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WaveGroup Sound
Fremont, Calif.

JACK JOHNSON

In the Studio

A PENTON MEDIA PUBLICATION

Ten Good Reasons Why Lynx Aurora Converters are the Tools to add to your Pro Recording System.

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As an owner of a professional recording system, you have made a significant investment to provide world-class audio production for you and your clients. The single most crucial factor is the quality of the converters you choose. In developing the Aurora 8 and Aurora 16 converters, we had your needs in mind. We would like to point out 10, 11, maybe more reasons why Lynx is a great choice for you.

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Reason #6 The sound / audio quality - Rich, open, transparent. Let your ears give it a try.

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To see the entire list, please go to **http://www.lynxstudio.com/10reasons.**

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Steve Law - FOH Mixer for Keith Urban

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Jason Spence - Monitor Mixer for Keith Urban

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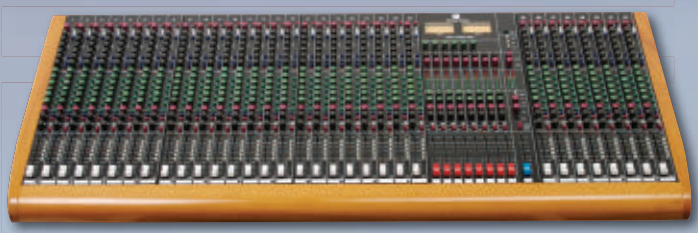

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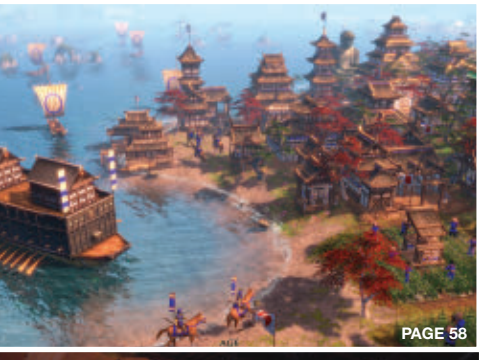
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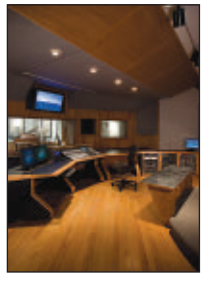
On the Cover: Wave Group Sound is the studio behind the music for the mega-hit *Guitar Hero* game series. Pictured is Mix A, a Genelec surround room fitted with one of the studio's two Sony DMX 100 consoles. Story on page 58. **Photo:** John E. Pelmudder. **Inset:** Mr. Bonzai.



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FEBRUARY 2008, VOLUME 32, NUMBER 2

Game Sound Special!

From lavish big-screen budgets to the seemingly limitless capabilities of next-gen platforms, it's a great time to be in game audio. In this special section, we go behind the scenes on some of today's biggest titles, from top shooters to everyone's favorite rock star simulator. Coverage begins on page 33.

34 Game Industry News

36 Answering the Call of Duty
Infinity Ward's audio team is on a mission: to score and capture the sounds of war for the hugely successful first-person shooter game *Call of Duty 4: Modern Warfare* (*CoD 4*).

44 Total Immersion Effects
There's a growing number of sound effects libraries being designed especially for surround. Find out which products are perfect for your next game soundtrack.

50 *Guitar Hero* Rocks!
Blair Jackson tours WaveGroup Sound, and meets the engineers and composers who turn shredding guitar anthems into this year's hottest interactive music game.

58 RTS Games Still Going Strong
The popularity of shooter games keeps growing, but real-time-strategy titles hold their own appeal. The latest addition to the growing *Age of Empires* series, *Asian Dynasties*, lets players rule their own game universe.

70 Gamers Got Game
Two veteran *Splinter Cell* game players who cut their teeth on creating music for film trailers score their dream job: composing the music for Ubisoft's *Splinter Cell: Conviction*.

Check Out Mix Online! http://www.mixonline.com

(Volume 32, Number 2) is ©2008 by Penton Media Inc., 9800 Metcalf Ave., Overland Park, KS 66212. Mix (ISSN 0164-9957) is published monthly with an extra issue in January. One-year (13 issues) subscription is $35. Canada is $40. All other international is $50. POSTMASTER: Send address changes to Mix, PO Box 15605, North Hollywood, CA 91615. Periodicals Postage Paid at Shawnee Mission, KS and at additional mailing offices.This publication may not be reproduced or quoted in whole or in part by printed or electronic means without written permission of the publishers. Printed in the USA. Canadian GST #129597951; Canada Post Publications Mail Agreement #40597023. Canada return address: BleuChip International, P.O. Box 25542, London, ON N6C 6B2.

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The Art of Analog

UA Founder M.T. "Bill" Putnam

Universal Audio: Making Music Sound Better Since 1957

1945: Milton T. "Bill" Putnam established Universal Recording in Chicago, where he installed a prototype "610" console.

1947: The first million-selling record, "Peg O' My Heart" by The Harmonicats appeared on Bill's Vitacoustic ("Living Sound") label.

1948 - 56: Bill engineered and/or produced Bing Crosby, Frank Sinatra, Nat King Cole and countless others while pioneering innovations such as the control room, vocal booth, console, sends /returns, echo, artificial reverberation ... even stereo recording and half-speed mastering.

1957: Bill founded United Recording, and later United Western Studios on Sunset Boulevard in Hollywood, which are now the world-famous Ocean Way and Cello.

1957: Bill founded Universal Audio, whose legendary products such as the 1176LN, LA-2A and LA-3A became synonymous with sound quality and hit records.

1983: Bill retired and sold UA (now UREI) to Harman International. His original products became prized collectors items for almost two decades.

1999: Universal Audio was revived by two of Bill's sons. Bill, Jr., and Jim Putnam continue their father's legacy with hand-assembled reissues based on Bill, Sr.'s, drawings, vintage components and design secrets from his personal diaries.

2000: Bill, Sr., was awarded a posthumous Technical Achievement Grammy as the "Father of Modern Recording."

Today: UA continues the Putnam legacy of "making music sound better." Its world-class hardware and software is designed with passion in Scotts Valley, California, according to the company motto: Analog Ears, Digital Minds.

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The Pick of Destiny

When I was a kid, I was addicted to those *Choose Your Own Adventure* books—you know, the stories in which the readers get to determine the outcome themselves, through a series of choices: "You meander down a wooded path and you come to a cave. A pair of glowing eyes blinks back at you out of the dark. If you go inside, turn to page 25. If you run away, turn to page 72." While everyone else was outside playing kickball, I'd be holed up in the basement with a pile of paperbacks, cheating my way through story lines by reading ahead and dog-earing key plot points.

They were books, and they were interactive; I controlled my fate.

The concept was not really different from today's videogames (albeit without jet fighters and aliens in 5.1 surround). Both the book and the game call for the consumer to direct the action. I didn't know it back then, but I was discovering the difference between the linear and nonlinear experience.

At *Mix*, we regularly explore the unique challenges of creating sound for the nonlinear world of videogames. Dialog management, for example, is an enormous undertaking: *Halo 3* has 35,000 lines of dialog in 10 languages. Adaptable sonic environments help sustain the thrill for players who spend weeks working through the levels on a single title: For Infinity Ward's *Call of Duty 4*, featured in this month's special game audio section, the sound crew introduced 4-channel ambience streams from disc, with dynamic switching of battle ambiences based on the amount of action happening and real-time filtering based on the player's line of sight.

The process of recording, editing and processing sounds for games is not that much different from any other post-production discipline; it's the implementation that turns the linear story into the nonlinear experience. That implementation—that mindset—is what puts game development, or more broadly interactive entertainment at the forefront of the new means of production.

On the technology side, it's clear that videogames serve as the model for future-based platforms. Take mobile, for example: It's a technology still in its infancy, yet we're already watching feature-length films on our PDAs and listening to stereo audio over Bluetooth from our cellphones. And what about interactive TV? It won't be long before you're able to test-drive a car from your couch, construct your own *Survivor* challenges or rearrange the furniture on *Extreme Makeover: Home Edition*.

There will always be storytellers, but how will those stories be told? Will it be in the form of a single narration, or will the viewer determine where they want the story to go? The possibilities are endless.

And those *Choose Your Own Adventure* titles? They're now available as interactive animated DVD movies, featuring voice talent from the likes of William H. Macy and Frankie Muniz. I can't wait for the virtual reality version.

Sarah Jones
Editor

MIX®

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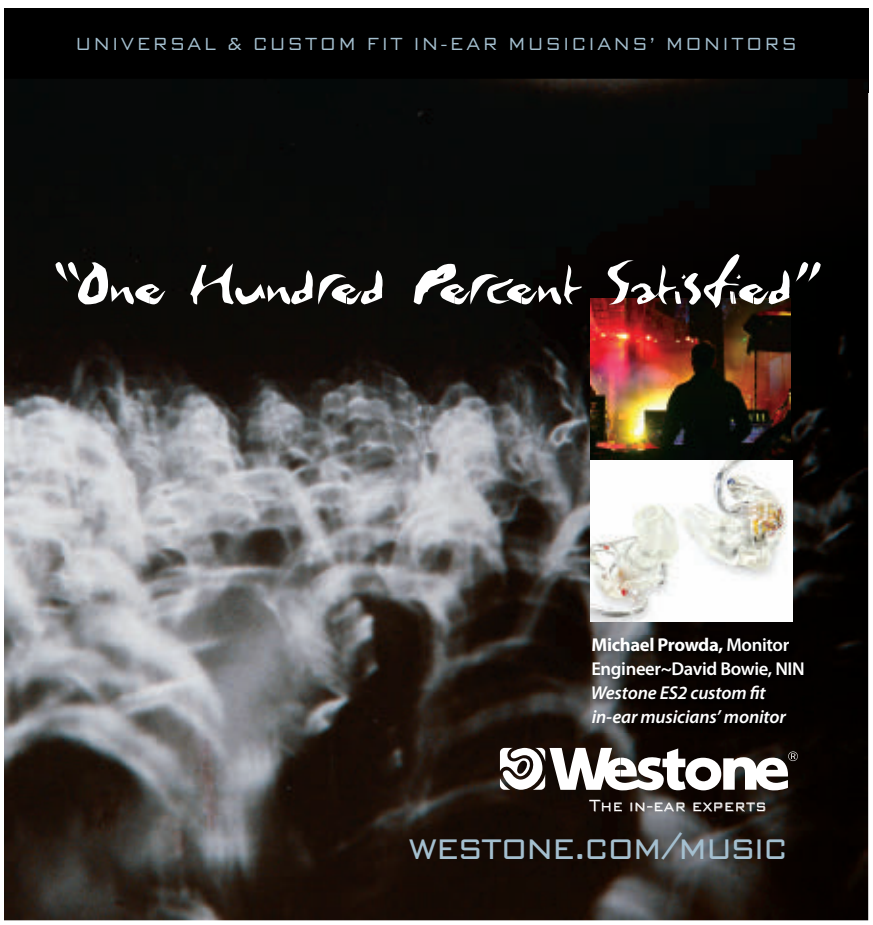

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BACK ISSUES: Back issues are available for $10 each by calling 866/860-7087 or 818/487-2020.

POSTMASTER: Send address changes to *Mix* magazine, P.O. Box 638, Mt. Morris, IL 61054.

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Letters to Mix

THE PRICE OF GOLDEN EARS

I felt compelled to write and add my voice to the chorus ("Critical Listening," December 2007)! Having just finished recording and mixing The OaKs' upcoming album, and working with Alan Douches of West West Side Music in New Windsor, N.Y., who mastered it, I can't imagine trying to go through that final step alone—or worse, not taking it at all. The cost of mastering is so small compared to what the overall project cost can be, and the results are priceless.

The great thing with Alan was that he worked with us, starting with the initial mixing. We would send sample mixes and he would send back sample masters. It allowed us to tweak our mixes, which then let the final masters have exactly the sonic character that we were after.

His advice and help were invaluable. So my advice is, don't wait until mixing is finished; get a mastering engineer who understands your vision and is onboard right from the start of the project.

Tim Cocking
Orlando

COAST TO COAST...TO COAST

Just read "From the Editor" in the December 2007 edition ("The Reluctant Mastering Engineer") and had to e-mail about one sentence: "Over the years, Denten has developed relationships with top mastering houses on both coasts..."

Hopefully, I don't have to pull out the map to remind you that there are three coasts to the United States. Otherwise, nice story.

Allen Corneau
Essential Sound Mastering

HISTORICAL PERSPECTIVES

Mix *continues to receive letters about "30 People Who Shaped Sound" in the October 2007 issue, which profiled producers, engineers and musicians who significantly influenced the pro audio industry or consistently stood out among their peers during* Mix*'s 30 years of publication, as chosen by the* Mix *editors.*

Where's Tom Dowd?
Mike

My God, you left Rupert Neve off the list! No list is creditable without having Rupert Neve on it.
Jay P.

What about Bill Schnee? What about Sheffield Labs? Doug Sax and team?
Leland Bennett

Your list is fun to read, but the title is misleading. I suggest instead: "30 People From the U.S. (Some From the UK) Who Shaped Non-Classical Sound in the U.S."

But I guess there is nothing wrong with listing people who are known only to you in the States. At least then we'll get to know them better here in the rest of the world. Cheers!
Bernhard Güttler

TALKBACK

Because Mix*'s January 2008 issue features a guide to personal monitoring systems, we asked our readers, "Have you recently turned an artist onto in-ear monitors or are you trying to figure out how exactly to broach the subject with a musician?" Here is one response that we received.*

We are a small regional production company located in Kansas that has worked with several touring acts using in-ear monitoring. I was not extremely impressed with some of the early models; we usually wound up putting wedges at the artist's feet, un-muting them and ducking an occasional tossed receiver from a disgruntled artist.

When my company started producing Christian rock bands a couple years ago, we re-evaluated using in-ears.

Reason one: Sound pressure levels in some church sanctuaries, which are designed to project sound, were getting out of hand. There were constant fights between artist and engineer in these venues, and in-ear monitors seemed like the answer. Getting the artist to understand this took some selling. Common complaints were the loss of "feel" onstage and an inability to communicate onstage on a one-on-one basis. I donned a pair at a rehearsal and found some of the complaints to be true. The "feel" problem was easily eliminated by facing a couple of mics toward the crowd to pick up audience reaction and the house system. Simple fix.

Reason two: Weight and space savings. With diesel production trucks needing gas that costs more than $3.50 per gallon, every pound we can save in transportation is important. By leaving most of the wedges and monitor amps at the shop, we can save nearly 1,200 pounds. That equates to a big savings in fuel and labor.

Reason three: Eliminate stage clutter, something that is extremely important in churches and small club stages. Enough said.

We tried several brands before deciding on the Shure PSM 700 system. Cost and quality were concerns, and the Shure system seemed to give us the biggest bang for the buck. A large percentage of the touring acts we worked with seemed to be using the Shure units, and generally leave their transmitters in their truck and use ours, or at least use their own in-ear devices and our transmitters and receivers. We racked up 10 transmitters and 20 receivers, and they have served us well now for about two years.

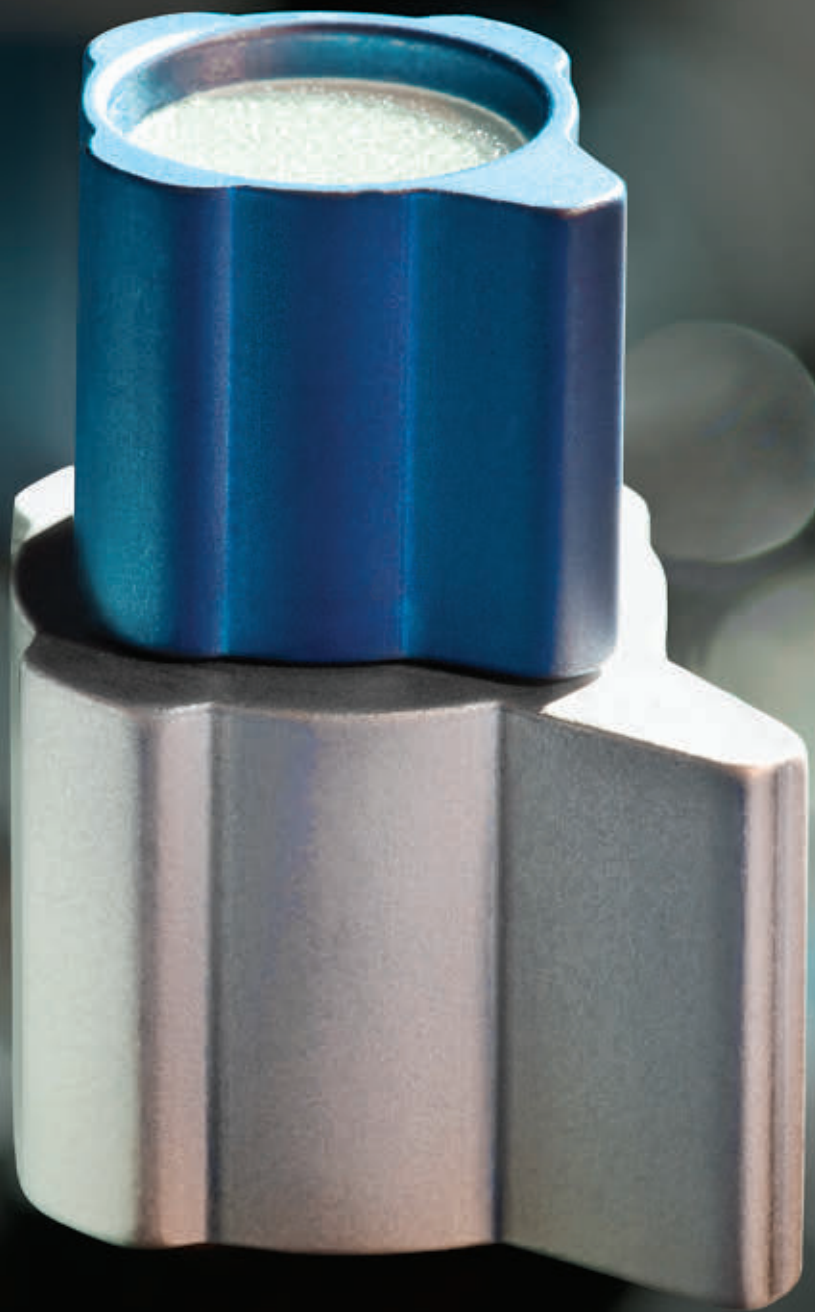
The story that it's "all or nothing" when it comes to in-ear systems is not necessarily true, especially outdoors. We have found that a couple of sidefills along with the in-ear monitors work great.

Trying to strike a balance between tech and artist is an ongoing battle. While some have truly embraced the technology, others refuse to even try. As a front-of-house engineer, I love them. I even keep a pair at FOH to punch into an artist's mix if it looks like there is a problem.

Bill Knight
Segue Sound Company, USA

Next month, *Mix* takes a look at indie production, focusing on how indie artists can get their album out to the public. Got a cost-saving trick or advice for a budding artist on making a slick record on a budget? E-mail us at mixeditorial@mixonline.com.

Gain Control.



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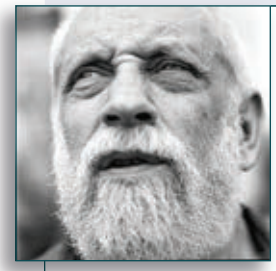

JOEL DORN, 1942-2007

Jazz/R&B producer Joel Dorn passed away on December 17 due to a heart attack. Dorn's numerous accomplishments as a producer all stemmed from his great love of music and a burning desire to share great recordings.

Dorn's career spanned more than 35 years, beginning with work as a radio DJ and then as Nesuhi Ertegun's assistant at Atlantic Records. While with Atlantic, Dorn produced seminal albums by Keith Jarrett and Gary Burton, Bette Midler and Roberta Flack. He won a Grammy for the Jarrett/Burton release, *Keith Jarrett and Gary Burton*, and consecutive Grammys in the category of Record of the Year for Flack's singles "Killing Me Softly" and "The First Time Ever I Saw Your Face."

After leaving Atlantic in the mid-'70s, Dorn went on to work with a tremendously diverse list of artists, including the Neville Brothers, Leon Redbone, Lou Rawls and Asleep at the Wheel. By the mid-'80s, Dorn had accumulated a lifetime's worth of Gold and Platinum albums, and more Grammy Awards, including the Best Country and Western Instrumental Award for Asleep at the Wheel's "One O'Clock Jump."

In the CD era, Dorn devoted much of his time to reissue work, releasing on labels that he founded (Night, 32 Records, Label M, Hyena), as well as for GRP, Columbia and Rhino. His 13-CD production of Atlantic jazz recordings showcased the breadth of his talent and knowledge of the genre. He received a Grammy nomination for *The Heavyweight Champion*, a seven-disc collection of John Coltrane's works.

Representatives of Dorn's current venture, Hyena Records, report that at the time of his death, Dorn was completing a five-CD box set for Rhino Handmade entitled *Homage a Nesuhi*—a tribute to Nesuhi Ertegun and their years together at Atlantic. He was also the voice of Sirius Satellite Radio's Pure Jazz channel. *—Barbara Schultz*

STEVE KUSICIEL

Longtime Gepco employee and audio engineer Steve Kusiciel has passed away.

Kusiciel got his start in the audio engineering field while working at Paragon Studios, where he worked with the late Malcolm Chisholm and the late Marty Feldman, as well as Gepco founder Gary Geppert, whose friendship would later lead Kusiciel to join Gepco in 1991. Kusiciel then worked at Chicago Recording Company and Streeterville Studios (the latter also with Geppert). During this time, Kusiciel worked on projects for the Ohio Players and Tyrone Davis, among others.

At Gepco, as the company expanded and additional divisions were formed, Kusiciel took on more responsibilities for the design, installation and maintenance of many of the factory's manufacturing and other processes, later taking on lead responsibilities for the company's IT and test and measurement systems.

"Along with being a close friend, Steve was a part of the company's foundation, a welcoming presence in the workplace and a knowledgeable asset to the team," says Geppert. "Regardless of how busy he was, Steve always made time for friends and co-workers. He was a natural teacher, ready to share his knowledge with anyone who asked. Steve will be deeply missed by all who knew him."

RONALD J. SCALISE, 1953-2007

Ronald J. Scalise died Friday, December 21, 2007, as the result of an automobile accident. He was employed by ESPN for more than 20 years as senior audio producer and was the recipient of 15 Emmy Awards.

Scalise was an expert in surround sound and was among the industry leaders in enhancing the audio experience for viewers of ESPN events, including work on the X Games, *Monday Night Football* and NASCAR.

"You need to create an audio bed that puts the viewer in the best seat in the house, and you'll sprinkle in things like a fan yelling, 'Let's go Jets,' " Scalise once said, as reported by ESPN. "But you also need to take the elements of the game that match up with a camera shot."

Scalise was a proponent of educating both consumers and audio professionals in how to bring the sound of sports into the nation's living rooms. "I'm not there to make a *National Geographic* special; it has to sound bigger than life," Scalise said. "When a zoom lens focuses in on a quarterback's eyes, I want to let viewers hear the QB call and the crunching and grinding."

He also was the co-owner of the 19 Recording Studio of South Glastonbury, Conn.

Memorial contributions may be made to Ron Scalise Memorial Fund, c/o Kurt Heitmann, 200 Clearbrook Rd., Elmsford, NY 10523.

LET'S GO GAMING!

Check out Mix's new Game Audio digital magazine—with profiles, products and more—covering the latest audio news and developments from the world of videogames. Visit mixonline.com; also, sign up for the e-newsletter!

COMPILED BY SARAH BENZULY

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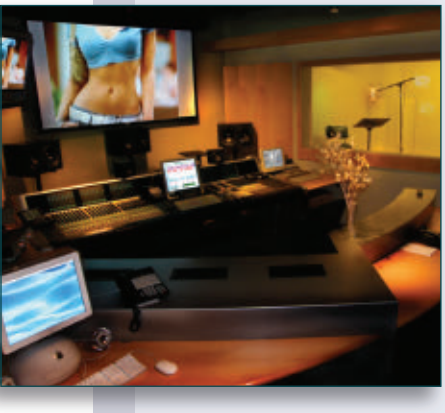


Studio Center Total Production (Virginia Beach, Va.; www.studiocenter.com) has acquired New York City–based Tonic Studios (left). The deal gives Studio Center seven rooms in N.Y., bringing the total number to 24 studios in six cities.

ASCENT MEDIA, RAVE MUSIC ALIGN

Ascent Media has formed a strategic alliance with New York music production company Rave Music. Together, Ascent and Rave have formed a new company, R West (www.rwestmusic.com), to provide original music production for commercials via Ascent Media's Creative Sound Services group. R West's creative staff includes composers Daniel Cage and Todd Haberman, as well as talent from Rave Music's East Coast facility, including the company's founder, Grammy-nominated composer John Loeffler. The two companies plan to extend their relationship to also include original music production for film and television.

IRON MOUNTAIN, XEPA DIGITAL

Iron Mountain, which focuses on information protection and storage services, acquired Xepa Digital, which provides services in the conversion of analog and outmoded digital audio and videotapes to high-resolution digital file formats for archiving and distribution. Iron Mountain will retain former Xepa Digital employees, including the company's three founders—Ken Caillat, Edwin Outwater and Claus Trebly—who join Iron Mountain as studio executives.

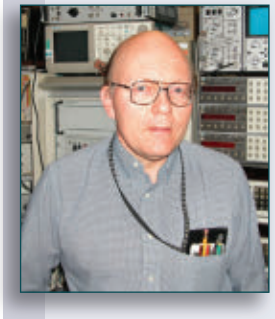
Rave Music founder John Loeffler

HAVE TAPES, WILL PLAY

Paul Stubblebine Mastering and valve-electronics manufacturer Bottlehead Corp. have introduced The Tape Project (www.tapeproject.com), a new(ish) music-delivery format and "record label," which will showcase a series (10 per year) of analog releases on reel-to-reel tape. Sold primarily on a subscription basis, the 15 ips, half-track stereo, reel-to-reel recordings will come from a wide range of musical genres; the company recommends tape machines and specifications for playback, as well as offering its own specially modified tape decks with custom valve components from Bottlehead Corp.

The first 10 titles are *The Number White* by jazz singer Jacqui Naylor; Dave Alvin's *Blackjack David*; *Arnold Overtures* original music by Malcolm Arnold with the London Philharmonic; Robert Cray's *False Accusations*; Raphael Fruhbeck de Burgos with the New Philharmonia Orchestra performing "Albeniz: Suite Espanola"; David Oistrakh and the London Symphony Orchestra with music by Bruch and Hindemith; Eiji Oue and the Minnesota Orchestra performing "Exotic Dances From the Opera" (Saint-Saëns, Strauss, Rabaud); Bill Evans *Waltz for Debby* live at the Village Vanguard in 1961; Mose Allison in the 1959 *Creek Bank*; and Sonny Rollins in *Saxophone Colossus*.

STANLEY AN AES FELLOW AWARD PRESENTED AT SHOW



The AES Awards Committee and Board of Governors selected Gerald Stanley, Crown Intl.'s senior VP of research, to receive the AES Fellowship Award for his "significant contributions to power amplifier design and electronic networking of communications systems," according to AES secretary Han Tendeloo. The award will be presented during the 125th AES Convention in San Francisco, also the Society's 60th anniversary.

"I was surprised and humbled to receive the offer to become an AES Fellow, not having been highly absorbed in regular society activities," noted Stanley. "There have been a number of technical presentations made to the local chapters over a period of many years and an occasional conference paper, but not the level of AES involvement that is typical of a number of my 'Fellow' friends. And although awards presentations are often associated with doing something difficult or heroic, I consider myself fortunate to soon be recognized for simply doing what I've always considered fun."

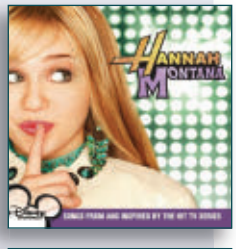
TEC AWARDS DATE SET

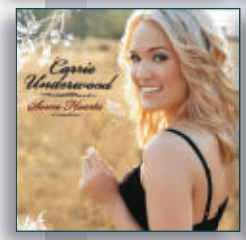
The 24th Annual Technical Excellence & Creativity Awards will be held Friday, October 3, 2008, at the Westin St. Francis in San Francisco. For ticket or sponsorship information, contact Karen Dunn at 925/939-6149 or Karen@tecawards.org.

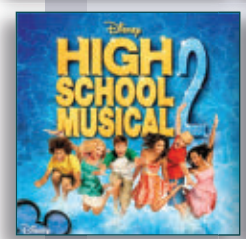
The TEC Awards Nominating Panel is now accepting product nominations for this year's awards show. To be eligible, products must have been released and in commercial use during the period from April 1, 2007, to March 31, 2008. "Call for Entry" forms can be found at www.mixfoundation.org. All entries must be returned by Friday, February 29, 2008.

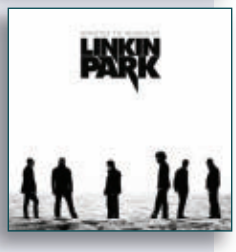
BILLBOARD 2007 TOP 10

1: Daughtry, *Daughtry*
2: Akon, *Konvicted*
3: Fergie, *The Dutchess*
4: *Hannah Montana* soundtrack
5: Carrie Underwood, *Some Hearts*
6: Nickelback, *All the Right Reasons*
7: Justin Timberlake, *FutureSex/LoveSounds*
8: *High School Musical 2* soundtrack
9: Various Artists, *Now 23*
10: Linkin Park, *Minutes to Midnight*









P&E SURROUNDS S.F.

PHOTO: WIREIMAGE/JOHN MEDINA

Eric "ET" Thorngren (left) with Jerry Harrison

The P&E Wing and the S.F. Chapter offered Academy and community members the opportunity to learn about 5.1 surround mixing and speaker technology at the 5.1 Surround Sound Experience. Presented by JBL, the event featured a keynote discussion between artist Jerry Harrison (Talking Heads) and engineer Eric "ET" Thorngren, who have together created surround mixes for Talking Heads, Kenny Wayne Shepherd and O.A.R., among others. Hosted as the first official event at the new rehearsal and recording studio facility, Bay Area Sound Studios, the event drew around 100 members and audiophiles who listened to JBL's LSR Series of studio monitors with Room Mode Correction in several different acoustic environments.

"Before, everyone knew the great album, where you and your friends would sit and listen to the record together," Harrison said, "and then sit and listen to it again. With surround, you drag people to experience all these angles of the experience. I'll tell someone, 'This is special and you need to be right here to hear it.' Not, 'I'll burn it for you and you can get out your ear buds.'"

ON THE MOVE

Who: Ted Leamy, COO at Pro Media/UltraSound
Main responsibilities: running the day-to-day business of Pro Media/UltraSound tour sound and installation divisions.
Previous Lives:
• 2000-2007, various positions at JBL, including VP of installed sound
• 1977-2000, Electrotec Productions (Electrosound), managing director from 1999-2000
The best part about being involved with the touring world is...the music and the people.
The one concert I wish I could have seen would be...hmmmm...
Currently in my CD changer: Bonnie Raitt's *Greatest Hits*.
When I'm not in the office, you can find me...on the road.

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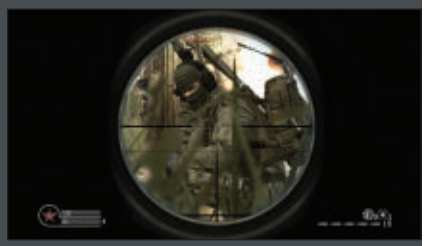


PLAY: Game Audio
Check out mixonline.com for all of your game audio information—from our monthly digital edition, bi-weekly e-newsletters, product and new game news, and much more!

WATCH: Jack Johnson in the Studio
We have way more session photos than we could print in two pages. Check out this expanded behind-the-scenes gallery.

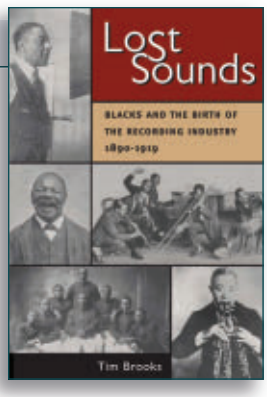
LISTEN: "Recording Notes"
Put on the headphones and listen to these audio clips from Cowboy Junkies, Joe Jackson, Classic Track: "Loving You" and "Cool Spins."

WATCH: Euphonix "Technology Spotlight"
Take a tour with George Petersen as he checks out Euphonix's new MC Series controller.

QUAD NAMES SWAN MANAGER

New York City's Quad Studios, which celebrated its 30th anniversary last year, named Glenn Swan studio manager; he most recently was at Sony Music Studios, where he served as studio manager. "With all the changes constantly taking place in the global recording scene, there's a lot of new guard that may not know Quad beyond the name," says Swan. "I have the contacts, along with the hard-earned relationships to make that difference, and I expect to do so."

BOOKSHELF



In *Lost Sounds—Blacks and the Birth of the Recording Industry, 1890-1919*, author Tim Brooks and co-researcher Dick Spottswood have spotlighted a epochal time in the recording industry. One particular highlight is a section on the life and career of George W. Johnson—believed to be the first black artist on commercial recordings. In all, the book covers the works of some 40 artists. University of Illinois Press, www.press.illinois.edu. *—George Petersen*

INDUSTRY NEWS

Harry Chalmiers

Former VP for academic affair/provost at Berklee College of Music, **Harry Chalmiers** is the new president at **McNally Smith College of Music** (St. Paul, MN)...**World Media Group** (Indianapolis) added **Matthew Belsaas** to its mastering and authoring staff...**Mark Warner** joined **Advanced Broadcast Solutions** (Seattle) as VP...**Meyer Sound** (Berkeley, CA) appointed **Mauricio Saint Martin** as director of Middle East sales...New national sales manager at the **Stanton Group** (Hollywood, FL) is **Chris Celtrick**...**Joe Meleski** joins **Harris Corp.** (Cincinnati) as district sales manager for the Mid-Atlantic region...**Yamaha Pro Audio and Combo** (Buena Park, CA) division changes: **Cliff DeManty**, sales and marketing manager for the Consumer Products department; new marketing content department comprises manager **Jeff Hawley**, and project managers **Nic Chaffee** and **Ron Martino**; **Dennis Webster**, marketing manager for Yamaha Guitars; **Garth Gilman**, director of administration; and **Greg Crane**, percussion tech specialist at Yamaha Drums...**Dale Sandberg** is **QSC**'s (Costa Mesa, CA) senior product manager...**Sennheiser** (Old Lyme, CT) promoted **Robb Blumenreder** to industry team manager, music industry...**EAW** (Whitinsville, MA) news: **Andy Jordan**, application support group, and opening of **EAW Europe** in Wickford, Essex, UK...Broadway sound tech/engineer **Allen Rowand** joins **Metric Halo** (Hopewall Junction, NY) to facilitate product training and Website tutorials...New distribution deal: **Turbosound** (West Sussex, UK) named **Erikson Pro** (Montreal) for Canada.

CORRECTION

In the December 2007 "New York Metro" column, we misspelled Jeff Berman's name; in addition, Berman is the owner, while Gail Nord is the general manager. *Mix* regrets the error.

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BY PAUL D. LEHRMAN

Late for the Future

Sync and Swim in HDTV

SHUTTERSTOCK IMAGE: BYRON W.MOORE

I guess I first noticed it a couple of years ago while I was watching an HD documentary on my local PBS channel. "Welcome to the future!" said the breathless hi-res promo just before the show. But then a talking head appeared, and it seemed that the future was going to be, well, a little delayed. I was seeing a very odd thing on my old 27-inch Panasonic CRT TV set: The person who was supposed to be an expert on whatever the program was about looked more like an actor playing a scientist in a badly dubbed, post-World War II, Japanese atomic-monster movie. The movements of his mouth and the sound I was hearing seemed to have very little to do with each other.

After a few minutes I figured it out: The program was out of sync, and the picture was later than the sound by something like half a second. A few minutes after that, something changed and the video and audio locked up.

In the months to come, I saw this happen a lot. Sometimes when I watched the news on a local commercial station that had switched to HD, the lip-sync would seem to shift whenever there was a remote pickup and some reporters were more out of sync than others. Sometimes even the anchors were out of sync for a little while, and then somehow it would get corrected.

When television programs relied on videotape and simple studio-to-transmitter coaxial or microwave links, the chances of the sound and picture getting away from each other were essentially nil. When the world of video was analog, if sound and picture left the plant in sync, then you could be sure that they would show up on the viewer's TV set that way. But as distribution systems became more numerous and elaborate, and digital technology entered the delivery path, opportunities were created for all sorts of gremlins to creep in. One memorable event was described by veteran TV mixer Ed Greene in his Hall of Fame acceptance speech at the recent TEC Awards banquet.

"I was watching an awards show—which I wasn't doing—that George Lucas, of all people, was speaking at, and he was *seconds* out of sync. The program was seconds out of sync for 20 minutes. So I called the mixer the next day, and I said, 'What happened here?' And he said, 'Well, when they took the program in back in New York, the primary [feed] was sent on fiber and the backup was sent on satellite. And they took picture from one and audio from the other.' [Cue giggles from the audience.] And then about 10 minutes into the program, they figured out it was wrong, and they switched—*both* of them. [Screams from the audience.] So I said, 'How come at the end of it they didn't fix this for the West Coast [broadcast later]?' And he said, 'Well, it was a Sunday, and that would have

JIMMY DOUGLASS

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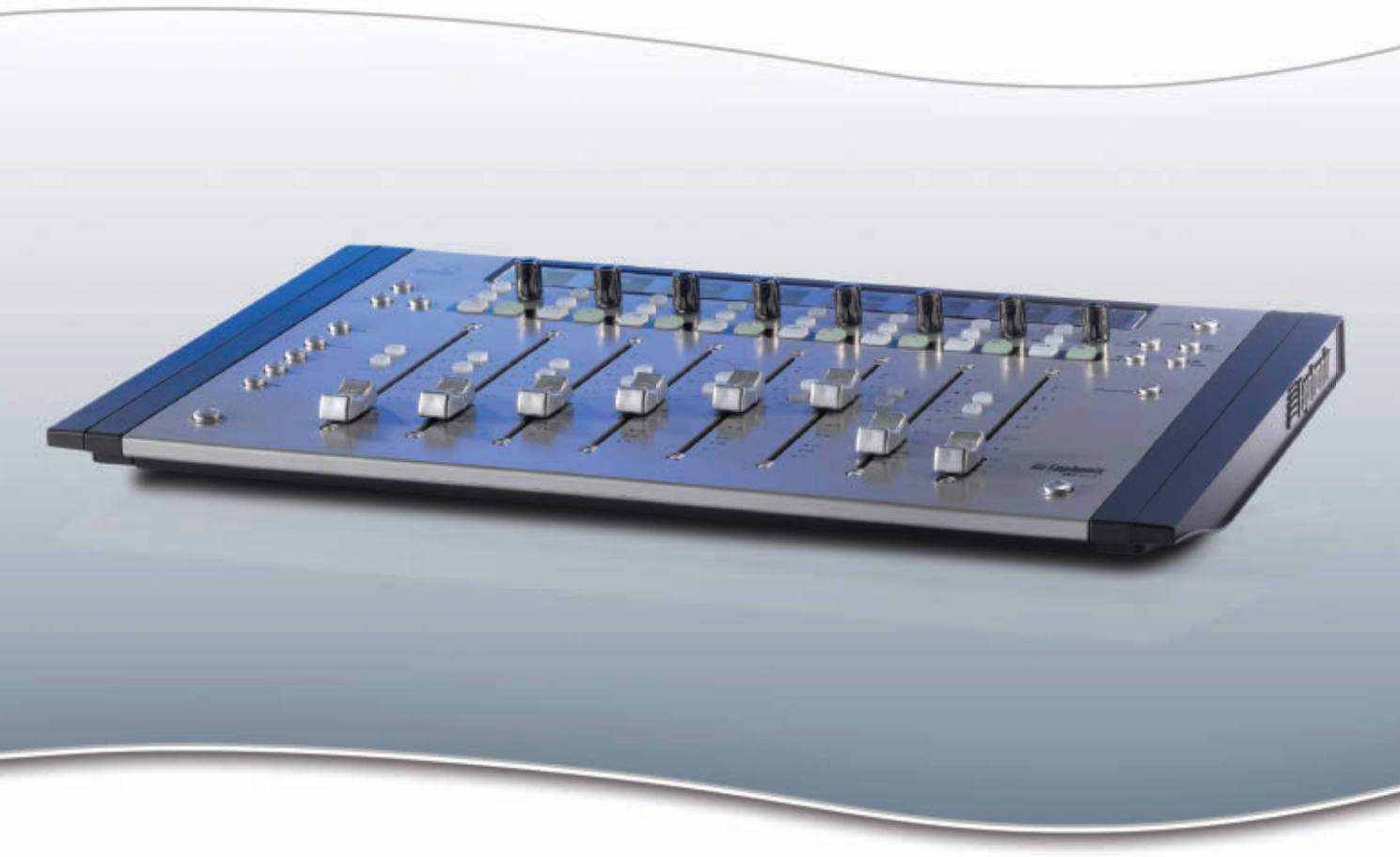

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Mac Universal

Euphonix artist

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meant bringing somebody in on overtime.'" Loud groans. (You can watch the video at www.mixonline.com.)

But now that digital television signals are going right to the home, the chances of things screwing up have grown dramatically. And it's not just a problem with careless engineering. According to a lot of people whose business it is to make audio and video stay together, these problems are built into the system, and they're not going to go away soon.

In fact, this was the subject of a fascinating, if not particularly well-attended, session

When it comes to viewer awareness of sync problems, there are two timing thresholds: detectability and noticeability. Both thresholds are much shorter if the audio leads the video, which is no surprise if you think about it for a moment.

at the AES conference this pas fast fall entitled "Audio for HDTV: The Lip Sync Issue." This seminar featured three presenters, none of whom were particularly optimistic.

Randy Conrod, digital products manager at Harris Corporation, discussed the nature of the problem. When it comes to viewer awareness of sync problems, he said, there are two timing thresholds: detectability, the point at which if the viewer *tries* to look for problems he will see them; and noticeability, the point at which the viewer notices them *without* trying. Both thresholds are much shorter if the audio leads the video, which is no surprise if you think about it for a moment. Sound arriving later than vision is part of the natural world, he explained, so when the sound is ahead, "Our brains find the experience particularly rattling." He also pointed out that once a sync problem is noticed, the viewer is more likely to *continue* to be aware of it if the sound leads than if the picture leads.

Another member of the panel, Andrew Mason, who is an R&D engineer with the BBC, talked about some preliminary research he has done that suggests the problem is worse with HDTV—the acceptable delay window in either direction seems to be smaller with higher-resolution broadcasts.

Conrod pointed to an additional problem that is caused by delays, over and above their being annoying: When the audio is ahead, even if the timing differential drops below the detectability threshold, speech intelligibility and comprehension go way down. Maybe sportscasters don't care much whether their mouth movements match their words, but you can bet that the last thing an advertiser wants to hear is that because of some esoteric sync discrepancies, no one in the audience can remember their message.

It's not hard to understand why—now that the whole broadcast chain is digital—this has become a big problem. Digital audio processing is fast: Typical processing delays in most plug-ins are a few dozen samples or fewer, and even a look-ahead limiter will only delay the signal 1,000 or so samples, which at the lowliest 44.1kHz sampling rate is still way less than a single video frame. But video processing is not fast, and the nature of the way it is clocked means that delays tend to be in multiples of fields (i.e., half-frames) or frames, not samples. Even a single CCD camera might have a delay on its video output, and if you follow it with character generators, switchers, routers, digital video effects, frame synchronizers, and especially compressors and decompressors, then you've got a signal chain that can put a significant chunk of time between when something happens in front of the camera and when it shows up onscreen. And the delay is not consistent, as I had noticed: In a news program, adding a picture over the anchor's shoulder—because the two frames have to be processed and synchronized—will add at least a one-frame delay to the picture. If that picture is of a reporter doing a live remote, then when the reporter goes to full screen, the video delay will jump back.

So the program originator, whether it's a network or a local station, has to be able to insert delays into the audio to keep pace with the video. Some video equipment will provide proper audio compensation automatically, but often it has to be done by hand and that can be tricky. One engineer I know at a network affiliate says, "It's hard to chase it down because it's going through so many different paths, and it's hard to see where the delay is happening." Some stations are using slewing delays on the audio to make these quick changes in sync, but they have had reports from listeners that the slewing is quite audible—and sounds pretty weird.

They have to be careful with those delays, too. "Sometimes, people patch around equipment they're having trouble with," my network-affiliate engineer friend says, "and don't realize that the delays change." His station just moved into new quarters and this issue reared its ugly head. "Before we moved, we had a delay line on the audio from Studio A to the equipment room because the audio was analog, but the video was being digitized and reconverted, and that caused a delay. But when we moved, we needed the analog equipment to do something else in the new place, so we patched around it. Everything went out of sync, but it took days before anyone noticed, and there really wasn't anything we could do about it. A lot of stations are run these days without engineers for much of the day, and if there are lip-sync problems, they literally can't do anything."

Compression introduces its own dan-

gers. Kenneth Hunold, a broadcast applications engineer with Dolby Labs who was the third member of the panel, pointed out that decoders and encoders that work with MPEG-2, the most common professional digital video codec, use audio and video "packets" that are intentionally sent out of sync, with delays of many frames. In fact, video frames are often sent in the wrong order, and time stamps and buffers are supposed to make everything right before the signals are output. Although MPEG-2 itself is not the problem, said Hunold, the fact that the delays on the encoders and decoders can be set independently of each other—with one end not knowing what the other end is doing—can lead to big problems.

Both Conrod and Hunold prescribed a number of measures that originators and broadcasters can take to keep these problems at bay. Good old-fashioned clap boards, 2-pops and beep-and-flash frames might seem anachronistic in the digital age, but, in fact, they can be tremendously helpful in determining proper sync in a complex signal chain. Testing, calibrating and documenting video-processing equipment are important so that the broadcaster knows what each stage does to the signal and can compensate intelligently.

But no matter how hard broadcasters may work to ensure the integrity of their programs, once a DTV signal leaves their hands, they are helpless against the biggest threat of all: the "STB"—the set-top box in the viewer's home. Why is this the case? Because when the Federal Communications Commission adopted the new DTV "standard," it gave the industry no fewer than 18 different formats to play with. (In a regulation-averse political climate, the FCC somehow reasoned that specifying a single format—as it did with AM radio, FM stereo, color TV and stereo analog TV, and we all know what failures those media have been—would be "anti-business.")

If a TV manufacturer wants to have a ghost of a chance of succeeding in the market, that company has to make sure that all of its new sets can handle all of the different flavors. A flat-panel display with a fixed number of pixels can have only a small selection of closely related native formats, which will, by necessity, be only a subset of the possible formats it will be asked to show. That means there will be lots of circuitry to deal with varying frame rates, line counts, aspect ratios and scanning formats (interlaced vs. progressive). Well, guess what? All that conversion takes time! How much time? It depends, but in most

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cases where the signal has to be de-interlaced or scaled, you can count on it being at least 200 ms.

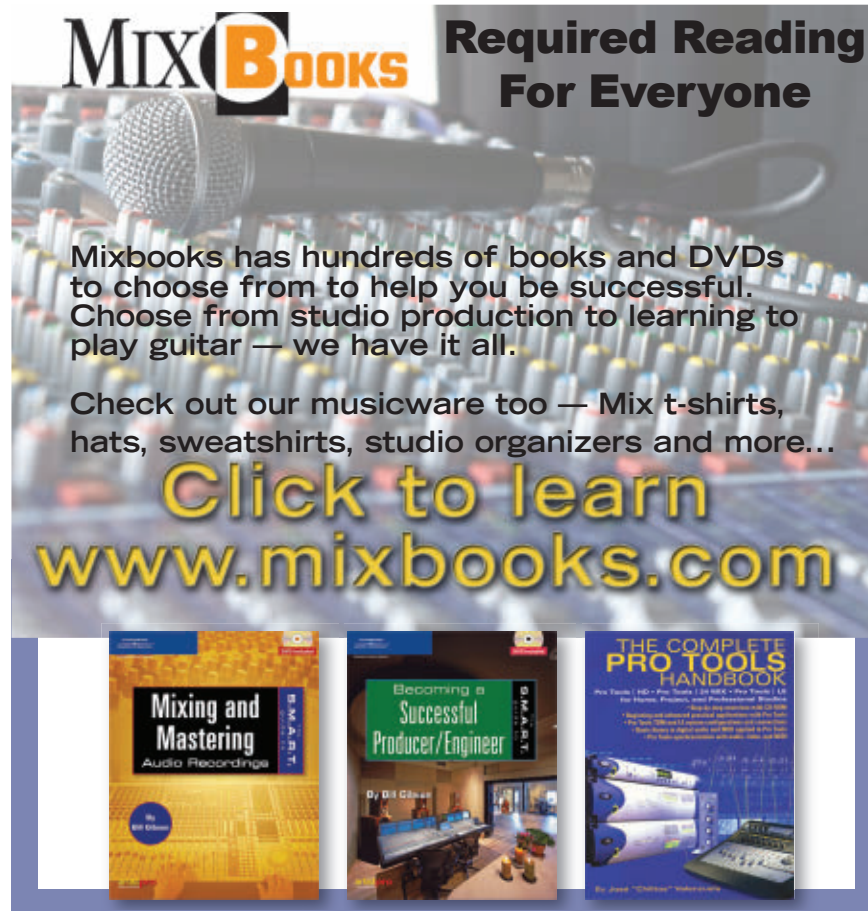
Now, if you are getting audio right from your television set, then it should be smart enough to delay the audio automatically to match the conversion delay that it's imposing on the video. But a whole lot of people who want to enjoy DTV—especially HDTV—have separate audio systems (with their DVD and TiVo players connected to them), and those audio systems, which are fed right from the cable box or DTV receiver, don't know nothin' 'bout no delays. So here we are again: audio leading video by a very noticeable, and very annoying, amount.

So now what do we do? Well, if you're very conscientious, then you can read all the documentation that comes with your TV set and surround sound system, and try to figure out what kind of delay is being introduced on the video side and how to set your Dolby or DTS or whatever decoder to match it. But not everyone receiving DTV is going to want to deal with this level of complexity (there are still people, after all, who think the rear speakers of their 5.1 system belong in the spare bedroom), so it's not a particularly practical solution.

Is there such a thing as a practical solution? According to the panelists at the AES session, the answer is no, not really. Hunold suggested that information about status and delay times of different devices in the home could be shared among them. But this data would not come from the broadcaster because the broadcaster has no idea of what the viewer's system is; instead, it would have to be generated locally and distributed through some kind of home network, perhaps using FireWire or Bluetooth or even infrared.

Until that happens, and until every manufacturer of home audio and video equipment gets onboard with it—which means, basically, never—you're on your own. Feel free to blame the government for being too chicken to keep a tight enough handle on DTV so that you can watch the news without getting nauseous. As Greene said in his speech, with tongue only slightly in cheek, "If a program gets through in good shape, it's almost a mistake." If it doesn't, you can always pretend you're watching a Godzilla flick. ■

Paul D. Lehrman sometimes has trouble catching up with himself. You can catch up with his past 10 years of scribblings in The Insider Audio Bathroom Reader, *available from mixbooks.com and the usual suspects.*



Jack Johnson's *Sleep Through the Static*

Analog Style in Eco-Friendly Environs

Early in 2007, Jack Johnson began remodeling an old L.A. mansion that also houses a recording studio and offices for his record label, Brushfire Records. Eco-friendly building renovations were made, and last June he began tracking his new album, *Sleep Through the Static*, out this month. The album was produced by J.P. Plunier, with recording and mixing by engineer Robert Carranza, and features Johnson's band: Merlo Podlewski on bass, Adam Topol on drums and Zach Gill on keyboards. In contrast to the Pro Tools production on Johnson's recent albums, the group went analog this time, tracking to Studer 24-track. "I liked not looking at the music on a computer screen—just hearing it," says Johnson. "If it had a good feel, you moved on, living with your little mistakes. Those little mistakes become part of the character of the song.

"I am not a real audiophile; I leave that stuff to Robert," Johnson continues. "The guys in the band can hear the difference between tape and digital. I have always been more into the songwriting and putting the song together. But it feels really warm, and we aren't using a click. We just go sit in the room together and track the songs."

Jack Johnson with his guitar on the steps of his new recording studio, Solar Plastic Power Plant. "We found this old building in Los Angeles with a room in the back with high ceilings—perfect for a studio," says Johnson. "We wanted to make it as eco-friendly as possible: We put the solar panels on the roof. We are using bamboo for the floors, which is a replaceable resource, and we used the old wood to put in floors and ceilings in the house. We have toilets with the low-flush option, and the insulation in the walls is all recycled blue jeans. When you have the chance to do it this way, why not do it?"

From left: Producer J.P. Plunier, Jack Johnson and engineer/mixer Robert Carranza break for a photo opp.

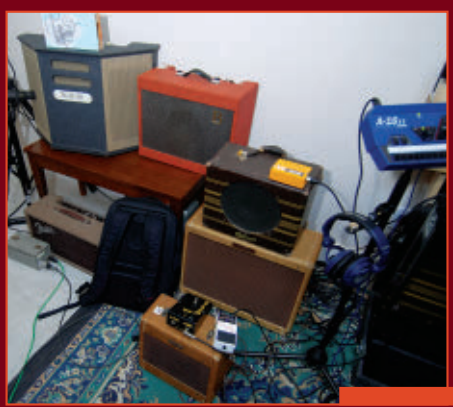
"We used a variety of microphones for the drums," says Carranza. "For the overheads, we used Audio-Technica 4050s. They have a nice top-end brilliance and warmth. You can get them really close to the cymbals and they sound really good. For the toms, we used standard 451s. Snare was a 57 with a 451 tied to it, bottom snare was a 451. Hi-hat was a 451. On the kick drum, we had an [AKG] D 12, which has a nice 'pump' to it. Adam [Topol's, above] sound is very much how he plays, and he tunes them a certain way that works for him. We put up a stereo room mic about three feet back, an AKG, which gives an overall sound for everything."

Engineer Robert Carranza positions a Telefunken | USA U 47AE. "He is our sound now," says Johnson of his longtime engineer. "In a certain way, he is in the band."

"Jack has kind of a velvet voice, and this is the first time I really got the sound I have been trying to get all along," says Carranza. On the guitar is an Audio-Technica 4050.

Zach Gill's keyboards include Celeste, Clavinet, Wurlitzer, Rhodes, Moog and piano. "He did most of the piano live," explains Carrana. "It was blocked off, with the soundboard faced away from the drums with a little gobo, some 451s and that was our tracking style. Sometimes he played through a little Fender Deluxe amp miked with a [Shure] 57." Pianos went through two Neve 1073s miked L/C/R using less of the center to create space.

Carranza miked Johnson's acoustic guitar with an AKG. "Jack is such a mellow player. He would sometimes play acoustic, sometimes electric, all done live in the room," Carranza says. "One of the best things about making this record is that we used the Avion headphone system. You can discretely send tracks to each player and everyone can make and store their own mixes."



Many amps on the project were borrowed from producer J.P. Plunier's collection. "The one on the left is a Bell stereo amplifier that has two inputs so you can create a stereo effect; we used that one quite a bit," says Carranza. "The little orange one is an old Gibson. We also used the little combo on the bottom with the tweed design. Standard miking [included] an SM7 or a 57; sometimes, I put the 251 on the amp farther back."

Overall, signal chains were simple. "All the drums went through APIs," says Carranza. "Room mics went through Neves. API straight in, straight to tape, with just a little bit of API EQ. Adam has his drums dialed in, and they sound good the way they are. Jack's acoustic went through a Neve, bass went through the UA 610s with those great tube electronics." Vocals went through an API mic pre from the Telefunken | USA U-47 re-issue into the API 512, into an LA-2A and straight into tape. "We used the 1176 every once in a while, not too much; this is more of an LA-2A kind of record. No aggressive stuff." Acoustic guitars went through APIs with graphic EQ to add high end.

Analog treats (top-bottom): Summit Audio DCL-200 Dual compressor/limiter, Empirical Labs EL-7 Fatso Jr., Ridge Farm Boiler ultra compressor. ("Serial number 35," says Carranza. "When you want something to go crazy, put it through that box."), Tube-Tech-Dual Compressor CL 2A. Lindcraft Denmark tube stereo compressor, TLA-100A Summit tube leveling amplifier, and a Teletronix LA2A original limiter. ("When used with an amplifier, it zooms in on sound and brings out all the little characteristics that are in there.")

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(Green Day, Kid Rock, My Chemical Romance)

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"I can't think of any large monitoring system I'd rather have in Skywalker Scoring Stage than Allen's Ocean Way Monitors." **- Leslie Ann Jones**

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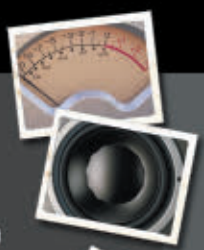

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game AUDIO

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Game Growth Outpaces Economy

CALLING ALAN GREENSPAN:
The U.S. computer and videogame industry's annual growth rate from 2003 to 2006 exceeded **17 percent**, according to a study released by the Entertainment Software Association. This growth outpaces the U.S. economy as a whole, which grew at **4 percent** during this same period. According to the study, *Video Games in the 21st Century: Economic Contributions of the U.S. Entertainment Software Industry*:

- The computer and videogame industry's value added to U.S. Gross Domestic Product (GDP) in 2006 was $3.8 billion.
- In 2003 to '04 and 2005 to '06, the industry's contribution to real growth exceeded its share of GDP by more than four to one.
- The entertainment software industry directly and indirectly employs more than 80,000 people in 31 states.
- U.S. game industry employees received total compensation of $2.2 billion.

"Videogames represent a new and innovative medium for what we've always tried to do, which is to tell great stories. But this medium is unique in that it gives the player control over how those stories unfold."

—film producer Jerry Bruckheimer, on his deal with MTV Games to develop and create new videogames

AFM Teams With G.A.N.G.

The American Federation of Musicians of the United States and Canada (AFM) announced that its International Executive Board authorized AFM's Diamond Sponsorship of the Game Audio Network Guild (G.A.N.G., www.audiogang.org).

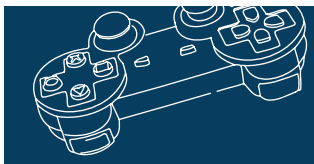
Aimed at capturing a greater share of the videogame-scoring market, the AFM's International Executive Board recently authorized its officers to enter into a series of "one-off" agreements with terms that are consistent with current industry practices. These agreements allow publishers to use videogame music from their titles for all other purposes, including promotional materials such as DVD bonus features, trailers, commercials and soundtrack albums.

"This is really a groundbreaking step by the AFM," says G.A.N.G. founder Tommy Tallarico. "It's fantastic that the AFM recognizes the importance of the videogame industry and they are making it a top priority to work with us. We're pleased to have them aboard, and look forward to working together to create the finest music possible for videogames."

BE A BAR HERO

Peavey and ArtGuitar, a designer of custom graphics for electric and acoustic guitars, have teamed up to release the RiffMaster Pro bundle, a complete speaker system and guitar controller package for guitar-based music videogame tournaments in bars and clubs.

Exclusively available at www.artguitar.com, the RiffMaster Pro features a Peavey P.A. system offering four 10-inch speakers and two tweeter drivers within a 412 stack exterior design, and two limited-edition AG RiffMaster guitar controllers, which are Peavey guitars modified for play with guitar-based games on PlayStation 2. Choose from 17 different designs, from Megadeth to Lynyrd Skynyrd. True shredders can even plug in real instruments…Next up: air guitar?



ALL WORK, NO PLAY?

If the results of a highly unscientific mixonline.com survey are any indication, audio engineers spend less time playing games than the average gamer, who plays about seven hours per week. We're guessing *Mix* readers are using all that time to work on their studio tans.

How much time during the week do you play videogames?

None >>>>>>>>>>>>>>> 51%

One to four hours >>> 22%

Five to 10 hours >>>> 15%

Not now, I'm about to beat level 25! >>>>> 9%

Welcome to GDC '08!

The Game Developers Conference (GDC) takes place February 18 to 22, 2008, in San Francisco, and this year's audio track is shaping up to really rock. Developers and composers alike can benefit from the panels, which range from hands-on advanced skills sessions to real-world case studies. Highlights include "Audio Boot Camp," "Audio Post-Mortem: *HALO 3*" and "26 Slick Tricks for Game Dialog and Other Voiced Bits."

Music licensing is a scorching-hot topic these days, and a host of show sessions target the composer, from panels on understanding underscore deals and working with the AFM to the Composer Challenge 2008. Detailed information on the entire audio track is available at gdconf.com/audio.

And don't miss the always-packed G.A.N.G. events: the 6th Annual G.A.N.G. Awards (February 21) and the Demo Derby, the *American Idol* of GDC (without all the weeping). Stay up to date with *Mix*'s exclusive show coverage, featuring blogs, podcasts and San Francisco survival guide—coming this month to mixonline.com.

GameDevelopers Conference

Name the Game

LOST IN TRANSLATION

Sega released this shoot-'em-up arcade game in Japan in 1989, and an English version debuted two years later. But it wasn't until 2001 that one particularly poorly translated dialog line from the game sparked a major Web phenomenon. If you can name the game and the phrase, send your answer to mixeditorial@mixonline.com by February 29 to enter in a random drawing to win *King of Kong: A Fistful of Quarters*, which chronicles Billy Mitchell and Steve Wiebe's epic battle for the title of *Donkey Kong* world champion.

EVERYONE'S A CRITIC

The votes are in: According to Metacritic, which averages "scores" from reviewers at more than 100 top publications, the following titles rank as best-reviewed games of 2007:

Wii ..... *Super Mario Galaxy* (Nintendo)

Xbox 360 ..... *Bioshock* (2K Games/Irrational)

PS3 ..... *Call of Duty 4* (Activision/Infinity Ward)

PS2 ..... *God of War II* (Sony)

PC ..... *Out of the Park Baseball 2007* (Sports Interactive)

Call of Duty 4

BY MICHEL HENEIN

Answering the Call of Duty

Behind the Scenes of a Top Modern Warfare Videogame

In 2004, game developer Infinity Ward released *Call of Duty* (*CoD*) to much critical acclaim, and the title soon became the benchmark World War II first-person shooter (FPS) game. Published by Activision, *CoD* immerses the player in a cinematic experience with exciting missions and intense battles amidst one of history's most epic chapters. Earlier this year, Infinity Ward released the fourth installment of its extremely successful franchise, *Call of Duty 4: Modern Warfare* (*CoD 4*), which continues to dominate the FPS genre. In addition, *CoD 4* taps into next-generation platform technology and is available for PC, PlayStation 3 and Xbox 360.

CoD 4 is the first game in the series that is not based in the WWII era; it is primarily set in modern-day combat scenarios of black ops. The game gives the player the ability to star in several interactive roles, including a role in Britain's elite SAS special forces, as a member of the U.S. Marine Corps 1st Force Recon and as a gunner on an AC-130 Spectre Gunship. The player is key to neutralizing the ability of rogue separatists to launch nuclear warheads.

Needless to say, the audio production for *CoD 4* was a monumental undertaking, but in the hands of the veterans of the Infinity Ward audio team (based in Encino, Calif.), no challenge was too great.

CAPTURING THE SOUND OF WAR

The audio team faced a major challenge in capturing the sounds of weapons for *CoD 4*, not just in the actual recording, but in the logistics of finding the heavy-duty firepower needed to provide the necessary realism. According to Mark Ganus, audio lead at Infinity Ward, "We were fortunate to gain access to various military bases here in Southern California for a variety of vehicle and live-fire field recordings." This access included various weapons, specifically live-fire training at various bases, M1A1 Abrams tank exercises at Twentynine Palms, CH-46 Sea Knight helicopters at Miramar. According to Ganus, the team spent "nearly…an entire day at Camp Pendleton to record an AH-1 Cobra helicopter."

When it came time to record small arms, the team held two recording sessions: one in Nevada and another along the California/Mexico border. "Everything we needed to support the change from World War II weapons to modern-day was used," Ganus says, "such as AK-47, M249 SAW, MP5 and MP5SD. We used a variety of recorders for our shoots, [which were] chosen for their different-sounding preamps, including the Sound Devices 744, which was more clinical and precise sounding. The Fostex FR-2 was also used, in addition to an [analog] Nagra because there is just no replacement for tape saturation. We like the [FR-2's] preamp for its warm and full sound, its ease of use and for the ability to copy the data over from the cards instead of streaming off of a DAT."

According to Ganus, the team used a variety of microphones with the different recorders; models included Sennheiser lavaliers and the MD-421, Audio-Technica AT822 stereo mic, Neumann RSM191 stereo shotgun mic and KMR81, DPA 4007, AKG D-112 and many others.

The original score for *CoD 4* was composed and arranged by veteran film composers Harry Gregson-Williams and Stephen Barton. Music spotting was done by the Infinity Ward team, which provided the composers with video of specific scenes that were chosen for their emotional significance. Ethnic in-

Recording tank exercises at Twentynine Palms

struments provide an authentic flavor to the various locales where certain events unfold, including the Middle East and various parts of Eastern Europe. In addition, a modern guitar gives the mission a heroic sense as the player comes to the aid of his fellow soldiers. The score was recorded at Air Lyndhurst and Abbey Road Studios in London, and then mixed at Gregson-Williams' Southern California studio.

THE CRIES OF BATTLE

The most powerful (and obvious) way to tell a story is, of course, through dialog. But in a military shooter, there are key game cues that are also delivered through dialog. According to dialog editor Chrissy Arya, there were challenges associated with the casting of voice-over talent, primarily with foreign-language actors. "It was difficult to find quality actors here in Southern California who could fluently speak and read Arabic and Russian," she says. "We even went abroad to the UK to record a couple of our key British voice actors." The language challenges prompted the team to "use phonetic translations for the editors and voice-over directors to follow what was being said.

"We wanted the recordings to feel natural on our battlefield in the game," Arya continues. "We leaned very heavily on our performers to deliver their lines with battle-like intensity."

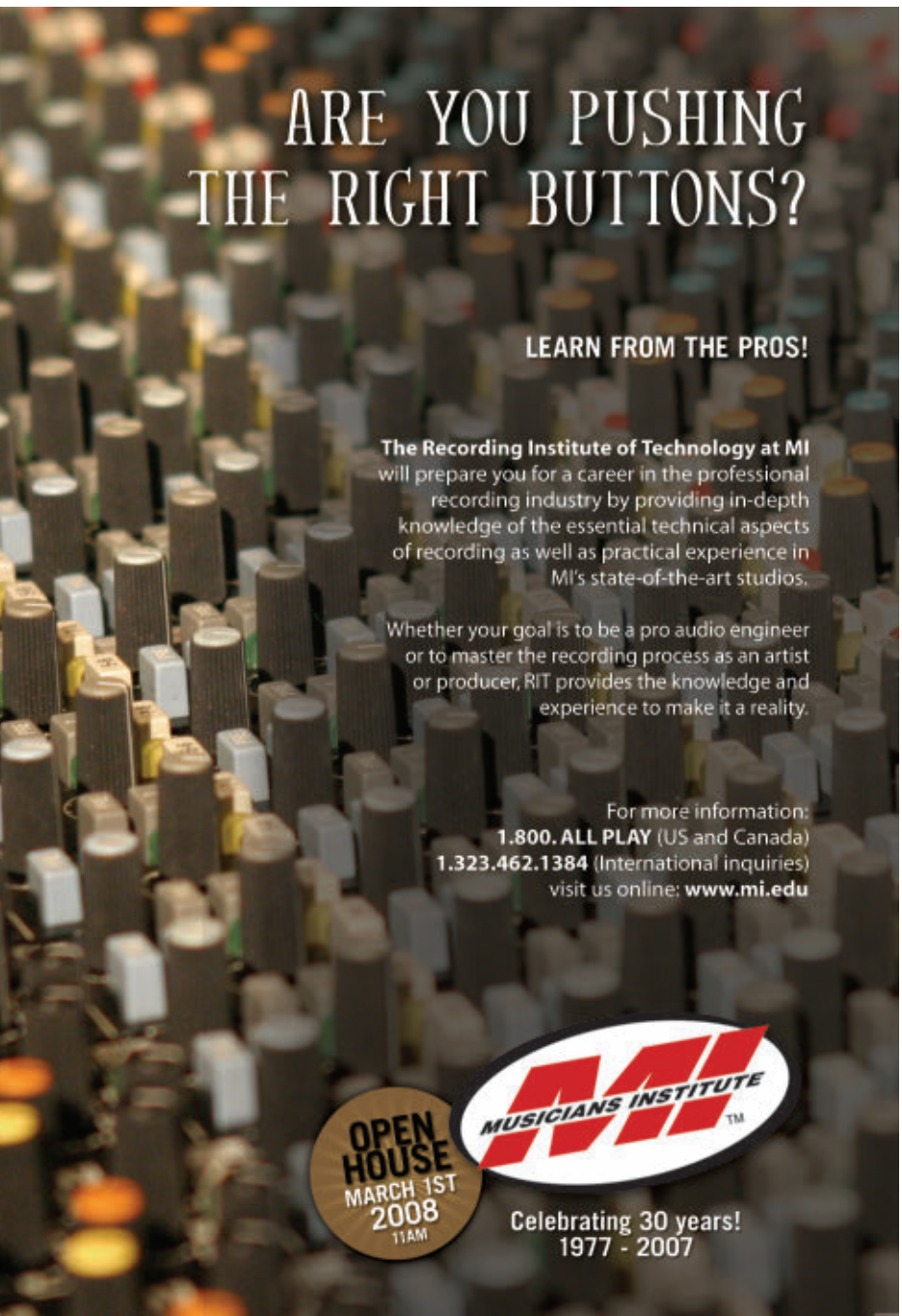
The audio team at Infinity Ward took in-game radio communication to a whole new level by providing templates for 11 different types of radio processing. "We did this to help deliver realism to the player by providing an aural difference when communicating with other soldiers who were in tanks, helicopters, flying in an AC-130 or even under heavy fire in another area of the game," says Arya.

AUDIO IMPLEMENTATION

CoD 4 introduces a few technical firsts for Infinity Ward's team. According to sound designer Stephen Miller, the number of 3-D sound emitters was vastly increased to provide a heightened sense of realism for the player. "Everything—from a large variety of creaks and groans, to simple things like flies and crickets—was added to help further immerse the player into the environment," Miller says The game also introduces 4-channel ambient streams from disk, which, according to Miller, feature "dynamic switching of different battle ambiences based on the amount of action going on in the game."

Sea Knight helicopters at Miramar

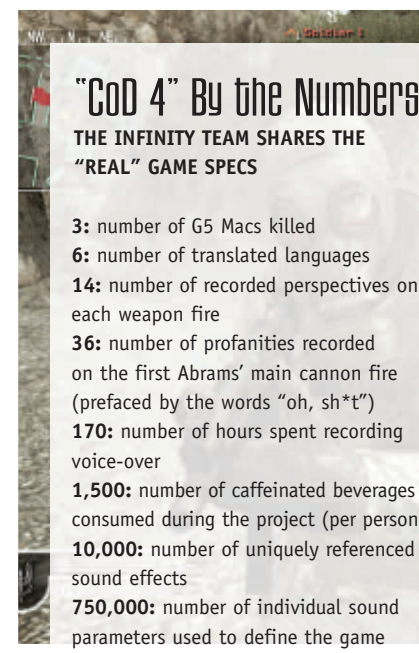
Recording small arms "on location"



Audio effects include real-time filtering based on line of sight; essentially, every 3-D sound emitter's line of sight relative to the player is checked by the game engine, with filtering applied accordingly.

Signature game sounds received special consideration. "A lot of attention was placed on trying to replicate the power we experienced from the Abrams' [M1A1 tank] main canon," explains Miller. "Each single shot is actually broken down into four separate components: The first two are the 3-D positional crack and boom of the initial part of the sound. The next part is the 3-D positional tail or decay. The fourth part is a stereo sweetener that envelops the player, playing out of both the front-left and -right speakers, but also the surround speakers." This sound is further modified based on the player's proximity to the effect, says Miller. "If the player is too close to the tank when it fires, this action will trigger a real-time mix change, deadening the surrounding chaos and initiating a realistic ringing of the ears."

The audio team applied this tiered approach to explosions and other regular sonic elements in the game. "We didn't want to have just a single canned sound with a couple of variations, so we decided to take it much further," says Miller. "Additional sounds were also placed on headlights, windows and tires, which are also triggered during an explosion. We made use of our physics engine to attach sounds to the car hood and doors, so after the explosion the falling debris impacts the ground or other objects nearby, triggering the correct sound.



"CoD 4" By the Numbers

THE INFINITY TEAM SHARES THE "REAL" GAME SPECS

3: number of G5 Macs killed
6: number of translated languages
14: number of recorded perspectives on each weapon fire
36: number of profanities recorded on the first Abrams' main cannon fire (prefaced by the words "oh, sh*t")
170: number of hours spent recording voice-over
1,500: number of caffeinated beverages consumed during the project (per person)
10,000: number of uniquely referenced sound effects
750,000: number of individual sound parameters used to define the game

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Everything works together so that the explosion never feels out of place—it never sounds exactly the same way twice."

Instead of providing a continuous soundtrack, the game's music judiciously emphasizes dramatic moments, changing dynamically based on what's happening on-screen. Ganus mentions one piece in particular: "Launch Facility B," which "dynamically changes through five different versions of the music piece to coincide with the clock timer counting down, giving the player an aural sense of urgency and to help compel the player forward through the mission."

One of Infinity Ward's sound design suites

All of the implementation for *CoD 4* was done through the use of proprietary tools integrated within a level editor that allows a sound designer to place sound emitters graphically into the world and edit their properties easily.

MIXING FOR THE PLAYER PERSPECTIVE

Ganus notes that in mixing *CoD 4*, the audio team wanted to give the player the sense that he or she is influencing the action rather than merely observing it. "The player's weapon sounds are in the foreground [of

the mix] and immediacy is given to nearby whiz-by, bullet impact and explosion sound effects, connecting the player to the danger of the situation," he explains.

Given the sheer amount of music, dialog and sound effects produced for *CoD 4*, the team at Infinity Ward had to implement a sophisticated mixing system to address the inherent complexities of such a large amount of in-game audio playback. The team relied on the proprietary sound engine's ability to allow an individual sound effect to dynamically influence the sound mix, as sound designer Miller explains: "When the player steadies his weapon and holds his breath [in sniper mode], the sound engine ducks any extraneous sound effects, giving more focus to the sound of the player's heartbeat while retaining any current musical intensity." As another example, when a player is in close proximity to a flash-bang grenade blast, a "ringing-in-the-ear" sound effect is triggered as all other sounds duck out for a brief moment of time, simulating the effect of being temporarily deafened by a grenade's sonic blast.

The team also enhanced the sound engine's bus architecture. "We increased the number of mixing buses from *CoD 2* to *CoD 4* to provide a higher degree of manipulation," says Ganus. "We also added more user-definable bus attributes, giving us control and flexibility not previously available."

The center channel was used to emphasize key dialog and sound effects rather than for sound positioning, Ganus explains. "This decision was based on the fact that sound can be placed in a full 360-degree perspective without the use of the center channel, and to account for individual consumer taste in setup and calibration of this channel that can skew the intended 3-D positioning."

A SOUND COMMITMENT

Because audio is such an integral part of Infinity Ward's game production, the com-

pany invested in the development of two Dolby-calibrated 5.1 sound design suites, in addition to two dialog editing rooms and a multipurpose Foley/recording room.

Throughout the project, three programmers ensured that working with the three individual platforms—PC, PlayStation 3 and Xbox 360—was as transparent as possible. This allowed the audio team at Infinity Ward to focus on the game's audio design rather than worry about individual platform idiosyncrasies. According to Ganus, "This was the first time Infinity Ward has done a three-sku simultaneous release and the second game in a row [for Infinity Ward] to tool up for a new platform—*CoD 2* was new on the 360, *CoD 4* is new on PlayStation 3."

Call of Duty 4: Modern Warfare has received an incredible amount of praise, not only for providing spectacular photo-realistic graphics, but also for achieving one of the best audio experiences available today for any first-person shooter videogame currently on the market. The Infinity Ward audio team has proved yet again that videogames have truly reached the audio production scale and sophistication of film. ■

Michel Henein couldn't be reached for several days after this assignment—something to do with research for this article.

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Total Immersion Effects

Surround Libraries Enhance Game Development

BY DAVID WEISS

Feeling surrounded by sound libraries? If so, you're probably not alone. The number of packages seems to be growing by the day, and with good reason: Elite collections offer their users an express path to high-quality music and sound effects.

If there is relatively uncharted territory in this space, however, it is in the category of 5.1 surround sound effects (FX) libraries. There are only a handful of surround library products, as opposed to the thousands of collections designed to fit just two speakers. Although libraries have long been useful for cinematic and an increasing number of HDTV productions, videogame developers are one example of a user base who have created a demand for specialized collections.

Soundeffects' Civilisation Soundscapes (right) is available on hard drive (above).

At **Midway** (www.midway.com), the publisher of such popular gaming titles as *Stranglehold*, *Big Buck Hunter* and *Aqua Teen Hunger Force: Zombie Ninja Pro-Am*, Marc Schaefgen holds two titles: worldwide audio director of Midway Home Entertainment and studio audio director of Midway Studios Austin. "The beauty of pre-encoded surround sound effects is that when you do fast things like trailers, bumpers and quick video snippets, they're fast, easy to go to and you can get really cool surround effects in a short amount of time," he says. "That's often preferable to our team starting with a bunch of mono files and creating a huge thing; instead, you can get three to five mono surround elements from a library and have something pretty quickly. In short-turnaround projects, it definitely helps that libraries have cool elements that people are looking for: swishes, explosions, interesting electrical effects and slow-mo sounds that enhance the reality or unreality, if you will."

Gearbox Software (www.gearboxsoftware.com) has released such titles as *Aliens*, *Halo and Tony Hawk's Pro Skater 3*. The company's audio director, Ed Lima, is in agreement with Schaefgen that surround sound FX libraries, while powerful, at this point are far more useful for in-game cinematic sequences than they are in game-play situations. "We use 5.1 effects libraries when simulating traditional post techniques—pre-rendered or post-cut scenes—where the imaging is 'baked in' to a fixed camera/listener perspective," says Lima. "However, they don't work for us in soundscapes that are being made while your playing is being generated by the game's avatar, listening with a 6-channel ear in real time.

Ljudproduktion AB's Digiffects library focuses on backgrounds.

"For example, you might be walking through a forest with a river to the left and birds to the right, with a bad guy running at you and remaining in the foreground," he contnues. "If you turn to the right, everything shifts 90 degrees, but I can't use a sound effect there with a pre-configured surround or stereo placement. That's why developers use them in non-cut scenes' pre-rendered video, but not during gameplay."

While mind-bending sounds might capture attention for other types of libraries, Lima says that an outstanding 5.1 effect may very well be one that doesn't stand out. "In this category, I would look for something useful without a lot of unique character," he says. "I prefer something fairly static and minimal due to the fact that we would have spent so much time making our own custom assets. A monster we build has to have a custom sound, and we want to make associations between that and the

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experience; that's why we want something vanilla for the forest scene and then have something custom for the game at large. I would be less interested in relying on something signature that comes out of the box, having spent a lot of time and money on the custom sound.

"Generic and vanilla also get me something else for free, which is easy loopability," Lima continues. "I want something that will run for an incredibly long time, if necessary. Something that's less interesting right off the needle drop lends itself to that. The result will hopefully still draw you in, but I'm also layering. I can't have just a turnkey drone because folks will recognize it, but by building layers, again, we're able to leverage the custom assets that we've built for the game."

For Schaefgen, who makes use of collections like Midway's recently acquired Revolver library from Blastwave FX, sample size and its place in the frequency spectrum are two constant considerations. "You have to constantly balance how large the resource will be in terms of memory streaming bandwidth," he explains. "We also often go down to quad instead of 5.1. Our first-person shooter game *Blacksite: Area 51* is a good example of why. So much of the action happens right in front of you—in the center channel—that we take ambiences out of that center channel, and for LFE [low-frequency FX] we use spot-mono LFE as opposed to bass, which is bass-managed in the user system."

> The beauty of pre-encoded surround sound effects is that when you do trailers, bumpers and quick video snippets, they're fast, easy to go to and you can get really cool surround effects in a short amount of time.
>
> —*Marc Schaefgen*

"If I know there's going to be a lot of explosions or deep things going on, I'll go for a shriller kind of wind for the exterior ambience," Lima adds. "I might pick some nice winds, but if they have a deep 100Hz sublayer, I'll probably end up using EQ to carve that out."

New company Blastwave FX rolls out with Revolver.

When it comes to the technical particulars, Lima names fairly up-to-the-minute preferences. "I'd rather have 96kHz than 48, 24-bit rather than 16; the highest-quality original sound source we can get is ideal," he says. "Hard drive delivery is also ideal."

After all that, of course, videogame developers are also painfully aware that they must look beyond their armed-to-the-teeth audio suites and into the messy basements of their customer base. "This will sound like a step backward," says Lima, "but one of the things we have to contend with in the game is that only a small percentage of our users have a properly configured 5.1 setup. We often spend a lot of times verifying that our surround mixes fold down to stereo properly by checking them on headphones, near-field monitors, TVs, earbuds—all manner of 2.0 and 2.1 setups. One of the best things engineers on the authoring side of 5.1 effects libraries can say about their product is 'easy fold-down.' Don't introduce anything that can phase out or phase-augment. Not surprising me when I knock it down to 2.0 is the biggest favor you could do for me."

With all of the demands that users require from a surround sound effects library, companies are responding in kind—releasing new offerings every year. Here is a look at what is currently on the market; companies are listed in alphabetical order.

A new arrival on the scene is **Blastwave FX** (www.blastwavefx.com), headed up by veteran sound designer Ric Viers and his gang from the Detroit Chop Shop, rolling in with its new 5.1 surround sound production elements collection Revolver. Distributed by Pro Sound Effects (www.prosoundeffects.com), Revolver is an all-in-one set of 1,000 hi-def 5.1 surround sound imaging el-

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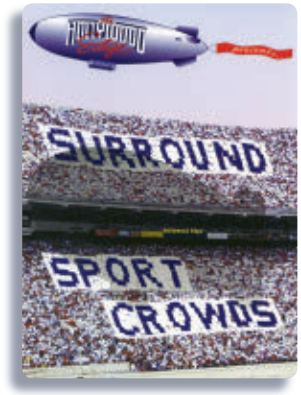

Hollywood Edge Surround Sport Crowds is a remastered release.

ements, compositions, drones and trailers on six DVDs. All sounds were originally recorded at 24-bit, 96k, and then delivered as 24-bit, 48k broadcast WAV files, along with iTunes-compatible reference MP3 files.

All Blastwave collections, including Revolver, are Click N' Drag™ libraries, meaning that they be clicked and dragged onto any hard drive and are cataloged with embedded metadata for easy search and retrieval in Pro Tools, AVID, SoundMiner, NetMix, iTunes and other sound library search engines.

De Wolfe Music (www.dewolfe.co.uk) offers a four-CD collection, Renaissance 5.1. A digital 24-bit, 48kHz remastering of the company's original surround sound collection, the release's process was accomplished through use of Renaissance Sound Technology's proprietary psychacoustic software applications. Collections include World Ambiences, Sounds From Nature, Special Environments and Subwoofer FX.

In April of 2008, film score composer and sound designer **Frank Serafine** (www.frankserafine.com) will introduce the new Ambience 5.1 collection to the Serafine Collection of sound effects libraries. A 20-DVD collection of surround sound samples from both natural and city environments, Ambience 5.1 includes traffic, rain, waterfalls, forests, Grand Canyon winds, countryside, neighborhood, weather, aquatic, crowds and more.

No one can say **Hollywood Edge** (www.hollywoodedge.com) lacked focus when it created this 5.1 library: Surround Sport Crowds, a remastered release. This 58-track, single DVD provides a variety of sound effects recorded in a large audience venue, with the feel and intimidation of a large sports crowd. All types of audience reactions are covered, from idle walla, victory elation and infuriated losses. The original stereo set has been remastered into 5.1 surround WAV and AIFF files, which were also subsequently bounced into L/R stereo WAV and AIFF files for quick television editing.

Slithering into the field is **Iguana Kitchen** (www.iguanakitchen.com), presenting its new Quantum Audio Mechanics Vol. 1. The company states that this product was designed to be the world's first 12-channel HD surround effects library. That's not to say that these are in 11.1; rather, the company has made it simpler to mix for multiple surround formats by providing separate tracks for every surround sound format currently in use: left/front, left/center, center/front, right/center, right/front, left/rear, center/rear, right/rear, left/side, right/side, IMAX (overhead) and LFE, with each sound recorded and labeled with all 12 channels.

In this way, an editor/sound designer can insert the tracks for the particular format they're working on and get the same consistent sound for 5.1, 6.1, 7.1, 8.1 and/or 9.1. Perspectives can also be changed by reversing the track order (front to rear and rear to front) or loading the tracks sideways. All tracks have been recorded at the source at 24-bit/192kHz, and are delivered on a portable hard drive that includes both AIFF and WAV files of every track.

Sounds on Quantum Audio Mechanics include weapons at an outdoor shooting range and indoor shooting range; suburban outdoor ambiences, including traffic, trains, fire trucks and emergency vehicles, helicopter flyover, planes, fireworks and more; interior ambiences, including bathroom showers, washers (top- and front-load washers) and dryers; quiet room sounds; a unique collection of sounds of things being dropped on the floor above the microphones; and an assortment of industrial sounds, both interior and exterior.

Backgrounds are in the foreground with Digiffects Surround Sound FX from **Ljudproduktion AB** (dist. by Sound Ideas, www.sound-ideas.com). All of the 169 royalty-free sound effects in the three-DVD collection have been recorded in 4-channel surround at 24-bit and 48kHz quality. Two stereo WAV files make up the 4-channel surround sound; audition MP3 files (at 192 kbps) are also supplied.

The point of **Point One Sound** (www.pointonesound.com) is total surround, as evidenced by its Immersion 5.1 surround sound library. Comprising seven DVDs and seven CDs (for preview or stereo applications) of royalty-free ambience tracks,

all contents were recorded, edited and mastered by the motion-picture engineers and mixers at Point One Sound. Immersion 5.1 offers more than 220 ambience tracks, including airplanes, arenas, cottages, beaches, elevators, frogs, marshes, percussion, subways, train stations, wind and more.

Get your subwoofer on with Sound Ideas' Just Boom Trax collection.

Sony Creative Software (www.sonycreativesoftware.com) is arriving on the 5.1 surround scene with a bang—literally. Volume 7 of the Sony Pictures Sound Effects Series features a series of layerable 5.1 surround sound explosions. Each of the 14 sets of WAV files is labeled to indicate where in the 5.1 field the user can achieve the best sound effect; i.e., 5.1 Explosion Set 01: C.wav; 5.1 Explosion Set 01: L.wav; etc.

For something a little more civilized, turn your ears to **Soundeffects** (www.soundeffects.ch) and its 14-DVD or hard-drive Civilisation Soundscapes 5.1 surround sound library. This collection was created to provide sound professionals with an archive of field-recorded 5.1 sounds, focusing on the sounds of nature and civilization. In addition, the recently released Industrial Soundscapes 5.1 surround sound library, delivered on a hard drive, adds ambient surround tracks in the "Industry" category to the mix.

Soundeffects points out that part of the fun of surround is the new possibilities that arise from integrating various stereo and mono files in surround, and the company's surround sounds were specifically recorded to be combined with each other. Civilisation Soundscapes 5.1 contains many foregrounds, such as interior recordings of airports, museums, train stations, theaters, bars and restaurants. Exteriors were recorded in cities, forests and parks. In addition, the library contains numerous traffic ambience tracks that feature different vehicles and varying traffic density. There are also pure nature atmospheres, including birds, trees, swamps and fields with chirping crickets. Weather, traffic and rain are also well-represented, as is ambient silence in the "Open Space" part of the collection. "Room Tones" has the hum and buzz of HVAC systems, electrical installations and more.

All sound files come fully equipped with metadata for Soundminer Versions 3 and 4, as well as comprehensive PDF documentation or dynamic HTML track sheets that can be downloaded from www.soundeffects.ch/soundeffectsdownloads.php for free.

Talk about in-depth. The Just Boom Trax Surround Sound FX Collection from **Sound Ideas** (www.sound-ideas.com) was created specifically to stimulate one's subwoofer. Designed to provide sweeteners for use in the subwoofer channel when mixing surround sound productions, Just Boom Trax offers 250-plus royalty-free tracks on two CDs or DVDs of real-life, fantasy and utility low-frequency sound effects.

This collection is for enhancing the depth and impact of audio via LF growls, impacts, hums, booms, throbs, rolls and drones. Real-life sound effects include aircraft carriers, jets and helicopters; boats, ships and submarines; automobiles, races and crashes, trains, trucks and motorcycles; animal growls, footsteps and cries; human hits and bodyfalls; thunder, wind, earthquakes, avalanches and volcanoes; weapons and military battles; construction, crashes and hits; explosions and impacts; and doors, industrial and motor sounds, stampedes and the space shuttle's sonic boom—wow! The Just Boom Trax library also provides sci-fi and fantasy sound effects tracks, a set of oscillator tones, low-frequency white- and pink noise, and a selection of drum hits and synth accents. A variety of sample rates and bit depths are offered. ■

Sony Pictures Sound Effects Series Version 7 features layerable surround sound explosions.

David Weiss is Mix*'s New York editor.*

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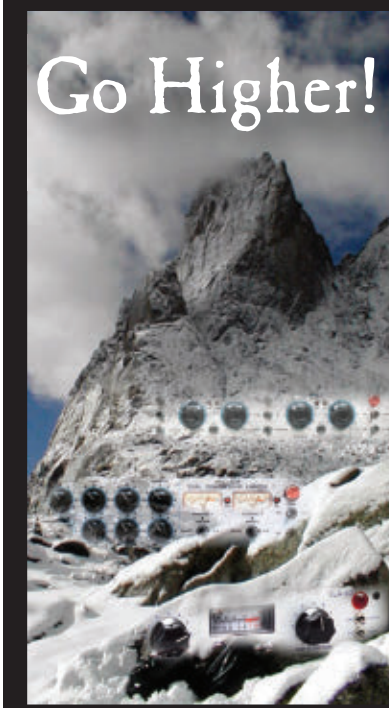

Pete Townshend
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"Guitar Hero" Rocks

WaveGroup Carves Its Niche In Interactive Music Videogames

It's two days after Christmas, a time when many companies are closed for vacation or coasting lazily into the new year. But at the headquarters of WaveGroup Sound in Fremont, Calif., just north of San Jose, there's work being done in nearly all of the facility's studios and editing suites, much of it centered around recording and mixing tunes for a Latin music/rhythm game called *Samba de Amigo* being published by Sega for the Nintendo Wii platform. "It's a casual Wii game, originally released in the late '90s for Sega Saturn," explains WaveGroup owner/president Will Littlejohn, who's giving me a tour of the facility. "With all the interest now in interactive music games, this is a natural."

It's also a "natural" that WaveGroup would be working on the game. During the past five years, the company has established itself as the undisputed leader in producing tracks for the new generation of wildly successful interactive music videogames: Nearly all of the music tracks for *Guitar Hero*, *Guitar Hero II* and *Guitar Hero Encore: Rock the '80s* were produced, recorded and mixed by WaveGroup, and even on games such as *Guitar Hero III* and *Rock Band*, where the emphasis has moved to using recordings by the original artists, WaveGroup still contributed numerous cuts to each (as well as all the crowd sounds for *Rock Band*). Additionally, WaveGroup has been part of a number of hot karaoke games and the phenomenally successful *Dance Dance Revolution*.

"It's funny to do the math on the exposure on this material in these games," Littlejohn says. "The *Guitar Hero* franchise has sold over 10 million units and we've produced so many of the songs—we figure we're up to something like 250 million individual recordings that have been acquired through the *Guitar Hero* franchise alone. We're really happy, too, because it's exposing the artists who wrote these songs and the bands that performed them originally, attracting a new generation of people to their music. You've got hip hop kids playing David Bowie songs."

For those of you not familiar with *Guitar Hero*, it's a videogame (available on multiple formats) in which the controller is a small plastic version of a Gibson guitar, except instead of strings and frets it has a fixed row of color-coded push buttons for "fingering" and a raised lever where the pickups would be for "strumming." Once you choose the animated guitarist you want to be in the game—anyone from mohawked punks to rocker girls to Slash himself—and select a song, the screen depicts a view down a guitar neck (as well as your animated band playing). Then, different colored "notes" corresponding to the fingering buttons come rolling toward you on the screen, and it's your job, as a totally awesome rock guitar god, to reproduce the "notes" as they come speeding at you—*red-red-blue-blue-blue-red-green-green-red*…gotta keep up!—and supply the rhythm/time with your other strumming hand. Any note you miss is greeted with a *clank*, and if you miss enough of 'em (trust me on this one), the crowd in the video starts to boo and then the music screeches to a halt because you have failed so miserably! It takes quite a bit of skill and dexterity, and there are different levels of difficulty that allow you to go from competent picker to shredding whammy-bar-slamming maniac.

The more recent entrant into the field, *Rock Band*, expands on the *Guitar Hero* concept by adding other instruments—from drums to vocals, allowing up to four people to play (or sing!) at once. (*Guitar Hero III* also allows guitar and bass duels.) They're both great party games, completely addictive, and when played well do have *some* of the feeling of actually playing music.

WaveGroup popsicles, L-R: Lindsay Bauer, Leslie Barton, Mark Lee, Bob Marshall, Scott Dugdale, Dave Urrutia, Will Littlejohn, Nick Gallant, Tearle Tomlin, Lance Taber, Sue Pemulder, Kim Nieva, Clay Barlow, Bill Frank

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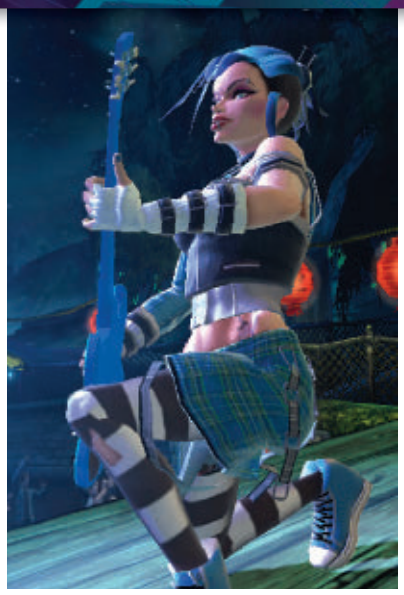

ROOTS IN MUSIC AND POST

WaveGroup got in on the ground floor of this phenomenon, but has been involved with music, games and other media productions since the mid-'90s. Not surprisingly, Littlejohn originally came from the music world. "I was on the road as a keyboard player for 10 years in the 1980s. In the '90s, I spent four or five years as a real estate broker, but on the side I was doing studio work out of my house in Sacramento. Then, to fill in some gaps in my audio education, I took a bunch of courses [at Sacramento City College], and I had a teacher there, John Altman, who turned me on to an internship doing post for the ABC-TV series *Bump in the Night*."

That show was created from top to bottom in Brisbane, just south of San Francisco. The audio post was done in a one-room facility run by James Allen, whose small company was called WaveGroup Sound. Cool as the show was, it did not survive ABC's purge of programming when the network was gobbled up by Disney, so the crew at WaveGroup had to look for other post opportunities. Not long after, the company moved down the road to Santa Clara, Allen left the business and Littlejohn took over. As their reputation spread, WaveGroup attracted many corporate clients for post work (still one of the company's big revenue streams, along with telephony jobs) and increasingly expanded into videogame music and sound design.

"We worked on a *ClayFighter* game in the mid-'90s, doing sound design," Littlejohn says, "and we've been involved ever since. We've probably worked on 40 or 50 titles at least, and all kinds—from shooters to sports games. One of my favorites was the *Blade Runner* game in the late '90s, which we did for Westwood Studios. That was a sound design job where our specific assignment was to create the ambiences and effects from the movie.

"Then, when the consoles hit [PlayStation, Xbox, etc.] a few years ago, with more memory and higher resolution for audio assets, *that's* when it really got fun. These advances really played into our post experience."

As the business grew, WaveGroup moved again, settling into its current warehouse location nestled in a nondescript business park close to both Silicon Valley and the Bay Area's larger metropolises. The 6,000-square-foot "mother ship," as Littlejohn jokingly refers to the Fremont facility, is based around a good-sized tracking room and a control room originally built for the hard-rocking band Y&T many years ago, but which has been completely revamped by WaveGroup.

"We gutted the building and re-engineered and rewired the entire thing," Littlejohn remembers. "We redid the acoustics, working with ASC on the main room, and moved the old machine room, which was placed behind the control room, out to a more central location in a corridor and created more of a star configuration with other smaller rooms [interconnected]. We have six Pro Tools rooms—three HD rigs and a bunch of 002s, and various other workstations. We also have a couple of HD rigs in a San Francisco satellite facility."

Two rooms—the main Mix A and one of the editing suites—are equipped with Sony DMX 100 consoles: "We bought two of the first ones to hit the West Coast, and they've been great," Littlejohn notes, "even with the transition over to all the digital stuff." Mix A is equipped for surround mixing (5.1 or 7.1, with Genelec monitors), offers a nice complement of both traditional outboard gear (Avalon, Eventide, etc.) and digital plug-ins, and has a unique feature: WaveGroup's Sue Pelmulder, who has a background in both civil engineering and sound engineering, designed the main work desk in the control room to move on dolly tracks and be modular, "so the producer's desk can pop off, we can move the board into the middle of the room and the Pro Tools rig becomes a support station. Or you can have the console off to the side as a monitoring station," she says.

On the day I was there, Santana lead singer Tony Lindsay was in Mix A preparing for a vocal session with producer/bassist Darryl Anders for the *Samba de Amigo* game. (Anders also played on numerous tracks in the *Guitar Hero* games.) Down the hall, in what's known as Edit B, Scott Dugdale—an Emmy-winning composer and musician who played in the band Leo Swift with Littlejohn during the '80s, and has been with WaveGroup for four years—sits at a Pro Tools rig surrounded by keyboards and a monstrous percussion setup. "I'm sketching out a little tune I'm writing for the [Wii] game," he offers. "It has a nice retro-samba feel to it. I've got a scratch-chord progression in it, Nick [Gallant, another staff musician and engineer] is going to lay down some nice acoustic guitar stuff over it, and then I'm

going to put in some nonlyrical vocal lines, a lá the old Sergio Mendes sort of sound." Meanwhile, across the building, Gallant himself, who is also the music producer for the game, is in another edit suite working on a different tune.

"We all bring different things to the music," Gallant says. "We might take a straight-ahead Latin pop song, add *surdu* drums and whatnot, then add breaks to it that make it more fun [for the game players]. We'll take it from the idea stage through all our levels here, [which might include] Scott down the hall doing a bunch of piano and percussion work, and then sending it down the hall for me to do some bass and guitar and vocals."

PHOTO: JOHN E. PELMULDER

WaveGroup's Mix A is built around a modular work desk on dolly tracks. Note the reverse configuration on the magazine cover.

THE 'GUITAR HERO' CONNECTION

Littlejohn estimates that WaveGroup has produced more than 400 songs specifically for games since breaking into the market with *Karaoke Revolution* five years ago. That game was developed by the Cambridge, Mass.–based company Harmonix Music Systems (first known for the "rhythm action" games *Frequency* and *Amplitude*), which is also the co-creator of *Guitar Hero*. The impetus to make that game, Littlejohn says, came from a small Bay Area company called RedOctane (since acquired by Activision), which started out as an online videogame rental service in 1999 but made its mark over the next few years as developers of dance pads for *Dance Dance Revolution* and other video dance games. RedOctane and Harmonix joined forces to make a guitar peripheral game, "to bring the magic of playing music to the person who's not a musician," Littlejohn says. "They called us up and asked if we wanted to be involved, and we didn't think twice. We jumped right in.

"In the first *Guitar Hero*, we produced all the music in the main game—30 songs—and it was also our responsibility to create the road map: What do you play? What's the most visceral part you would play at any moment during the song, essentially the air guitar part, as there may be multiple guitars jamming," Littlejohn continues. "So that was the parameter we started to work with. We also helped develop what I think is one of the key parts of the game, which is what happens when you miss a note—it's *gone* [with a clank]. I was a big advocate for the guitar part dropping out completely because the pay-off is playing it right: *Then* you hear the song as it was intended to be heard and you are actively participating in the music."

The *Guitar Hero* tracks were recorded using a combination of WaveGroup staff musicians and a large pool of outside players (some well-known), who were "cast" song by song, depending on the style, "just like you would in L.A. or Nashville," Littlejohn says. "A lot of people assume we have these cover bands come in and perform the songs, but that's not how it's done. We approach these songs a number of different ways. We've done full live recordings; sometimes we'll do rhythm sections only; we've done them one piece at a time—it really depends on the song and what we're trying to accomplish.

As for the all-important guitar parts, "The first thing is bringing in the right player," he says. "Then we basically break down the song and create the solos. In some cases, the arrangement and the solos are similar to the original recording. But in other cases, we'll change the arrangement and add solos that don't exist in the original recording. We like to stay true to the original recording in terms of the vibe and the feel and we put a lot of thought into what a guitarist of this style would do on these additional solos. Obviously, we're not going to put a bunch of '90s grunge licks in a '70s classic-rock song. So we'll talk about that and the general arrangement of the song with the guitarist, and then we let the guitarist come up with their take on what that would be."

Do they think about the degree of difficulty for the prospective gamers? "We're thinking about that a little more than we used to be. By the second game, we started getting a little more *evil*," Littlejohn says with a chuckle. "You're always going to find people who want more of a challenge and will complain that it's not as hard as it should be. There's a gaming mentality with a certain subset: 'I need something that's literally impossible to play that I can focus on for the next five years!' [Laughs] But that wasn't what we set out to accomplish—we wanted to help put out a game that gave you the feeling of what it's like to play music. But, yes, we do factor the level of difficulty into our arrangement choices."

And though some in the mainstream press have suggested that interactive music games will keep people from taking up real musical instruments (as sports videogames supposedly keep many kids, teens and young adults from exercising), Littlejohn isn't buying that argument at all.

"I believe the opposite," Littlejohn says. "There's a lot of anecdotal evidence that it's driving more people *toward* instruments. One of our guitarists, Lance Taber, besides being sort of a rock star in the game world, also teaches, and he said he's seen a lot of kids who've played these games coming in and they've already mastered the relationship of rhythm-fingering versus the strum rhythm, and that's a big part of learning guitar. The game engages that part of your brain. *Obviously*, it's different—you don't have theory, you're not playing real notes—but the rhythm part of it is similar. I really think that in 10 or 15 years, we're going to see big artists who got turned on to playing music by this thing, and in that way I feel honored being part of it. We're bringing something positive to the world. You can't ask for anything more than that." ■

Blair Jackson is Mix*'s senior editor.*

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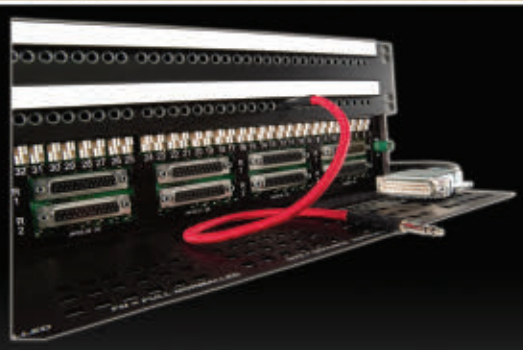

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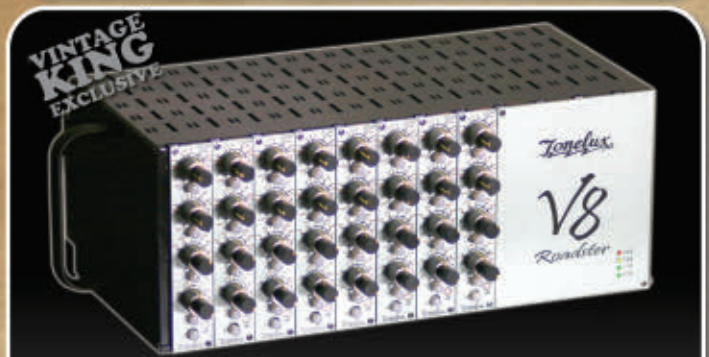

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BY HEATHER JOHNSON

Persist Music

Tom Salta Scores Leading Game Titles in a Customized Space

West Norwalk, Conn., is a quiet town located less than an hour from New York City. This time of year, a foot of snow covers the barren foliage and the streets lined with Colonial- and Cape Cod–style homes. In one of these homes, if you walk through the garage and up a stairway, you'll find composer/producer Tom Salta. Neighbors in this picturesque town may not know it, but behind closed doors Salta composes electronic and orchestral music for some of the videogame industry's most highly charged releases.

His recent scores include the *MTV Video Music Award*–nominated game *Tom Clancy's Ghost Recon: Advanced Warfighter* and the IGN Award–winning *Red Steel* (both from Ubisoft). Beginning in the early '90s, Salta spent most of his time recording album projects for a wide variety of major-label pop, rock, R&B, jazz and dance artists. In 2003, he shifted his career toward the game industry with a segue into film trailers. He also produced a solo album under the name Atlas Plug.

Today, Salta does most of his composing, recording and mixing in his project studio, Persist Music, which he's operated in its current location since 2005. "When we were house shopping, one of the key factors was to have a space for the studio," says Salta. "This house was perfect because it featured a fully finished great room over an attached garage, with a full bath and windows on both sides of the room overlooking all the trees that surround our property."

Dave Mawhinney, who works for Sound Ideas, a high-end home theater and custom A/V systems company in Armonk, N.Y., assisted in the facility's design, while another close friend of Salta's, Bill Dougherty, handled the construction.

"The room has a 13-foot A-frame ceiling, so building slightly angled walls within the room took some serious geometry to get right," says Salta. "Bill built all the framing for the walls on the floor first and then raised them up so they friction-fit on the existing ceiling. The angles were crazy. Even the front wall in the control room leans toward you a little bit to avoid any right angles. I teased Bill, and told him, 'Thank God you were an engineering major!'"

The front of the control room is lined with custom rectangular wood-framed absorption panels that are made with 2-inch-thick black acoustical fabric, while the back wall is reflective with diffusion. An iso booth features doubled walls, ceiling and doors, and resides next to an office area. The booth offers sight lines to Salta's chair through two sets of double-paned windows. "Because the ceilings are so high in the main room," Salta adds, "we decided to give the interior of the booth a 7-foot ceiling and use that remaining height for storage above the booth."

Inside the control room, Salta runs Apple Logic Pro 8 on a dual quad-core Mac Pro G5 using a Wacom tablet and pen. "I've always toyed with the idea of a control surface, but it's simply not worth the extra real estate for me," he says. Salta discovered the Wacom tablet when years of mouse-clicking left him with stiff wrists. "With the Wacom, you can literally jump from one corner to the next instantly; you don't have to slide over. It's a completely different way of working, but once you get it, it's incredible. And I no longer have any stiffness."

Tom Salta enjoys a control surface–free studio environment.

Salta keeps his outboard gear to a minimum, save for a few integral pieces, such as an API 512C mic preamp, an Apogee Rosetta 800 interface and an Apogee Big Ben master word clock. He also owns a custom tube mic designed by Roy Hendrickson, chief engineer at Avatar Studios in New York City. "It sounds like a [Neumann] U67, only with more low-frequency extension," says Salta.

Although Salta incorporates live instruments as often as possible, he also calls upon extensive inventory of virtual instruments, including Spectrasonics' Stylus RMX, Atmosphere and Trilogy. "I've always been a big fan of [Spectrasonics founder] Eric Persing's sounds, even those from the Roland days," he says. Other key players include Native Instruments Kontakt and Absynth. "I really like the plug-ins that have built-in libraries with searchable attributes like the NI software," says Salta. "That's one of my favorite aspects of using VI's like Absynth 4, FM8 and Massive." He also uses the Project SAM sound libraries for more cinematic scores, as well as various custom libraries, depending on the project.

As Salta's career progressed, his studio evolved to become more efficient and virtual. "Composing for games is about collaborating with game developers," says Salta. "My love of games, combined with my past experience [in] scoring, programming, producing and songwriting, helps me anticipate the needs of the developers and create music that fully immerses the player in the experience." ■

Heather Johnson is a Mix *contributing editor.*

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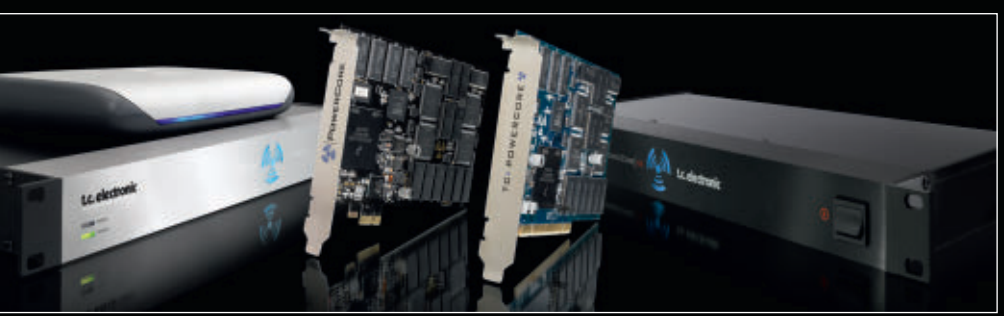

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RTS Games Still Going Strong

A Look at "Age of Empires III: Asian Dynasties"

BY BLAIR JACKSON

Although there's no question that the videogames getting the most attention from both gamers and the press these days are the latest generation of elaborate, sophisticated and realistic "shooters" for the Xbox 360 and PlayStation 3, there are still millions of players around the globe who love nothing more than to immerse themselves in the fantastic worlds offered by (primarily) PC-based real-time strategy (RTS) games. These, too, have come a long way in recent years, boasting ever-more impressive visuals and better sound (along with stronger stories). To say that they can't realistically "compete" with popular (and much-hyped) games such as *BioShock*, *Assassin's Creed* and *Call of Duty 4*, is to miss the point; that's an apples-and-oranges comparison. RTS games continue to be a vital part of the industry.

***Players look down at their world in* Age of Empires: Asian Dynasties.**

One of the most successful RTS franchises of the past decade is Ensemble Studios/Microsoft Game Studios' *Age of Empires*, which, in its third iteration, continues to grow thanks to such best-selling expansion packs as *The War Chiefs* and last fall's *Asian Dynasties*—the latter produced with Maryland-based Big Huge Games (itself best known for the RTS game *Rise of Nations*). *Asian Dynasties* takes the base *AOEIII*, in which players strategically manage different European powers and build armies and face various obstacles and foes, and then grafts on a number of historic Asian civilizations, including India, China and Japan, so Japanese samurai can face off against Dutch colonialists and other improbable but intriguing situations.

Sound design for the *Asian Dynasties* expansion pack was by Big Huge Games audio director Devin Hurd, who has more than a decade of experience working in game sound since his days at Dartmouth's Electro-Acoustic Music program. Out of college, the Boulder, Colo., native got a job with a friend's start-up company in Seattle called Orca Games. "I saw it as an opportunity to do sound and music as a living, so I got my start there, and seven companies later I'm still doing it," he says with a laugh. His journey has involved stints at Humongous Entertainment, Boss Game Studios, Kush Games and others, working on everything from racing games to sports titles—and now, with Big Huge, on RTS and RPGs (role-playing games). "I've always admired their games," he says, "and I'd always wanted to work on real-time strategy games, so it all fell into place."

The sound requirements of every style of videogame vary, and RTS games have their own peculiarities in that regard. As Hurd notes, "The perspective is different on RTS titles as compared to a shooter, where you're right there in the action. With RTS games, you're sort of looking down on the world and it's like you're the deity *and* the player. There's really the idea that the sounds sort of funnel upward to where you are. So the sense of space is very different."

Obviously when, as a player, a scene is unfolding on a bigger scale and is outdoors, less-detailed sound design is needed—you're not hearing every shell-casing hit the floor in some bombed-out building. "There's a lot less concern with reverb and reverb tails," Hurd offers, "and the space is so open that I do

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things to make it sound and feel like it's in an open environment. I'll use a little convolution to make it feel like it's outdoors."

In the case of the *Asian Dynasties* expansion, Hurd had to work somewhat within sonic parameters established in the original *Age of Empires III* by Ensemble Studios music and sound director Stephen Rippy. "I wanted to stay consistent with their feel," Hurd says. "There's a language of the game, so to speak, so the key is to match up with what's there.

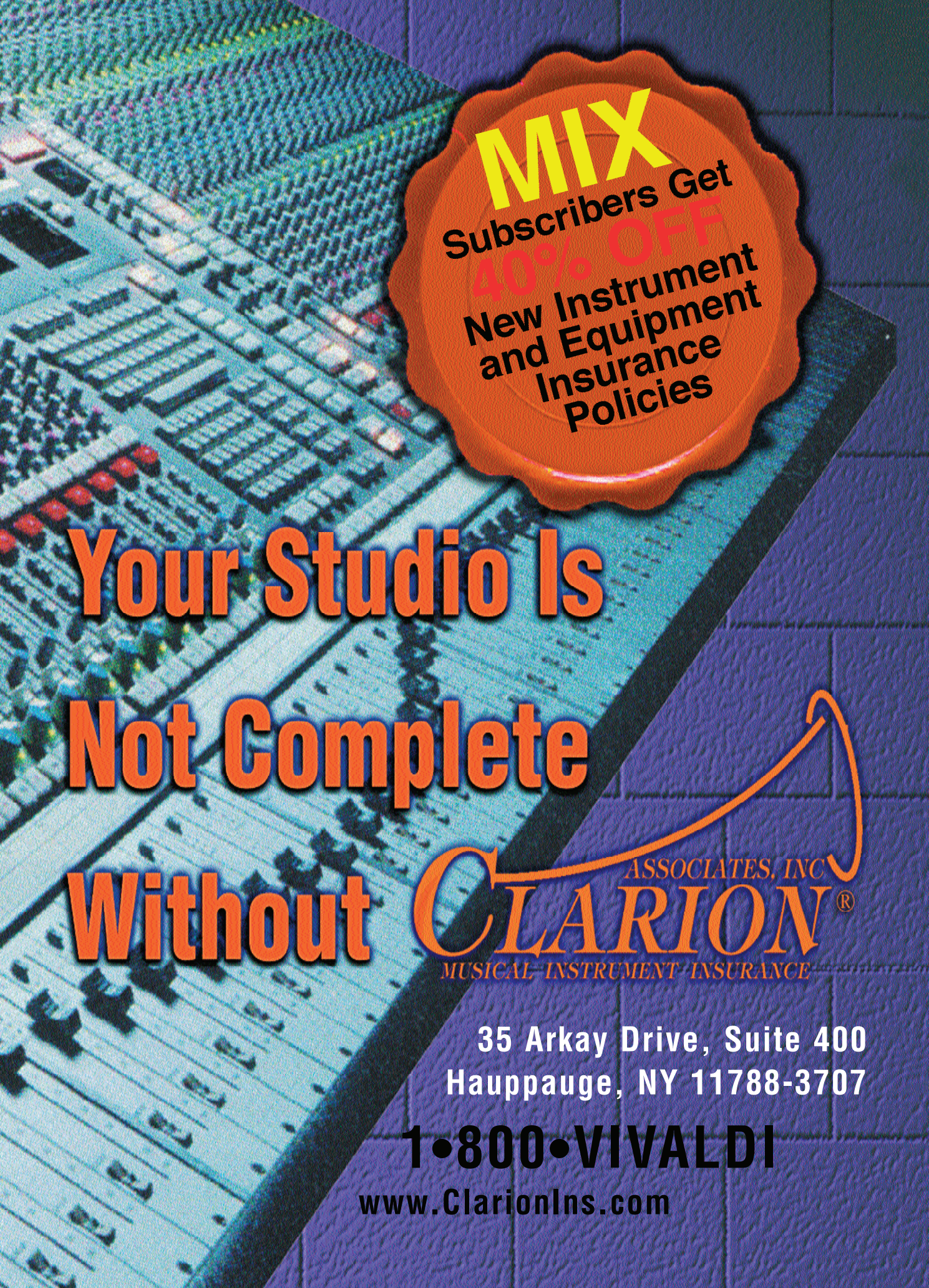
"I talked to Stephen and got a list of what they had done before—what the format and duration was for the assets [anything animated], because I wanted to make sure that anything we added wouldn't be too jarring or too much a departure from what the players would expect," he continues. "Still, we certainly did some new things and we also added some Asian flair to things, and that was fun.

"I like working on expansion packs because when you start you already have a base code that works; you're not really shooting in the dark and that easily cuts a year to a year-and-a-half off the development time."

Big Huge Games audio director Devin Hurd

With RTS games, a crucial part of the sound design is establishing the ambiences of the different scene/settings. Hurd spent countless hours toiling over each environment, layering sounds—pulled from a combination of libraries and his own original recordings—that would make the gameplay more evocative. "I'd almost *compose* with a multitrack editor something that would loop, but be fairly long and have a lot of fresh material in it so it doesn't get boring," he says. "I try to do a lot editing [of sound samples], because I find that after all these years, I actually recognize a lot of the source material that other people use. There's a sheep sound I swear I hear in every game. [Laughs] I don't want to be the guy who uses that sample. So I do a lot of layering and I'll also alter them, trying to give the sounds a unique character. I think the environment sounds in *Asian Dynasties* came off really well. There's some pretty dense layering, but the trick is to try to make it not sound like a thick mix, so you've got to be careful with where you're placing things, and you do what you can to put some space in it because you don't want it to just be a noisy din, which can be distracting."

As for Hurd's primary sound design tool, "I do a lot of it in Sonic Foundry's Vegas," he says. "It's a pretty straight-ahead multitrack editor that also supports video, so it allowed me to do a lot of the cinematic work for the cut scenes in the game, as well."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Then within the different ambiences, obviously there are other types of specific action that demand sound design with various levels of detail. "In this game, the creatures and new animals required a lot. There's a giant squid that was fun to work on. I mean, what does a giant squid sound like? I ended up using some whale and some lion; you mix that with water splashing and it sounds pretty good. That's a kind of obvious example of sound design, but some of the best things in the game are little details that don't necessarily jump out at people and aren't spectacular sounds, but they give a nice context to what's going on.

"Like there's a scene with some dialog on a ship out at sea, and as the 'camera' is coming into the ship I did some things with the ambient ocean waves so it sort of cross-fades from being out on the ocean to being heard from on the deck of the ship, and then you bring in the creaking of the ship and other sounds. There are a lot of subtle details that enhance the big event sounds, so that when something blows up it's not blowing up in a vacuum; it actually feels like it's in that environment that you've already established."

Speaking more generally about the technical requirements of game sound design and integration, Hurd notes, "The tools are getting so refined now. There are things I can do with middleware that five or six years ago I had to beg programmers to supply me with. *Age of Empires* used an older engine, so I had to deliver a lot of raw WAV and MP3 assets, and then they were plugged in behind the scenes. The format submitted was largely dictated by available memory and disk space. My first choice is to supply stereo WAV files for all assets and then scale back in a manner that meets memory requirements while doing the least damage to sonic fidelity. One of the strengths of the *Age of Empires III* core engine is that there was no additional overhead for playing back files of different formats and resolutions, so it was possible to employ some trial and error.

"Some of the stuff I'm working on now is using a lot more sophisticated middleware," he continues. "Much of the industry is moving toward FMOD, and with good reason: FMOD has consolidated the best features of game-specific middleware for audio. It's particularly useful for handling a lot of the cross-platform differences behind the scenes so that sound designers and programmers can expect a fixed set of assets to work the same way regardless of the implementation requirements unique to Sony, Nintendo or Microsoft platforms. It also empowers the sound designer to build complicated, multilayer and randomized sound events that only require the programmer to fire a start-sound event. Playing back a single pre-recorded asset is increasingly an old-school approach to game audio as the tools allow for real-time mixing of multiple component parts at run time."

The integration of sounds was done internally at Big Huge, "but I wasn't directly involved with integration on this game," Hurd says. "I spent a couple of years programming, so I understand that world, and knowing what's possible and desirable definitely affects some of the choices I make."

With *Asian Dynasties* behind him, Hurd has a few other projects percolating—but as is typical in the game world, he cannot discuss any of the particulars. "I'm working on a role-playing game and another title that's totally under wraps," he says conspiratorially. "They're very contrasting projects and really exciting." ■

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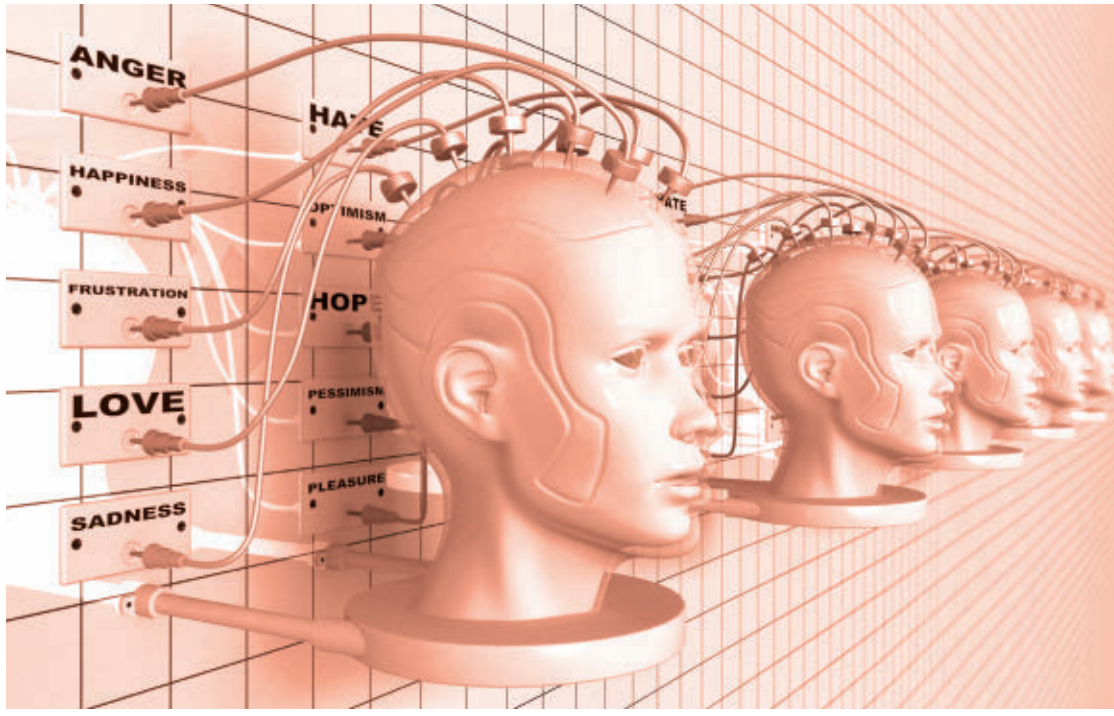
BY ALEXANDER BRANDON

The Importance of Being Earnest

Why Realistic Audio is Key to Game Character Expression



SHUTTERSTOCK IMAGE: YANNIS NTOUSIOPOULOS

People are beginning to take games seriously, but not as seriously as they regard film in terms of dramatic presentation. This is in large part because of one of the weakest links in game sound, as opposed to film: the way voice acting and screen action work (or don't work) together. Look at a game and you'll instantly know it's a game, not a movie. For one thing, game characters don't look like onscreen live actors. Motion is robotic or unrealistic, lighting sometimes cuts off, or a texture might get jittery. It just isn't the *real* that we get on film. So, it doesn't help that game characters' voices don't seem real either. This incongruity exists largely because actors performing game voiceovers rarely record or do ADR (automated dialog replacement) to picture. Also, it's difficult to pull off a successful performance of the, possibly, thousands of lines that an actor must read, particularly in the case of role-playing games. How hard is it to do *one* line *well* without seeing the picture? Now multiply that by several thousand...But the goal of capturing game voices that lend realtiy, rather than unreality, to a game soundtrack is not unattainable. This column explores the voice-recording techniques that are currently in use and ways to use them to reach that goal.

A bit of history first. Back in the '90s, when games first started to incorporate recorded voices rather than having the player rely on reading text, the voice-over technique was way ahead of the visuals. Facial motions were based on static painted pics or extremely simplified, generic open-and-close-mouthed animations on 3-D characters, even before the concept of cameras was introduced. Now thanks to motion capture, we have realistically rendered models of characters that are tough to distinguish from the real thing, even when they are walking—that is, until they talk.

For you film folks who are reading this, there are two different schools of thought for speech in games. There are cut-scenes and modes, in which the player has no control over how the story is communicated, and there is gameplay, in which the player can be close or far from a conversation and have its position change in real time. Increasingly, the latter is taking precedent, where real-time camera shots become critical to communicate the story without interrupting the player's control—which, of course, is impossible to predict.

A recent example of a character that looks very realistic statically is John Shepard from the successful role-playing game *Mass Effect* by BioWare. Shepard is so well-rendered and motion-captured that when his character is idling (a term used for standing still but moving slightly or fidgeting while shifting weight), you might just mistake him for the real thing for a few sec-

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onds. Eyelids, eyes and head tracking (which refers to how a head moves independently of a body to observe surroundings) are all extremely lifelike, not unlike the character Aki Ross from the film *Final Fantasy: The Spirits Within*. However, once Ross opens his mouth, the realism ends. His lip-sync quality is mostly very unconvincing. Sometimes his mouth doesn't even move while he is speaking, or he appears to be pronouncing a consonant when he should be pronouncing a vowel.

It is one thing to create a photorealistic model with recorded live motion; it is quite another to successfully implement a system that gets input data from WAV files in real time and generate phonemes, which represent the simplest elements of human speech. In the case of lip synching, phoneme refers to the shape that a mouth makes when it forms vowels, consonants and short phrases. The process is incredibly complex, and a systematic approach has been mediocre at best.

For example, say the letter "a" to yourself and pronounce it "ah." Your lower jaw drops a bit and your upper-jaw raises. This is a simple characteristic, but in phoneme lip-sync systems, pronouncing "ah" may not be distinguishable from "aw," which presents a rounder mouth shape. In addition, going between phonemes, and especially indicating emotion in words, presents further challenges. For example, saying "s" by itself usually draws the lips back, especially when the character is being emphatic. But when saying the word "waves," the "s" forces the mouth into a more closed position if the character is more relaxed. Films such as *Pirates of the Caribbean: Dead Man's Chest* and *At World's End* use motion-captured facial animations at the time voice-over is recorded so that the animations will sync exactly with the voice-over files. As a result, we're convinced that the character Davy Jones (played by Bill Nighy) puts on a great performance, even though most of his head is animated CGI.

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The lesson for us game snobs is pretty simple: Either we shape up by providing more convincing systems for real-time phoneme generation using markers or indicators for emphasis and better mid-word/sentence phoneme translation, or we capture lip movement during recordings. In my view, when it comes to an audience that is increasingly demanding more realistic gameplay, there is no in-between, even though there are technical limitations such as memory and CPU resources. You can't use partial generic animations for facial expressions, nor can you partially use custom animations; that will only create even

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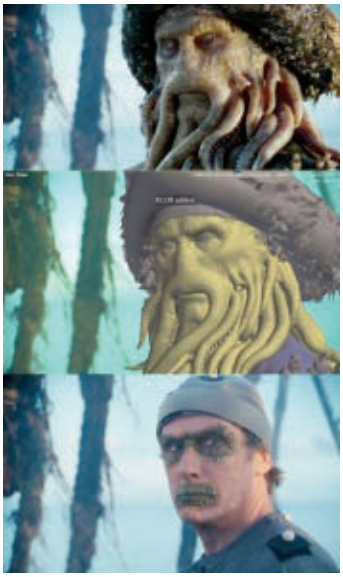
more disappointment for the player. Don't set a bar and then go below it. There *is* a third option, which is incredibly expensive, and that is hand-animating all lip movement. But in games that have 30,000 lines of dialog or more, such methods are out of the question.

Various studios, such as Technicolor Interactive, provide services in their ADR suites for capturing lip movement. The company's director of audio services, Tom Hays, mentions that the studio runs a Canon GL-2 into a capture box to deliver video takes that are edited alongside dialog takes, and the process also involves a custom teleprompter.

A few middleware options offer the systems-based approach: FaceFX (www.oc3ent.com/facefx.html) is used on *Mass Effect* and a number of other titles. It provides moderate (but by no means perfect) lip synchronization by analyzing audio files and extracting phonemes that are then translated onto reference points on a character's face model.

Take a look at the Image Metrics' Website (www.image-metrics.com) to see a demo of its technology. You'll see that the results are pretty impressive, yet still not quite there. (Don't look at the live actor; just look at the larger, 3-D-rendered face.)



Many films (such as* Pirates of the Caribbean, *pictured) use motion-captured facial animations during voice-over.

Image Metrics uses either straight-on video or a head-mounted camera, and analyzes video data rather than audio data.

Famous3D's proFACE (http://famous3d.com/3d/index.html) is a more cost-effective solution that also uses either video or motion capture to achieve results. Also, Sega plans to roll out a new facial animation tool called the Magical V Engine, claiming that it is very realistic.

Visage (www.visagetechnologies.com) features an SDK (software development kit) that allows games to incorporate lip-sync animation generated automatically from audio files. A tool that interprets the audio data spits out new data that is applied to "morph targets," which are a set of vertices controlled individually. (The corner of a mouth could be considered a morph target, the upper lip could be another, and so on; there are dozens that could be applied to the lips alone.) The morph targets then react according to the movement interpreted by the audio interpretation tool.

So to all who are involved in game industry voice-over: Fight for your right to have the lines spoken properly, and consider that the industry is genuinely on the cusp of realistic performances. This is probably why Steven Spielberg has struck a three-game deal with Electronic Arts. ■

Alex Brandon is audio director at Obsidian Entertainment.

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Gamers Got Game

Two Longtime Fans Get the Call To Score "Splinter Cell: Conviction"

Michael Nielsen and Kaveh Cohen are a study in concentration as they sit alongside each other behind the colossal SSL 9000K console in the control room of the Clint Eastwood Scoring Stage at Burbank, Calif.'s Warner Bros. Studios. The two composers, both 33, are in the final stages of the biggest project of their short careers—scoring the Xbox 360 videogame *Splinter Cell: Conviction*, the fifth installment in Ubisoft's popular series based on the Tom Clancy espionage novel of the same name. On the other side of the glass is a 62-piece string orchestra, and the sound coming through the big monitors is both lush and edgy, as the strings saw away over an ominous electronic pulse.

Both hardcore gamers, Nielsen and Cohen are intimately familiar with the *Splinter Cell* Series, which they've been playing since the initial release. They beat

PHOTO: COURTESY UBISOFT

Michael Nielsen (left) and Kaveh Cohen at the conductor's podium for the orchestral sessions

out seven other candidates for this highly desirable job, knowing only that it was for a Ubisoft project until they got the gig. "When they called us from Montreal to tell us it was for the next *Splinter Cell*, there was a lot of high-fiving," says Nielsen.

The partners are relative newcomers, but their rise has been explosive. Ten years ago, while working at the Guitar Center in Sherman Oaks, Calif., they bonded over a mutual desire to break into orchestrating, though they came to it from opposite directions—Nielsen was a rock guitarist who had studied history at UCLA, while Cohen, who had learned the basics of composition at the Musicians' Institute, was an avid collector of film scores. Both are essentially self-taught, but they're quick studies. "There's nothing like doing it," says Cohen of their education in the field.

Their first job, at the dawn of the decade, was doing the music for the E! series *Hollywood Off-Ramp*. The show only lasted a few episodes, but the neophyte composers were hooked. They set their sights on doing trailers, formed their own company, Ninja Tracks, hooked up with Groove Addicts for distribution and client bookings, and packaged their first batch of pieces on a data DVD titled *Full Tilt*. Trailer production companies are always hungry for new sounds, and the partners' edgy, up-to-the-minute melding of orchestral music and electronica quickly found receptive ears around the industry.

"It was a trial by fire," says Nielsen. "But as soon as we got our first batch of music out, it took off. At that point, I said to Kaveh, 'I think we've found our niche.'" That was in 2005. Since then, the collaborators have scored dozens of trailers, including *Transformers*, *Eastern Promises*, *The Bourne Ultimatum*, *Grindhouse*, *The Island* and *Get Rich or Die Tryin'*.

In early 2007, a Ubisoft staffer zipping through the most recent *Full Tilt* sampler heard a cue he decided was perfect for the upcoming *Splinter Cell*. Nielsen and

PHOTO: COURTESY UBISOFT

Cohen put together an elaborate pitch, and after two months of sitting on pins and needles while the field of candidates narrowed, they emerged victorious.

Nielsen and Cohen were told that the fifth *Splinter Cell* installment would be a complete departure from its predecessors, with an overhaul of the character and the game play, and that called for a "big Hollywood sound," Nielsen recalls. "So we decided to maintain what we loved about the franchise and bring our own thing to it—bring it to the next level."

Ubisoft sent them a QuickTime video of a partial map with camera fly-through to familiarize them with the environment. From there they were on their own. Because videogames work on looping, this process wasn't about sound to picture. "But we've had several years of scoring to picture without the picture," Nielson points out, "because that's the nature of the trailer business. We're used to going off our gut to feel out the pacing, and we applied that skill to this project."

The partners have virtually twin home studio setups: Mac G5s, 1.2TB SATA servers holding tons of matching samples and keyboards that they use as MIDI input controllers—Cohen has a Kurzweil PC 88 and Nielsen uses a Yamaha SO8. Both are "diehard Logic users."

The first challenge, says Cohen, was "trying to get the layers to work seamlessly with each other. Layer one required a stealthy, espionage sound, with the tension heightened for layer two. The third layer, when the character gets into a fight, had to be balls-to-the-wall combat music—very intense and a huge jump from layer one."

Challenge number two was creating music "that holds your attention but doesn't distract from the illusion of being inside the game," Nielsen explains. Cohen offers an analogy: "They say the best movie score is one you don't remember hearing—it does its job without hitting you in the face. It's the same with videogames."

In all, the partners would compose more than 90 minutes of music, with 90 percent of it orchestral—hence the need for elaborate mockups; Ubisoft obviously wanted to know precisely what the completed score contained before shelling out the big bucks for the two-day scoring session. To this end, Nielsen and Cohen made extensive use of sample libraries like VSL's and the SONiVOX Symphonic Collection. When all the orchestral material was mocked up, the composers sent it to their orchestrator, laying out what each section of the orchestra would play. "He got a huge stash of MIDI files per layer, which he then pulled into Finale and assembled the whole thing," says Cohen.

After months of exhausting, concentrated work, the big day arrived. Sitting beside the partners at the big SSL was engineer Casey Stone, recording the orchestra using Pro Tools, having already dumped the prerecorded music into Pro Tools from Logic. Once the orchestrations were completed, Stone handled the final stage, mixing the whole enchilada and stemming each cue as a single track. But for the composers, the peak moment of the entire process was happening right in front of them on the Eastwood stage.

"To hear your music come to life is the most transcendent experience imaginable," Nielsen marvels. "It's indescribable. At the end of the second day of recording, I turned to Kav and said, 'Man, we've gotta find a way to do this again.'" ■

Bud Scoppa is Mix*'s L.A. editor.*

The 62-piece-strong string orchestra at the Clint Eastwood Scoring Stage at Warner Bros. Studios

The* Splinter Cell: Conviction *recording team, from left: Mike Zarin, Vincent Gagnon (Ubisoft), John Rosenberg (contractor), Tristan Bernier (Ubisoft), Ira Hearshen (conductor), Dain Blair, Michael Nielsen (composer), Kaveh Cohen (composer), Milton Nelson (orchestrator)

Led Zeppelin Reunion Concert

By Sarah Benzuly

Last year saw numerous rock 'n' rollers reuniting on the stage—The Police, Van Halen, et al. But perhaps garnering the biggest headlines was Led Zeppelin taking the stage on December 10 in London's new O2 arena for a charity show in memory of Atlantic Records co-founder Ahmet Ertegun. On hand to ensure that the sound was up to par for this long-awaited show were monitor engineer Dee Miller and front-of-house engineers Roy Williams (mixing Robert Plant) and Big Mick (Jimmy Page, guitar; John Paul Jones, bass; and Jason Bonham, drums); the sound system was supplied by Britannia Row.

Both Williams and Mick mixed on a Midas XL8. "I had known from before the start of rehearsals that two engineers would be doing the show: one to look after the band and one to concentrate on Robert's vocals and effects," Williams says. "Not the easiest thing to do…[but] Mick and I have known one another for over 30 years, so that helped a lot."

"We felt that using the XL8 gave us an unlimited amount of options," Big Mick says. "The operation of the console made it really easy for Roy and myself to divide the worksurface. Being able to set the last bay of the console to the 'B' zone and then recall a POP [population] group containing Robert's vocal and effects into the 'B' zone meant that Roy had his own section. This allowed me the remaining two bays and the VCA section to mix the band."

As the band does not use in-ears, Dee spec'd 11 Turbosound TFM-350 wedges, a pair of TFM-450s and six Flashlights for sidefills; he mixed on a Midas Heritage 3000. "With John Paul Jones playing bass guitar, bass pedals and keyboards, there was a lot going on," he says. "And Robert likes it edgy. He has a lot of top end on his vocal mix, so it's always a challenge. I have to keep an eye on him and my hand on his fader at all times."

FixIt

PHOTO: STEVE JENNINGS

Front-of-house engineer Bryan Worthen is mixing a nine-date UK arena tour for Foo Fighters. He's manning two DiGiCo D5s to handle the show's double stages: the A stage for the main "electric" show (with an Electro-Voice X Line line array) and a smaller B stage (L-Acoustics V-DOSC and dV-DOSC) for the acoustic segment.

One desk does the A stage and the other desk does the B stage, but both can feed either P.A. That's because there is a point in the show where I am pulling inputs from the A stage and feeding them through the B stage P.A., at the same time as inputs from the B stage are also feeding its own P.A. Dave [Grohl] plays on the B stage by himself with his A stage electric guitar, so his wireless system feeds the receiver and inputs on the A stage. However, he's singing into the mic on the B stage, so I'm pulling the guitar signal from the A stage and feeding it through the B stage P.A. with his vocals. Halfway through, the rest of the band kicks in on the A stage, so I bring in the A stage P.A. and kill the B stage P.A. There is a lot going on—almost 90 inputs, and it's quite complicated—but it works out really well. You just need to get your head around making it happen. The crowd goes crazy because they're all looking at Dave on the B stage, and all of a sudden it gets big and loud behind them. Working from two consoles is much less confusing than doing it from one, which is what I tried to do before and it didn't really work out.

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News

Indian musical group Shankar-Ehsaan-Loy brought their Cheers India tour to the Hitec Grounds in Hyderabad, India, where an Acoustic Control PVT Ltd.–supplied system included gear from Electro-Voice, Midas and Klark Teknik; S.E.L engineer Ashish Saksena mixed the show.

Technomad Associates' loudspeakers and subwoofers are compliant with the International Electrotechnical Commission's (IEC) IP56 rating under its IP code…**Modest Mouse**'s front-of-house engineer **Jason Raboin** and monitor engineer **Myles Kennedy** are using gear from **Thunder Audio**, including **Digidesign** Profile (FOH) and **Midas** XL250 (monitor) boards, **Meyer** and **Nexo** arrays, and mics from **Heil Sound**…The **Opera Bastille Paris** is one of the first operas to employ **Optocore** optical-fiber networking, where three **Yamaha** PM1D consoles located in three of the opera's halls are now linked together using three Optocore YG2 and 21 YS2 cards, along with two DD32Es, two X6P-16 IN and two X6P-8/8 devices forming a redundant ring…Musical *Wicked* is now touring Japan, where sound designer **Tony Meola** created a basic loudspeaker design template for all of the resident productions based on two main clusters each of **Meyer Sound** M2D and M1D loudspeakers…At the **MTV Europe Music Awards**, **Sennheiser** mics and G2 Evolution wireless system were used for the majority of the performing artists…**SSE** supplied a **Midas** XL8 for **Arctic Monkeys**' FOH engineer **John Ashton** for the bands performances in Europe and the UK.

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On the Road

Currently out with Mel Brooks' musical tour of* The Producers *is Dustyn Peiffer, who is mixing in a wide range of theaters and working with a full ensemble of musicians.

How much gear are you carrying?

I currently have a Yamaha PM1D with two engines in mirror mode that feeds eight Aviom A-16 personal mixers as the mixing sections. We carry 16 Meyer M1Ds, 12 Meyer UPMs, two Meyer CQ1s and two CQ2s as the main speaker rig. For mics, we use a Shure Beta 52, SM57s and SM58s; Neumann 184s, U87s and U89s; and Sennheiser MKH-40s and 604s in the pit. We also use 34 DPA 4061s to mike the cast. They are then transmitted through 34 bands of Sennheiser that are then routed to a listening station and the PM1D.

Do you have a miking technique?

On the men, we mount a DPA 4061 on an ear rig that comes straight out to about the peak of the cheek bone. On the women, we mount DPA 4061 on an elastic headband that comes down to the peak of the forehead, without being too low for sight purposes. In the pit, we use a lot of small-diaphragm condensers to close-mike the sources. We have two 57s on the snare: one on the top head and one on the bottom that is 180 degrees out of phase with the top mic. We also use a virtual orchestra that comes out of a Mac digitally in stereo. Each channel then hits a PreSonus converter and from there it goes to a tube direct box. The reed players all have two mics: one small-diaphragm condenser for the clarinets, flutes and oboe; and a large-diaphragm for the saxes, as well as a U89 about two or three feet from the bell of the trumpet.

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

I toured with this show for 10 months last year, had a six-week vacation at home. I also rented a cabin in northern Michigan for a week that my friends and I converted into a rogue recording studio, where we used extemporaneous recording techniques of improvisational music.

Now Playing

Joe Cocker

Sound Company: Concert Sound
FOH Engineer/Board: Chris Madden/Digidesign VENUE
Monitor Engineer/Board: Niall Slevin/Digidesign VENUE D-Show Profile
P.A./Amps: EAW KF760, KF761, KF750, KF755, SB1000, KF730/Lab.Gruppen 6400
Monitors: PSL in-ears
Outboard Gear: XTA DP324 SiDD, DP448, DP226, AudioCore
Additional Crew: system tech Dave Dixon

Meg & Dia

FOH Engineer/Board: Venue-provided
Monitor Engineer/Board: Venue-provided
P.A./Amps: Vox AC30, Fender Deville, Mesa Boogie
Monitors: Sennheiser in-ears
Microphones: Shure SM58 Beta

PHOTO: BIRON TOLSKI

Lorie Line

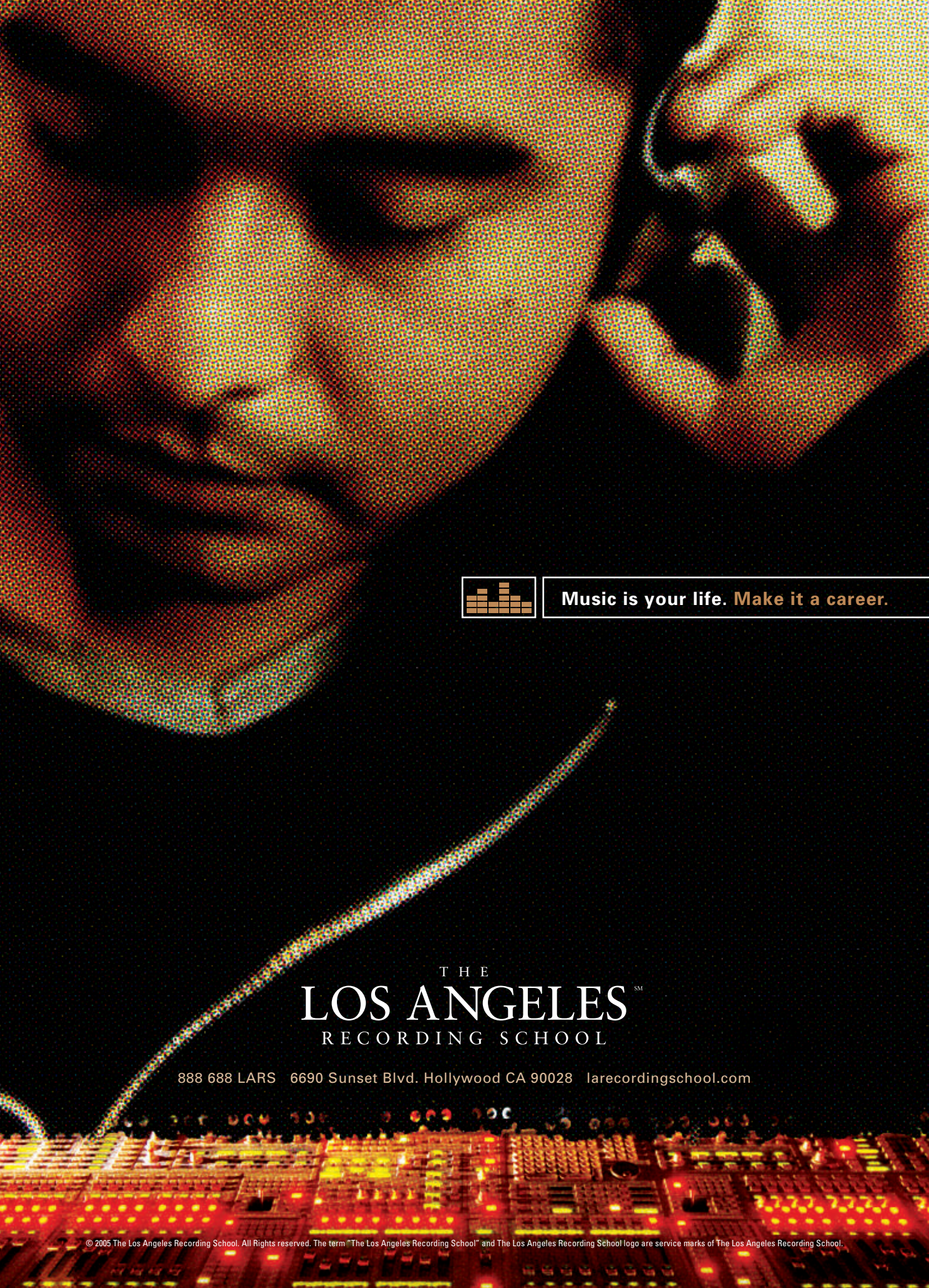
Sound Company: Reach Communications (Minneapolis)
FOH Engineer/Board: Scottie Pakulski/Yamaha M7CL-48
Monitor Engineer/Board: Todd Behrens/Yamaha DM1000
P.A./Amps: Nexo GEO S1210, S1230, GEO S8/Camco Vortex 6, 4; QSC PL236
Monitors: Nexo PS10, PS8; Sennheiser 3000 IEM
Microphones: Shure SM91, KSM32; Sennheiser e 604, e 614; Sony ECM 66 (wireless); Countryman E6 (wireless), Type 85 DIs; AKG C12VR; Neumann M149
Outboard Gear: Nexo NX242/ES4/241 and PS8-TD-V2/PS15-TD-V2/PS10, Lake Contour
Additional Crew: systems tech Matt Dellwo

PHOTO: LORIE LINE MUSIC

Technomad Donates to 'Extreme Makeover'

Technomad Associates has donated a turnkey P.A. system to ABC's *Extreme Makeover: Home Edition* for a show scheduled to air in February 2008. The Hughes family will have their home renovated to be safer and more accessible for their blind and disabled son, Patrick Henry, age 19 (right). Henry was born blind and without the ability to fully straighten his arms and legs, leaving him unable to walk. Despite these obstacles, Patrick Henry is a proficient pianist, trumpet player and vocalist, and marches in the University of Louisville School of Music Marching and Pep Band, maneuvering his wheelchair through the formations with the other 220-plus members with help from his father.

The Technomad donation (two weatherproof loudspeakers and a complete P.A. rack system to power the loudspeakers) will be installed at the university, improving the audio quality at the practice stadium where Henry marches with the band.



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AVENGED SEVENFOLD

Photos & Text by Steve Jennings

Five-piece Avenged Sevenfold (vocalist M. Shadows, lead guitarist Synyster Gates, guitarist Zacky Vengeance, bassist Johnny Christ and drummer The Rev) were introduced to metal fans when they toured in opening slots for the Warped Tour and Ozzfest. Now, their nonstop, high-energy shows keep their own sold-out crowds rockin'. Culling a set list mostly from their latest self-titled release, the band also chose some crowd favorites from their previous three albums when they played San Francisco's Warfield Theatre in December.

When Mix caught up with front-of-house engineer Nigel Paul during the first leg of the tour, he was manning a Yamaha PM5D-RH V2; on the second leg he'll be working on a Digidesign D-Show Profile. With the Yamaha board, Paul keeps his mixes straightforward, using the desk's onboard facilities: gates, comps, GEQ/PEQs and effects (a stereo delay and all three Rev-X programs).

"The only piece of outboard gear I'm using is a Waves Maxx BCL across the main L/R," Paul adds. "I use it as the D-to-A converter for the AES output from the 5D and to add a little light compression to the overall mix. To my ears the converters sound superior, and while the system compression I'm doing is definitely subtle, it's also totally transparent."

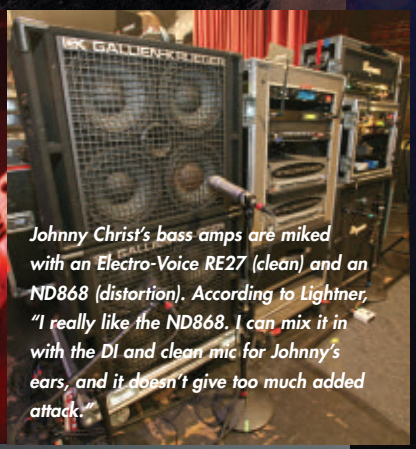
The tour is not carrying its own P.A. system, but rather just FOH and monitor consoles, mics, in-ears, splitters, AC and all stage cabling. "As sound-critic-in-chief, I think we've been able to maintain a high level of quality and consistency across the many different systems that we've been provided with on this leg, but the T-polish has definitely been called for on a couple of occasions," Paul says. "On this leg, we're dealing primarily with in-house and regional sound companies' systems, so it's been a fairly eclectic selection that has included JBL VerTec 4889 and 4888, d&b Q Series, Electro-Voice X-Line and X-Array, EAW 850 and 750, Renkus-Heinz PN102, Martin W8LC, a QSC line array hitherto unfamiliar to me and a couple of proprietary systems. I consider a clean, clear, articulate, detailed, full-sounding, balanced, volume-appropriate mix to be my goal," he continues. "Of course, I'll always integrate into my approach any suggestions or guidance from the artists themselves, but I'm also mindful of the fact that ultimately I've been hired for the skills, taste and judgment that it is believed I bring to the situation."

Monitor engineer Rob Lightner is also manning a Yamaha PM5D-RH and only uses the onboard X-Hall and X-Plate reverbs. As for outboard, Lightner carries Shure PSM700 IEM units and a Pro Tools rack (two hard drives, two Digi 003 racks, two Furman UPS units and a Radial SW8 auto-switcher that runs on two MacBook Pro computers).

"The band seems very conscious about their hearing, so the stage volume is not that loud," Lightner says. "They keep their IEM at a low level, which I think they are very smart about."

For main (right) and spare vocals, Lightner switched from a Shure Beta 58A to an Audio-Technica AE6100 wireless. "The A-T seems to reject a little more noise onstage and is very durable," he says. "Nigel [Paul] previously used this mic for a few shows, and we both agreed it was a good choice. There is also a wired 6100 for drum vocal, and we kept the Shure Beta 58A for backup vocals."

Johnny Christ



Johnny Christ's bass amps are miked with an Electro-Voice RE27 (clean) and an ND868 (distortion). According to Lightner, "I really like the ND868. I can mix it in with the DI and clean mic for Johnny's ears, and it doesn't give too much added attack."

M. Shadows

Zacky Vengeance

Synyster Gates

Drum tech Jason "Diz" Berry (below, right), says The Rev's kit is miked with a Shure Beta 91 and Audix D6 (kick, stage-right and stage-left); AKG D22 (snare top) and 460 (snare bottom); 451 (hi-hat); Audix D2s (toms 1/2/3) and D4s (toms 4/5/6); Audio-Technica AT4050s (overheads L/R); and an AKG 451 (ride cymbal).

According to guitar tech Stephen Ferrera-Grand (left), guitarists Synyster Gates (lead) and Zacky Vengeance's amps are miked with 57s and Audio-Technica 4050s; for vocals, they sing through Shure Beta 58As.

Chris Brown's Holiday Exclusive

R&B SENSATION CONTINUES TO BREAK NEW GROUND

By George Petersen

PHOTO: ADAM J. SABLICH

Chris Brown may be one of the fastest rising acts in R&B, but with his Holiday Exclusive tour—which wraps up February 3, 2008, in Honolulu, after a two-month arena run in major U.S. markets—this teen sensation proved that he is isn't afraid to take chances and try something new.

Performing to pre-recorded tracks is hardly unknown in the genres of rap, R&B and pop. However, for this tour, which supports *Exclusive*, his second album, Brown injected a novel twist by appearing on multiple synched video screens that ran clips of him acting as though he was playing bass, two guitar parts, two keyboards and a trumpet from the pre-recorded tracks. Joining these virtual players was the real-life Chris Brown singing, accompanied onstage by drummer Gerald Heyward, DJ Baby Drew and a dozen or so live dancers.

Senior audio consultant Rick Camp at the FOH position during setup for the opening show at Cincinnati's US Bank Arena.

MAKIN' PREPARATIONS

The project actually began months before the tour. Rehearsals were at the CenterStaging facilities in Burbank, Calif., where the project's senior audio consultant, Rick Camp with J&R Audio (www.jraudio.net), worked with the tour's front-of-house mixer and production manager, Maceo Price, and Pro Tools engineer Doug Sadler to cut the tracks to be used during the live shows. "The band was keyboards, guitar, bass, drums and DJ, so some parts were recorded live, others overdubbed and others taken straight from the record," explains Camp. "We spent eight weeks in the regular rehearsal room, rehearsing and recording the band, and then a week on the soundstage perfecting the show at CenterStaging. There was a lot happening during rehearsals because Chris was also rehearsing for the AMA and VMA award shows and had to go overseas to do some promos in Japan and Europe while the band was still rehearsing. It was nuts."

According to monitor engineer William "Chainey" Harpe, "One of the challenges was capturing a live feel with spontaneity and emotion when recording Chris' original band in a rehearsal room, but everybody felt good about the Pro Tools tracks." Rather than mix to stereo for the live playbacks, most of the tracks were kept as discrete individual channels, with some 40 Pro Tools tracks going to FOH and monitors on an "A" system and another 40 tracks on a "B" system for full redundancy. Some of it was mixed down to stems, such as the loops and special percussion tracks. These were combined with 16 channels of live drums and four channels of live DJ turntables and a 360 Systems Instant Replay.

"There are also five or six channels of vocal mics because Chris is all over the place," adds Camp. "He has a special stand that comes up out of the elevators [on the multitiered stage]." The mics are all Shure, including KMS9 wireless for lead vocals. Other than the live inputs from the drummer, the DJ and Brown's vocals, everything comes from Pro Tools with Brown singing backup vocals and "playing" all the instruments on video screens—with everything locked to timecode.

The video playback—and there is a lot of it—was handled by Las Vegas–based Tour Screen Productions on a Dataton Watchout system with a customized Show Sage tour rack/PC server handling picture playback/distribution of the multiple im-

ages: six 60-inch plasma displays (turned vertically) for the nearly life-size images where Brown appears to be playing the instruments. Other effects are provided using a see-through screen that flies into midstage for projecting holograms of Brown (and other artists such as T-Pain and Rhianna) and a 30x40-foot LED screen upstage hosting other images.

IN THE HOUSE

A Chris Brown provider for the past year-and-a-half, J&R Audio supplied two of the tour's 96-channel Digidesign D-Show VENUE consoles and three Pro Tools rigs—two custom dual-playback systems and a third rig at FOH for recording the shows. Two additional 96-channel D-Show mixers—we're talking *full* redundancy here—came from Clair ShowCo Chicago (formerly dB Sound), which also provided stacks and racks. The system was all Electro-Voice, with X-Line mains and Xsub subwoofers. Speaking of the subs, there were no corners cut in terms of laying down the thump, with 24 single-18 Xsubs in the air and 24 double-18 Xsubs on the ground. And 66 EVX 180B 18-inch woofers can move a lot of air.

The setup is further complicated by the use of two stages, says Camp. "There's also a B stage that sits behind front of house. It's a huge 30-foot circular disc that's 20 to 30 feet high. Chris and two of his dancers perform up there, strapped to a center post because the disc rotates and tilts 60 degrees while he's dancing. At the AMA awards, he did a dance routine while strapped upside down. This guy's 18 years old and is not scared of anything."

THE PRO TOOLS CONNECTION

Designed by Camp was a custom dual Pro Tools HD rig—all flightcased for protection from road torture, with two 4GB RAM, 2.66GHz Macintosh G5 systems and six Digidesign 192 interfaces—three dedicated for each system, with a total output capacity of 96 channels and 48 inputs. "During the show, I'm pretty much sending out 40 channels of the 'band in a box' playbacks," says Pro Tools engineer Sadler. "We're running two completely redundant systems: If ones goes down, the monitor and FOH consoles are preset with mute groups, so the engineers can make a near-instantaneous changeover to keep the show rocking. It's all on a freewheel mode—jam sync—so if the 'A' system stops or glitches, the 'B' system continues to run, outputting the same audio and timecode to the FOH, monitor, video and lighting consoles." According to Camp, this actually occurred during one performance and the changeover happened seamlessly—without losing a beat or anyone in the audience noticing the glitch.

Doug Sadler with the custom dual Pro Tools rig

Once it's showtime, Sadler has a busy schedule. "I trigger every song, getting it cued up and ready while Chris is talking between numbers or taking a DJ break. But during each song, I'm getting the next one cued up and ready to go," he explains. "I get cues from multiple people during the show—the DJ, the stage manager or the front-of-house engineer, depending on where Chris is at that moment. I'm set up below the level of the stage and can't see what's going on, so the video crew sends me a feed of the stage—exactly what FOH sees—so I know what Chris is doing. I supply a timecode out to lighting and video with a 2-track reference mix, so they just line up their video feeds to that, and when I hit Play everything happens. They slave to my timecode, and there's a 1.5-second pickup [pre-roll] and then the video goes live."

When asked about how it feels to be the one guy the entire show depends on, Sadler shrugs it off. "It feels like the world's on me," he says with a laugh, "but it's definitely a team thing with the four of us—myself, Chainey, Maceo, Rick. We had a plan and it's all come together."

OVER IN MONITORLAND

With some 18 monitor mixes to create—for Brown, the drummer and the DJ—monitor mixing is different from the usual tour. "I've got nothing on the deck—there are no wedges for this show, so all the cabinets I'm using for monitors are in the air, except for some subs. I've got flown medium line array sidefills and then a small line array center cluster that's thrown out of phase because the set is three layers high," says monitor engineer Harpe. "Chris is on in-ears—the dancers are not—and I've got full three-way fills for [drummer] Gerald Heyward and the DJ, and they're also on in-ears. So from event to event, I've got a lot of flexibility, especially for the drummer, who has a small Yamaha 03R digital mixer that allows him to do some automation on his own. He's got a click track coming back to him, along with some Pro Tools stem channels and submixes of Chris' lead vocals, the band tracks and a talkback to the Pro Tools engineer and the DJ in case they want to make any changes during the show. This lets him tweak his mix and store the changes for the next night."

Monitor engineer William "Chainey" Harpe

But mixing monitors on this tour can definitely present a few other challenges. "The sidefills are there for the dancers, but also for Chris, who will often pull one—or both—of his earpieces out, even if he's perfectly satisfied with his in-ear mix. He just loves to be out in the thick of it all," Harpe continues. "I remember the first time I introduced him to audience mics for his in-ear mixes. He liked it, but with all the screaming he gets from his fans I have to keep one hand on the audience mic feeds at all times, especially during ballads where he may go to the edge of the stage and reach out to a girl. Suddenly, I have 119 dB of female screams and I have to turn that down or he won't hear another note for another 30 seconds."

With two stages, live and recorded performances, four 96-channel D-Show VENUE consoles, two 48-channel Pro Tools systems (for playback), a 96-channel Pro Tools recording rig, multiple video feeds routed to eight onstage screens, a dozen dancers and flamethrower pyrotechnics, Brown's Holiday Exclusive tour was one complicated production. "It's an interesting show," says Harpe. "It's a different approach and we're all excited about making sure everything works day in and day out." True, it's not your typical tour, but for the crew that made it happen, it's just another day at the office. ■

George Petersen is the executive editor of Mix.

New Sound Reinforcement Products

AVLEX MX8-1RM MIC LINE MIXER

Designed for multiple applications, the single-rackspace MX8-1RM mixer from Avlex (www.avlex.com) supports eight mic/line channels, each with its own volume and tone control. The rear panel has six channels with balanced XLR and TRS mic/line inputs, and two channels of RCA unbalanced line inputs and TRS balanced mic/line inputs. Outputs are TRS and XLR balanced, and two mixers can be cascaded for 16 total inputs. Retail is $240 and it is shipping now.

SOUNDCRAFT GB2R CONSOLE

Soundcraft (www.soundcraft.com) expands its GB Series with the GB2R, a tabletop or rackmount mixer designed specifically for smaller installs or use with a portable P.A. It's offered either with 16 mono inputs to a stereo mix output, or a 12.2 version with 12 mono inputs, two full-feature stereo inputs and two group buses. All feature six aux sends, the same mic preamp/EQ designs as the larger GB4/GB8 models, a pre/post-switchable direct output on each input channel and a rotatable pod providing top or rear connections. The stereo ins on the 12.2 have mic and line inputs, where the line inputs are stilll usable when the mic is routed to the main channel; with the two stereo return channels and 2-track play input, up to 26 inputs to mix are available.

EAW NTL720

The NTL720 from Eastern Acoustic Works (www.eaw.com) is a compact, powered, three-way line array loudspeaker. Its entire face is covered by a large MF/HF horn for better horizontal pattern control. Six 1-inch dome tweeters feeding a slot in the center of the horn produce the highs. Dual 6-inch woofers handle mids and load onto the horn. Inside the 50-pound, 9.4x24x14.3-inch enclosure are three 500-watt Class-D amps under EAW's Gunness Focusing alignment and driver-processing algorithms. EAWPilot control software provides DSP control and amp-status monitoring. Inputs include a choice of analog, AES L/R and EAW's proprietary U-Net. Communication options include U-Net and a rear panel USB port for interfacing with the DSP.

D.A.S. AUDIO REFERENCE SERIES

The D.A.S. (www.dasaudio.com) Reference Series of loudspeakers comprises two 12-inch models, two 15-inch models and two double-15-inch models available with 1-inch and 1.5-inch compression drivers. The range of externally powered products also offers single- and double-18 subwoofers for applications requiring additional low-frequency power. Features include 18mm birch plywood construction, rotatable horns with 80x50 and 60x40 dispersion, and 12 M10 rigging points. Options include a new horizontal array frame for up to three RF-12 or RF-15 models.

P.AUDIO ADDS TO DRIVER LINE

P.Audio (www.paudiothailand.com) expands its range of pro woofers and HF drivers. The new Woofer Series includes six lines of LF drivers from the economical, stamped steel-frame/ferrite-magnet IMF Series II to the no-compromise Flagship Series, with cast-aluminum frames, neodymium magnets and 4-inch voice coils. The new Driver Series of HF compression drivers includes the BM-D Series II (ferrite) and PreNeo (neodymium) models—both with tough, lightweight titanium diaphragms.

LINK DGLINK DIGITAL SNAKE

Said to be the first multi-protocol modular digital snake system, the DGlink from Link (www.linkitaly.com) is designed to operate with traditional audio distribution systems (analog and digital) using one—or multiple—digital transport protocol standards over Cat-5 or -6 cables. The 24-bit/96kHz system supports up to 64 mic/line-level inputs and up to 64 line-level outputs (foldback and drive sends), with remote control of all stage box functions, including control of phantom power, polarity and gain settings. ■

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ON THE MAP

From coast to coast, Remote Recording has made a name for itself with involvement in big names and even bigger shows. Sporting dual DM2000's with 24-bit 96kHz performance and 96 inputs, this truck is really going places. Key features include a complete surround sound panning and monitoring package, a full mixdown automation system and advanced DAW integration. Newly added VCM effects such as recreations of compression and EQ units from the 70's, and a variety of vintage stomp boxes provide endless options in the world of recording.

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BY EDDIE CILETTI

The Kit Is It

Evolution of the D.I.Y. Movement

The magic combination of three ingredients—do it yourself (D.I.Y.), curiosity and tenacity—are essential to the success of audio entrepreneurs who have more passion than cash. Thanks to the Internet, that tradition has been reinvigorated on message boards, user's groups and by companies that have found new ways to help everyone—from newbies to veterans—learn and build stuff that looks less like a homemade prototype and more like the first in a new professional product line.

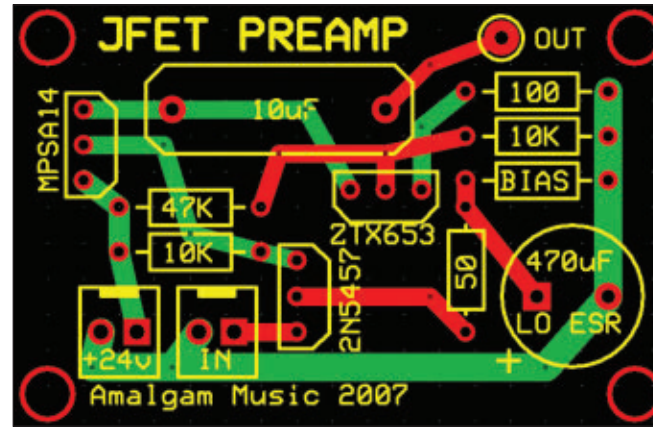

Figure 1a: One of Ciletti's grad students took advantage of ExpressPCB.com by laying out this circuit board for a simple JFET preamp (circuit courtesy of Scott Hampton/Hamptone.com).

THE WAY IT WAS

The industrial revolution fueled the growth of technology well before the 20th century, but D.I.Y.'s evolution was sparked in the early 1920s when vacuum tubes brought AM radio into the home. Back then, people listened on the "crystal" sets—passive radio receivers that required no batteries or power supply. Believe it or not, there is enough current in the air to drive a pair of 2k-ohm headphones!

Before active electronics (and loudspeakers) became affordable to the masses, D.I.Y.'ers made their own crystal sets using many household remedies, such as winding coils around an oatmeal container or coupling the headphone to a horn to provide enough acoustic amplification to share with a friend or two. Kits and plans are still available for these simple, yet remarkable devices.

When high fidelity arrived in the '50s, kit companies like Dynaco, HH Scott, Fisher, McIntosh, Eico, Heathkit, Allied Radio/Knight-Kit and Lafayette Radio made hi-fi ham radio and electronic test equipment affordable for D.I.Y.'ers. Buying the kit version was a no-compromise way of getting a name-brand product, with the educational bonus of D.I.Y. Fully assembled Japanese goods arrived in the '60s and '70s that rivaled American prices and quality.

As those classic American companies were nudged toward the fade-out, one kit company—PAiA—was fading in, with electronic musical instrument kits as its D.I.Y. niche. PAiA's first products appeared in the late '60s, and 40 years later one of my students walked in with a brand-new FatMan analog MIDI synth that he built and wanted to modify.

GET BENT

It had to happen sooner or later, but from vintage analog it's a natural progression to vintage digital. These days, there's a geeky, underground electronic music movement known as "circuit bending." It starts simply enough with the poking and probing of everyday toys and games to get unusual "internal" sounds, but that quickly evolves into a remarkable artistic and technical subculture and support group. Creating software and interfaces—such as adding a MIDI to a Game Boy—provides access to the primitive sounds of the "low-bit" world (2, 4 and 8-bits' worth) to make music that relies heavily on creative ways of making a little go a long way.

GOT THE PAPERWORK?

In 1985, about 10 years into my audio career, I built a reissue of a Dynaco PAS-3X, a vacuum tube preamp kit—the one I always wanted but couldn't afford. Looking back, every step was meticulously detailed (and part of a checklist), with much attention paid to soldering and wiring basics. Helping a friend sell a kit online, plus teaching, has made me that much more aware that the documentation is just as important, and possibly more important, than the kit itself.

CREATING MY LESSON PLAN

Which brings me to my most recent D.I.Y. project: teaching a 10-week basic electronics course in which students build their own preamp. On one hand, the technology is simple enough, but interconnecting it all can be a challenge for students without much specialized, fine-motor-skill experience. (Live and recorded videos were projected to assist students in developing their geek technique.) I refine this course every quarter, but I am always struggling for balance. Making the project easier would dilute its educational aspects, but it still has to be easy enough to complete within approximately 40 hours.

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In addition to the basics, students are required to analyze the power supply by midterm and be able to draw the audio circuit schematic from memory for the final exam. In between, they stuff and solder all the components on the printed circuit boards (see the PCB in Figs. 1a and 1b), then wire all the connectors, pots, switches, etc.

YOU WILL NEED...

At one time, CAD and PCB-layout software cost hundreds—or even thousands—of dollars. Manufacturing circuit boards requires lots of chemicals, both photographic and for etching copper. The elements required to fabricate a front panel—engraving and the drilling of holes—now come under the umbrella of CNC (Computer Numerical Control).

Now it's easier to make a D.I.Y. project look less like a prototype, thanks to Internet-savvy companies that realize more business by "giving the tools away." I'm talking about free software that, while somewhat limited (and mostly designed for the Wintel OS), is more than enough to get you started. A year ago, one of my grad students took advantage of Express PCB and Front Panel Express. I was so impressed with the end results that I used his circuit board layout for this project and designed my own front panel. Twenty panels like the one in Fig. 2 cost $500, plus shipping. It really helped inspire my students—building a mic preamp that looked manufactured (at least from the outside) and gave them a sense of pride.

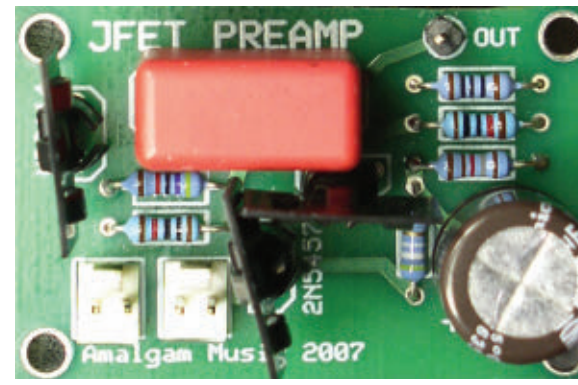

Figure 1b: The completed circuit board with solder mask and silk screening. Students stuffed and soldered all of the components.

A LITTLE HELP FROM OUR FRIENDS

The most recent kit was made easier when a local manufacturer provided a finished chassis (a scratch and dent sale) and power supply components that required minimal modifications to work with our electronics and custom-made front panel. It was not quite as ambitious as Fig. 2 might imply; students were only required to connect the phantom-power switch, hi-Z input, sensitivity and output level controls—the additional holes were for future options. It's better to have nicely drilled, unused holes (filled with hole plugs) than to have to drill by hand and label later.

EXTRA CREDIT

In addition to power supply and amplifier electronics, I felt it necessary to include input and output transformers so students would have a better grasp of their benefits. Their ability to convert a signal from unbalanced to balanced increases the Common Mode Rejection Ratio (CMRR). In addition, they isolate the ground from one piece of gear to another, further reducing power- and ground current–related noise.

The other thing that transformers do is impedance matching, with ratios of 1:1

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Figure 2: This front panel was designed using online software from Front Panel Express. It inspired students to work extra hard on the guts.

and 1:10 being a typical range for line and mic transformers, respectively. The power is equal on each "side" of a transformer—primary and secondary—a 1:10 (pri: sec) ratio matches the microphone's low impedance (lo-Z) to the high impedance of JFETs or vacuum tubes. Voltage gain is the result on the secondary side, with a corresponding loss of current (power = volts x amps).

In addition to a transformer's obvious benefits, one of the most interesting differences is that each type has a sonic signature. Lower ratios are more sonically transparent, higher ratios require more care (in manufacture and implementation) to maintain transparency. Transformers are not "one-way" devices. To reap the benefits of impedance matching, it's important to understand, for example, how the load on the secondary can be reflected back to the primary; this effect was demonstrated by the load switch on the prototype preamp.

Fortunately, the Websites from most transformer suppliers provide application notes on how best to optimize the circuitry around the transformer. The Jensen Website (www.jensen-transformers.com) is perhaps the best for "white papers" on how transformers work.

QUALITY CONTROL

After creating this course, I can say that these are great times to be a geek. All of the tools are out there to help make your next custom project look professional. All it takes is a bit of discipline, some time and the motivation to get started. ■

Eddie would like to thank all of the transformer manufacturers for just being: Altran, AMI, CineMag, Edcor, Jensen, Lundahl and Sowter. Additional thanks to Great River Electronics for the chassis.

Low-Fi D.I.Y.

An Intro to Circuit Bending

By Logan Erickson

Since the beginning of Micro-Music/Chip-Tunes/Circuit Bending (for more info, see www.8bitcollective.org, www.micromusic.net or groups.yahoo.com/group/bendersanonymous), the use of low-bit (2/4/8-bit) audio sources has provided a way of combining new and old technology to create something new. Focusing in on a small medium within the micro-world of low-bit music we have the classic Game Boy, aka "the old gray brick." And this childhood icon (for those of us born in the '80s) is now being used to create energy-packed dance music. Using D.I.Y.-programmed carts running programs such as LittleSoundDJ (www.littlesounddj.com) and Nanoloop (www.nanoloop.de), you can create your own video-game-sourced music while sitting on the couch!

The musical software exists, but that still leaves hardware to be improved, and improved it was. With the knowledge of simple Pic programming, you can now sync (via MIDI time code) these Game Boys, Commodore 64s, Ataris, etc., via MIDI. Or go one step further and actually control the "synth" engine in the device via MIDI (see MidiNES at www.wayfar.net), just like any other synth module you have in the rack. However, I recommend clearing at least two spaces in your rack to fit the old NES system! ■

Logan Erickson (aka LameBoy) bases his music and electronic projects around the world of circuit bending and low-bit music. He is the founder of Benders Anonymous (an online circuit-bending community) and is a host on Micro Sound Dee Jay (www.microsounddj.blogspot.com), a podcast dedicated to the low-bit music uploaded to www.8bitcollective.org.

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ESTONIA: IS Music Trading Ltd. . music@online.ee
FINLAND: Carbo'n Music Oy (Ltd) . www.carbonmusic.fi
FRANCE: Arbiter France . www.arbiterfrance.com
GERMANY, AUSTRIA: Synthax GmbH . www.synthax.de
GREECE: Logothetis Music . www.logothetismusic.gr
HUNGARY: Midisoft Studio Kft. . www.midisoft.hu
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RUSSIA, BELARUS: 4Sonic. . www.4sonic.ru
SERBIA, MONTENEGRO: Artist d.o.o. . www.artistsystems.co.yu
SLOVAK REPUBLIC: Sound Service . www.soundservice.sk
SLOVENIA: MTD . www.mtd-el.si
SPAIN: Makermid SL . www.makermid.com
SWEDEN: Fitzpatrick Import Group S.A. . www.fitzpatrick.se
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ULTRASONE PRO HEADPHONES

Fresh from NAMM are UltraSone's (www.ultrasoneusa.com) new headphone lines. The UltraSone HFI line now includes the HFI 580 and 780 models with new S-Logic-Plus™, an enhanced version of S-Logic™ based on the ear cup design of the company's limited-run Edition 9 headphones. HFI features include MU metal shielding, Logic-Plus, an aluminum nameplate and velvet transportation bag. Also, the Elite PRO 550, 650, 750 and 2500 models now all offer an aluminum nameplate, and semi-hard case for storage and transport of headphones and accessories.

DIGIDESIGN ELEVEN PLUG-IN

Digidesign's (www.digidesign.com) new guitar amp–emulation plug-in promises to provide access to a connoisseur's collection of vintage and modern amp sounds. The set offers selected emulations of modern amplifiers and speaker cabinets from Vox, Fender, Marshall, Mesa/Boogie and Soldano, as well as several custom Digidesign creations inspired by some of the most revered amplifier designs. Designers used a variety of techniques to capture cabinet resonance unique to each amp and speaker combination, and modeled speaker load and coupling with the power amp emulating the natural cabinet resonance produced when driving a speaker at different volumes. It is available in TDM ($595) and LE ($395) versions in RTAS and AudioSuite formats.

HOSA TECHNOLOGY SNAKES

Featuring a compact, 8-channel junction box for inputs and terminated with eight Hosa XLR connectors in both 25- and 50-foot lengths, this new sub snake from Hosa (www.hosatech.com) is targeted for performing and studio musicians. The SH-8X0 is available in both 25-foot ($115) and 50-foot lengths ($150). In addition to the new SH-8X0, the SH Series encompasses the "Little Bro" SH-6X2 sub snake that features six XLR sends and two TRS returns, which may be used as a headphone out and a line out, as well as two separate stereo monitor feeds. Hosa XLR-to-TRS cables may also be used to convert one of the returns to an additional send, creating a 7x1 configuration. The SH-6X2 sub snake is available in 20, 30 and 50-foot lengths. Additionally, the company's SH Series stage boxes include 8, 12, 16, 24 and 32-channel configurations available in lengths ranging from 25 to 150 feet.

MARANTZ PMD620 RECORDER

This handheld recorder from Marantz (www.d-mpro.com) offers 24- and 16-bit recording, and features two built-in condenser microphones, stereo or mono recording modes, and a choice of uncompressed 44.1kHz WAV files or three levels of MP3 file compression. The PMD620 ($499) uses an SD Flash memory card for data storage and can accept memory cards up to 2 terabytes. The unit features one-touch recording, familiar transport controls, a thumb-operated scroll wheel and a vivid organic LED (OLED) screen featuring two font sizes. Two AA batteries power the PMD620. Other features include Copy Segment editing, which uses nondestructive cut-and-paste–style editing to create a new sound file; and Skip Back, allowing transcribers to review recorded audio from 1 to 60 previous seconds. Files can be downloaded via the unit's USB 2 port.

EDIROL M-16DX VERSION 2 SOFTWARE

The M-16DX digital production console from Edirol (www.edirol.com) features 18 inputs, mixing, 24/96 processing, a 3-band sweepable EQ and three pro-quality effects. When run with the free V. 2 software upgrade, the unit can be used with Cakewalk SONAR and Apple Logic, allowing these DAWs to be controlled out of the box, with the knobs on the hardware mixer assigning to their equivalent software controllers. In Logic, for example, the M-16DX appears in the software's list of compatible controllers and the equivalent controls are tied together automatically once it's selected. The application can also be used to control other software such as Reason and Ableton Live through its MIDI Learn facility. This feature enables any user to make full use of the 54 hardware knobs and numerous assignable buttons on the mixer surface to control the functions of a variety of DAWs and virtual instruments.

CEDAR DNS1500 RESTORATION SYSTEM

The Cedar (dist. by Independent Audio, www.independentaudio.com) DNS1000 ($6,974) made its mark by saving otherwise unusable audio for film and TV and audio forensic investigation, saving costs in ADR and looping. Taking the DNS1000 to the next level, the DNS1500 offers an improved chassis and updated processors, coupling the practical ergonomics of the DNS1000 with improved 2-channel performance and up to 100kHz capabilities for increased compatibility in today's audio environments.

MXL GENESIS TUBE MIC

MXL's (www.mxlmics.com) new flagship microphone, Genesis ($799) exhibits the clarity and warmth typically associated with tube mics. Designed primarily for vocals, this large-diaphragm cardioid condenser features a 1.2-inch diameter capsule with a 6-micron, gold-sputtered diaphragm and a hand-selected Mullard 12AT7 tube—known for its clean, rich tone and a silky high-end. The mic has a -10dB pad; a 100Hz, 6dB/octave roll-off switch; and operates with 48-volt phantom power. Genesis will be supplied with a power supply, heavy-duty shockmount, and Mogami mic and tube cables housed in a high-quality flight case. Each Genesis mic has a serial number and is supplied with QC verification of excellence documentation.

VSL VIENNA ENSEMBLE

This cross-platform (Mac/PC) software solution for hosting Vienna Instruments from Vienna Symphonic Library (www.vsl.co.at.) is a free download for all registered users. The application features a mixer-like GUI and supports RTAS, Audio Units and VST plug-in standards. Features include total recall of orchestra setups, definable play ranges for multi-instrument setups, inserts for Audio Units and VST effects plug-ins, and flexible routing. Other features include eight ports with 16 MIDI channels each, panning and Power Panning for precise positioning and instrument naming. For efficient operation, the software offers a separated server solution that uses additional free memory, leaving host sequencer memory or memory used by additional Vienna Instruments plug-ins unaddressed.

FAIRLIGHT CC-1 MEDIA PRODUCTION ENGINE

Promising lower latency than ever and a mound of new features, this scalable processing card from Fairlight (www.fairlight-au .com) offers 8.5 GFLOPS of processing power from a single PCIe card, promising to reduce power consumption from 600 to 12 watts with a 98% reduction in heat generated. The CC-1 leverages advances in FPGA (Field Programmable Gate Array)-powered processing to execute a vast number of operations in parallel, requiring far fewer cycles when compared to serial processing devices such as CPUs. The unit also boasts FPGA reconfigure on the fly, a technology development that enables

its application to reconfigure the hardware during run time. The first released CC-1 engines are capable of delivering 230 channel paths, each with eight bands of EQ, three-stage dynamics processing, floating insert point with return, onboard HD video, 12 auxiliary sends and up to 72 user-definable mix buses.

RME DMC-842

Using the AES-42 standard, this 8-channel digital microphone controller from RME (www.rme-audio.com) acts as a power supply and control device for digital microphones using the new standard currently supported by Sennheiser, Neumann and Schoeps, among others. DMC-842 ($3,999) I/O includes AES-42 8x, analog 8x, AES/EBU eight channels at 192k, ADAT eight channels at 96k, MIDI I/O, word clock I/O and optional MADI I/O. Mode 1 permits asynchronous operation via the use of sample rate converters built into the unit. Mode 2 allows microphones to be synchronized. In both modes, control data for adjusting gain, polar patterns, highpass filter and compression settings can be sent to the microphones; further functions are available depending on the individual product. To adjust the various microphone parameters, RME includes a Windows-based software application that communicates with the DMC-842 via MIDI and supports the transfer of MIDI data over MADI and AES/EBU signals. All the main microphone parameters are also directly accessible on the unit.

FUZZMEASURE PRO 3 ACOUSTICS TOOL

Optimized for use with Leopard (Mac OS 7.5), FuzzMeasure (www.fuzzmeasure .com) Pro 3 ($150) is an acoustical measurement application featuring a live SPL meter that can be calibrated in the field and then used to produce accurate Sound Pressure vs. frequency graphs. Users can add, average, convolve and correlate measurements to illustrate interactions between multiple systems such as speakers and crossovers. In addition, the software includes the ability to produce group delay and harmonic-distortion graphs for exploring nonlinear behavior in audio systems. Current registered users can upgrade for $75, and users who purchased since June 1, 2007, will receive a free upgrade.

SIMS AUDIO INFRA-SONIC BLOW5D DIGITAL MONITORS

Featuring onboard D/A conversion using Burr-Brown op amps, these new monitors from SIMS Audio (www.simsaudio.com) feature room-compensation controls and a low-frequency response switch, letting the user adjust the monitors to the listening space. The speakers ($550) support up to a 24-bit/192kHz sample rate, and can accept a wide range of inputs including S/PDIF, RCA, AES/EBU, XLR, TRS or TS. The 14-pound, front-ported monitors feature a 5.25-inch LF driver and 0.75-inch silk-dome tweeter with waveguide and measure approximately 7.5x12x10 inches.

DISC MAKERS REFLEX15 DUPLICATOR

The new 15-drive Reflex15 from Disc Makers (www.discmakers.com) features the latest 20x DVD±R/48x CD-R/8x DVD±R DL drives and new load and copy features that

greatly speed up the duplication process. The 250GB hard drives with Dynamic Smart Partitioning (DSP) offer hard drive optimization and are housed in a new case that includes strategic air vents to maintain optimized temperatures while duplication is in progress. The tower is scalable from one up to 15 drives and can duplicate 225 CDs or 120 DVDs per hour. Prices: $249 to $1,399.

SYSTEMAX TOWER WORKSTATIONS

These beefy workstations from Systemax (www.systemaxpc.com) come standard with an Intel 5000x chipset motherboard and quad-core Intel Xeon processor E5310 1.6GHz CPU; it can be upgraded to the quad-core Intel Xeon processor E5335 at 2.0GHz 1333. The case offers hot-swap drive bays and can be upgraded to 4 GB of fully RAM. Game production types will love the optional NVidia Quardro and ATI Fire GL video cards. Both models will also feature a 20z DVD±RW dual-layer drive, Microsoft Windows XP Professional 32-vit and a 750W SLI-certified power supply. There is also a 15k SAS hard drive solution. Prices: $2,199 to $2,299. ■

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BY GEORGE PETERSEN

Euphonix Artist Series

Pro-Level DAW Controllers for the Rest of Us

Twenty years ago, Euphonix made its public debut at an AES show with plans for Crescendo, its first console. The prototypes were rough, offering Macintosh, Atari(!) and PC-AT interfaces for viewing, editing and storing automation data. However, the Euphonix approach of combining a digitally controlled analog mixer with a central control area—where equalization, panning and aux sends could be manipulated without leaving the sweet spot—and onscreen displays of EQ curves was right on the money. In the years to come, the company's fast, flexible mixing systems caught on with pro users, and Euphonix became a major player in the large-format mixer market with award-winning consoles for music, video/film post and broadcast production. Three years ago, Euphonix launched its MC (Media Controller) and System 5 MC, two high-end solutions for DAW mixing.

Now, Euphonix has expanded its offerings with an affordable Artist Series line of control surfaces that brings the precision and ergonomics of its MC systems to a wider audience. Unveiled at last month's NAMM show, the new MC Control and MC Mix (pictured) are pro-quality mix controllers intended for use in smaller studios, project rooms, edit suites or portable applications.

Like the larger MC systems, the Artist Series units communicate via EuCon, the high-speed control protocol developed by Euphonix. MC Control and MC Mix easily interface with any Macintosh OS X–based media software, such as Ableton Live, Apple Logic Pro/Soundtrack Pro/Final Cut Pro, Digidesign Pro Tools (HD/LE/M-Powered), MOTU Digital Performer, Propellerhead Reason, Steinberg Cubase/Nuendo and other apps. In EuCon, control data for functions such as faders, mutes, knobs and displays is carried over Ethernet at 250 times the speed and eight times the resolution of MIDI. The HUI and Mackie control protocols are also supported.

HAVE IT YOUR WAY

The heart of the system, the MC Control ($1,499 street) combines an 800x480-pixel, customizable touchscreen that can display track names, metering (mono to full 5.1 surround), fader/pan settings, plug-in and EQ parameters, eight touch-sensitive rotary encoders, 12 assignable soft-keys, and dedicated controls for bank switching, track nudging, control room playback level, talkback, and application switching for multitasking between several programs or workstations running at once. There are four assignable 100mm Alps touch-sensitive moving faders with illuminated solo and mute buttons, as well as automation-arming and track-select keys for quickly creating master fader, submix or group faders.

A large jog/shuttle/data wheel allows parameter tweaking, horizontal/vertical track zooming, analog-style edit control and transport functions with lighted record/play/stop/rewind/fast-forward keys. The rear panel has a power socket for a supplied DC adapter, the Ethernet port for connecting to your network or computer, and a ¼-inch footswitch jack for hands-free record punch-in/outs. MC Control's compact 20x9.5-inch footprint is ideal for desktop production or as a remote controller—placed atop a producer's desk or synth or MIDI/USB keyboard.

Designed to be used with the MC Control or independently, the MC Mix ($999 street) adds eight additional moving faders and rotary encoders to the system. However, the unit adds a few tricks of its own, including high-resolution 128x64-pixel OLED displays over each fader, showing track number/name, metering, automation status and the parameter currently being modified. A Shift key can temporarily change the function of various controls, which adds transport control for using the MC Mix without the MC Control unit.

One of the system's most attractive features is expandability. Multiple MC Mix units can be combined, or up to four MC Mixes can be added to an MC Control for as many as 36 faders. Removable end caps allow units to be bolted together, and all MCs ship with tilting riser brackets that slightly increase the height and viewing angle, allowing for the placement of a QWERTY keyboard in front of the MC or creating a compact layout with—for example—one MC Control/MC Mix combination in the front and three raised MC Mix units behind it. In addition, the modular nature of the Artist Series lets you start with a smaller configuration and expand the system as budgets—or production needs—allow.

As the system communicates over Ethernet, controllers can be placed anywhere on the network; if desired, an MC Control and MC Mix can reside in different physical locations. At the same time, the "network" can be quite simple, comprising little more than one—or several—Ethernet cables connecting the Mac to the MC unit(s).

COMING SOON

The MC Mix units begin shipping this month, with the MC Control coming later. "This is an exciting time for Euphonix as we launch the Artist Series line into the MI market segment, bringing our EuCon technology to an entirely new audience," says company CEO Martin Kloiber. "The 'connected studio' has long been promised, but with the Artist Series we have developed controllers that functionally and ergonomically integrate into the personal studio. By working in partnership with Apple, Steinberg, Apogee and others, we are increasing the reach and power of the EuCon control protocol to deliver an unmatched level of connectivity between software and hardware control surfaces."

For more information on the Artist Series, visit www.euphonix.com. ■

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BY KEVIN BECKA

Digidesign C|24 Workstation Controller

Upgrade Offers Improved Preamps, Intuitive Operation

During this past October's AES, one of the hottest product releases was the new C|24 Pro Tools controller from Digidesign. It was a much-anticipated upgrade to the Digidesign/Focusrite Control|24, the first medium-format Pro Tools controller priced at less than $10k. The handsome 24-fader unit offers a bevy of elegant features, including upgraded mic preamps (borrowed from the 003); two-story, six-character scribble strips; an expanded monitor section; and, most importantly, a more intuitive interface. Because I believe this unit to be of major interest to current Control|24 owner/users, I'm going to compare old to new quite a bit in this review.

LOOKING AT THE LAYOUT

The first thing you notice with the C|24 is its low-profile design. The Control|24 took up quite a bit of vertical space because of its upwardly sloped section. This design accommodated the internal power supply, which, frankly, failed more often than it should have and was a repeating problem for many owners. The new unit has an external and well-vented power supply that leaves the audio on the inside of the controller, where it can't cross paths with its noisy neighbor. Moving the supply outside the unit and placing most I/O on DB-25 connectors allowed designers to flatten the footprint considerably.

The channel strip has a fresh layout that is well thought out, easy to read and doesn't cram too many buttons into too small of a space. The mic preamp gain and rotary controllers are on mushroom-like knobs, with the rotaries offering an LED ring for level and pan reference. Each channel offers the familiar mute, select, solo, EQ, dynamics, insert and send buttons, and now there's also a dedicated input button. One complaint I have is that the input and record buttons are side by side, negating the ability to sweep across with a finger to quickly change the status of a group of channels. I'd like to be able to "hold the first button and push the last," allowing all channels in between to be selected in reference to these two.

One of the most requested changes for this upgrade, I'm sure, was that the phantom-power buttons (configured in banks of eight as before) be moved to the front of the console; they were on the rear. The scribble strips are expanded, offering six characters per channel and an upper and lower section. The lower section of the strip can be altered as you desire to show momentary or constant fader levels (including the extra 6 dB of fader headroom available since Pro Tools Version 6.4), remaining headroom and more. During certain functions, such as instantiating plug-ins or creating sends, the strip takes on the look of a continuously viewable horizontal display, losing the segmented and confusingly truncated view of the Control|24. One downside is the parallel view of the strips, which renders them unreadable at certain angles. This is a contrast issue and unfortunately is not adjustable. The good news is that because of the low-profile design, you can prop up the back of the unit five to six inches, making the strips more readable when viewing at an angle.

INTUITIVE WORKFLOW

Control|24 users will love that, while the C|24 is much more intuitive, Digidesign didn't try to re-invent the wheel. Bottom line: The C|24 offers better Pro Tools software integration while using the same procedures you're used to on the Control|24. For instance, in the past when instantiating a plug-in, you had to use the rotary controller to go through a long alphabetized plug-in list. Now, when you push insert and then assign, instead of getting a list of *all* plug-ins, you get a choice of TDM or RTAS; once you select your preference, a list of plug-in categories pops up (EQ, dynamics, instrument, etc.).

After you select your category, you can browse lists specific to your area of plug-in interest. You can go through the list using the rotary controller, or hit the Flip button and use the fader. There is also duplication of certain function buttons, making it easier to get around. For example, when you choose insert, you can go to the dedicated assign hardware button *or* find it under each insert across the scribble strip. To take a plug-in off the channel, you now push the Default button under the global controls, plus the insert button on the desired channel. From there, two quick button pushes under the plug-in in the scribble strip allow you to revert back to No Insert.

If you have favorite plug-ins in the dynamic and EQ categories, you can now map them to show up at the top of your plug-in choice list. Simply go to Pro Tools prefer-

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ences and choose your default plug-ins. These will then show up at the top of the procedural list when you instantiate a plug-in (above TDM and RTAS). When creating a send (send/assign), the same hierarchical system makes you choose interface or bus, and then gives you the lists.

The Flip button truly does what it says: Anything that shows up on the rotaries can be flipped down to the faders. For instance, if you're on the Pan layer, now called Home, and you hit Flip, all the faders jump to the middle of the throw and you can pan up and down for left and right. Two more cool features are the latching talkback button that, when double-clicked, stays in the On position and an 8-channel line mixer that can be sent to the monitors.

One odd thing worth mentioning is something I encountered while I was installing the C|24 in place of a Control|24. (See "Quick and Easy Integration" sidebar.) The new unit is Dolby (Film) order in and out, but the older controller was SMPTE order. When you set the 5.1 outputs on the I/O setup page to Dolby, the speakers no longer fall in odd/even pairs. For instance, in SMPTE order, L and R would be on hardware outputs 1 and 2, respectively, and Ls and Rs would be on 5 and 6, respectively. But, in Dolby order, L and C are on 1 and 2, respectively, while Rs and sub are on 7 and 8, respectively. At first, this may not seem like a big deal, but if you ever use the internal multing feature in Pro Tools (Control, drag and drop to another out), you will certainly miss it. In the past, I've used this multing feature to get my stereo bus subpath out to my 2-track recorder; however, having to use Pro Tools in Dolby order now makes that impossible.

MONITORING AND SURROUND

The monitor section is greatly enhanced, with a scribble strip readout for master gain, two 5.1 inputs and two alternate stereo inputs. A Sum button allows you to add the four sources together in any combination. Switchable monitor modes include stereo, L/C/R/S and 5.1, with individual buttons for either muting or soloing each of the six speakers; a latching button enables the solo function. One of the coolest new functions involves individual monitor trim controls. If you double-click on a speaker's Select button, a Trim screen shows up in the far-right scribble strip closest to the monitor section. You can then use the control room volume knob to raise or lower the gain of the C|24's output to any speaker in ½dB increments.

Surround panning is greatly enhanced by the fact that you can flip the surround pan functions down to the faders, allowing you to grab different combinations together to move the image easily. You can also lock left and right and front and back together, and use two rotaries for surround panning, Etch a Sketch® style. If you don't like either one of these, then you can always purchase the JLCooper surround panner, which integrates nicely with all of Digidesign's controllers. Other improvements make global panning easier: For instance in the past, to go through and pull every channel out of the center of a 5.1 panner you had to go through each track individually. Now you can choose a global option for a single surround-panning parameter and physically go across each channel and change them on the rotaries, or push Flip and use faders.

Quick and Easy Integration

Going From Control|24 to C|24 in Two Hours

There's no question that the best way to integrate gear into a studio is through a professional patchbay. But what if you have to switch out gear quickly with incompatible connectors when it's hard-soldered to a patchbay? This was the situation I encountered when reviewing the new C|24 from Digidesign. On the upside, the studio in which I work has a Control|24 built into a custom desk, with all connections going through a professional TT patchbay. On the downside, the harnesses that work with the Control|24 are not compatible with the C|24 because the newer unit uses DB-25s for most of its connections. I had very little time to make the change, so resoldering the patchbay connections with new harnessing was out of the question. However, after a quick read of the manual and some homework using photos of the backs of both units, I was able to do the physical turnaround in about two hours—all for less than $400.

The first and biggest hurdle was getting line and mic inputs from the old patchbay harness into the C|24. The Control|24 uses 16 male XLRs and 16 male TRS to accomplish this; the C|24 greatly simplifies this with DB-25 connectors. Getting from old to new was easily tackled by buying four of the shortest DB-25-to-female-XLR snakes I could find. The XLR mic inputs from the patchbay were then plugged into two of the new snakes, which were then plugged into the C|24's DB-25 mic inputs—done. Because I couldn't find a DB-25-to-female-TRS snake to handle my line inputs, I used the other two XLR-female-to-DB-25 snakes and bought 16 XLR-male-to-TRS-female barrel turnarounds. The 16 line inputs were plugged into the female turnarounds and then into the two other snakes, which, in turn, were plugged into the DB-25 line inputs.

The easy part of the swap was line out to Pro Tools, Pro Tools sources in, external sources in and monitor speakers out, which are all on DB-25s on both units; those are just plug-and-play. The slate out, however, which is on a TRS on the old unit, is now on a DB-25, along with some other I/O. To get it back to the patchbay, I used the same method as I did with the line inputs. I solved the problem by using another short DB-25-to-XLR-female snake and a TRS-to-XLR-male turnaround.

The most vexing issue in this install was getting out of the C|24's DB-25 monitor outs into a Martinsound MultiMAX monitor controller. I should say that the C|24 has a nice monitor section, which should be enough for most applications; it was, however, a few features short for use in this install. The problem is that the Control|24's I/O is configured SMPTE in and SMPTE out (L/R/C/S/Ls/Rs) and the C|24's I/O is Dolby (also called Film) order (L/C/R/Ls/Rs/sub). This caused a problem when going out of the new unit into the MultiMAX, which is on a DB-25 in SMPTE order. It worked perfectly for the older unit, but was not in the right order for the new. The only solution is to wire a custom DB-25-male-to-male with one side in Dolby order and the other side in SMPTE.

—Kevin Becka

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IN SESSION

I first used the C|24 in a surround recording session with a group of five mics set up in an ITU array (L and R set 30 degrees off-center, and Ls and Rs at 110 degrees). For this I used Audio-Technica AT4051 mics, and on a later session the Holophone H3-D. The first thing I noticed was how much clean gain the mic preamps offered. Each preamp has a highpass filter that I used to take the rumble out of the room when cutting a shaker track. Playback sounded great, as did the mic preamps with the noise floor noticeably lower than the Control|24's.

I was especially interested in how the Holophone would sound with the new unit. When using the H3-D with the Control|24, I had a problem with a "motorboating" sound on each channel, which is attributable to phantom-power issues. I was glad to hear that no such noise occurred with the C|24's preamps. The feed was clean, and even when I cranked the gain louder than you'd ever need to, the noise floor remained where it belonged—in the basement.

On a stereo session while recording drums, I ran into a problem with a few mics with hot outputs—most notably the Yamaha Subkick and some other condensers used on toms that didn't have pads. Even with the mic preamps turned all the way down, the output was still too hot for Pro Tools. Having a pad at the input would have been great for this situation, but it is not offered on the C|24. In this case, inline pads provided just the attenuation that was needed.

What was noticeably missing during the session was the 10-key pad from the Control|24. It was a quick way to navigate to a marker and, in truth, is literally worn out from use on the Control|24 that I'm used to working on. The C|24 addresses marker navigation differently, in that they can now be brought up on the lower row of the scribble strip. I personally like the new marker feature, but would like to have also retained the 10-key pad; it would be more convenient to have something as important as session navigation on a dedicated keypad rather than have it be relegated to a switchable software feature.

IS THERE A C|24 IN YOUR FUTURE?

With very few exceptions, the C|24 is nothing short of great. Better monitor control, vastly improved mic preamps, intuitive design and improved Pro Tools integration make it a surefire winner. Studios looking for an upgrade from an existing control surface, or mouse-mixers in need of a way to put Pro Tools under both hands and send their rodent into semi-retirement will love this unit.

The best part is that jumping from a Control|24 to a C|24 is easy in terms of features and installation. Once I found my most often-used buttons, I was blazing through my favorite features in short order. As for the price ($9,995), Digidesign makes it very attractive for those who currently own a controller. The company is offering a 40-percent discount with a Control|24 trade-in; if you own a third-party controller worth more than $2,500, Digidesign will knock the price down 30 percent. If you're looking to make Pro Tools feel more like a console, you should check out the C|24; it takes the app to a more hands-on level at an affordable price.

Digidesign, 650/731-6300, www.digidesign.com. ■

Kevin Becka is Mix*'s technical editor.*

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BY MICHAEL COOPER

AMS Neve 8801 Channel Strip

Stripped-Down 88R Console Into Channel Strip Format

The AMS Neve 8801 continues a recent, exciting trend in which select manufacturers produce rackmountable channel strips based on their large-format consoles. AMS Neve's single-channel 8801 ($3,250) takes key sections of the 88R mixing console, with the transformer-coupled mic preamp sections said to be identical. Comprehensive and ultraflexible filter, dynamics and EQ sections join the 8801's preamp to create a jack-of-all-trades processor.

LOADED TO THE GILLS

I haven't seen an analog processor fit so much functionality into a 1RU front panel, and the 8801 does so with very few ergonomic compromises. Rotary controls are continuously variable, and the EQ section's gain and Q controls offer center detents. All but six of the 22 rotary controls can be pushed to activate alternate functions, whose status is indicated by bright LEDs, and titling of several intermediate parameter values for most knobs (with few exceptions) is afforded without confusing the eye. The unit's 11 pushbutton switches are brightly backlit.

An XLR/¼-inch TRS combo jack on the front accepts balanced mic or balanced/unbalanced DI input. This jack is wired in parallel with XLR mic and TRS DI jacks on the rear. An additional XLR connector on the back accepts balanced or unbalanced line input. The manual briefly mentions an optional daughter card that can be installed to accommodate digital input; additional information was not available at press time. You can cycle through mic, line, DI and digital inputs by successively pressing the input gain knob. Maximum input and output levels are +26 dBu; DI input capability tops out at +20 dBu.

The input gain control produces +20 to +70 dB of gain for mic input or -24 to +24 dB for line or DI input. A switch for a 20dB pad serves the front panel combo mic/DI jack but is not intended for use with high-impedance instruments; when DI input is selected, activating the pad lowers the input impedance from 750k ohms to 100k ohms to optimally buffer a line-level signal inputted via the combo jack. A switch for 48-volt phantom power serves only the mic input, while a phase-inversion switch serves all inputs.

The HPF (whose corner frequency can be set from 30 to 300 Hz) and lowpass filter (1.5 to 18 kHz) immediately follow the input section. The filters can be independently activated and routed together to the audio path or the dynamics section's sidechain.

The dynamics section includes a compressor/limiter and a gate/expander/ducker, each with their own controls and separate 5-stage LED meters that show gain-reduction amounts. Separate rotary controls for makeup gain, threshold, ratio and release serve the compressor/limiter, which provides soft-knee action by default. The knobs for these controls can be pressed to activate hard-knee, link (to compressors in other 8801 units), fast attack and auto- (program-dependent) release functions. Bypass the compressor by setting its threshold to +20 dBu and ratio to 1:1.

Rotary controls for the gate/expander/ducker include hysteresis, threshold, range and release. (Set the range control to 0 dB to bypass the gate/expander/ducker.) The value of the hysteresis control (variable from 0 to 25 dB) is added to that of the threshold control to determine when signals rising in level will turn on, whereas the threshold alone determines when falling levels are turned off. This helps prevent the gate from chattering on and off when signal levels fluctuate around the threshold. While the default operation in this section is gating, two of the rotary knobs can be pressed to activate expander or ducker action. Pressing two other knobs in this section activates key input and initiates faster attack time, respectively. A D-sub connector on the rear panel provides connections for key input to the gate/expander/ducker and compressor linking. The excellent owner's manual details the pin-out configuration. Currently, users must supply their own breakout cables.

THAT'S A SWITCH

The 4-band EQ includes HF and LF bands that can each be switched to provide either shelving or bell-curve response; the latter setup offers switchable Q values of 0.7 and 2. The two middle bands are fully parametric, including rotary Q controls varying in value from 0.4 to 10. Up to 20 dB of boost/cut is available to each band. Frequency ranges are 33 to 440 Hz (LF band), 120 to 2k Hz (lo-mid), 800 to 9k Hz (hi-mid) and 1.5 to 18 kHz (HF). The entire EQ section can be placed in either the audio or dynamics sidechain path.

An ingenious, user-friendly audio router lets you view and reorder the position in the audio path of the downstream dynamics and EQ sections, and rear panel XLR inserts in mere seconds. You can also independently bypass the dynamics, EQ and inserts. The rotary output gain control's range is -∞ (mute) to +10 dB. Pressing on the knob for this control toggles an associated 7-stage, multicolored LED meter between showing input and output levels. Backlit buttons light red to indicate overload in the input, dynamics, EQ or insert stage, or in an option board that provides A/D conversion. The 8801's power supply is external, lump-in-the-line.

COMPUTER CONTROL

An XLR line output, ¼-inch TRS headphone output and USB port join previously mentioned rear panel input connectors. The USB port can be linked to a PC or Mac. Up

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to 16 "88 Series" units, including the 8801, can have their current state stored, named and later recalled using the included AMS Neve 8801 Channel Strip/AMS Neve Recall software and this port. Minimum system requirements are Windows 2000 SP4 or XP SP2 or later (PC) and Mac OS 10.3.9 or later. When you recall a setup, the software automatically restores all switch settings and shows you to which position the rotary controls must be manually moved to duplicate their stored settings. You can also drag and drop virtual processing blocks and inserts in the GUI to quickly add them to or remove them from the audio path (or the sidechain where allowed). Individual 88 Series units may be removed from a system-wide recall for stand-alone operation.

The AMS Neve Recall software was a breeze to install and immediately recognized the 8801—connected to my Mac's USB hub—after launching. I was happy to note that the software's excellent GUI is bidirectional, mirroring any real-time control changes (including rotating continuously variable controls) I made on the 8801 itself. As I matched the setting for each control to its stored value in a Recall file, the GUI confirmed the match, eliminating any doubt. On the downside, the 8801's current switch settings are lost on powering down. Save your setups often—the Recall software occasionally freezes. [*According to the company, this can occur if the unit is connected to an unpowered USB hub.—Eds.*]

The optional A/D card ($900) breaks out on the unit's rear panel and features an A/D converter; AES, S/PDIF and DSD outputs; AES 3-format sync input; and word clock I/O. The card supports internal and external synchronization to standard sampling frequencies from 44.1 to 192 kHz. The A/D converter can output at twice the sampling rate it receives at its sync input. DSD output is switchable between SDIF-2 and SDIF-3 formats.

TAKING IT THROUGH ITS PACES

The 8801 sounded great on an electric guitar cabinet miked with a Royer R-121. I intentionally clipped the channel strip's pre to add some full-bodied hair to the sound. Moderately boosting midrange frequencies and employing low-shelving cut in the EQ section helped the sound cut through a dense production; further sculpting with the HPF and LPF gave the resulting track its own frequency "window" for the mix. I was disappointed that the compressor's makeup gain stage only boosts and not attenuates levels. I would have preferred to drive the preamp hard, set the compressor to 1:1 ratio and lower the output level of the compressor to preserve headroom in the downstream EQ section. Nevertheless, the sound still rocked.

Plugging a passive electric bass guitar into the 8801's DI input, the sound was restrained and "closed in." I surmised this was due to the pickups being loaded by the DI input's unusually low input impedance. The input stage also didn't offer enough gain to overdrive the preamp with this relatively quiet instrument. I got similarly dull and lifeless results on a DI'd vintage Strat.

Activating the compressor with a 3:1 ratio and suitably long release time caused no pumping on electric bass with 5dB gain reduction. But when set to a very short release time, the comp acted strangely on a singer holding a long note—the gain-reduction amount would repeatedly and quickly drop and recover, causing very short and artificial-sounding 3dB spikes in output level. I tested a second 8801 and noted the same problem.

The compressor worked great as a vocal de-esser. I set this up by routing the EQ section to the dynamics sidechain, cranking high-shelving EQ and cutting low-shelving, and using the fastest-possible compressor attack and release times. Set up thus or with the compressor bypassed, vocals sounded wonderfully round, soft and warm.

When routing a "cardboard-y"-sounding kick track and lifeless snare track in turn to the 8801's rear panel line input and intentionally overdriving the preamp stage, the results were pretty remarkable. The kick sounded noticeably meatier and the snare had much more crack to it. On the kick track, the compressor reigned in the drummer's wild dynamics, and the expander tightened the decay nicely and cleaned up the mic bleed. Routing a bass guitar track into the 8801's line input created a much bigger and warmer sound, and a little 8801 EQ cut at 1 kHz deftly moderated the somewhat piano-like tone caused by the player using a plastic pick.

A MIXED BAG

The 8801's mic and line input stages sound fantastic, and its EQ section is wonderfully musical. The audio router and included Recall software are also terrific assets. For such a pricey unit, however, I wish the compressor had more personality and wasn't so glitchy. The DI input could also sound a lot better. These shortfalls aside, the 8801 is a great-sounding box.

AMS Neve, www.ams-neve.com. ■

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BY BOBBY FRASIER

Toft Audio Designs ATB Analog Console

8-Bus Mixer With Trident Series 80 Pedigree

The name Malcom Toft is etched in the audio history books; he will always be remembered for his console designs and his engineering work with The Beatles, David Bowie and James Taylor. These days, Toft designs affordable analog mixing desks with lineage back to Trident, a company he founded in the '70s. Toft's intent is to offer that vintage style and sound, without breaking the bank. I was able to test this premise by putting the 16-channel version of the ATB (24- and 32-channel frames are also available) through its paces on a number of tracking and mixing sessions. I also A/B'd the new board with a vintage 1987 Trident 80B so that I could hear the similarities and sonic differences of the two mixers.

STRIKING FEATURES

Before even digging into the specs on this console, you can't help but notice its style: real wood sides, black-anodized surface with aluminum-machined knobs, VU meters and LED ladders for the eight buses and the 2-bus, all designed in the tradition and colors of a vintage Trident 80B desk.

The I/O module comprises a switchable mic/line preamp with 48-volt phantom power and polarity reverse. The EQ section (patterned after the 80B) has high shelving, selectable at 8 and 12 kHz, with low shelving at 60 or 120 Hz. There are two sweepable, overlapping mids (low-mid, 100 to 1.5k Hz; high-mid, 1 to 15 kHz), both of which have a 15dB cut/boost capability. Rounding out the EQ section is an 80Hz highpass filter. The EQ can also be switched into the monitor section—a nice feature if you're using every available input during mixdown. Six auxiliary sends are provided, with aux 5/6 able to do double-duty across either the monitor path or the channel path.

The monitor path is controlled by a rotary potentiometer, which can then feed the L/R bus during mixdown, for a total of 32 channel inputs during mixdown. Using all available inputs—an additional eight dedicated stereo effects returns and eight monitor returns in the subgroup section—you have access to a total of 56 inputs on mixdown. Metering on the channel is provided via a signal-present light appearing at -20 dB, while a red LED is activated when the level reaches +10 dB at the channel's output.

YES, MASTER

The submaster module comprises eight subgroup outputs, with an associated 100mm fader and 12-segment LED meter. This signal can be split via aux 5/6 for headphone mixes or reverb sends. An additional line input to the subgroups is accessed via the tape switch, effectively allowing you to monitor the send from the desk or the return from tape. Your "tape" machine could be the eight outputs from your DAW interface. This feature gives you easy send and return switching directly to the monitor section. Also, by selecting line on the first eight I/O modules, this monitor input ("tape") is directed to the channels, giving you access to the EQ and aux sends.

The Master section includes a variable-level talkback mic, master monitor-level control, alternate monitor switching, a headphone jack with level control and a 12-segment/2-bus meter, as well as traditional VU meters, a level control for the solo system, a mono switch and three 2-track returns. The third return (2TK DIG RET) is only available if the optional digital I/O card is in use.

The optional digital I/O card supports sample rates up to 192 kHz with 24-bit conversion. A total of 10 digital sends and 10 digital returns are provided. The eight subgroups are available as ADAT optical signals, while the master left/right outputs are available in S/PDIF format. Word clock I/O is provided on BNC connectors. My test unit did not include this card, so I am unable to report any findings regarding the converters.

HEAR HERE!

I first tracked various saxophones through the ATB with a beyerdynamic M160N ribbon, and found the mic pre's to have plenty of clean gain, even though I was close to the limit of the potentiometer's excursion. During this same session, I set up a Holophone H3-D to capture surround information with the same player. Both mics sounded crisp and clear, with a good clean midrange and rich overtones. Next, I used an AKG C 451 B on a tenor sax, just to get some differentiation between mics through the ATB mic pre's. Again, a smooth midrange was apparent, with no edginess whatsoever. Even though these three mics differ greatly, the ATB didn't favor any particular one; they all presented a depth of harmonics and tone.

The real test came when I put the ATB up against the Trident 80B, as Toft is marketing this mixer as a modern alternative to his vintage design. But keep in mind that we're really talking apples and oranges

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here, seeing as how the 80B sold for approximately $85,000 in 1987 and the ATB 16-channel model lists at $4,499.99. There *have* to be differences, and, of course, there are—mechanically and sonically.

Using a Neumann U87i, I tracked acoustic guitar and vocals through both desks to a DA-88. There was more gain available at the mic pre on the 80B than the ATB, but the levels were matched and the test began. Both mic pre's went direct to tape.

My first observation was that the ATB had greater amplitude in the midrange, making the guitar sound a bit less natural than the 80B. This was confirmed with an RTA; there was a 2dB level increase between 800 and 1.25k Hz. The 80B was slightly more natural; the recording sounded more like what was happening in the room. Vocals had a similar quality: The midrange was pushed forward by the ATB. This was by no means harsh; it was simply different. The upper-harmonics were very similar, however, with the 80B just barely winning over the ATB in the "open top-end" category.

Using previously recorded drums, guitars, bass and vocal tracks, a mult was created to feed both line inputs of the two desks, addressing the EQ sections. I gave the ATB way too much gain and swept through the frequencies, with no ringing heard on any source. Getting a bit more realistic, I listened carefully to the two EQs with a modicum of restraint. I found that the 80B had more punch in the 80 to 120Hz range, and it was more open and realistic in the 8 to 10kHz range. Also on the ATB, I found that the faders would ever-so-slightly bind when I was doing very subtle, minute moves. This could be a problem when riding faders during tracking or mixing. The American distributor, PMI Audio Group, has since told me that a different fader is in the works to alleviate this issue.

The last test was to use the ATB as a summing mixer. I set up a Pro Tools LE session, using a Digidesign 002 interface with 18 tracks directed to eight outputs. I fed these outputs to the ATB and summed them through the desk. I took the same session and went through the internal-summing architecture of Pro Tools and did a bounce, then a direct-to-Masterlink mix. Of the three mixes, the ATB version gave the mix a definite "glue": The sound was punchier, having a better soundstage and more depth than when I used the summing bus inside Pro Tools or bouncing. I must say, I have tried other similar pieces of analog equipment that were supposed to do this, but the others came up short.

ANALOG TOUCH IN A DIGITAL WORLD

Toft Audio is marketing the ATB desk as a perfect solution for the DAW user, and my tests show this to be true. The preamps performed consistently well in a variety of situations, and the EQ is musical with only slight variations from the original 80B design. The summing capabilities, when the ATB is used across the outputs of a DAW, would make the ATB a favorable addition to a project or marketplace studio. Used as a sidecar in a commercial studio, a location-recording desk or as an upgrade to an existing home studio, the ATB will provide consistent results and a vintage vibe that would be hard to come by elsewhere at this price point.

Toft Audio Designs, dist. by PMI Audio Group, 310/323-9050, www.pmiaudio.com, www.toftaudio.com. ■

Bobby Frasier is an audio engineer, consultant, educator and proud player/owner of 28 guitars.

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BY BARRY RUDOLPH

Brainworx bx_digital Mastering Plug-In

Multilayer Processor Features M/S Conversion, EQ

Brainworx's bx_digital Audio Units/VST/RTAS/TDM plug-in is designed to emulate the company's M/S bx1 Modus EQ and bx2 Image Shifter hardware mastering units. The bx_digital works in any of three modes: as a stereo/dual-mono EQ; an M/S matrix equalizer for applying level and EQ changes separately to mid- and side signals; and as an M/S recording processor for converting and equalizing mid and side microphone signals into a mono-capability conventional stereo.

MEET BX1

The bx1 comprises two 5-band parametric equalizers, and two high- and lowpass 12dB/octave filters, both with 20 to 20k Hz ranges. The EQs' high- and low-band sections are switchable to shelving filters and Q ranges from 0.3 to 15. The maximum boost/cut for each EQ band is 12 dB. The five bands are LF and LMF (both range from 20 to 1k Hz); MF (from 20 to 20k Hz); and HMF and HF (both span 400 to 20k Hz).

Each equalizer and filter section has Link buttons that unite operation and settings to the corresponding section on the other channel. Both channel equalizers are set the same when you adjust only one channel's controls. Click to unlink them, and if they are already unlinked, clicking on the Link button adjacent to a band's frequency control will update the opposing channel's band settings to that band. A global Link on/off button is provided.

AND BX2

The bx2 Image Shifter has four processors. Presence Shift boosts at 12 kHz and, at the same time, cuts at 6 kHz. It has a range of ±12 dB and puts "air" into the sound without exacerbating sibilance. Bass Shift boosts at 63 Hz and, at the same time, cuts at 315 Hz. With a range of ±12 dB, Bass Shift can fatten the bottom end with less upper-bass puffiness or enlarge the low midrange without booming out the low bass. De-Esser is a 2-channel dynamic equalizer with an adjustable frequency range of 4.5 to 20 kHz, and an adjustable threshold range from 0 to -60 dB. A gain-reduction meter shows its operation.

All three of these dual-channel processors also have channel coupling/decoupling linking. Finally, Mono-Maker forces all frequencies, adjustable from 20 Hz up to 400 Hz, from stereo into mono. There are solo buttons for both channels, both De-Essers and a master EQ I/O button but no individual I/O buttons for the De-Esser, Bass Shift or Presence Shift processors.

Auto-solo makes touching any control solo that section's channel. When you're using bx as an M/S EQ, touching the MF boost/cut control on the side EQ will solo the side channel so you can hear what your doing. There is full metering of pre/post-EQ and final L/R output level, but there's no way to adjust the L/R final output when you are in M/S mode. For external dynamic processing, an insert path for the mid and side channels would make a good update.

The bx_digital GUI features EQ, M/S processing and de-essing.

EASY M/S PROCESSING

As a stereo EQ for mixing, bx worked great for equalizing stereo stems such as strings, pads or pianos. In M/S mode, it works wonders for spreading out narrow synthesizer pads and other keyboard patches. I liked it on Fender Rhodes, sample stereo strings, a Hammond organ and any stereo effect like reverb, phasing, choruses and flanging.

In stereo mixing—especially without the benefit of a talented mastering engineer—bx is most useful as the "crowning touch" on the stereo bus. Besides adding air with the Presence Shift, I could widen the stereo image out somewhat, knowing that the compromise is a receded center image.

M/S APPLICATIONS

I set up an M/S pair using a Neumann U67 in figure-8 for the side mic and a Peluso 2247 SE cardioid for the mid. I recorded acoustic guitar, vocals and percussion into Pro Tools as separate mid and side tracks. After recording, I routed the mid and side to a TDM version of bx_digital running on an aux channel.

With my singer (or any source), moving left and right and even behind the mic is audible. Also, the tracks are mono-compatible; in mono, all you hear is the mid-channel. If you raise the level of the side component, then the ambience of your recording space dramatically increases. Similarly, raising the mid-signal brings the center image forward and "dries" out the entire recording. Recording vocals, including all ambience information, on just two tracks is a tremendous mixing option. You can dial in as much ambience as you like, and if you compress the side channel, then the ambience becomes more present.

ADDING TO YOUR TOOLBOX

bx_digital is a whole new set of mixing and recording tools that opens up the mastering engineer's world of M/S processing to any DAW user. I found all the processors powerful and easy to use, both when mixing and/or processing separately recorded M/S tracks. Prices: $798, TDM; $398, native.

Brainworx, 49/2173-911-563, www.brainworx-music.de. ■

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

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Snapshot Product Reviews

CAD TRION 7000
Studio Ribbon Microphone

The passive CAD Trion 7000 ribbon microphone offers a figure-8 pattern, ships in a sturdy aluminum case and comes with a shock-mount. This short mic with a bulbous top uses twin ribbon elements, and the nice thing is the $479 list, although I've seen it priced as low as $279, which is right where this entry-level mic should be.

The 7000 has a low-frequency bump (a few dB) from 40 Hz to about 150 Hz. From there, it flattens out until 4 kHz, where it starts diving, ending up -10 dB down at 10 kHz. Output impedance is 940 ohms, and as it's a ribbon this can fluctuate greatly when your source material approaches the ribbon's resonant frequency; a preamp with an elevated input impedance is recommended. (For more info on this, check out "Wes Dooley on Ribbons" at mixonline.com/news/audio_wes_dooley_ribbons.) The bottom line: If you're loading down your mic by running it through a preamp with a lower impedance than the mic puts out, it will result in increased distortion and a thinner sound.

Like most ribbons, this mic can take a boatload of SPL, so I first used it on a kick drum. Placement was about four inches from the front head with a pop filter in front of it to protect the engine. I paired it with a Shure Beta 52 placed about four inches from the beater head inside the drum. The 7000 added a nice, round and compressed ribbon-like sound to the track. The top transient was shaved off as the ribbon moved beyond the magnetic field—beautiful. This pairing was used on a number of different sessions with the same results.

I next used the 7000 to record a guitar through a Fender Supersonic amp. It was placed in front of the speaker where the dust cover meets the cone and was paired with an SM57. While the 7000 sounded a bit dull by itself, in combination with the SM57 it worked great, providing a nice bottom-end component that the 57 lacked as it starts rolling off where the 7000 starts boosting the bottom.

The Trion 7000 provides a great way for entry-level engineers to get into a ribbon, not to mention a nice, inexpensive extra mic to have in the arsenal for any studio at any level.

CAD Professional, 800/762-9266, www.cadmics.com.

—Kevin Becka

MACKIE SRM450 VERSION 2
Active Sound Reinforcement Speaker

When Mackie introduced its original-model SRM450 at NAMM in 1999, the developers had no idea that it was to become one of the best-selling live sound speakers of all time. I've been using a pair of SRM450s for years now, and they've held up to the abuse of countless rock 'n' roll gigs while still having the delicacy for acoustic material.

At last month's NAMM show, Mackie unveiled the second generation of the SRM series, the 12-inch, two-way SRM450 V. 2 and the smaller SRM350 V. 2. The new versions are outwardly identical to their predecessors, other than the switch to a midnight blue (rather than original gray) in the molded polypropylene enclosures. All have side and top handles, 10 rigging points with M10 threaded inserts, pole-mount socket and wide-dispersion 90x45-degree HF horns, allowing the units to be used vertically as mains or horizontally as stage wedges.

Likewise, the rear panel is the same, with XLR thru and input jacks, wide-ranging line/mic gain pot, switchable low-cut filter and acoustic contour (smile curve), IEC power socket and an AC switch. Inside, Mackie has retained the 24dB/octave Linkwitz-Riley crossovers and onboard phase-alignment/EQ/time-correction functions. The big change is in the 300-watt amp powering the woofer, now a Class-D (switch-mode) design resulting in lower weight. This is now paired with an (also lighter-weight) neodymium 12-inch woofer with a larger 3-inch voice coil. The 100W HF amplifier on the titanium-diaphragm compression driver is unchanged, still a Class-A/B type.

With the new woofer and Class-D amp, the SRM450 V. 2 is now a svelte 40 pounds, down from the 51-pound original, which I appreciated on my first gig, especially when placing the speakers on a tripod stand. On rock gigs, I was pleased by the SRM450 V. 2's sound, which is consistent with the original, except that the low end seems to have more punch due to the beefier woofer. The switch-mode amp had no problems keeping up, even with bass-heavy rock material. On acoustic shows with guitar vocal duets, the top end exhibited that same transparency of the originals, and there was no harshness in the 1.6kHz crossover point.

It doesn't happen often, but the SRM450 V. 2 is a sequel that's better than the original. Retail is $899 each.

Mackie, 866/858-5832, www.mackie.com.

—George Petersen

PSPAUDIOWARE XENON
AU/VST/RTAS Mastering Plug-In

Featuring the latest in adaptive envelope extraction algorithms, the Xenon mastering plug-in offers a two-stage limiter, integrated leveling amp, absolute intersample peak prevention and word-length reduction (requantization) using a triangular probability density

function with three noise-shaping options. The plug-in uses 64-bit processing throughout its signal path, handles up to 192kHz files, and works in Audio Units, VST and RTAS hosts running on PCs, PPCs or Intel-based Macs.

Xenon's first stage of limiting does most of its gain reduction depending on how fast you set the transient control (a kind of attack control). The second stage uses finite impulse response–based envelope detectors with look-ahead to ensure every single transient is detected and controlled. Switching on oversample prevents intersample peak distortion that is ultimately produced by D/A converters in devices such as CD players. A D/A's reconstruction filter may construe two or more consecutive full-level (and legal) samples to describe a waveform peak with an illegal over(s). This "over" often exceeds the subsequent analog section's dynamic range and distorts.

To compensate for gradual volume changes long-term, Xenon's switchable Leveler works before the limiters when the entire program is to be consistently the same level at all times.

Xenon uses mastering engineer Bob Katz's K-System (www.digido.com) metering, measuring both true RMS and peak levels simultaneously, while also showing the crest factor or peak-to-average ratio. The K-System attempts to coordinate average recording levels and headroom with a standardized monitor level of 83dB SPL assigned to 0 dB. To accommodate the generally accepted standard amount of headroom used in broadcast (12 dB), CD production (14 dB) and film work (20 dB), all three K-System metering variants or scales K-12, K-14 and K-20 are available. To calibrate your monitoring system, an onboard pink-noise generator produces noise at 0dB RMS level appropriate to the chosen K-System scale.

I used Xenon on the 2-bus in Pro Tools in place of my usual mastering plug-in pair: a bus compressor followed by a limiter. I tried Xenon on many different songs, from soft and mellow acoustic to metal rock to pop R&B. I used Roger Nichols' Inspector XL plug-in to monitor the number of three-sample clips, "over" incidents and hidden clips. From both empirical data and listening tests, I concluded that I could get any mix louder with fewer artifacts and clips with Xenon—and this was without engaging the envelope oversampling feature in the first limiter stage. Turn that on and you can crank into the world of hypercompression without worrying about intersample peaks, clips or illegal overs—ever!

At more reasonable (and better-sounding) levels of bus compression, I used the output meter oversample function (different from the previously mentioned envelope oversampling feature) to "estimate" intersample peaks that the D/A's reconstruction filter might render as distortion. If the output meters go red, you can decide whether to reduce output or click on envelope oversampling.

Xenon makes mastering-style 2-bus processing a breeze with transparent control and important assurance against illegal peaks and distortion. At $249, Xenon can exceed (and now replace) the performance of much more expensive combinations of plug-ins in every way.

PSPaudioware, www.pspaudioware.com.

—Barry Rudolph

PRIMACOUSTIC RECOIL STABILIZERS
Studio Monitor Decouplers

We use a variety of acoustic materials—reflectors, absorbers, diffusers and bass traps—to change a room's character, but there have been few such products created to enhance the performance of monitor speakers. So when Primacoustic announced its Recoil stabilizers, I was intrigued.

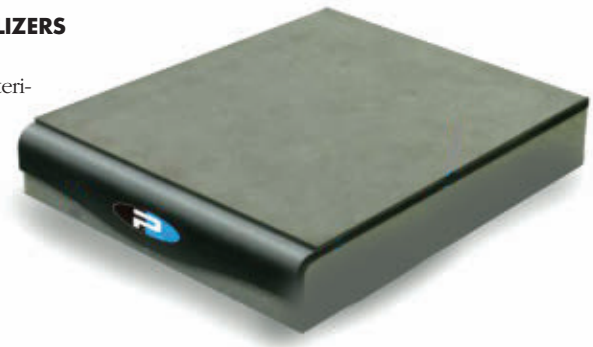
Recoil is a passive device that provides a stable base to reduce the recoil caused by the forward energy of the loudspeaker motion while eliminating disruptive resonant coupling from the loudspeaker to the stand. Conventional speaker designs move air using a cone, creating a piston-like forward motion modulated by the amplifier's signal driving a voice coil within a magnetic field. Along with this forward motion comes a recoil as the cone springs backward. And vibrations within the speaker enclosure can be transmitted to other surfaces, through stands, shelves, etc., causing unwanted resonances. One method of decoupling speakers involves placing a foam pad under the monitor cabinet, which isolates the enclosure, but such a spring-like surface can actually magnify the speaker's motion, resulting in image smearing.

The Recoil stabilizer attacks this problem by using a high-density urethane foam base for isolation, combined with a heavy laser-cut steel plate layered above the foam and then topped with a nonslip neoprene pad. By applying a substantial mass to the monitor/isolation combination, Recoil offers isolation, with vibration control of the speaker itself.

In A/B comparisons using a variety of studio near-fields—Mackie HRM8s, Meyer HD-1s and Dynaudio Air-6s—the difference was clearly discernable. In every case, the stereo soundstage was improved, as was the reproduction of HF transients. Recoil's secret is nothing more than basic physics: It's all about mass. At a retail of $99.95 each, Recoil stabilizers add a noticeable measure of clarity for serious listening. I'm impressed.

Primacoustic, dist. by Radial Engineering, 604/942-1001, www.radialeng.com.

—George Petersen ■



JOE JACKSON'S "RAIN"

NEW SOUNDS FROM THE OLD SCHOOL

By Barbara Schultz

Joe Jackson doesn't waste time with nostalgia. *Look Sharp* may have been your favorite album in 1979, but when Jackson reunited his original band a few years ago, it wasn't to indulge in a money-grabbing reunion tour or to relive anyone's new wave childhood. He simply had some new songs written and, for the first time since *Beat Crazy* in 1980, thought that his original bandmates were the best musicians for the job.

So in 2003, Jackson went back into the studio with guitarist Gary Sanford, bass player Graham Maby and drummer Dave Houghton, and made a rocking album called *Volume 4*—so named because it was his fourth studio production with the group. Three years later, Jackson's musical mood was just a bit different. He called back only Maby and Houghton, and recorded/self-produced a stunning piano-trio collection called *Rain*.

Jackson is a talent of truly broad-reaching abilities and interests. His piano work and his singing are always brilliantly effective. Rock 'n' roll, jump blues, jazz, classical—the style of his music is simply a matter of his own choosing. *Rain* happens to be a jazz- and classical-influenced singer/songwriter album with a few rocking tracks—easily imaginable for fans who have followed Jackson over the years.

"Joe always has a clear idea of how he wants his music to sound," says recording engineer Julie Gardner, who recorded Jackson's *Volume 4* and live album *Afterlife*, as well as *Rain*. "He took the band on tour to warm up before they made the album to make sure they were really tight. But they're amazing musicians anyway, so they were completely tight with each other and knew the songs really well before they came into the studio."

Jackson, who has homes in New York City, London and Berlin, had chosen Planet Roc Studios to record *Rain*. Before the wall came down, Planet Roc was an East Berlin radio station that must have broadcast live musical performances—the rooms are big and, Gardner says, "acoustically very beautiful. Sony Publishing in Berlin took Joe around to various studios, and he liked this one because he wanted a great-sounding room where we could record a grand piano and it would be big enough to have the band set up in the same room.

"They had a big range of vintage microphones and mic preamps, which was brilliant," continues Gardner, whose career included years engineering at top London studios The Townhouse and Olympic. She now runs jamDVD, which specializes in live recordings and DVD production. "There were some problems with the control room—the tape machine and patchbay were a little run down—but we got around these problems and made a brilliant album."

Gardner's observations about Planet Roc's control room are particularly meaningful, as Jackson records to analog—in this case, an Otari MTR90 2-inch machine. "This is a different discipline to get back to as almost all my work is now done on Pro Tools. With Pro Tools, you have more options: everything is nondestructible, fixable or you can simply undo. With

—CONTINUED ON PAGE 115

COWBOY JUNKIES GO BACK TO CHURCH

INSIDE "TRINITY REVISITED"

By Blair Jackson

Twenty years ago, an album called *The Trinity Session* put a largely unknown Canadian band with the unlikely name of the Cowboy Junkies firmly on the musical map. Their music was intimate, languorous and seductive—almost like country-folk chamber music. Anchored around four Timmins siblings—leader/guitarist/songwriter Michael, guitarist John, drummer Peter and the mesmerizing singer Margo—along with bassist Alan Anton and a few musical friends, the album served up a haunting blend of originals and dreamy, achingly slow covers of such tunes as Hank Williams' "I'm So Lonesome I Could Cry" and Lou Reed's "Sweet Jane" (their FM radio breakout). The album was recorded live by engineer/producer Peter Moore in Toronto's

beautiful Church of the Holy Trinity during the course of one 12-hour session using just a single stereo microphone plugged into a DAT recorder; remarkably, the recording has real presence *and* it captures the ambience of the old church.

That album turned out to be a jumping-off point for what has been a rich and rewarding career for the Cowboy Junkies. During the course of a dozen studio albums since, the group (always featuring at least Michael, Peter and Margo Timmins, and Alan Anton) has succeeded in creating its own oeuvre, and a catalog peppered with brilliant original songs and absorbing interpretations of others' tunes. Still, *The Trinity Session* is such an important part of their legacy it's not too surprising that the group agreed to revisit that classic recording. And so, over two days in November 2006, the band and a trio of special guests returned to the Toronto landmark and recorded new versions of all the songs on *The Trinity Session*—this time with many microphones and a slew of outboard gear to multitrack Pro Tools—and with a full HD video crew on hand to capture the magic for a brilliant DVD and CD called *Trinity Revisited*, which came out in October in Canada and is being released in the U.S. later this month on the Rounder label. The package contains both the video and audio versions, plus a superb documentary about the making of *The Trinity Session* and its update two decades on.

More a celebration and reinterpretation of the original album than a re-creation, *Trinity Revisited* is a wonderfully realized work from every perspective—"a different thing with the same songs," as Peter Timmins puts it in the documentary. Though many of the tunes on the album have been part of the group's live repertoire for the better part of two decades, the decision to bring in three idiosyncratic "outsiders"—all fans of the band and *The Trinity Session* album—ended up having a huge impact on the music: Singer Natalie Merchant blends

—CONTINUED ON PAGE 117

PHOTO: STEPHANE BOULÉ FOGOLABS

Natalie Merchant and Margo Timmins during the* Trinity Revisited *sessions

PHOTO: CHRIS BUCK

L-R: Margo, Michael and Peter Timmins, Alan Anton

MINNIE RIPERTON'S "LOVIN' YOU"

By Gary Eskow

Let's check out the formula: You grow up loving literature, pick up the guitar in college and then, while you and your young wife—whom you adore—are looking after the baby, noodle around until you find a melody, its lyric, and the simple chord changes that will turn your work into a monster hit that continues to attract listeners 30 years after its release.

Richard Rudolph offers no set of instructions to those who would follow in his footsteps, but more or less that's how he and his late wife, Minnie Riperton, came up with "Lovin' You," the chart-topping single that exploded off her solo LP *Perfect Angel* in 1975.

Rudolph and Riperton met back in the day while he was managing a rock ballroom in Chicago and she was performing with the Rotary Connection, a band signed to the Chess/Checker label produced by the legendary Charles Stepney. Featuring Riperton's stratospheric soprano weaving around and over a rhythm section, elements of the Rotary Connection sound would find their way into the production values Stepney brought to a subsequent set of recordings he made with the session drummer who played on those RC dates, Maurice White. Featuring songs they co-wrote, including "That's the Way of the World" and "Reasons," Stepney and White would later make their own history with Earth, Wind and Fire.

One of Rudolph's compositions, "Come to My Garden," caught Stepney's ear, and it became the title track of Riperton's first solo album, which Stepney produced for GRT, the label that purchased Chess Records. The pair would write a number of songs together before the Rudolphs moved to Florida. Rudolph picks up the story:

"I'd started messing around with 'Lovin' You' in 1971, when we were living in Chicago. We went to visit some friends in Cape Cod, and one of them, Bert Malatesta—who had a great influence on me musically—encouraged me to complete it. Minnie was pregnant with our daughter, Maya, at the time. [The couple also have a son, Marc.]

"After Maya was born, I'd play the song all the time at the little house we had in Gainesville. It was idyllic, with a duck pond, a hammock and a screened-in front porch. One day while Minnie was cooking, she started to hum along, and she came up with the final melody. Then I wrote the lyrics and developed the bridge. For a while though, the song remained within our Gainesville property.

"A couple of years later," he continues, "Don Ellis, who was head of A&R at Epic Records at the time, came down to Gainesville to meet us and signed us to their label. We moved to L.A. to record the album, and when Epic asked us who we wanted to produce it, Minnie told them Stevie Wonder. Why not? Not only is Stevie a genius, he was also at the peak of his popularity at the time.

"At the time, Stevie was practically living in the old Record Plant with his band, Wonderlove. We met someone who knew Stevie and was able to get him on the phone. As it turned out, Stevie was a huge fan of Minnie's, and he asked her what she was doing. A half-hour later, she's in the studio singing background on one of his tracks! Shortly after we met, he agreed to produce *Perfect Angel*, but there was a hitch: Stevie was signed to Motown back then and was afraid they wouldn't let him work on the project. The only way he'd consent to producing the record was if I agreed to co-produce it. Come on—me co-producing with Stevie Wonder? But my presence, along with the pseudonym we came up with for him—El Toro Negro—and the production company we created, Scorbu Productions, provided Stevie with some cover, so I agreed.

"What an experience working with him was! Every night we'd show up early at the Record Plant because you never knew when Stevie and his band—Ollie Brown, who shared drum duties with Stevie, Michael Sembello, [singers] Deniece Williams and Lani Groves, among them—would appear.

"We tracked 'Lovin' You' a couple of times but it didn't feel right, so Stevie asked to hear the original demo, which we had recorded down in Gainesville on a 2-track recorder. We actually made a loop of that demo that we played for Maya while she was in her Swing-o-Matic. It would make her think her mother was there while Minnie and I slipped off for some private time! The demo was just Minnie singing to my accompaniment on the guitar.

"Sembello, then a brilliant young guitarist [who would later enjoy pop success as a solo artist with "Maniac," a single that appeared in the film *Flashdance*], was recovering from surgery for carpal tunnel syndrome and experiencing a lot of wrist pain, so Stevie asked me to play the guitar part to a click track. Me, playing guitar on an album produced by Stevie Wonder? The idea seemed ridiculous, but they insisted that I do it, so I stepped into the booth and

put on a set of headphones. I was having a little trouble laying down a serviceable pass, and so in an effort to loosen me up, Stevie and Minnie started saying the most obscene things to me through the talkback mic! Eventually, we got a usable take on tape. Then Stevie added a pair of beautiful Rhodes parts, Minnie sang the track and we thought we were done.

"But Minnie felt that something was missing, and so went back and listened to the original demo again. Although we hadn't focused on it, a window had been left open while we were recording and the sound of a bird singing had made its way onto the tape. If you needed to add a bird song to a multitrack today, you'd just comb through production library CDs; there were LPs of natural sounds back then, but they weren't readily accessible. So Stevie, Minnie and I headed off to the UCLA botanical gardens with Stevie's Nagra. Minnie could sing like a bird, and she started to engage one. I can still remember Stevie sitting there with his headphones on pretending to be an engineer! Eventually, he captured the sound that we added to the track.

"Then we moved on to the rest of the album, and when it was finished [we] went out on the road to tour behind it. Plans called for me to stay with the kids, not perform, but there were a few problems with the band that I had to straighten out and I ended up in the middle of things playing guitar and a little flute. We found ourselves performing in Portland one night during a huge blizzard. We look around and see that people are putting their arms around each other and having a great time as we're playing 'Lovin' You.' We told the label that they had to release it as a single, but they resisted, saying that it would compromise their strategy of marketing her as an R&B singer. But we told them she was a singer, period, and insisted.

"Then we went back into the studio with Gary Starr, a friend of ours who we initially met when we were all living in Chicago and he was an in-demand engineer. Odell Brown, a brilliant musician, also from Chicago, was in our band, and he brought his ARP String Ensemble into Village Recorder one night and Gary tracked him."

Though Rudolph's memory is that "Lovin' You" was finally mixed at the Record Plant, Robert Margouleff, who mixed it with his partner during that era, Malcolm Cecil, recalls that in fact it was finished "at Tom Hidley's place, which was called Westlake Audio. He had a demo room in the back with an API console in it that had some of the early automation on it, so we went there. Some of the other songs were mixed at the Plant, but not that one," Margouleff says.

Asked whether he was surprised that "Lovin' You" became such a big hit, Margouleff says, "Not at all. There was a space of about three or four years there when it seemed like Malcolm and I could do no wrong. Everything we touched turned to gold. I can't explain it; it wasn't a conscious thing. We were just at the right place at the right time with the right ideas, I guess."

As for the division of labor on their mixes for Riperton (and for Wonder, as well—it was Margouleff and Cecil who brought him to the Record Plant initially), "we both liked to do everything," Margouleff says with a laugh, "but you could say that he tended more toward the mechanical—moving the faders and such—and I focused a little more on EQs and blends. I would often do the basic setup and then Malcolm would do the moves. But we didn't have any set way of working."

> We look around and see that people are putting their arms around each other and having a great time as we're playing "Loving You." We told the label that they had to release it as a single.
>
> —*Richard Rudolph*

"The mix sounds simple," Rudolph adds, "but it required some thinking, particularly regarding the way Stevie's Rhodes parts were handled. These parts are harmonically advanced and work perfectly together as a pair, but the Rhodes has pulsing overtones that can overwhelm a mix, particularly when it's as exposed as it was on this record. Eventually, we got things right, and the single was released in short order."

"Lovin' You" skyrocketed to the top of the pop charts and became a Number One hit across the globe. "We're still licensing the song all over the world," says Rudolph. In fact, the day we spoke, Rudolph had capped a deal with a Romanian production company to use the song.

Dreams tumble, though, and the Rudolphs' perfect flight hit hard winds in 1976 when Riperton was diagnosed with breast cancer, which claimed her life in 1979 at just 31. Rudolph went on to become a successful producer in L.A., where he still lives, and is currently the chief creative executive of Music Sales West/Rudolph Productions.

Thirty-plus years later, mixer Margouleff says of Riperton's classic, "It's a beautiful record. Steve and Dickie [Rudolph] did *such* a nice job on it. It's very sensitive, beautifully performed and it deserves to last. And it has. I hear it everywhere. When something sticks to the wall, it's because it's good writing. And that's also why Minnie could embrace it, too." ■

JOE JACKSON

FROM PAGE 112

tape, you really have to be precise and know exactly what you are going to do before you punch in, which can be difficult when dropping in on drums and grand piano. Joe is one of the few artists who still likes using tape, which, without doubt, does sound great."

The tracking setup at Planet Roc began with Jackson and his grand piano. Bassist Maby stood to his left, and drummer Houghton and his kit were situated next to a wall, in front of Jackson. Gardner captured the rhythm tracks first, with Jackson playing along on an electric keyboard and singing a guide vocal. Later, she would record the final piano and lead vocal tracks, and backing vocals. She says she experimented with Jackson's vocal mic on *Volume 4* and again on *Rain*, and both times decided a Neumann U87 was best for his voice.

"For the piano sound, I used a AKG solid tube large-diaphram mic down the bottom of the piano," she recalls. She also placed two Schoeps CMC 5s with MK2G capsules at the front, above the hammers, and one Schoeps SMC 5 above the highest strings.

Gardner was also creative with capturing natural reverb: "The studio in its heyday was used for Foley," she explains, "so besides there being different surfaces on floors and different types of acoustics and props in rooms, behind where we had the grand piano in the main room was a large staircase. Underneath the stairs was a cellar, so I left the door open and put a microphone in there, which I faced toward the wall. The room sounded like a chamber, which I recorded and used as an effect. I also used a Neumann SM69 stereo microphone, positioned high in front of the drums in the

A break in Berlin (L-R): Graham Maby, Dave Houghton and Joe Jackson

main room to capture the room sound of the drums."

Gardner also makes a point of mentioning that her experience recording these wonderful musicians in a gorgeous old studio was all the better because the facility provided an excellent assistant engineer, Yensin Jahn. "He was really brilliant and knew the studio really well. He and Christian Bader, who owns Planet Roc, did their best to make sure everything ran as smoothly as possible, that we were all comfortable and well looked after. Christian was also responsible for getting me the large range of different vintage Neumann microphones, which we tried out on Joe's vocal before settling on the U87."

Before leaving Berlin, Gardner and Jackson put together rough mixes of the tracks for him to take to New York City, where the album would be team-mixed by engineers Paul Kolderie and Sean Slade, who also mixed *Volume 4*.

"Julie's tracks are beautifully organized and very musical," Slade says. "It's a pleasure working on them. We've worked on two albums together, but we've never met," Slade says.

Slade and Kolderie have known each other since they were in bands together in college. They've been working as a production team since the late '80s, when they opened Fort Apache Studios in Cambridge, Mass. Together, they worked at their craft and their business, and in time began attracting major-label clients, such as Hole, Warren Zevon, Mighty Mighty Bosstones and Radiohead.

Jackson's manager had heard their mixes of the first two Radiohead albums and liked the idea of pairing them with Jackson. Kolderie and Slade mixed *Volume 4* in Steve Rosenthal's studio, The Magic Shop (New York City), and Jackson was happy to return there for *Rain*.

"We like The Magic Shop. It's a nice, funky studio, it's got a great sound, a great custom Neve board—we love that board, and we've mixed million-selling albums on it," Kolderie says.

Another key benefit of working on Jackson's projects at The Magic Shop is Rosenthal's supply of well-maintained analog gear. Kolderie and Slade played the recordings back on a Studer machine and mixed to an Ampex half-inch ATR 102. They also took full advantage of the studio's vintage outboard pieces.

"We dug around in the basement of The Magic Shop, and we came up with an old Aphex professional sound enhancer, a broadcast unit—you have to adjust it with a screwdriver," Kolderie recalls. "I remembered they used to use that for Warren Zevon to get that L.A. piano sound back in the '70s. We slapped it on the piano, and it really made it stand out and sparkle, and gave it that sound that Joe was looking for.

"They also have a fantastic old Gates SA39B tube limiter—I have one at my own studio, too—and I swear by it," Kolderie recalls. "It's from the '60s. I got mine from a guy I know that bought old radio stations and sold them off in chunks. It's the kind of thing that in an old radio station would be the last piece in the chain; it was meant to drive the long transmission line to the tower."

Kolderie says he also used the studio's Alan Smart C2 limiter across the stereo bus, a TC Electronic Finalizer and a couple of UREI LA2 limiters, but he points out that most of the work happened inside the console: "Other people have outboard modules of consoles like that, but The Magic Shop has the whole console, so you don't need a lot of outboard there. You don't need to patch in something else to make it sound good."

Slade says they mixed about a song a day on average, but one of the unique qualities of this project was that the tracks were never regarded as totally separate pieces. "He came in with a sequence already established," Slade explains. "He constructed it as sort of a song suite. A term like that might come off as being pretentious, but it did have a real order to it and a flow."

Slade and Kolderie actually mixed the tracks in album order. "It would be like a filmmaker shooting in the order the scenes occur, so you get a cumulative effect where you're able to see the bigger picture and you're able to concentrate on the details in a more natural, intuitive kind of way," Slade says.

During the mix, Kolderie naturally takes on more of the technical work while Slade is more focused on arrangements, but they're definitely both hands-on. "When we work with bands, they always think it's really unusual because when we mix, Paul takes half the board and I take the other half of the board," Slade says. "He'll mix more of the drums and bass—he's a bass player—I'll

Recording engineer Julie Gardner says the rooms at Planet Roc are "acoustically very beautiful."

do the piano, background vocals, other percussion.

"When we started, I thought it was the most natural thing in the world, but Paul and I came from a do-it-yourself background," he continues. "Neither of us went to recording school or anything. We had never worked in studios, but we started our own, and neither of us knew the 'correct' way to go about things. So when people see us, they'll say, 'Boy, that's really weird, you don't even talk to each other when you're mixing.' I'll lean over and jiggle one of his EQs, and he'll lean over and jiggle one of my EQs, and that's fine. It's just the way it works."

Apparently, Slade and Kolderie's methods work beautifully, as Jackson's new album is outstanding; his artful songs are realized with sparkling piano playing, passionate vocals and masterful accompaniment.

"The main thing is he sings *beautifully*," Slade says. "It was just getting the music into a space where you didn't need to work at all to hear how well-written the lyrics were—getting the emotion right there so you don't have to do anything but enjoy it and understand the story the music is telling." ■

PHOTO: STEPHANE BOULÉ, FOGOLABS

Setup for the video shoot in Toronto's Church of the Holy Trinity

COWBOY JUNKIES

FROM PAGE 113

wonderfully well with Margo and Michael Timmins and sings some leads; Ryan Adams brings an unpredictable edge as both a guitarist and singer; and singer/guitarist Vic Chesnutt is utterly unique. And then there is multi-instrumentalist Jeff Bird, who's been a part of all the band's studio albums from *The Trinity Session* on, and is an essential part of the CJ "family"—his contributions are varied and vital throughout.

There are some risky choices made in these arrangements, but every single one pays off. Both visually and aurally, *Trinity Revisited* is a stunning achievement: The church is lighted in ways that make it look different in almost every shot, while the band is captured in crystal-clear close-ups and well-framed groupings; meanwhile, every whispered vocal, soaring harmony, every string rattle, brushed snare and reverbed amp tone matches the clarity and beauty of the picture. (In fairness, I should not say that not all Cowboy Junkies purists are happy with the contributions of the guests. I'm *not* a purist, however.)

PHOTO: FOGOLABS

Co-producer Pierre Lamoureux

Spearheading the making of *Trinity Revisited* were brothers Francois and Pierre Lamoureux, owners of the Montreal-based company FogoLabs, who specialize in this sort of high-quality production. "FogoLabs is a private facility with just 12 employees, and everything is catered toward live music production," Francois Lamoureux explains. "We go around the world doing these shows, like the Cowboy Junkies, and it's end to end, so the team here books the facility, does the lighting and we have all the video equipment. Having a full HDCAM SR online in-house makes life easier. We do all the audio production and we post it here, as well."

Francois Lamoureux started Fogo as a mixing studio, "but now Pierre is with me full-time and we are joined at the hip. We have always worked together, but for a few years he was running a company called Enliven Entertainment, which would produce a lot of shows and then would hire FogoLabs to do the post-production. Pierre directs and produces most of everything we do. But I do not work with him because we are brothers; I work with him because I really do believe he is one of the best in the world at what he does."

According to Francois Lamoureux, FogoLabs developed as it did in part because "we got fed up because the video people would always treat audio people like crap. We'd always get these tapes that wouldn't work and the timecode was all wrong, and so we decided we were going to buy all the gear ourselves and try to do these [productions] from top to bottom. I stole an employee from Technicolor—an Avid specialist—and got him onboard here and never looked back. So here, audio controls video, which is very rare; I don't know of any other post place where audio is king."

FogoLabs has a number of exceptional projects under its belt, including ones featuring The Who, Harry Connick Jr., Zappa Plays Zappa, Damien Marley, Aimee Mann, Brian Setzer, Branford Marsalis, the Warped Tour and many more. Additionally, the company has archived all 1,200 tapes in the Canadian band Rush's live and studio catalog.

"The Cowboy Junkies was a labor of love for us," Francois Lamoureux says, "and a different sort of thing because typically we do live performances, and though this was live, it had no crowd. Having a crowd changes things because you can't really start over. Still, with the Cowboy Junkies, I said, 'Guys, I don't want to do 50 takes.' And they didn't—they were really, really good. I think we did one or two takes of each song. We kept it as if it was really live, and it was a difficult thing to do because they hadn't been back in

the church for 20 years and that original album was very special for them—and, of course, it was recorded with one microphone.

"We weren't going to try that, but what I decided to do was at least be faithful to that *idea*, so I got a [Holophone HV-3] surround microphone and I put all the guys in a circle, and then I augmented that with close-miking. I used it for Branford Marsalis on *A Love Supreme*, and it was fantastic. In that one, most of what you hear is the Holophone and it's pretty stunning musically. With the Cowboy Junkies, I didn't know what was going to happen with the Holophone in the church. It sounded great, but it really picked up too much ambience; it was *too* live, so I couldn't use just that. In the stereo version, there's not that much of the Holophone in there—probably about 10 to 15 percent. There's a lot more on [the surround version].

"For the close mics, I used a bunch of Shure mics—the KSM Series, which I didn't know very well before I heard about them from Paul at the Record Plant [Remote] when we did an Aimee Mann special. He's the one who told me to check out these mics, and then when I was going to do the Cowboy Junkies, I wanted pristine mics, so I rented brand-new KSMs and they were fantastic—the 141 is a twist-capsule [condenser] where you can put it in omni, go 24-bit/96k and it sounds great." Preamps used on the session were mostly API's and some by Buzz—"If I had 48 of those, I would have used only those, but we had 10," Francois Lamoureux says. "They have a lot headroom, so they really let things speak."

The band and their guests had a three-hour rehearsal the night before the shoot, and it turned out to be more than just running through the tunes. In the documentary, you see Adams making suggestions for the "out" on "Working on a Building"; indeed, everyone was involved in re-imagining the songs and breathing new life and fresh nuances into the material. "It was a very collaborative effort," Francois Lamoureux offers. "I think you have to give the Cowboy Junkies a lot of credit for being so open to everyone's ideas." Then, it mostly became a matter of just capturing the performances as they went down.

"There are so many DVDs out there where everything is overdubbed," Francois Lamoureux says, "whereas when we do things, I can only think of a couple where we had to overdub stuff, and two of them were because a wireless microphone died. Typically, we don't overdub, so everything you hear the guys actually played. We went to great lengths—because it was so live in the church—to mike things properly. A lot of care was given—good cables and good outboard gear—but at the end of the day, great audio doesn't make a hit album. But if you have fantastic audio, fantastic music and fantastic players, you get classics."

You can see and hear the players and singers locking in on each song; the chemistry is palpable. The performances feel fresh, not overworked, so you can actually feel the arrangements coalescing. "It was a magical night," Francois Lamoureux says without a hint of hype in his voice, just admiration. The old church "embraced" the music, Jeff Bird says.

In true Cowboy Junkies fashion, there's very little in the way of flashy playing or musicians and singers calling attention to themselves. Yet the interlocking parts seem just about perfect, and there are so many little touches that make *Trinity Revisited* the masterpiece it is: Bird's wah-wah mandolin on "Sweet Jane"; the elegant but soulful interweaving of Natalie's, Margo's and Ryan Timmins' voices on "Misguided Angel"; the melancholy interplay of Bird's fiddle and Merchant's piano and vocal on "To Love is to Bury," about which Francois Lamoureux comments: "That was challenging because we had to mike the violin and there were so many cameramen and so much noise because of all the people working, and everything was ambient-miked, so everybody had to be really quiet. That was the one I was most worried about, but Natalie has such a haunting voice and Jeff plays so beautifully.

"I think there's a lot of spontaneity in this music," he concludes, "and that's because of who they are. The Cowboy Junkies have never stopped to analyze what makes them great. They just go and do it. There's a lot of thought behind what they do, but they're also not afraid to take chances or leave things open to chance. It was a risk going back to that church 20 years later, but they had the right approach and the right attitude.

"People have been listening to this music for 20 years, so they have their own opinions of how it 'should' sound, and probably also their own imagination of how the church looks. It's hard because it's like reading a novel and then the movie comes out. Is it going to be as good as your imagination? That's the chance you take. I think it's great they're willing to take chances." ■

PHOTO: DAVID LEYES

Co-producer Francois Lamoureux

PHOTO: STÉPHANE BOULÉ, FOGOLABS

FogoLabs arranged the musicians in a circle around a Holophone HV-3 surround mic.

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COOL SPINS

The Mix Staff Members Pick Their Current Favorites

Nick Lowe

Jesus of Cool 30th Anniversary Edition (Yeproc)

I guess I'm officially elderly, because I still have my vinyl LP of the album that was released in the U.S. as *Pure Pop for Now People* in 1978. Back then, punk and new wave were still fringe, and fairly frightening to label execs, and apparently there was no way Columbia was going to release an album that proclaimed Lowe the "Jesus" of anything. *Jesus of Cool*, in its "pure" form was only available on Stiff Records in the UK. Now, thanks to Yeproc, the album is here, with its original title, packaging and sequence, and 10 bonus tracks to boot.

In whatever order you play these tunes, *Jesus* is a classic, showcasing the artist's reverence for rock 'n' roll ("Heart of the City") and irreverence for the music business ("Music for Money"). The arrangements are straightforward, with Lowe's elegant vocals out in front of various configurations of the great musicians who were part of his circle. At that time, he was an in-demand producer as well as performer, so many of his clients and friends appear, including drummers Pete Thomas, Steve Goulding and Bobby Irwin; guitarists Martin Belmont, John McPhee, Larry Wallis and Dave Edmunds; keyboardists Steve Nieve and Bob Andrews, and more. Thirty years later, on the rare occasion that he tours, Lowe fans still shout for chestnuts like "Marie Provost" and "Cruel to Be Kind," and it's a joy to listen to *Jesus* the way the artist/producer intended. But I'm not giving up my Columbia LP; the photo of Lowe playing in front of a gold lamé curtain in a green Riddler suit is well worth the babysitting money I paid for it.

Remastering producer: Gregg Geller. Remastering engineer: Vic Anesini/Sony Music Studios (NYC). Original recording credits at mixonline.com.

—Barbara Schultz

Live Earth: The Concerts for a Climate in Crisis (Warner Bros.)

If you didn't get a chance to attend, listen to, watch or find any other in a number of ways to check out the multi-city Live Earth concerts, then grab this CD/2-DVD package; the tracks (in bundled form) are also available from a number of digital retailers, including iTunes. The CD showcases great performances of mainly hit songs from from Smashing Pumpkins, John Mayer, Metallica, Rihanna and more. I only wish that the powers that be had chosen more adventurous tracks from each artist. Was "Wanted Dead or Alive" the most interesting Bon Jovi performance to choose? Or "Intergalactic" from the Beastie Boys? But, overall, it's a great collection for a great cause.

Mixers: Stuart Price, Tim Summerhayes, Jay Vicari, Serban Ghenea, James Guthrie, Guy Charbonneau, Peter Cobbin, Obie Obrien, Beastie Boys and Jon Weiner. Mastering: Bob Ludwig/Gateway. More credits at mixonline.com.

—Sarah Benzuly

moe.

Sticks and Stones (Fatboy)

The jam band moe. are on a roll. Their last three CDs—*Wormwood*, *The Conch* and now this one—all corral some of the group's legendary live power, while also showing real record-making craft. There are hooks galore, well-rendered harmonies, typically great guitar interplay…and tons of energy. This time, the band wrote most of the songs in the studio, so the tunes haven't gone through their usual live evolution. The result is more-concise (10 songs in 40 minutes!), but they're not stiff; they feel fully realized. There's also lots of variety: riff-heavy rock, the sumptuous ballad "September," the anthemic "Raise a Glass," and my favorite this time out: an instrumental called "Zed Naught Z" that sounds like Zappa-meets-Quicksilver but is unmistakably moe.

Produced by moe. and John Siket. Engineer/mixer: John Siket. Recorded at The Cathedral (North Egremont, MA). Additional recording at The Magic Shop (NYC). Mixed at Allaire Studios (Shokan, NY). Mastering: Bob Ludwig/Gateway. *—Blair Jackson*

Bob Mould

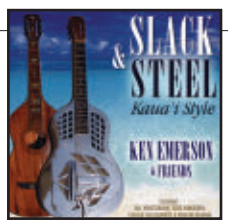
District Line (Anti)

Before Eddie Vedder there was Bob Mould, and the former Hüsker Dü and Sugar frontman is still a powerful voice for thinking-people's rock. In his new album, *District Line*, Mould waxes poetic about growing older, but as always, he musically attacks his subject with passion and power. A couple of songs have semi-danceable grooves and some moderately processed vocals, but there's no big budget or big production here. Mould recorded much of this self-produced album in a converted warehouse using a mobile rig, and the keys to his sound remain his hard-strumming guitar and deep voice. As he's done for nearly three decades, this singer/songwriter can still make college kids stand at attention.

Producer: Mould. Recording engineers: Frank Marchand and Brendan Canty. Mixer: Mould. Studios: Granary Music and Blindspot (Washington, D.C.), Waterford Digital, (Millersville, MD). Mastering: Jim Wilson/Airshow (Boulder, CO). *—Barbara Schultz*

Ken Emerson & Friends

Slack & Steel Kauai Style (Cord International/ Hana-Ola/)



Even if I weren't hopelessly in love with the island of Kauai, I'd still think this is one of the best Hawaiian albums I've heard in a couple of years. A master of slack key and Hawaiian steel styles, Emerson and his friends (including guitarist/bassist Pancho Graham, blues harpist Charlie Musselwhite, Kauai residents Todd Rundgren and Grateful Dead percussionist Bill Kreutzmann) roll through a set of recent originals and Hawaiian tunes spanning more than a century. Then, there's Bob Marley's "Small Axe," Santo & Johnny's "Sleepwalk" and the theme from the surf classic *Endless Summer*. The guitars shimmer like the sun on Kilihiwai Bay, the mood is relaxed as a family luau, and all is well in this idyllic world.

Producers: Michael Cord, Ken Emerson. Engineers: Emerson, Ron Pendragon, Harry Gale, John Hawthorne, David Jenkins. Studios: Treble in Paradise, Hi Fat Tuesday, Tin Roof, Rockville, Dave's Sound Lab, Route 44. Mastering: Lee Herschberg. *—Blair Jackson*

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L.A. GRAPEVINE

by Bud Scoppa

During the course of this rough-and-tumble decade, many record makers have been faced with the challenge of doing more with less. This month, we take a look at how a pair of cagey D.I.Y. veterans have turned limitations into strengths.

L.A. institution Mad Dog has nimbly done the tighten-up in reaction to a general belt-tightening among its clientele. Throughout its 28-year existence, the facility, founded and owned by producer/bass player Dusty Wakeman, has been a magnet for the roots-rock/alt-country community, from Dwight Yoakam and Lucinda Williams to John Doe and Peter Case, thanks to its plentitude of old-school gear and an atmosphere as comfortable as a pair of faded Levis 501s.

From left, Mad Dog studio manager Samur, owner Dusty Wakeman and staff producer/engineer Eric Corne.

Mad Dog has been at its present location in Burbank for the past decade-and-a-half, but two years ago Wakeman leased out Studios A and B long-term to a film composer and moved his gear into the big room, known as the Stage, which had previously been used for video shoots, rehearsals and pre-production.

Rather than framing out a separate control room, Wakeman decided to position his Neve 8088 board, Pro Tools HD system and racks of hardware in one corner of what is now a 2,500-square-foot tracking room, outfitted with movable baffles and a roomy iso booth. This setup is as organic as a professional recording studio gets—not only is a talkback button unnecessary, neither are headphones. It turns out that a lot of Mad Dog's loyal clients prefer recording face to face, without being separated by walls or windows.

"The experience is very immediate," says engineer/producer Samur, a recent M.I. graduate who started as an intern during the changeover and showed such aptitude and drive that Wakeman soon made him studio manager. "With no wall between you and the band, you can just stand up from behind the Neve and coach the musicians. The room has its own sound, it's really big and our clients love it. We're doing really well right now, and that's saying something, given the current climate."

Wakeman doubles as the president of Mojave, the condenser mic division of nearby Royer Microphones, and that connection has added a custom dimension to Mad Dog's requisite arsenal of vintage goodies, which includes UREI, Joemeek and PreSonus compressors; reverbs and delays from Lexicon, EMT, Eventide and Roland; equalizers from Lang, Summit, API and Krone-Hite; and mic pre's from Demeter, API, Neve and Hardy. "There's always a bunch of cool prototype tube mics here, all handmade by David Royer," says Samur, "and they're just awesome-sounding."

Mad Dog's appeal is three-fold, Samur offers. "We always keep indie bands' budgets in mind so that they get a good room at a good price. At the same time, we have every kind of gear you could imagine—tons of vintage organs and amps, a Yamaha grand piano. But, ultimately, it's about the vibe here. There are no egos or politics involved. It's like one big family—you're in this giant room together, making a record. So it's like a small club of really good friends who keep the studio going."

—CONTINUED ON PAGE 126

NASHVILLE SKYLINE

by Barbara Schultz

A couple of months ago, Omnisound Studios (www.omnisoundstudios.com) was acquired by Billy Austin's Platinum Pen company. The new owner has made good on his promise to keep the existing studio, gear and staff in place, including manager/former co-owner Steve Tveit. In fact, Austin also acquired the neighboring property originally built by MasterMix owner Hank Williams. That property—which has seen a couple of other owners since Williams moved to his current studio on Division Street—is now officially part of Omnisound Studios. "We've doubled in size," Tveit reports. "We have a *complex*. We just outfitted the rooms with new gear and kept the original build-out. The rooms themselves already sounded great." Most of the neighboring space comprises a new mix room, now centered around a Digidesign ICON.

For 20 years, Omnisound has remained the kind of mid-priced studio that supports the recording industry from above and below. Tveit and his staff offer front-to-back services for newer artists: hooking them up with songwriters, session musicians and technical personnel if needed, and offering recording packages that range from three-song demos to CD-length projects. Austin also owns an independent publishing company, which Tveit says will further expand the range of services he can offer.

The studio continues to be a favorite among established artists looking for high-end service and gear in a creative atmosphere. Most recently, country/bluegrass artist Dan Tyminski of *O Brother, Where Art Thou?* fame took advantage of the expanded facilities, tracking a new solo album for Rounder in Omnisound's API Legacy–centered Studio A and moving to the new ICON room for overdubs and mixing.

Omnisound is also celebrating a Grammy nomination for Miranda Lambert's single "Famous in a Small Town," from her sophomore release *Crazy Ex-Girlfriend*. Both of Lambert's studio albums for Sony were recorded in Studio A with producer Frank Lidell and engineer/mixer Mike Wrucke. "Miranda's production team have

become great friends of ours," Tveit says. "Mike has been a client of ours for years, and he and Frank had these amazing musicians coming in from all over the place. They hand-picked those musicians because they were really after a signature sound—to do something creative that doesn't sound like everything else coming out of Nashville. I think that's our strength as well: to foster a creative atmosphere.

Another memorable project created at Omnisound in '07 was the late Porter Wagoner's last album, *Wagonmaster*, produced by Marty Stuart and engineered by Joey Turner. That album was a fantastic labor of love, and Rick Clark wrote in depth about the production in Nashville Skyline exactly one year ago in this space.

Speaking of Rick Clark, "Nashville Skyline" readers may have been wondering about him for the past few months. After five years of writing this column, Rick (who can still be reached via e-mail at mrblurge@mac.com) has moved on to focus more of his considerable talents on producing music and supervising music for films. Peter Cooper will step into the job of "Nashville Skyline" columnist, beginning with our March issue. Cooper is a superb staff writer for the *Nashville Tennessean*, as well as a teacher and musician. Stay tuned. ■

Dan Tyminski looks on as engineer Neil Cappelino works on tracks on Tyminski's new solo album, recorded at Omnisound.

NEW YORK METRO

by David Weiss

Don't call them, they'll call you. Well, maybe the owners of the studios in this month's column aren't that exclusive, but they're not exactly beating the bushes for billable hours, either. Instead, they're happier operating under the radar for the clients who have figured out how to find them: no Websites, no publicity. Just recording.

At House of Loud in Elmwood Park, N.J, just across the George Washington Bridge not far from Manhattan, there is no question about the focus of the tightly knit production team that features John Bender, David Bendeth, Dan Corniff and Kato Khandwala. "The business model is that we're four guys that make rock records," says Khandwala. "If you want to make a rock record with us, this is where we do that."

Their facility is already booked straight through the end of 2008, and the group has worked with major-label acts Silvertide, Your Vegas and Red Jumpsuit Apparatus, plus they notched a 2008 Grammy nomination for their work on Paramore's album *RIOT!* But owning a studio was never the dream for the HOL crew; rather, taking ownership of their own facility became a necessity borne out of the constraints of the elite studio recording scene.

"We work in big studios, and we needed real rooms at the top-caliber commercial facilities available for 90 to 120 days per record," notes Corniff. "It was getting hard to book a room that long anywhere. Because these were long-term lockout projects, the scheduling became as much of a challenge as making the record."

Finally fed up with this scattered lifestyle, the men of HOL decided to settle down and make a nice, rockin' nest they could call their own. After shopping around the area, they found a former R&B artist's studio that met their square-footage requirements. Situated in a small commercial park, the House is anything but flashy on the outside, but within the sizable one-story complex the HOL foursome has everything they and their clients need to be creative, efficient and, yes, *loud*.

PHOTO: DAVID WEISS

In the House of Loud, L-R: David Bendeth, Kato Khandwala, Dan Corniff, and John Bender

In addition to multiple comfy lounges and truly classic videogames, they run two control rooms, the main one outfitted with an SSL 4056 G+ and the other with a 32x8 Allen & Heath board, while Steinberg Nuendo rules as the DAW of choice. "It was very simple: Every rock record that we like the sound of was mixed on the G," says Corniff of their console. "We prefer Nuendo because when it first came out, it was the only 96kHz DAW. A lot of the editing has much more advanced features, with a layout that is much easier to grasp. All of our records are very editing-intensive, and we can really fly around that program."

The centerpiece, however, is the 2,400-square-foot live room, where the checkerboard linoleum floor, foosball and dining table off to the side lend a relaxed informality. It's an instantly familiar atmosphere for rock musicians who have ever jammed in their parents' basement (so, approximately 99.99 percent).

"The band comes in and they do preproduction in the live room with a full P.A.," Khandwala explains. "They get comfortable there, and then they can immediately track the songs. Once the drums are done and finalized, with solid scratch guitar and bass parts, we can split out into three rooms from that point. One room is doing guitar overdubs, another is doing bass and another is

—CONTINUED ON PAGE 126

MASTERING LAB MILESTONE

SAX AND COMPANY CELEBRATE 40 YEARS

If you work with Doug Sax on a project this year, be sure to wish him a happy anniversary. The Mastering Lab (www.masteringlab.com) is celebrating 40 years and counting, and Sax—who continues to be involved with both of his two studio locations—has a lot to be proud of.

"We were possibly the first independent mastering service in the country," Sax says. "When we opened in December 1967, all the record companies had their own mastering departments and very large studio complexes might have had a mastering group where they could cut lacquers, but we were arguably the first to go into this as specialists. When we started out, we couldn't get anybody to use us, but by the early '70s, you couldn't get into the place."

Back then, Sax and Co. kept the Hollywood studio open 24 hours a day, Monday through Saturday, to meet the needs of clients such as Pink Floyd, Steppenwolf, Three Dog Night, The Eagles, The Who, etc., etc. Today, Sax, Robert Hadley (who heads the Hollywood studio) and Sangwook "Sunny" Nam (who works with Sax in the newer surround facility in Ojai, near Santa Barbara) work somewhat more civilized hours, but the Lab's reputation for stellar work continues. When we spoke, Sax had just put the finishing touches on new albums by Jackson Browne and Sheryl Crow.

"Thirteen years ago, Bill Bottrell produced Sheryl Crow," Sax says, "and they are together again. I've always been a fan of Bottrell. My wife and I went to Mendocino on vacation, and I got in contact with him because he lives up there, and I wound up doing this album."

Hadley's impressive credit list includes Tim McGraw, Faith Hill, the Dixie Chicks, Diana Krall, Ryan Adams and Los Lobos. Nam, who worked as a mastering engineer in his native South Korea for five years before joining the Mastering Lab in 2005, has worked on projects for David Gilmour, Linda Ronstadt, Keith Urban, Patti Austin and others. The Mastering Lab also still holds the distinction of being the mastering studio whose projects have been awarded and nominated for the most engineering Grammys.

Mastering lab president and co-founder Doug Sax

Sax mostly works in the Ojai studio (profiled in December 2005 *Mix*), but he still travels to Hollywood for film clients and others who prefer to work there. He says that some aspects of his business have remained constant—the custom gear, the basic principles of making the best possible transfers, and using critical listening and good judgment—but he's willingly adjusted budgets to accommodate clients who record and mix in personal studios.

"I love working on home projects," Sax says. "We have two fixed rates for self-released albums. There's a package price if you're working with Sunny or Robert Hadley of $1,500, and for me it's $2,250. I love the fixed price, because if something needs more work I don't want someone who can't afford it to be sweating while I'm working, and I'm always going to put in as much time as it needs." —*Barbara Schultz*

BEHIND THE GLASS

VAMPIRES AT THE LODGE

LAZAR MASTERS INDIES

African-influenced indie band Vampire Weekend visited The Lodge (New York City), where studio founder/chief engineer Emily Lazar was mastering their debut album for XL Recordings. The album was recorded, mixed and produced by keyboardist Rostam Batmanglij in a variety of locations, including a radio station.

L-R, standing: Chris Baio (bass), Kris Chen (XL Recordings), Ezra Koenig (guitar/vocals), Rostam Batmanglij (keyboards/vocals), Emily Lazar (engineer). Seated: Christopher Tomson (drums), Joe LaPorta (assistant engineer).

STAR OF THE SEA

CLASSIC AT RETROMEDIA

Alternative rocker Nicole Atkins and her band The Sea recorded a version of The Mamas and The Papas' hit "Words of Love" at Retromedia Studios (Redbank, N.J.). Engineer/producer Paul Ritchie captured the track, which was slated to be included on a special release for the Barnes and Noble imprint.

Engineer/producer Paul Ritchie cheek to cheek with Nicole Atkins of The Sea

NEW ROOMS

TANGERINE OPENS
DESIGN BY STORYK

Tangerine Mastering owners Gene Holder (left) and Roger Johansen

Roger Johansen and Gene Holder are the proud owners of a new John Storyk–designed mastering studio in Weehawken, N.J. The lead mastering engineer will be Andreas K. Meyer (Joshua Bell, Yo Yo Ma). Gear includes an original Abbey Road EMI mastering chain, as well as processing gear from Pultec, Cinema and Universal Audio.

COMING SOON
AVRON'S NEW STUDIO

Neal Avron makes a call from his studio-to-be.

Delta H Design reports that the firm has designed a Hollywood studio for producer/engineer Neal Avron (Linkin Park, Fall Out Boy, Everclear). The facility, which will be situated on the second floor of a freestanding building, is still under construction (as you can see) and will incorporate Delta H's patented Zero Acoustics architecture.

TRACK SHEET

NORTHEAST

At **Avatar Studios** (NYC), **My Morning Jacket** spent a month in Studio A recording their upcoming album with producers **Jim James** and **Joe Chiccarelli** (who also engineered). **Rick Kwan** assisted. **Mick Guzauski** was in Studio B mixing a project by **Griffith Frank** with producer **David Frank** and assistant **Brian Montgomery**. Also in Studio B, engineer **Gary Chester** spent a week remixing the score of Sony Pictures' ***The Other Boleyn Girl*** for 5.1...**Allaire Studios** (Shokan, NY) took delivery of a Neve Air Montserrat console—one of only three ever built, and the only one currently installed in the U.S. Watch for David Weiss' in-depth story about the new board in next month's "New York Metro"...**Rocky Gallo** mixed music and voice tracks for a new **Sandra Bernhard** album on the SSL 9000J at **The Cutting Room** (NYC). Other projects at the studio include members of **Good Charlotte** writing in Studio B with engineer **Jeff Swart**, and Australian group **Scarlet Belle** working on their debut album with writer/producer **Heather Bright**...Trombonist **Fred Wesley** was in **Twain Recording** (West Milford, NJ) to record a new album for Columbia Music Japan. Twain owner **Bob Both** produced and engineered the sessions.

SOUTHEAST

The Lights Fluorescent were in **Catalyst Recording** (Charlotte, NC) recording their debut album, which was produced and engineered by **Rob Tavaglione**. The release was then mastered by **Dave Harris** at **Studio B** (also in Charlotte)...Recent sessions at **Audio Matters** (Kodak, TN) include artist **Robin Patrick** and **John Thomas** co-producing mixing and mastering sessions for Patrick's material with engineers **Trevor Reddick** and **Greg Huffman**; and **Lakieta Bagwell** tracking vocals for a contemporary Christian project with engineer Reddick...

MIDWEST

At **Elabs Multimedia** (Madison, WI), rockers **Nonpoint** mixed their live acoustic show for WJJO radio program *The Craft*, which was recorded by Elab's remote truck. **Randy Hawk** and **Jack LeTourneau** produced.

NORTHWEST

Producer/engineer **Steve Fisk** (Nirvana, Screaming Trees, Wedding Present) worked on the new album from **Mark Pickerel**, *Cody's Dream*, in **Philosophy of the World Studios** (Seattle, WA). The album is scheduled for a March release on Bloodshot Records...**Kevin Nettleingham** mastered releases for **Debra Huddleston**, **Ashen Relic**, **Vida Meets the Van** and others at **Nettleingham Audio** (Vancouver, WA).

Jay Baumgartner at the SSL 9000 console

NRG SESSIONS
NEW ALBUMS FROM P.O.D., WALLS OF JERICHO

Engineer Jay Baumgartner has been busy in Studio C at NRG Recording (North Hollywood). Recently completed projects include albums for P.O.D. and Walls of Jericho. Studio C is centered around an SSL 9000 console, Pro Tools HD and Dynaudio C4 monitors. Also key to Baumgartner's setup is LavryBlue A/D conversion.

SOUTHWEST

Kirk Franklin finished recording and mixing a new album at **Luminous Sound** (Dallas) with engineers **Tre Nagella** and **John Jazcsz**, and assistant **Grant Greene**...**Five Times August**'s new album, *Brighter Side* (out next month), was recorded at **Bass Propulsion Laboratories** (Dallas). **The Pipes Brothers** produced the release, which was mixed by **Andy Zulla** and later mastered by **Adam Ayan** at **Gateway** (Portland, ME).

SOUTHERN CALIFORNIA

At **Ollywood Studios** (Hollywood), **Rob Chiarelli** mixed the single "Desert Nights" for artist **Shaun LaBelle** and a new album for **Salvador Santana**. Both projects were produced by **Oliver Leiber**... **Christine Wu** recorded strings for **Jessie James**' forthcoming album at **A Family Affair Productions** (Calabasas). The tracks were produced and mixed by **Julian Bunetta**...**Solange Knowles** was in Studios A and B at **The Village** (L.A.) for a couple of days with producer **Chester French**. **Greg Morgenstein** engineered with assistance from **Brad Conrad**. Also in Studio A, **The Pogues**' frontman **Shane MacGowan** worked with producer **Hal Willner** and engineer **David Rideau**. **Brad Conrad** and **Jared Nugent** assisted. **Nick Lachey** was in Studio F with producer **David Eriksen** at the controls of the Digidesign ICON, assisted by Nugent. ■

Send session news to bschultz@mixonline.com.

L.A. GRAPEVINE FROM PAGE 122

Wakeman still spends as much time as possible at Mad Dog, swinging by to eat lunch and rap it down with the staff, as well as overseeing all the cues for TV commercials that are created there, but he hasn't produced a project at the studio since the changeover. Instead, he's put his trust in Samur, who has expanded the stylistic range of Mad Dog's clientele, which now includes underground hip hop, death metal and hard-rock acts. "There's a new generation at Mad Dog," he says. "We're attracting a hip, younger crowd and staying current with what's going on, but at the same time Dusty's whole circle of Americana artists are still coming and keeping the doors open.

"The projects vary from esoteric indie stuff to engineers who like working Abbey Road–style," Samur notes. Clients in recent months have included Craig Schumacher mixing Devotchka's next album, Poison's Bret Michaels filming a TV special, repeat customers The Bonedaddies, Mötley Crüe's Mick Mars and legendary producer Eddie Kramer (a longtime Mad Dog habitué—he does all his *Experience Hendrix* mixing there), who tracked and mixed an album with Leroy Powell. Looking ahead, Wakeman has been gearing up to record his first solo album—and he wouldn't think of cutting it anywhere else.

The tireless Samur also somehow manages to operate his own Seahorse Sound (www.seahorsesoundstudios.com) in San Bernardino, which he opened in the fall, making for 18-hour work days and one helluva daily commute. With the price of gas, he's just breaking even on the Mad Dog gig. "But you've gotta do what you love, do it now and do it all the time," he says. "I had to make a decision: Did I want to work as an assistant on big-time projects at a big studio and be able to throw names around, or did I want to make records that I felt good about being a part of? And I decided that it was better to be in a position to make a difference rather than being the weakest link in the chain. Mad Dog is a great studio, and I believe in it."

Greg Laswell recorded his brand-new Vanguard EP, *How the Day Sounds*, completely by himself, which is the way he's been operating since transitioning from a bandmember (Shillglen) to a solo artist in 1994.That's when he taught himself to make records as a sort of one-man band, coming up with the parts, playing and programming them, engineering, producing and mixing.

Mix and *Electronic Musician* served as Laswell's primary textbooks as he studied the ABCs of recording. "Those magazines were like porn to me," he says jokingly. The neophyte producer made his first solo album on a Roland 1680 16-track recorder, then he hunkered down and sold copiers for nine months to "go computer," as he calls it, "and I've never looked back." His digital palette presently includes a high-mileage Mac dual G4, MOTU Digital Performer, a 1296 interface and Apogee Big Ben clock. He also does some work in Propellerhead Reason and makes extensive use of an Electron PCN plug-in reverb. "It's a modest setup," he says, "but it's better to get a few really high-end things and learn the shit out of them than it is to get a bunch of low-grade stuff."

The seven-song EP follows Laswell's 2006 album, *Through Toledo*, his first for Vanguard. That record not only drew critical accolades, it also generated the opportunity to make money on the road while leading to song placements in TV series including *Shark*, *Smallville*, *One Tree Hill* and *Without a Trace*. Concurrently, he's continued to serve as producer/player/programmer on various indie projects. The combined income from these activities has allowed him to make a decent living.

As he's done ever since getting the bug, Laswell has used part of any extra income, as well as the recording advances from his label, to upgrade his rig. His most critical acquisition has been a Millennia Origin Twincom compressor/limiter. "I pretty much send everything through it—vocals, guitars, drums," he says. "There's a really great switch that you can flip on the left-hand side that makes everything magically sparkle."

He's also fallen in love with the drum-sample libraries of Drum Kit From Hell and, for the latest project, BFD. "I can play drums," he points out, "but I end up programming them most of the time because it's now extremely hard to detect that they're not real drums. On the EP, the drums are completely programmed using BFD, and then I just added some real tambourines, shakers and handclaps, which help to legitimize the tracks. It's the easiest thing you can do to make a track a lot better.

"On the EP, I did a bunch of the drum parts first," Laswell continues. "The drum part for 'Embrace Me' came right out of BFD, and I liked the drum part so much that I decided to write a song around it. I don't even really play on that song—I just hold down whole notes on the piano, get out of the way and let the drums take over."

Laswell conceived and executed the EP's title song in a sustained burst of inspiration, enabled by his trusty set of digital tools. "I stumbled across this little piano line that I liked and laid it down really quickly so I wouldn't forget it. Then I decided to put down a quick guitar part, too. At that point, it got a hold of me, to the point where I started singing a melody over it just so that I could remember it. So I sang my fake lyrics and I actually *liked* the fake lyrics, so I decided to finish the song right then and there. I got all the verses by looping them, came up with a chorus, went back and programmed the drums. I literally wrote it and recorded it simultaneously. That's one of the great things about a home studio—and GarageBand is a big part of the process because you can immediately listen back to an idea and get an objective view of it."

Laswell remains in his comfort zone with Digital Performer for both recording and mixing his projects, and he's been planning to pick up a top-of-the-line Mac to replace the G4, but he wasn't about to do so in the midst of recording the EP, knowing from bitter experience the perils of changing horses midstream. He's also getting into Logic after receiving an NFR copy from Apple. "It's an amazing program, and I'm thinking of using it next time around," he says.

In December, Laswell started work on his next full-length, once again commuting between his Hollywood apartment and the garage studio in Santa Ana he leased before cutting the EP; he decided to separate life and work when he moved up from San Diego six months ago. But work remains play for him on a fundamental level. "You have to love the process as much as the end result," he asserts. "If you don't love the process, you'll never get there because the process can be brutal." ■

Send news for "Grapevine" to bs7777@aol.com.

NEW YORK METRO FROM PAGE 123

doing vocals. We're all such a tight team that we know what the other is doing.

"This way, instead of the guitar player sitting around waiting for the bassist to do 10 songs, the guitarist can get going as soon as two songs are done," Khandwala continues. "So everybody gets a lot more up-time, and it allows for more time to experiment and pursue different directions."

After the overdubs, the intensive editing and assembly begins, with producer/executive producer Bendeth making changes and directing the other team members. After that, it's mix time on the SSL, everything comes together and a rock record is born.

If you're in a position to hire the House of Loud (and you know who you are), odds are great that you'll have a satisfied band that may very well leave the studio with a hit record. "I think you do much better

work when you're comfortable," Khandwala observes. "One comment we hear is that usually, at the end of the day, you just want to get out of the studio as fast as possible. Our bands never want to leave."

On the West Side, near the Port Authority, is one of Manhattan's music buildings, with floor after floor of compact rehearsal and recording studios. Some of these spaces are little more than dimly lit dungeons with a P.A., while others pull off creative environments with extremely good recording prospects. After years of experimentation and a dedication to mastering audio engineering, Peter Vassil's Gain Studios—with its focus on providing artists with an expert-yet-affordable pre-production studio—has evolved into a highly desirable facility.

"This is *not* a commercial studio," says Vassil. "I've always been an underground type of person. So if you've heard one of my recordings and loved it, and you become a friend of mine, I'll let you into my personal haven and let you in on the way I record. But I only want to do projects I'm interested in, so I don't publicize it and I don't have a card—it's strictly a word-of-mouth thing."

Dedicated early on to the art of hard-rock drumming, Vassil had zero interest in audio engineering for most of his life. Then one fateful day when he was working as a salesman at famed Manny's Music, Vassil happened to obtain a Tascam 4-track following a customer trade-in. Unexpectedly, he got nailed with the recording bug, kicking off an obsession with obtaining the best possible gear for capturing sounds in his music building room, first for his own band, Ruby Bullet (www.myspace.com/rubybullet), and now for a select clientele.

A decade later, he's outfitted the space with a pair of Neve 54 Series broadcast mixers, two tall racks of tasteful equipment that includes multiple Empirical Labs Distressors, Amek dual-compressor/limiter, CBS Laboratories limiters, vintage Langevin mic pre's and more. A host of Neumann microphones captures the action, and 1-inch tape machines are onhand, as well as Digidesign Pro Tools (piloted by mix engineer and co-conspirator Ben Arons), which was grudgingly added by Vassil, a self-admitted analog freak.

"Pre-production is so important," says Vassil, "but it's not stressed or valued as much as it used to be. I'd much rather have a band come in and hear what they sound like before they go into a room and spend big money on the clock. When a band uses a 4-track for pre-production, it's not a sharp enough microscope to tell them what they'll really sound like on a record. This is built to be the ultimate pre-production studio—actually, most bands decide to stay here and record the final product."

Vassil pays extra attention to the rhythm section when he works. "The bass track is just as important as the drums in the basic tracks, and I *never* record the drums without the bass together," he notes. "There has to be that connection that you can only get by playing in the same room. I would love to get the whole band live ultimately, but if I can't, I'll settle for bass and drums. This is the spine of my recording process."

Although offering consistently affordable rates might not make sense to economists, for Gain Studios, the creative independence everyone gains is, you know, priceless. "My loss is your gain," Vassil says jokingly. "I'm not into becoming a millionaire. I'm into breaking all the rules. I just want to get a vibe, and it's a very loose thing. Because expenses are low, we have a lot of freedom and time to capture something. So if you don't get it tonight, come back tomorrow night." ■

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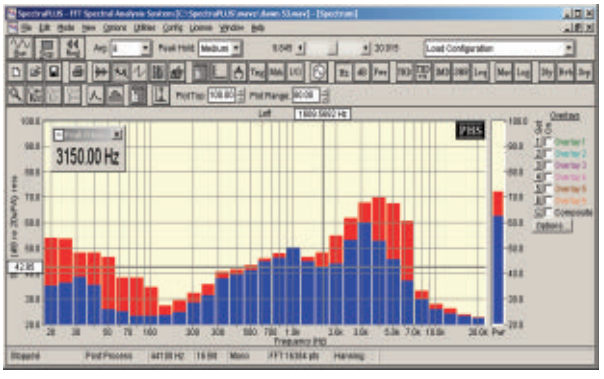

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A

B

C

The Revolver can hold two single width 500 series modules, or one double width module (C - shown with one Buzz Audio Elixir and one OSA MP1-L3) (B - Shown with one double width Buzz Essence Class A Opto compressor).

One Revolver is perfect for desktop usage (vertically - see B & C), or you may rackmount one, two, or three Revolvers using our custom 19" rack kits (A - shown above with 2 empty Revolvers racked horizontally).

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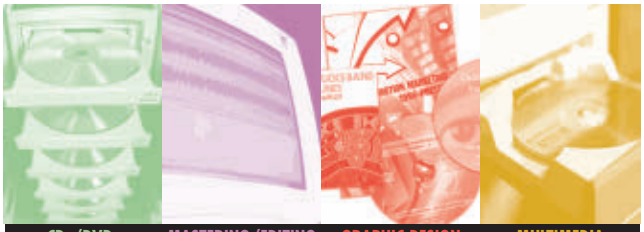

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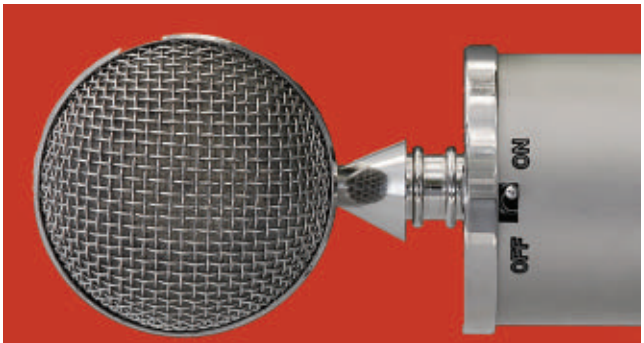

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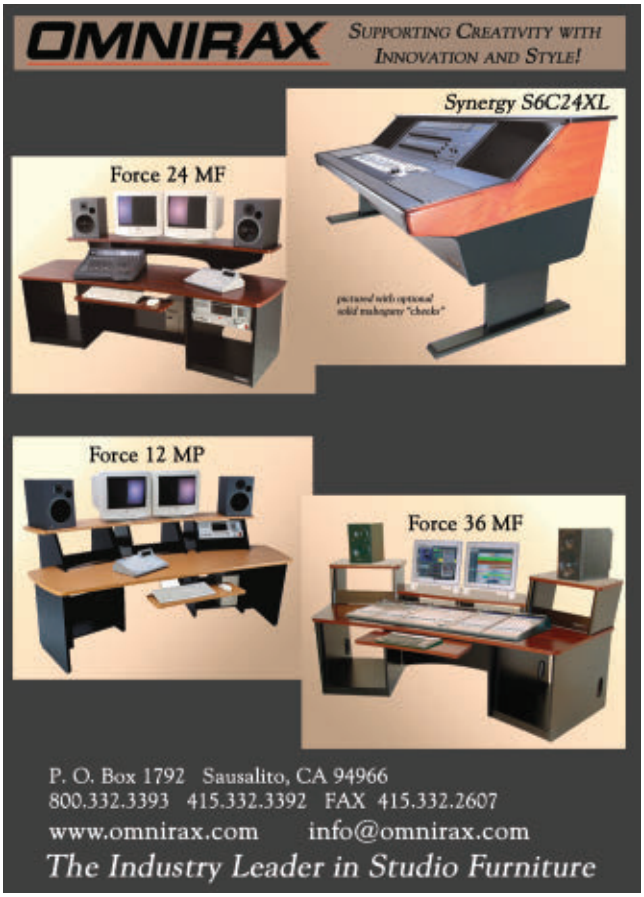
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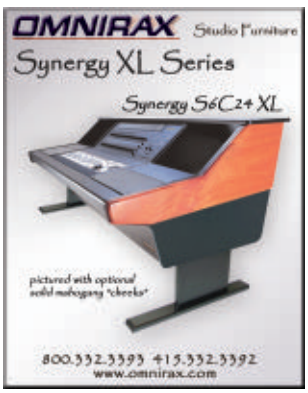

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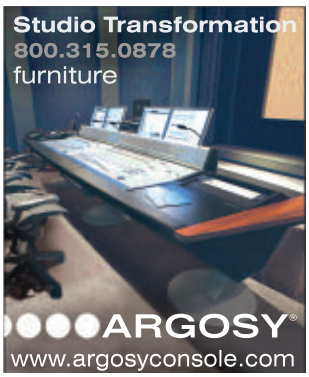

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Six stunning new plug-ins for Digital Performer: unparalleled spectral matching, linear-phase multi-band dynamics processing, super natural pitch correction/transposition, comprehensive analysis, 10-band paragraphic mastering EQ and high-quality gating – all at a breakthrough price.

Configure the MOTU Studio that's perfect for you

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Mackie HR824mk2
Active studio reference monitors

These high-resolution monitors sound as smooth as they look. The new Zero Edge Baffle™ minimizes diffraction for a crystal clear image and controls sound waves for wide, even dispersion. Acoustic Space, LF roll-off and HF controls let you tailor the sound to suit your MOTU studio space — and your taste.

Mackie Control Universal Pro
Automated control surface

The ultimate hands-on control for Digital Performer. Nine motorized, touch-sensitive Penny + Giles faders, eight V-Pots and more than 50 master buttons let you tweak to your heart's content. Apply the included custom overlay for Digital Performer for dedicated labeling of DP-specific functions.

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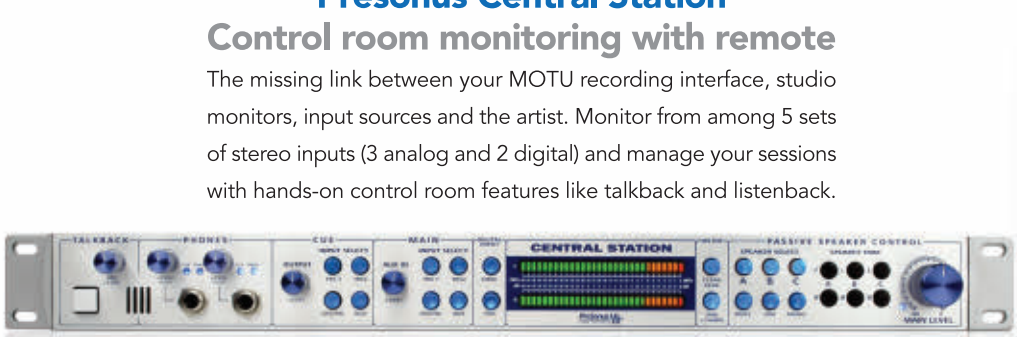

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BY STEVE MACMILLAN

Digidesign Pro Tools Elastic Time

Fast, Creative Multitrack Drum Editing, Manipulation

The star feature of Pro Tools Version 7.4 is Elastic Time (ET). Similar to MIDI, ET can conform audio data to changes in tempo or time. This is useful for fitting drum loops to a song's tempo or changing the tempo of your entire session, as well as adjusting vocal phrasing. Compared to Beat Detective, ET allows for larger tempo changes and does a better job of preserving the inside feel of hi-hats and snare ruffs without sounding choppy. ET also simplifies workflow using Groove Templates for quantizing—once you quantize your kit, you can still experiment.

GOING INTO WARP

When using ET, Pro Tools examines the audio and automatically places Analysis markers at the top of transient events. Generally, you should let Pro Tools automatically create Analysis markers. Timing changes within a region are accomplished with Warp markers, which are created automatically over Analysis markers when you quantize, or you can manually add them as needed. If you think of an ET region as a rubber band, then the Warp markers are the pins that anchor different parts of the region in time.

Creating Warp markers automatically often works well, but some spots may need manual adjustment; for example, if you want to quantize a certain hit that isn't the group's earliest marker (like a hi-hat beat that falls slightly in front of a kick drum when the kick should be on the grid) or when an automatic Analysis marker is slightly off.

To adjust markers manually, put the drum kit channels into Warp View mode and zoom in to see precisely how far the warped transients are from the grid. Use the Tab key to advance through the Warp markers and fix the ones that are in the wrong place. Then put Pro Tools into Grid mode (the Grid should match your quantize level) and select the Grabber tool. Tab to the next Warp marker—if it looks good, tab again; if not, you can move the Warp marker by hovering over it while holding the Control key. The cursor will then look like a little Warp marker with arrows on either side. Drag the Warp marker to the proper place and release. Then, if you hover over the Warp marker without holding Control, you will get a cursor that looks like arrows only. Drag the Warp marker onto the grid, press the Tab key and repeat.

The Elastic Properties window provides access to TCE parameters.

IN THE MODE

ET has four different real-time Time Compression and Expansion (TCE) algorithms, each suited for different applications. Use the Polyphonic mode for general instrument tracks; the Rhythmic mode for drums, loops and percussion; the Monophonic mode with mono voices and solo instruments; and Varispeed for analog tape deck VSO-style effects.

The Rhythmic Algorithm works by *not* stretching the transient just after an Analysis marker, and then crossfades into stretched audio until the next marker. This way, the transient is not smeared by the TCE. It also means that under certain circumstances, you can hear the transition to stretched audio. This effect is easy to hear on an open cymbal crash that occurs just before a breakdown section or at the end of a song. In such cases, separate the crash as its own region (across the group), and with the region selected open the Elastic Properties window (Option-5) and set source tempo to the current song tempo. (The TCE factor will change to 100 percent, which is not stretched.)

Both the Polyphonic and Rhythmic Algorithms have real-time adjustments for fine-tuning. With Elastic tracks, click the tab next to the ET plug-in selector to open a little plug-in that allows window-sized adjustment for Polyphonic mode and decay-time adjustment for Rhythmic mode. This Rhythmic decay adjustment can be important for spacious loops, but for acoustic drums the default setting works well.

FLIM FLAMS

Say the drummer you recorded plays his hi-hat part early relative to his side-stick beats across the snare rim. Here's a trick for removing an unwanted flam that precedes a hit that you have corrected. You can clean up most of these errant hits by first making sure the side-stick is warped onto the grid, then go into Slip mode, select from the top of the early hi-hat beat and hit Shift+Tab, highlighting to the top of the stick. Change to Waveform view and delete the selection. Switch back to Grid and Warp view, then use the Grabber tool to grab the right edge of the previous region before the separation and pull the edge over to where it snaps to the stick hit.

CPU SAVER

Elastic Time uses your computer's CPU to do its processing in real time. Rendering the audio can lighten the load. By choosing Rendered-Processing from the ET plug-in selector, the Elastic regions are written to a temporary folder and the green LED goes out on the Elastic plug-in tab. All of your Warp and Analysis markers stay intact and you can return to real-time mode simply by selecting Real-Time Processing. ■

Steve MacMillan is a mixer/engineer and has owned Pro Tools since V. 1. He has worked with Shania Twain, Seal, Rod Stewart, Toto and Kelly Clarkson. Visit him at www.macmandigital.com.

m802 8 channel remote control mic preamplifier

Our second generation remote control mic preamplifier combines absolute purist audio performance with a feature set simply unavailable with any other preamplifier design. With the stand alone remote control, up to eight m802s (64 channels) can be controlled from up to 1000' away, or directly from Digidesign® Pro Tools|HD® systems or any host computer via MIDI. Add the optional reference 24bit/192kHz A/D converter card, and the m802 becomes the complete input solution for even the most demanding recording applications.

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Why is the 8PRE more than just an interface?

Because it's two products in one.

16x12 FireWire audio interface with 8 mic inputs

As a 16-input, 12-output FireWire audio interface, the MOTU 8PRE delivers 8 mic inputs in one rack space, complete with five-segment level meters, phantom power switch, 20 dB pad switch and trim knob for each input. Now add eight more channels of ADAT optical digital I/O, even at 88.2 or 96 kHz. Top it off with separate main outs, MIDI I/O and on-board monitor mixing, and you can turn your Mac or PC into a complete desktop studio that records your entire band.

Mic pre to optical converter with 8 mic inputs

The 8PRE is really two products in one: it's a 16 x 12 FireWire audio interface, and it's also an analog-to-optical expander that converts 8 mic inputs to 8-channel optical. If you already own an interface or mixer with ADAT optical connectors, you can connect the 8PRE optically to add 8 mic inputs to your existing rig and seamlessly integrate them into your current mixing environment, with no extra strain on the FireWire bus. Two for the price of one: now that's value.

- FireWire audio interface for Mac & PC
- 8-channel mic input-to-optical converter
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- 96 kHz recording
- On-board CueMix DSP mixing
- 8 mic/line/instrument inputs
- Individual 48V phantom & 20 dB pad
- Individual front panel trim knobs
- 8 channels of optical I/O up to 96 kHz
- Main outs w/front panel volume knob
- Five-segment metering for mic inputs
- On-board SMPTE sync
- Sample-accurate MIDI
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- Mix & match with other interfaces
- Includes AudioDesk™ software for Mac
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