difficult as it once was. In fact, the only person still on wedges is bass player Mike Hindert. "When we



Monitor engineer Scott Eisenberg at the Crest HP-8

started out, they were all on wedges and it was really loud onstage," says Eisenberg. "Anthony [Burulcich], the drummer, is solid, but not a heavy hitter, and the guitar player isn't insanely loud, but just because of the monitor volume, the vocals had to be super-loud and then everybody was competing.

"Going to in-ears quieted the volume," he continues, "and dropping the side-fills and the wedges for the drummer helped, and the singer felt much more comfortable. But, it's interesting, because no matter how quiet it is onstage, you still have to deal with front of house and every once in a while there's that one night where you're in a club and the subs are kicking, and Sam's like, 'Can we turn down the bass?' There's nothing I can do."

On the band's headlining dates, Eisenberg works on a Crest Audio HP-Eight console that they own. "If we're opening for somebody like Linkin Park or Green Day, we'll use what they have," Eisenberg adds. To get the wedge mix at the Warfield, Eisenberg sent a mix from the HP-Eight into the venue's PM5D to use that board's EQ.

So far, he is not carrying outboard gear for monitors. "Every now and then, the band will ask for a little bit of reverb, but usually the mixes are pretty focused," he explains. "Every so often, I'll use some compression, but unless it's absolutely necessary, I won't use a gate. If the drummer hears [a gate], he'll start playing lightly, and then say, 'Hey, how come I can't hear that?' Even with compression I'll go pretty light because it seems like they want exactly what they are doing instead of a processed sound of it."

Mixes across the band are fairly standard, with everyone getting a bit more of their instrument in addition to a general mix, except for Endicott, who gets mostly his guitar and vocals. The drummer can adjust his own ears, including the amount of click he'll hear on any given song via a mixer installed at his kit.

As the band's stature has grown and they begin to play on larger stages, Eisenberg has been asked to provide different things to their mixes. "On the biggest stages they want to hear what everyone else is doing," he says. "On the smaller stages they're asking for more audience. I'm just guessing, but I think that's because when they're the headliner, the crowd is there for them and there's more enthusiasm and they want to be in on that." III

David John Farinella is a San Francisco-based writer.

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Paramore, from left: guitarist Josh Farro, vocalist Hayley Williams, drummer Zac Farro, bassist Jeremy Davis and guitarist Taylor York

PHOTOS: STEVE JENNINGS

Paramore

ALBUM SOUND MIXED FOR THE STAGE

By Sarah Benzuly

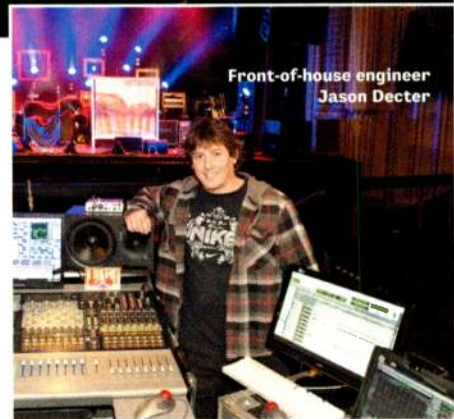
For front-of-house engineer Jason Decter (previously with Panic at the Disco!) and monitor engineer Travis Bing (Little Big Town), who are both Paramore first-timers, the name of the game for the current Paramore tour is re-creating the album sound onstage. At each sold-out club/theater date, the hundreds of teenaged fans have come to hear such radio-friendly songs as "Misery Business," "Ignorance" (from the recently released *Brand New Eyes*) and "I Caught Myself" (on the *Twilight* soundtrack), and the engineers want to ensure that the fans are satisfied. Their plan of attack involves carrying digital desks (a pair of Digidesign Profiles), using little in the way of effects and keeping Hayley Williams' vocals on top. The tour is relying on house racks and stacks (a Meyer Sound system running through Lake Contour at the Warfield); Clair Global provides all other gear.

Decter had his snapshots programmed a certain way since pre-production, but chose to go back to one scene doing manual cues for the entire set to have more fun with the mix each night. "For the past week or two, I've been mixing the show without any snapshots. I changed it up a little bit from one extreme to the other. I was getting bored just saying, 'Next, next, next' [laughs]. I have a Crane Song Phoenix on a lot of my subgroups—

sometimes on my left and right—but I have a new trick: I come out AES in the desk and go into the Crane Song HEDD Harmonic device and convert it in that instead of the desk so it frees up some DSP. I only run on two cards, maybe three—two DSPs on the third card—but I have four cards in the desk. This gives me more plug-in power, more horsepower. Because I didn't know what I was going to encounter with the band as far as plug-ins, I've got it pretty limited to the Phoenix and Smack!, and I put Hayley's vocal out on an outboard vocal Distressor and it goes right through the P.A.

"I just try to hit the keys [that are on] the record," Decter continues. "They want to create that feel with a bit of moving air on the bottom. We've had open discussions and I record every night [to a Pro Tools HD rig] so the band can hear what's going on. I just go for the open, non-compressed but still in-your-face sound. I leave the dynamics in; I don't squash anything to the point where it sounds bad."

Bing is also using little in the way of effects—a bit on drums, keys and acoustic guitars: "Nothing crazy," he says. "Just general hall, reverb and plate sounds." He is also giving each bandmember a specific mix. "I give them a CD mix in their ears



Front-of-house engineer Jason Decter

and tailor it to what they want specifically. Hayley's mix is very CD-esque: guitars and drums panned stereo with her vocals on top. I'm compressing the guitars a bit to keep it a bit more even in their ears. I mix in-ears very similar to how I mix FOH: lots of EQ, compression and soft gates across the board," Bing adds. "Drums has a lot of click; I just drown him in click and snare, and he's good to go. I rely heavily on audience mics and sidefills to make the band feel like they're not wearing in-ears. Hayley feeds off of the crowd, and being able to hear them while hearing herself clearly is key to her performance. Sidefills allow the band to feel the energy from their instruments that they could once feel when they all used to use wedges." In-ear models include Ultimate Ears UE-11 quad drivers (Williams and bassist Jeremy Davis), UE-7 triple drivers (guitarists Taylor York and Josh Farro) and a combo Weston 3Sxs and generic M-Audios for drummer Zac Farro. "Zac has an issue of keeping in-ears in his ears," Bing says. "His head is just shaking too much. I think we're going to get him

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Monitor engineer Travis Bing

on UE-11s and get the molds just right.”

Onstage, there are only wedges for Zac Farro and Davis, as they both like to feel the sub energy from the kick and bass guitar. Sidefills alone were not enough for Davis to “feel” his bass, and even some wedges could not handle the output Davis was requesting. Decter says they’ve gone through quite a few wedges for Davis (moving from a 12AM 12-inch woofer to an LP115 15-inch woofer) as he has a way of “killing the driver,” the FOH engineer says. “There’s basically a P.A. system on-stage for him.”

The engineers’ main concern is keeping Williams’ vocals on top, and so the choice of mic was key. Interestingly, she sings through a hard-wired Sennheiser e935 as she likes to whip around the long cable as she jumps around the stage; brightly colored tape (matching whatever her hair color is at the moment) is wrapped around the handheld. The rest of the mics are Shure and Sennheiser models. Another interesting choice is Royer R121s on overheads. “We picked up the Royers in Nashville when the tour started,” Decter recalls. “We started them on guitars but we have iso cabs and it didn’t sound natural because there was just too much SPL. I wanted to use them on something else so we switched them to overheads. In both guitar cabinets, there’s an SM7 and a Neumann TLM194 on a 4x12 cab—it’s very, very loud.”

And just like any tour where there is a young audience, keeping volume (both onstage and through the P.A.) is crucial. “We’re running at 104dB A-weighted,” Decter says. “It can peak at 106, 108. I definitely put [the band] over the kids screaming, but they don’t go much farther than [108 dB].”

“We work together, and if we get into a room where it’s too loud,” Bing adds, “we talk to the band about turning down the stage volume to help out with FOH sound. We’re both new to the band so we’re trying to figure out what works for everyone.” III

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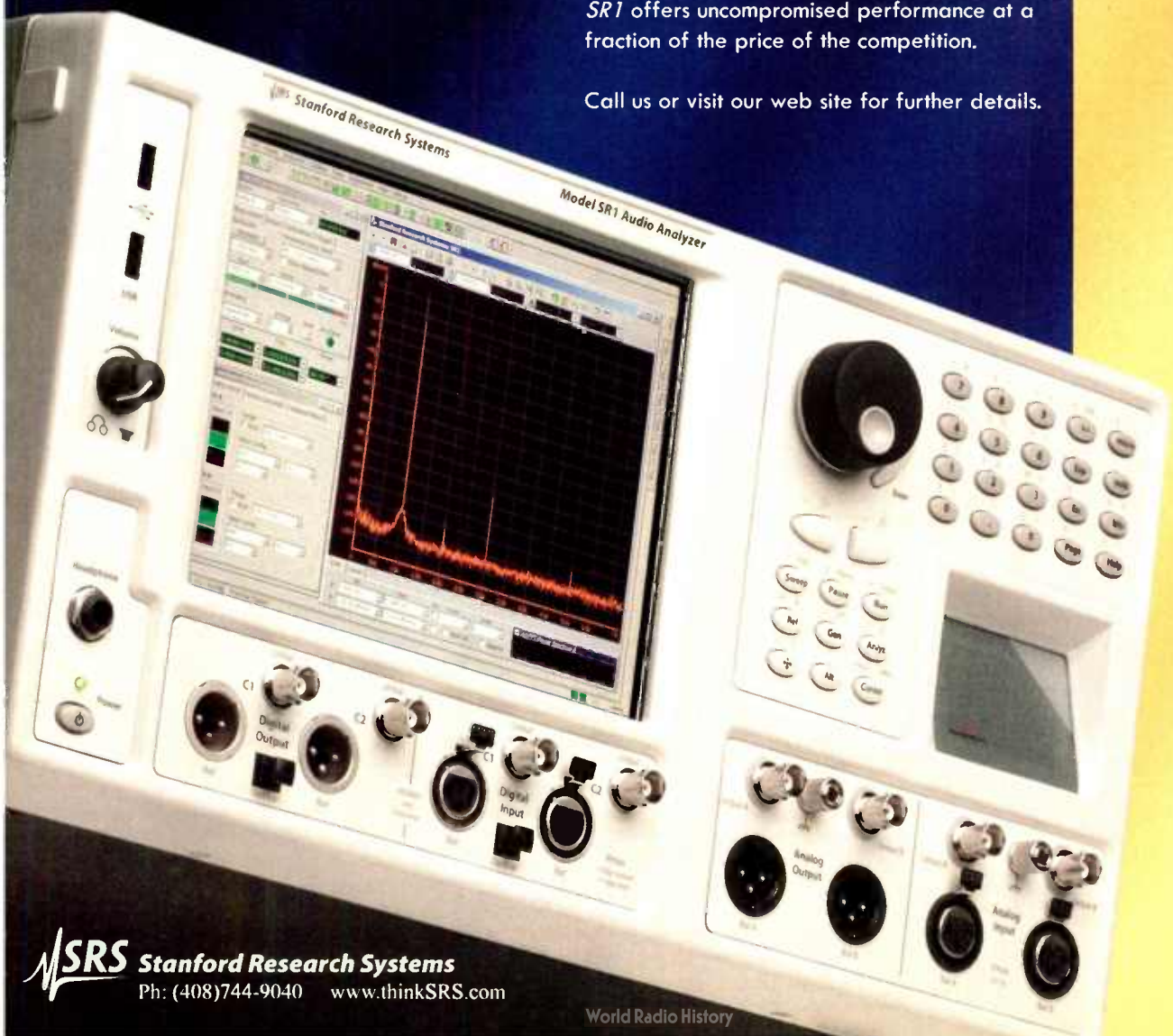
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SOUNDCHECK

Grammy Museum Exhibits Roland



Visitors at the Roland Live exhibit at the Grammy Museum



The newest permanent installation at the Grammy Museum in Los Angeles (www.grammymuseum.org) is Roland Live, which lets visitors participate in the music-making process. A wide variety of Roland products are on exhibit and ready to play, including V-Drums, Boss pedals, HandSonic, VIMA keyboards and the MV-8800 production studio.

"Working with Roland is a natural fit for the Grammy Museum," says Robert Santelli, executive director of the museum. "Roland Live will greatly add to the interactivity of our exhibits, allowing visitors to actually experience another step in the creative process—playing instruments."

"[The Grammy Museum] has so many amazing activities that make music come to life," comments Dennis Houlihan, president of Roland Corporation U.S. "We're excited to bring the experience of performing on Roland instruments to a place that everyone can enjoy."

tour log

Derek Toews, Skillet

Hard-rockers Skillet (singer/bassist John Cooper, keyboardist/vocalist Korey Cooper, guitarist Ben Kasica and drummer/vocalist Jen Ledger) are on tour supporting their latest release, *Awake*. *Mix* caught up with the *Awake* and *Alive* tour and chatted with front-of-house engineer Derek Toews.



PHOTO: JOSH OLIVER

Derek Toews (left) at the Yamaha PM5D during a recent Skillet (below) show



How much gear are you carrying?

Knowing that Skillet's music is like big arena rock, we took out a Meyer P.A. system. We are flying a pair of MILO line arrays with nine elements a side, along with six M'elodie elements a side as side hangs. On the ground, we have 12 700HP subs and two UPA front-fills. For monitors, we're using a Yamaha M7 with Sennheiser G3 transmitters. At FOH, I'm mixing on a Yamaha PM5D with a Big Ben word clock.

What is your mixing style for this band?

I do my best to create energy. Guitars are the main part of the mix and spatial separation is my primary focus when trying to layer the guitars with John Cooper's vocals. I try to reduce the presence of the guitars in the upper-mids to create space for the vocals to sit on top.

Where can we find you when you're not on the road?

In Nashville on a dirt bike track or having a good time with my friends

fix it

Tori Amos FOH engineer Mark Hawley

Marcel [Van Limbeek, monitor engineer] and I make all of Tori's albums using an analog desk, and this is the setup we've used over the years [live]; we like the way it colors the sounds. As far as mixing goes, it's identical to the mix that comes out of the studio console. I like the fact that everything can be accessed instantly on the [Midas] PRO6. I have the drums, bass, keyboards and piano on VCA groups so I can mix them. Then I have four channels of Tori's vocals, and I've found the PRO6 works better for this than anything else. [Two vocal mics to individual channels] are fed into a group that inputs back into three channels, with a different compressor on each, depending on what songs she's singing. I just push that fader up and un-mute one of the two vocals with the auto-mutes. Then those three channels are fed into another group that has the EQ inserted on it, which is an overall EQ for either vocal.



Delicate Productions Expands

Delicate Productions, a full-service event production company based in Camarillo, Calif., has opened a

Northern California area. George Edwards, a veteran of the audio industry and former general manager of Sound on Stage, has been named account executive and will oversee day-to-day operations of the new office. The new office and warehouse marks Delicate Productions' first geographic expansion outside of Los Angeles.

"We are excited to not only expand our reach into the Northern California market, but to have the talents and expertise of George Edwards," comments Smoother Smyth, CEO of Delicate Productions. "He has the knowledge, experience and relationships to help lead Delicate Productions in this new period of growth."

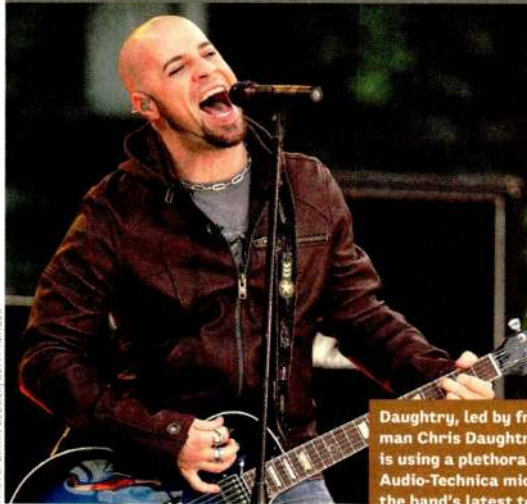
"I'm thrilled to be joining such a highly respected and innovative company," Edwards comments.



Delicate Productions' newest staff member, George Edwards (formerly of Sound on Stage)

new South San Francisco office and warehouse to support clients in the

load in



Daughtry, led by frontman Chris Daughtry, is using a plethora of Audio-Technica mics on the band's latest tour, including an AE6100 hypercardioid dynamic handheld mic.

Front-of-house engineer Marc Jacob Hudson is using Sennheiser evolution 900 Series microphones and ew 300 IEM G2 wireless personal

monitors on the current Taking Back Sunday tour...On-Stage Rentals (Azusa, CA) took delivery of D.A.S. Audio Aero 38A line array elements and Compact 218 Sub 2K subs...After a two-year restoration project, the Fox Theater Pomona (Pomona, CA) sees a new L-Acoustics system designed and installed by Rat Sound Systems...A new Allen & Heath iLive-T digital mixing system (iDR-32 MixRack and iLive-T80 control surface) has found a home at Black Magic Audio (UK)...Smash Mouth participated in a teen motivational event at the Barrington (IL) High School. With the assistance of Gand Concert Sound, Joe Perona mixed FOH on a Yamaha M7CL console while Aaron Patkin mixed monitors on a PM5D-RH; a Nexo GEO T system rounded out the gear list.

road-worthy gear

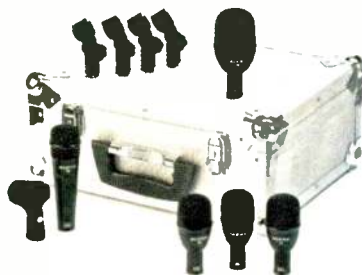
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www.waveslive.com



ALL ACCESS

Photos and text by Steve Jennings

SNOW PATROL AND PLAIN WHITE T'S



Pop-rockers Snow Patrol and Plain White T's warmed up the San Francisco Bay Area in early November to the delight of their increasing fan bases. Playing favorites from recently released *Up to Now* (Snow Patrol) and *Big Bad World* (Plain White T's), the two bands rocked the house at Oakland, Calif.'s Fox Theatre; all gear except P.A. is provided by Eighth Day Sound.



(Snow Patrol bandmembers, this page.) Vocalist Gary Lightbody sings through a Neumann KMS 104; Beta 57As are used for the other vocals. Background: drummer Jonny Quinn (background). Not pictured: percussionist Richard Colburn.



Lead guitarist Nathan Connolly is sporting Farrow's favorite new guitar mic: Roger 122. "It captures all this essence and has an incredibly flat response."



Bassist Paul Wilson



Keyboardist/sampler Tom Simpson



Snow Patrol FOH engineer Suneil Pusari is mixing on a Digidesign Profile for a number of reasons, including joining the band mid-tour. He says the Profile "offered the solution of running a Pro Tools recording of their set through the board. This allowed me to sit in a studio in London with a small P.A. and have my own virtual rehearsal. I could put a show together from this, storing snapshots, building FX and getting comfortable with the songs. Also, this board is very intuitive: Both the layout and screen display are very impor-

tant to me when mixing on-the-fly; changes must be immediate and fluid.

"Although I have a digital board, I'm a big fan of valves, so in my rack I have some Summits to warm things up, a Tube-Tech to keep the bottom end tight yet warm, a Focusrite Producer Pack [that] helps with the main vocals and dbx 160SLs for things that need to shine without being toppy or thin. I love Distressor EL8s—they are brilliant for vocals and on drums."



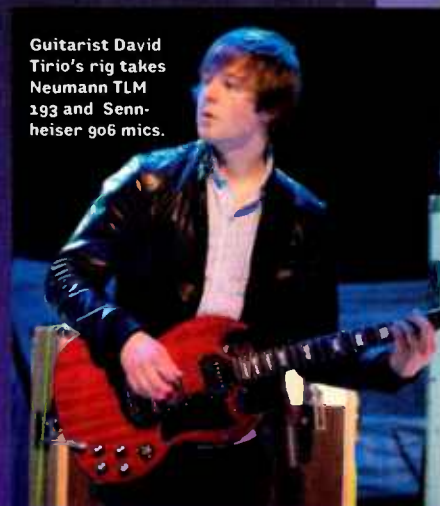
Snow Patrol monitor engineer Tristan Farrow is mixing on a Yamaha PM5D using the updated FX library onboard. All bandmembers are on IEMs: "[Vocalist] Gary Lightbody uses Sensaphonics as he prefers the soft silicon fit along with the warm tone," Farrow says. "The keyboardist also uses them as he finds they suit his key tone. The rest of the band is on UE11s. For me, mixing on the UE11s is like putting on your favorite pair of old slippers."



(Plain White T's bandmembers this page.) Vocalist Tom Higgenson (vocals, guitar) sings through Sennheiser EW 500 wireless; the rest of the band uses wired Sennheiser 935.



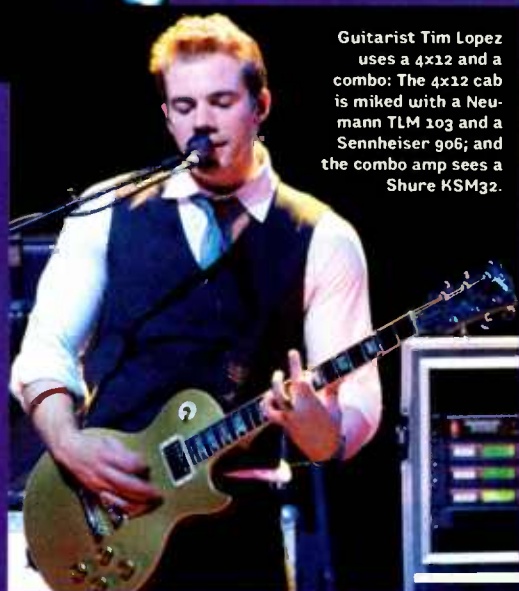
Mike Retondo's bass cab is miked with a Sennheiser 421.



Guitarist David Tirio's rig takes Neumann TLM 193 and Sennheiser 906 mics.



For drummer De'Mar Hamilton, mics are either clamped on directly or his drum tech uses modified DW hardware and puts LO2 quick-releases on arms and such. "It makes for a very sleek and clean look while allowing us to set up and tear down quickly," Robinson says.



Guitarist Tim Lopez uses a 4x12 and a combo: The 4x12 cab is miked with a Neumann TLM 103 and a Sennheiser 906; and the combo amp sees a Shure KSM32.



Plain White T's sound crew, from left: stage manager/drum tech Charles "Spyder" Wallace, FOH engineer Adam Robinson, guitar/bass tech Evan Bovee and monitor engineer Gino Scarim

Plain White T's FOH engineer Adam Robinson (below) is sharing a Digidesign Profile board with Snow Patrol FOH engineer Suneil Pusari. The system is running five DSP cards and they are currently using the FWx card to record board mixes every once in while.

Robinson uses such onboard plug-ins as Smack! comps, a few Focusrite EQs, McDSP mul-

tiband comps ("my 'never mix on a VENUE system without' plug-in," Robinson describes) and the reverbs ported from a TC 6000 system. "I have an Eventide Eclipse I use for some special FX and spend the rest of the time drooling at the rack of top-notch outboard gear Suneil spec'd for his show," Robinson adds. "Suneil and I have a computer set up next to the console running SMAART, which we use to tune the [house-provided] system and do time alignments with. Typically, each day we start by listening to the systems 'as-is' and then do the time alignment. Suneil will then walk the room with the Lake tablet, tuning the system. I then add an overlay to his EQ and make the few modifications to get my mix to where I want it.

"For our changeovers, we were completely offstage in an average of six minutes, leaving the Snow Patrol crew the remainder of the 30-minute changeover to get ready."



Gino Scarim, Plain White T's monitor engineer (above), mixes on a DiGiCo SD8, touting the board's great sound and user-friendliness. The band recently upgraded to the Sennheiser Evolution Wireless G3 300 IEM Series. "The Sync function was a great new feature. Tom, Tim, Dave, Mike and I are using Ultimate Ears UE7 ears, with De'Mar using Ultimate Ears UE7, UE10 and UE11. We're not using any wedges, though we are talking about adding a pair for Mike Retondo in the future. We both really like the d&b [M2] wedges Snow Patrol is using."



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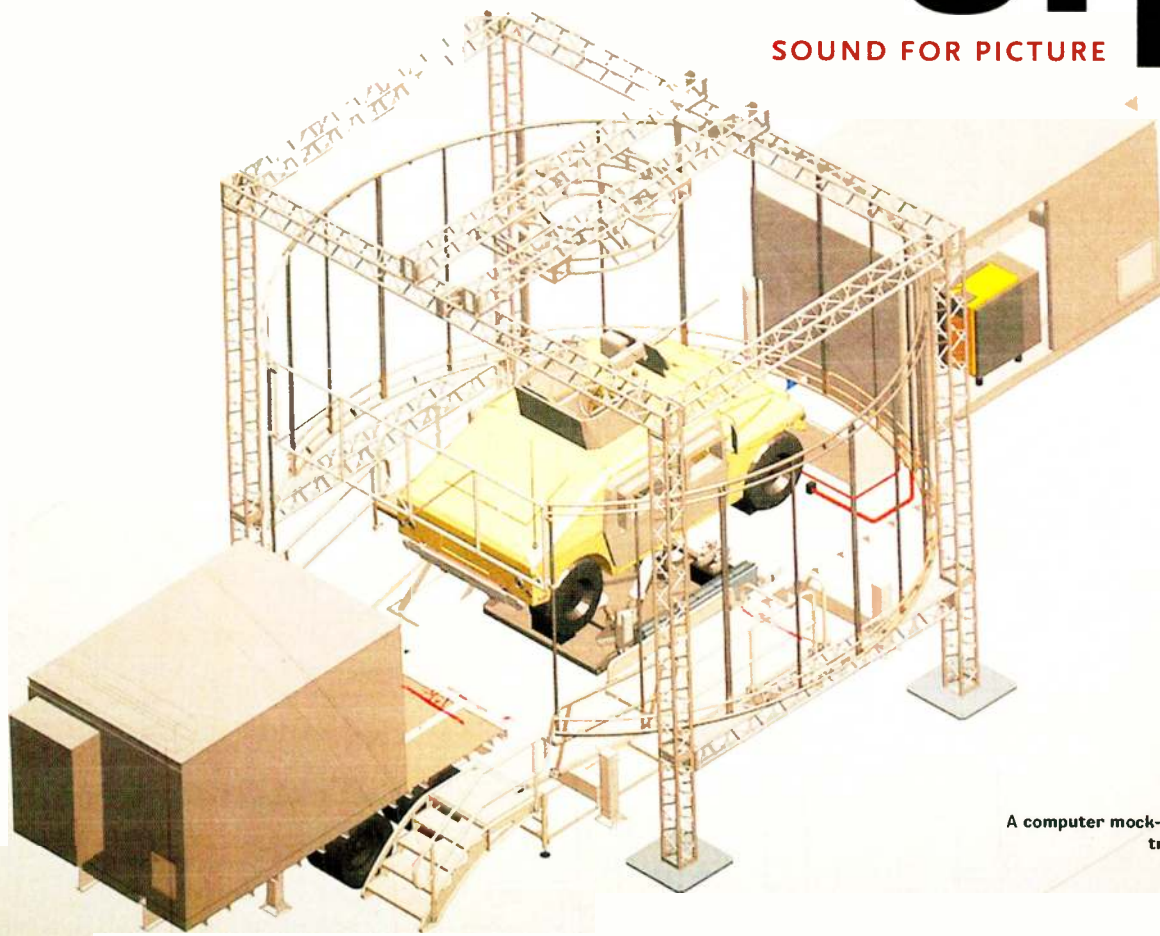
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World Radio History



A computer mock-up of the Humvee training simulator

By Blair Jackson

Trying to Save Lives With Sound

RE-CREATING THE WAR IN AN IED ATTACK SIMULATOR

Ezra Dweck has been working in post-production for some 18 years now, and he's amassed quite a résumé for himself. He started his career recording FX at a company called Thunder Tracks, which also included future Hollywood post aces Mark Mangini, Steve Flick and Richard Anderson. That company then became Screaming Lizards and later Weddington Productions. "[Weddington] built a little mix stage," Dweck recalls, "and I started mixing, and I've been a freelance and sometimes staff re-recording mixer ever

since—mostly feature films, but also television." Add to that an occasional credit for FX editing, Foley editing or mixing, even supervising. He continues to mix both features and TV—the past three-plus years he's juggled work on two hit series, *Brothers and Sisters* and *CSI: New York*.

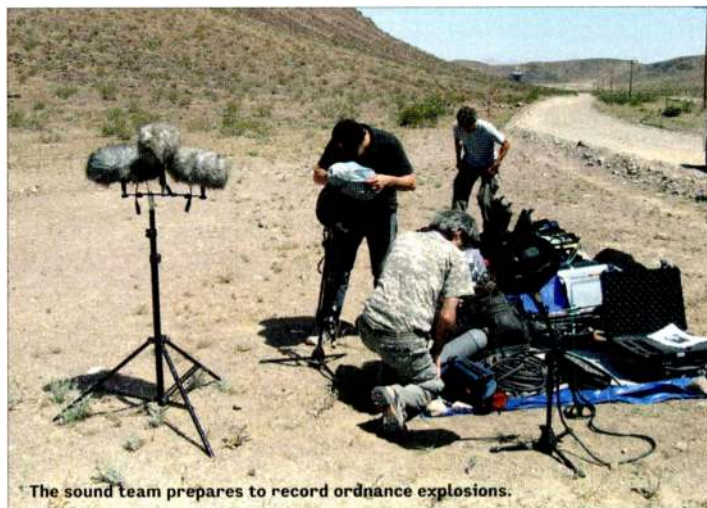
But one of his recent jobs, away from the Hollywood mainstream, has proven to be one of his most interesting and challenging: designing, cutting and mixing the effects for an ultra-sophisticated military Humvee train-

ing simulator aimed at protecting U.S. troops from IED (Improvised Explosive Device) bombings and other insurgent attacks. ("Humvee" is actually a loose acronym for HMMWV, or High Mobility Multipurpose Wheeled Vehicle.)

According to Dweck, RI Leaders project executive producer Richard Lindheim and associate producer Bob Wolterstorff—both of whom have TV backgrounds—"were approached by a three-star general who had gotten some intel that said if somebody survived an IED explosion, they were many times



Ezra Dweck mixing inside the Humvee



The sound team prepares to record ordnance explosions.

more likely to survive the next one. So the general approached Richard about working on this project, and then I got involved. It went through many iterations. Originally, it was just going to be some motion seats in a room, and then it turned into something much bigger”—namely, a customized, engineless Humvee on a motion base in a 60-foot semi-circle surrounded by 260 degrees of large screens onto which is projected a crystal-clear HD image from five Christie projectors at 15,000x1,080 pixels.

The visuals are a Humvee POV as it drives through a setting that looks remarkably like Afghanistan, with rumbly dirt roads, near-desert off-road conditions, small villages, jagged snow-capped peaks in the background and danger clearly lurking nearby. It was shot at a place called Lone Pine, a desolate area between Fresno and Death Valley in east-central California. “You’re driving down dirt roads identifying what they call ‘observables’ and ‘signatures,’ looking for the things that have been known to indicate IEDs,” Dweck explains. “There’s going to be a guy behind the curtain—an observer/controller who will be communicating with the guys in the Humvee. If they get it right, he can branch them off to a safe path; if they get it wrong, he can blow them up at any time or send them down other more difficult paths. In all, there are about a dozen different scenes with different branch points.”

The Audio Challenge

For the sound design, Dweck was tasked with coming up with as realistic a presentation of the sound inside a Humvee in patrol and combat situations as possible. The training Humvee will have five soldiers in it—four in the cramped main part of the vehicle, and one turret gunner on top partially exposed through the roof. “My

initial idea was to investigate some 360-degree surround speaker systems, but they just weren’t feasible for the space inside the Humvee,” says Dweck. “I went through a lot of negotiations with the guys who are building the thing—a company called Technifex that does a lot of theme park stuff—and what I wound up with basically is 6.1, but not in a traditional layout inside the vehicle. So it’s five speakers in a normal L/C/R, Ls/Rs position, and then there’s a full-range, full-sized speaker mounted in the dash in the middle and a subwoofer in the engine bay where the engine would be. I did a bunch of research to find a full-performance, relatively small driver speaker I thought would work, and I wound up with a Meyer MM4XP for the five. It’s about the size of a 4-inch tile, but about six inches deep. They run on a 48-volt distribution system, but they’re self-powered. They’re good down to about 300 Hz, so I need the full-sized midrange speaker in the middle to kind of balance it out.

“Then on the exterior, mounted on this giant truss that the projectors are mounted on, I also have three speakers [JBL EONs] arranged left-center-right.”

To get the sort of sounds he needed for the project, Dweck made several trips to the Army’s national training center in California’s Mojave Desert, a facility that’s often used by Hollywood sound crews to capture ordnance and vehicle recordings under military supervision. For the interior sounds of what is formally known as an M-1151 Up-Armored Humvee, “I spent a lot of time in Humvees, bouncing around with military personnel. I’ve done a lot of vehicle recording in my years—what some of us call ‘auto Foley’—so I had a pretty good idea of what I needed to get to make a usable kit out of my recording. I went out with a military driver.

They have a couple of interesting, intense off-road courses with 20-foot-high berms that you can drive up and down—we did several laps on those.

“For the interior, I used an 8-channel Holophone mic, which is like a bunch of DPAs in this big ball; it’s quite a nice mic. I used five of those channels out of the possible eight. Then there’s a guy who’s poked out of the gunner turret, so I knew it was important for me to get some exterior sounds for those three exterior speakers. For that, I used a Neumann 190 [stereo shotgun] single point M/S mic in M/S mode, which I stuck basically where the 50-cal [gun] goes to get some stereo exterior recordings. Then, for the last of the eight channels on my Sound Devices 788, I stuck a lavalier in some of the armor right near the tail pipe. So I ended up with a whole bunch of coincident 8-channel recordings of the Humvee, shot 24-bit.”

For the ordnance recordings, Dweck had help from some of his film sound colleagues: Mark Mangini, Jon Fasal and Charlie Campagna. For the massive main IED explosion, Army EOD (Explosive Ordnance Disposal) personnel used several pounds of C4 to detonate a 120mm tank shell in a dry creek bed as Dweck and company captured the sound from numerous mics ranging from 100 to 1,000 feet away. Dweck, with a Sound Devices 744 and [Crown] SASS-B with B&K 4006 omnis and Neumann 190 in Stereo mode—was the farthest away (and put mics inside a van for that muted sound); Mangini used a 788, his custom Schoeps setup and a Holophone; Fasal had a 788 and various dynamics and condensers, which he changed for each explosion; and Campagna’s rig was an 8-channel Deva with several different dynamics and condensers, and some PZMs.

The Army let Dweck and a couple of his

team members record AK-47s firing several hundred rounds—he amassed 20 tracks of that. Dweck also recorded some simulated radio communications “chatter” over secure military radios, tracked directly to Pro Tools LE on a laptop. That chatter is heard on two channels inside the Humvee training setup.

Not the Usual Post Process

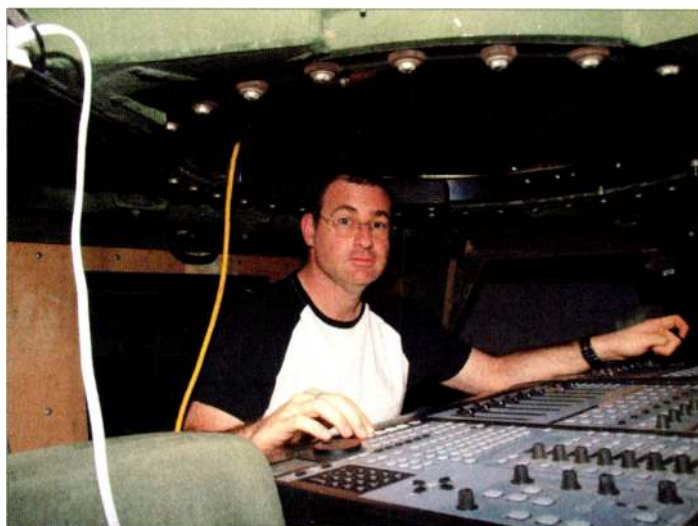
“When we were done, I brought it all back, put it up on Pro Tools and started weeding out and mastering it,” he says. “I used a little compression on some things, but I was trying not to use too many Hollywood tricks on any of this stuff. Through the whole project, I had to keep telling myself, ‘Verité, verité, verité!’ Those guys who are going to sit in the Humvee know how they sound, so it was really important that it was accurate and they weren’t instead paying attention to, ‘Wow, what neat sound effects!’” In fact, Dweck learned early on that the sound inside a Humvee when an IED blasts outside is fairly muffled, so the more pure explosion sounds would be heard primarily just on the exterior speakers, where the gunner hears most clearly.

Next, Dweck and Aaron Glascock (another top Hollywood mixer and supervisor) cut the FX, which ran the gamut from engine idles to a sandstorm and various winds, to ordnance fire and even simulated tinnitus effects for the chaotic first minutes after an IED explosion. Dweck did a rough mix of the material in one of the brand-new Pro Tools/D-Control “Concept”

rooms at Warner Bros., got some feedback from his producers and then did the final mix (also at Warner Bros.) on the speakers that were to be mounted in the Humvee. “I would like to mention how incredibly helpful Warner Bros. was with this project,” Dweck says, “especially Kim Waugh, Bill Angorola and the engineering staff.”

Of course, sound is just one part of this amazing simulation apparatus. The six-piston motion platform on which the altered Humvee sits can generate up to five Gs of acceleration and reproduce the bumps and hills shown in the HD video. Also, when an IED “explodes” under the Humvee, Dweck says, “a gas-powered pneumatic ram hits the bottom of the thing—it’s a helluva kick!—while a propane-powered concussive device called a bird cannon produces a 140dB bang.”

For the final mix in the actual simulator, Dweck rented a Pro Tools HD rig from Absolute Rentals. “We figured out how to get a ProControl main unit and one fader pack wedged between the two front seats of the Humvee, which was mounted on the motion



Dweck at a ProControl console stuffed into the tight confines of the Humvee.

base about seven feet up in the air. I had to climb in and out with a ladder. I jammed my 6-foot body into the back sitting on the transmission hump. The inside of a Humvee is a little torture palace, with large exposed bolts and brackets everywhere. I can’t count the number of times I hit my head, and I couldn’t sit up straight.

“It was without question the most uncomfortable mix room I’ve ever worked in. I would mix a scene, get out and stretch, and then grab Bob Wolterstorff and Richard Lindheim for a playback; they’d sit in the back seats directly next to me, we’d make some tweaks, they’d climb out and I’d move on to the next scene. The proof came when we started putting all the elements together—the mix plays exactly as we expected it to when the motion profiles are applied.”

Asked whether, ultimately, he feels like he’s doing a good deed by taking on this sort of project, Dweck notes, “You know, I’ve spent years sitting there at two o’clock in the morning replacing and removing inconsequential dog barks for the fourth time at the whim of some producer—which is my job and I’m glad to do it. But I’ve looked at my co-workers, and said, ‘You know, we’re really not saving lives here, guys.’ This is the first time I’ve been involved in something where I actually *might* have some effect on somebody’s life. If I can make this real enough and help a guy learn to spot something and avoid it, or help them learn how to make a direct hit more survivable because they’ve been through something like it once, that’s *huge*. That’s bigger than all my past credits put together.” III



One of the Pro Tools/D-Control “Concept” rooms at Warner Bros.



Director James Bartling, left, and author/composer Arlan Boll in Boll's composition studio

'Nostalgia'

VOICING A SOUNDTRACK

By Arlan Boll

As an advocate of newness in sound and film, I am constantly looking for art that has no repetitive boundaries. We are bombarded today with the same old thing. There are pointless film remakes and sequels, CDs that are mastered at 0db by default, and the total abuse of Auto-Tune software on vocals, which will date most music created in 2009. My feeling is that we should mix things up and seek creativity that challenges our being.

In an article I wrote for *Mix* a few years ago ("Surreal Sound, Toy Cameras," January 2002, available at mixonline.com), I told the story of using the sound from a toy camera to score a film titled *Killer Me*. A director happened to see this film (I'll admit, it wasn't easy to find), and he was interested in having the score of his own movie be completely different than what he saw as "the norm." I'm glad he called.

As a film composer, I have always had the idea of creating an entire vocal score, just to see if it could be done. Finding someone who would be willing to fund me to do so, and put that in his or her film, was the proverbial needle in a haystack. James Bartling from Twilight Child Productions Corp., the director of *Nostalgia*, had seen *Killer Me* and asked later if there was anything I had ever wanted to do

differently regarding the scoring of a film. When I told him about the vocal score, he was apprehensive to say the least, but after several conversations, we agreed to move forward.

Nostalgia is a very different sort of film in that the dialog was recorded beforehand with a micro-recorder and put directly into the non-fiction script. *Everyone* from the movie's events plays themselves, and many of the actual locations were used in re-creating particular moments in time as specifically as possible after the fact. Bartling has told me more than once that "*Nostalgia* is a movie about human connections," so it made sense to extend that theme to the score. Musically speaking, it doesn't get any more human than the larynx.

As we all know, music can certainly change the viewers' experience of a film. But if you bring human voice as the only musical instrument, it can have both an enormous impact and introduce countless challenges. I now know why nobody scores film in this manner—because it's harder than hell to do.

Hundreds of individuals contributed vocally to the *Nostalgia* score. The vocalists and compositions are from numerous ethnic backgrounds; the genres range from classical to tribal. The recording of the music involved

everything from one-take solos to quarter-second edits. Some pieces practically wrote themselves. Others were painstaking to assemble. I know it's a cliché, but you really have to hear it.

One piece in particular, titled "For You," was composed for the end credits, and it is the culmination of the soundtrack album. Because lyrics tend to fight with dialog in film, this is one of the only pieces that has lyrics in its composition. "For You" comprised about 40 vocalists, with 128 tracks total in a Pro Tools Mix Plus session. Because I run a recording studio [AB Audio Visual], I have many vocal clients. "For You" included a country-western artist, an opera singer, a gospel vocalist and a crooner, to name a few. There was also Susaye Greene, an ex-Supreme.

Most Pro Tools users are familiar with Beat Detective, which sees transients in the music file and cuts before the transient. For example, if you had a file of a bongo hitting 10 times, you would have 10 cuts. If you put a vocal line through Beat Detective, it sees the consonants and cuts there. I used this to define notes in the lyrical lines of "For You." I took one line from one client and one line from another until I had a potpourri of different voices. Then, within Beat Detective, I got a potpourri of vocal notes times a thousand.

With those notes, I was able to create patterns and harmonies, layer upon layer, until I had a full canvas of new music. In some ways, it wrote itself: There is a lead instrumentation bridge in which vocals are reversed and panned left and right. In the verses of the song, there are layers of notes. The menagerie of the piece as a whole is very hypnotic. The only effect used was reverb. Nothing else was necessary because the voices themselves were the effects.

Not all pieces of the album were constructed in this manner. "Batra Dreams" was actually composed as an emulation of the Harmonium, an Indian instrument. The *Nostalgia* title theme, written with the director, was actually made-up phrases, or scat, sung as its own language. There's an 80-year-old vocalist who sings an antiquated hymnal and a gentleman born in Tanzania who used a verbal click-y language called Xhosa in another piece. In the song "Roy and Mo (O and D Dance)," I took the initiative of simulating George Martin's approach to the calliope at the end of the song "For the Benefit of Mr. Kite," where he took the magnetic tape of the recording of the calliope, cut it up with

INDIE FILMMAKING TODAY

[Editor's Note: Ever since *Nostalgia* director James Bartling finished his film, he has been trying to sell it in today's climate, with little help. We asked him to share some of the "business" side of today's filmmaking experience.]

When asked about my profession, I explain that I'm a dork from Long Beach who happens to have a privilege of falling in love with ideas. I've spent 13 years making a truly independent movie, *Nostalgia*, and have worn many different hats, most recently as a distributor. I have no big-wig Hollywood ties. My family has risked a second mortgage against our house for funding, and we've come a hair's breadth from foreclosure. I've been ripped off tens of thousands of dollars, and to date I haven't earned a penny. Through it all, I have truly maintained my love of art, its processes and its people.

Traversing the entertainment world is an intimidating and potentially frightening prospect. Can the creative side reconcile with the business end? How can I constructively survive in this industry when it can appear more likely to meet someone who cares more about their own personal gain rather than one who wants to develop a meaningful collaborative working relationship?

Becoming a distributor grew out of necessity. *Nostalgia* was screened for larger distributors in early 2009, and of the roughly dozen invited, only one attended. I was turned down. The struggling economy played a role, I was told. No one wanted to take a risk, no matter how conservative, and they still don't today. So how do I deliver *Nostalgia* to the theatrical market and make the economy work for me?

I do my research and get on the phone. From the beginning, *Nostalgia* was intended for the theater; it was shot and mixed that way. My instincts told me that distribution through any other market first would mean the kiss of death, so that narrowed my focus. When speaking with theater circuits, a key point of my pitch is drawing an untapped audience who do not normally attend. I include myself in that grouping. Hollywood as a business looks at the bottom line: money. At the end of the day, my product has to sell itself.

On a practical level, I'm responsible for the completion and delivery of the physical product, all related promotional materials and

a marketing plan of attack that can all simultaneously execute during the course of an entire year, depending on how the movie is rolled out geographically. I don't have the space here for a detailed essay outline, but let's say you're a distributor and a theater circuit that has 20 theaters in one state takes you on. Just because those theaters are available doesn't mean you're going to open in all of them at once. The circuit will most likely select three theaters in specific cities to start, based on the economic knowledge of the population that has the most history of supporting your film's genre. After a few weeks, if business does well, one or more of those prints may be shipped to other theaters throughout the state, continuing the cycle. Knowing this going in, you save money at the outset, freeing up funds for other needs and opening up the opportunity to make enough in sales to pay back into itself if the need arises. When and where a movie is first released is referred to as its "first run." It is not uncommon for a movie to have a 32nd run. *Nostalgia*'s opening run is tentatively slated for March of 2010. It is no accident that its soundtrack is released first to kick off the marketing campaign. Composer Arlan Boll and myself are hoping that interest in the music will carry over to the movie, given that each is strikingly original in its own way, and we will be updating this journey on *Nostalgia*'s Website (www.nostalgia-movie.com), which launches in January.

A remarkable offer for angel funding came in June, from a source who attended the first screening. This offer included paying for prints and advertising, although none of those funds have yet been made available. So for the conceivable future, I'm still going it alone, with only my wits about me. It's a rather exciting prospect to bring an independent production to fruition in a completely independent way.

One of *Nostalgia*'s main themes is "connections," and that applies perfectly to my role as a distributor. I'm just one man, without a car, without a cell phone, sitting in a small room, using a single land line, making a sincere human connection with the person on the receiving end. Along with having a product you believe in—created from real sweat, blood and tears—this connection is what's most important; it's what it takes.

—James Bartling



Nostalgia's mysterious lucky charm appears on the liner notes.

scissors, put the pieces of tape in a hat and pulled them out one by one, then Scotch-taped them back together. If you notice at the end of this song, the calliope has some jarring edits, but it still works within the song's framework. In the same way, we had a female vocalist sing lines out of a phone book, and we subsequently chopped them up, put them in a digital hat, shook them around and arranged them as they fell out. The variety of musical pieces makes this album one of a kind, and I believe it's worth a listen.

Nostalgia's 42-minute vocal sound-

track debuted in December as a digital download, released through TuneCore to all major online digital outlets. Director Bartling feels strongly that no individual tracks should be sold separately. "Arlan and I are not enamored with singles," he says. "I much prefer experiencing the total journey from A to B. We want the album experienced in the way it was originally intended and constructed, and give the consumer the best value for their dollar. At the same time, we realize that in the end we have to leave people to their own devices. It's ultimately up to you how you listen, or if you choose to listen at all. Whoever takes the journey will be rewarded." III



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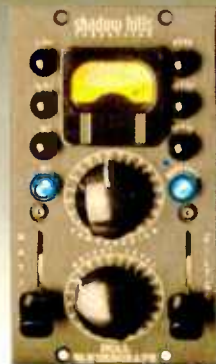
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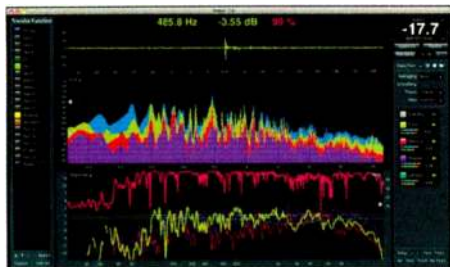
The UltraLite-mk3 Hybrid (\$595) from MOTU (www.motu.com) promises to be the world's first dual FireWire and USB 2 audio interface for Mac and Windows. It offers recording at up to 24-bit/192kHz, two mic/instrument inputs, six line-level analog inputs, 10 analog outputs, stereo S/PDIF and a headphone output. Other features include separate 48-volt phantom-power switches for the two mic inputs, a switchable -20dB pad and mic trim range from 0 to 60 dB. The unit ships with CueMix FX™, a 10-input/14-bus mixer with onboard DSP effects, including reverb, plus EQ and compression on every input and output.



Smart Gets Smarter

Rational Acoustics Smart Version 7

Smart 7 from Rational Acoustics (www.rationalacoustics.com) is FFT-based software for real-time sound system measurement, optimization and control. It can access multichannel input devices, operating native on both Windows and Mac—including 32- and 64-bit versions—running multiple, simultaneous spectrum and transfer function measurements. New features include delay tracking, enhanced impulse response, RTA and real-time FFT with better than 48th-octave resolution and an improved spectrograph, while a new code base and improved GUI support a modern object-oriented architecture for enhanced data acquisition and optimized measurement engines. Price: \$895, with various upgrade paths.



Tonal Tweaker

FabFilter Pro-Q Plug-In

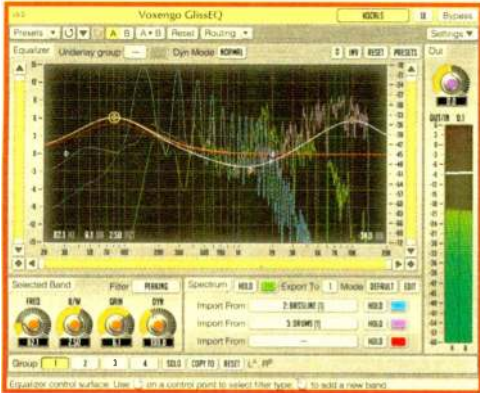
The Pro-Q (\$199) EQ plug-in from FabFilter (www.fabfilter.com) features up to 24 bands that operate in either zero-latency mode or in linear-phase mode with adjustable latency. Filter shapes include bell, high/low shelf, high/low cut with 6/12/24/48dB per octave slopes. You can link the bands or run them independently on multiple channels; a mid/side mode lets users process the mid and side signals separately. The display can be changed to 6/12/30dB ranges, and it provides automation of all parameters. It is available in RTAS, VST, VST 3 and Audio Units for Mac OS X and Windows.



Correct and Control

JBL MSC1 Monitor System Controller

No stranger to speaker tuning, JBL (www.jblpro.com) now brings its expertise to any manufacturer's monitor. The MSC1 (\$375) Monitor System Controller features console-like controls essential for listening from the mix position, as well as JBL's third-generation RMC™ Room Mode Correction technology. RMC allows connecting two sets of speakers and a sub, and then tunes the system to overcome LF room problems that can affect the quality of the mix. Features include the ability to monitor up to three 2-channel input sources while controlling the volume of the monitor system and connected headphones. The subwoofer output has its own level control, selectable crossover settings and RMC to blend the sub with the speakers perfectly.



Dynamic Behavior

Voxengo GlissEQ Plug-In

The GlissEQ (\$119.95) plug-in from Voxengo (www.voxengo.com) features 32 filter bands whose effective gain is dynamically adjustable according to the sound material being filtered. These "dynamic behavior" filters promise an assistive equalization experience where boosting highs will not create fatiguing overload and boosting lows will not "mush" the sound. Other features include instance naming, undo/redo, M/S mode, a real-time spectrum analyzer, and export to any other instance of GlissEQ—making it possible to compare intertrack spectrum in real time. It's offered in Audio Units and VST plug-in formats for Mac OS X (V. 10.4.11 and later) and Windows (32-bit and 64-bit) computers.

Sonic Refinement

SPL Vitalizer Plug-In

The SPL (www.soundperformancelab.com) Vitalizer (native, \$359; TDM, \$579) plug-in is based on the company's MK2-T hardware unit, which makes use of scientific psychoacoustic technology to process audio signals. The Vitalizer allows users to choose between a dry, percussive bass or a punchy, soft and very deep sonic character, and also offers mid- and top-end processing, which unmasks overlapping sounds. An easy-to-use compressor complements the bass section, allowing the correction of level change due to bass processing. Supported platforms include VST, Audio Units, RTAS and TDM for Mac and PC and Digidesign's VENUE.



Desktop Producer

Lexicon Omega Studio Bundle

Lexicon (www.lexiconpro.com) has launched the Omega Studio Bundle (\$279.95), an integrated computer/recording package that combines Lexicon's Omega Studio USB recording interface with Steinberg Cubase LE 4, Lexicon Pantheon VST reverb plug-in and an AKG D 88 S microphone. The interface is an 8-in/4-bus/2-out USB I/O mixer with inserts, instrument input, MIDI I/O, metering and monitoring functions, and the ability to record up to four tracks at once to Cubase LE's 48 tracks.



Affordable Performer

SE Electronics Project Studio Reflexion Filter Software



Aimed at the home studio on a budget, SE Electronics' (www.seelectronics.com) Project Studio Reflexion Filter (\$169) offers the same basic design as the company's Reflexion Filter minus the multiple layers, acoustic boundaries and higher price of the original. Instead of using multiple layers, the Project Studio Reflexion Filter uses a patented polyester acoustic board lined in high-density crystal foam with a curved ridge cut, promising better performance than standard acoustic foam.



Super-Quick RoboDuplicators

Primera BravoPro Xi Series Disc Publishers

The latest disc publishers from Primera (www.primera.com) offer 300-percent faster robotics, a seventh-generation disc-picking mechanism, optional Blu-ray recordable drives, and compatibility with Windows XP/Vista/7 and Mac OS 10.5 (or higher). The BravoPro Xi Disc Publisher (\$2,995) has a 100-disc capacity and a high-speed CD/DVD drive that can burn/print up to 32 discs per hour, while the \$3,295 BravoPro Xi2 Disc Publisher has a 100-disc capacity with two high-speed CD/DVD drives creating 60 discs per hour.

Stop Feeling Powerless

Roland Systems Group RSS S-o8o8 Digital Snake

Perfect for field use, the S-o8o8 (price TBA) digital snake from Roland Systems Group (www.rolandsystemsgroup.com) is an 8-in/8-out, compact, lightweight digital snake that supports multiple power options, including battery power, embedded-powered over REAC and power over Ethernet (PoE). It can be used paired together as a complete point-to-point 8x8 snake system or as a stage input box with any RSS V-Mixer. The inputs offer remote-controlled preamps, phantom power and 24-bit/96kHz A/D conversion, as well as choices of XLR, TRS line and hi-Z capability, which reduces the need for direct boxes. The included side-mounting adapter plate enables powering via IDX V-Mount or Anton Bauer Gold Mount battery systems.



Virtual Fretmeister

MusicLab Real PC Guitar

MusicLab (www.musiclab.com) has created the \$249 RealLPC virtual guitar instrument. It features multichannel layering incorporating a custom library of samples taken from every fret of all six strings of a real Gibson Les Paul Custom guitar. Floating fret position technology imitates the change of fret position of a guitarist's hand on the neck, giving the user the ability to play 140 frets using just 46 keys of a standard keyboard. Other features mimic strumming, plucking, sliding, bending and muting using a standard MIDI keyboard, as well as MIDI controllers such as Pitch Bend, Modulation Wheel, Sustain Pedal and Aftertouch.



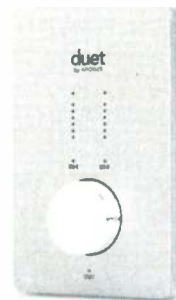
Track Tidier for Post

Waves WNS Noise Suppressor

Designed for fast, effective broadband noise suppression on dialog tracks, Waves (www.waves.com) WNS (\$2,800, native and TDM) offers Pro Tools integration, multiple simultaneous instances, full recall and full automation. Features include zero latency, low CPU usage, user-definable frequency range selection and operation at up to 24-bit/192kHz. Supported formats include TDM, RTAS, AudioSuite, VST, Audio Units, Windows 7 and Mac OS X. III



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JZ BT-201 Condenser Microphone

Affordable Cardioid Has Open Top End, Interchangeable Capsules

The BT-201 is Latvian manufacturer JZ Microphones' take on a small-diaphragm pencil studio condenser mic. Its unique appearance is reminiscent of a '60s TV announcer's stick mic, with a slim black body tapering to a teardrop-shaped capsule. The 13mm-diameter electret capsule offers a sensitivity rating of 11 mV/Pa and a max SPL handling of 140 dB without requiring a pad. Capsules are hot-swappable and come as cardioid, wide cardioid and omni (more on that later).

The head amp is a discrete Class-A circuit that uses a FET and no output transformer. There are no pad or low-filter switches. The mic's body is made from a machined-brass alloy and measures 6.35 inches long and one inch in diameter. It will fit into most dynamic mic clips such as Shure's SM57, which is a good thing as no clips or shock-mounts are included. My review pair came with two optional JZ1-7 shock-mounts made by Rycote that sell for \$104 each.

In the Studio

My first job for the BT-201 was recording a Martin D-15 mahogany acoustic guitar. I placed the mic about 16 inches away, aimed at the 12th fret and at about the player's chest height. I recorded with no equalization or compression, straight into Pro Tools HD at 24-bit/96kHz using 45 dB of gain from my RTZ 9762 mic preamp (based on the Neve 1272 design). I tried all three capsules.

The wide cardioid pattern produced the



The BT-201 comes with a cardioid capsule with wide cardioid, omni and stereo pairs available optionally.

best results, as it captured this dreadnought guitar in the most balanced way—not overly bright or excessively boomy. It sounded just like the guitar sounded in the room. The regular cardioid setting was also good but not quite as rich sounding. The omni yielded even less bass because of the lack of proximity effect, but as with any omni mic, the overall sound was more open, pulling in more room sound—including my computer's fan noise.

The BT-201's hot-swappable feature is nice. I liked changing capsules on-the-fly; while in use, they stay solidly on the mic's body, but when changing them you do have to mute the mic's channel to avoid loud pops. The Rycote shock-mounts are a must, and I'd recommend a good pop filter for vocal recording.

Next, the pair went to work as wide-spaced cardioid drum overheads through a vintage Neve 8028 console. Compared to the 30-plus-year-old AKG C 12As that they replaced, the JZs, with wide cardioid capsules, were a lot brighter, making them better for light traditional jazz drumming where you might desire the extra articulation. However, for this particular hard-rock session with a cymbal-bashing drummer, they didn't work out.

But at another studio, the BT-201's bright sound worked well for a rock piano sound. I had them set to omni and placed just at the edge of the crook of a Steinway 6-foot grand. Using DigiDesign's C24 console mic preamps and no processing, I placed the mics facing directly across the harp and aimed at the hammers.

Compared to a pair of Audio-Technica AT4050s in the same location, the BT-201s were brighter—they gave me the brightness I wanted to cut through a dense track. To achieve this kind of percussively bright sound, I usually place mics right over the hammers. With the BT-201s placed farther away, I got a wider sound that captured more of the piano's total sound: the soundboard, harp, hammers and the recording space itself. It sounded less compressed than it usually does when close-miked.

Rockin' Pair

The JZ BT-201 comes in a foam-lined wooden box in several variants: A single microphone with a single cardioid capsule is \$515. You can also buy a single mic with cardioid, wide cardioid and omni capsule heads for \$635; or \$1,349 buys a matched stereo pair (reviewed here) where each mic has the three capsules. Extra capsules are \$105, and there is also an optional wide cardioid capsule available with a built-in -20dB pad for \$130.

A matched pair of JZ BT-201s makes an excellent addition to any collection. These mics have a high output level and require little or no processing to capture great sound—particularly from pianos, acoustic guitars and quieter or more somber instruments. I liked all three capsules that come with the mics and found the quick-change, hot-swappable feature very useful and preferable to pattern switches. **III**

Barry Rudolph is an L.A.-based engineer. Visit him at www.barryrudolph.com.

PRODUCT SUMMARY

COMPANY NAME: JZ Microphones

PRODUCT: BT-201

WEBSITE: www.jzmic.com

PRICES: \$515, single mic/single capsule; \$635, single mic/three capsules; or \$1,349, stereo pair (all MSRP)

PROS: Well-made, three included hot-swappable capsules, bright sound.

CONS: No mic clips or shock-mount or any other kit included, bright sound.



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Universal Audio UAD-2 Solo/Laptop Card

Portable PCIe Interface Runs Excellent Processor Emulations

Whether Universal Audio is focused on developing analog gear or software emulations, the company has always been dedicated to sonic excellence. Its UAD system offers expertly crafted plug-in versions of the vintage analog gear the industry has come to love—outboard, classic consoles and more. The plugs run on UA's DSP, which offers the advantage of not using resident (native) processing to achieve the processing outcome. Until recently, the UAD system used the PCIe bus of desktop computers, but now the UAD-2 Solo/Laptop accommodates the needs of laptop-based DAW users, attaching to the ExpressCard slot to achieve much higher bandwidth than FireWire or USB 2 can provide. This port has been available on high-end PC laptops manufactured in the past few years, as well as MacBook Pros.

In the Test Lab

Installation was a snap on my 3GHz MacBook Pro with 8 GB of RAM. The latest version of the accompanying software from the UA Website installed in a few minutes. Authorization meant downloading a small app from UA's Website and running it—very simple. No iLok is necessary as the card is required to run the plug-ins and serves as security in and of itself.

The software control panel is inviting and makes it easy to flip through different settings to optimize the hardware. I can appreciate a plug-in manager where you can see which plug-ins are authorized, which ones you are demo'ing and which ones are available for trial. If you want more info about a plug-in—for example, the device on which the model is based—convenient buttons link directly to an online description. This makes

it easy to figure out which tool will be right for the job. Every plug-in in the store is available for a 14-day, fully functional trial. The card also comes with a few free plug-ins to get you started.

Among the free plugs is the high-efficiency version of the 1176. This works much like the actual hardware version. The 1176's compression is one of those unparalleled sounds that's well-suited to a variety of applications, and as I turned the dials, I was pleased to hear its familiar tone faithfully represented. On an electric bass, it provided even, round bottom end while enhancing the bite of the strings' attack. The included Pultec EQ plug-in performed admirably. A Pultec EQ across the two-bus has always been one of my favorite finishing touches in a pop mix, just before the last limiter. It's great for adding an overall low-end bump and some edge on the top. The Pultec plug did this cleanly, emphasizing the overall harmonic content in these ranges without muddying the midrange frequencies.

I also tried some of the demo plug-ins. As far as vintage reverb goes, an EMT 140 plate is among the finest. Universal Audio studied three different plates from The Plant studios in Sausalito, Calif., and modeled them well. They sound warm, lush and open in the midrange, and there's a nice top-end sheen. This really helped glue the elements of a mix together while maintaining detail. The newly modeled Empirical Labs FATS0 limiter lends a unique squashed sound to a drum subgroup or the two-bus. In more extreme instances, the FATS0 imparts enhanced harmonics through tasteful analog distortion. I was skeptical of a software model's ability to convey those inherently analog sounds, yet the UAD version surpassed my expectations. The



The Solo/Laptop card comes with a free set of plug-ins.

same was true of the Neve 88RS. Its distinctive tone and combination of EQ and compression pulls a vocal forward in a very distinctive way, enhancing the upper midrange and relieving the density in the lower midrange. It's also great for unearthing synth pads lost in the battle of the midrange. No EQ or compressor I've ever heard has provided a comparable character, but the UAD-2's 88RS truly delivered the same benefits as real Neve components.

On With the Performance

I used the Solo/Laptop with Logic 9 running on Mac OS X Snow Leopard; Logic 8 with a Harrison Mixbus virtual console; and Pro Tools M-Powered Version 7.4 running on Leopard. Aside from the MixBus, which crashed frequently while I was manipulating plug-ins (a problem Harrison has recognized and plans to correct in an update arriving soon), the performance was flawless. I like the small DSP Meter window, which doesn't occupy much room on the screen. I was a bit disappointed with how quickly I could max out the processing power of the UAD-2 Solo/Laptop's SHARC chip.

However, this made more sense when I tallied my plug-in count. I maxed out at four 88RSs, two 1176 SEs, two Pultec EQs, an LA-2A, a Moog Filter, an SSL Bus Compressor, a Plate 140, a UA RealVerb Pro and a Cooper Time Cube—a tall stack with 14 instantiations of the heartier plug-ins. That said, it would be nice if you could run additional UAD-2 plug-ins in

PRODUCT SUMMARY

COMPANY NAME: Universal Audio
PRODUCT: UAD-2 Solo/Laptop
WEBSITE: www.uaudio.com
PRICE: \$649 list; \$499 street

PROS: Good variety of quality plug-ins. Frees up DSP. Very portable.

CONS: ExpressCard slot not available on many laptops.

By Brandon Hickey

RTAS or VST versions when the SHARC chip is used up while still necessitating the device itself for authorization. My quad-core internal processor had significant CPU headroom, and considering the fact that the MacBook Pro is the only laptop in the Mac family with the ExpressCard slot needed for this device, it seems that this might often be the case.

My only other issue was the considerable latency introduced by many of the UAD-2 plug-ins. Logic compensates automatically, but when trying to track a vocal overdub or a MIDI keyboard feeding a Logic instrument, I had to bypass some plug-ins for the sake of performance. Pro Tools M-Powered suffered the most because there is no automatic delay compensation, but UA offers a solution. Bundled with the UAD-2 Solo/Laptop is a third-party RTAS plug-in from Mellowmuse called ATA (Automatic Time Adjustment). You start by putting an instance of the plug-in on each track and the master fader. It compensates by playing a pulse through each track and measuring the round-trip delay. This certainly helped when using dynamic processors and it tightened up the Pro Tools/UAD-2 relationship overall, but when it came to time-based processors, the results were more unpredictable. Naturally, when you are deliberately inducing some amount of delay as an effect, the ATA has no way of knowing what you're trying to do. I found that upping the dry output of the plug-in during pinging, and then switching back to 100 percent wet afterward seemed to help, though it was less convenient.

Is It Top Gear?

Altogether, I am pleased with the UAD-2 Solo/Laptop experience. It's a valuable tool, particularly when access to high-end outboard gear is limited due to budget or the need for portability. The models offered provide excellent processing, and as far as plug-ins go are certainly among the most valuable tools I have encountered. Trying to run these powerful plugs would certainly take a toll on a native system, so the additional DSP is certainly welcome and now more portable than ever. There are no cables and no power supply, and the card sits neatly inside the machine with only a small protrusion. With only minor complaints and plenty of praise, it seems that Universal Audio has created a product that will fit into a variety of production environments. ■

Brandon Hickey is an engineer, educator and post-production consultant.

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iZotope Alloy Channel Strip Plug-In

Affordable Toolkit Brings Unexpected Versatility, Low CPU Drain

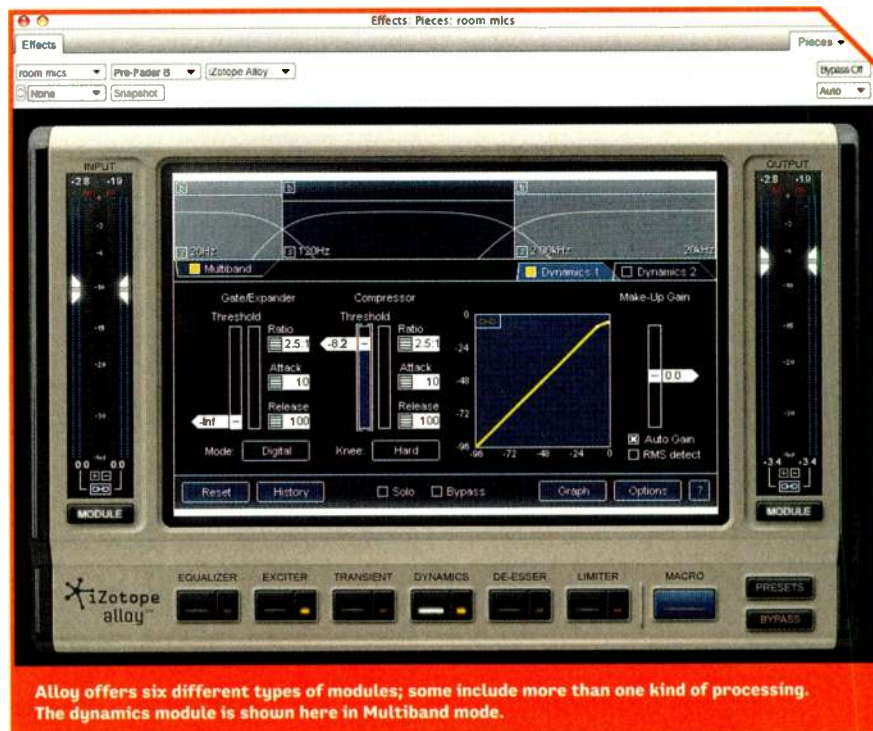
Most channel strips include EQ, compression, phase inversion and perhaps limiting and gating. iZotope Alloy does all this and more, adding transient shaping, stereo widening, harmonic excitation, de-essing and phase rotation to the mix. Many of the processors offer a Multiband mode wherein you can apply processing independently in up to three frequency bands. Side-chaining, MacroPresets (stripped-down presets with simple controls) and an uncluttered GUI add to the appeal of this cross-platform Mac/PC plug-in. Alloy is available in Audio Units, RTAS, AudioSuite, VST, MAS and DirectX formats. I tested the MAS version of Alloy Version 1.01 in MOTU Digital Performer 6.02, using an 8-core 2.8MHz Mac Pro running Mac OS X 10.5.4.

Metal or Gas?

Alloy is to mixing what Ozone is to mastering, and users of either iZotope product will feel immediately at ease with the other due to their similarities. Alloy's GUI is easy on the eye, thanks to its modular approach: The first module in the chain is an 8-band parametric equalizer, but you can freely re-order individual modules.

The equalizer offers seven different filter types for each band: low and high shelving, lowpass and highpass (both gentle- and sharp-sloped versions) and peak (bell-shape). Up to 15 dB of boost and 30 dB of cut is available for shelving and peak filters. You can use Alloy's wide-ranging Q controls to implement both surgical notch filtering and broad tonal shaping. A defeatable soft-saturation option emulates the response of analog EQ at high signal levels.

Alloy's Exciter module emulates the har-



Alloy offers six different types of modules; some include more than one kind of processing. The dynamics module is shown here in Multiband mode.

monic enhancement of vacuum tubes, analog tape and transistors. Or, you can select custom "bright" and "warm" settings that generate only even-numbered harmonics. Can't decide which to use? Drag a cursor around an X/Y axis to create a blend of different types of excitation and adjust the number of harmonics generated. Choose Multiband mode and select a different type of exciter for each of two or three bands, adjusting the crossover frequencies to your liking. On stereo tracks, use Alloy to widen the stereo image independently in up to three frequency bands. Imagine widening the stereo image of a synth's tube-processed high frequencies while collapsing its tape-flavored bottom end to mono.

The Shape I'm In

Use Alloy's transient-shaper module to increase or decrease gain independently for a track's attack and sustain portions. For example, you can boost the attack of a snare drum to enhance

the stick hit while simultaneously decreasing its sustain to tighten up the sound. Or try tweaking the duration of the attack and sustain envelopes for a finer or broader point on kick drum hits.

Two independent dynamics modules can be chained in series or parallel. Each has a compressor and gate/expander with threshold, ratio, attack and release controls. The compressors can emulate the multistage release and program-dependent response of opto compressors or yield a more linear compression curve. The gate/expander includes upward-compression capabilities. You can apply processing in Multiband mode and trigger individual bands from an external source. For example, make bass guitar notes trigger compression of low frequencies in a kick drum track to tighten up the bottom end.

Alloy's de-esser offers threshold, attack and release controls. Adjust the bandwidth of the frequency band to be processed. Then solo that band to home in on the sibilance.

Alloy offers soft and brickwall limiting.

PRODUCT SUMMARY

COMPANY: iZotope
PRODUCT: Alloy
WEB: www.iZotope.com
PRICE: \$249 (MSRP)

PROS: The majority of processing modules sound great to phenomenal, especially in combination. Superb GUI ergonomics. Very low CPU draw. Low price.

CONS: Substandard transient shaper. Harmonic excitement sounds too subtle on some sources; introduces clicks on others.

Both modes feature automatic makeup gain, making Alloy's limiter also a maximizer. An accompanying phase tool does more than allow independent phase inversion for left and right channels of a stereo track. It also includes a zero-latency phase-rotation control that increases headroom by improving waveform symmetry.

Each module can be independently bypassed or solo'd and have its I/O levels adjusted. Alloy's extensive metering tools include spectrum analysis for the equalizer and exciter modules; I/O, gain-reduction and curve-level meters for the dynamics section; and a limiter histogram. Sampling rates up to 192 kHz are supported. Comprehensive automation support, unlimited Undo history, a deep directory of presets and helpful A/B/C/D comparison tools add to Alloy's allure. Pro Tools LE users will appreciate Alloy's zero-latency mode, which prevents processed tracks from falling out of sync.

Mixing With Alloy

On a bass guitar track—with the equalizer set to boost the bottom end and roll off highs, and the exciter set to "warm" for frequencies below 190 Hz—the sound was a bit richer than what I started with. The real magic happened when I engaged Alloy's brickwall limiter downstream, which made the bass sound huge and very even.

I tried adding sustain to the bass using Alloy's transient shaper, but musical rests sometimes inexplicably resulted in a big jump in level on the first-following note's attack, making the transient shaper unusable for this application. I got far superior (punchier) results on trap drums using other transient shapers—SPL Transient Designer and Waves TransX—instead of Alloy's to pump up their attack. Alloy's Shaper made a snare drum sound downright brittle.

That said, Alloy's other modules in combination sounded phenomenal on room mics for drums. The compressor's hard-knee mode, using an 8.2:1 ratio and fast attack/release times, produced an explosive sound. But by also widening the stereo image in the Exciter module, the sound was transformed into a bombastic monster!

Alloy's equalizer sounded great on lead vocals, adding focus, roundness and shimmer. However, all but the sparest application of the exciter in midrange and HF bands tended to noticeably smear fricatives and sometimes caused loud clicks. (iZotope is aware of the problem and says it will address it in a future release.)

Alloy's compressor—set to soft-knee, 3:1 ratio and moderate attack and release times—

did a good job reining in the dynamic range of lead vocals without audible pumping. I did notice a slight loss of depth, however, which made it sound a tad thinner than results using the far more expensive Waves LA-3A plug-in. Alloy's de-esser worked phenomenally well. It removed sibilance so transparently and effectively that it has become my go-to de-esser for vocals.

On acoustic guitar, Alloy's exciter sounded far too subtle for my tastes. The equalizer did a good job clearing up boominess and mud.

A Steel?

Alloy imposed negligible CPU drain on my 8-core Mac Pro. Its harmonic exciter and transient shaper both need improvement. But at the modest price of \$249, Alloy is worth buying for its excellent de-esser, limiter, stereo widener, equalizer and compressors. There's a lot to rave about. III

Visit contributing editor Michael Cooper at www.myspace.com/michaelcooperrecording.

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Focusrite Scarlett Plug-In Suite

Versatile Virtual Toolset Mimics Legacy Hardware

Focusrite's Scarlett plug-in suite is a set of professional processors selling at the decidedly non-professional price of \$99. Available in boxed or downloadable versions, it comes in AU, RTAS and VST formats for both Mac and PC hosts (no TDM). Reminiscent of Focusrite's ISA and Red Series hardware, Scarlett was developed by the Forte Suite designers.

Get More From Four

The Suite has four processors: an opto-based compressor/limiter; a cross-linked dual-mono/stereo gate; a 6-band Red 2 and ISA-inspired EQ with filters, two parametric midrange and high/low-shelving EQs; and a reverb that uses a classic studio reverb algorithm. All four plug-ins have input and output level controls—helpful for dealing with over-recorded “red” levels—but there are no individual in/out buttons on the EQ for checking the effect of each of the EQ's six sections.

Once the suite was into my Pro Tools HD3 Accel rig on a Mac PPC quad-core running OS 10.4.11, I started with the Scarlett compressor and found it especially smooth on bass guitar. Just 2 or 3 dB of compression at 3:1 ratio, 2ms attack time and a 1-second release brought dynamic steadiness to a jumpy performance. Two large VU meters accurately reflect the compressor's action, although gain reduction is measured upward—opposite to most gain-reduction meters.

On electric guitars, I loved the sound of the factory Tight Limiter preset for dynamically shaping a pushy eighth-note rhythm guitar part to fit better in the song. I used both Scarlett EQ and compressor on the lead vocal—a good combo because after rolling out mic proximity with the EQ's Shelf section and brightening with the high-mid sections, the overall sound got thin. But fol-



The Scarlett Suite comprises four plug-ins: gate (pictured), EQ, reverb and compressor.

lowing it with the Scarlett compressor warmed and fattened it back up nicely.

On electric guitars, I used the low-shelf EQ for clearing out speaker “chuffing”—low midrange mud—and then pushed the upper midrange for articulation with both the low-mid and high-mid parametric settings.

The Scarlett gate has the same metering as the compressor, and controls for attack, hold, release, threshold and range. Sidechaining is covered by a set of mode choices. Default mode is for a normal mono or stereo noise gate; Left 1 mode allows input 1 to control the gating of input 2 while you hear only input 2; Left 2 mode is identical but monitors both channels; mode Right 1 lets input 2 control input 1 while you hear only input 1; and Right 2 is the same but you hear both inputs.

I tried an old disco trick by routing the drum machine kick-drum track to bus 1 and the bass guitar track to bus 2. I set up a stereo aux fader (whose input was bus 1 and 2) and inserted the stereo Scarlett gate. Scarlett caused the kick to trigger the bass. This worked great because the machine kick-drum pattern was strictly on time, fast and busy while the bass player played legato. The

producer loved that the bass guitar track only passed audio whenever the kick drum hit.

The Scarlett reverb is handy for inserting on individual tracks or for adding more reverb to another reverb. When setting this up and dialing in the reverb parameters, advance the wet/dry to wet to first understand the nature of the reverb. You'll hear the built-in pre-delay and how the Size, Pre-Filter and Air parameters affect the reverb's sound. This is a present-sounding reverb that worked well in good amounts for electric guitars and keyboards, and in smaller amounts on vocals.

When instantiating the reverb on single tracks, you'll get a mono reverb—an old-school reverb in which the track and reverb become a unified sound, a localized point source. When I used it as a send/return stereo reverb, it sounded big and realistic. I liked the shorter settings for adding subtle ambience and coloration to rhythmic guitars or percussion instruments.

Undeniably Suite

The Scarlett Suite is a tremendous value, offering the Focusrite sound for less than \$100. The only downside was the lack of individual bypass switching on the EQ. Other than that, I found all four plug-ins to be useful problem solvers. III

PRODUCT SUMMARY

COMPANY: Focusrite Audio Engineering Ltd.
PRODUCT: Scarlett Professional Plug-In Suite
WEBSITE: www.focusrite.com/products/software/scarlett/
PRICE: \$99 MSRP

PROS: Great sound. Multi-mode gate. Smooth compressor. Affordable.

CONS: No individual EQ section in/out. Reversed gain-reduction meter.

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IK Multimedia AmpliTube Fender Modeler

Guitar Amp/Effects Unit Brings More Toys to Your Wire Choir

In the studio, variety is the spice of great tracks. You can never have too many guitar amps/effects and IK Multimedia's AmpliTube Fender offers a versatile selection in a virtual package. With models of 12 different Fender amps, 12 cabinets, nine mics, nine stomp boxes and seven rack effects, the tonal possibilities expand to a dizzying level. This is not a simple amp modeler, but plug-ins within in a plug-in that let you stack effects and create your own dream rigs, or build upon the vast included library of gear combinations. I tested it within Logic and Pro Tools HD and LE, but it also operates as a stand-alone app supporting Audio Units, VST, RTAS in Mac OS X, and VST and RTAS in Windows XP or Vista.

All amp models are represented with careful attention to detail.



Go With the Flow

The completely modular and intuitive GUI makes the signal flow of the separate sections a breeze to understand. The bright yellow signal-flow diagram at the top of the GUI explains it all and lets you easily click into the separate sections and set up sounds. Need to tune? Click over to the slick, full-window tuner for a touch up or check it quickly at the bottom of the GUI, then jump to any other section you'd like.

The stomp box section offers virtual floor-space for 12 boxes in any combination. I was quite pleased with the Fuzz-Wah, which I controlled with IK's new Stealth pedal. Using this pedal, the virtual Fuzz-Wah operated smooth-

ly and produced tones that could easily pass for the real deal.

Next up are the amp and cabinet sections. As you flip between the choices, you'll see faithful graphic representations of the amps being modeled. The knobs and switches are also true to the actual amps; however, don't count on pulling out your old session-recall sheets, matching the control values set on your original tracking dates and expect to hear identical tones. When I compared some of the plug-in amps to the real-world equivalents, it seemed that most of the EQ frequencies matched up, for example, but the overall behavior and feel of the knobs varied slightly. Furthermore, no plug-in is going to produce a spot-on re-creation of the distortion and feedback of a cranked tube amp.

Once you choose your rig, you can use any of the included virtual microphones with any of the virtual speaker cabinets. There are added switches on the amps for moving the mic on/off axis and near/far from the cabi-

net, or you can quickly switch to another mic using the handy up/down arrows.

And if too much isn't enough, you can expand on your tonal palette by purchasing additional AmpliTube packages and using the free X-Gear software to combine their components with your favorite pieces of AmpliTube Fender gear. For example, you can run the Overdrive Screamer from AmpliTube Metal into your '59 Bassman from the Fender package.

The rack section provides journeyman processing, featuring a simple knob-per-parameter layout for such effects as pitch shift, flanger, tape echo, triangle chorus, wah and compressor. The "selected parameter" readout at the bottom of the GUI reflects your changes in numbers, though I'd rather see this readout on the individual rack effects and not at the bottom of the screen.

If you're worried that all this may get a bit noisy, there is a rudimentary noise gate at the bottom of the GUI that operated as most of these do: For major downtime, it will keep out the noise if the performance is quiet in the holes, but if the ambient noise of the track rises above the threshold, then the noise floor will

PRODUCT SUMMARY

COMPANY: IK Multimedia
PRODUCT: AmpliTube Fender
WEB: www.ikmultimedia.com
PRICE: \$229

SYSTEM REQUIREMENTS: PPC: dual 2GHz G4 processors/2GB RAM; Intel Mac: 2.3GHz core dual/2GB RAM; Windows: 2.33GHz core dual/2GB RAM.

PROS: Works very smoothly, grants much-needed control of software wah pedals, very expandable.

CONS: Maximum sample rate of 48 kHz.

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From left: You can move mics on- or off-axis, near or far, and add room ambience. The package also includes rack and stomp effects and a tuner.

rush to center stage.

Does It Rock?

As I stated above, no plug-in is going to nail the sound you get from actually moving air and heating up tubes. Nonetheless, the software consistently delivered some of the best

sounds I've heard from any amp synthesizer. You can get some warm, fat chunk with tube-ish grunge, or sparking Fender clean tones. Putting a distortion pedal in front of a Twin Reverb has always been one of my favorite Fender tones, and I heard a very practical representation of that. I was also really impressed

by the virtual microphones. For example, you switch out a Shure SM57 for a Sennheiser 421 and you get the approximate changes in tone you'd expect. Altogether, AmpliTube Fender is a solid, great-sounding package. With all the variables offered and some tweaking, you can definitely come up with enough usable sounds to take a bland guitar to the next level.

Depending on your processors and DAW, you may need to make some adjustments to run this CPU-hungry plug. When I used it while recording live in Logic, I wasn't able to run it with stomp boxes or rack effects unless I set the AmpliTube buffer to an unacceptably high level. However, on a beefier system in Pro Tools HD, I was able to run it in a mix at full capability, but only after lowering my CPU usage in the playback engine to 60 percent.

If you want to break out of the tonal limitations your gear is imposing on you, AmpliTube Fender is a very practical solution. Add up all of the good-sounding amps, pedals and microphones simulated by this plug-in, then multiply that by its convenience and expandability, and the \$229 price tag looks pretty good. III

Stealth Pedal/24-Bit Interface/MIDI Controller



I've always looked at wah plug-ins as a joke. You can set them to filter a certain frequency band or you can auto-wah, but it's not the real thing. What makes a wah unique is the fact that you manually control the sweeping filter and create an expressive talking effect.

This is exactly what you'll achieve when you pair IK Multimedia's Stealth pedal with the AmpliTube software.

The housing is shaped just like a Dunlop Crybaby wah, and the feel is similar to that pedal when controlling virtual wahs in the included software. However, it isn't just a MIDI controller; it's a 24-bit, 44.1kHz/48kHz interface that will work with your DAW (excluding Pro Tools) or the included Sonoma Riffworks T4 recording software. In addition, each Stealth pedal package includes a variety of AmpliTube virtual amp and effects bundles that can run as stand-alone software, Audio Units, RTAS or VST plug-ins.

In this tight little package, you get a pair of mono instrument-level analog inputs; there's no need for a DI. The inputs can also be used at balanced line-level. As for outputs, there is a built-in headphone amp with a level control and a stereo pair of balanced analog TRS outputs. Best of all, there's an input to plug in any two-button footswitch; you don't have to buy proprietary components. If

you have an amp with a footswitch (or a keyboard sustain pedal), hook it up to the Stealth pedal and go to work. There's even an input to connect an additional expression pedal. With all of that, you can control the bypass state of multiple software stomp boxes while simultaneously controlling a wah effect and a volume pedal effect. You can also write automation while tracking and then clean it up in the edit. Cool!

Upon installing the included software and drivers, the AmpliTube application recognized the hardware right away; there's no complicated setup. Mapping the Stealth pedal to the control values of the AmpliTube software was easy. Additional control of the audio I/O can be accessed through AMS. There's also an included application that lets you map MMC messages from the Stealth pedal to non-IK applications. This is a little more advanced, but was still user-friendly.

Aside from that, the pedal control was smooth and worked impeccably. In the included software, I found a whammy pedal reminiscent of the sound of the classic DigiTech Whammy. This sounded great and was a lot of fun. There were also a couple of wah effects that lent a great sound to solos or scratchy rhythm guitars. This is a killer product that feels sturdy, includes a lot of software and is a great buy. Prices: \$269.99, pedal and limited software; \$449.99, Deluxe package with pedal and additional software; both include AmpliTube Metal for a limited time.

—Brandon Hickey

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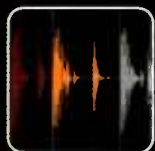
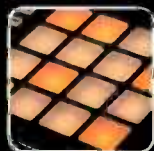


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Battery Power: Conventional or Rechargeable?

Going Green Might Be Easier Than You Think

Batteries have a language all their own. At the heart of all batteries is a single electro-chemical device called a cell. Examples are the AAA, AA, C and D. In non-rechargeable form, each cell generates 1.5 volts, and when “stacked” (wired in series) multiple cells create a battery; the 9-volt “transistor” and 12-volt “automotive” are the most common. Using simple mathematics, it is obvious that six 1.5-volt cells add up to 9 volts.

Disposable batteries are referred to as a primary power source and are most commonly made from alkaline (zinc–manganese dioxide) and zinc carbon; there are lithium-based disposables, as well. Rechargeable batteries are made from many different materials; nickel cadmium (NiCd), nickel metal hydride (NiMH) and lithium ion are popular with electronic devices; each has properties that make it suitable for certain applications over others.

Relative to primary batteries, the most obvious trade-off with rechargeable batteries is current capacity over time measured in milliAmp-hours (mAh), output voltage (typically less, but improving) and cost. As with many green technologies, the initial investment is higher. Local store prices on single quantities are most discouraging. Bulk buys at specialty stores can cut prices almost in half, yet the cost is easily three times more than, say, a conventional 9-volt battery at \$2 a pop in a box of 12.

The Hidden Feature

Modern gizmos are typically rechargeable by design and include power management—an essential feature that's built in to maximize our pleasure and minimize our pain. Familiar examples include laptops, cell phones and cameras that dim or power-down their screens but are otherwise fully capable, ready to do our bidding at the touch of a button.

The magic behind any energy management system is the software equivalent of having a voltmeter, ammeter, chart recorder and a brain, all in one compact package. Not only is energy transfer optimized during discharge (normal use), but also when charging, to maximize the total number of charge/discharge cycles. In plain English, for dealing with more complex and power-hungry gear, power management squeezes every last drop of juice out of the power source.

Elevated Awareness

Using rechargeable batteries in gear designed for disposable batteries requires a higher consciousness. The initial cost is higher, and it's also necessary to buy at least two batteries for every device—at minimum, there should always be one charged spare/backup. All should see regular activity.

When the best a vintage stomp box can offer is being “off” when no ¼-inch plugs are inserted, the onus is on us to be “the brain” that handles the power-management chores. How often have you left something on overnight, only to find it dead in the morning? For this reason alone, rechargeable batteries really do pay for themselves several times over in the long run.

Pessimista

Most rechargeable cells produce in the range of 1.2 to 1.45 volts instead of the typical 1.5 volts. This might not seem to be such an issue for one cell,



but in applications where multiple cells are in series, the end results may be just above the minimum threshold for operation. Consider these worst-case examples, based on 1.2-volt cells: a camera expecting to see 6 volts from four AA's instead sees 4.8 volts; walkie-talkies and audio analyzers expecting 4.5 volts from three AA batteries see 3.6 volts.

Dissection of a 9-volt alkaline battery reveals six 1.5-volt cells capable of 565 mAh. The same number of NiCd or NiMH cells—1.2 volts each—produces only 72 volts, so one or two additional cells must be added to make 8.4 or 9.6 volts, respectively. (Lithium-ion cells generate 3.2 volts.)

Primary battery manufacturers are varied, yet we tend to rely on the two popular brands: Energizer (Eveready/Union Carbide) and Duracell. Rechargeables take us into unfamiliar territory, where brand recognition is an oxymoron.

Three “discoveries” in the rechargeable 9-volt category help define the expectations. Powerex has a true 9.6-volt/230mAh NiMH battery; Powerizer's 76V/400mAh Lithium Ion version has a built-in PCB to prevent overcharging and over-discharging (notice the trade-off of more capacity, but less voltage), and IPower US has a 520mAh “9-volt” with a working voltage range of 8.4 to 6.5 volts.

Ottimista

With rechargeable batteries, the working voltage may not be too far above the most basic of energy-management systems—the “low battery” warning. The major difference is rechargeable batteries hold the bulk of their charge longer than disposable batteries. Figure 1 details a simple test using a 1.5-volt battery driving a Mini Maglite bulb consuming about 200 mA. The disposable battery is in red; the rechargeable is in green. As you can see, the red dots make an “S” curve, while the green dots go longer and are nearly horizontal, after which the voltage drop-off is severe.

It pays to have a good charger and to know the battery's history. For example, consider a set of batteries that get exclusive use in a digital camera. Digital cameras are very energy-conscious—they need to accurately write and preserve image data—so these batteries will experience the same charge/discharge routine and as a result, should have a similar life expectancy.

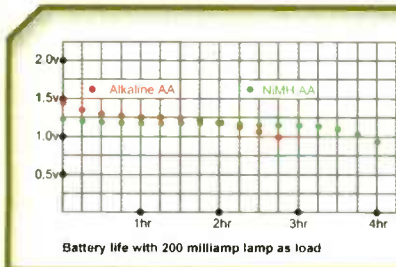


Figure 1: This comparison of AA cell life shows the conventional alkaline (red) battery maintaining power and then suddenly dropping off. The rechargeable NiMH (green) battery shows a gradual voltage reduction over a longer period of time.

Under the best circumstances there will always be the exception, a “surprise shut-off” that’s most likely caused by only one of the batteries. Testing each battery under load—that is, with a current drain similar to the camera’s requirements—will reveal the culprit. Similarly, inside a disposable 9V are six AAAA batteries—yes, smaller than an AAA! Inside a defective unit, one leaky cell was dead, the other cells ranged from 800 mV to 1.2 volts.

Experience and Observation

I’ve used rechargeable batteries in all sorts of conventional battery-powered gear—from kids’ toys to test equipment, flashlights and student lab kits—and always had plenty of charged spares. After testing several readily available appliances, I learned that an aged digital camera (using four AA batteries) sucked 800 mA when running the motor to extend the lens, then settled in at 500 mA with the screen on. A basic wireless mic, a simple oscillator and an Ibanez Dual Chorus consume 30 mA, 10 mA and 92 mA at

9 volts, respectively.

Modern electronics designed for battery operation consume about one-tenth the current of their cabled cousins. I recently helped a student repair the electronics in an active bass guitar. Inside was a surface-mount TL062 operational amplifier (a dual op amp), the low-powered version of Texas Instruments’ TL080 series, the former consuming 200 μ A (micro amps) per amplifier compared to 2 mA (milli-amps)/amp for the latter.

To obtain the most consistent results, I recommend one of the most complex and labor-intensive procedures known to scientists around the world: routine inspection, cleaning and preservation of everything—the battery, device and charger contacts. When using test equipment, it’s amazing how the slightest amount of contamination increases contact resistance, affecting both charge/discharge performance as well as how much pressure must be applied to get stable readings.

The essence of the scientific method is to observe, minimize variables, collect data and correlate the information. This is great when you have time but can be a nuisance when the show must go on and there’s no time for failure. The pressure to have a glitch-free show may put our “green-ness” to the test—it’s common to replace batteries for wireless mics and stomp boxes before every show. Used batteries are often recycled into less critical applications. That said, a little research and experimentation go a long way. III

Eddie’s mental battery is long overdue for a recharge in Italy. Send him a postcard via tangible-technology.com.

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'Cherry Bomb,' continued from page 47

sub-par—it would have been quite a nicely equipped 16-track studio in its time. Whatever the reason, the studio was the perfect environment for The Runaways to unleash their five-girl rock rebellion.

"Kim Fowley was a visionary," says Ripp, whose 40-plus-year résumé includes producing hits from the Shangri La's to the Lovin' Spoonful to Billy Joel and so many others. "He was creative, demanding, energetic and he understood he was dealing with something new. He wasn't making a Xerox. He encouraged the freedom and creativity and energy that he knew the girls had; they were young, they were impressionable, and they were teenaged girls connected with their experience of being girls playing in a guy's world."

Ripp sold Fidelity Recording in 2002 to Tom Weir, who renamed it Studio City Sound. The studio has remained busy and recently hosted Exene Cervenka of X, recording a cover of "Cherry Bomb."

In addition to continuing to produce, re-

cord, perform and write music, Fowley has a weekly program that's part of Little Steven's "Underground Garage" on Sirius/XM satellite radio. He's also been consulting with the producers and actors who are working on a movie about The Runaways, set for release in June 2010. The film stars Michael Shannon as Fowley, Kristen Stewart as Jett and Dakota Fanning as Currie.

The real Cherie Currie left The Runaways after the band completed three albums (*The Runaways*, *Queens of Noise* and *Live in Japan*). She made more recordings, including an album with her twin sister, Marie Currie, and she has acted in films and TV shows. The band recorded two more albums after her departure, with Jett singing lead. Sandy West remained with the band till the bitter end; after they broke up in 1979, she continued to record and perform, and worked as a drum teacher. She was diagnosed with cancer 2005 and died the following year.

Bassist Jackie Fox left the band in 1977 and became a Harvard-educated attorney. Lita Ford went solo after The Runaways

split, recording several successful hard-rock albums, including last year's *Wicked Wonderland*. Jett, of course, became the best-known graduate of The Runaways. She founded Blackheart Records with producer Kenny Laguna when she couldn't get a U.S. label deal for the debut album by Joan Jett & The Blackhearts. Her hits include "Bad Reputation," "I Love Rock 'n' Roll," "I Hate Myself for Loving You" and others. She continues to tour and record, and is one of the executive producers of the forthcoming Runaways biopic in which, rumor has it, the actresses portraying the bandmembers actually perform "Cherry Bomb" and other Runaways songs.

"A lot of the older stuff comes back, gets re-used or re-recorded," Fowley says, "and I'm grateful for that, but I'm always interested in tomorrow. Each day I have a new song, and each new song is better than any song I've ever written." III

Many thanks to Joey Latimer for providing technical information and contacts related to this article.

'Avatar,' continued from page 27

leave the orchestra out front. He likes to do that sort of thing—trade a bit. If the hooves of the Dire Horses [six-legged creatures] come in and drums are playing, often there's confusion, so he'll want to pick one or the other. In one instance we let the drums herald the horses coming in and then let the real horse hooves take over. And because we had the stems we could do that."

Asked whether the film being shown principally in 3-D affected his music mix, Nelson says,

"Just a little. I had worked on another 3-D film, *Monsters vs. Aliens*, and I applied a principle there that I also used on *Avatar*, which is to bring the music a little more out in the room, so it just hangs a bit from the screen without seeming gimmicky. It's subtle, but when you put the [3-D] glasses on, it has a slightly more wrapped feeling."

Of course, it was more important for the FX mix to reflect the film's 3-D qualities. Boyes, the effects mixer at the final, notes, "We knew we had to step up how we surrounded the audience in sound because we knew they were going to be

surrounded in image," he says. "So we would go upstairs [at Fox] and Jim would play us scenes in 3-D. We'd put on glasses, and he'd say, 'You see how that bullet comes by? The audience is really going to feel that come by.' Or, 'You see how this arrow flies through the screen—that specific one we need to take from the back to the front [speakers].' So we would pick specific elements that we really wanted to enunciate the back-to-front movement. We took copious notes of frame counts, and then downstairs we'd often step through it frame by frame with Jim and then perform it, and he would sign off when he felt it was working.

"I never felt we had to make radical adjustments [for the 3-D] and I also felt it was very important to just choose certain details to highlight and not get gimmicky because there's a tremendous amount of information to take in, and if we give them too much sonic information at the same time, it will detract from the experience. Jim's edict to me was: Clarity is king. He was always looking for a focus and clarity to the sound. It was important to him—and to me—that any sound that went into the film really had to have a reason behind it and be driving the story forward or really selling an environment, but not overselling it." III



The battle between nature and technology is embodied in the Na'vi.

Blair Jackson is Mix's senior editor.

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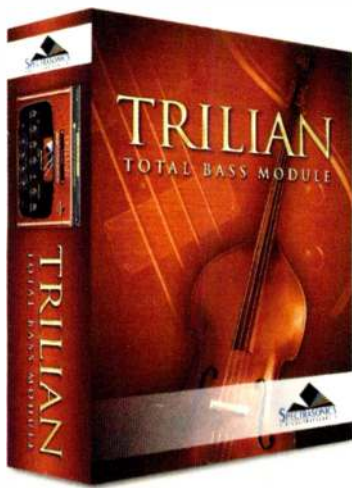
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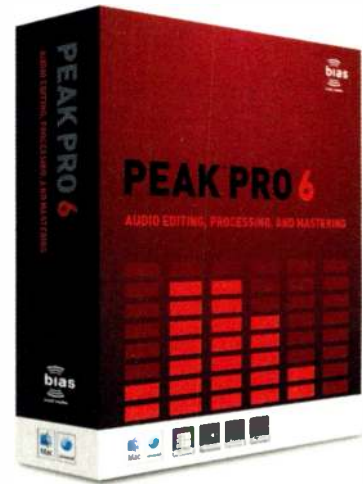
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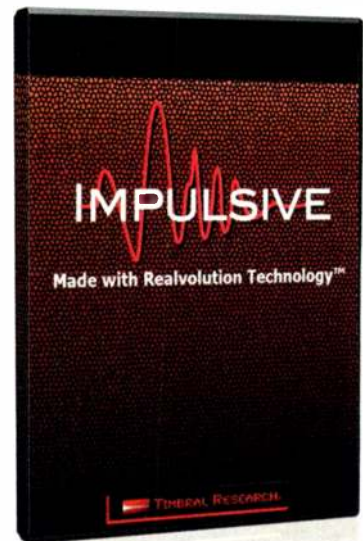


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World Radio History

John Meyer

As Meyer Sound enters its fourth decade, the company president talks about technologies—past, present and future

What inspired you early on?

In the 1950s, I grew up with KPFA [public radio, Berkeley, Calif.]. I got my third-class-restricted FCC license at age 12; then I could run Alan Rich's show. I later studied and got my second-class license; but as a teenager, there was no way I could get a first-class license where the test covered trigonometry.

My uncle was in Southern California doing sound at Walt Disney's for the Mouseketeers [on *The Mickey Mouse Club*] show and *Spin and Marty*. I'd go down there and watch him work, but my family—being from the dramatic arts—wanted me to audition to be a Mouseketeer. I had zero interest in that, but I was interested in the technology. We did some early binaural broadcasts at KPFA, which required using two radio stations. That really fascinated me.

I wanted to learn more about P.A.s. The first experiments I did were at McCune [Harry McCune Sound in San Francisco].

I also met Steve Miller while I was working at a hi-fi store in Berkeley in 1966. He had just formed a band and wanted to do something with hi-fi gear—we carried Klipsch and stuff like that, but everything was blowing up. We even talked to Klipsch about using La Scalas as a front end, but it just tore them to shreds. We burned up a whole system at the Monterey Pop Festival in 1967.

McCune was an Altec dealer, so everything they used was Altec, but I wound up using Gauss and built a horn-loaded, double-18 box with Gauss drivers and the rest was Altec parts. One thing that became clear to me was the need to form a company to figure out

more systematic solutions to problems, like why 15-inch loudspeakers weren't behaving like they should and instead created nonlinearities, like a guitar speaker.

How did Meyer's first product, the UM-1 UltraMonitor, come about?

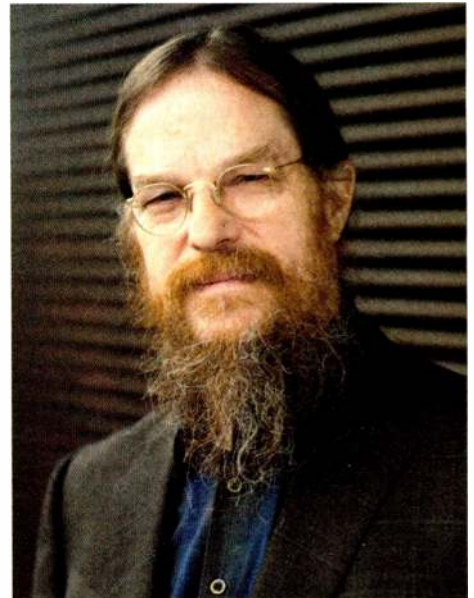
I built the UltraMonitor for Starship. They wanted a high-power monitor that was compact and wouldn't block the audience's view. We first tried a studio monitor from Switzerland, but it died a dismal death—it couldn't handle 110, much less 120dB continuous peaks. We created the UM-1 and there were people in the industry who refused to listen to it, simply because they didn't believe that such specs could come out of such a little space.

Didn't some of that skepticism also stem from the use of control electronics?

The processing was really the only way we could keep the UM-1 alive, especially running 300-watt amps into parts that only handled 50 watts continuous. It was all about creating something to keep the customers happy. They wanted to run bass drums into this poor thing, which meant we had to do some tricks, like taking out some of the bass when the voice was on. This only happened very quickly on an on-demand basis, but there were people who checked out the processor on the bench and thought it was crunching this all the time. It actually only did this when it was under stress—to survive as opposed to suddenly blowing out.

Meyer seems very involved with film sound with the launch of your new Acheron and Cinema Experience products. What are some of the obstacles in this area?

Things like 32 bits or 192kHz are not difficult anymore. In fact, it seems like all the technology obstacles are gone. All we have to figure out now is how to communicate what it is we want to do. It's really shifted from trying to put information between sprockets. It's probably going to come from



a satellite and be loaded at night.

Are there any frontiers left in audio?

The big thing will be figuring out how we can really create positional imaging. It's believed that we should be able to project an image from a screen with some unknown number of parts and project a sound image that would allow you to walk 180 degrees around it. There are two possibilities about this: Either we'll be where the mythological Greeks were in flying or we'll stumble upon it.

One interesting thing coming out of all this research is that positioning may not all have to do with delay in terms of how the ears work. It may have something to do with things that are occurring differentially. It's been suggested that we might be able to see the interference pattern directly, as well as indirectly. So as you move around, you start to solve this image that's coming from multiple sources.

Just because we can't see something doesn't mean it can't exist...

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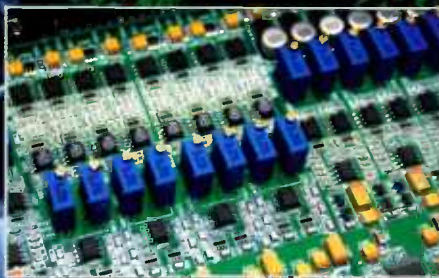
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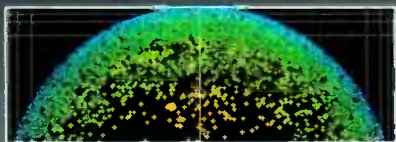


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